PHYLOGENETIC SYSTEMATICS OF SOUTH AMERICAN LIZARDS OF THE GENUS *STENOCERCUS* (SQUAMATA: IGUANIA)

By

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The Dissertation Committee for Omar Torres-Carvajal certifies that this is the approved version of the following dissertation:

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ABSTRACT

The South American iguanian lizard genus *Stenocercus* includes 58 species occurring mostly in the Andes and adjacent lowland areas from northern Venezuela and Colombia to central Argentina at elevations of 0–4000 m. Limited taxon or character sampling have characterized all previous phylogenetic analyses of *Stenocercus*, which has repeatedly been proposed as sister taxon to the *Tropidurus* Group. In this study, I use molecular and morphological data to (1) infer the phylogenetic relationships among most species of *Stenocercus*, (2) perform explicit statistical tests of previous phylogenetic hypotheses, and (3) infer the ancestral distribution of *Stenocercus*. Using parsimony and Bayesian analyses, monophyly of this genus is strongly supported with a dataset of 32 species of *Stenocercus*, 12 outgroup taxa, and 1641 bp of mtDNA. Molecular data also are used to analyze evolutionary relationships within *Stenocercus* with a Bayesian approach based on mixture models, which accommodate variability in the parameters of the rate matrix across sites. Morphological data were obtained from 55 species of *Stenocercus* and one outgroup taxon; polymorphic and continuous morphological characters were coded using step matrices with frequency parsimony and gap-weighting methods, respectively. Parsimony and Bayesian analyses were performed with a combined dataset of 55 ingroup taxa, one outgroup taxon, and 1764 characters. All analyses support a basal split of *Stenocercus* into two clades. When all 55 ingroup taxa are included, these clades are composed of 26 (clade A) and 29 (clade B) species. In general, species in clade A have small scales and granular scales on the posterior surface of thighs, whereas species in clade B have large scales and non-granular, imbricate scales on posterior surface of thighs. Clade A is restricted to the central Andes except for a few species occurring in the northern Andes in Ecuador and Colombia. Clade B is more widespread and includes species occurring in the northern, central, and southern Andes, as well as species in the Amazon Basin and lowlands in southeastern South America. A dispersal-vicariance analysis suggests that the most recent common ancestor of species of *Stenocercus* occurred in the central Andes. Four new species of *Stenocercus* are described from the northern Andes of Colombia, southern Andes of Ecuador, northern and central Andes of Peru, and Cerrado forest in Brazil. In addition, *S. torquatus* is resurrected and *S. variabilis* is redescribed.

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INTRODUCTION

The iguanian lizard genus *Stenocercus* is one of the most geographically and ecologically widespread reptile taxa currently ranked as a genus in South America. It includes 58 species that occur mostly in the Andes and adjacent lowland areas from northern Venezuela and Colombia to central Argentina at elevations of 0–4000 m (Fig. 1). Members of this genus occupy a variety of habitats such as dry and humid lowland tropical forests, montane forests, puna and paramo.

Systematic studies on *Stenocercus* (family Tropiduridae of Frost *et al.,* 2001a; Iguanidae of Macey *et al.,* 1997a; subfamily Tropidurinae, tribe Tropidurini of Schulte *et al.,* 2003) include mostly species descriptions and taxonomic revisions. Approximately one-third of the species of *Stenocercus* have been described after 1980 (Ayala and Castro, 1982; Corredor, 1983; Cadle, 1991, 1998, 2001; Avila-Pires, 1995; Torres-Carvajal, 2000, 2005a, b), and new species are still being discovered (this study). One of the main causes of this dramatic rate of increase in the number of known species is that collections are being made in previously unexplored areas throughout the Andes (e.g., Lehr, 2002). Another reason is that existing collections have not been carefully examined. Hence, it is very likely that a considerable number of new species will be described in the near future. Taxonomic revisions of those species occurring in Ecuador (Torres-Carvajal, 2000), northern Peru (Cadle, 1991, 1998), and Brazilian Amazonia (Avila-Pires, 1995) have been published. In contrast, there are only a few phylogenetic studies (e.g., Frost, 1992; Frost *et al.,* 2001b; Harvey and Gutberlet, 2000; Schulte *et al.,* 1998, 2003) including species of

Stenocercus. Moreover, except for one (Fritts, 1974), these studies include only up to four species of this genus.

More than three decades ago, Fritts (1974) published the first systematic study to include a phylogenetic analysis of species of *Stenocercus*. Following the quantitative phyletic algorithm of Kluge and Farris (1969), Fritts (1974) analyzed the phylogenetic relationships of 36 operational taxonomic units (OTUs) representing 19 species of *Stenocercus* based on morphological characters. Even though Fritts (1974) mentioned that 29 morphological characters were recorded from each specimen for statistical analyses, he did not specify how many of these characters were included in the phylogenetic analysis, nor did he provide a data matrix. Based on the resulting Wagner tree (Fig. 2), Fritts (1974) concluded that there are three major clades within *Stenocercus*. One major clade includes species from central Peru and Ecuador; the second major clade contains species with similar distribution than the previous clade except that it also includes species on the western slopes of the Andes in central and northern Peru; the third clade includes species from the Amazonian slopes of Peru and Bolivia (Fritts, 1974).

Etheridge and de Queiroz (1988) proposed that *Stenocercus*, *Ophryoessoides*, and *Proctotretus* form a monophyletic group, the *Stenocercus* Group, which they identified as the sister taxon of the *Tropidurus* Group (Fig. 3). This sister taxon relationship has been recovered repeatedly in subsequent studies (e.g., Frost, 1992; Frost and Etheridge, 1989; Frost *et al.,* 2001b; Schulte *et al.,* 2003). However, Etheridge and de Queiroz (1988) recognized that monophyly of the *Stenocercus*

Group was supported only by the presence of a “long” dentary. Furthermore, they mentioned that *Stenocercus* is likely paraphyletic because they found no single character or combination of characters to diagnose this genus relative to *Ophryoessoides* and *Proctotretus*. Frost and Etheridge (1989) found the *Stenocercus* Group to be weakly corroborated by secondary enlargement of the angular and extensive hemipenial sheath musculature. Their analysis inferred the monophyly of *Stenocercus* + *Tropidurus* Groups, which formed their Tropidurinae (Fig. 3). In a phylogenetic analysis of the *Tropidurus* Group, Frost (1992) proposed recognizing the groups as the tribes Tropidurini (*Tropidurus* Group) and Stenocercini (*Stenocercus* Group) within Tropidurinae. Additionally, Frost (1992) synonymized *Ophryoessoides* and *Proctotretus* with *Stenocercus* based on morphological evidence suggesting that *Ophryoessoides* and *Proctotretus* are derived from *Stenocercus* (Fig. 3).

CHAPTER I: PHYLOGENETIC RELATIONSHIPS AMONG SPECIES OF *STENOCERCUS* AS INFERRED FROM mtDNA SEQUENCE DATA

In this chapter I use mtDNA sequence data of 32 species of *Stenocercus* and 12 outgroup taxa to test for monophyly of *Stenocercus* under parsimony, likelihood, and Bayesian approaches. Then I examine the phylogenetic relationships among species of *Stenocercus* using mixture models (Pagel and Meade, 2004). This approach accommodates heterogeneity across sites in the rate matrix parameters by assigning more than one model to each site in the alignment. The individual likelihoods of the various models at each site are then summed, weighting the models by the probability that they apply to that site (Pagel and Meade 2004, 2005). Finally, I use parametric and non-parametric approaches to test previous phylogenetic hypotheses.

MATERIALS AND METHODS

Taxon sampling

I obtained new sequence data from 29 species of *Stenocercus* and used previously published sequences for three additional species of *Stenocercus*, six species of the *Tropidurus* Group, and six species from other iguanian clades. Voucher specimens of all ingroup taxa were examined to confirm their identities. All taxa were included in parsimony and Bayesian analyses to test for ingroup monophyly. Because of computational complexity, maximum likelihood and Bayesian analyses using mixture models were conducted with a reduced dataset containing all 32 species of

Stenocercus and *Microlophus atacamensis* as an outgroup. Taxon names, voucher numbers, collecting localities, and GenBank accession numbers are given in Table 1. Museum codes follow Leviton *et al.* (1985) except for Museo de Zoología, Pontificia Universidad Católica del Ecuador, Quito (QCAZ), Museum für Tierkunde Dresden, Germany (MTD; formerly abbreviated as MTKD, E. Lehr, pers. comm.), and Sección Zoología de Vertebrados, Facultad de Ciencias, Universidad de la República, Uruguay (ZVC).

Laboratory protocols

Genomic DNA was extracted from liver or muscle using the DNeasy Tissue Kit® (Qiagen, Inc.). Amplification of genomic DNA was conducted in a DNA Engine® (PTC-200™) Peltier Thermal Cycler (MJ Research) with a denaturation at 95 C for 30 s, annealing at 52 C for 30 s, and extension at 72 C for 150 s for 35 cycles. Negative controls were run on all amplifications to check for contamination. Amplified products were purified with either spin purification columns (Qiagen, Inc.) or AMPure® magnetic beads (Agencourt). Cycle-sequencing reactions were performed using ABI Prism Big Dye Terminator (Perkin-Elmer) chemistry with a denaturation at 96 C for 10 s, annealing at 50 C for 10 s, and extension at 60 C for 4 min for 35 cycles. Sequencing reactions were run on an ABI Prism 3100 Genetic Analyzer (Applied Biosystems). Editing and assembling of contigs was performed with SeqMan™ II 4.00 (DNASTAR, Inc.).

Sequences analyzed in this study include 1786 base pairs that extend from the protein-coding gene *ND1* (subunit one of NADH dehydrogenase) through the genes encoding $tRNA^{Ile}$, $tRNA^{Gln}$, $tRNA^{Met}$, ND2 (subunit two of NADH dehydrogenase), $tRNA^{Trp}$, $tRNA^{Ala}$, $tRNA^{Asn}$, the origin of light-strand replication, $tRNA^{Cys}$, $tRNA^{Tyr}$, to the protein-coding gene *COI* (subunit I of cytochrome c oxidase). PCR and sequencing primers used in this study are listed in Table 2.

Sequence alignment and phylogenetic analysis

DNA sequences were aligned in ClustalX 1.83 (Thompson *et al.,* 1997) with default gap costs. Sequences encoding tRNAs were manually adjusted to accommodate secondary structure based on standard tRNA models (Kumazawa and Nishida, 1993; Macey and Verma, 1997). Protein-coding sequences (i.e., ND1 and CO1 fragments, ND2) were translated to amino acids using MacClade 4.03 (Maddison and Maddison, 2001) for confirmation of alignment. Regions in which positional homology was ambiguous were excluded from the analysis. The molecular data matrix is presented in Appendix I.

I tested for monophyly of *Stenocercus* by performing maximum parsimony (MP) and Bayesian (BA) analyses with the complete dataset (i.e., 32 ingroup and 12 outgroup taxa). MP analyses were run in PAUP* 4.0b10 (Swofford, 2003) using a heuristic search with 10,000 random addition sequence replicates and tree bisection and reconnection (TBR) branch swapping. Support for individual nodes was assessed with non-parametric bootstrap resampling (MPB; Felsenstein, 1985) using 10,000 bootstrap replicates with 10 random addition sequence replicates each and tree bisection and reconnection (TBR) branch swapping. Decay indices (DEI; Bremer, 1994) also were calculated for all internal branches using TreeRot.v2c (Sorenson, 1999). Bayesian analyses were run in MrBayes 3.0b4 (Ronquist and Huelsenbeck, 2003) using the model selected by MrModeltest 2.2 (Nylander, 2005) under the Akaike information criterion (AIC). Herein, I prefer the model selected under the Akaike information criterion (AIC) because it has some advantages over traditional model selection using hierarchical likelihood-ratio tests (hLRTs). Some of the pitfalls of hLRTs are the (1) need for an arbitrary choice between sequential addition or removal of parameters, (2) election of parameter addition/removal order, and (3) inability to account for model selection uncertainty (Pol, 2004; Posada and Buckley, 2004; Sanderson and Kim, 2000). The AIC, as well as some Bayesian approaches (e.g., Bayes factors, Bayesian information criterion), avoid these problems because they (1) compare multiple nested or non-nested models simultaneously, (2) account for model selection uncertainty, and (3) permit model-averaged inference (Pol, 2004; Posada and Buckley, 2004). To reduce the chance of converging on a local optimum, four independent analyses were performed. Each analysis consisted of five million generations and four Markov chains with default heating values. Parameter values for the model were estimated from the data and initiated with flat priors. Trees were sampled every 1000 generations resulting in 5000 saved trees per analysis, of which 500 were discarded as “burn-in”. Stationarity was confirmed by plotting the –ln *L* per generation in the program Tracer 1.2 (Rambaut and Drummond, 2003). After confirming that the four analyses reached stationarity at a similar likelihood score and that the topologies were similar, the resultant 18,000 trees were used to calculate posterior probabilities (BPP) for each branch in a 50% majority-rule consensus tree.

To reduce computational time, I used a pruned dataset (i.e., excluding all but one outgroup taxon) to assess the statistical support for phylogenetic relationships among species of *Stenocercus*. I analyzed the pruned dataset in the computer program BayesPhylogenies under the mixture model approach (Pagel and Meade, 2004). Conventional likelihood ratio tests for model selection are not applicable in a Bayesian framework because they assume that parameter estimates are at their maximum likelihood values and MCMC methods sample the posterior density of parameters rather than finding maximum likelihood estimates (Pagel and Meade, 2005). Therefore, I based model selection on Bayes factors estimates. If we compare between models *a* and *b*, the Bayes factor (B_{ab}) is the ratio of the marginal likelihood (i.e., probability of the data given the model scaled by the model's prior probability and integrated over all parameter values) of model *a* to that of model *b* and represents a summary of the evidence provided by the data in favor of certain model (Kass and Raftery, 1995). However, computing the marginal likelihoods of the models is difficult to do. Here, I used Mathematica 5.1 (Wolfram Research, Inc.) to estimate the marginal likelihood of a model by computing the harmonic mean of the posteriors of the corresponding converged chain (Kass and Raftery, 1995; Raftery, 1996). Although the harmonic mean estimator can be unstable, it is accurate enough for interpretation on a logarithmic scale; $2\log B_{ab}$ values > 5 were considered to be strong evidence favoring one model over the other (Kass and Raftery, 1995; Pagel and Meade, 2004; Raftery, 1996). The Bayes factor penalizes more complex models by multiplying the likelihood of the data by the set of prior probability terms (usually numbers < 1) for each parameter, which results in a reduction of the marginal likelihood. By default, the program BayesPhylogenies assigns uniform priors on a 0–100 interval to the parameters of the evolution models, and all trees are considered equally likely a priori. I performed 12 MCMC runs with nQ and $nQ + \Gamma$ mixture models, where n varied between 1–6 independent rate matrices (Qs) and Γ represents a gamma-rates model with four rate categories. Each run consisted of two million generations and four Markov chains. Markov-chains were allowed to reach stationarity before sampling 100 trees at intervals of 10,000 generations. Stationarity was confirmed by plotting the $-\ln L$ per generation and checking for no average improvement in the likelihood scores. Thus, the means and averages presented for each model are based on 100 trees sampled from each run.

I also used the pruned dataset to perform a ML heuristic search in PAUP* 4.0b10 under a successive approximations approach, in which parameter estimation and tree-searching are alternated until the same tree is found in successive iterations (Swofford *et al.,* 1996). I first used the parameters estimated with Modeltest 3.06 (Posada and Crandall, 1998) to perform a heuristic search with 20 random addition sequence replicates and tree bisection and reconnection (TBR) branch swapping. The resultant ML tree was used to estimate new model parameters, which were used to initiate a subsequent ML heuristic search in PAUP*. This process was repeated until the same tree and likelihood scores were estimated successively. Support for individual nodes in ML trees was assessed with non-parametric bootstrapping (MLB) using PAUP* with 1000 pseudoreplicates, neighbor-joining starting trees, and TBR branch swapping. In addition, nodal support was assessed with Bayesian posterior probabilities following the protocol described for the complete dataset above.

Hypothesis testing

Alternative hypotheses were evaluated with significance tests. The non-parametric Shimodaira-Hasegawa (SH) test evaluates whether conflicting topologies represent equally good explanations of the data (Goldman *et al.,* 2000; Shimodaira and Hasegawa, 1999). SH tests were performed in PAUP* with 100,000 RELL bootstrap replicates. The parametric bootstrap test determines the significance of differences between the competing hypotheses through Monte Carlo simulation of data sets (Goldman *et al.,* 2000; Hillis *et al.,* 1996; Huelsenbeck *et al.,* 1996). For each parametric test, 500 matrices were simulated with the Batch Architect Package (Maddison and Maddison, 2004a) in Mesquite 1.05 (Maddison and Maddison, 2004b). These matrices were simulated on the optimized constrained tree (i.e., null hypothesis) with parameters obtained from maximum likelihood analyses. For each simulated matrix, the difference in tree length (parsimony criterion) between the null and alternative hypothesis was calculated in PAUP*. The null hypothesis was then evaluated in Mesquite 1.05 using the 95% confidence interval obtained from the simulations. It was rejected if the observed difference in tree length was greater than 95% of the values for the simulated data sets.

RESULTS

Stenocercus monophyly

I excluded 145 bp from the final alignment for all analyses due to ambiguity of inferred homology among aligned DNA sequence sites. Of the remaining 1641 characters included in the complete molecular dataset (see above) 578 are constant, 898 are parsimony informative, and 1033 represent distinct site patterns. MP analyses yielded two equally most-parsimonious trees of 7048 steps each, with consistency and retention indices of 0.2648 and 0.3925, respectively. BA analyses were performed under the GTR + I + Γ model (Lanave *et al.* 1984, Tavaré 1986, Rodriguez *et al.* 1990), which identified 1033 unique site patterns. Likelihood scores of the 18000 sampled trees in the BA analysis varied between –29895 and –29837 (mean = –29860 ± 7.42); estimated parameters are as follows: α = 0.53–0.81, mean = 0.66 ± 0.04; proportion of invariant sites = 0.23–0.34, mean = 0.29 ± 0.02; substitution rates r(C↔T) = 1.75–7.10, mean = 3.54 ± 0.61, r(C↔G) = 0.08–0.63, mean = 0.26 ± 0.06, r(A↔T) = 0.27–1.17, mean = 0.57 ± 0.11, r(A↔G) = 2.71–8.01, mean = 4.57 ± 0.60, r(A↔C) = 0.21–1.08, mean = 0.54 ± 0.11, r(G↔T) was set to 1; base frequencies A = 0.37–0.45, mean = 0.41 ± 0.01, C = 0.31–0.37, mean = 0.34 ± 0.01, G = 0.05–0.07, mean = 0.06 ± 0.00, T = 0.17–0.22, mean = 0.19 ± 0.01.

Both MP and BA analyses strongly support the monophyly of *Stenocercus* (DEI = 46, MPB = 100, BPP = 1.00), the *Tropidurus Group* (DEI = 17, MPB = 98, BPP = 1.00), and the clade including these two taxa (DEI = 11, MPB = 92, BPP = 1.00). Although this pattern of relationships has been repeatedly suggested (e.g., Etheridge and de Queiroz, 1988; Frost, 1992; Frost *et al.*, 2001b; Harvey and Gutberlet, 2000; Schulte *et al.*, 2003), this is the first time that it is corroborated with a large sample of species of *Stenocercus* (Fig. 4). My results also support the hypothesis that former genera "*Ophryoessoides*" (i.e., *S. caducus*, S. *iridescens*, *S. limitaris*, *S. puyango*, and *S. scapularis* in this study) and "*Proctotretus*" (i.e., *S. azureus* and *S. doellojuradoi* in this study) are nested within *Stenocercus* (Etheridge and de Queiroz, 1988; Frost, 1992; Frost and Etheridge, 1989); therefore, I agree with Frost's (1992) designation of "*Ophryoessoides*" and "*Proctotretus*" as junior synonyms of *Stenocercus*.

Mixture models and model selection

The log-likelihood score of the gamma rate-heterogeneity model with one rate matrix ($1Q + \Gamma$) is about 2349 units better that the score of the model with only one rate matrix ($1Q$), indicating that there is a large component of rate-heterogeneity in the data (Fig. 5). However, the difference in log-likelihood scores decreased as the number of rate matrices increased; $6Q + \Gamma$ is only 35 units above $6Q$ (Fig. 5), which supports the idea that a mixture model allowing pattern-heterogeneity can mimic a model that includes gamma rate-heterogeneity (Pagel and Meade, 2004).

Furthermore, the model selected under the AIC was TVM + I + Γ confirming that there is rate-heterogeneity in the data. Therefore, models allowing only pattern-heterogeneity (i.e., 1–6Q) were not considered for tree estimation.

Based on interpretation of logarithmic Bayes factors (Raftery, 1996), models 1–6Q + Γ are very strongly supported (Table 3). However, model 6Q + Γ produces a large tree value and two rate matrices with very small weights (0.07 and 0.08), which indicate that a sixth rate matrix is inadequate for my dataset (Pagel and Meade, 2004). Small matrix weights were not obtained under other models.

The standard deviations of the estimated rate parameters are expected to increase abruptly as more rate matrices are included (Pagel and Meade, 2004). However, my data do not follow that pattern (Fig. 5), indicating that the standard deviations of estimated rates do not always increase as additional matrices are estimated. A large increase in the standard deviations is observed at three rate matrices (3Q), suggesting that the parameters of this model were not well estimated. At four and five rate matrices, the standard deviations resemble those obtained at two rate matrices (Fig. 5).

All the above observations justify a fifth rate matrix, but I prefer four rate matrices because the number of independent sites in the dataset is probably fewer than the total number of sites included in the analyses. If this is true, the differences in likelihood scores between models would be inflated and the Bayes factors overestimated. Given that the Bayes factor favoring a fifth matrix is modest (Table 3), the presence of some non-independent sites might be enough to decrease this Bayes factor value and reject a model with five rate matrices (Mark Pagel, pers. comm).

Phylogenetic relationships within Stenocercus

The phylogenetic relationships among species of *Stenocercus* were inferred using a taxon-reduced dataset (see Phylogenetic Analyses section above) containing 735 constant characters, 715 parsimony informative characters, and 854 distinct character patterns. A model with four rate matrices was selected for the mixture models approach (described above), whereas for the ML analysis the TVM + I + Γ model was selected with estimated parameters (final iteration of successive approximations) as follows: $\alpha = 0.77$; proportion of invariant sites = 0.36; substitution rates $r(C\leftrightarrow T) = 6.94$, $r(C\leftrightarrow G) = 0.21$, $r(A\leftrightarrow T) = 1.10$, $r(A\leftrightarrow G) = 6.94$, $r(A\leftrightarrow C) = 1.17$, $r(G\leftrightarrow T)$ was set to 1; base frequencies A = 0.37, C = 0.36, G = 0.08, T = 0.18.

Species of *Stenocercus* included in this study are nested within two major clades (Fig. 6). One of the clades is weakly supported (MLB = 72, BPP = 0.89) and includes 18 species from the Andes and lowlands of Argentina, Uruguay, Brazil, Bolivia, Peru, Ecuador, and Colombia, most of which form the clades ((*S. apurimacus*, *S. scapularis*), (*S. formosus*, *S. ochoai*)), MLB = 90, BPP = 1.00, and (((((*S. angel*, *S. guentheri*), *S. festae*), *S. chota*), *S. rhodomelas*), (*S. iridescens*, *S. puyango*)), MLB = 83, BPP = 0.97. The relationship of *S. caducus* and *S. roseiventris* to other *Stenocercus* is unclear; their sister taxon relationship suggested by the 4Q + Γ model (BPP = 0.98) was not supported by the ML tree obtained via successive approximations (MLB < 50, Fig. 6), or the MP tree (Fig. 4). On the other hand, there is strong support for a sister taxon relationship between *S. ornatus* and *S. percultus* (MLB = 100, BPP = 1.00), as well as two (the only ones sequenced) of the three species formerly included in "*Proctotretus*" (i.e., *S. azureus* and *S. doellojuradoi*; MLB = 100, BPP = 1.00). The position of *S. limitaris* is less clear, but it is probably included in a clade with *S. angel*, *S. guentheri*, *S. festae*, *S. chota*, *S. rhodomelas*, *S. iridescens*, *S. puyango*, *S. ornatus*, and *S. percultus* (MLP = 67, BPP = 0.93; Fig. 3). The second major clade within *Stenocercus* receives strong support (MLB = 95, BPP = 1.00) and includes 14 species from the Andes of Peru and Ecuador in four well supported clades (Fig. 6)— ((*S. empetrus*, *S. eunetopsis*), *S. imitator*), MLB = 61, BPP = 0.99; ((*S. crassicaudatus*, *S. torquatus*), (*S. humeralis*, *S. varius*)), MLB = 52, BPP = 0.95; (*S. latebrosus*, *S. melanopygus*, *S. orientalis*, *S. ornatissimus*, *S. stigmosus*), MLB = 100, BPP = 1.00; and (*S. boettgeri*, *S. cupreus*) (MLB = 99, BPP = 1.00). Those clades with strong support under the $4Q + \Gamma$ model were also inferred in the maximum parsimony analysis of the complete dataset (Fig. 4).

Tests of previous hypotheses

I compared the ML and Bayesian ($4Q + \Gamma$) trees against four alternative hypotheses listed below (Table 4). The $4Q + \Gamma$ tree was obtained by (1) computing a 50% majority-rule consensus tree of the 100 sampled trees and (2) optimizing branch lengths on this consensus tree using the same parameter models that were used to compute the ML tree. The same branch length optimization was performed on all alternative hypotheses before the tests.

1. Etheridge's 1970 (Peters and Donoso-Barros, 1970) *Stenocercus*.—Following Etheridge's 1970 key, I identified in my dataset 15 species of *Stenocercus*, which were constrained to form a monophyletic group (Fig. 7). This hypothesis was rejected with parametric bootstrapping, although the differences in parsimony tree lengths with the ML and $4Q + \Gamma$ trees were only 31 and 38 steps, respectively ($P < 0.012$; Table 4). The SH test failed to reject this hypothesis ($P = 0.551$; Table 4). Parametric bootstrap tests are prone to Type I error (Buckley, 2002), which might explain why this hypothesis of *Stenocercus* (sensu Etheridge) monophyly was rejected with parametric bootstrapping, but not with the SH test.
2. Etheridge's 1970 (Peters and Donoso-Barros, 1970) *Ophryoessoides*.—Etheridge (1966) recognized 17 species of *Ophryoessoides* after placing all South American species of *Leiocephalus* into *Ophryoessoides*. Of these, 14 species are currently recognized as valid species of *Stenocercus*. Following Etheridge's 1970 key, I identified in my dataset 15 species of *Ophryoessoides,* which were constrained to form a monophyletic group (Fig. 8). This hypothesis is congruent with our ML tree (Fig. 3A); therefore, it was not surprising that it could not be rejected with the SH test ($P = 0.960$; Table 4) or the parametric bootstrap test that used our ML tree as the alternative hypothesis ($P = 1.000$; Table 4). However, Etheridge's hypothesis was 7 steps

different in parsimony tree length from our $4Q + \Gamma$ tree, and was rejected with parametric bootstrapping when the $4Q + \Gamma$ tree was used as the alternative hypothesis (P < 0.012). Contrary to the topology of the ML tree (Fig. 3A), the position of *Stenocercus roseiventris, S. azureus,* and *S. doellojuradoi* in the $4Q + \Gamma$ tree makes *Ophryoessoides* sensu Etheridge (1966) paraphyletic (Fig. 3B). Etheridge included the former species in *Stenocercus* and the latter two species in *Proctotretus* (Peters and Donoso-Barros, 1970.)

3. Fritts' (1974) *Ophryoessoides*.—Following Fritts (1974), species of *Stenocercus* with enlarged head scales, keeled ventrals, and pairs of inscriptional ribs articulating midventrally were placed in *Ophryoessoides* until Frost (1992) synonymized *Ophryoessoides* with *Stenocercus.* According to Fritts' (1974) criteria, my dataset contains five species of *Ophryoessoides* (*S. caducus, S. iridescens, S. limitaris, S. puyango,* and *S. scapularis*), which were constrained to be monophyletic in the hypothesis tests (Fig. 9). This hypothesis was rejected with parametric bootstrap (P < 0.012; Table 4) and SH (P < 0.05; Table 4) tests. The differences in parsimony tree lengths with our ML and $4Q + \Gamma$ trees were 42 and 49, respectively.
4. Fritts' (1974) *Stenocercus*.—Fritts (1974) also performed the first phylogenetic analysis of *Stenocercus,* including 19 species and probably 29 morphological characters. (Fritts [1974] used 29 characters for taxonomic accounts of *Stenocercus,* but he did not specify how many characters he included in the phylogenetic analysis.) The resulting phylogenetic tree

contained three major lineages (Fig. 2), none of which correspond to any of the lineages found in the present study. My dataset includes only 12 of the 19 species from Fritts' (1974) hypothesis; therefore, I constructed the constrained tree by pruning Fritts' tree (Fig. 2) to exclude the seven species for which I lacked DNA sequence data (Fig. 10). This hypothesis was strongly rejected with parametric bootstrap ($P < 0.012$; Table 4) and SH ($P < 0.05$; Table 4) tests. The differences in parsimony tree lengths with the ML and $4Q + \Gamma$ trees were 169 and 176, respectively.

DISCUSSION

This is the first phylogenetic analysis of *Stenocercus* that includes more than half (32 of 58) of its currently recognized species including the ones described in this study (i.e., *S. frittsi, S. puyango, S. santander, S. sinesaccus)*. Previous molecular analyses have used no more than four *Stenocercus* species either as taxonomic outgroups or as representatives of the clade containing the *Tropidurus* Group and *Stenocercus* (e.g., Frost, 1992; Frost *et al.,* 2001b; Harvey and Gutberlet, 2000; Schulte *et al.,* 1998, 2003). I found evidence that *Stenocercus* is the sister taxon to the *Tropidurus* Group as proposed by many authors (e.g., Etheridge and de Queiroz, 1988; Frost, 1992; Frost *et al.,* 2001; Harvey and Gutberlet, 2000; Schulte *et al.,* 2003). My results also support the hypothesis that "*Ophryoessoides*" and "*Proctotretus*" are included within *Stenocercus* (Etheridge and de Queiroz, 1988; Frost, 1992). Furthermore, parametric and non-parametric statistical tests strongly reject monophyly of "*Ophryoessoides*" as defined by Fritts (1974, see also Cadle, 2001), which was already suspected by the distribution of some morphological characters (Frost, 1992; Torres-Carvajal, 2005a) used to diagnose that genus (Fritts, 1974). Even though my dataset included only five of Fritts' "*Ophryoessoides*" species, they are clearly separated in different clades; therefore, it is unlikely that inclusion of the remaining species will lead to the inference of a monophyletic "*Ophryoessoides*". On the other hand, all species of "*Ophryoessoides*" as defined by Etheridge (in Peters and Donoso-Barros, 1970) are included in one of the main clades of my tree. However, I prefer not to name this clade *Ophryoessoides* at the present time because (1) it is not strongly supported (MLB = 72; BPP = 0.89), and (2) I do not know if it includes the type species of "*Ophryoessoides*" (i.e., *S. tricristatus)*.

The use of rate matrix mixture models in phylogenetic analyses of sequence data has been proposed to account for qualitative variability in the pattern of evolution across sites without prior knowledge of this variability (Pagel and Meade 2004, 2005). The expectation that the likelihood scores increase and reach a plateau as more rate matrices are added is supported by the results of this study (Fig. 5). However, these results do not follow the expected pattern of variation in standard deviation values of the estimated rate parameters. At three rate matrices, the average parameter standard deviation increases significantly, then decreases to a previous value (i.e., 2*Q*) with the addition of a fourth rate matrix (Fig. 5). This indicates that the standard deviations of the estimated parameters do not necessarily increase with the addition of rate matrices. A second expectation is that one or more matrices will receive very small weights if they are added after sufficient rate matrices have been already estimated (Pagel and Meade, 2004). I obtained small weights for two matrices with the $6Q + \Gamma$ model, which indicates that the parameters of those two matrices were poorly estimated and addition of a sixth matrix was not appropriate. Another reason for not including a sixth rate matrix was that the tree length score (i.e., sum of all branch lengths) increased significantly (Table 3). Finally, Bayes factor estimates should be used carefully when selecting the model because they can be inflated if sites are not independent. A small amount of non-independent sites in my dataset (e.g., stems of tRNA genes) would probably be enough to obtain a Bayes factor estimate that rejects a model with five rate matrices. I recommend not selecting models supported by low Bayes factor values when non-independence of some sites is suspected.

The $4Q + \Gamma$ mixture model improves the likelihood score obtained under the traditional maximum likelihood heuristic search (i.e., $1Q + \Gamma + I$) by about 484 units (Table 3). This indicates that pattern-heterogeneity in the data has an important effect in phylogeny estimation. Mixture models can be implemented to detect both pattern-heterogeneity and rate-heterogeneity, which probably results in a more accurate estimation of the phylogeny. The advantage of a mixture model as applied here (i.e., probability of entire dataset given different rate matrices) over data partitioning (i.e., probability of each partition given some rate matrix) is that the former does not require prior knowledge on qualitative variability in the pattern of evolution across sites (Pagel and Meade, 2004). Simulation studies have demonstrated that mixture models retrieve correctly the signals of pattern-heterogeneity and outperform conventional data partitioning (Pagel and Meade, 2004).

CHAPTER II: PHYLOGENETIC RELATIONSHIPS AMONG SPECIES OF *STENOCERCUS* AS INFERRED FROM MORPHOLOGICAL AND COMBINED DATA

In this chapter I use morphological data of 55 species of *Stenocercus* (i.e., all species in this genus except *S. santander* sp. nov., *S. sinesaccus* sp. nov., and *S. tricristatus)* and *Microlophus occipitalis* (outgroup) to analyze phylogenetic relationships among species of *Stenocercus*. First, 91 unordered, discrete characters are analyzed under parsimony. Second, 17 continuous and 15 intraspecifically variable (i.e., polymorphic) characters are added to the dataset, which is again analyzed under parsimony. The continuous and polymorphic characters are analyzed with the step-matrix-gap-weighting and frequency parsimony methods, respectively. Finally, Bayesian and parsimony methods are used to analyze a combined dataset containing all morphological and molecular characters.

MATERIALS AND METHODS

Taxon sampling

Morphological data were obtained from 1957 specimens representing 55 species of *Stenocercus*, as well as *Microlophus occipitalis* (outgroup). Although not included in the analyses, some morphological data not available in the literature were observed in five species of the *Tropidurus* Group—*Microlophus stolzmanni, Plica*

plica, Tropidurus etheridgei, Uracentron azureum, and *Uranoscodon superciliosum*. This dataset includes all recognized species of *Stenocercus* including two new species described herein (*S. frittsi* and *S. puyango),* and one resurrected species (*S. torquatus).* Data on *S. tricristatus, S. sinesaccus* sp. nov., and *S. santander* sp. nov. are excluded from all analyses; specimens of the former species were not available for examination, whereas the latter two species were discovered too late to be included in these analyses. However, based on morphological similarity and geographic distribution, I predict that *S. tricristatus, S. sinesaccus* sp. nov., and *S. santander* sp. are sister taxa (or at least very closely related taxa) of *S. dumerilii, S. caducus,* and *S. erythrogaster*, respectively. Museum abbreviations follow Leviton *et al.* (1985) except for Fundación Herpetológica Gustavo Orcés, Quito, Ecuador (FHGO), Instituto Alexander von Humboldt, Villa de Leyva, Colombia (IND), Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogota, Colombia (ICN; formerly abbreviated as ICNMNH), Museo de Historia Natural de San Marcos, Lima, Peru (MHNSM), Museo de Historia Natural, Pontificia Universidad Javeriana, Bogota, Colombia (MUJ), Museo de Historia Natural, Universidad Industrial de Santander (UIS), Museo de Zoología, Pontificia Universidad Católica del Ecuador, Quito (QCAZ), Museum für Tierkunde Dresden, Germany (MTD; formerly abbreviated as MTKD, Fritz, 2002), Sección Zoología de Vertebrados, Facultad de Ciencias, Universidad de la República, Uruguay (ZVC), Museo de la Universidad del Azuay, Cuenca, Ecuador (UDAR). The morphological data matrix contains 91 discrete, 15 polymorphic and 17 continuous characters

(Appendix II). Fluid-preserved and osteological specimens examined are listed in Appendices III and IV, respectively.

Character descriptions

Osteology

1787. Nasal process of premaxilla (Frost, 1992; Character 5) (0) significantly narrower (i.e., < 50 %) than dentigerous portion; (1) as wide as, or broader than dentigerous portion, at least ventrally (Fig. 11). Among species examined, only *Stenocercus aculeatus* and *S. dumerilli* have premaxillae with relatively wide nasal processes; within the *Tropidurus* Group, this condition (State 1) is shared by *Plica*, *Strobilurus, Uracentron* and *Uranoscodon* (Frost, 1992; Frost *et al.,* 2001b). Fixed.

1788. Anterolateral processes of frontal (Etheridge, 1964) (0) exposed; (1) completely covered by nasals and/or prefrontals (Fig. 12). Anterolateral processes of frontal are covered (State 1) in *Stenocercus apurimacus, S. azureus, S. caducus, S. cupreus, S. doellojuradoi, S. nigromaculatus, S. pectinatus, S. praeornatus,* as well as *Microlophus occipitalis, M. stolzmanni,* and *Tropidurus etheridgei*. All other species of *Stenocercus* share State 0 with *Plica plica, Uracentron azureum,* and *Uranoscodon superciliosus*. Fixed.

1789. Frontal-postorbital contact (Wiens and Reeder, 1997; Character 8) (0) absent; (1) present. Frontal contacts postorbital in *Stenocercus doellojuradoi*, *S. dumerilli*, *S. fimbriatus*, and *S. formosus*. Examined species in the *Tropidurus* Group share State 0 with remaining species of *Stenocercus*. Fixed.

1790. Anterodorsal postorbital process (Torres-Carvajal, 2003) (0) absent; (1) present. All species of *Stenocercus* examined in this study have an anterodorsal postorbital process (Fig. 13); this process is absent in examined species of the *Tropidurus* Group. Fixed.

1791. Posterior end of squamosal (Wiens and Reeder, 1997; Character 12) (0) articulates on or adjacent to dorsal crest of supratemporal process of parietal; (1) articulation more ventral (articulating with supratemporal). Among species of *Stenocercus* examined, *S. dumerilli* is unique in having the posterior end of the squamosal articulating with the parietal (State 0). All other species of *Stenocercus* share State 1 with species of the *Tropidurus* Group examined in this study. Fixed.

1792. Squamosal shape and skull width (Frost, 1992; Character 10) (0) squamosal relatively straight, posterior apex of supratemporal fossa forms an acute angle; (1) squamosal bone curved around posterior end of supratemporal fossa—posterior apex of supratemporal fossa forms smooth curve (Fig. 12). Among species examined, State 1 was observed only in *Stenocercus aculeatus* and *S. dumerilli*. This condition is shared with only the three species of *Plica* in the *Tropidurus* Group (Frost, 1992; Frost *et al.,* 2001b). Fixed.

1793. Squamosal and superior fossa of quadrate (modified from Frost, 1992; Character 11) (0) squamosal not penetrating fossa; (1) a process of the squamosal fitting into the fossa. Species of *Stenocercus* differ from species in the *Tropidurus*

Group by having a small process of the squamosal that penetrates the superior fossa of the quadrate (Frost, 1992; Frost *et al.,* 2001b). Fixed.

1794. Pterygoid teeth (0) absent; (1) present. Presence and number of pterygoid teeth in *Stenocercus* vary intraspecifically (e.g., Torres-Carvajal, 2002), which explains some contradictory data from the literature (see Cadle 1991 for a summary.) In this study, pterygoid teeth were observed in the outgroup and all species of *Stenocercus* except *S. crassicaudatus, S. humeralis, S. lache, S. praeornatus, S. scapularis,* and *S. varius*. Basal members of the *Tropidurus* Group and other outgroups have pterygoid teeth (Frost, 1992; Frost *et al.,* 2001b), which suggests that presence is the plesiomorphic state within *Stenocercus*. Polymorphic.

1795. Lingual coronoid process of dentary (Frost, 1992; Character 13) (0) overlapping anterior lingual process of coronoid; (1) not overlapping anterior lingual process of coronoid. Members of the *Tropidurus* Group have a dentary conspicuously overlapping the anterior lingual process of the coronoid (State 0; Frost, 1992; Frost *et al.,* 2001b); this condition is absent in all species of *Stenocercus* (State 1). Fixed.

1796. Second ceratobranchials (Wiens and Reeder, 1997; Character 25) (0) parallel through most of their length; (1) divergent through most of their length (Fig. 14). State 0 was observed in all species of *Stenocercus* examined except *S. doellojuradoi, S. fimbriatus, S. lache,* and *S. pectinatus*. Fixed.

1797. Posterior process of interclavicle (Frost, 1992; Character 27) (0) “free” part of process short, < 25% of total length of sternum; (1) “free” part of process long, > 25% of total length of sternum (Fig. 15). All species of *Stenocercus* have interclavicles with long posterior processes (State 1). Among iguanian lizards, only the *Tropidurus* Group and Phrynosomatidae have interclavicles with relatively short posterior processes (State 0; Frost, 1992; Frost *et al.,* 2001b). Fixed.

1798. Interclavicle median process (Etheridge, 1964) (0) not extending posteriorly beyond lateral corners of sternum; (1) extending posteriorly well beyond the lateral corners of the sternum (Fig. 15). Species of *Stenocercus* examined have long interclavicle median processes (State 1). Except for *Tropidurus bogerti*, *T. spinulosus*, and *Uracentron azureum*, species in the *Tropidurus* Group have short processes (State 0; Frost, 1992; Frost *et al.,* 2001b). Fixed.

1799. Scapular fenestra (Lécuru, 1968) (0) present; (1) absent (Fig. 16). Some species of *Stenocercus* have a scapular fenestra (e.g., *S. aculeatus*, *S. festae, S. lache, S. ochoai, S. pectinatus),* whereas other species lack it (e.g., *S. crassicaudatus, S. humeralis*, *S. imitator, S. melanopygus, S. puyango)*. A scapular fenestra is present (State 0) in all members of the *Tropidurus* Group except *Tapinurus semitaeniatus*, although this fenestra is very small in *Tropidurus bogerti, T. callathelys, T. guarani, T. melanopleurus, T. spinulosus,* and *T. xanthochilus* (Frost, 1992; Frost *et al.,* 2001b). Fixed.

1800. Sternal fontanelle (0) small, only slightly wider than the posterior process of the interclavicle; (1) large, much wider than the posterior process of the interclavicle (Fig. 15). The sternal fontanelle is small (State 0) in *Microlophus occipitalis, M. stolzmanni, Tropidurus etheridgei* and some species of *Stenocercus*, such as *S. aculeatus, S. azureus, S. caducus, S. ornatus,* and *S. trachycephalus*. Other species of *Stenocercus* (e.g., *S. boettgeri, S. crassicaudatus, S. imitator, S. roseiventris, S. varius*) and *Plica plica* have a large sternal fontanelle (State 1). Fixed.

1801. Postxiphisternal inscriptional ribs (Etheridge, 1965; Torres-Carvajal, 2004) (0) not in contact medially; (1) articulating medially (Fig. 17). The postxiphisternal inscriptional ribs do not articulate midventrally (State 0) in species of the *Tropidurus* Group and most species of *Stenocercus* examined except *S. aculeatus, S. caducus, S. erythrogaster, S. fimbriatus, S. huancabambae, S. iridescens, S. limitaris, S. prionotus, S. santander,* and *S. sinesaccus*. Fixed.

1802. Medial centrale: (0) present; (1) absent (Fig. 18). *Stenocercus lache* is the only species in the genus that lacks a medial centrale. In the *Tropidurus* Group, this bone is lacking in all species east of the Andes except *Uranoscodon* (Frost, 1992). Fixed.

1803. Number of phalanges in Finger IV (0) five; (1) four. State 1 is unique to *S. pectinatus*. Members of the *Tropidurus* Group have five phalanges in Finger IV. Fixed.

1804. Number of distal tarsals (0) three; (1) two. In those species with three distal tarsals (e.g., *S. carrioni, S. ochoai, S. praeornatus, S. rhodomelas, S. scapularis)*, one of the elements lies approximately between the proximal ends of metatarsals I and II and is visible in ventral view. Two distal tarsals (State 1) were observed in *Stenocercus angel, S. boettgeri, S. bolivarensis, S. crassicaudatus, S. cupreus, S. dumerilii, S. empetrus, S. humeralis, S. varius,* and examined species of the *Tropidurus* Group. Fixed.

1805. Haemal spines (0) not expanded; (1) expanded in the proximo-distal plane (Fig. 19). Among species of *Stenocercus* examined, expanded haemal spines (State 1) were observed in *S. aculeatus, S. caducus, S. dumerilii, S. fimbriatus, S. huancabambae, S. imitator, S. percultus,* and *S. scapularis*. Haemal spines are not expanded (State 0) in the remaining species of *Stenocercus* and examined species of the *Tropidurus* Group (*Uracentron azureum* not examined). Fixed.

1806. Caudal fracture planes (Frost, 1992; Character 40) (0) present; (1) absent. The presence of caudal autotomy is considered primitive within iguanian lizards (Etheridge, 1967; Etheridge and de Queiroz, 1988). Among species of *Stenocercus*, only *S. dumerilli*, *S. scapularis*, and a new species from Brazil lack caudal fracture planes. All species in the *Tropidurus* Group except for *Uracentron* have caudal fracture planes (Frost, 1992). Fixed.

Squamation

1807. Surface of dorsal head scales (0) smooth or granular; (1) slightly keeled, wrinkled, or raised into small ridges; (2) strongly keeled (Fig. 20). This character refers to scales on fronto-nasal, parietal, postparietal, and occipital regions, which correspond to State 0 in some species (e.g., *S. apurimacus, S. chrysopygus, S. imitator, S. iridescens)* and State 1 in *Microlophus occipitalis* and other species of *Stenocercus* (e.g., *S. chota, S. erythrogaster, S. guentheri, S. rhodomelas)*. Prominently keeled dorsal head scales (State 2) were observed in *Stenocercus azureus, S. caducus, S. doellojuradoi, S. dumerilii, S. huancabambae, S. limitaris, S. pectinatus,* and *S. prionotus*. Fixed.

1808. Posterior dorsal head scales (0) small, occipitals, parietals, and postparietals broken into many scales; (1) large, distinct parietals, postparietals, and occipitals (Fig. 20). Large posterior head scales was considered one of the diagnostic characters of "*Ophryoessoides*" (Fritts, 1974), but it was not possible to decide whether these scales were large or small in some species without a more accurate definition of these character states (i.e., providing scale names). Posterior head scales in some species previously assigned to "*Ophryoessoides*" (e.g., *S. caducus, S. dumerilii)* are intermediate in size between other "*Ophryoessoides*" (e.g., *S. iridescens)* and some *Stenocercus* (e.g., *S. varius)* as defined by Fritts (1974). Large parietals, postparietals, and occipitals (State 1) were observed in *S. aculeatus, S. apurimacus, S. fimbriatus, S. huancabambae, S. iridescens, S.*

limitaris, and *S. puyango*. These scales are small or indistinct in *Microlophus occipitalis* and all other species of *Stenocercus* examined. Fixed.

1809. Interparietal (Frost, 1992; Character 67) (0) enlarged, larger than interorbital distance; (1) not enlarged, smaller than interorbital distance or absent. The *Stenocercus* Group differs from the *Tropidurus* Group in lacking an enlarged interparietal. Fixed.

1810. Interparietal cornea (0) absent; (1) present (Fig. 20). I propose this term instead of the traditional and misleading terms parietal eye, "third eye", or pineal organ to refer to that region of the interparietal scale that lies dorsal to the parietal eye and has been modified to form a cornea (Quay, 1979). The parietal eye (third eye) and the pineal organ (epiphysis) are two different but interrelated organs. In some reptiles (e.g., most iguanian lizards), the actual parietal eye is extracranial (i.e., lies dorsal to the skull roof) and is exposed to light through transparent and cornea-like modifications of adjacent integumentary tissue (Quay, 1979). All examined specimens of *Stenocercus aculeatus, S. bolivarensis, S. chlorostictus, S. crassicaudatus, S. cupreus, S. empetrus, S. eunetopsis, S. fimbriatus, S. formosus, S. frittsi, S. haenschi, S. humeralis, S. imitator, S. ivitus, S. marmoratus, S. nubicola, S. percultus, S. praeornatus, S. roseiventris, S. scapularis, S. simonsii, S. torquatus, S. variabilis* and *S. varius* lack a cornea on the interparietal scale. Polymorphic.

1811. Temporal scales between postoculars and ear opening (0) imbricate; (1) juxtaposed or granular (Fig. 21). Among species of *Stenocercus* examined, *S.*

boettgeri, S. bolivarensis, S. carrioni, S. chlorostictus, S. crassicaudatus, S. empetrus, S. humeralis, S. imitator, S. praeornatus, S. roseiventris, S. simonsii, S. torquatus, and *S. varius* have juxtaposed or granular temporals (State 1). All remaining species of *Stenocercus* and *Microlophus occipitalis* have imbricate temporal scales (State 0). Fixed.

1812. Temporal scales between postoculars and ear opening (0) keeled; (1) smooth (Fig. 21). In addition to the species with juxtaposed or granular temporals (see above), *Stenocercus chrysopygus, S. eunetopsis, S. melanopygus,* and *S. nubicola* have smooth temporals. Fixed.

1813. Enlarged angulate temporal (0) absent; (1) present, not projected; (2) present, dorsally projected (Fig. 21). Among species of *Stenocercus* examined, *S. aculeatus, S. caducus, S. dumerilii, S. huancabambae, S. prionotus,* and *S. scapularis* are unique in having dorsally projected angulate temporals (State 2). These scales are indistinct (State 0) in some species (e.g., *S. boettgeri, S. cupreus, S. imitator, S. varius)*, or enlarged but not projected (State 1, shared with *Microlophus occipitalis)* in others (e.g., *S. angel, S. doellojuradoi, S. iridescens, S. percultus)*. Fixed.

1814. Posterior supraciliary (0) not enlarged or projected; (1) enlarged, projected (Fig. 22). *Stenocercus dumerilii* and *S. tricristatus* are unique among *Stenocercus* and the *Tropidurus* Group in having enlarged, projected posterior supraciliaries which contribute to the triangular shape of the head in lateral view (Avila-Pires, 1995). Fixed.

1815. Supraciliary scales (0) not or only weakly projected laterally; (1) projected laterally to form a lateral crest. Among species in the *Tropidurus* and *Stenocercus* Groups, *S. dumerilii*, *S. scapularis*, and *S. tricristatus* are unique in having supraciliaries that are strongly projected laterally. Fixed.

1816. Row of enlarged supraoculars (0) absent; (1) present (Fig. 20). A longitudinal row of 3–6 supraoculars that occupies most of the supraocular region. Each enlarged scale is at least 3–4 times as large as adjacent supraoculars. Within *Stenocercus,* there is a distinct row of enlarged supraoculars (State 1) in *S. aculeatus, S. erythrogaster, S. fimbriatus, S. haenschi, S. huancabambae, S. iridescens, S. limitaris, S. puyango,* and *S. scapularis*. This condition is shared with *Microlophus occipitalis*. Fixed.

1817. Maximum number of supraoculars between supraciliaries and frontals (Fig. 23). Meristic. Range of mean species values = 3.78–7.13.

1818. Number of canthals (0) one; (1) two (Fig. 23). Among species of *Stenocercus* examined, *S. aculeatus, S. caducus, S. fimbriatus, S. huancabambae, S. prionotus,* and *S. scapularis* are unique in having one canthal (State 0). State 1 is shared by *Microlophus occipitalis* with all other species of *Stenocercus*. Fixed.

1819. Subnasal-postrostral contact (Wiens and Reeder, 1997; Character 53) (0) absent; (1) present (Fig. 23). The subnasal is in contact with the postrostral in some or all specimens of all examined species of *Stenocercus* and *Microlophus occipitalis*. Polymorphic.

1820. Number of postrostrals (Fig. 23). Meristic. Range of mean species values = 4.00–6.57.

1821. Rostral-nasal contact (Wiens and Reeder, 1997; Character 54) (0) absent; (1) present (Fig. 23). Some specimens of species like *Stenocercus apurimacus, S. caducus, S. erythrogaster, S. latebrosus, S. ornatissimus* have the rostral in contact with the nasal (State 1). This condition is shared by one of the four examined specimens of *Microlophus occipitalis* (KU 142717). Polymorphic.

1822. Nostril position (0) medial to canthus; (1) lateral to canthus (Fig. 22). The nostril lies medial to the canthus (State 0) in members of the *Tropidurus* Group and most species of *Stenocercus* except *S. aculeatus*, *S. caducus, S. dumerilii,* and *S. prionotus*. Fixed.

1823. Nasal (0) about as broad as high; (1) elongated, about twice as broad as high (Fig. 22). An elongated nasal (State 1) is present in *Stenocercus fimbriatus* and all species with laterally oriented nostrils (Character 1822, State 1). Fixed.

1824. Number of internasals (Fig. 23). Meristic. Range of mean species values = 2.11–6.91.

1825. Minimum number of lorilabial scale rows (Wiens and Reeder, 1997; Character 89) (0) one row; (1) 2 rows (Fig. 23). A minimum of two longitudinal rows of lorilabials (State 1) is present in *Stenocercus dumerilli* and all species formerly assigned to *Proctoporus* (i.e., *S. azureus*, *S. doellojuradoi*, and *S. pectinatus).* All other species of *Stenocercus* share State 0 with examined species in the *Tropidurus* Group. Fixed.

1826. Maximum number of longitudinal scale rows between suboculars and supralabials (modified from Frost, 1992; Character 69) (0) one; (1) two (Fig. 23). Only those species formerly assigned to "*Proctotretus*" (i.e., *Stenocercus azureus, S. doellojuradoi,* and *S. pectinatus)* have up to two rows of lorilabials between the suboculars and supralabials. Among members of the *Tropidurus* Group, this condition is shared with *Plica*, *T. spinulosus*, and *Uranoscodon* (Frost, 1992). Fixed.

1827. Number of supralabials (Fig. 23). Meristic. Range of mean species values = 3.94–6.00.

1828. Number of loreals (scales between subnasal and preocular in contact with lorilabials; Fig. 23). Meristic. Range of mean species values = 1.93–4.59.

1829. Loreals and/or loreolabials (0) smooth; (1) keeled. *Stenocercus aculeatus, S. azureus, S. caducus, S. doellojuradoi, S. dumerilii, S. fimbriatus, S. pectinatus, S. prionotus,* and *S. scapularis* are unique among *Stenocercus* in having keeled loreals and/or lorilabials (State 1). Species examined in the *Tropidurus* Group share State 0 with the remaining species of *Stenocercus*. Fixed.

1830. Mental scale (Frost, 1992; Character 58) (0) reduced, not extending posteriorly well beyond level of adjacent infralabials; (1) enlarged, extending posteriorly well beyond level of adjacent infralabials. In most species of the *Tropidurus* and *Stenocercus* Groups the mental scale is much larger than adjacent infralabials. Similar to *Plica* and *Tropidurus spinulosus* (Frost, 1992), the mental is reduced in only three species of *Stenocercus* (*S. caducus*, *S. dumerilii*, and *S. prionotus)*. Fixed.

1831. Mental deeply indented by infralabials (Wiens and Reeder, 1997; Character 99) (0) no; (1) yes (Fig. 24). Among species examined in *Stenocercus* and the *Tropidurus* Group, *S. azureus, S. doellojuradoi, S. pectinatus,* and *S. stigmosus* are unique in having deeply indented infralabials. Fixed.

1832. Mental groove (0) absent; (1) present (Fig. 24). A median groove extending longitudinally from the posterior margin of the mental scale onto the anterior portion of the chin (State 1) is present in some species of *Stenocercus* (e.g., *S. boettgeri, S. carrioni, S. empetrus, S. imitator, S. marmoratus, S. torquatus)*. Other species (e.g., *S. chota, S. erythrogaster, S. iridescens, S. ivitus, S. lache, S. rhodomelas)* share State 0 with *Microlophus occipitalis*. Fixed.

1833. Mental-sublabial contact (Wiens and Reeder, 1997; Character 98) (0) absent; (1) present (Fig. 24). Among species examined in *Stenocercus* and the *Tropidurus* Group, only *S. azureus* and *S. pectinatus* have the mental in contact with the sublabials (State 1). Fixed.

1834. Third sublabial-second infralabial contact (0) absent; (1) present (Fig. 23). All specimens examined of *Stenocercus aculeatus, S. bolivarensis, S. caducus, S. haenschi,* and *S. prionotus* have the third sublabial in contact with the second infralabial (State 1). The converse (State 0 in all specimens) is shared by some species (e.g., *S. azureus, S. chrysopygus, S. cupreus, S. formosus)* and *Microlophus occipitalis*, whereas in other species this character varies intraspecifically (e.g., *S. crassicaudatus, S. festae, S. limitaris, S. orientalis)*. Polymorphic.

1835. Infralabials and sublabials (0) smooth; (1) keeled (Fig. 23). Among species of *Stenocercus* examined, only *S. azureus, S. caducus, S. dumerilii, S. pectinatus, S. prionotus,* and *S. scapularis* have keeled infralabials and sublabials. The remaining species share State 0 with *Microlophus occipitalis*. Fixed.

1836. Postmental series (Frost, 1992; Character 59) (0) well defined, very distinct from anterior gulars; (1) poorly defined, not distinguishable from adjacent gulars except for first pair (Fig. 24). Most species in the *Stenocercus* and *Tropidurus* Groups have distinct postmentals. These scales cannot be distinguished in *S. dumerilii*, *Strobilurus*, *Plica*, *Uranoscodon*, *Tropidurus spinulosus* and *T. melanopleurus* (Avila-Pires, 1995; Etheridge, 1968, 1970; Frost, 1992). Fixed.

1837. Postmentals (0) smooth; (1) keeled (Figs. 23, 24). Among species of *Stenocercus* examined, only *S. aculeatus, S. caducus, S. dumerilii, S. fimbriatus, S. prionotus,* and *S. scapularis* have keeled postmentals (State 1). All remaining species share State 0 with *Microlophus occipitalis*. Fixed.

1838. First pair of postmentals (0) separated by gulars; (1) in contact. All specimens of species like *Stenocercus chrysopygus, S. empetrus, S. formosus, S. huancabambae,* and *S. modestus* have the first pair of postmentals in contact (State 1). This character varies intraspecifically in other species of *Stenocercus* (e.g., *S. apurimacus, S. cupreus, S. frittsi, S. nigromaculatus, S. praeornatus)*, as well as in *Microlophus occipitalis*. Polymorphic.

1839. Anteriormost gulars between anterior chin shields (Wiens and Reeder, 1997; Character 103) (0) paired; (1) single. One gular between the anterior chin shields (State 1) was observed in all specimens of *Stenocercus aculeatus, S. ivitus, S. modestus*. Similarly, two anteriormost gulars were observed in all specimens of *S. chlorostictus, S. haenschi, S. nubicola,* and *Microlophus atacamensis*, although sample size of these four species was very small. Intraspecific variation of this character was observed in all remaining species of *Stenocercus.* Polymorphic.

1840. Lateral gular scales (Frost, 1992; Character 62) (0) imbricate laterally; (1) imbricate posteriorly. All species of *Stenocercus* have the lateral gular scales imbricate posteriorly. This condition is shared with only *Uracentron* and *T. bogerti* among taxa in the *Tropidurus* Group (Frost, 1992). Fixed.

1841. Gulars (0) cycloid, smooth, slightly imbricate; (1) rhomboidal, smooth or slightly keeled, imbricate; (2) projected posteriorly, strongly keeled, strongly imbricate (Fig. 24). Most species of *Stenocercus* have cycloid (e.g., *S. boettgeri, S. carrioni, S. empetrus, S. orientalis, S. stigmosus;* State 0) or rhomboidal (e.g., *S. angel, S. cupreus, S. guentheri, S. nigromaculatus, S. roseiventris;* State 1) gulars; State 1 is shared by *Microlophus occipitalis*. Strongly keeled, imbricate, and posteriorly projected gulars are present only in *S. aculeatus, S. azureus, S. caducus, S. dumerilii, S. huancabambae, S. iridescens, S. prionotus,* and *S. scapularis*. Fixed.

1842. Apical pits in gulars (0) absent; (1) present. Gulars have apical pits in most species of *Stenocercus* except *S. aculeatus, S. azureus, S. caducus, S. dumerilii, S.*

erythrogaster, S. fimbriatus, S. huancabambae, and *S. prionotus*. This condition (State 0) is shared by *Microlophus occipitalis*. Fixed.

1843. Posterior gulars (0) all unnotched; (1) some or all notched. Some gulars are notched in *Stenocercus apurimacus, S. chrysopygus, S. doellojuradoi, S. ivitus, S. melanopygus, S. modestus, S. orientalis, S. ornatissimus, S. pectinatus, S. rhodomelas,* and *S. stigmosus*. This condition (State 1) is shared by *Microlophus occipitalis*. Fixed.

1844. Number of gulars on an imaginary transverse line between ventral margins of ear openings. Meristic. Range of mean species values = 16.30–56.00.

1845. Preauricular fringe (modified from Frost, 1992; Character 71) (0) absent; (1) formed by projected granular scales; (2) formed by projected non-granular scales that partially or completely cover the ear opening (Fig. 21). The ear opening is partially covered in most species of the *Tropidurus* Group (Frost, 1992). Relative coverage of the ear opening by the preauricular fringe depends on the size of the scales forming the fringe, as well as the relative size of the ear opening. Most species with non-granular preauricular fringes (e.g., *Stenocercus lache, S. modestus, S. trachycephalus*; State 2) have approximately 50% of the ear openings covered by the fringe. However, the preauricular fringe covers most of the ear opening in some species with State 2 (e.g., *S. doellojuradoi*, *S. percultus)*. This variation in ear opening relative coverage was not coded. A prearicular fringe is absent in *S. aculeatus, S. dumerilii, S. fimbriatus, S. roseiventris,* and *S. scapularis*. Fixed.

1846. Lateral nuchals (Fritts, 1974) (0) same size as dorsal nuchals; (1) less than half the size of dorsal nuchals. The size of the lateral and dorsal nuchals is similar (State 0) in species like *Stenocercus aculeatus, S. crassicaudatus, S. doellojuradoi, S. iridescens, S. ornatus, S. trachycephalus*. Other species (e.g., *S. bolivarensis, S. cupreus, S. frittsi, S. marmoratus, S. ochoai, S. variabilis)* share State 1 with *Microlophus occipitalis*. Fixed.

1847. Lateral nuchals (0) granular; (1) smooth and imbricate; (2) keeled and imbricate. Most species of *Stenocercus* have granular (e.g., *S. carrioni, S. empetrus, S. humeralis, S. nubicola, S. praeornatus, S. varius;* State 0) or keeled and imbricate (e.g., *S. apurimacus, S. caducus, S. festae, S. ivitus, S. latebrosus, S. puyango;* State 2) lateral nuchals; the latter condition is shared by *Microlophus occipitalis*. Smooth and imbricate lateral nuchals (State 1) were observed only in *S. melanopygus* and *S. stigmosus*. Fixed.

1848. Dorsal nuchals (0) granular; (1) smooth and imbricate; (2) keeled and imbricate. Most species of *Stenocercus* have granular (e.g., *S. crassicaudatus, S. empetrus, S. torquatus, S. varius;* State 0) or keeled and imbricate (e.g., *S. dumerilii, S. guentheri, S. lache, S. rhodomelas;* State 2) dorsal nuchals; the latter state is shared by *Microlophus occipitalis*. Fixed.

1849. Laterals (Fritts, 1974) (0) same size as dorsals; (1) less than half the size of dorsals. Species like *Stenocercus erythrogaster, S. iridescens, S. latebrosus, S. modestus,* and *S. trachycephalus* have laterals and dorsals similar in size; this condition (State 0) is shared by *Microlophus occipitalis*. Laterals are less than half the size of dorsals (State 1) in other species, such as *S. bolivarensis, S. chlorostictus, S. frittsi, S. percultus,* and *S. simonsii*. Fixed.

1850. Lateral body scales (Frost, 1992; Character 74) (0) granular; (1) smooth or slightly keeled, imbricate; (2) strongly keeled, imbricate, keels not projected; (3) strongly keeled, imbricate, keels projected posteriorly. Fixed.

1851. Paravertebrals (i.e., 3–5 rows next to vertebral row on each side) (0) granular; (1) smooth or slightly keeled, imbricate; (2) strongly keeled, imbricate, keels not projected; (3) strongly keeled, imbricate, keels projected posteriorly. Fixed.

1852. Middorsal scale row (Etheridge and de Queiroz, 1988; Character 44) (0) absent; (1) present. I follow previous authors (Etheridge and de Queiroz, 1988; Frost, 1992) in considering all middorsal scale rows as homologous characters and not taking into account the degree of development of the scales forming the middorsal row (i.e., scale enlargement or projection). The relative size of the vertebral scales varies inter- and intraspecifically; this variation is continuous and too difficult to characterize. The middorsal row in *Stenocercus* (if present) is formed by enlarged and non-projected (*S. boettgeri)*, moderately projected (e.g., *S. guentheri)*, or strongly projected vertebral scales (e.g., *S. prionotus)*. In addition, the middorsal row is not continuous from the neck to the tail in a few species (e.g., *S. marmoratus)*. Species within the *Tropidurus* Group exhibit a similar variation pattern (Frost, 1992). Fixed.

1853. Dorsolateral crest (0) absent; (1) present. Among examined species of *Stenocercus,* a dorsolateral crest is present (State 1) in *S. aculeatus, S. azureus, S.*

dumerilii, S. fimbriatus, S. pectinatus, and *S. scapularis*. *Microlophus occipitalis* and other species of *Stenocercus* lack this crest (State 0). Fixed.

1854. Number of scales around midbody. Meristic. Range of mean species values = 35.17–116.96.

1855. Number of vertebrals (middorsal scales between occipitals and level of posterior edge of thigh extended perpendicular to the body). Meristic. Range of mean species values = 25.76–98.86.

1856. Number of paravertebrals (scales adjacent to vertebrals between occipitals and level of posterior edge of thigh extended perpendicular to the body). Meristic. Range of mean species values = 36.53–129.03.

1857. Ventral scales (modified from Frost, 1992; Character 76) (0) not keeled; (1) slightly keeled, not mucronate; (2) strongly keeled, mucronate. Within the *Tropidurus* Group, *Plica umbra* and *Uranoscodon superciliosus* are unique in having keeled ventral scales. This character was coded as 1 in those species of *Stenocercus* that lose the keels on ventral scales with age (e.g., *S. festae*, *S. iridescens)*. Fixed.

1858. Caudal notch on ventrals (Harvey and Gutberlet, 2000; Character 92) (0) absent; (1) present. Caudals are notched in *Stenocercus apurimacus, S. chota, S. cupreus, S. doellojuradoi, S. ivitus, S. melanopygus, S. modestus, S. orientalis, S. pectinatus,* and *S. rhodomelas;* this condition (State 1) is shared by *Microlophus occipitalis*. Fixed.

1859. Preanals (0) not projected; (1) posteriorly projected (Fig. 25). Unlike other species of *Stenocercus* with State 1 (i.e., *S. aculeatus, S. caducus, S. dumerilii, S. erythrogaster, S. fimbriatus, S. huancabambae, S. iridescens, S. limitaris, S. prionotus, S. puyango,* and *S. scapularis)*, preanals of species formerly assigned to *Proctotretus* (i.e., *S. azureus*, *S. doellojuradoi*, and *S. pectinatus)* form a denticulate border. Preanals are not projected (State 0) in *Microlophus occipitalis* and remaining species of *Stenocercus*. Fixed.

1860. Inguinal groove (0) absent; (1) present (Fig. 25). A ventral groove at the insertion of each hind limb is present in *Stenocercus boettgeri, S. bolivarensis, S. carrioni, S. chlorostictus, S. chrysopygus, S. crassicaudatus, S. cupreus, S. empetrus, S. eunetopsis, S. frittsi, S. haenschi, S. humeralis, S. imitator, S. marmoratus, S. praeornatus, S. roseiventris, S. simonsii, S. torquatus,* and *S. varius*. This groove is absent in *Microlophus occipitalis* and all other species of *Stenocercus*. Fixed.

1861. Distal margin of palmars (0) uniform, without projections; (1) tridentate. Most species of *Stenocercus* have palmars with tridentate distal margins (State 1) except *S. fimbriatus* and *S. scapularis*. State 1 is shared by *Microlophus occipitalis*. Fixed.

1862. Number of subdigital lamellae on manual digit IV (ventral scales from point of convergence of manual digits III and IV to terminus of digit IV). Meristic. Range of mean species values = 9.39–29.68.

1863. Distal margin of plantars (0) uniform, without projections; (1) tridentate. Most species of *Stenocercus* have plantars with tridentate distal margins (State 1) except *S. fimbriatus, S. haenschi,* and *S. scapularis*. State 1 is shared by *Microlophus occipitalis*. Fixed.

1864. Number of subdigital lamellae on pedal digit IV (ventral scales from point of convergence of digits III and IV to terminus of digit IV). Meristic. Range of mean species values = 19.48–37.38.

1865. Posterior thigh scales (Fritts, 1974) (0) not imbricate; (1) imbricate. The scales on the posterior surface of the thighs are not imbricate in some species of *Stenocercus* (e.g., *S. cupreus, S. humeralis, S. ivitus, S. melanopygus, stigmosus)* and imbricate in others (e.g., *S. aculeatus, S. festae, S. lache, S. roseiventris, S. trachycephalus)*; the latter condition (State 1) is shared by *Microlophus occipitalis*. Fixed.

1866. Posterior thigh scales (Fritts, 1974) (0) granular; (1) imbricate. In *Stenocercus,* the scales on the posterior surface of the thighs are granular (e.g., *S. bolivarensis, S. eunetopsis, S. varius)*, or imbricate (e.g., *S. angel, S. festae, S. ochoai).* The latter condition (State 1) is shared by *Microlophus occipitalis*. Fixed.

1867. Posterior thigh scales (0) same size as dorsal thigh scales; (1) less than half the size of dorsal thigh scales. Among examined species of *Stenocercus,* the posterior and the dorsal thigh scales are of similar size (e.g., *S. caducus, S. formosus, S. huancabambae, S. puyango)*, or the former are less than half the size of the latter (e.g., *S. apurimacus, S. chota, S. humeralis, S. rhodomelas)*. State 1 is shared by *Microlophus occipitalis.* Fixed.

1868. Row of enlarged, projected scales on posterodorsal aspect of thigh (Avila-Pires, 1995) (0) absent; (1) present. Among included species of *Stenocercus* and the *Tropidurus* Group, State 1 is unique to *S. fimbriatus*. Fixed.

1869. Caudal whorls per autotomic segment (0) none; (1) two; (2) three; (3) four. Among examined species of *Stenocercus, S. dumerilii, S. scapularis, S. sinesaccus,* and possibly *S. tricristatus* lack any identifiable caudal whorls (State 0). Most species have two (e.g., *S. carrioni, S. doellojuradoi, S. marmoratus;* State 1) or three (e.g., *S. apurimacus, S. erythrogaster, S. percultus;* State 2) whorls; *Microlophus occipitalis* shares the latter condition. *S. formosus* is unique in having more than three caudal whorls per autotomic segment (State 3). Fixed.

1870. Caudal scales (modified from Frost, 1992; Character 75) (0) without projected mucrons; (1) with moderate to strongly posterodorsally projected mucrons (Fig. 26). The relative size of the projected mucrons (State 1) varies continuously and was not taken into account because it is too difficult to characterize. Species with strongly projected mucrons forming conspicuous caudal spines include *S. bolivarensis*, *S. eunetopsis, S. marmoratus*, and *S. roseiventris.* Other species of *Stenocercus* share State 0 with *Microlophus occipitalis.* Fixed.

1871. Cross-section shape of tail in adult males (0) rounded or elliptical (= weakly compressed); (1) strongly compressed laterally. Among included species, *Stenocercus aculeatus, S. apurimacus, S. erythrogaster, S. huancabambae, S.*

iridescens, S. limitaris, S. ornatus, S. percultus, S. prionotus, S. puyango, S. rhodomelas, and *S. trachycephalus* have a strongly laterally compressed tail. The tail is rounded or elliptical in *Microlophus occipitalis* and remaining species of *Stenocercus.* Fixed.

Dermal folds and mite pockets

1872. Antehumeral fold (0) absent; (1) present (Fig. 27). When both the antehumeral and gular folds are present, *Stenocercus* differs from the *Tropidurus* Group in the arrangement of these two dermal folds (Frost, 1992). They are confluent with each other in the *Tropidurus* Group (e.g., *Microlophus occipitalis)*. However, the antehumeral fold (bordered by small scales) in *Stenocercus* (e.g., *S. crassicaudatus, S. frittsi, S. latebrosus, S. simonsii)* extends obliquely under the gular fold (bordered by large scales). Fixed.

1873. Gular fold (0) absent; (1) present (Figs. 24, 27). Similar to *Leiocephalus* and most species in the *Tropidurus* Group (e.g., *Microlophus occipitalis,* Frost, 1992), the gular fold is incomplete medially in those *Stenocercus* species that have one (e.g., *S. boettgeri, S. marmoratus, S. nubicola, S. torquatus)*. Fixed.

1874. Supra-auricular fold (Frost, 1992; Character 53) (0) absent or poorly developed; (1) present (Fig. 27). Within the *Tropidurus* Group, a distinct supra-auricular fold is present only in the *T. peruvianus* Group (Frost, 1992). Within *Stenocercus,* this fold is present in species like *S. bolivarensis, S. empetrus, S. imitator, S. roseiventris,* and *S. torquatus.* Fixed.

1875. Oblique neck fold (0) absent; (1) present (Fig. 27). This fold is present in species like *Stenocercus carrioni, S. cupreus, S. humeralis, S. praeornatus,* and *S. varius.* This condition (State 1) is shared by *Microlophus occipitalis.* Fixed.

1876. Antegular fold (modified from Frost, 1992; Character 47) (0) absent; (1) present, incomplete medially; (2) present, complete medially (Fig. 27). When present, this fold can be incomplete (e.g., *S. cupreus, S. frittsi, S. marmoratus)* or complete medially (e.g., *S. boettgeri, S. haenschi, S. torquatus).* Among species in the *Tropidurus* Group with antegular folds, *Plica* and *T. spinulosus* are unique in having an antegular fold that approaches or overlaps the gular fold (Frost, 1992; Character 47, State 2); this condition is not present in *Stenocercus*. The antegular fold is absent in *Microlophus occipitalis.* Fixed.

1877. Longitudinal neck fold (0) absent; (1) present (Fig. 27). This fold is present in species like *Stenocercus bolivarensis, S. humeralis, S. marmoratus, S. nubicola,* and *S. roseiventris.* Other species (e.g, *S. aculeatus, S. fimbriatus, S. guentheri, S. huancabambae, S. stigmosus)* and *Microlophus occipitalis* lack this fold. Fixed

1878. Postauricular fold (0) absent; (1) present (Fig. 27). This fold is present in species like *Stenocercus chlorostictus, S. imitator, S. praeornatus, S. simonsii,* and *S. variabilis.* Other species (e.g, *S. formosus, S. iridescens, S. ivitus, S. ornatus, S. scapularis)* and *Microlophus occipitalis* lack this fold. Fixed.

1879. Ventrolateral fold (0) absent; (1) present (Fig. 27). A distinct ventrolateral fold is present in species like *Stenocercus cupreus, S. empetrus, S. imitator, S.*

ochoai, and *S. simonsii*. Other species (e.g, *S. chota, S. doellojuradoi, S. festae, S. lache, S. pectinatus)* and *Microlophus occipitalis* lack this fold. Fixed.

1880. Inguinal granular pocket (Frost, 1992; Character 56) (0) absent; (1) present (Fig. 28). Some species in the *Tropidurus* Group have distinct inguinal granular mite pockets (Frost, 1992; Rodrigues, 1987). Within *Stenocercus*, some species have a short vertical fold covered by granular scales in this region (e.g., *S. boettgeri, S. crassicaudatus, S. marmoratus, S. varius)*. Although no mites have been observed near this structure in *Stenocercus*, I follow Frost (1992) in considering this fold as homologous with the inguinal pocket of the *Tropidurus* Group because they are similar structures that occur in the same topographic position. Fixed.

1881. Posthumeral or axillary pocket (Frost, 1992; Rodrigues, 1987) (0) absent; (1) one or more vertical folds; (2) shallow semicircular depression with wide opening; (3) deep depression with wide or narrow opening (Fig. 29). Conditions 1 and 2 were coded only from well preserved adult specimens. The vertical folds (e.g., *S. frittsi;* State 1) can be difficult to distinguish if the specimen is not well preserved. The shallow semicircular depressions (e.g., *S. guentheri;* State 2) are more evident in adult specimens. Deep depressions (e.g., *S. rhodomelas;* State 3) are easy to distinguish regardless of age or preservation status. This mite pocket is absent in *Microlophus occipitalis* and some species of *Stenocercus* (e.g., *S. azureus, S. dumerilii, S. lache, S. ochoai)*. Fixed.

1882. Axillary flap (Cadle, 2001) (0) absent; (1) present. A prominent axillary flap concealing the anteroventral aspect of the posthumeral (axillary) mite pocket is unique to *Stenocercus caducus* and *S. prionotus*. This structure is absent in the *Tropidurus* Group. Fixed.

1883. Postfemoral mite pocket (0) absent; (1) one or more vertical folds; (2) distinct pocket with vertical or posteroventrally oriented slit-like opening (Fig. 30). Variation in the number of vertical folds (e.g., *S. boettgeri; State* 1) was not coded. When a distinct postfemoral pocket is present (State 2), it may be shallow (e.g., *S. festae)* or deep (e.g., *S. variabilis)*; however, variation in pocket depth was not coded either. Species within the *Tropidurus* Group lack postfemoral mite pockets (Rodrigues, 1987). Fixed.

1884. Nuchal mite pockets (0) absent; (1) present, deep (Fig. 31). Distinct mite pockets underneath neck folds are present in many species of the *Tropidurus* Group (Frost, 1992; Rodrigues, 1987). Although shallow mite pockets under antehumeral folds have been reported in some species of *Stenocercus* (Cadle, 1991, 1998), I consider herein only those species with deep, distinct pockets underneath the antehumeral and oblique neck folds (i.e., *S. latebrosus*, *S. modestus*, and *S. ornatissimus)* as having State 1. Fixed.

Coloration

1885. Dark gular patch in adult females (0) absent; (1) present, covering most or all of gular region. The gular region is extensively covered by a dark patch in some adult female specimens of *Stenocercus aculeatus, S. apurimacus, S. boettgeri, S. formosus, S. frittsi, S. imitator, S. iridescens, S. limitaris, S. puyango, S. roseiventris,* and *S. trachycephalus.* Polymorphic.

1886. Dark gular patch in adult males (0) absent; (1) present, covering most or all of gular region (Fig. 32). The gular region is extensively covered by a dark patch in some adult male specimens of *Stenocercus aculeatus, S. angel, S. erythrogaster, S. festae, S. frittsi, S. nubicola, S. ochoai, S. percultus, S. prionotus,* and *S. rhodomelas*. Polymorphic.

1887. Black patch on neck in adult males (0) absent; (1) present (Fig. 33). A distinct black patch on the neck of some adult male specimens was observed in *Stenocercus erythrogaster, S. festae, S. frittsi, S. guentheri, S. huancabambae, S. imitator, S. iridescens, S. lache, S. limitaris, S. ochoai, S. percultus, S. praeornatus, S. puyango, S. trachycephalus,* and *S. variabilis.* Polymorphic.

1888. Dark ventral patch in adult males (0) absent; (1) present (Fig. 32). In some species of *Stenocercus,* adult males might have a dark brown or black ventral mark that varies from being a very narrow midventral stripe (e.g., *S. iridescens)* to occupying most of the ventral surface of body (e.g., *S. lache)*. Polymorphic.

1889. Dark patches on ventral surface of thighs in adult males (modified from Frost, 1992; Character 42) (0) absent; (1) present (Fig. 32). Dark markings on the ventral surfaces of thighs are present in *Stenocercus nigromaculatus, S. ornatus, S. rhodomelas* and some species of the *Tropidurus* Group (e.g., *T. etheridgei, T. torquatus;* Frost, 1992). Fixed.

1890. Black patch on shoulder in adult males (0) absent; (1) present. An irregular black patch is present on the shoulder of adult males of some species of *Stenocercus*, such as *S. bolivarensis*, *S. dumerilii, S. haenschi, S. lache,* and *S. varius.* Fixed.

1891. Light vertical stripe on shoulder (0) absent; (1) present (Fig. 33). A white, cream, or yellow thin vertical stripe extending dorsally from each forelimb insertion to the dorsolateral aspect of body is present in some species of *Stenocercus* (e.g., *S. apurimacus, S. eunetopsis, S. limitaris, S. pectinatus, S. scapularis).* Fixed.

1892. Black collar in adult males (0) absent; (1) present (Fig. 33). In most species with State 1—*Stenocercus bolivarensis, S. chlorostictus, S. eunetopsis, S. humeralis, S. simonsii,* and *S. torquatus*—, the black collar is incomplete middorsally. Intraspecific variation in collar middorsal completeness was not coded. Fixed.

1893. White or cream horizontal stripe on posterior surface of thigh (0) absent; (1) present. This stripe is unique to species formerly assigned to *Proctotretus* (i.e., *Stenocercus azureus, S. doellojuradoi,* and *S. pectinatus).* Fixed.

1894. Dorsolateral light stripes (0) absent; (1) present. A distinct white or cream dorsolateral longitudinal stripe extending from neck to base of tail. Only *S. azureus* and *S. pectinatus* have these stripes. Fixed.

1895. Oblique dark stripe on eye (0) absent; (1) present (Fig. 22). A dark brown oblique stripe extending anterodorsally from the subocular region to the supraciliaries is present in species like *Stenocercus caducus, S. dumerilii, S. formosus, S. iridescens,* and *S. roseiventris*. Fixed.

1896. Light stripe from below eye to shoulder (0) absent; (1) present (Fig. 33). A white, cream, or yellow longitudinal stripe extending from subocular region, through dorsal border of tympanum, to shoulder is present in some species of *Stenocercus,* such as *S. angel, S. azureus, S. formosus, S. latebrosus,* and *S. marmoratus*. Polymorphic.

1897. Light stripe between ventral margin of tympanum and forelimb insertion (0) absent; (1) present (Fig. 33). A white, cream, or yellow longitudinal stripe extending between ventral border of tympanum and shoulder is present is some species of *Stenocercus,* such as *S. apurimacus, S. chrysopygus, S. festae, S. lache,* and *S. nigromaculatus*. Polymorphic.

1898. Dark interorbital bar (0) absent; (1) present. A black or dark brown transverse bar on the dorsal surface of head between the orbits can be present in *Stenocercus aculeatus, S. apurimacus, S. boettgeri, S. formosus, S. frittsi, S. imitator, S. iridescens, S. limitaris, S. puyango, S. roseiventris,* and *S. trachycephalus*. Polymorphic.

1899. Dark lips contrasting with rest of head (0) absent; (1) present. Dark brown or black lips contrasting with the background color of the head can be present in *Stenocercus bolivarensis, S. guentheri, S. huancabambae, S. latebrosus, S. nigromaculatus, S. ornatus, S. percultus,* and *S. rhodomelas.* Polymorphic.

1900. Dark mark on tympanic region in adult females (0) absent; (1) present (Fig. 34). A lateral black, gray, or dark brown irregular mark around tympanic area, sometimes extending into lateral areas of gular region, . Polymorphic.

Hemipenes

1901. Hemipenial lobes (Frost, 1992; Character 44) (0) long; (1) short (Fig. 35). Bilobate hemipenes with distinctly divided sulci is one of the synapomorphies of the clade formed by *Stenocercus* and the *Tropidurus* Group; however, the hemipenial lobes are short in all *Stenocercus* and long in all members of the *Tropidurus* Group (Frost, 1992). Fixed.

1902. Transversus penis muscle (Arnold, 1984; hemipenial sheath musculature of Frost, 1992) (0) not extensive; (1) extending almost entirely around hemipenial sheath (Fig. 36). The hemipenis is surrounded laterally and ventrally by the transversus penis muscle. Unlike members of the *Tropidurus* Group, this muscle extends almost entirely around the hemipenial sheath in species of *Stenocercus*. Fixed.

1903. Hemipenial dorsal accessory muscle (Arnold, 1984) (0) present; (1) absent (Fig. 36). This muscle lies in the dorsal aspect of the hemipenial sheath and inserts medially onto the base of the hemipenis (Arnold, 1984). I examined hemipenes of most species of *Stenocercus* and none of them had a dorsal accessory muscle, which is probably present only in some polychrotids (e.g., *Enyalius)* and species within the *Tropidurus* Group (Arnold, 1984; Frost, 1992). Fixed.

Measurements

1904. Head length (distance between anterior margin of tympanum and snout)/SVL ratio (modified from Frost, 1992; Character 1.) Meristic. Range of mean species values = 0.22–0.30.

1905. Maximum head height/head length ratio (modified from Frost, 1992; Character 2.) Meristic. Range of mean species values = 0.56–0.72.

1906. Tail length/total length ratio in adult males. Meristic. Range of mean species values = 0.52–0.73.

1907. Tail length/total length ratio in adult females. Meristic. Range of mean species values = 0.49–0.72.

1908. Hind limb length (distance between limb insertion and tip of Toe IV)/SVL ratio. Meristic. Range of mean species values = 0.60–1.04.

1909. Forelimb length (distance between limb insertion and tip of Finger IV)/SVL ratio. Meristic. Range of mean species values = 0.38–0.58.

Phylogenetic analysis of morphological data

Two datasets of morphological data were analyzed under parsimony in PAUP* 4.0b10 (Swofford, 2003). The first dataset contained all 91 unordered, discrete characters that do not vary intraspecifically (i.e., continuous and polymorphic characters were not included.) This dataset was analyzed using a heuristic search with 10,000 random addition sequence replicates and tree bisection and reconnection (TBR) branch swapping. The second dataset was constructed by adding to the first dataset 17 continuous and 15 intraspecifically variable (i.e., polymorphic) characters. With this dataset (Appendix II) I performed a heuristic search with 500 random addition replicates and TBR branch swapping. Because of computational time, support for individual nodes was assessed only in the second dataset using non-parametric bootstrap resampling (Felsenstein, 1985) with 100 bootstrap replicates (5 random addition sequence replicates each).

To code intraspecific variation in qualitative characters I used the MANOB method of frequency parsimony (Swofford and Berlocher, 1987) with step matrices (Wiens, 1995). In the MANOB method the optimality criterion corresponds to tree length in a Manhattan metric, under the constraint that only observed character state frequency arrays may be assigned to hypothetical ancestors (Swofford and Berlocher, 1987). Although this frequency parsimony method was originally proposed for coding gene frequency data (Swofford and Berlocher, 1987), it also applies to polymorphic morphological characters (Wiens, 1995, 2000). In this method each taxon is assigned a unique character state in the data matrix. For a given character, the cost of transition between states is calculated and specified in a step matrix based on the Manhattan distances between the trait frequencies of each pair of species for that character (Swofford and Berlocher, 1987; Wiens, 1995). The Manhattan distance D between two taxa A and B is calculated with the formula

$$D(A,B) = \frac{1}{2}\sum_{j=1}^{N}\left|x_{Aj} - x_{Bj}\right|$$

where *N* is the total number of character states, and *xA*, *xB* are the frequencies of a given character state (*j*) in taxa *A* and *B*, respectively. Step matrices were built by (1) using the observed character state frequencies to create a FREQPARS file and (2) importing this FREQPARS file into PAUP*, which automatically calculates the step matrices. FREQPARS files and step matrices are presented in Appendices IV and V, respectively. Frequency parsimony was used for all characters except 1794 (presence/absence of pterygoid teeth) because sample size was very small ($N = 2$) for most species and intraspecific variation in the presence or absence of pterygoid teeth in *Stenocercus* has been reported (Cadle, 1991). Therefore, this character was coded with the “any instance” method (Campbell and Frost, 1993). In addition, the “modal” method was used to code the number of canthals (Character 1818) because the interspecific and intraspecific variation of this character is very small, and it seems pointless to use the meristic method described above to code this character. The only possible states for this character are "one" or "two" canthals, and in most species two canthals were observed in all examined species.

To code continuous characters I followed Thiele’s (1993) gap-weighting method using step matrices as proposed by Wiens (2001), with slight modifications (see below.) Thiele (1993) proposed to account for differences in continuous trait values across species by giving small weights to small differences in trait means between taxa and large weights to large differences. For a given continuous character, this method involves (1) finding the mean value of the trait for each taxon included in the analysis, as well as the range of mean trait values across taxa, and (2) dividing this range into smaller ranges equal to the maximum number of character states allowed by the phylogenetic software program (Thiele, 1993). Because this method is limited by the maximum number of character states allowed in computer programs, Wiens (2001) proposed to weight the differences between mean taxa values with step matrices. For a given character, a unique character state is assigned to each taxon with a unique mean trait value. Changing from one state to another has a cost that is specified in a step matrix based on the difference in mean trait values between each pair of taxa (Wiens, 2001). Given that the maximum cost between states in a step matrix is 1000 in PAUP*, Wiens (2001) proposed to convert the mean trait value (x) of each taxon to a score (X_s) between 0–1000 by modifying Thiele's (1993) formula as follows:

$$X_s = \frac{x - \min}{\max - \min} \times 1000$$

where "min" and "max" are the minimum and maximum mean taxa values of the trait across all taxa, respectively. The difference between these scores determines the costs of character state transformations in the step matrix. The above formula implies that if fixed characters also are included in the dataset, they need to be weighted by 1000; to avoid this step, here I modify the above formula by not multiplying the right term by 1000. Instead, the step matrices used here contain scores between 0–1, which does not require re-weighting fixed characters because the default weight in PAUP* is 1. Step matrices were built by (1) using the calculated scores to create a FREQPARS file and (2) importing this FREQPARS file into PAUP*, which automatically calculates the step matrices. The FREQPARS file was constructed by creating "dummy" alternative states (Y) for each score (X_s) as follows:

$$Y = 1 - X_s$$

The Manhattan distances calculated with these values (i.e., scores and corresponding "dummy" alternative states) are equivalent to the differences between scores because there are never more than two states, and the second (Y) is always redundant with the first. FREQPARS files and step matrices are presented in Appendices V and VI, respectively.

Phylogenetic analysis of combined data

The molecular and morphological characters described above were combined into a single dataset containing 56 taxa and 1764 characters (Appendices I and II). For those species with no sequence data, molecular characters were coded as missing data. Morphological data of *Microlophus occipitalis* and molecular data of *M. atacamensis* were combined into a single outgroup taxon. The combined dataset was analyzed in PAUP* under parsimony using a heuristic search with 500 random addition replicates and TBR branch swapping. Support for individual nodes was assessed with non-parametric bootstrap resampling using 100 bootstrap replicates with 5 random addition sequence replicates each. The same analysis was performed again after excluding all continuous and polymorphic morphological characters; however, a bootstrap analysis was not possible with the modified dataset because of computational time.

The combined dataset also was analyzed in a Bayesian framework using the GTR + I + Γ model (Lanave *et al.* 1984, Tavaré 1986, Rodriguez *et al*. 1990) for molecular data and two variants of the maximum likelihood model for discrete morphological character data (Markov *kv* or Mkv; Lewis, 2001) implemented in MrBayes3.0b4 (Ronquist and Huelsenbeck, 2003). The first variant of the Markov *kv* model assumed equal rates of change among characters (Mkv), whereas the second variant incorporated unequal rates among characters using the gamma distribution (Mkv + Γ). Because MrBayes 3.0b4 does not allow for use of step matrices, polymorphic and continuous data could not be coded using the methods described above. Instead, I followed Wiens *et al.* (2005) in coding polymorphic characters using the majority approach (i.e., <50% = 0 and >50% = 1), which is expected to produce similar results as the frequency parsimony method described above (Wiens, 1995, 1999). There were no species with trait frequencies of 50%. In addition, the continuous characters were ordered and recoded to have a maximum of 6 states, which is the maximum number of ordered states allowed in MrBayes. Each analysis consisted of two million generations and four Markov chains with default heating values and default priors. Trees were sampled every 100 generations resulting in

20,000 saved trees per analysis, of which 5000 were discarded as “burn-in”. Stationarity was confirmed by plotting the –ln *L* per generation in the program Tracer 1.2 (Rambaut and Drummond, 2003). The resultant 15000 trees were used to calculate posterior probabilities (BPP) for each branch in a 50% majority-rule consensus tree. Model selection (i.e., Mkv vs. Mkv + Γ) was based on Bayes factors estimates as described in Chapter I.

RESULTS

Phylogenetic analysis of morphological dataset

Based on the results of the phylogenetic analyses of DNA sequence data, *Stenocercus* is treated as a monophyletic group in all analyses of morphological data, and all morphology trees are rooted with *Microlophus occipitalis*. This outgroup taxon occupies a basal position in the phylogenetic tree of the *Tropidurus* Group (Frost, 1992; Frost *et al.,* 2001; Harvey and Gutberlet, 2000), the sister taxon of *Stenocercus*.

The dataset containing only discrete, fixed characters included 91 characters, of which 74 are parsimony informative. Phylogenetic analysis of this dataset yielded 1261 equally most-parsimonious trees of 302 steps each, with consistency and retention indices of 0.334 and 0.755, respectively. A non-parametric bootstrap analysis for this dataset was not possible because of computational time. The strict consensus tree of all 1261 trees indicates a basal split between species formerly placed in the genus “*Proctotretus*” (i.e., *S. azureus*, *S. doellojuradoi*, and *S.*

pectinatus) and all other *Stenocercus* (Fig. 37). Within the "*Proctotretus*" clade, *S. doellojuradoi* is the most basal species. Remaining species of *Stenocercus* are grouped within two major clades. One of these clades has 50% of its nodes resolved and includes 24 species ((*S. formosus*, *S. ochoai*), (*S. angel*, *S. chota*, *S. festae*, *S. guentheri*, *S. lache*, *S. nigromaculatus*, *S. ornatus*, *S. percultus*, *S. trachycephalus*, ((*S. erythrogaster*), (*S. iridescens*, *S. limitaris*, *S. puyango*, (*S. huancabambae* ((*S. caducus*, *S. prionotus*), (*S. aculeatus*, (*S. fimbriatus*, (*S. dumerilii*, *S. scapularis*))))))), (*S. apurimacus*, *S. rhodomelas*)). The other major clade has 61% of its nodes resolved and includes 28 species ((*S. ivitus*), ((*S. melanopygus*), ((*S. orientalis*), ((*S. latebrosus*), ((*S. ornatissimus*), ((*S. modestus*), ((*S. stigmosus*), ((*S. chrysopygus*), (*S. cupreus*, *S. frittsi*, *S. haenschi*, (*S. carrioni*, *S. eunetopsis*, *S. imitator*, *S. marmoratus*, *S. praeornatus*, *S. variabilis*, (*S. boettgeri*, *S. varius*), (*S. bolivarensis*, *S. chlorostictus*), (*S. nubicola*, *S. roseiventris*), (*S. empetrus*, (*S. crassicaudatus*, (*S. simonsii*, (*S. humeralis*, *S. torquatus*))))))))))))))).

The phylogenetic analysis of the dataset containing all discrete (i.e., fixed and polymorphic) and continuous morphological characters yielded a single most parsimonious tree of 455.945 steps with consistency and retention indices of 0.289 and 0.700, respectively (Fig. 38). Of the 123 characters included in this dataset, 103 are parsimony informative. In general, this tree is similar to the strict consensus tree recovered from the discrete, fixed morphological data (DFT). There is a basal split between a well supported "*Proctotretus*" clade (MPB = 99) and a weakly supported clade containing all remaining *Stenocercus* (MPB < 50). The latter clade is different from the corresponding clade in DFT in having *S. apurimacus* as sister to all remaining species. Otherwise, it contains the same two major clades, only that these are fully resolved—(*S. chota*, (*S. angel*, (*S. guentheri*, (*S. festae*, ((*S. trachycephalus*, ((*S. limitaris*, ((*S. erythrogaster*, (*S. huancabambae*, (*S. aculeatus*, ((*S. dumerilii*, (*S. caducus*, *S. prionotus*)), (*S. fimbriatus*, *S. scapularis*))))), (*S. iridescens*, *S. puyango*))), (*S. percultus*, (*S. ornatus*, (*S. nigromaculatus*, *S. rhodomelas*))))), (*S. lache*, (*S. formosus*, *S. ochoai*))))))) and (*S. ivitus*, (*S. melanopygus*, (*S. orientalis*, (*S. latebrosus*, (*S. ornatissimus*, (*S. modestus*, (*S. stigmosus*, (*S. chrysopygus*, (*S. nubicola*, (*S. frittsi*, (*S. cupreus*, (*S. variabilis*, (*S. haenschi*, (*S. boettgeri*, (*S. varius*, (((*S. bolivarensis*, (*S. chlorostictus*, ((*S. simonsii*, (*S. crassicaudatus*, (*S. humeralis*, *S. torquatus*))), (*S. empetrus*, *S. eunetopsis*)))), (*S. carrioni*, (*S. marmoratus*, *S. roseiventris*))), (*S. imitator*, *S. praeornatus*))))))))))))))))). Clades with bootstrap support values > 60 also were recovered in DFT.

Phylogenetic analysis of combined dataset

The maximum parsimony analysis of the dataset containing all morphological and molecular data yielded a single most parsimonious tree of 4938.3765 steps, with consistency index 0.2855 and retention index 0.4442 (Fig. 39). Of the 1764 characters included in this analysis, 734 are constant and 818 are parsimony informative. The resulting tree follows the same general topology as the phylogenetic trees obtained from molecular data. Thus, species of *Stenocercus* are split between two major clades congruent with the two major clades obtained from analysis of molecular data—

((((((*S. apurimacus*, (*S. erythrogaster*, (*S. huancabambae*, (*S. aculeatus*, (*S. fimbriatus*, *S. scapularis*))))), (*S. formosus*, *S. ochoai*)), (*S. doellojuradoi*, (*S. azureus*, *S. pectinatus*))), (((*S. chota*, ((*S. angel*, *S. guentheri*), (*S. festae*, *S. lache*))), (*S. nigromaculatus*, *S. rhodomelas*)), ((*S. trachycephalus*, (*S. limitaris*, (S. *iridescens*, *S. puyango*))), (*S. ornatus*, *S. percultus*)))), ((*S. dumerilii*, (*S. caducus*, *S. prionotus*)), (*S. marmoratus*, *S. roseiventris*))), and ((*S. nubicola*, (*S. chrysopygus*, ((*S. boettgeri*, (*S. haenschi*, (*S. variabilis*, (*S. cupreus*, *S. frittsi*)))), ((((*S. bolivarensis*, *S. carrioni*), (*S. empetrus*, *S. eunetopsis*)), (*S. imitator*, *S. praeornatus*)), ((*S. torquatus*, (*S. chlorostictus*, (*S. crassicaudatus*, *S. simonsii*))), (*S. humeralis*, *S. varius*)))))), (*S. latebrosus*, ((*S. stigmosus*, (*S. modestus*, (*S. ivitus*, *S. melanopygus*))), (*S. orientalis*, *S. ornatissimus*))))). This topology also is largely congruent with the morphology-based trees except that the basal, well-supported "*Proctotretus*" clade of the morphology trees is placed within one of the two major clades in the combined-evidence tree. Another discrepancy is that sister species *S. marmoratus* and *S. roseiventris* "switch" between the two major clades if we compare the morphology trees against the combined or molecular trees.

Parsimony analysis of the same combined dataset excluding continuous and discrete polymorphic characters yielded 161 equally parsimonious trees of 4795 steps each, and consistency and retention indices of 0.327 and 0.447, respectively. Of the 1732 characters included in this analysis, 735 are constant and 789 are parsimony informative. The strict consensus tree in this analysis has basically the same topology (Fig. 40) that was obtained with the previous combined dataset (Fig. 39). The major difference is that there is less resolution within each of the two major clades if we exclude continuous and discrete, polymorphic characters.

Bayesian analysis of the combined dataset using the Mkv model (morphological data) with equal rates of variation among sites yielded a tree with only a few well-supported clades (Fig. 41). In contrast, the analysis based on the Mkv+ Γ model yielded a well-resolved tree similar those obtained with maximum parsimony using the complete dataset (Fig. 42). The Mkv+ Γ model was selected with a Bayes factor value of 310; therefore the tree based on this model is referred as the “Bayesian tree” from now on. The same two major clades recovered in the MP tree are strongly supported (BPP = 0.96 and 0.97) in the Bayesian tree. In general, the MP tree is more resolved than the Bayesian tree; however, those clades with MPB > 90 are maintained with BPP > 0.95—(*S. formosus*, *S. ochoai*) (MPB = 94, BPP = 1.00), (*S. doellojuradoi*, (*S. azureus*, *S. pectinatus*)) (MPB = 99, BPP = 1.00), and (*S. caducus*, *S. prionotus*) (MPB = 90, BPP = 1.00). The only exception is the clade (*S. angel*, *S. guentheri*) (MPB = 94, BPP = 76). The Bayesian tree obtained from the combined dataset is chosen as the preferred hypothesis of phylogenetic relationships among species of *Stenocercus* (Fig. 42). This tree is preferred because (1) it combines all morphological and molecular information available, and (2) it is the result of a phylogenetic analysis that allowed morphological and molecular data to evolve under different models.

Character support for combined tree

A complete list of morphological apomorphies supporting each stem in the combined Bayesian tree (Fig. 42) is presented in Appendix VII. A change (transformation) is referred as ambiguous if it occurs under some reconstructions but not others. On the other hand, if a change occurs in all possible reconstructions it is designated as unambiguous.

Stem 1 (*Stenocercus)* is supported by 10 unique (i.e., consistency index=1), unreversed, and ambiguous transformations: 1790.1 (anterodorsal postorbital process present), 1793.1 (process of squamosal fitting into superior fossa of quadrate), 1795.1 (lingual coronoid process of dentary not overlapping anterior lingual process of coronoid), 1797.1 ("free" part of posterior process of interclavicle > 25% of total length of sternum), 1798.1 (interclavicle median process extending posteriorly well beyond posterolateral corners of sternum), 1809.1 (interparietal smaller than interorbital distance or absent), 1840.1 (lateral gular scales imbricate posteriorly), 1901.1 (hemipenial lobes short), 1902.1 (hemipenial sheath musculature extensive), 1903.1 (hemipenial dorsal accessory muscle absent). Of these character changes, Frost (1992) referred only to the extensive hemipenial sheath musculature (1902.1) as apomorphic for *Stenocercus*, although he also proposed transformations 1793.1, 1797.1, 1840.1, and 1809.1 as "useful" characteristics to diagnose this genus. In addition, stem 1 is supported by 18 (ACCTRAN) or 14 (DELTRAN) ambiguous, homoplastic character changes.

Stem 2 leads to one of two major clades resulting from a basal split (the other major clade derives from to stem 23) and includes 29 species of *Stenocercus*. This stem is poorly supported by 4 unambiguous changes. Changes on this stem are highly homoplastic (consistency indices = 0.083–0.281), which is congruent with the low support received for this clade in all analyses. Species of *Stenocercus* derived from stem 2 differ from those derived from stem 23 by having imbricate (granular in stem 23) scales on the posterior surface of thighs (1865.1). Most character transformations supporting stems derived from stem 2 (i.e., 3–22) are highly homoplastic; therefore, here I will refer only to non-homoplastic characters (i.e., consistency index = 1) including autapomorphies. Stem 5, from which *S. aculeatus*, *S. caducus*, *S. dumerilii*, *S. fimbriatus*, and *S. prionotus* are derived, is supported by one unambiguous character change: 1823.1 (nasal elongated, about twice as longer as wide). Stem 8 (*S. caducus* and *S. prionotus)* is supported by one unambiguous transformation: 1882.1 (axillary flap present). Stem 16, which includes all species formerly placed in *Proctotretus* (i.e., *S. azureus*, *S. doellojuradoi*, and *S. pectinatus)* is supported by two unambiguous transformations: 1826.1 (two longitudinal scale rows between suboculars and supralabials) and 1893.1 (white or cream horizontal bar on posterior surface of thigh). Furthermore, the stem leading to *S. azureus* and *S. pectinatus* (stem 17) is supported by two unambiguous transformations: 1833.1 (mental in contact with sublabials) and 1894.1 (a distinct white or cream dorsolateral stripe extending from neck to base of tail). Autapomorphies occur in *Stenocercus fimbriatus* (1868.1, row of enlarged, projected scales on posterodorsal aspect of thigh), *Stenocercus dumerilii*

(1791.0, posterior end of squamosal articulates with parietal; 1792.1, squamosal bone curved around posterior end of supratemporal fossa; 1814.1, posterior supraciliary projected; 1836.1, postmental series poorly defined or absent), and *Stenocercus pectinatus* (1803.1, four phalanges in Finger IV). It is possible that some or all autapomorphies of *S. dumerilii* proposed here are shared with the morphologically similar *S. tricristatus*, which was not examined in this study. Finally, *Stenocercus lache* has one autapomorphy (1802.1, medial centrale absent), which is shared with all species in the *Tropidurus* Group east of the Andes except *Uranoscodon* (Frost, 1992).

Stem 23 leads to the second major clade within *Stenocercus* (the other major clade derives from stem 23) that includes 26 species. This stem is better supported than stem 2, with 4 ambiguous and 10 unambiguous changes. These changes are less homoplastic than the changes supporting stem 2 (consistency indices = 0.086–1.0). Moreover, stem 23 is supported by two unique (non-homoplastic) transformations: 1865.0 (posterior thigh scales not imbricate), 1866.0 (posterior thigh scales granular). Unlike stem 2, none of the stems derived from stem 23 are supported by non-homoplastic characters, and no autapomorphies were observed among species derived from stem 23. However, there is a basal split resulting in two major subclades derived from stems 24 and 38. The subclade derived from stem 24 includes 17 species and is supported by 4 ambiguous and 11 unambiguous changes; consistency indices of these changes vary between 0.094–0.400. Fixed transformations supporting stem 24 are: 1813.0 (enlarged angulate temporal absent), 1849.1 (laterals less than half the size of dorsals), 1860.1 (inguinal groove present), 1876.1 (antegular fold present, incomplete medially), 1878.1 (postauricular fold present). The subclade derived from stem 38 includes 9 species and is supported by 3 ambiguous and 9 unambiguous changes; consistency indices of these changes vary between 0.086–0.200. Fixed transformations supporting stem 38 are: 1812.1 (temporal scales smooth), 1841.0 (gulars cycloid, smooth, slightly imbricate).

DISCUSSION

This is the first attempt to infer the phylogenetic relationships among most species of *Stenocercus* (55 of 57). Previous molecular phylogenies have included no more than four species of *Stenocercus* (e.g., Frost, 1992; Frost *et al.,* 2001b; Harvey and Gutberlet, 2000; Schulte *et al.,* 1998, 2003), and the only other analysis based on morphological data included 19 out of 29 species known at that time (Fritts, 1974). Similar to the results obtained with the molecular data (Chapter I), the phylogenetic hypotheses based on combined data do not support monophyly of *Ophryoessoides* as defined by Fritts (1974), but are highly congruent with the composition of *Ophryoessoides* provided by Etheridge in Peters and Donoso-Barros (1970). Monophyly of *Ophryoessoides* sensu Fritts (1974) is weakly supported when molecular data are excluded (Fig. 38).

In this study, analysis of two morphological datasets (i.e., excluding and including polymorphic and continuous data) yielded similar results, with a basal split between species formerly included in *Proctotretus* and all remaining species (Figs.

37, 38). Moreover, non-*Proctotretus* species are nested within one of two major clades (except *S. apurimacus* when all morphological characters are included.) Support for most clades in the all-morphology tree is low, with only five clades having bootstrap support values ≥ 80 (Fig. 38).

Morphological data support weakly a clade including species that meet the criteria of "*Ophryoessoides*" as defined by Fritts (1974)— (*S. limitaris*, (*S. iridescens, S. puyango*), (*S. erythrogaster*, (*S. huancabambae*, (*S. aculeatus*, ((*S. dumerilii*, (*S. caducus*, *S. prionotus*)), (*S. fimbriatus*, *S. scapularis*)))))). Given that monophyly of *Ophryoessoides* was rejected using molecular data (see Chapter I), recovery of this clade indicates that some morphological characters supporting it are homoplastic. Non-monophyly of *Ophryoessoides* is further supported with analyses of the combined dataset (Figs. 39, 42). All analyses of the combined dataset recover a basal split into two clades containing 26 (clade A) and 29 (clade B) species; these clades are congruent with the two major clades recovered from molecular data (see Chapter I.) Although these clades are not strongly supported by morphological characters, there are some morphological differences between them. Scales on the posterior surfaces of thighs are granular in species included in clade A and imbricate (usually keeled) in species in clade B. Moreover, species in clade A have generally smaller scales (except the clade containing *S. nubicola, S. chrysopygus, S. melanopygus, S. stigmosus, S. ivitus, S. orientalis, S. latebrosus, S. modestus,* and *S. ornatissimus* in Bayesian combined tree; Fig. 42) and more skin folds than species in clade B. Again, the maximum parsimony analysis excluding polymorphic and continuous characters provides poor resolution within each of the two major clades (Fig. 40). On the other hand, if we include polymorphic and continuous characters, the maximum parsimony tree is fully resolved; however, most clades in this tree receive low support, with only 6 clades having a bootstrap support value ≥ 80 (Fig. 39). These clades also are recovered in the Bayesian tree (Fig. 42), although two of them, (*S. angel*, *S. guentheri*) and (*S. iridescens*, *S. puyango*), receive low posterior probability values (0.76 and 0.63, respectively). These low support values are incongruent with those obtained from the molecular data only (Fig. 6). It is possible that these incongruent results are caused by lack of molecular data for 23 of the 55 species included in the combined dataset.

CHAPTER III: HISTORICAL BIOGEOGRAPHY OF *STENOCERCUS*

In this chapter, I describe the geographical distribution of *Stenocercus* and investigate how it relates to the phylogenetic hypotheses inferred in Chapters I and II. To explain general distribution patterns, I use the preferred tree from the combined Bayesian analysis (Fig. 42) in combination with distribution data from the literature and museum collections. To infer the distribution history of *Stenocercus* (i.e., taxon biogeography), I use dispersal-vicariance analysis to optimize the known distribution of each species onto the maximum likelihood and Bayesian trees obtained from analyses of molecular data (Chapter I). My results suggest that the most recent common ancestor of *Stenocercus* occurred in the central Andes and reject the idea that *Stenocercus* originated in the southern Andes.

MATERIALS AND METHODS

Locality records

Locality data were obtained from the literature (Andrade *et al.,* 2003; Avila, 1999; Avila-Pires, 1995; Cadle, 1991, 1998, 2001; Cardinale and Vignolo, 1996; Castro and Ayala, 1982; Castro and Granados, 1993; Cei, 1986, 1993; Corredor, 1983; Cruz *et al.,* 1996; Fritts, 1972, 1974; Harvey *et al.,* 2004; Torres *et al.,* 2000; Torres-Carvajal, 2000, 2005a,b) and from museum collections after confirmation of species identification (Appendix III). Relevant localities were georeferenced with the Global Gazetteer Version 2.1 (Falling Rain Genomics, Inc.).

Andean regions

The Andes form an 8000-km-long mountain belt that extends along the western border of South America. This large mountain chain varies in width between 250 km in northern Peru (5ºS) and southern Chile (52ºS–55ºS) to approximately 750 km in Bolivia (18ºS). The Andes are composed of three main segments of distinct orientation separated by two major bends (Fig. 43; Jaillard *et al.,* 2000); each segment can be divided in subregions as follows:

1. The northern Andes (12ºN–5ºS) are 2000 km long, have a NNE–SSW orientation, and extend from easternmost Venezuela to northernmost Peru. Here, I recognize the following subregions proposed by previous authors (Duellman, 1979, 1999; Jaillard *et al.,* 2000): eastern, central, and western cordilleras in Colombia; Nudo de Pasto (ca. 100,000 km^2 of highlands in southern Colombia and northern Ecuador); inter-Andean basins and eastern and western cordilleras in Ecuador (Fig. 43).

2. The central Andes (5ºS–18ºS) also are about 2000 km long, have a NW–SE orientation, and extend from northern Peru to northern Bolivia and Chile; they are separated from the northern Andes by the Huancabamba Depression (Aleman and Ramos, 2000; Duellman, 1979; Mégard, 1987; Jaillard *et al.,* 2000). Eastern and

western cordilleras are recognized herein as major subregions within the central Andes (Jaillard *et al.,* 2000; Fig. 43).

3. The southern Andes (18ºS–56ºS) are 4000 km long and have a N–S orientation (Fig. 43). They are separated from the central Andes by the Arica bend (Jaillard *et al.,* 2000). Species of *Stenocercus* occur only on the northeastern slopes of the southern Andes. This portion of the Andes completed was formed much earlier than the central and northern Andes, possibly prior to the Tertiary (Simpson, 1979). The central Andes were next, followed by the northern Andes, which did not reach their current high elevations before the mid-Pliocene (Aleman and Ramos, 2000; Simpson, 1979).

Ancestral distributions

To infer ancestral distributions of *Stenocercus,* I used DIVA 1.1 (Ronquist, 1996) to perform a dispersal-vicariance analysis as proposed by Ronquist (1996, 1997). This is a character optimization method that allows reconstruction of ancestral distributions by maximizing vicariance events and minimizing dispersal and extinction events based on a three-dimensional cost matrix derived from a simple biogeographic model in which vicariance events have a cost of zero and dispersal or extinction events have a cost of one. I used the ML and Bayesian trees obtained from analyses of molecular data (Fig. 6) to optimize the known distributions of species of *Stenocercus*. These trees were chosen because they are fully bifurcate as required by DIVA 1.1 (Ronquist, 1996) and at least the Bayesian tree has good support for most nodes. Furthermore, species from Clades A and B (as inferred from morphology, Fig. 42) not included in the molecular dataset occupy the same unit areas as those included in the dispersal-vicariance analysis; that is, no species from Clade A in the morphology tree occurs in the southern Andes or Atlantic lowlands. Therefore, we can expect that for most basal nodes the ancestral distributions inferred in this study will remain similar even if more species of *Stenocercus* are added to the dispersal-vicariance analyses.

Each species was coded as absent or present (Appendix VIII) in 11 geographic subregions within the Andes and adjacent lowland areas (Fig. 43; Table 5)—(1) western and (2) eastern cordilleras in the northern Andes, (3) inter-Andean basins in the northern Andes, (4) Nudo de Pasto, (5) Huancabamba Depression, (6) western and (7) eastern cordilleras in the central Andes, (8) eastern cordillera in the southern Andes, (9) Pacific coast lowlands, (10) Atlantic coast lowlands, (11) Amazon Basin. For each tree, an exact search was performed in DIVA 1.1 with a maximum of 2 unit areas for ancestral distributions (MAXAREAS = 2) and the maximum upper bound to tree length of the optimal reconstruction allowed by the program (BOUND = 250).

RESULTS

Major distribution patterns

Most species of *Stenocercus* occur in the Andes and adjacent lowland areas from northern Colombia and northwestern Venezuela to central Argentina (Fig. 1), with only four species restricted to lowland areas away from the Andes—*S. azureus*

(Uruguay and southern Brazil), *S. sinesaccus* sp. nov. (western-central Brazil), *S. tricristatus* (eastern-central Brazil), and *S. dumerilii* (northern Amazonian Brazil). Here, I describe the general distribution of the two major clades (A and B) within *Stenocercus* (Fig. 42).

Clade A.—This clade is composed of 26 species, of which 20 are endemic to the central Andes in Peru. The remaining six species are restricted to the northern Andes, with five species endemic to Ecuador (*S. carrioni, S. haenschi, S, humeralis, S. simonsii,* and *S. varius)* and one endemic to Colombia (*S. bolivarensis)*. Thus, species in this clade occur approximately from 14ºS (*S. crassicaudatus)* to 2ºN (*S. bolivarensis)* between sea level (*S. modestus)* and 3966 m (*S. frittsi)*. However, most species are restricted to high elevations, with 70% at elevations higher than 1500 m and 54% in areas above 2000 m (Table 5).

Clade B.—This clade is composed of 29 species, of which 14 occur in the northern Andes (11 endemic), 12 in the central Andes (8 endemic), four in the southern Andes (1 endemic), three in the Amazon Basin (1 endemic), and three in the Atlantic lowlands (2 endemic) and adjacent areas of southeastern South America (Table 5). Thus, species in this clade occur approximately from 25ºS (*S. pectinatus)* to 11ºN (*S. erythrogaster)* between sea level (*S. dumerilii, S. iridescens, S. pectinatus)* and nearly 4000 m (*S. guentheri, S. lache, S. trachycephalus)*. Unlike species in clade A, only 35% and 17% of the species in clade B are restricted to areas above 1500 m and 2000 m, respectively (Table 5).

Ancestral distributions

Dispersal-vicariance analysis resulted in 48 and 96 equally optimal reconstructions of ancestral distributions on the ML and Bayesian ($4Q + \Gamma$) trees, respectively. Each optimal reconstruction required 25 dispersal events. Overall, the ancestral distributions in the ML and Bayesian trees (Fig. 44) are very similar, if we compare the optimal distributions at each common node (i.e., a basal node from a clade present in two or more trees). Both trees support the idea that the most recent common ancestor of *Stenocercus* occurred in the eastern cordillera of the central Andes (Figs. 43, 44). This area is still occupied by species belonging to both major clades (A and B) within *Stenocercus*. However, there are major differences in the geographic areas that have been occupied by each clade. Clade A includes ancestral lineages that have dispersed and subsequently diversified into the western cordilleras of the central and northern Andes, as well as inter-Andean basins in the northern Andes (Fig. 45). Although not included in the molecular trees, morphological data provide strong evidence for including *S. bolivarensis* within Clade A (Fig. 42), which indicates that this clade has spread as far north as the central cordillera of the northern Andes in Colombia. Clade B includes two sets of lineages that have dispersed and diversified in different directions (Fig. 45). Most extant species in Clade B have resulted from one set of ancestral lineages that have spread and speciated along the northern Andes and adjacent Pacific lowland areas (and Caribbean coast if we include *S. erythrogaster* in this clade; Fig. 42.) The second group of lineages within Clade B has dispersed and diversified along the eastern slopes of the central Andes, northeastern slopes of the southern Andes, and Atlantic lowlands of northern Argentina, Uruguay, and Brazil. Furthermore, morphological evidence suggests that extant species occurring in western (e.g., *S. aculeatus, S. fimbriatus)* and northern (i.e., *S. dumerilii)* areas of the Amazon Basin are members of Clade B (Fig. 42) that have dispersed to these areas from the central Andes.

The biogeographic history of Clade A is very similar if we compare the reconstructions of ancestral distributions between the ML and Bayesian trees. Based on the ML tree (Figs. 6A, 44), the most recent common ancestor of Clade A occurred in the eastern and western cordilleras of the central Andes (Figs. 43). Using the Bayesian tree (Fig. 6B, 44), the most recent common ancestor of Clade A occurred only in the eastern cordillera of the central Andes. Both trees support a basal split within Clade A, with the resulting two descendant lineages diversifying within the eastern and western cordilleras of the central Andes; moreover, one of these lineages includes descendants that extended into the northern Andes (Figs. 44, 45). In contrast, there are major differences in the inferred historical biogeography of Clade B if we compare the ML and Bayesian trees. Using the ML tree (Figs. 6A, 44), (1) the eastern cordillera of the central Andes, or (2) the eastern cordilleras of the central and southern Andes are the two optimal distributions for the most recent common ancestor of Clade B (Fig. 44). From the two immediate lineages hypothetically derived from this ancestor, one may have spread south into the Atlantic lowlands and east into the Amazon Basin without becoming extinct in the eastern cordillera of the central Andes. The second lineage may have split into one clade that diversified along the northern Andes and adjacent lowlands, and a second clade that remains in the central Andes (with *S. caducus* expanding south). The Bayesian tree (Fig. 6B, 44) suggests a different biogeographic scenario. The Bayesian topology suggests that the most recent common ancestor of Clade B may have occurred in the eastern cordillera of the central Andes, as well as the western cordillera of the northern Andes (Fig. 44). Of the two immediate lineages derived from this ancestor, one may have diversified along the eastern cordilleras of the central and southern Andes, Amazon Basin, and Atlantic lowlands. The second lineage may have diversified along the northern Andes and adjacent lowlands.

DISCUSSION

Within the South American herpetofauna, *Stenocercus* has long been recognized as a primarily Andean taxon (Duellman, 1979; Fritts, 1974; Lynch, 1986). One conclusion derived from the dispersal-vicariance analysis presented in this study is that the two major clades of *Stenocercus* have significantly different distribution patterns. Currently, species in Clade A are absent from the southern Andes and have highly restricted distribution ranges, which is reflected in the high levels of endemism by country or Andean region. Furthermore, no species in this clade occurs both in the northern and central Andes; rather, most species (77%, Table 5) in Clade A are endemic to the central Andes. In contrast, Clade B appears to have been more "successful" in expanding its range, and presently includes species in all three main Andean regions (i.e., northern, central, and southern), as well as the Atlantic lowlands of southeastern South America and Amazon Basin. However, Clade B is similar to Clade A in that the largest number of species (48%, Table 5) occurs in the central Andes; however, 45% of the species in Clade B occur in the northern Andes and 17% in the southern Andes (northeastern slopes) and adjacent lowland areas. Major differences in distribution patterns between Clades A and B include: (1) the western cordillera south of 7ºS in Peru (central Andes) appears to have been colonized only by species in Clade A; (2) Clade B includes some species with large latitudinal ranges (Table 5), such as *S. caducus, S. guentheri, S. iridescens,* and *S. roseiventris;* (3) Clade A includes more species occurring at high elevations (70% of species > 1500 m) than clade B (35% of species > 1500 m).

Phylogenetic studies of Andean taxa have allowed formulation of hypotheses to explain evolutionary patterns and processes for Andean organisms (e.g., Graham *et al.,* 2004; Lynch, 1986; Lynch and Duellman, 1997; Patton and Smith, 1992). In this study, I have used dispersal-vicariance analysis to infer the distribution of ancestral lineages within *Stenocercus* and hypothesize how this group of lizards has diversified along the Andes and adjacent lowland areas. Results from the dispersal-vicariance analysis suggest that *Stenocercus* originated in the eastern cordillera of the central Andes and not in the southern Andes as proposed by Duellman (1979). This ancestor diverged into one lineage that diversified primarily within the central Andes (Clade A), and another lineage that diversified along the northern, central, and southern Andes, as well as Atlantic and Pacific lowlands and Amazon Basin (Clade B). This biogeographic scenario is further supported by the high numbers of extant species of

Stenocercus that occur in the central Andes (77% and 48% in Clades A and B, respectively).

A south-to-north hypothesis of speciation (SNHS) congruent with the south-to-north uplift of the Andes (Aleman and Ramos, 2000; Simpson, 1979) has been proposed for Andean lizards "*Proctoporus*" (Doan, 2003), with basal species occurring in Bolivia and southern Peru and more derived species in Venezuela. However, a fine-scale evaluation of the SNHS in "*Proctoporus*" was not possible because of poor resolution of the phylogenetic tree (Doan, 2003). Furthermore, Castoe *et al.* (2004) demonstrated that "*Proctoporus*" as conceived by Doan (2003) was not monophyletic, and the name *Proctoporus* was suggested for a clade restricted to the Andes of central and southern Peru and Bolivia (Doan and Castoe, 2003, 2005; Doan *et al.,* 2005). In *Stenocercus,* a south-to-north speciation pattern is supported by the clade stemming from the most recent common ancestor of *S. guentheri* and *S. limitaris* in the ML and Bayesian molecular trees (Figs. 6, 44). Basal species *S. limitaris, S. percultus,* and *S. ornatus* occur in the southern region of the northern Andes and adjacent areas, whereas more deeply nested species (*S. angel, S. guentheri)* have more northern distributions (Table 5). Unfortunately, tissue samples for DNA extraction were not available from species inhabiting the northern region of the northern Andes (i.e., Colombian taxa), which would allow a more precise evaluation of the SNHS in *Stenocercus*. The clade stemming from the most recent common ancestor of *S. rhodomelas* and *S. guentheri* in the molecular trees (Figs. 6, 44) reveals a perfect south-to-north speciation sequence except for the position of *S.*

chota (northern Ecuador) as basal to *S. festae* (southern Ecuador); however, this exception does not contradict the SNHS. A fine-scale south-to-north speciation sequence is not a prediction of the SNHS, and such a sequence is not necessarily expected because of (1) the complexity of Andean orogeny and (2) the repeated events of expansion and compression of species distributions caused by Pleistocene glaciations.

CHAPTER IV: TAXONOMIC OVERVIEW OF *STENOCERCUS*

New collections from previously unexplored areas, as well as careful reexamination of existing collections, have lead to the discovery of a considerable number of species of *Stenocercus* during the last 15 years (Avila-Pires, 1995; Cadle, 1991, 1998, 2001; Torres-Carvajal, 2000). In this chapter, I describe four new species of *Stenocercus* from the northern Andes of Colombia, southern Andes of Ecuador, northern and central Andes of Peru, and Cerrado forest in Brazil. Additionally, *S. torquatus* is resurrected and *S. variabilis* redescribed. Following the evolutionary species concept (Wiley, 1981), I recognize 58 species of *Stenocercus,* which are listed in Appendix IX.

MATERIALS AND METHODS

I follow the terminology of Cadle (1991) and Torres-Carvajal (2000, 2004) for characters included in the description. Museum abbreviations follow Leviton *et al.* (1985) except for Museo de Historia Natural, Pontificia Universidad Javeriana, Bogota, Colombia (MUJ), Museo de Historia Natural, Universidad Industrial de Santander (UIS), Museo de Zoología, Pontificia Universidad Católica del Ecuador, Quito (QCAZ), Museum für Tierkunde Dresden, Germany (MTD; formerly abbreviated as MTKD, Fritz, 2002). Measurements of snout–vent length (SVL) and tail length (TL) were taken with a ruler and recorded to the nearest 1 mm. All other measurements were made with digital calipers and recorded to the nearest 0.1 mm.

Osteological characters were examined from cleared-and-double-stained specimens or x-ray photographs. Sex was determined either by dissection, or by noting the presence of hemipenes. Eggs of *Stenocercus puyango* were incubated in a terrarium at 25–28 C. Clutch size for other species was determined from x-ray radiographs. Egg volume was calculated with the prolate spheroid formula: $V = 4/3\ \pi\ (\text{length}/2)(\text{width}/2)^2$. Differences in quantitative characters between *S. torquatus* and *S. crassicaudatus*, and between both sexes in *S. torquatus* were evaluated with *t*-tests. One of the assumptions of the *t*-test for two samples is that the variances of both samples are equal; therefore, *F*-tests also were performed for each character to test for equality of variances. If the variances were not the same (i.e., $P<0.001$), an unequal variance *t*-statistic (Welch test) was used. Statistical tests were performed in PAST 1.27 (Hammer *et al.,* 2004). Most localities were geo-referenced with Stephen and Taylor's (1983) ornithological gazeteer of Peru and Global Gazetteer Version 2.1 (Falling Rain Genomics, Inc.). Fluid-preserved specimens and osteological specimens are listed in Appendices III and IV, respectively.

SPECIES ACCOUNTS

Stenocercus frittsi **sp. nov.**

Stenocercus variabilis; Fritts (part), 1974:65.

Holotype.—KU 134181, an adult male, from Mariscal Cáceres (12°34'S, 74°57'W, 3966 m), Departamento Huancavelica, Peru, collected on 18 October 1969 by T. H. Fritts.

Paratypes.—PERU: *AYACUCHO*: KU 134198–207, 134215–23, Ayacucho (13°09'S, 74°13'W, 2804 m), collected on 4 November 1969; KU 134208–10, 20 km N Ayacucho, and KU 134211–13, 4 km N Ayacucho, collected on 5 November 1969; USNM 306935–40, vicinity of Ayacucho, collected in 1972; *HUANCAVELICA*: KU 134180, 134182–90, same locality data as holotype, collected between 18–19 October 1969; KU 134191–92, Izcuchaca (12°29'S, 75°01'W, 3327 m), collected on 20 October 1969; KU 134193–97, Villa Azul (2350–2400 m), NE Colcabamba, collected on 26 October 1969.

Diagnosis.—*Stenocercus frittsi* is distinguished from all species of *Stenocercus* except *S. variabilis* in having granular scales on the posterior surface of thighs, imbricate, keeled lateral body scales, a distinct row of enlarged vertebral scales, unnotched gular scales, neck folds, three caudal whorls per autotomic segment, gray or brown dorsal ground color, and no black patch on shoulder in males. The main difference between *Stenocercus frittsi* and *S. variabilis* is that the former species lacks a postfemoral mite pocket (distinct, deep pocket in *S. variabilis*). In addition, *S. frittsi* is smaller than *S. variabilis* and it has on average fewer scales around the midbody, as well as fewer gulars, paravertebrals, and subdigitals (Table 6).

Characterization.—(1) Maximum total length in males 79 mm (*N* = 23); (2) maximum total length in females 66 mm (*N* = 21); (3) vertebrals 48–71; (4) paravertebrals 59–90; (5) scales around midbody 60–76; (6) supraoculars 4–6; (7) internasals 4–5; (8) postrostrals 5–7; (9) loreals 2–4; (10) gulars 20–28; (11) lamellae on Finger IV 16–22; (12) lamellae on Toe IV 24–29; (13) posthumeral pocket shallow, Type 2 of Cadle (1991); (14) postfemoral pocket absent; (15) parietal eye not visible; (16) occipital scales small, smooth, juxtaposed; (17) no projecting angulate temporals; (18) supraoculars subequal in size; (19) scales in frontonasal region weakly imbricate anteriorly; (20) short preauricular fringe present; (21) antegular, antehumeral, gular, longitudinal, oblique, postauricular, and supra-auricular neck folds present; (22) lateral nuchals less than half size of dorsal nuchals; (23) posterior gulars in adults smooth, imbricate, not mucronate; (24) lateral scales reduced in size, approximately half size of dorsal body scales; (25) vertebral crest prominent; (26) dorsolateral crest absent; (27) ventrals in adults smooth, imbricate, not mucronate; (28) scales on posterior surfaces of thighs granular; (29) prefemoral fold absent; (30) inguinal groove absent; (31) preanals not projecting; (32) tail not compressed laterally in adult males; (33) tail length 59–65% of total length; (34) caudal whorls per autotomic segment three; (35) caudals not spinose; (36) dark stripe extending anterodorsally from subocular region to supraciliaries absent; (37) gular region of adult females dark or densely pigmented in some specimens; (38) gular region of adult males dark or densely pigmented in some specimens; (39) black blotch on ventral surface of neck in adult males absent; (40) thin black or dark brown midventral line absent; (41) black patch on ventral surface of thighs absent; (42) dorsal ground color gray or dark brown in females and males; (43) postxiphisternal inscriptional ribs not articulating midventrally, Pattern 2B of Torres-Carvajal (2004). Sexual variation in measurements and scutellation of *Stenocercus frittsi* is presented in Table 7.

Description of holotype.—Male (Figs. 45A, 46); SVL = 75 mm; TL = 141 mm; maximum head width = 15.3 mm; head length = 18.6 mm; head height = 12.2 mm; scales on parietal and occipital regions small, smooth, juxtaposed; parietal eye not visible; supraoculars in six rows, smooth, slightly imbricate, subequal in size; canthals two; anterior most canthal separated from nasal by two minute scales; scales in frontonasal region slightly imbricate; internasals four; postrostrals six, two most lateral wider than long on each side, medial postrostrals longer than wide; supralabials four; infralabials six; loreals four; lorilabials in one row; preocular not divided, in contact with posterior canthal; lateral temporals imbricate, moderately keeled; gulars in 28 rows between tympanic openings; all gulars smooth, imbricate, each bearing one apical pit; second infralabial in contact with first two sublabials; mental in contact with first pair of infralabials and first pair of postmentals; lateral and dorsal scales of body and dorsal scales of neck keeled, imbricate; lateral scales of neck granular; scales around midbody 64; vertebrals large, in 53 rows, forming a prominent serrate vertebral crest; paravertebrals 66; ventrals smooth, imbricate; preauricular fringe short, composed of five enlarged scales, of which the second from below is largest; antegular, antehumeral, gular, longitudinal, oblique, postauricular, and supra-auricular neck folds present; limb scales keeled, imbricate; ventral scales of hind limbs and upper arms smooth; lamellae on Finger IV 19; lamellae on Toe IV 29; tail not compressed laterally; caudals keeled, imbricate; basal subcaudals smooth, imbricate; vertebral crest extending more than half length of tail; tail length 1.8 times SVL; posthumeral pocket shallow (Type 2 of Cadle, 1991) with vertically oriented fold approximately 4 mm long (Fig. 48); postfemoral pocket absent; postfemoral region composed of imbricate, smooth scales that become smaller toward insertion of hind limb (Fig. 49A).

Color in life of holotype.—Dorsum dark gray with extensive black reticulations; scales on dorsal surface of head black with white centers; chin white with black reticulations; ventral surface of body, hind limbs, and tail pale yellow; dorsal aspect of hind limbs light gray with dark blotches; angle of jaw and post-tympanic area tan (T. H. Fritts, field notes, 18 October 1969).

Color variation.—In life, an adult male (KU 134195) differed in coloration from the holotype in having a black chin, light blue midventral stripe with a bright pink stripe on each side, and orange posterior surface of thighs and ventral aspect of tail. An adult female (KU 134184) had the following coloration in life: dorsum grayish-beige with paired dull black blotches on body and tail; head brown; post-tympanic area and angle of jaw gray; infralabial region charcoal; chin and ventral surface of body light gray without reticulations. Two young males (KU 134180, 134182) had the following coloration in life: dorsum gray with dull black blotches; dorsal surface of head brown with white flecks; lateral surface of body light gray with black markings; infralabial region, angle of jaw, and post-tympanic area charcoal; chin and gular region antique white with black reticulation; ventral surface of body antique white; ventral aspect of hind limbs and tail pale yellow (T. H. Fritts, field notes, 19–26 October 1969). As mentioned by Fritts (1974), there is considerable variation in the amount of dark pigment on the chin of both males and females. More than half of the specimens examined (56%) have a gray or black patch on the ventral portion of the tympanic area (Fig. 34); this patch extends onto the chin in 60% of these specimens.

Distribution and ecology.—*Stenocercus frittsi* inhabits the upper valleys of Río Mantaro on the eastern slopes of the Andes in central Peru (Fig. 50). It occurs at elevations of 2350–3966 m in Departamentos Huancavelica and Ayacucho. Specimens were collected in xeric areas with *Agave* and several species of cactus as prevalent plants (T. H. Fritts, field notes). Fritts (1974) reported Villa Azul (Departamento Huancavelica), 17 km ESE Colcabamba, 1200 m, as the lowest elevation within the distribution of the species described herein. However, in his field journal Fritts provides a different altitude (1600 m) and does not mention the location of Villa Azul relative to Colcabamba. According to a 1:100000 map from the National Geographic Institute of Peru, Villa Azul lies NE of Colcabamba at 2350–2400 m. Therefore, it is likely that the Villa Azul data provided by Fritts (1974) are inaccurate, and I consider 2350 m as the lowest elevation record of *S. frittsi*. No other species of *Stenocercus* is known to occur in sympatry with *S. frittsi*.

Etymology.—The specific name is a noun in the genitive case and is a patronym for Thomas H. Fritts, who collected most of the type specimens of the new species described herein. During his graduate research on the ecology and systematics of this genus (Fritts, 1972, 1974), Fritts made important collections of *Stenocercus* from Peru and Ecuador.

Stenocercus puyango **sp. nov.**

Holotype.—QCAZ 6723, an adult male, from Puyango (03°53'S, 80°04'47"W, 300 m), Provincia El Oro, Ecuador, collected on 7 January 2004 by Martha C. Carvajal-Aguirre and Omar Torres-Carvajal.

Paratypes.—ECUADOR: *El Oro*: QCAZ 6355, from 19 km N Alamor, collected on 28 March 2003 by Martín Bustamante and Italo G. Tapia; QCAZ 6356, from Bosque Protector Puyango (3.88°S, 80.083°W), collected on 28 March 2003 by Martín Bustamante and Italo G. Tapia; QCAZ 6701–6703, 6705–6713, same data as holotype except collected on 6 January 2004; QCAZ 6715–6722, 6724, 6725, same data as holotype; AMNH 21934–36, from Río Puyango, collected on 12 October 1921 by G. H. H. Tate. PERU: *Lambayeque*: MVZ 82364, from 21 km E, 7 km N Olmos, 1310 m, collected on 16 August 1967 by R. Huey; *Tumbes*: LSUMZ 26989, from Rica Playa, Río Tumbes, collected on 30 October 1973 by D. A. Tallman; KU 219834, from Matapalo, 90 m, collected on 12 January 1991 by Eric R. Wild; LSUMZ 39443, 39445–47, 39451, from Quebrada Faical, E El Caucho, 24 km SE

Pampa de Hospital, 400 m, collected between 21–27 June 1979 by T. S. Schulenberg; AMNH 22186, no locality data.

Diagnosis.—From all species of *Stenocercus, S. puyango* is similar to those species included in the "*Ophryoessoides* group" (Cadle, 2001) in having an enlarged row of supraocular scales and large posterior head scales. However, *S. puyango* differs from species in the "*Ophryoessoides* group", except *S. iridescens*, by having smooth head scales and smooth ventrals (slightly keeled in some juveniles and subadults). The only two other species of the "*Ophryoessoides* group" with relatively smooth head scales—*S. aculeatus* and *S. fimbriatus*—have strongly keeled ventrals. *Stenocercus puyango* is distinguished from *S. iridescens* (character states in parentheses) by having a shallow postfemoral pocket (postfemoral pocket absent), posterior circumorbitals (posterior circumorbitals generally absent, observed only in 4% of the specimens examined), and by lacking inscriptional ribs that articulate midventrally (three pairs of postxiphisternal inscriptional ribs articulate midventrally) and black marks around tympanum or posterior gular region in males (males with small black irregular marks on posterior gular region and around tympanum, Fig. 51). Measurements, scutellation, and other morphological characters of *Stenocercus puyango* are presented in Table 8.

Characterization.—(1) Maximum total length in males 309 mm (*N* = 14); (2) maximum total length in females 265 mm (*N* = 11); (3) vertebrals 42–50; (4) paravertebrals 43–53; (5) scales around midbody 30–45; (6) supraoculars 4–6; (7)

internasals 2–3; (8) postrostrals 4; (9) loreals 2–4; (10) gulars 18–22; (11) lamellae on Finger IV 15–20; (12) lamellae on Toe IV 22–27; (13) posthumeral pocket shallow, Type 2 of Cadle (1991); (14) postfemoral pocket shallow, Type 5 of Cadle (1991); (15) parietal eye usually visible; (16) occipital scales large, smooth, imbricate; (17) projecting angulate temporals absent; (18) enlarged supraoculars occupying most of supraocular region in one row; (19) scales on frontonasal region weakly imbricate anteriorly; (20) preauricular fringe short; (21) neck folds absent; (22) lateral and dorsal nuchals similar in size; (23) posterior gulars in adults smooth, imbricate, not mucronate, not notched; (24) lateral and dorsal body scales similar in size; (25) vertebral crest prominent; (26) dorsolateral crest absent; (27) ventrals in adults smooth, imbricate, not mucronate; (28) scales on posterior surfaces of thighs keeled, imbricate, mucronate; (29) prefemoral fold absent; (30) inguinal groove absent; (31) preanals projected; (32) tail strongly compressed laterally in adult males; (33) tail length 68–73% of total length; (34) caudal whorls per autotomic segment three; (35) caudals not spinose; (36) dark stripe extending anterodorsally from subocular region to supraciliaries in females and some males; (37) gular region of adult females black or densely pigmented; (38) gular region of adult males not black; (39) black blotch on ventral surface of neck in adult males usually present; (40) thin black or dark brown midventral line present; (41) black patch on ventral surface of thighs absent; (42) background color of dorsum in females and males dark brown; (43) postxiphisternal inscriptional ribs not articulating midventrally. Sexual variation in measurements and scutellation of *Stenocercus puyango* is presented in Table 9.

Description of holotype.—Male; SVL = 88 mm; TL = 198 mm; maximum head width = 16.2 mm; head length = 20.6 mm; head height = 14.7 mm; occipitals, parietals, interparietal, and postparietals large, smooth, slightly imbricate (Fig. 52); parietal eye visible; supraoculars in five rows, smooth, slightly imbricate, with one row more than three times larger than adjacent rows; anterior and posterior circumorbitals smooth, imbricate; canthals two; anteriormost canthal separated from nasal by two tiny scales; scales in frontonasal region slightly imbricate; internasals two; postrostrals four, wider than long; supralabials four; infralabials five; loreals three; lorilabials in one row; preocular not divided, in contact with posterior canthal; lateral temporals imbricate, slightly keeled; gulars in 19 rows between tympanic openings; all gulars smooth, imbricate, each bearing one apical pit; second infralabial in contact with first three sublabials; mental in contact with first pair of infralabials and first pair of postmentals; dorsal and lateral scales of body and neck keeled, imbricate; scales around midbody 41; vertebrals large, in 48 rows, forming a prominent serrate vertebral crest; paravertebrals 49; ventrals smooth, imbricate; preauricular fringe short, composed of three enlarged scales, of which the ventralmost is largest; neck and body folds absent; limb scales keeled, imbricate; ventral scales of hind limbs smooth or slightly keeled; lamellae on Finger IV 17; lamellae on Toe IV 24; tail strongly compressed; caudals keeled, imbricate; basal subcaudals smooth, imbricate; vertebral crest extending more than half length of tail; tail length 2.2 times SVL; posthumeral pocket shallow with wide opening and lined with tiny scales (Type 2 of Cadle, 1991); postfemoral pocket shallow with slit-like opening (Type 5 of

Cadle, 1991); two xiphisternal and two long postxiphisternal pairs of inscriptional ribs that do not articulate midventrally (Pattern 1A of Torres-Carvajal, 2004).

Color in life of holotype.—Dorsum light brown with darker chevrons over vertebral line; distinct dark brown chevron on suprascapular region; cream line extending vertically from shoulder to dorsolateral part of body; subocular and loreal regions cream; dark brown interorbital bar, wider between semicircles; occipital region with two black blotches; gular region rosy; borders of infralabials, sublabials, postmentals, mental, and anterior gulars with irregular light red marks; posterior gular region, and ventral and lateral sides of neck with tiny red marks aligned longitudinally; black blotch on ventromedial aspect of neck; throat bright yellow; ventral surface of body between pectoral and pelvic girdles lavender with a faint, narrow dark midventral line; flanks of body with tiny red marks between forelimbs and hind limbs (Fig. 51).

Color variation.—An adult female (QCAZ 6702) had the following coloration in life: dorsum dark brown with darker chevrons over vertebral line; cream line extending longitudinally from subocular region, through dorsal border of tympanum, to level of insertion of forelimbs; another cream line extending vertically from the former to shoulder; subocular and loreal regions white cream; posteroventrally oriented dark brown band on subocular region; dark brown interorbital bar; gular region and neck dark brown; ventral surfaces of body, limbs, and tail cream with dark brown flecks; 8-shaped dark brown mark on throat; thin dark brown midventral stripe between 8-shaped mark and vent; three large cream blotches on posterior surface of each thigh. Other females have similar color patterns (Fig. 51). Juvenile males (QCAZ 6701, 6703) also have yellow throats, but they differ from adult males in having dark throat marks similar to those observed in females. However, these throat marks are faint, which suggests that the neonatal throat pattern is retained in females and modified in adult males.

Natural history.—Specimens were active between 1000–1600 h. Whereas juveniles and some adult females were found on leaf litter, adult males and some females were found on rocks or logs exposed to the sun. Several adult males were observed doing push-up displays. An adult female (QCAZ 6721) laid two eggs in captivity on 10 January 2004. The sizes of these eggs were 17.29mm x 8.72mm and 17.42mm x 8.73mm; their volumes were 688.38mm^3 and 695.14 mm^3, respectively. After 96 days, a 0.7 g neonate (SVL = 26.7 mm, TL = 54.7 mm) hatched from one of the eggs.

Distribution and ecology.—*Stenocercus puyango* inhabits lowland deciduous forests of the western slopes of the Andes in southern Ecuador and northern Peru (Fig. 53). It occurs at elevations of 90–1500 m in Provincia El Oro (Ecuador) and Departamentos Tumbes, Piura, and Lambayeque (Peru). *Stenocercus puyango* is sympatric with *S. limitaris* at Quebrada Faical in Departamento Tumbes, Peru (Cadle, 1998). It is very likely that these two species are sympatric at other localities in southwestern Ecuador and northwestern Peru as well. One of the paratypes (QCAZ 6355) of *S. puyango* was collected close to Alamor (Provincia Loja, Ecuador), where both *S. limitaris* and *S. carrioni* occur (Cadle, 1998; Fritts, 1974).

Etymology.—The specific name is a noun in apposition and refers to the Puyango Protected Forest, where the holotype of this species was collected. This 2658 ha reserve in southwestern Ecuador has one of the world's largest collections of petrified tree trunks, on which several adult males and females of the new species were found.

Remarks.— Similarity in external morphology and color patterns (Figs. 50, 51), as well as adjacent geographical distribution (Fig. 53), suggest that the new species is closely related to *S. iridescens* (Table 8). Günther (1859) described *S. iridescens* as having smooth or very indistinctly keeled ventrals, but there seems to be some confusion concerning the degree of keeling of ventral scales in this species (e.g., Cadle, 1998, 2001; Fritts, 1974). Similar to other species of *Stenocercus* (e.g., *S. festae*), there is ontogenetic variation in the degree of keeling of the ventral scales in *S. iridescens*. Juveniles have keeled ventrals, which become less keeled or smooth in adulthood.

Stenocercus limitaris is another species with enlarged head scales that occurs in the lowlands of southwestern Ecuador and northwestern Peru in sympatry with *S. puyango*. The main differences between these two species (Table 8) are that *S. limitaris* has keeled dorsal head scales, a strongly keeled angulate temporal, strongly keeled and mucronate ventrals, and deep posthumeral and postfemoral pockets (Cadle, 1998).

Before Frost (1992) synonymized *Ophryoessoides* and *Proctotretus* with *Stenocercus*, species of *Stenocercus* with enlarged posterior head scales, one row of enlarged supraoculars, keeled ventrals, and pairs of inscriptional ribs articulating midventrally were placed in *Ophryoessoides* (Fritts, 1974). Even recently the term "*Ophryoessoides* group" has been proposed to refer to the species of *Stenocercus* that have the character states mentioned above (Cadle, 2001). However, the distribution of several morphological characters among species of *Stenocercus*, including those used by Fritts (1974) to diagnose *Ophryoessoides*, suggest that *Ophryoessoides* is not a natural taxon (Frost, 1992). *Stenocercus puyango* is an example of a species with some but not all of the diagnostic characters of "*Ophryoessoides*". It has enlarged supraoculars and posterior head scales (Fig. 52), but it has smooth ventrals and its inscriptional ribs do not articulate midventrally.

Stenocercus santander **sp. nov.**

Stenocercus erythrogaster; Ayala (part), 1986:563; Cadle (part), 2001:217; Harvey *et al.* (part), 2004:941.

Holotype.—UIS-R 478, an adult male, from Vereda Tres Esquinas, approximately 6°59'22"N, 73°3'13"W, Municipio Piedecuesta, Departamento Santander, Colombia, collected on 23 February 1999 by Rances Caicedo.

Paratypes.—COLOMBIA: *SANTANDER*: MUJ 542, 567, from Hacienda El Roble, Vereda La Granja, 6º51'57"N, 73º2'57"W, 1570, collector unknown; MLS 1220, from Piedecuesta, collected on 22 October 1970 by L. F. Ordoñez; ANSP 24136, from San Gil, collected by N. María; MLS 22–24, 38, 39, from San Gil, collected on November 1948 by N. María; UIS-R 1199, 1286, from Vereda Las Amarillas, 6º58'11"N, 73º1'17"W, 1400–1500 m, collected by I. Jaimes on 24 October 2002 and 23 January 2003, respectively; UIS-R 1196, from Vereda Los Monos, collected on 15 November 2003 by R. Caicedo.

Diagnosis.—*Stenocercus santander* differs from all other species of *Stenocercus* except *S. erythrogaster* and *S. huancabambae* in having keeled ventrals, strongly keeled and imbricate head scales, distinct parietals, interparietal, and postparietals, strongly laterally compressed tail, prominent vertebral crest in adult males, distinct posthumeral mite pocket, nostrils medial to canthus, and postxiphisternal inscriptional ribs in contact medially (Torres-Carvajal, 2004). It differs from *S. erythrogaster* (character states in parentheses) in having a more prominent, serrate vertebral crest in adult males that extends from posterior border of head onto less than half the length of tail (vertebral crest low, serrate only anteriorly), a distinct postfemoral mite pocket (postfemoral mite pocket absent) and in lacking a dark stripe extending anterodorsally from subocular region across eyelids (dark stripe present). The new species differs from *S. huancabambae* (character states in parentheses) in having two canthals (one canthal), and in lacking dorsally projected angulate temporals (two projected angulate temporals).

Characterization.—(1) Maximum total length in males 96 mm (N = 7); (2) maximum total length in females 78 mm (N = 2); (3) vertebrals 33–40; (4) paravertebrals 45–57; (5) scales around midbody 37–47; (6) supraoculars 3–5; (7)

internasals 3–4; (8) postrostrals 4–6; (9) loreals 2–3; (10) gulars 16–21; (11) lamellae on Finger IV 15–19; (12) lamellae on Toe IV 24–29; (13) posthumeral pocket deep with wide opening (Type 4 of Cadle, 1991); (14) postfemoral pocket deep with slit-like opening (Type 5 of Cadle, 1991); (15) parietal eye usually visible (69% of specimens examined); (16) occipital scales small, strongly imbricate, keeled; (17) one or two enlarged, non-projected angulate temporals; (18) enlarged supraoculars occupying most of supraocular region in one row; (19) scales on frontonasal region imbricate; (20) preauricular fringe present; (21) neck folds absent; (22) lateral and dorsal nuchals similar in size; (23) posterior gulars in adults keeled, imbricate, not notched; (24) lateral and dorsal body scales similar in size; (25) vertebral crest prominent; (26) dorsolateral crest absent; (27) ventrals in adults keeled, imbricate, mucronate; (28) scales on posterior surfaces of thighs keeled, imbricate, mucronate; (29) prefemoral fold absent; (30) inguinal groove absent; (31) preanals not projected; (32) tail strongly compressed laterally in adult males; (33) tail length 67–74% of total length; (34) caudal whorls per autotomic segment three; (35) caudals not spinose; (36) dark stripe extending anterodorsally from subocular region to supraciliaries absent; (37) gular region of adult females yellowish cream or densely pigmented with gray; (38) gular region of adult males yellowish cream; (39) black blotch on ventral surface of neck in adult males might be present (14% of specimens examined); (40) dark midventral stripe in adult males usually thin, faint (1 specimen with wide, distinct black midventral stripe); (41) black patch on ventral surface of thighs absent; (42) background color of dorsum in males brown; (43) postxiphisternal inscriptional ribs in contact medially (Pattern 6A of Torres-Carvajal, 2004). Sexual variation in measurements and scutellation of *Stenocercus santander* is presented in Table 10.

Description of holotype.—Male (Figs. 53, 54); SVL = 96 mm; TL = 239 mm; maximum head width = 14.77 mm; head length = 22.33 mm; head height = 17.76; occipitals, parietals, interparietal, and postparietals large, keeled, imbricate; parietal eye visible; supraoculars in four rows, keeled, imbricate, with one row approximately three times larger than adjacent rows; canthals two, the anteriormost in contact with nasal; scales in frontonasal region keeled, imbricate; internasals three; postrostrals five; supralabials four; infralabials five; loreals three; lorilabials in one row; preoculars two, the dorsalmost in contact with canthal; lateral temporals imbricate, keeled; gulars in 18 rows between tympanic openings; posterior gulars slightly keeled, imbricate, without apical pits or caudal notches; second infralabial on right side in contact with first three sublabials; second infralabial on left side in contact with first and second sublabials; mental in contact with first pair of infralabials and first pair of postmentals; dorsal and lateral scales of body and neck keeled, imbricate, mucronate; scales around midbody 38; vertebrals 36, more than 4 times larger than adjacent paravertebrals, forming a prominent serrate crest; paravertebrals 52; ventrals keeled, imbricate, mucronate; preauricular fringe present; neck and body folds absent; limb scales keeled, imbricate, mucronate; lamellae on Finger IV 19; lamellae on Toe IV 29; tail strongly compressed laterally; caudals and subcaudals keeled, imbricate, mucronate except for anterior subcaudals, which are smooth and imbricate; vertebral crest extending less than half length of tail; tail length nearly 2.5 times SVL;

posthumeral mite pocket with wide opening, lined with granular scales (Type 4 of Cadle, 1991); postfemoral mite pocket deep with slit-like opening (Type 5 of Cadle, 1991); caudal fracture planes present; three caudal whorls per autotomic segment.

Color in preservative of holotype.—Dorsum of head black with large, light gray blotches; cream-white longitudinal stripe on rostral, subnasal, loreals, lorilabials, and subocular; the latter stripe extends posteriorly through dorsal border of tympanum to scapular area, where it merges with a thin, vertical, cream-white line that extends ventrally to forelimb insertion; dorsal and lateral body background brown; gular and ventral background light brown; from head to tail, vertebrals I, II, IV, V, VI, VIII, and IX black; faint dark midventral stripe on gular region continuous with faint dark patch on ventral surface of neck; cream-white transverse stripe extending across pectoral region between forelimbs, cream-white patch covering ventral surface of thighs, pelvic region, and anterior subcaudals; tail same color as body background.

Color variation.—An adult male (ANSP 24136) differs from the holotype in having both a distinct black patch on ventral surface of neck and a distinct black midventral stripe between pectoral and pelvic regions. Additionally, this specimen lacks the cream-white ventral patches present in the holotype (see above), and the dorsal aspect of the head is dark brown with light brown large blotches. An adult female (UIS-R 1286) has the following coloration in preservative: dorsum of head, body, limbs, and tail dark brown with no marks; cream-white longitudinal stripe on rostral, subnasal, loreals, lorilabials, and subocular; the latter stripe extends posteriorly through dorsal border of tympanum to scapular area, where it merges with a thin, vertical, cream-white line that extends ventrally to forelimb insertion; thin, dark brown line extending on subocular region from posterior supralabials to ventral margin of eye; dorsal and lateral body background brown; gular region light gray anteriorly and dark gray posteriorly; posterior border of scales on ventral surface of neck whitish gray; ventral surfaces of body, limbs, and tail yellowish cream; posterior half of scales covering flanks and belly whitish gray.

Natural History.—An adult female (UIS-R 1286) collected on 23 January 2003 contained four oviductal eggs, one of which was damaged and could not be measured. The sizes of these eggs were 21.28 mm x 10.44 mm, 19.18 mm x 8.68 mm, and 15.86 mm x 8.23 mm; their volumes were 1214.43 mm^3, 756.63 mm^3, and 562.47 mm^3, respectively. The smallest individual was collected on 15 November 2003 and has a total length of 105 mm (SVL = 35, TL = 70).

Distribution and ecology.—*Stenocercus santander* is known from the western slopes of the eastern Andean cordillera in northern Colombia. It occurs in Departamento Santander at elevations between 1189–1570 m (Fig. 56). Specimens from Vereda Las Amarillas and Vereda Los Monos were collected in abandoned field crops (Rances Caicedo, field notes) indicating that this species can be found in disturbed areas. No other species of *Stenocercus* is known to occur in sympatry with *S. santander*.

Etymology.—The epithet *santander* is a noun in apposition and refers to Departamento Santander, Colombia, where all specimens of the new species were collected.

Remarks.—Similarity in external morphology and geographic distribution (Fig. 56) are probably the main reasons for misidentification of specimens of *Stenocercus santander* as *S. erythrogaster* (Ayala, 1986; Cadle, 2001; Harvey et. al, 2004). Recognition of specimens from Departamento Santander as a new species restricts the geographic distribution of *S. erythrogaster* to the Caribbean lowlands of Colombia (Departamentos Bolívar, El César, and Magdalena) and Venezuela (Estado Zulia; Harvey et. al, 2004) at elevations of 17–700 m. In addition, I report a new record (ICN 9096) of *S. erythrogaster* from Departamento Chocó, Municipio Bahía Solano, Playitas de Nabugá, 6°24'0"N, 77°20'60"W, which lies on the Pacific coast of northern Colombia (Fig. 56) approximately 400 km SW of the westernmost previously known record from Departamento Magdalena, Parque Nacional Tayrona, El Cedro Station (Harvey et. al, 2004: not shown in their Figure 2). This suggests that *S. erythrogaster* is widespread in the northern lowlands of Colombia including Departamentos Antioquia, Atlántico, Córdoba, La Guajira, and Sucre.

Stenocercus sinesaccus **sp. nov.**

Stenocercus caducus; Cope, 1887:55; Peters and Donoso-Barros (part), 1970:213; Cei (part), 1993:302.

Holotype.—BMNH 1903.3.26.7, an adult male, from Chapadá [Chapada dos Guimarães, 15°26' S, 55°45' W, 690 m], Mato Grosso, Brazil, collected by M. A. Robert.

Paratopotypes.—ANSP 12947 (adult male), 12948 (adult female), collected by H. H. Smith; MCZ 171198 (formerly BMNH 1903.3.26.9, adult male), same data as holotype.

Diagnosis.—*Stenocercus sinesaccus* (Fig. 57) differs from all other species of *Stenocercus* except *S. caducus*, *S. dumerilii*, *S. prionotus*, and *S. tricristatus* in having strongly keeled and mucronate body scales, laterally oriented nostrils, and in lacking a postfemoral mite pocket. It differs from *S. caducus* and *S. prionotus* in lacking a posthumeral mite pocket; the latter two species have a deep posthumeral mite pocket covered by an axillary flap (Fig. 58, Cadle 2001). The new species differs from *S. dumerilii* and *S. tricristatus* in lacking enlarged post-supraciliaries (Avila-Pires 1995). In addition, *S. sinesaccus* lacks caudal fracture planes, a condition only present in *S. dumerilii*, *S. scapularis*, and *S. tricristatus*.

Characterization.—(1) Maximum total length in males 257 mm (N = 3); (2) maximum total length in females 272 mm (N = 1); (3) vertebrals 28–30; (4) paravertebrals 32–34; (5) scales around midbody 31–34; (6) supraoculars 4; (7) internasals 6; (8) postrostrals 4–5; (9) loreals 3; (10) gulars 12–14; (11) lamellae on Finger IV 13–16; (12) lamellae on Toe IV 23–25; (13) posthumeral pocket absent; (14) postfemoral pocket absent; (15) parietal eye visible; (16) occipital scales large, imbricate, strongly keeled; (17) one enlarged, non-projected angulate temporal; (18) row of enlarged supraoculars absent; (19) scales on frontonasal region imbricate; (20) preauricular fringe absent; (21) neck folds absent; (22) lateral and dorsal nuchals similar in size; (23) posterior gulars in adults keeled, imbricate, mucronate, not notched; (24) lateral and dorsal body scales similar in size; (25) vertebral crest prominent; (26) dorsolateral crest present; (27) ventrals in adults keeled, imbricate, mucronate; (28) scales on posterior surfaces of thighs keeled, imbricate, mucronate; (29) prefemoral fold absent; (30) inguinal groove absent; (31) preanals projected; (32) tail not strongly compressed laterally in adult males; (33) tail length 72–73% of total length; (34) caudal fracture planes absent; (35) caudals not spinose; (36) dark stripe extending anterodorsally from subocular region to supraciliaries in males; (37) gular region of adult females cream; (38) gular region of adult males cream; (39) black blotch on ventral surface of neck in adult males absent; (40) thin black or dark brown midventral line absent; (41) black patch on ventral surface of thighs absent; (42) background color of dorsum in males brown in preservative; (43) postxiphisternal inscriptional ribs in contact medially (Pattern 6A of Torres-Carvajal, 2004). Sexual variation in measurements and scutellation of *Stenocercus sinesaccus* is presented in Table 11.

Description of holotype.—Male (Figs. 56, 58); SVL = 73 mm; TL = 184 mm; maximum head width = 12.5 mm; head length = 17.4 mm; head height = 10.5 mm; occipitals, parietals, interparietal, and postparietals large, strongly keeled, imbricate; parietal eye visible; supraoculars in four rows, keeled, imbricate; canthal single, separated from nasal by a tiny scale; scales in frontonasal region keeled, imbricate; internasals six; postrostrals four; supralabials four, keeled; infralabials five, keeled; loreals three, keeled; lorilabials in one row, keeled; preocular in contact with canthal; lateral temporals imbricate, keeled; gulars in 12 rows between tympanic openings; all gulars strongly keeled, imbricate, without apical pits or caudal notches; second infralabial in contact with first three sublabials; mental in contact with first pair of infralabials and first pair of postmentals; dorsal and lateral scales of body and neck keeled, imbricate, mucronate; scales around midbody 31; vertebrals 28, about 1.5 times larger than adjacent paravertebrals, forming a prominent serrate crest; paravertebrals 34; ventrals keeled, imbricate, mucronate; preauricular fringe absent; neck and body folds absent; limb scales keeled, imbricate; lamellae on Finger IV 15; lamellae on Toe IV 23; tail not compressed laterally; caudals and subcaudals keeled, imbricate; vertebral crest extending less than half length of tail; tail length 2.5 times SVL; posthumeral (Fig. 58) and postfemoral pockets absent (Type 1 of Cadle 1991); postxiphisternal inscriptional ribs I-III in contact medially (pattern 6A of Torres-Carvajal, 2004); caudal fracture planes absent.

Color in preservative of holotype.—Dorsum of head and body light brown; subocular and loreal regions whitish cream; dark brown bar extending anterodorsally from commissure of mouth to eye; gular and ventral surfaces golden brown; ventrolateral edges (approximately two scales wide) of body between hind and forelimbs iridescent pink; tail with alternating dark and light brown rings.

Distribution and ecology.—*Stenocercus sinesaccus* is known only from its type locality, Chapada dos Guimarães, 15°26' S, 55°45' W, 690 m, Mato Grosso, Brazil (Fig. 60). This city lies within the Cerrado (savanna) Biome and is part of the Chapada dos Guimarães National Park. No other species of *Stenocercus* is known to occur in sympatry with *S. sinesaccus*.

Etymology.—The epithet *sinesaccus* is derived from the Latin words *sine,* meaning "without" and *saccus,* meaning "pocket, bag." This name refers to the absence of mite pockets in *S. sinesaccus*, a trait that distinguishes this species from the morphologically similar *S. caducus* (Fig. 58).

Remarks.—Presence of *Stenocercus caducus* in Brazil remains to be confirmed. Cope (1887) provided the first record of *S. caducus* for Brazil based upon examination of specimens collected by H. H. Smith at or near the "village of Chapada, 30 miles northeast of Cuiabá" (Cope 1887, Vanzolini 1953). This locality seems to correspond to Chapada dos Guimarães, the type locality of the new species herein described. I have examined these specimens and they correspond to *S. sinesaccus*. The second and only other voucher-based record of *S. caducus* for Mato Grosso was provided by Boulenger (1903) based on specimens collected in the Percy Sladen expedition to central Brazil by M. A. Robert. These specimens include the holotype and one of the paratypes of *S. sinesaccus*. Later records of *S. caducus* from Brazil (e.g., Peters and Donoso-Barros 1970, Cei 1993) do not refer to any voucher specimens and are probably based on Cope's (1887) and Boulenger's (1903) accounts. Therefore, the presence of *S. caducus* in Brazil has not been verified, although its occurrence in this country seems likely because it has been reported in Bolivia near the Brazilian border (Cadle, 2001).

Cei (1986, 1993) reported *S. pectinatus* from Brazil without reference to voucher specimens. A recent study on the distribution of *S. pectinatus* suggests that these records are mistaken (Avila 1999); therefore, I question the presence of this species in Brazil in the absence of voucher specimens. Accordingly, I recognize seven species of *Stenocercus* from Brazil—*S. azureus*, *S. caducus*, *S. dumerilii*, *S. fimbriatus*, *S. roseiventris*, *S. sinesaccus*, and *S. tricristatus* (Table 12).

Stenocercus torquatus Boulenger[1]

Stenocercus torquatus Boulenger, 1885:133. Holotype: BMNH 61.5.22.4, a male from "Peru." Type locality herein restricted to María Teresa, 19 km on road Oxapampa-Llaupi (10°42'05"S, 75°27'22"W), 1470 m, Departamento Pasco, Peru.

Stenocercus crassicaudatus (part) Burt and Burt, 1931:287; Peters and Donoso-Barros, 1970; Fritts, 1974:45. Synonymy fide Burt and Burt (1931).

Diagnosis.—*Stenocercus torquatus* differs from all other species of *Stenocercus* except *S. bolivarensis, S. carrioni, S. chlorostictus, S. crassicaudatus, S. empetrus, S. eunetopsis,* and *S. simonsii* in having granular scales on the posterior surface of thighs and spinose caudal scales. It differs from these species in having a

[1] This species was resurrected in collaboration with E. Lehr and M. Lundberg.

black antehumeral collar complete middorsally in adult males, subadult females, and juveniles, two black transverse bands anterior to the antehumeral collar, and the ability to change colors between emerald green and dark brown or grey. An antehumeral collar also is present in all species mentioned above except *S. crassicaudatus*; however, in these species the collar is usually incomplete middorsally. Similarly, two black transverse bands anterior to the antehumeral collar have been reported in *S. eunetopsis* (Cadle, 1991), but they are not as distinct as in *S. torquatus*.

Characterization.—(1) Maximum total length in males 84 mm (*n* = 27); (2) maximum total length in females 74 mm (*n* = 16); (3) vertebrals 83–115; (4) paravertebrals 103–151; (5) scales around midbody 102–137; (6) supraoculars 6–8; (7) internasals 4–6; (8) postrostrals 6–8; (9) loreals 2–5; (10) gulars 47–67; (11) lamellae on Finger IV 22–29; (12) lamellae on Toe IV 26–32; (13) posthumeral vertical wrinkle present, pocket Type 2 of Cadle (1991); (14) postfemoral pocket shallow, Type 3 of Cadle (1991); (15) parietal eye absent; (16) occipital scales small, smooth, juxtaposed; (17) projecting angulate temporals absent; (18) enlarged supraoculars occupying most of supraocular region in one row absent; (19) scales on frontonasal region juxtaposed; (20) preauricular fringe short; (21) antegular, antehumeral, gular, longitudinal, oblique, postauricular, supra-auricular, and transverse antegular neck folds present; (22) lateral and dorsal nuchals similar in size; (23) posterior gulars smooth, imbricate, with apical pit; (24) lateral and dorsal body scales similar in size; (25) vertebrals slightly enlarged, forming inconspicuous longitudinal row between forelimbs and hind limbs; (26) dorsolateral crests absent; (27) ventrals smooth, imbricate; (28) scales on posterior surfaces of thighs granular; (29) prefemoral fold present; (30) inguinal groove present; (31) preanals not projected; (32) tail not strongly compressed laterally in adult males; (33) tail length 47–54% of total length; (34) two caudal whorls per autotomic segment; (35) caudals spinose; (36) dark stripe extending anterodorsally from subocular region to supraciliaries absent; (37) color pattern of gular region in adult females without dark marks, similar to ventral color pattern; (38) color pattern of gular region in adult males without dark marks, similar to ventral color pattern; (39) black blotch on ventral surface of neck in adult males absent; (40) dark midventral stripe in adult males absent; (41) black patches on ventral surface of thighs in adult males absent; (42) background color of dorsum grey, brown, or green; (43) postxiphisternal inscriptional ribs not articulating midventrally (Pattern 1B of Torres-Carvajal, 2004). Measurements, scutellation, and other morphological characters of *Stenocercus torquatus* are presented in Table 13. All quantitative characters examined in this study are significantly similar between males and females (Table 14).

Description of holotype.—Male (Figs. 60, 61); SVL = 80 mm; TL = 86 mm; maximum head width = 14 mm; head length = 18.8 mm; head height = 11.8 mm; posterior dorsal head scales small, smooth, juxtaposed (Fig. 62); parietal eye not visible; supraoculars in seven rows, smooth, slightly imbricate, with the lateral most three rows less than half the size of the medial adjacent rows; distinct circumorbitals absent; canthals two; internasals four; postrostrals six, approximately as wide as long;

supralabials five; infralabials six; loreals three; lorilabials in one row; preocular divided into two scales, the dorsal most in contact with posterior canthal; lateral temporals granular; gulars in 54 rows between tympanic openings; all gulars cycloid, smooth, imbricate, each bearing one apical pit; second infralabial in contact with first three sublabials; first pair of postmentals in contact medially; mental in contact with first pair of infralabials and first pair of postmentals; dorsal and lateral scales of body and neck granular; scales around midbody 121; vertebrals enlarged, slightly keeled, imbricate, in 98 rows, forming distinct vertebral row; paravertebrals adjacent to vertebral row slightly enlarged, keeled, and imbricate; paravertebrals 115; ventrals smooth, imbricate, more than twice the size of dorsals; preauricular fringe short, composed of four enlarged, posteriorly projected granular scales; antegular, antehumeral, gular, longitudinal, oblique, postauricular, supra-auricular, and transverse antegular neck folds present; ventrolateral and prefemoral folds present; dorsal scales of forelimbs imbricate, keeled; dorsal scales of hind limbs imbricate, strongly keeled, mucronate; ventral humeral scales granular; ventral scales of forearms and hind limbs imbricate, smooth; palmars and plantars imbricate, keeled, with tridentate margin; lamellae on Finger IV 27; lamellae on Toe IV 29; tail rounded; caudals strongly keeled, mucronate, imbricate; basal subcaudals smooth, imbricate; vertical fold in axilla (posthumeral pocket Type 2 of Cadle, 1991); distinct postfemoral pocket with slit-like opening (Type 5 of Cadle, 1991).

Color in preservative of holotype.—Dorsal surfaces and throat dark olive; black dorsal transverse bar from one antehumeral fold to the other; pectoral region blue; belly pinkish white (Boulenger, 1885).

Color variation.—An adult male (MTD 45921, SVL = 74 mm) had the following coloration in life: dorsum emerald green with yellow spots anteriorly and greyish green with irregular black marks posteriorly; flanks of posterior third of body purple with yellow spots; forelimbs dark green with diffuse yellow spots and irregular black marks dorsally; hind limbs grey with irregular black marks and light yellow spots; head greyish green, darker dorsally and lighter laterally; posterolateral part of head and adjacent neck region light green with white blotches; upper and lower eyelids light yellow; black longitudinal stripe extending posterodorsally from preocular region to anterodorsal aspect of neck, posterior to this stripe is a middorsal black blotch; extracolumella metallic green; black antehumeral collar bordered with yellow bands anteriorly and posteriorly; yellow bands become green dorsally and white ventrally; two short, black transverse bands anterior to antehumeral collar; ventral surface of body light grey; pectoral and gular regions yellowish grey with light spots laterally; ventral surface of forelimbs grey with light grey spots; ventral surface of hind limbs cream with irregular grey marks; preanal region purple; tail purple laterally and grey dorsally. An adult female (MHNSM 18432, SVL = 66 mm) differed from the above description as follows: dorsum and flanks emerald green with white and black dots anteriorly and brownish grey posteriorly; forelimbs dark green with white and black dots dorsally; hands white with black irregular marks; hind limbs and feet grey with white and black dots dorsally; dark green antehumeral collar bordered with lime green band posteriorly and white spots anteriorly; lime green band becomes white ventrally; ventral surface of forelimbs and hind limbs cream with irregular black marks; preanal region white with grey dots; tail grey with dark reddish-brown bands that become darker and narrower distally; anterior portion of tail white midventrally. A juvenile (ML field number 936, SVL = 44 mm) had the following coloration in life: anterior three quarters of dorsum and flanks emerald green with white and black spots; black spots bigger dorsally; dorsal surface of hind limbs and posterior quarter of body grey with black and white spots; dorsal surface of forelimbs dark green with black dots; head greyish green, darker dorsally; upper and lower eyelids whitish green; sublabials emerald green; black longitudinal stripe extending posterodorsally from preocular region to anterodorsal aspect of neck, posterior to this stripe is a middorsal black blotch and a smaller blotch is in between; posterolateral part of head and adjacent neck region green with light green spots; antehumeral collar dark green, bordered with transverse row of lime green spots (lighter ventrally) anteriorly and posteriorly; two dark green transverse bands anterior to and shorter than antehumeral collar; preanal region white; ventral surface of body grey with light spots laterally; gular region and throat yellowish grey with light spots; ventral surface of forelimbs grey with light spots; ventral surface of hind limbs cream with irregular black markings; tail cream ventrally and grey dorsally with dark rings approximately two scales wide; tail darker distally.

The coloration in *Stenocercus torquatus* varies ontogenetically. The dark antehumeral collar and 2–3 shorter transverse bands anterior to it (Fig. 63) are present in juveniles of both sexes. They are retained in adult males, whereas females gradually lose them with age. A similar condition is present in other species of *Stenocercus*, such as *S. chota* (Torres-Carvajal, 2000) and *S. puyango* (Torres-Carvajal, 2005). However, in these species females and not males retain the neonatal color patterns. In addition, both sexes of *S. torquatus* have the ability to change their dorsal background color from emerald green to dark brown or grey, for which it has received the local name of "camaleón." This ability to change colors has not been reported previously for any other species of *Stenocercus.* During color change, the pale spots on the body and yellow eyelids are retained. Color change was observed immediately after capture suggesting that it occurs as a response to stressful situations. The green coloration blends into the color of the mosses and ferns where individuals where found. Although not observed, the dark coloration might provide camouflage against dark backgrounds, such as tree trunks or rocks.

Natural history.—One adult female (AMNH 23151, SVL = 59 mm) contained two eggs. The sizes of these eggs are 18.12 mm x 8.12 mm and 17.5 mm x 8.12 mm; their volumes were 625.56 mm^3 and 604.16 mm^3, respectively. The smallest individual (MTD 46294) was collected on 10 July 2004 and has a total length of 71 mm (SVL = 35 mm, TL = 36 mm).

Distribution and ecology.—*Stenocercus torquatus* inhabits the Chanchamayo Valley and surroundings on the eastern slopes of the Andes in central Peru (Fig. 64).

It occurs at elevations of 800–1800 m in departamentos Junín (provincias Chanchamayo and Junín) and Pasco (provincia Oxapampa). The distribution lies within the Selva Alta (400–1000 m) and Yungas (500–2300 m) ecoregions (Brack, 1986; Penaherrera del Aguila, 1989). Specimens of *S. torquatus* were found between approximately 1–4 m on tree trunks, and some juveniles were observed at higher distances on trees, suggesting that this species is mainly arboreal. *Stenocercus torquatus* is sympatric with *S. boettgeri, S. formosus,* and *S. scapularis* at María Teresa in departamento Pasco. *Stenocercus variabilis* occurs allopatrically at higher elevations (> 2500 m) in departamento Junín (Fritts, 1974). Intensive agriculture (coffee plantations), cattle breeding, and uncontrolled deforestation threaten the habitat of these species.

Remarks.—Ortiz (1989) designated a juvenile (MHNN 2267) as lectotype of *Stenocercus crassicaudatus.* This specimen lacks the disctinctive black collar and nuchal transverse bands (B. Mulhauser, personal communication) of *S. torquatus*; therefore, we conclude that it belongs to the same species as the specimens from Cusco examined in this study. Ortiz (1989) referred to the type locality of *S. crassicaudatus* (Urubamba [departamento Cusco]) given by Tschudi (1846) as an error because "it is far from the places that Tschudi visited in Peru"; consequently, he restricted the type locality to "surroundings of Rio Perené (departamento Junín)" (Ortiz, 1989). In this study, we conclude that *S. crassicaudatus* is restricted to departamento Cusco and *S. torquatus* to departamentos Junín and Pasco. Therefore, we accept Tschudi's (1846) designation of "Urubamba (departamento Cusco), Peru" as the type locality of *S. crassicaudatus*. In their checklist of South American lizards at the American Museum of Natural History collection, Burt and Burt (1931) synonymized *Stenocercus torquatus* with *S. crassicaudatus* and mentioned that there was much variation in coloration and scutellation within "*S. crassicaudatus.*" Interestingly, this was not questioned by subsequent workers (e.g., Fritts, 1974; Peters and Donoso-Barros, 1970), even though all AMNH specimens in Burt and Burt's (1931) checklist correspond to *S. torquatus*. Indeed, the black scapular "bars" of some specimens of "*S. crassicaudatus*" reported by Burt and Burt (1931) correspond to the antehumeral collar and nuchal black transverse bands that distinguish *S. torquatus* from *S. crassicaudatus* (Fig. 63). Fritts (1974) noted some differences between specimens of "*S. crassicaudatus*" from departamentos Junín (i.e., *S. torquatus*) and Cusco, but referred to it as intraspecific variation. Although these two species are similar morphologically (Table 13), *S. crassicaudatus* has significantly fewer scales around midbody (*t*-test, $t = 4.861$, df = 75, $P < 0.001$), fewer vertebrals ($t = 6.511$, df = 72, $P < 0.001$), fewer gulars ($t = 5.093$, df = 75, $P < 0.001$), more internasals ($t = -7.222$, df = 74, $P < 0.001$), more subdigitals on finger IV and toe IV ($t = -6.226$, df = 75, $P < 0.001$, and $t = -6.857$, df = 74, $P < 0.001$, respectively), and a longer tail ($t = -15.494$, df = 41, $P < 0.001$). In addition, *S. crassicaudatus* has dark brown or grey dorsal background with black spots (*S. torquatus* changes colors between green and grey or brown) and lacks a distinct black collar or nuchal bands. Fritts (1974) reported "*Stenocercus crassicaudatus*" from departamentos Loreto and San Martín based on examination of a neonate (AMNH 57176, SVL = 31 mm, TL = 35 mm) and a subadult male (AMNH 57173, SVL = 65 mm, TL = 65 mm), respectively. Because these two specimens are more similar morphologically to *S. torquatus*, we conclude that *S. crassicaudatus* is restricted to departamento Cusco. In the absence of a reasonable sample from Loreto and San Martín that includes adult specimens with data on coloration, we consider *S. torquatus* to be restricted to the Chanchamayo Valley and adjacent areas in departamentos Junín and Pasco. In addition, Fritts (1974) reported two specimens of "*S. crassicaudatus*" from Yungas de Cochabamba, departamento Cochabamba, Bolivia. We could not find this exact locality in any maps or Gazetteers, although there are several localities around Cochabamba that start with "Yungas de." These specimens (UMMZ 68115) form part of a collection from departamento Cochabamba made by F. B. Steinbach between 1926–1929, which includes specimens of *S. marmoratus* and *S. roseiventris* that are well known to occur in this area (Torres *et al.,* 2000). As noted by Fritts (1974), the UMMZ specimens differ from "*S. crassicaudatus*" in having fewer scales (85–92) around the midbody (97–121 in *S. crassicaudatus* and 102–137 in *S. torquatus*). Moreover, the caudals and the scales on the dorsal surface of hind limbs of these specimens lack projected mucrons as in *S. crassicaudatus* and *S. torquatus*. Therefore, we conclude that Yungas de Cochabamba is a valid locality, but we prefer to refer to the UMMZ specimens as an undescribed species of *Stenocercus*.

Stenocercus variabilis Boulenger

Stenocercus variabilis Boulenger, 1901:546. Syntypes: BMNH 1946.8.11.89–91, from Palca, 1000 ft., Bolivia (restricted to Palca [2875 m], Departamento Junín, Peru by Fritts [1974:65]). Fritts (part), 1974:65.

Stenocercus juninensis Shreve, 1941:75. Holotype: MCZ 45820, from Huasqui [3822 m], near Tarma, Departamento Junín, Peru. Synonymy fide Fritts (1974:65).

Diagnosis.—*Stenocercus variabilis* is distinguished from all species of *Stenocercus* except *S. frittsi* in having granular scales on the posterior surface of thighs, imbricate, keeled lateral body scales, a distinct vertebral row of enlarged scales, unnotched gular scales, neck folds, three caudal whorls per autotomic segment, gray or brown dorsal background, and no black patch on shoulder in males. The main difference between *Stenocercus variabilis* and *S. frittsi* is that the former species has a distinct, deep postfemoral mite pocket (pocket absent in *S. frittsi*, Fig. 49). In addition, *S. variabilis* is larger than *S. frittsi* and it has on average more scales around midbody, as well as more gulars, paravertebrals, and subdigitals (Table 6).

Characterization.—(1) Maximum total length in males 94 mm (*N* = 15); (2) maximum total length in females 76 mm (*N* = 4); (3) vertebrals 50–60; (4) paravertebrals 70–81; (5) scales around midbody 61–86; (6) supraoculars 5–7; (7) internasals 3–4; (8) postrostrals 6; (9) loreals 2–4; (10) gulars 26–33; (11) lamellae on Finger IV 19–24; (12) lamellae on Toe IV 26–35; (13) posthumeral pocket shallow, Type 2 of Cadle (1991); (14) postfemoral pocket deep, Type 5 of Cadle (1991); (15)

parietal eye not visible; (16) occipital scales small, smooth, juxtaposed; (17) no projecting angulate temporals; (18) supraoculars subequal in size; (19) scales on frontonasal region weakly imbricate anteriorly; (20) short preauricular fringe present; (21) antegular, antehumeral, gular, longitudinal, oblique, postauricular, supra-auricular, and transverse antegular neck folds present; (22) lateral nuchals less than half the size of dorsal nuchals; (23) posterior gulars in adults smooth, imbricate, not mucronate; (24) lateral scales reduced in size, approximately half the size of dorsal body scales; (25) vertebral crest prominent; (26) dorsolateral crest absent; (27) ventrals in adults smooth, imbricate, not mucronate; (28) scales on posterior surfaces of thighs granular; (29) prefemoral fold present; (30) inguinal groove present; (31) preanals not projected; (32) tail not compressed laterally in adult males; (33) tail length 60–67% of total length; (34) caudal whorls per autotomic segment three; (35) caudals not spinose; (36) dark stripe extending anterodorsally from subocular region to supraciliaries absent; (37) gular region of adult females with dark reticulation in some specimens; (38) gular region of adult males with blue reticulation in some specimens; (39) black blotch on ventral surface of neck in adult males absent; (40) thin black or dark brown midventral line absent; (41) black patch on ventral surface of thighs absent; (42) background color of dorsum brown; (43) pattern of inscriptional rib attachment unknown. Sexual variation in measurements and scutellation of *Stenocercus variabilis* is presented in Table 15.

Description of syntype BMNH 1946.8.11.89.—Male (Fig. 46B); SVL = 83 mm; TL = 168 mm; maximum head width = 14.29 mm; head length = 20.52 mm;

head height = 13.24 mm; scales on parietal and occipital regions small, smooth, juxtaposed; parietal eye not visible; supraoculars in six rows, smooth, slightly imbricate, subequal in size; canthals two; scales in frontonasal region juxtaposed; internasals four; postrostrals six; supralabials five; infralabials six; loreals four; lorilabials in one row; preocular not divided, in contact with posterior canthal; lateral temporals imbricate, moderately keeled; gulars in 27 rows between tympanic openings; all gulars smooth, imbricate, each bearing one apical pit; second infralabial in contact with first two sublabials; mental in contact with first pair of infralabials and first pair of postmentals; lateral and dorsal scales of body and dorsal scales of neck keeled, imbricate; lateral scales of neck granular; scales around midbody 61; vertebrals large, in 60 rows, forming a prominent serrate vertebral crest; paravertebrals 81; ventrals smooth, imbricate; preauricular fringe short; antegular, antehumeral, gular, longitudinal, oblique, postauricular, supra-auricular, and transverse antegular neck folds present; limb scales keeled, imbricate; ventral scales of hind limbs and upper arms smooth; lamellae on Finger IV 21; lamellae on Toe IV 29; tail not compressed laterally; caudals keeled, imbricate; basal subcaudals smooth, imbricate; tail length 2.02 times SVL; posthumeral pocket shallow with vertically oriented fold (Type 2 of Cadle, 1991); postfemoral pocket lined with granular scales, deep (Type 5 of Cadle, 1991), and with posteroventrally oriented slit-like opening (Fig. 49B). The specimens used by Torres-Carvajal (2004) to determine the pattern of inscriptional rib attachment in *S. variabilis* correspond to *S. frittsi*.

Color in preservative of syntypes.—Dorsal ground color green with white spots laterally, or gray with black spots dorsally or laterally; venter whitish; throat marbled with olive; one specimen [BMNH 1946.8.11.89] with a black bar across scapular region and black throat and belly (Fig. 46B; Boulenger, 1901).

Color variation.—An adult female (KU 134175) had the following coloration in life: dorsum medium brown with light tan dorsolateral area; middorsal irregular dark brown transverse bands extending onto base of tail; dorsal dark brown, narrow, transverse band anterior to forelimbs; ventral surface of body light gray anteriorly and yellow posteriorly; ventral surface of hind limbs yellow; iris bronze (T. H. Fritts, field notes, 7 October 1969). An adult male (KU 134178) had the following coloration in life: dorsum variegated dull brown and yellowish brown; flanks variegated pale blue and pale medium brown, with small clusters of black scales; head medium brown with whitish spots; chin grayish-white with pale blue reticulations; ventral surface of body whitish-beige with pale yellow midventral stripe; ventral surface of limbs and tail pale yellow, iris bronze (T. H. Fritts, field notes, 8 October 1969).

Distribution and ecology.—*Stenocercus variabilis* inhabits the upper valleys of Río Perene on the eastern slopes of the Andes in central Peru (Fig. 50). It occurs at elevations of 1557–3822 m in Departamento Junín. Some specimens were collected in rock piles, under solitary rocks, and on the ground at the bases of shrubs in moderately mesic areas with *Agave*, grass, and shrubs (T. H. Fritts, field notes). The lowest elevation within the distribution of *S. variabilis* reported by Fritts (1974) corresponds to one of the locality records for *S. frittsi* (See distribution of *S. frittsi* above.) The highest altitude limit was reported by Fritts (1974) as 3000 m, probably because he lacked altitude data for Huasqui, 11º25'33"S, 75º45'15"W, 3822 m. No other species of *Stenocercus* is known to occur in sympatry with *S. variabilis*. However, other species of *Stenocercus* inhabiting adjacent areas in the upper valleys of Río Perene are *S. boettgeri, S.* cf. *crassicaudatus, S. formosus, S. praeornatus* and *S. scapularis*. Future collections may reveal sympatry between *S. variabilis* and one or more of these species.

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TABLES

Table 1.—Taxa included in the molecular portion of this study, voucher numbers, collecting localities, and GenBank accession numbers.

Species	Voucher number and collecting locality	GenBank No.
Crotaphytus collaris	TCWC 72206; USA: Texas: ca. 6 mi N Archer City on Hwy. 79 (33° 40' 58" N, 98° 37' 31" W)	**U82681** (Macey *et al.*, 1997a)
Sceloporus magister	MVZ 182569; USA: California: Whipple Mountains	**AF528741** (Schulte *et al.*, 2003)
Anolis paternus	USNM 498070; Cuba: Pinar del Río: 11.5 km S Pinar del Rio on road to La Coloma (22º 18' 49" N, 83° 41' 53" W)	**U82679** (Macey *et al.*, 1997a)
Leiocephalus carinatus	no voucher; Bahamas: Abaco: Marsh Harbour	**AF049864** (Schulte *et al.*, 1998)
Liolaemus pictus	MVZ 162076; Argentina: Río Negro: Bariloche (41° 8' 60" S, 71° 17' 60" W)	**U82684** (Macey *et al.*, 1997a)
Oplurus cuvieri	RM 10468; Madagascar	**U82685** (Macey *et al.*, 1997a)
Microlophus atacamensis	JPV 145; Chile: Atacama: Pan de Azucar (26° 8' 60" S, 70° 39' 0" W)	**AF528752** (Schulte *et al.*, 2003)
Plica plica	OU 37036; Brazil: Acre: ca. 5 km N Porto Walter (8º 12' 57" S, 72° 44' 20" W)	**AF528748** (Schulte *et al.*, 2003)

Table 1.—*Continued.*

Species	Voucher number and collecting locality	GenBank No.
Tropidurus etheridgei	PT 4808; Argentina: Córdoba: 3 km S Cachi Yacu on Rt. 22 (29º 38' 38" S, 64° 2' 60" W)	**AF528750** (Schulte *et al.*, 2003)
Tropidurus spinulosus	FBC 116; Argentina: La Rioja: Señor de la Peña	**AF528751** (Schulte *et al.*, 2003)
Uracentron flaviceps	QCAZ 2536; Ecuador: Sucumbíos: Reserva Faunística Cuyabeno (RPF-Cuyabeno), Laguna Grande	**AF528747** (Schulte *et al.*, 2003)
Uranoscodon superciliosus	OU 37182; Brazil: Amazonas: Rio Ituxi at Madeirera Scheffer	**AF528749** (Schulte *et al.*, 2003)
Stenocercus angel	QCAZ 4118; Ecuador: Carchi: 8 km NE El Angel on road El Angel-Tulcán, 3560 m (0º 40' 0" N, 77º 52' 0" W)	**DQ080212**
Stenocercus apurimacus	MTD 45676; Peru: Apurimac: Cconoc, 1950 m (13º 32' 1" S, 72º 39' 11" W)	**DQ080213**
Stenocercus azureus	ZVC-R 5969; Uruguay: Rivera: surroundings of Bajada de Pena	**DQ080214**
Stenocercus boettgeri	MTD 45226; Peru: Pasco: Auquimarca, ca. 2600 m (10º 44' 58" S, 75º 42' 21" W)	**DQ080215**
Stenocercus caducus	MHNHP 6383; Paraguay: Concepción: Parque Nacional	**DQ080216**

Table 1.—*Continued.*

Species	Voucher number and collecting locality	GenBank No.
	San Luis de la Sierra, 175 m (22º 40' 0" S, 57º 21' 0" W)	
Stenocercus chota	QCAZ 4162; Ecuador: Imbabura: Salinas, 1544 m (0º 30' 0" N, 78º 8' 0" W)	**DQ080217**
Stenocercus crassicaudatus	MVZ 199531; Peru: Cusco: Machu Picchu ruins, 2400 m (13º 9' 30" S, 72º 31' 53" W)	**AF049866** (Schulte *et al.*, 1998)
Stenocercus cupreus	MTD 44380; Peru: Huanuco: W of Ichocán	**DQ080218**
Stenocercus doellojuradoi	FML 9298; Argentina: Salta: Finca Los Colorados (24º 26' 42" S, 63º 28' 56" W)	**AF528744** (Schulte *et al.*, 2003)
Stenocercus empetrus	KU 212634; Peru: Cajamarca: Cajamarca, 2627 m (7º 10' 0" S, 78º 31' 0" W)	**DQ080219**
Stenocercus eunetopsis	FMNH 232550; Peru: Cajamarca: ca. 1 km SSW Udima, Río Udima, 2500 m (6º 48' 46" S, 79º 5' 8" W)	**DQ080220**
Stenocercus festae	QCAZ 5599; Ecuador: Azuay: Sigsig, 2684 m (3º 3' 0" S, 78º 48' 0" W)	**DQ080221**

Table 1.—*Continued.*

Species	Voucher number and collecting locality	GenBank No.
Stenocercus formosus	MTD 46278; Peru: Pasco: María Teresa, 19 km on road Oxapampa-Llaupi, 1470 m (10º 42' 6" S, 75º 27' 22" W)	**DQ080238**
Stenocercus guentheri	KU 218382; Ecuador: Pichincha: 20.9 km N Quito (0º 0' 40" N, 78º 29' 7" W)	**DQ080223**
Stenocercus humeralis	KU 291508; Ecuador: Loja: 27 km W Loja on road Loja-Zamora, 2078 m (4º 0' 0" S, 78º 58' 25" W)	**DQ080224**
Stenocercus imitator	FMNH 232638; Peru: Cajamarca: ca. 1 km SSW Udima, Río Udima, 2500 m (6º 48' 46" S, 79º 5' 8" W)	**DQ080225**
Stenocercus iridescens	QCAZ 6194; Ecuador: Esmeraldas: Tonchigüe, 10 m (0° 49' 0" N, 79° 57' 0" W)	**DQ080226**
Stenocercus latebrosus	MCZ 178048; Peru: Cajamarca: Quebrada Cachil, 3 km (airline) SW Contumazá, 2420 m (7º 23' 9" S, 78º 50' 9" W)	**DQ080227**
Stenocercus limitaris	MCZ 182245; Peru: Piura: Toronche (ca. 16 km airline SE Ayabaca), 1950–2100 m (4º 35' 0" S, 79º 32' 0" W)	**DQ080228**

Table 1.—*Continued.*

Species	Voucher number and collecting locality	GenBank No.
Stenocercus melanopygus	KU 212640; Peru: Cajamarca: Cajamarca, 2627 m (7º 10' 0" S, 78º 31' 0" W)	**DQ080229**
Stenocercus ochoai	MVZ 199534; Peru: Cusco: Machu Picchu ruins, 2400 m (13º 9' 30" S, 72º 31' 53" W)	**AF528746** (Schulte *et al.*, 2003)
Stenocercus orientalis	KU 212774; Peru: Amazonas: Chachapoyas, 1846 m (6° 13' 0" S, 77° 50' 60" W)	**DQ080230**
Stenocercus ornatissimus	MTD 46277; Peru: Lima: km 80 carretera central, Chacahuaro, 2250 m (11º 48' 57" S, 76º 21' 28" W)	**DQ080240**
Stenocercus ornatus	KU 291509; Ecuador: Loja: Purunuma, slopes of Cerro Colambo (4° 12' 0" S, 79° 24' 0" W)	**DQ080231**
Stenocercus percultus	FMNH 232523; Peru: Cajamarca: ca. 1 km NE Monte Seco on road El Chorro-Monte Chico, 1330–1370 m (6º 51' 32" S, 79º 6' 42" W)	**DQ080232**
Stenocercus puyango	QCAZ 6712; Ecuador: El Oro: Puyango, 300 m (3º 53' 0" S, 80º 4' 47" W)	**DQ080233**

Table 1.—*Continued.*

Species	Voucher number and collecting locality	GenBank No.
Stenocercus rhodomelas	QCAZ 5645; Ecuador: Azuay: Santa Isabel, 1408 m (3° 16' 0" S, 79° 19' 0" W)	**DQ080234**
Stenocercus roseiventris	KU 214967; Peru: Madre de Dios: Cuzco Amazonico, 15 km E Puerto Maldonado (12º 35' 0" S, 65º 5' 0" W)	**DQ080235**
Stenocercus scapularis	MTD 45664; Peru: Junín: Pampa Hermosa, 1540 m (10º 59' 33" S, 75º 25' 58" W)	**DQ080222**
Stenocercus stigmosus	MHNSM 17113; Peru: Cajamarca: Pargo, 2–3 km (airline) NW El Pargo, 2950–3100 m (6º 28' 0" S, 79º 3' 0" W)	**DQ080236**
Stenocercus torquatus	MTD 46293; Peru: Pasco: María Teresa, 19 km on road Oxapampa-Llaupi, 1470 m (10º 42' 6" S, 75º 27' 22" W)	**DQ080239**
Stenocercus varius	QCAZ 5312; Ecuador: Cotopaxi: La Otonga reserve	**DQ080237**

Table 2.—Primers used to amplify and sequence the mtDNA ND1–CO1 region in this study. Their positions in the human mitochondrial genome (Anderson *et al.*, 1981), target genes, sequences, and references are given. H and L designate primers whose extension produces the heavy and light strands, respectively

Primer name	Human position[a]	Gene	Sequence[b] (5'–3')	Reference
ND1b[a,s]	L4160	ND1	CGATTCCGATATGACCARCT	Kumazawa and Nishida, 1993
ND1f.3[a,s]	L4178a	ND1	CAACTAATACACCTACTATGAAA	Macey *et al.*, 1997b
ND1f.7[a,s]	L3914	ND1	GCCCCATTTGACCTCACAGAAGG	Macey *et al.*, 1998
ND2f.14[a,s]	L4882a	ND2	TGACAAAAACTAGCCCC	Macey *et al.*, 1999
ND2f.57[s]	L4833	ND2	CACAYTTTTGACTNCCAGAAGT	this study
ND2f.60[a,s]	L5117	ND2	CATAACCACCTCCMTATTC	this study
ND2r.6[a]	H4980	ND2	ATTTTTCGTAGTTGGGTTTGRTT	Macey *et al.*, 1997b
ND2r.59[s]	H4618	ND2	GCTGCTTCTGTGGCTCGNGG	this study
CO1r.1[a,s]	H5934a	COI	AGRGTGCCAATGTCTTTGTGRTT	Macey *et al.*, 1997b
CO1r.8[a,s]	H6159	COI	GCTATGTCTGGGGCTCCAATTAT	Weisrock *et al.*, 2001
ILEf.1[s]	L4221	$tRNA^{Ile}$	AAGGATTACTTTGATAGAGT	Macey *et al.*, 1997b
ILEf.8[s]	L4220	$tRNA^{Ile}$	AAGGACTACTTTGATAAAG	this study

Table 2 *Continued*.

Primer name	Human position[a]	Gene	Sequence[b] (5'–3')	Reference
METf.6[a,s]	L4437	$tRNA^{Met}$	AAGCTTTCGGGCCCATACC	Macey *et al.*, 1997b
METr.5[a,s]	H4419	$tRNA^{Met}$	GGTATGAGCCCGATAGCTT	Macey *et al.*, 1997b
TRPf.12[a,s]	L5549b	$tRNA^{Trp}$	AACCAAGRGCCTTCAAAG	Schulte *et al.*, 2003
TRPf.13[s]	L5549c	$tRNA^{Trp}$	AACCAARGACCTTCAAAG	this study
ALAf.4[s]	L5638b	$tRNA^{Ala}$	CTGAATGCAACTCAGACACTTT	Macey *et al.*, 1997b
ALAr.2[a,s]	H5617a	$tRNA^{Ala}$	AAAATRTCTGRGTTGCATTCAG	Macey *et al.*, 1997b
ASNr.8[a,s]	H5692	$tRNA^{Asn}$	CTGGTTTGGGTAGTTAGCTGTTAA	this study

[a] Primers used in amplification.

[b] Primers used in sequencing.

Table 3.—Bayes-factors estimates used in model selection. Range followed by mean ± SD are given for log-likelihood and tree length (i.e., sum of all branch lengths) scores. Values for the $1Q + \Gamma + I$ model are based on the maximum likelihood tree.

Model	log-likelihood	tree length	Bayes-factor estimate
$1Q + \Gamma + I$	–20177.54132	4.96	n/a
$1Q + \Gamma$	–20288.24340 – –20257.95513	4.37 – 5.22	n/a
	–20272.57333 ± 7.22	4.81 ± 0.18	
$2Q + \Gamma$	–19905.73421 – –19864.89141	3.97 – 4.89	733.3
	–19879.34370 ± 7.20	4.44 ± 0.18	
$3Q + \Gamma$	–19770.00052 – –19731.04424	4.31 – 5.60	239.2
	–19753.72473 ± 7.77	4.89 ± 0.22	
$4Q + \Gamma$	–19715.68063 – –19678.35836	5.04 – 6.95	76.91
	–19693.98643 ± 8.27	5.92 ± 0.38	
$5Q + \Gamma$	–19679.31402 – –19637.30280	5.66 – 8.33	40.73
	–19657.44280 ± 8.98	6.47 ± 0.54	
$6Q + \Gamma$	–19648.39211 – –19608.09206	8.43 – 11.02	29.6
	–19629.60230 ± 8.56	9.68 ± 0.66	

Table 4.—Results of Shimodaira-Hasegawa (SH) and parametric bootstrap (PB) tests. For each hypothesis, the likelihood score (-ln *L*), parsimony tree length (PTL), tests statistics, and P-values are presented. For SH tests, the hypotheses in column one are the alternative hypotheses being compared to the ML (unconstrained) hypothesis. The ML (unconstrained) and $4Q + \Gamma$ trees are the alternative hypotheses in PB 1 and PB 2 tests, respectively. A Bonferroni-corrected significance level ($\alpha = 0.0125$) was used in PB tests.

ML Tree	-ln *L*	PTL	δ -ln *L*	δ PTL PB 1	δ PTL PB 2	P-value SH	P-value PB 1	P-value PB 2
Unconstrained	20177.54	4452	(best)	—	—	—	—	—
$4Q + \Gamma$	20179.06	4445	1.52	—	—	0.801	—	—
Monophyly of *Stenocercus* by Etheridge (Peters and Donoso-Barros, 1970)	20189.86	4483	12.32	31	38	0.551	<0.012	<0.012
Monophyly of *Ophryoessoides* by Etheridge (Peters and Donoso-Barros, 1970)	20177.54	4452	0.00	0	7	0.960	1.000	<0.012
Monophyly of *Ophryoessoides* (Fritts, 1974)	20248.54	4494	70.99	42	49	<0.05	<0.012	<0.012
Stenocercus phylogeny of Fritts (1974)	20487.22	4621	309.68	169	176	<0.05	<0.012	<0.012

Table 5.—Distribution of species of *Stenocercus*. Andean region, country, latitudinal range and elevation are given. NA=northern Andes, CA=central Andes, SA=southern Andes, WC=western cordillera, CC=central cordillera, EC=eastern cordillera, NP=nudo de Pasto, IB=inter-Andean basin, HD=Huancabamba deflection, PC=Pacific coast, AB=Amazon Basin, TL=Atlantic lowlands and adjacent areas.

Taxon	Andean region	Country	Latitudinal range		Elevation (m)
			S	N	
CLADE A					
S. boettgeri	CA: EC	Peru	12ºS	10ºS	2900–3250
S. bolivarensis	NA: CC	Colombia	1ºN	2ºN	1650–1750
S. carrioni	NA: WC	Ecuador	4ºS	4ºS	1320–1900
S. chlorostictus	CA: WC	Peru	8ºS	4ºS	1350–1740
S. chrysopygus	CA: WC, EC	Peru	10ºS	8ºS	2265–3500
S. crassicaudatus	CA: EC	Peru	14ºS	12ºS	1060–2404
S. cupreus	CA: EC	Peru	10ºS	9ºS	1900–2300

Table 5.—*Continued.*

Taxon	Andean region	Country	Latitudinal range		Elevation (m)
			S	N	
S. empetrus	CA: WC	Peru	8ºS	6ºS	2650–3200
S. eunetopsis	CA: WC	Peru	8ºS	6ºS	2450–2600
S. frittsi	CA: EC	Peru	13ºS	12ºS	2350–3966
S. haenschi	NA: WC	Ecuador	2ºS	1ºS	750
S. humeralis	NA: IB	Ecuador	4ºS	3ºS	2000–3000
S. imitator	CA: WC	Peru	7ºS	5ºS	1200–2600
S. ivitus	CA: WC	Peru	6ºS	5ºS	3100
S. latebrosus	CA: WC	Peru	8ºS	7ºS	2400–2600
S. melanopygus	CA: WC	Peru	8ºS	7ºS	2700–3250
S. modestus	CA: WC, PC	Peru	12ºS	11ºS	0–762
S. nubicola	CA: WC	Peru	6ºS	5ºS	3100

Table 5.—*Continued.*

Taxon	Andean region	Country	Latitudinal range S	Latitudinal range N	Elevation (m)
S. orientalis	CA: EC	Peru	6ºS	5ºS	2340
S. ornatissimus	CA: WC	Peru	12ºS	11ºS	2000–3400
S. praeornatus	CA: EC	Peru	12ºS	11ºS	3220
S. simonsii	NA: WC, IB	Ecuador	4ºS	3ºS	1980–2500
S. stigmosus	CA: WC	Peru	7ºS	6ºS	2500–3100
S. torquatus	CA: EC	Peru	12ºS	10ºS	800–1800
S. variabilis	CA: EC	Peru	12ºS	11ºS	1557–3822
S. varius	NA: WC	Ecuador	1ºS	0º	1460–2200
CLADE B					
S. aculeatus	NA & CA: EC	Ecuador, Peru	8ºS	1ºS	537–1311
S. angel	NA: NP	Colombia, Ecuador	0º30'N	1º30'N	3015–3560

Table 5.—*Continued.*

Taxon	Andean region	Country	Latitudinal range		Elevation (m)
			S	N	
S. apurimacus	CA: EC	Peru	14ºS	12ºS	1800–2700
S. azureus	TL	Argentina, Brazil, Uruguay	34ºS	24ºS	150–250
S. caducus	CA & SA: EC; TL	Argentina, Bolivia, Paraguay	26ºS	14ºS	50–2000
S. chota	NA: WC, IB	Ecuador	0º20'N	0º40'N	1575–1940
S. doellojuradoi	SA: EC	Argentina	34ºS	24ºS	100–1000
S. dumerilii	AB	Brazil	5ºS	0º	0–100
S. erythrogaster	NA: EC	Colombia, Venezuela	9ºN	11ºN	50–1000
S. festae	NA: IB	Ecuador	4ºS	2º20'S	2300–3200
S. fimbriatus	AB; CA: EC	Brazil, Peru	10ºS	4ºS	300–1000

Table 5.—*Continued.*

Taxon	Andean region	Country	Latitudinal range		Elevation (m)
			S	N	
S. formosus	CA: EC	Peru	11ºS	10ºS	1000–1600
S. guentheri	NA: IB, WC, EC	Ecuador	2º20'S	0º30'N	2135–3890
S. huancabambae	CA: HD	Peru	6ºS	5ºS	200–920
S. iridescens	NA: WC, PC	Colombia, Ecuador	3º30'S	2ºN	0–2000
S. lache	NA: EC	Colombia	6ºN	7ºN	2908–4000
S. limitaris	NA: WC, HD	Ecuador, Peru	5ºS	3ºS	600–2200
S. marmoratus	CA & SA: EC	Argentina, Bolivia	24ºS	16ºS	1000–3350
S. nigromaculatus	CA: WC	Peru	6ºS	5ºS	1900–2300
S. ochoai	CA: EC	Peru	14ºS	12ºS	2000–3000
S. ornatus	NA: IB, WC	Ecuador	4º30'S	4ºS	1500–3000
S. pectinatus	TL	Argentina	40ºS	25ºS	0–1100

Table 5.—*Continued.*

Taxon	Andean region	Country	Latitudinal range		Elevation (m)
			S	N	
S. percultus	CA: WC, HD	Peru	7ºS	5ºS	800–1600
S. prionotus	CA: EC	Bolivia, Peru	15ºS	6ºS	176–1520
S. puyango	NA & CA: WC, PC	Ecuador, Peru	6ºS	3º30'S	90–1500
S. rhodomelas	NA: IB, WC	Ecuador	3º30'S	3ºS	730–2100
S. roseiventris	AB; CA & SA: EC	Argentina, Bolivia, Brazil, Peru	24ºS	4ºS	200–680
S. scapularis	CA: EC	Peru	14ºS	10ºS	1000–1800
S. trachycephalus	NA: EC	Colombia	4ºN	6ºN	1749–3800

Table 6.—Summary of morphological characters and measurements of *Stenocercus frittsi* and *S. variabilis*. Range followed by mean ± SD, or range followed by mode are given for quantitative characters.

Character	*S. frittsi* $N = 46$	*S. variabilis* $N = 19$
Scales around midbody	60–76	61–86
	65.14 ± 3.7	71.29 ± 6.94
Vertebrals	48–71	50–60
	57.24 ± 5.07	57.41 ± 2.85
Paravertebrals	59–90	70–81
	70.16 ± 6.74	75.71 ± 4.21
Gulars	20–28	26–33
	22.63 ± 1.77	28.29 ± 2.14
Supraoculars	4–6	5–7
	6	6
Internasals	4–5	3–4
	4	4
Subdigitals finger IV	16–22	19–24
	19.02 ± 1.39	21.47 ± 1.07

Table 6.—*Continued.*

Character	*S. frittsi* $N = 46$	*S. variabilis* $N = 19$
Subdigitals toe IV	24–29	26–35
	26.98 ± 1.65	30.00 ± 2.15
Tail length/total length	0.59–0.65	0.60–0.67
	0.64 ± 0.02	0.65 ± 0.02
	$N = 14$	$N = 11$
Maximum SVL males (mm)	79	94
Maximum SVL females (mm)	66	76
Posthumeral pocket	shallow, with vertical fold	shallow, with vertical fold
Postfemoral pocket	absent	deep

Table 7.—Sexual variation in scutellation and measurements (mm) of *Stenocercus frittsi*. Range (first line), mean ± SD (second line), and *N* (third line) are given.

Character	Males	Females
Scales around midbody	60–76	60–76
	65.32 ± 3.54	65.20 ± 3.96
	22	20
Vertebrals	48–70	52–71
	56.41 ± 5.46	58.38 ± 4.74
	22	21
Paravertebrals	62–89	59–90
	70.41 ± 5.70	70.24 ± 8.01
	22	21
Gulars	21–28	20–26
	23.22 ± 1.78	22.19 ± 1.57
	23	21
Supraoculars	4–6	5–6
	5.70 ± 0.56	5.33 ± 0.48
	23	21

Table 7.—*Continued.*

Character	Males	Females
Internasals	4–5	4
	4.04 ± 0.21	4
	23	21
Subdigitals Finger IV	17–22	16–21
	19.57 ± 1.38	18.45 ± 1.23
	23	20
Subdigitals Toe IV	26–29	24–29
	28.09 ± 0.95	25.81 ± 1.50
	23	21
Tail length/total length	0.63–0.65	0.59–0.65
	0.64 ± 0.01	0.62 ± 0.02
	8	6
Maximum SVL	79	66

Table 8.—Summary of morphological characters, measurements (mm), and color patterns of *Stenocercus iridescens*, *S. limitaris*, and *S. puyango*. Range followed by mean ± standard deviation, or range followed by mode are given for quantitative characters. Data for *S. iridescens* and *S. limitaris* are from Torres-Carvajal (2000) and Cadle (1998), respectively.

Character	*S. iridescens*	*S. limitaris*	*S. puyango*
	N = 42	*N* = 44	*N* = 33
Scales around midbody	35–52	39–54	30–45
	41.57 ± 3.31	47.30 ± 3.16	41.06 ± 2.78
Vertebrals	40–52	40–52	42–52
	45.31 ± 3.22	45.70 ± 2.54	46.38 ± 2.62
Gulars	16–20	17–23	18–22
	18.19 ± 1.09	20.10 ± 1.28	19.00 ± 1.17

Table 8.—*Continued*.

Character	*S. iridescens*	*S. limitaris*	*S. puyango*
	N = 42	*N* = 44	*N* = 33
Supraoculars	2–5	3–5	4–6
	3	4	4
Internasals	2–4	4–5	2–4
	2	4	2
Subdigitals Finger IV	15–18	17–23	15–20
	15.90 ± 0.89	19.70 ± 1.26	16.64 ± 1.32
Subdigitals Toe IV	22–28	24–32	22–27
	24.73 ± 1.57	27.50 ± 1.93	24.70 ± 1.45
Tail length/total length	0.62–0.68	0.66–0.71	0.68–0.73
	0.66 ± 0.01	0.69 ± 0.01	0.70 ± 0.01

Table 8.—*Continued*.

Character	*S. iridescens* $N = 42$	*S. limitaris* $N = 44$	*S. puyango* $N = 33$
	$N = 30$	$N = 16$	$N = 25$
Maximum SVL males	99	97	108
Maximum SVL females	78	82	82
Posthumeral pocket	shallow	deep	shallow
Postfemoral pocket	absent	deep	shallow
Dorsal head scales	smooth	keeled, wrinkled, or multicarinate	smooth
Posterior circumorbitals	absent	present	present
Keeled angulate temporal	absent	present	absent

Table 8.—*Continued*.

Character	*S. iridescens* $N = 42$	*S. limitaris* $N = 44$	*S. puyango* $N = 33$
Ventral scales in adults	smooth or slightly keeled	strongly keeled, mucronate	smooth
Throat color in adult males	yellow	unknown	yellow
Venter color in adult males	lavender	unknown	lavender

Table 9.—Sexual variation in scutellation and measurements (mm) of *Stenocercus puyango*. Range (first line), mean ± standard deviation (mode for supraoculars and internasals, second line) are given.

Character	Males	Females
	N = 16	*N* = 16
Scales around midbody	38–45	30–45
	41.68 ± 1.99	40.56 ± 3.41
Vertebrals	42–50	43–52
	46.37 ± 2.52	46.66 ± 2.64
		N = 15
Gulars	18–22	18–21
	19.19 ± 1.17	18.87 ± 1.20
Supraoculars	4–6	4–5
	4	4
Internasals	2–4	2–4
	2	2

Table 9.—*Continued.*

Character	Males	Females
	N = 16	*N* = 16
Subdigitals Finger IV	15–20	15–18
	17.06 ± 1.44	16.31 ± 1.08
Subdigitals Toe IV	23–27	22–27
	25.00 ± 1.26	24.56 ± 1.50
Tail length/total length	0.68–0.73	0.68–0.70
	0.71 ± 0.01	0.69 ± 0.01
	N = 12	*N* = 8
Maximum SVL	108	82

Table 10.— Sexual variation in scutellation and measurements (mm) of *Stenocercus santander*. Range (first line), mean ± standard deviation (mode for supraoculars and internasals, second line) are given if applicable.

Character	Males	Females	*I*
	N = 7	*N* = 2	
Scales around midbody	38–47	37–38	
	41.86 ± 3.53	37.50 ± 0.71	
Vertebrals	33–40	34–39	
	36.00 ± 2.58	36.50 ± 3.54	
Gulars	18–21	18	
	18.86 ± 1.07		
Supraoculars	4–5	4	
	4		
Internasals	3–4	4	
	4		

Table 10.—*Continued.*

Character	Males $N = 7$	Females $N = 2$
Subdigitals Finger IV	17–19	15
	18.29 ± 0.95	$N = 1$
Subdigitals Toe IV	24–29	26
	27.00 ± 1.73	
Tail length/total length	0.70–0.74	0.74
	0.72 ± 0.01	$N = 1$
	$N = 4$	
Maximum SVL	96	78

Table 11.—Sexual variation in scutellation and measurements (mm) of *Stenocercus sinesaccus*. Range followed by mean ± standard deviation is given for quantitative characters if applicable.

Character	Males $N = 3$	Females $N = 1$
Scales around midbody	31–34 32.33 ± 1.53	33
Vertebrals	28–30 28.67 ± 1.15	28
Paravertebrals	32–34 33.33 ± 1.15	33
Gulars	12–14 12.67 ± 1.15	14
Supraoculars	4	4
Internasals	6	6
Subdigitals Finger IV	15–16 15.67 ± 0.58	13
Subdigitals Toe IV	23–24 23.33 ± 0.58	25

Table 11.—*Continued*.

Character	Males N = 3	Females N = 1
Tail length/total length	0.70–0.73 0.72 ± 0.02	0.70
Maximum SVL	73	81

Table 12.—Summary of morphological characters and measurements (mm) of Brazilian species of *Stenocercus*. Range followed by mean ± standard deviation is given for quantitative characters. Range followed by mode is given for internasals and supraoculars. Sample size (*N*) is given at the top of each column or in parenthesis when it varied for individual measurements. Data for *S. caducus*, *S. dumerilii*, and *S. fimbriatus* were mostly taken from the literature (Avila-Pires 1995, Cadle 2001). Data for *S. tricristatus* are based on the holotype (male, MNHN 6825) and were kindly provided by R. Etheridge.

Character	*S. azureus*	*S. caducus*	*S. dumerilii*	*S. fimbriatus*	*S. roseiventris*	*S. sinesaccus*	*S. tricristatus*
	N = 6	*N* = 43	*N* = 33	*N* = 33	*N* = 36	*N* = 4	*N* = 1
Scales around	33–39	34–44	41–50	39–51	55–82	31–34	33
midbody	35.8 ± 2.48	38.2 ± 2.10	45.3 ± 2.50	43.8 ± 7.83	69.8 ± 7.39	32.5 ±	
Vertebrals	30–37	30–43	24–30	37–52	44–66	28–30	22
	33.8 ± 2.48	35.9 ± 5.59	26.9 ± 1.50	43.7 ± 3.24	53.2 ± 5.01	28.5 ± 1.00	

Table 12.—*Continued.*

Character	*S. azureus*	*S. caducus*	*S. dumerilii*	*S. fimbriatus*	*S. roseiventris*	*S. sinesaccus*	*S. tricristatus*
	N = 6	*N* = 43	*N* = 33	*N* = 33	*N* = 36	*N* = 4	*N* = 1
Gulars	13–19	16–23	15–20 (17)	17–25	24–32	12–14	—
	17.5 ± 2.51	18.6 ± 1.41	16.58 ± 1.44	20.1 ± 2.29	27.9 ± 2.12	13.0 ± 1.15	
Internasals	4–5	6–7	6–7 (17)	4–7	4–6	6	—
	4	7	6	6	5		
Supraoculars	5	4–6	3–5 (17)	4–6	5–7	4	—
		5	4	4	6		
Subdigitals	10–14	15–21	12–18	14–18	13–20	13–16	16
Finger IV	12.7 ± 1.51	17.6 ± 1.16	14.8 ± 1.10	16.1 ± 0.83	15.8 ± 1.78	15.0 ± 1.41	
Subdigitals	16–23	23–30	18–24	22–26	17–24	23–25	19
Toe IV	19.5 ± 2.66	26.0 ± 1.59	20.6 ± 1.30	23.4 ± 1.17	20.7 ± 1.57	23.7 ± 0.96	

Table 12.—*Continued.*

Character	*S. azureus*	*S. caducus*	*S. dumerilii*	*S. fimbriatus*	*S. roseiventris*	*S. sinesaccus*	*S. tricristatus*
	$N = 6$	$N = 43$	$N = 33$	$N = 33$	$N = 36$	$N = 4$	$N = 1$
Posthumeral pocket	Absent	Present	Absent	Present	Present	Absent	Absent
Postfemoral pocket	Absent	Absent	Absent	Absent	Present	Absent	Absent
Caudal fracture planes	Present	Present	Absent	Present	Present	Absent	Absent
Tail/Total length	0.64 (1)	0.69–0.73 (21)	0.53–0.58 (15)	0.64–0.67 (8)	0.49–0.57 (16)	0.70–0.73	0.63
		0.70 ± 0.01	0.55 ± 0.01	0.66 ± 0.01	0.52 ± 0.02	0.72 ± 0.02	
Maximum SVL males	59	72	100	74	99	73	60
Maximum SVL females	83	93	109	91	96	81	—

Table 13.—Summary of morphological characters, measurements (mm), and color patterns of *Stenocercus torquatus* and *S. crassicaudatus*. For each quantitative character, the *F*-value, *t*-value, and corresponding *P*-values are given. For those characters with unequal variances (i.e., *F*-test $P<0.001$), an unequal variance *t*-statistic (Welch test) is presented. Range (first line), mean ± standard deviation or range (mode for supraoculars and internasals, second line), and *N* (third line) are given for quantitative characters.

Character	*S. torquatus*	*S. crassicaudatus*	*F*-value	*P*	*t*-value	*P*
Scales around midbody	102–137	97–121	1.753	0.107	4.861	<0.001
	116.96 ± 8.21	108.87 ± 5.99				
	46	31				
Vertebrals	83–115	83–97	4.618	<0.001	6.511	<0.001
	98.86 ± 7.94	89.80 ± 3.74				
	43	31				

Table 13.—*Continued.*

Character	*S. torquatus*	*S. crassicaudatus*	*F*-value	*P*	*t*-value	*P*
Paravertebrals	103–151	107–166	1.067	0.834	-0.672	0.504
	124.05 ± 12.17	126.67 ± 12.21				
	43	31				
Gulars	47–67	44–55	2.201	0.025	5.093	<0.001
	54.09 ± 4.58	49.57 ± 2.73				
	46	31				
Supraoculars	6–8	6–8	1.552	0.176	-0.203	0.840
	7	6				
	47	31				

Table 13.—*Continued.*

Character	*S. torquatus*	*S. crassicaudatus*	*F*-value	*P*	*t*-value	*P*
Internasals	4–6	4–7	3.032	<0.001	-7.222	<0.001
	4	6				
	46	30				
Subdigitals finger IV	22–29	23–32	2.014	0.033	-6.226	<0.001
	25.76 ± 1.49	28.53 ± 1.80				
	46	31				
Subdigitals toe IV	26–32	26–38	3.510	<0.001	-6.857	<0.001
	28.96 ± 1.55	33.00 ± 2.86				
	45	31				

Table 13.—*Continued.*

Character	*S. torquatus*	*S. crassicaudatus*	*F*-value	*P*	*t*-value	*P*
Tail length/total length	0.47–0.54	0.57–0.62	1.453	0.442	-15.494	<0.001
	0.51 ± 0.02	0.59 ± 0.01				
	26	17				
Maximum SVL males	84	95				
Maximum SVL females	74	85				
Posthumeral pocket	wrinkle	wrinkle				
Postfemoral pocket	moderate	moderate				
Black antehumeral collar	present	absent				
Dorsal background color	dark brown, grey or emerald green	dark brown or grey				

Table 14.—Sexual variation in scutellation and measurements (mm) of *Stenocercus torquatus* with *F*-values, *t*-values, and corresponding *P*-values. Range (first line), mean ± standard deviation (mode for supraoculars and internasals, second line), and *N* (third line) are given.

Character	Males	Females	*F*-value	*P*	*t*-value	*P*
Scales around midbody	103–129	103–137	1.725	0.216	0.278	0.782
	117.59 ± 7.27	116.88 ± 9.54				
	27	16				
Vertebrals	83–115	85–114	1.037	0.906	-0.575	0.568
	98.48 ± 7.68	99.93 ± 7.82				
	25	15				
Paravertebrals	103–149	112–151	1.192	0.749	-1.060	0.296
	122.88 ± 12.47	127.07 ± 11.42				
	25	15				

Table 14.—*Continued*.

Character	Males	Females	*F*-value	*P*	*t*-value	*P*
Gulars	47–67	48–62	2.865	0.037	0.662	0.512
	54.48 ± 5.39	53.50 ± 3.18				
	27	16				
Supraoculars	6–7	6–8	2.386	0.050	0.437	0.665
	7	6				
	27	16				
Internasals	4–5	4–5	1.582	0.357	0.834	0.409
	4	4				
	26	16				

Table 14.—*Continued*.

Character	Males	Females	*F*-value	*P*	*t*-value	*P*
Subdigitals finger IV	22–29	23–29	1.649	0.255	0.211	0.834
	25.85 ± 1.38	25.75 ± 1.77				
	27	16				
Subdigitals toe IV	26–32	27–31	1.146	0.737	0.046	0.963
	28.89 ± 1.45	28.87 ± 1.55				
	27	15				
Tail length/total length	0.49–0.54	0.47–0.52	1.676	0.426	3.577	0.002
	0.52 ± 0.01	0.49 ± 0.02				
	14	8				
Maximum SVL	84	74				

Table 15.—Sexual variation in scutellation and measurements (mm) of *Stenocercus variabilis*. Range (first line), mean ± SD (mode for supraoculars and internasals, second line) are given.

Character	Males $N = 13$	Females $N = 4$
Scales around midbody	61–86	63–74
	71.46 ± 7.57	70.75 ± 5.25
Vertebrals	50–60	52–59
	57.85 ± 2.73	56.00 ± 3.16
Paravertebrals	70–81	72–77
	76.31 ± 4.53	73.75 ± 2.36
Gulars	26–33	26–30
	28.38 ± 2.33	28.00 ± 1.63
Supraoculars	5–7	5–6
	5	5
Internasals	3–4	4
	4	

Table 15.—*Continued.*

Character	Males	Females
Subdigitals Finger IV	21–24	19–21
	21.77 ± 0.93	20.50 ± 1.00
Subdigitals Toe IV	26–35	28–32
	29.85 ± 2.30	30.50 ± 1.73
Tail length/total length	0.64–0.67	0.60–0.67
	0.65 ± 0.01	0.64 ± 0.03
	N = 7	
Maximum SVL	94	76

FIGURES

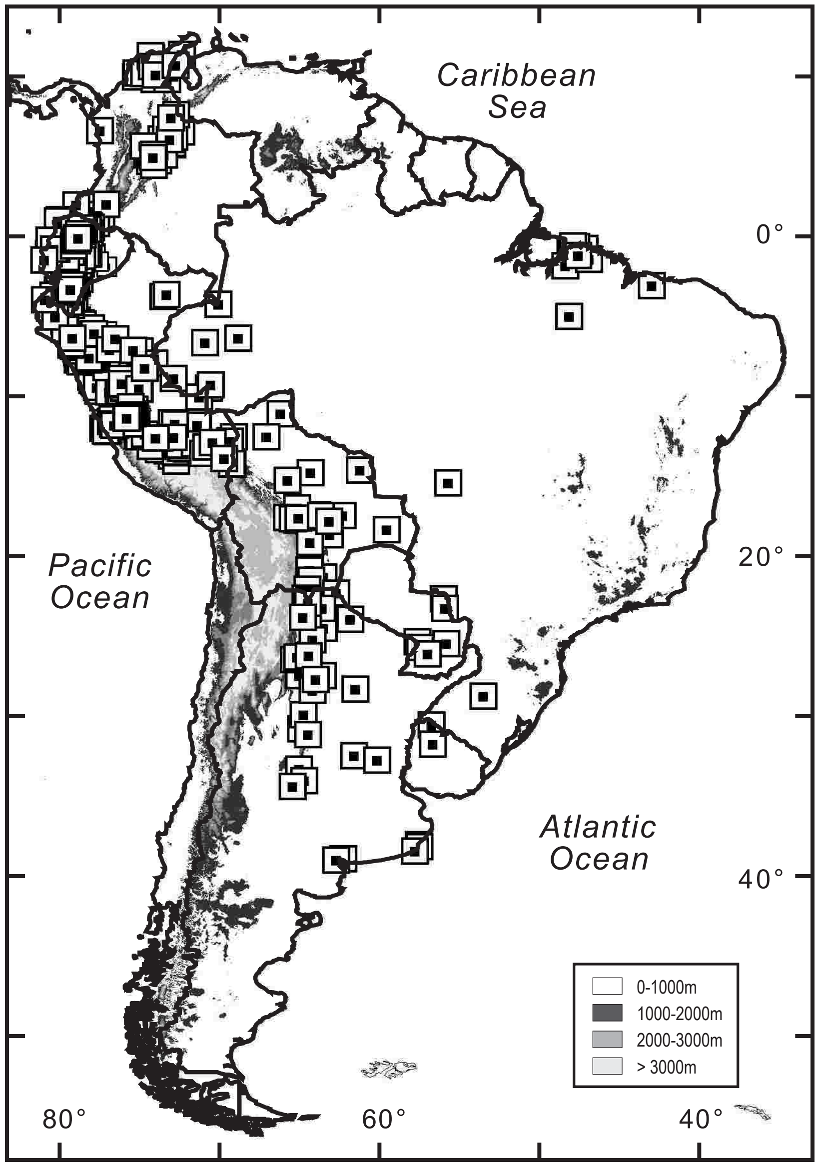

Figure 1.—Distribution of *Stenocercus* in South America.

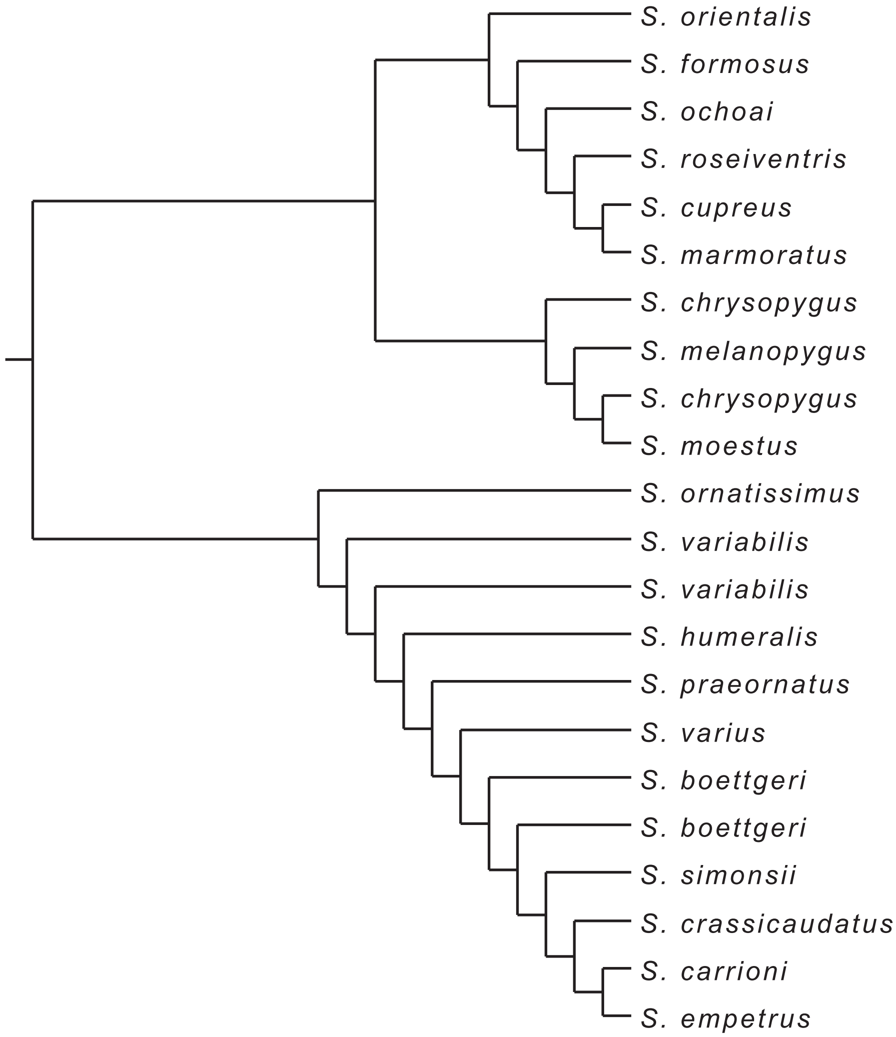

Figure 2.—Phylogenetic tree of *Stenocercus* based on morphological data (redrawn from Fritts, 1974).

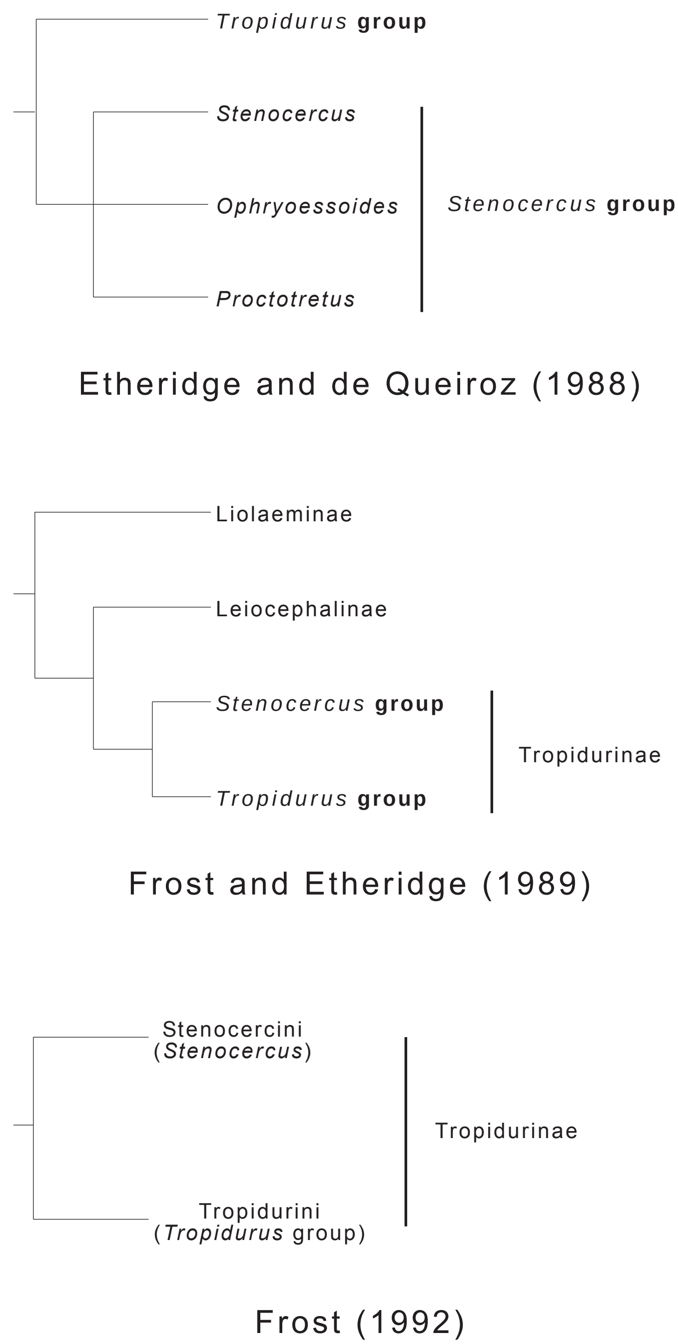

Figure 3.—Three phylogenetic hypotheses including *Stenocercus* and related taxa.

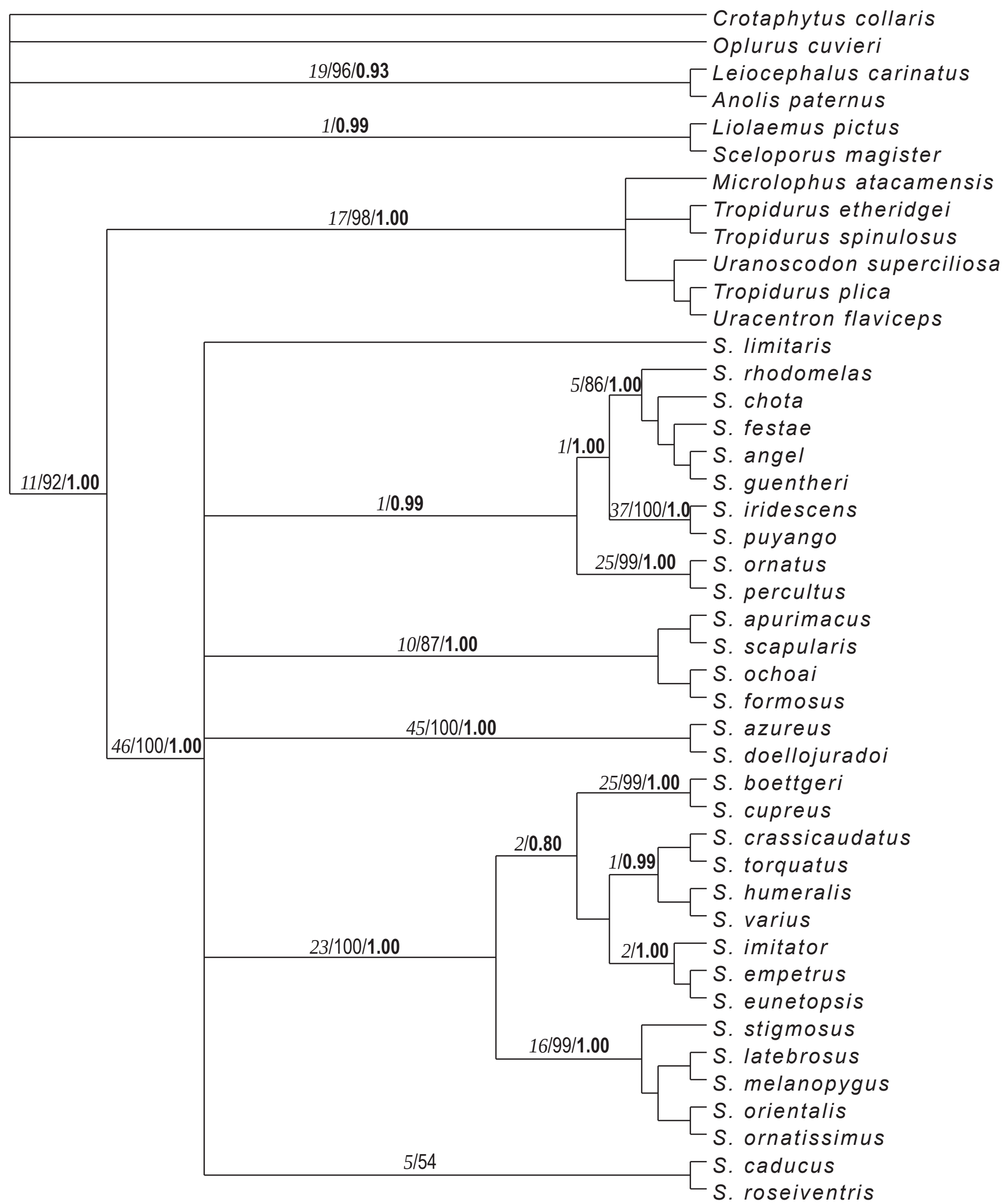

Figure 4.—Strict consensus of two equally most-parsimonious trees generated from analysis of 44 taxa and 1641 bp (length = 7048; consistency index = 0.2648; retention index = 0.3925). Numbers above branches correspond to decay indices (italics), bootstrap values (normal), and Bayesian posterior probabilities (bold). Bootstrap and Bayesian posterior probabilities < 50% are not shown. The dataset includes 578 constant characters, 898 parsimony informative characters, and 1033 unique site patterns.

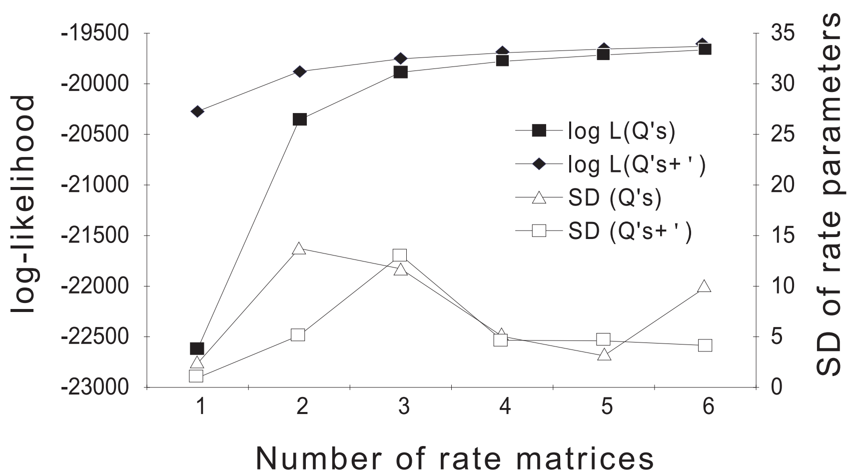

Figure 5.—Plot of the average log-likelihoods (left Y-axis) and average rate parameter standard deviations (right Y-axis) of the mixture models with and without gamma rate heterogeneity (gamma) using 1–6 rate matrices (Q’s, X-axis) on a dataset of 33 taxa and 1641 characters.

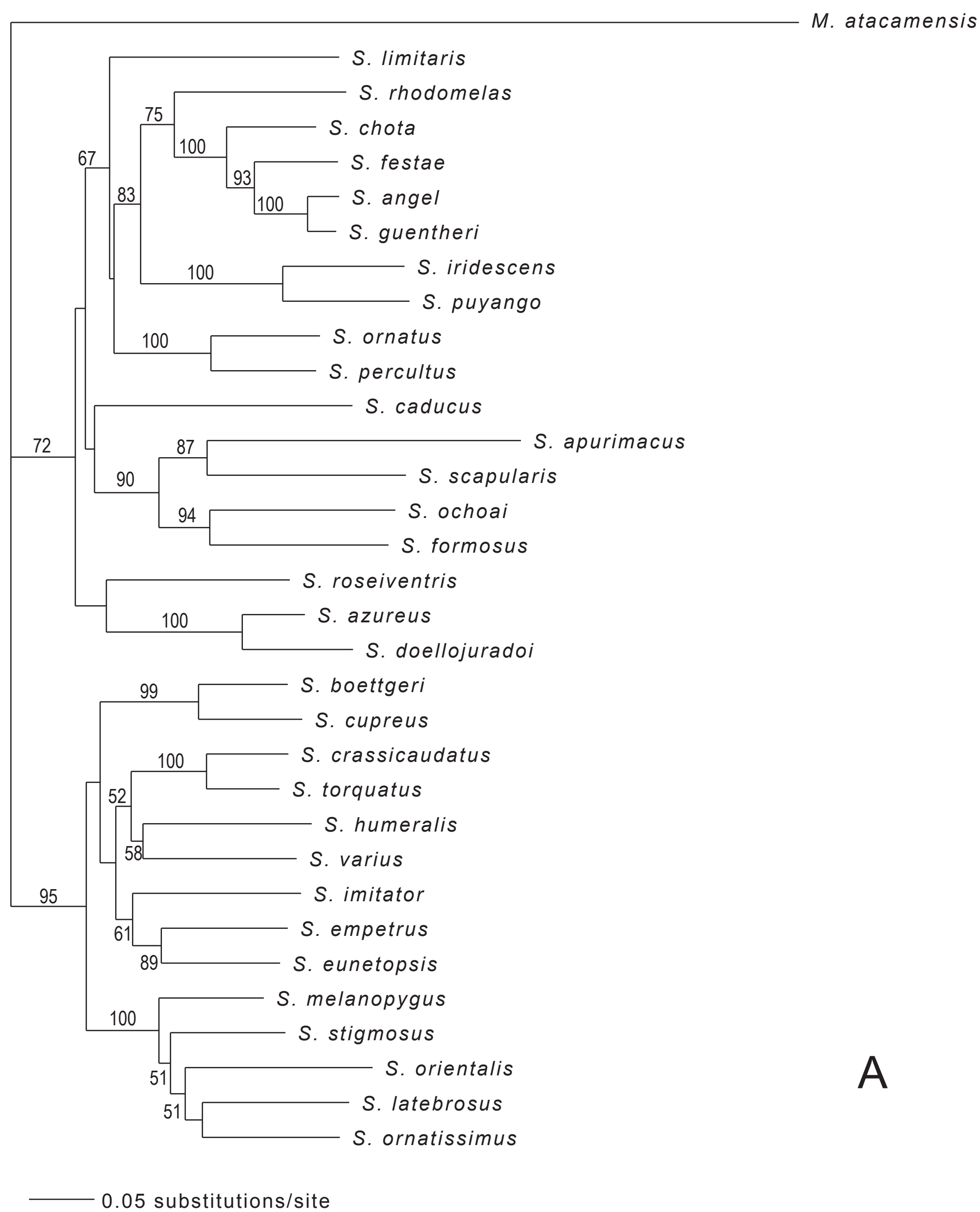

Figure 6.—Phylogenetic trees of *Stenocercus* based on analyses of mtDNA sequences; branches are proportional to their lengths. Of the 1641 included characters 735 are constant, 715 are parsimony informative, and 854 represent distinct data patterns. (A) Maximum likelihood tree (log-L = –20177.54132) obtained under the TVM + *I* + gamma model; numbers on branches represent bootstrap values (< 50% not shown). (B) Majority-rule (50%) consensus tree with maximum likelihood branch lengths for the 4*Q* + gamma model. The consensus is based upon 100 samples from a converged Markov chain. Numbers on branches are percentages representing posterior probability values (< 50% not shown).

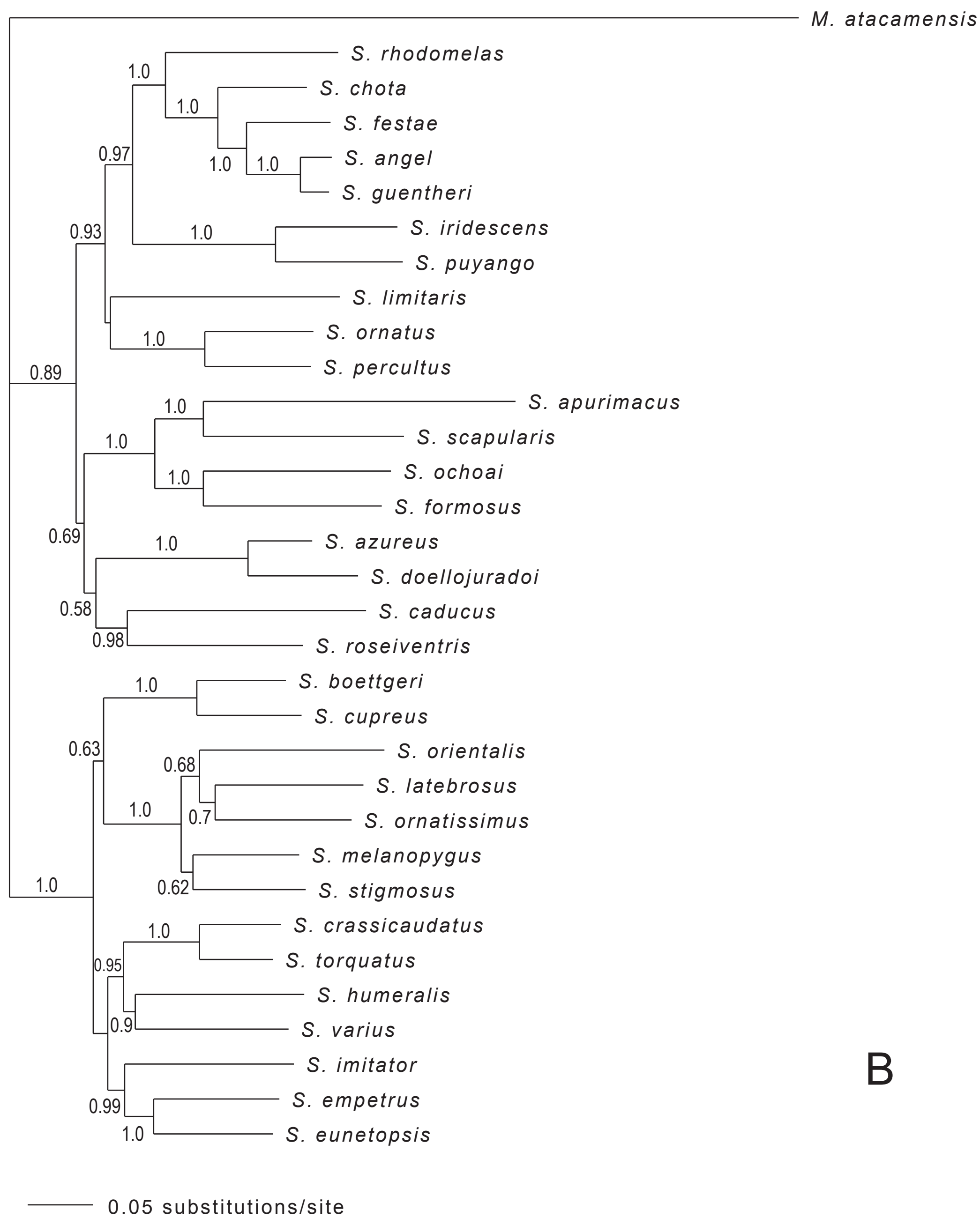

Figure 6.—*Continued.*

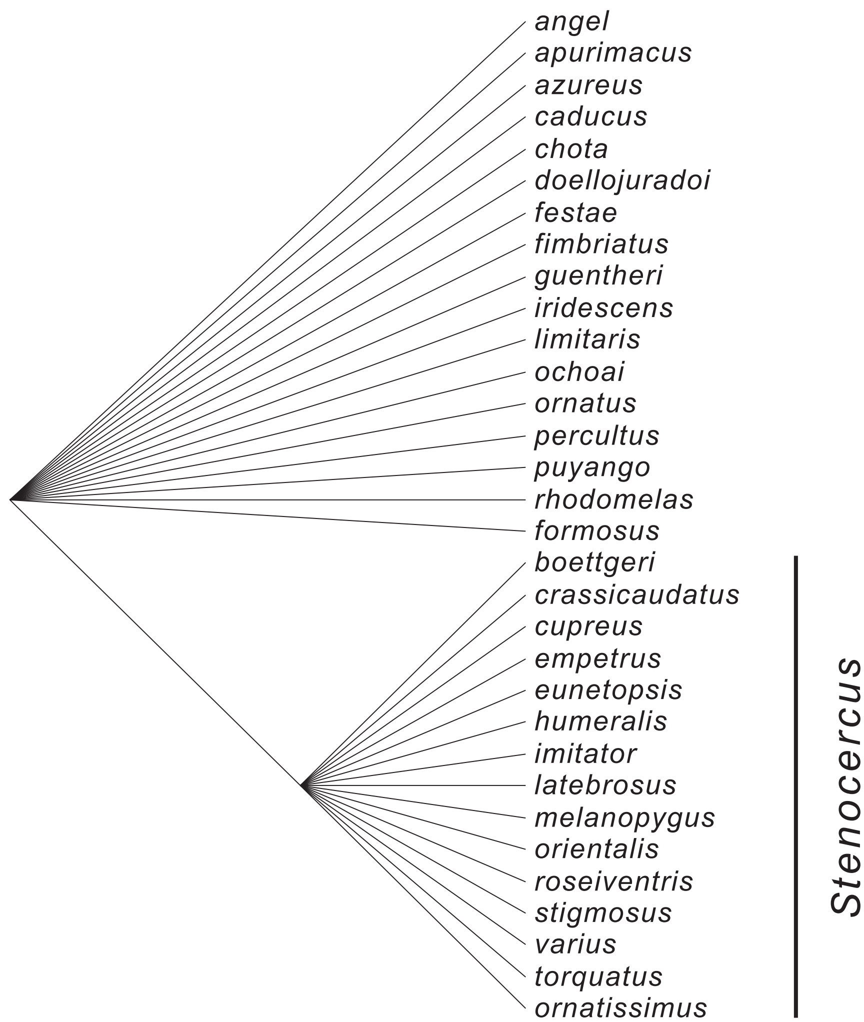

Figure 7.—Constraint tree separating "*Ophryoessoides*" and "*Proctotretus*" from *Stenocercus* based on Etheridge's (1970) taxonomic arrangement.

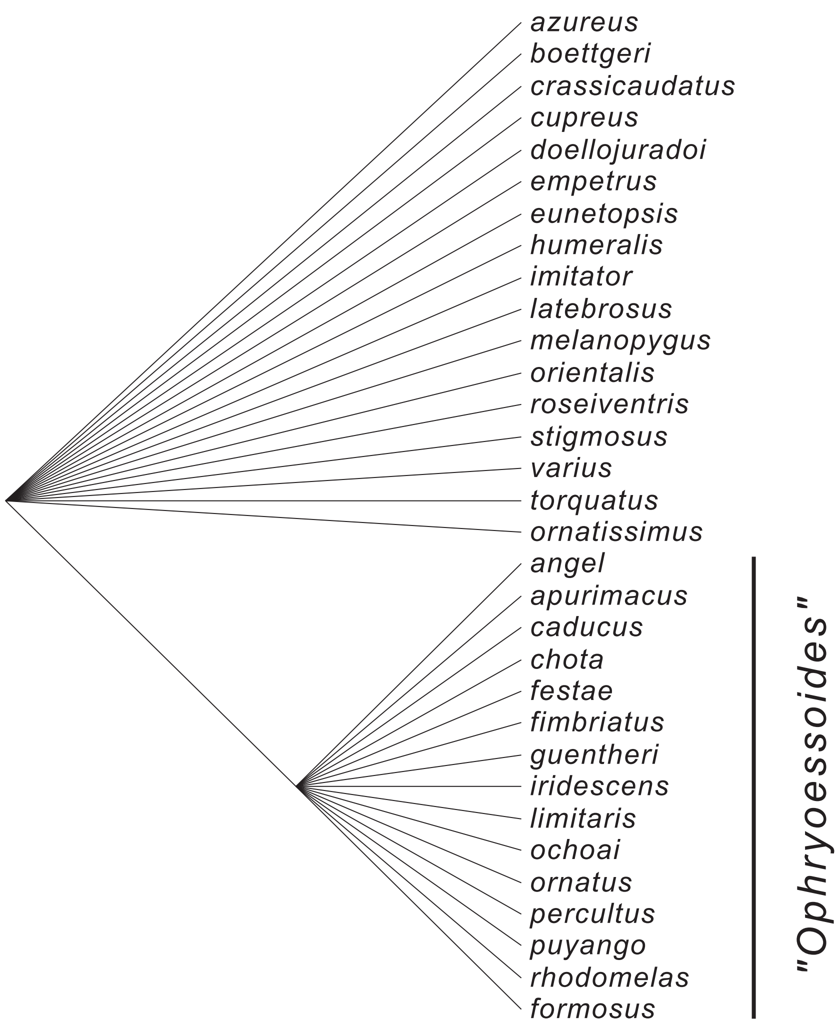

Figure 8.—Constraint tree separating *Stenocercus* and "*Proctotretus*" from "*Ophryoessoides*" based on Etheridge's (1970) taxonomic arrangement.

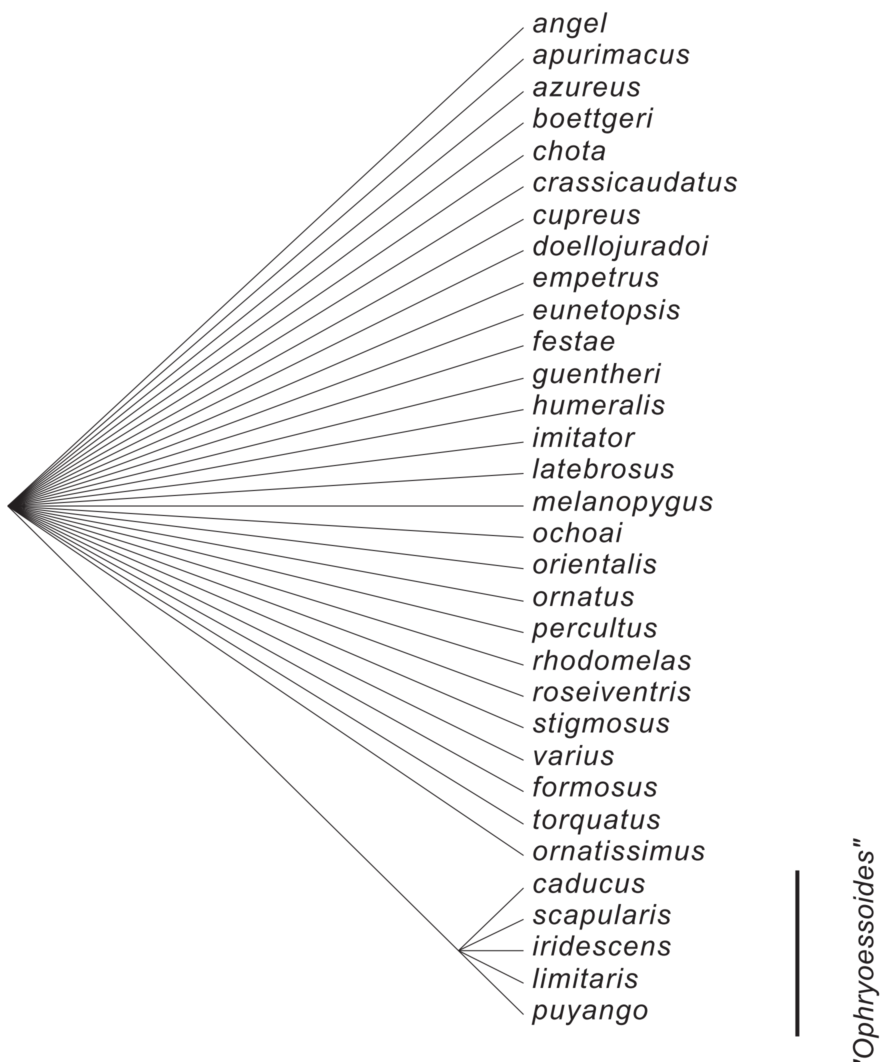

Figure 9.—Constraint tree with "*Ophryoessoides*" as a natural taxon based on Fritts' (1974) taxonomic arrangement.

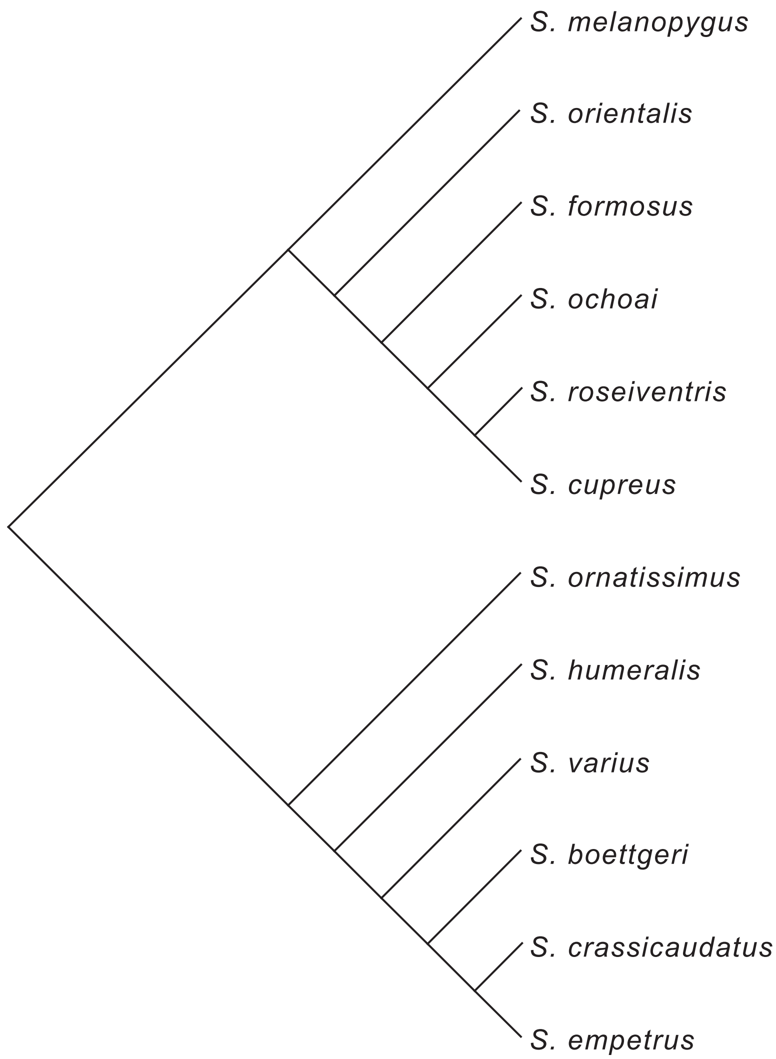

Figure 10.—Constraint tree based on Fritts' (1974) hypothesis of phylogenetic relationships among species of *Stenocercus*.

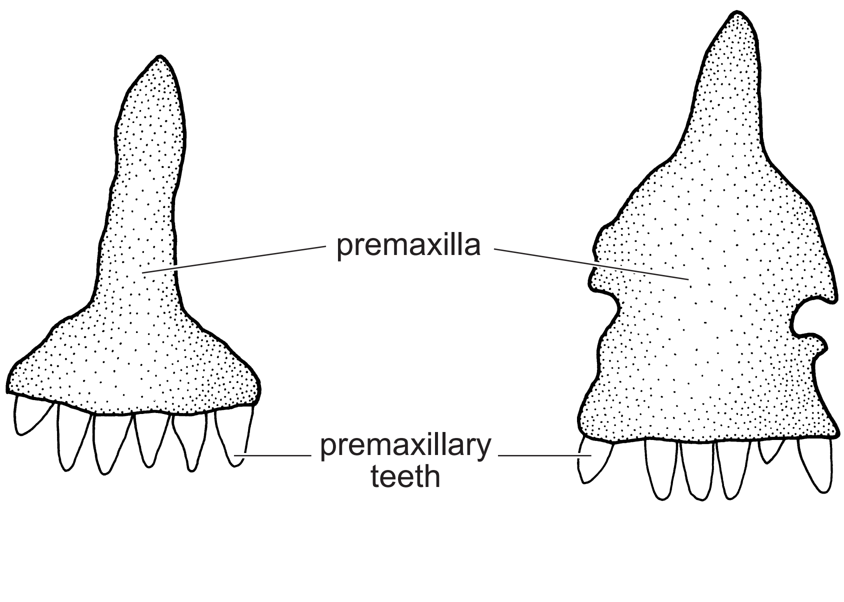

Figure 11.—Premaxilla of *Stenocercus apurimacus* (left; Character 1787: 0) and *S. aculeatus* (right; Character 1787: 1) in anterodorsal view. Scale bar = 2 mm.

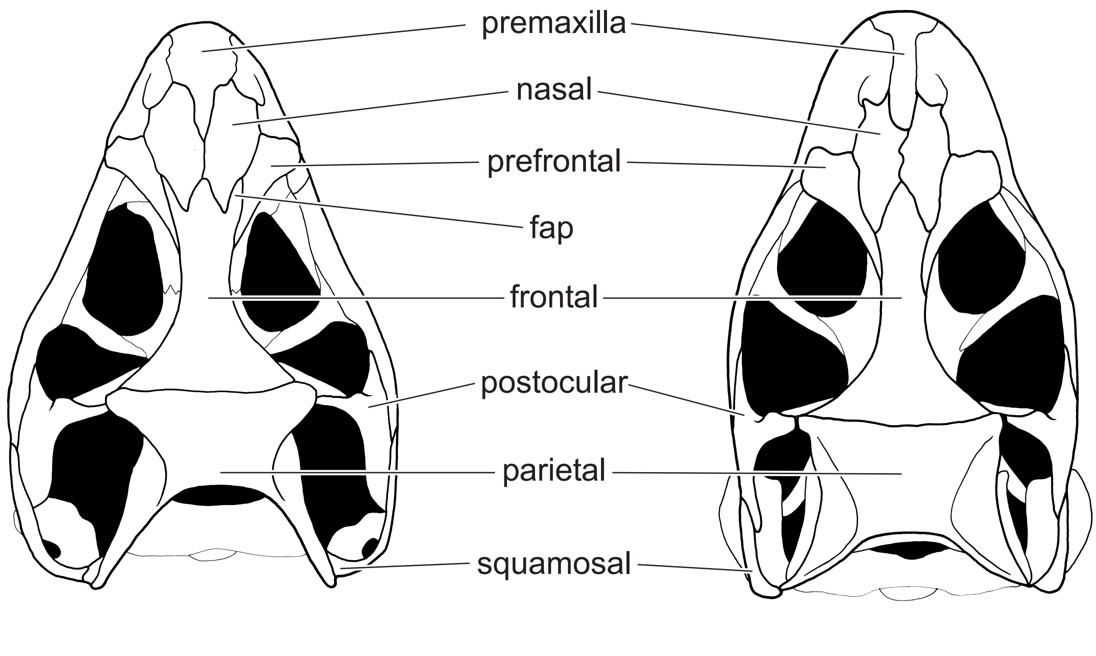

Figure 12.—Skull of *Stenocercus aculeatus* (left; Characters 1788: 0, 1792: 1) and *S. cupreus* (right; Characters 1788: 1, 1792: 0) in dorsal view. Scale bars = 5 mm.

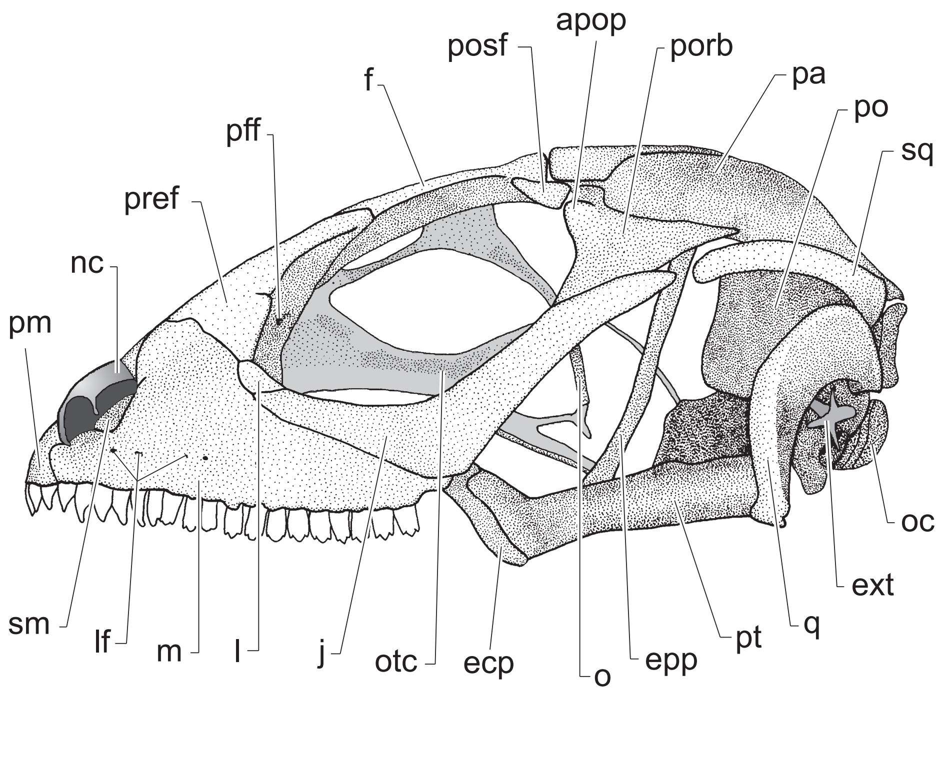

Figure 13.—Skull of *Stenocercus guentheri* in lateral view (Character 1790: 1). apop, anterodorsal postorbital process; ecp, ectopterygoid; epp, epipterygoid; ext, extracolumella; f, frontal; j, jugal; l, lacrimal; lf, labial foramina; m, maxilla; nc, nasal capsules; o, orbitosphenoid; oc, occipital condyle; otc, orbitotemporal cartilages; pa, parietal; pff, prefrontal foramen; pm, premaxilla; po, prootic; porb, postorbital; posf, postfrontal; pref, prefrontal; pt, pterygoid; q, quadrate; sq, squamosal. Gray indicates cartilage. Scale bar = 5 mm.

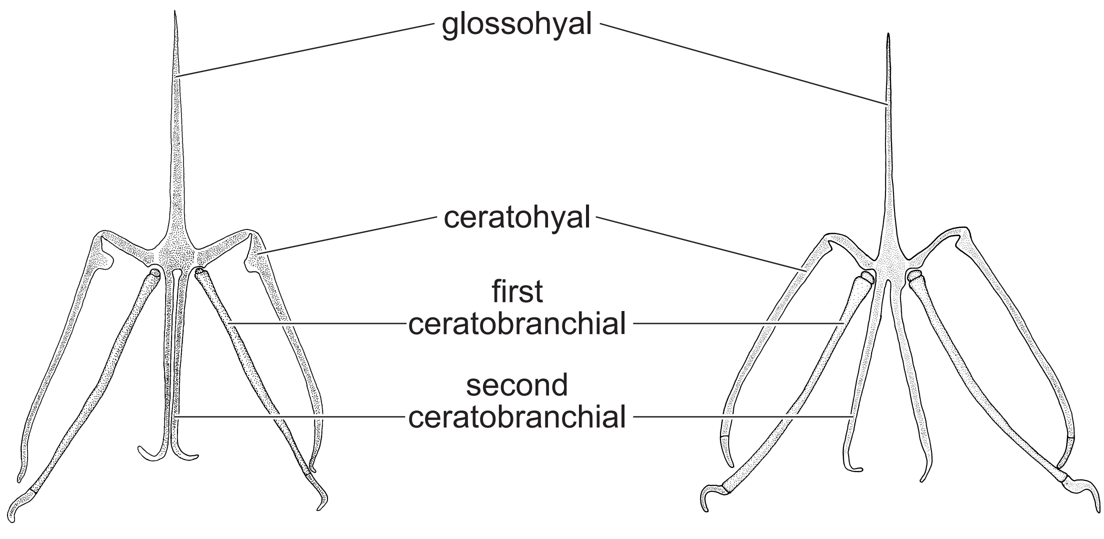

Figure 14.—Hyoid apparatus of *Stenocercus guentheri* (left; Character 1796: 0) and *S. lache* (right; Character 1796: 1) in ventral view. Scale bar = 5 mm.

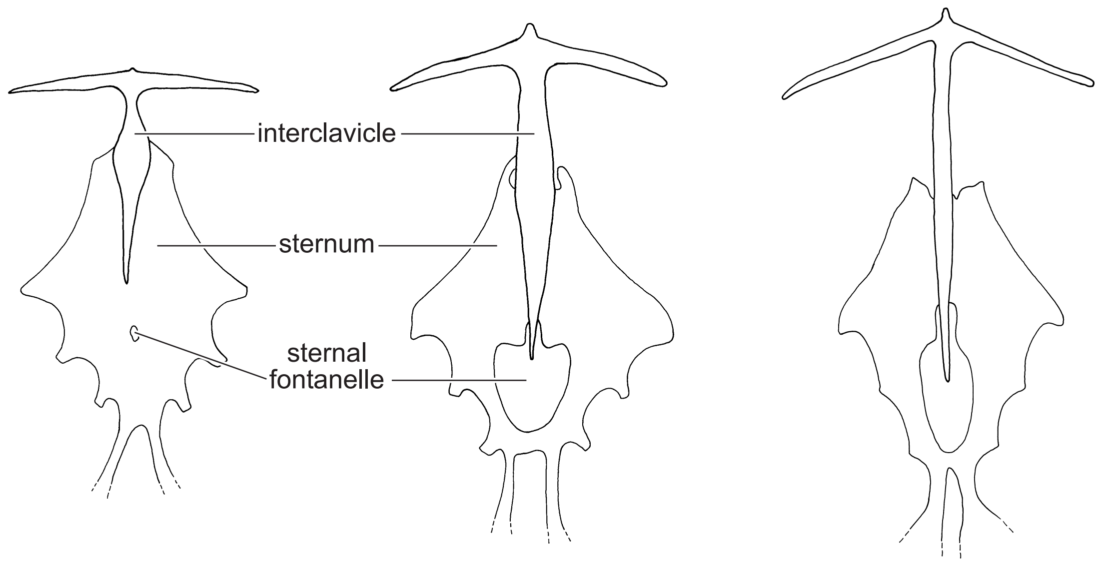

Figure 15.—Sternum and interclavicle of *Microlophus peruvianus* (left; Characters 1797: 0, 1798: 0, 1800: 0) *Stenocercus crassicaudatus* (center; Characters 1797: 1, 1798: 1, 1800: 1), and *S. festae* (right; Characters 1797: 1, 1798: 1, 1800: 0) in ventral view. Scale bars = 5 mm.

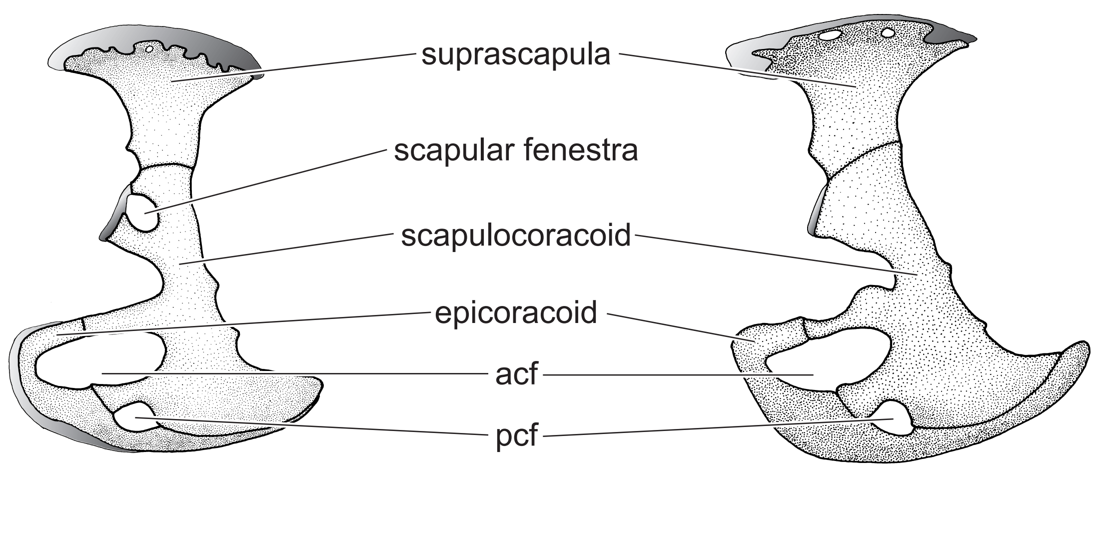

Figure 16.—Scapulocoracoid of *Stenocercus festae* (left; Character 1799: 0) and *S. crassicaudatus* (right; Character 1799: 1) in lateral view. acf, anterior coracoid fenestra; pcf, posterior coracoid fenestra. Scale bars = 5 mm.

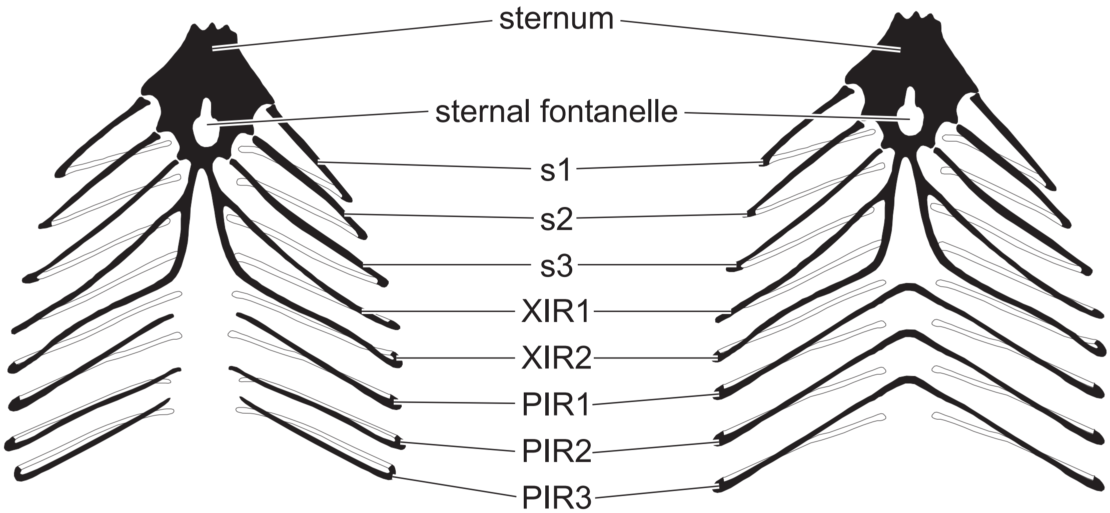

Figure 17.—Abdominal skeleton in ventral view; Character 1801: 0 (left), 1 (right). PIR, postxiphisternal inscriptional rib; s, sternal rib; XIR, xiphisternal inscriptional rib.

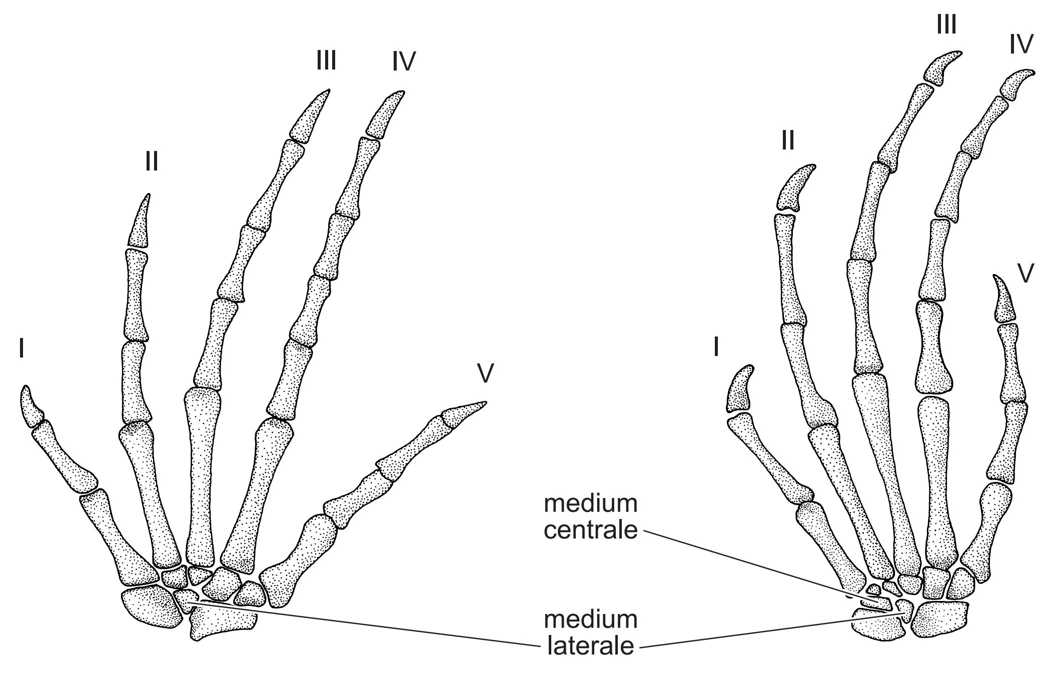

Figure 18.—Right hand skeleton of *Stenocercus lache* (left; Character 1802: 1) and *S. ornatus* (right; Character 1802: 0) in dorsal view. Scale bars = 5 mm.

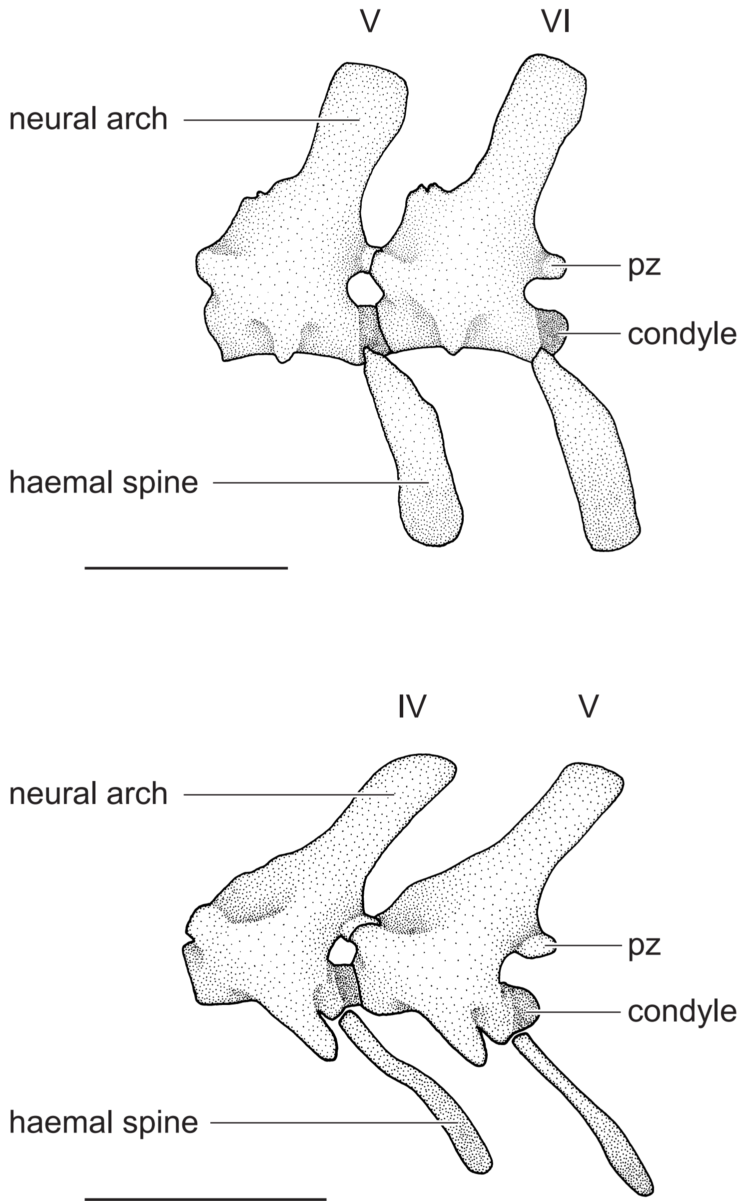

Figure 19.—Caudal vertebrae of *Stenocercus aculeatus* (top; Character 1805: 1) and *S. lache* (bottom; Character 1805: 0) in lateral view. pz, postzygoapophysis. Scale bars = 5 mm.

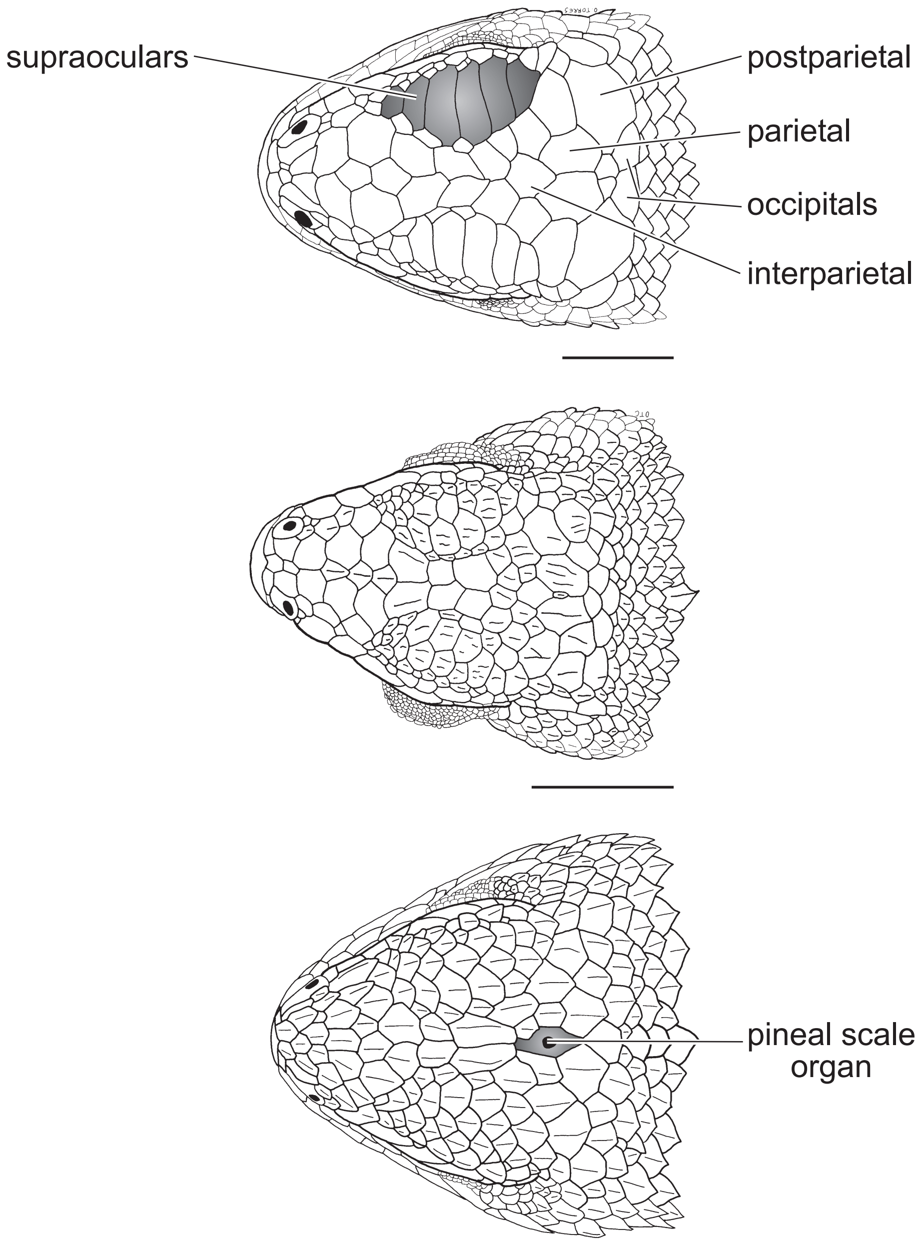

Figure 20.—Head of *Stenocercus iridescens* (top; Characters 1807: 0, 1808: 1, 1810: 0, 1816: 1), *S chota* (middle; Characters 1807: 1, 1808: 0, 1810: 0, 1816: 0), and *S. pectinatus* (bottom; Characters 1807: 2, 1808: 0, 1810: 1, 1816: 0) in dorsal view. Supraoculars (top) and interparietal (bottom) are shaded in gray. Scale bars = 5 mm.

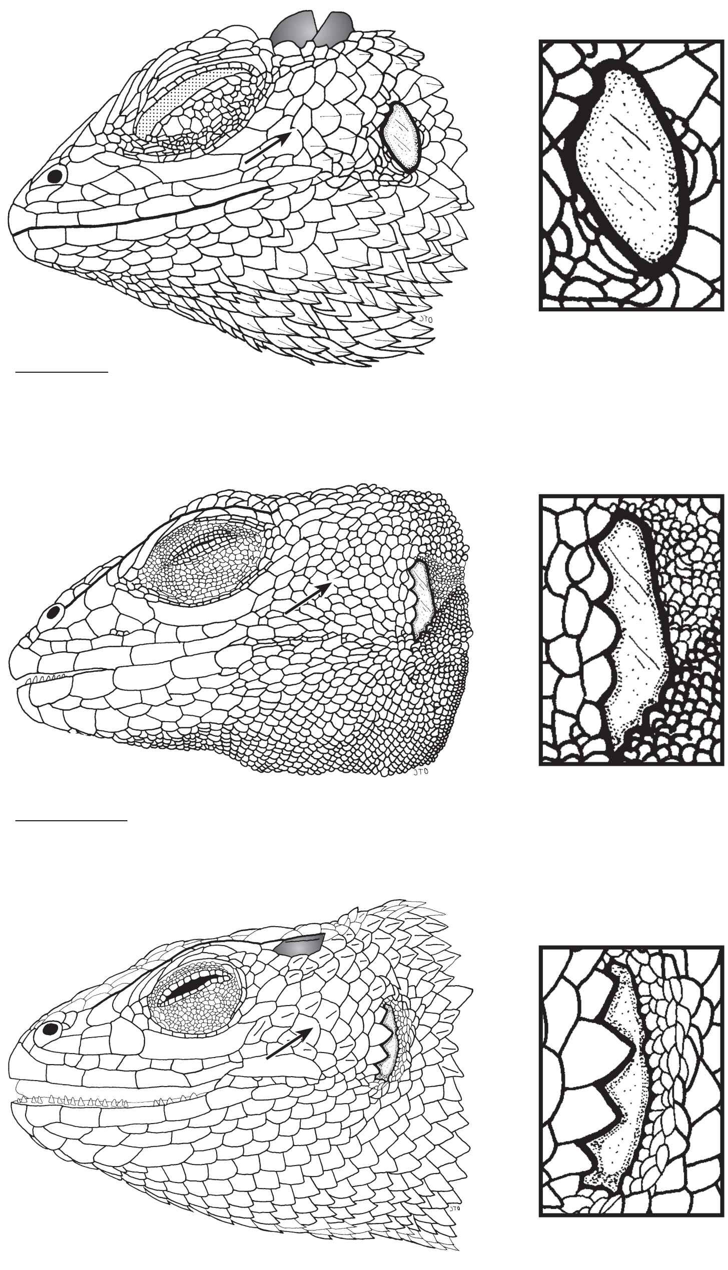

Figure 21.—Head of *Stenocercus aculeatus* (top; Characters 1811: 0, 1812: 0, 1813: 2, 1845: 0), *S. varius* (middle; Characters 1811: 1, 1812: 1, 1813: 0, 1845: 1), and *S. angel* (bottom; Characters 1811: 0, 1812: 0, 1813: 1, 1845: 2) in lateral view. Close-up of tympanic are in right boxes; black arrows indicate temporals; angulate temporals shaded in gray. Scale bars = 5 mm.

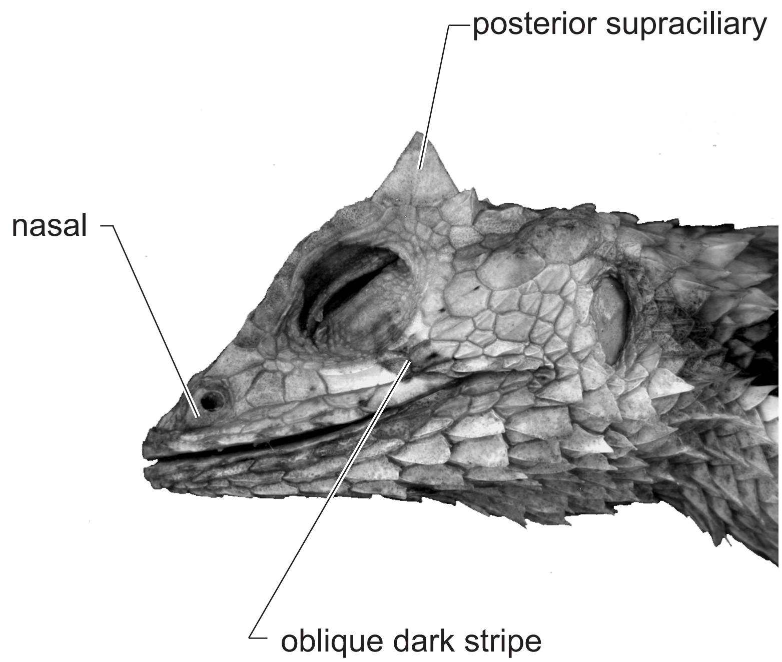

Figure 22.—Head of *Stenocercus dumerilii* in lateral view (Characters 1814: 1, 1822: 1, 1823: 1, 1895: 1).

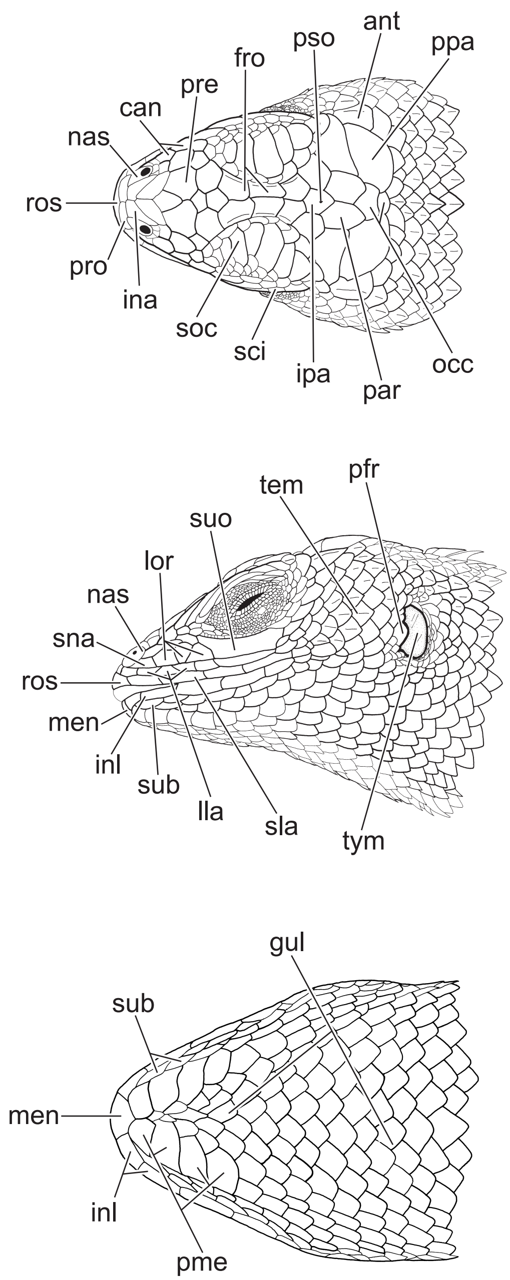

Figure 23.—Head of *Stenocercus puyango* in dorsal (top), lateral (middle), and ventral (bottom) views (Characters 1817: 4–6, 1818: 1, 1819: 1, 1820: 4, 1821: 0/1, 1824: 2–4, 1825: 0, 1826: 0, 1827: 4, 1828: 2–4, 1834: 0/1, 1835: 0, 1837: 0). ant, angulate temporal; can, canthals; fro, frontals; gul, gulars; ina, internasals; inl, infralabials; ipa, interparietal; lla, lorilabials; lor, loreals; men, mental; nas, nasal; occ, occipitals; par, parietals; pfr, preauricular fringe; pme, postmentals; ppa, postparietals; pre, prefrontals; pro, postrostrals; pso, pineal scale organ; ros, rostral; sci, superciliaries; sla, supralabials; sna, subnasal; soc, supraoculars; sub, sublabials; suo, subocular; tem, temporals; tym, tympanum.

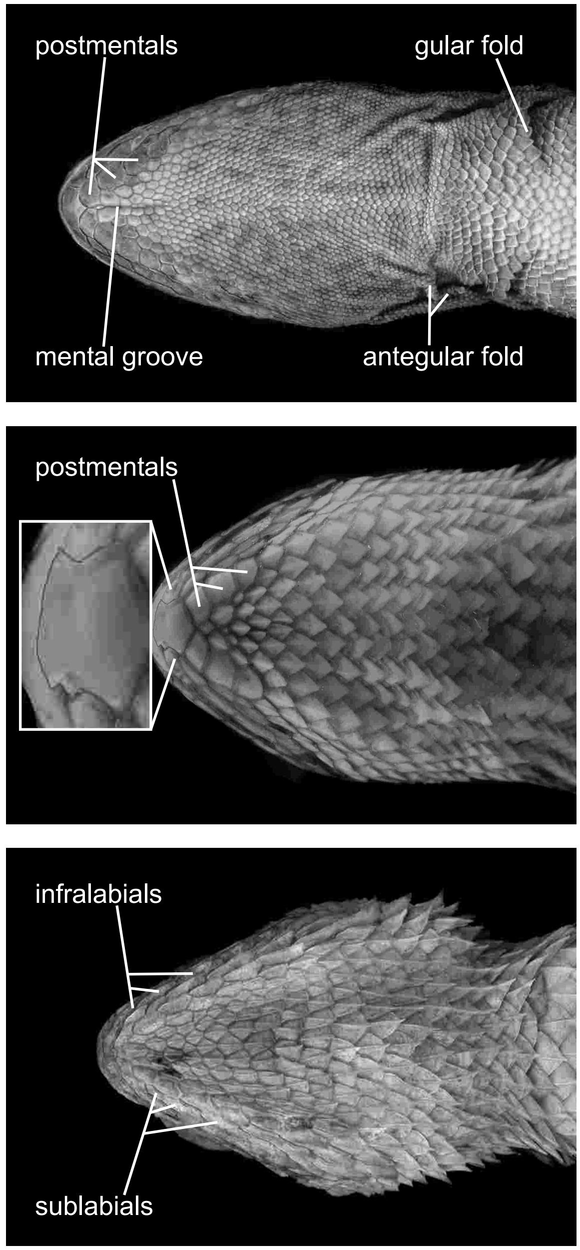

Figure 24.—Head of *Stenocercus boettgeri* (top; Characters 1831: 0, 1832: 1, 1833: 0, 1836: 0, 1837: 0, 1841: 0, 1873: 1, 1876: 1), *S. pectinatus* (middle; Characters 1831: 1, 1832: 0, 1833: 1, 1836: 0, 1837: 0, 1841: 1, 1873: 0, 1876: 0), and *S. dumerilii* (bottom; Characters 1831: 0, 1832: 0, 1833: 0, 1836: 1, 1837: 1, 1841: 2, 1873: 0, 1876: 0) in ventral view.

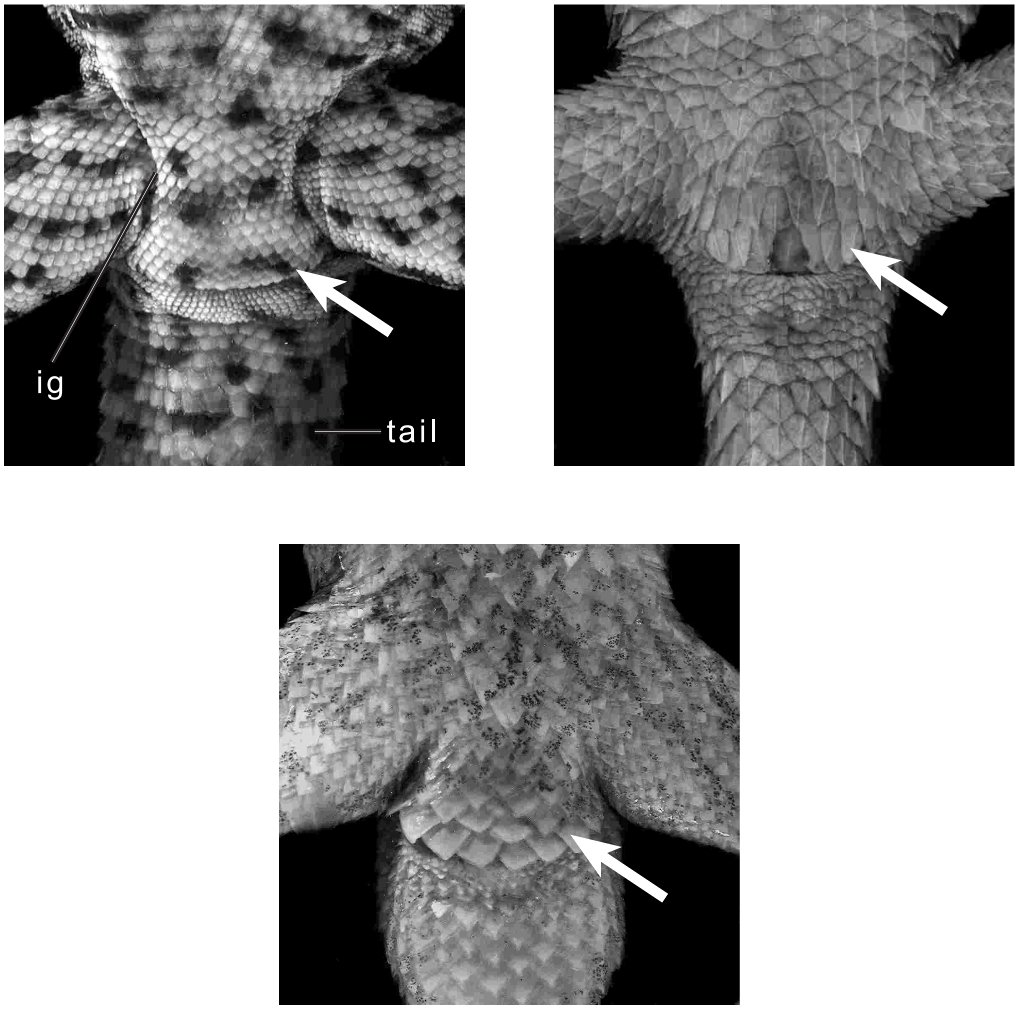

Figure 25.—Preanal region in *Stenocercus empetrus* (top left; Characters 1859: 0, 1860: 1), *S. dumerilii* (top right; Characters 1859: 1, 1860: 0), and *S. pectinatus* (bottom; Characters 1859: 1, 1860: 0) in ventral view. ig, inguinal groove; white arrows indicate preanals.

S. guentheri *S. empetrus* *S. roseiventris*

Figure 26.—Tail section of *Stenocercus guentheri* (left; Character 1870: 0), *S. empetrus* (center; Character 1870: 1), and *S. roseiventris* (right; Character 1870: 1) in dorsal view.

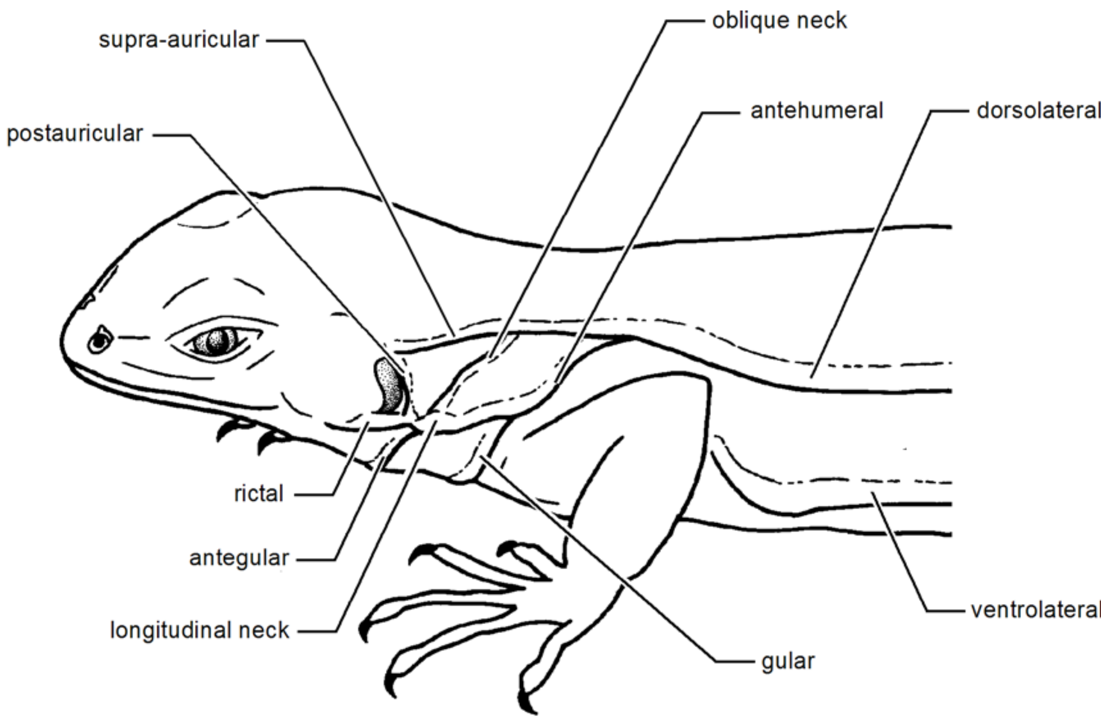

Figure 27.—Dermal folds in *Stenocercus* (Characters 1872–1879). Taken from Torres-Carvajal (2005).

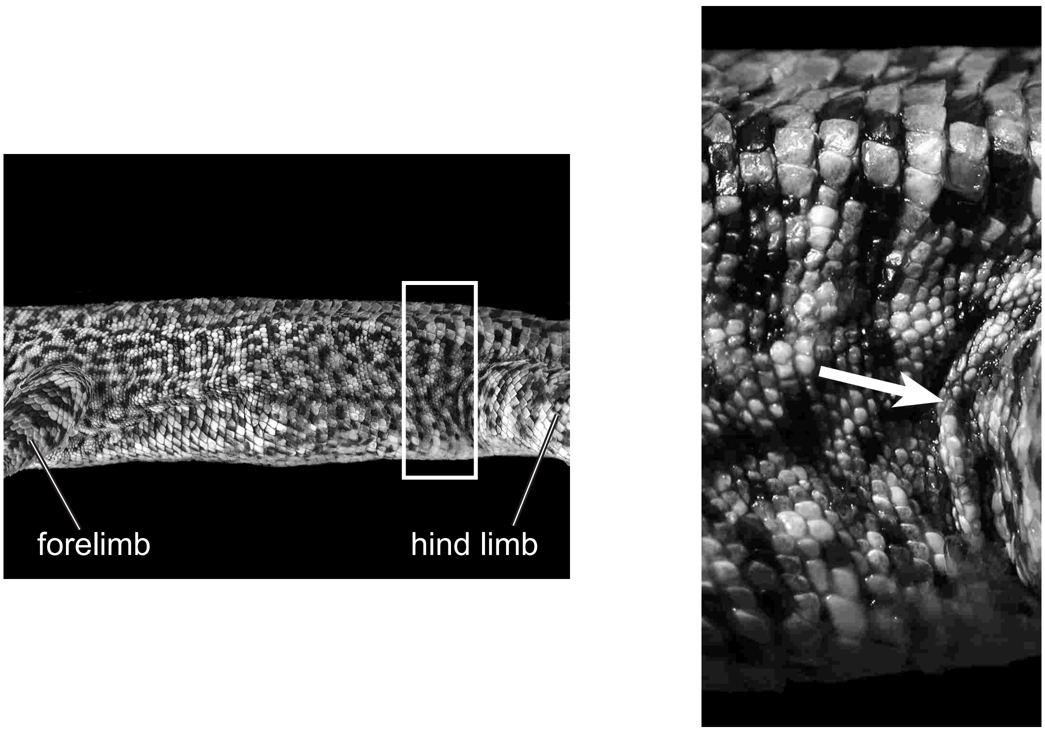

Figure 28.—Inguinal fold of *Stenocercus empetrus* in lateral view. Close-up of white box to the right; white arrow indicates inguinal granular pocket (Character 1880: 1).

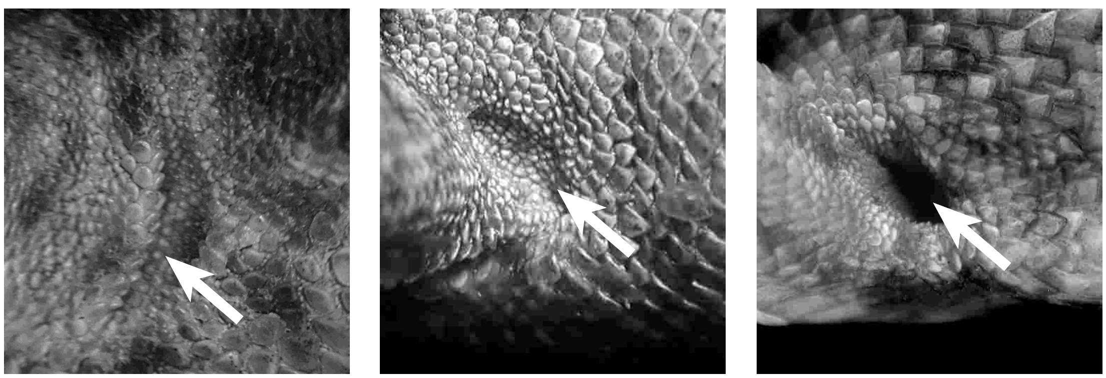

Figure 29.—Left posthumeral mite pocket of *Stenocercus frittsi* (left; Character 1881: 1), *S. guentheri* (center; Character 1881: 2), and *S. rhodomelas* (right; Character 1881: 3) in lateral view.

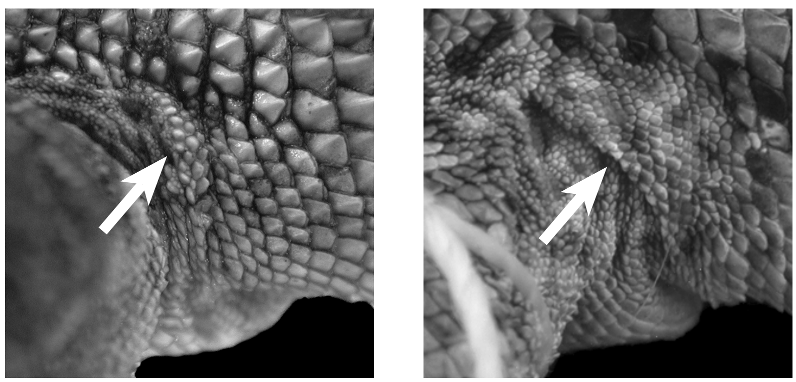

Figure 30.—Left postfemoral mite pocket of *Stenocercus boettgeri* (left; Character 1883: 1) and *S. variabilis* (right; Character 1883: 2) in lateral view.

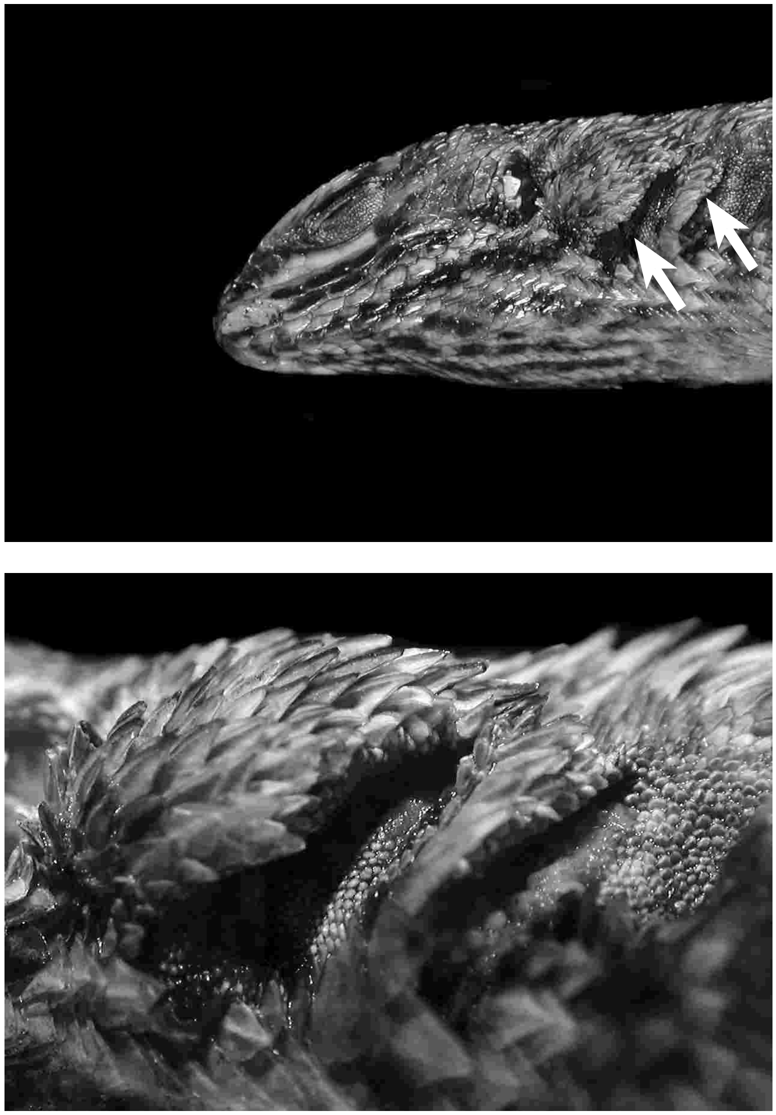

Figure 31.—Neck of *Stenocercus latebrosus* in lateral view (Character 1884: 1). Arrow in top box indicates nuchal mite pockets; close-up of nuchal mite pockets in bottom box.

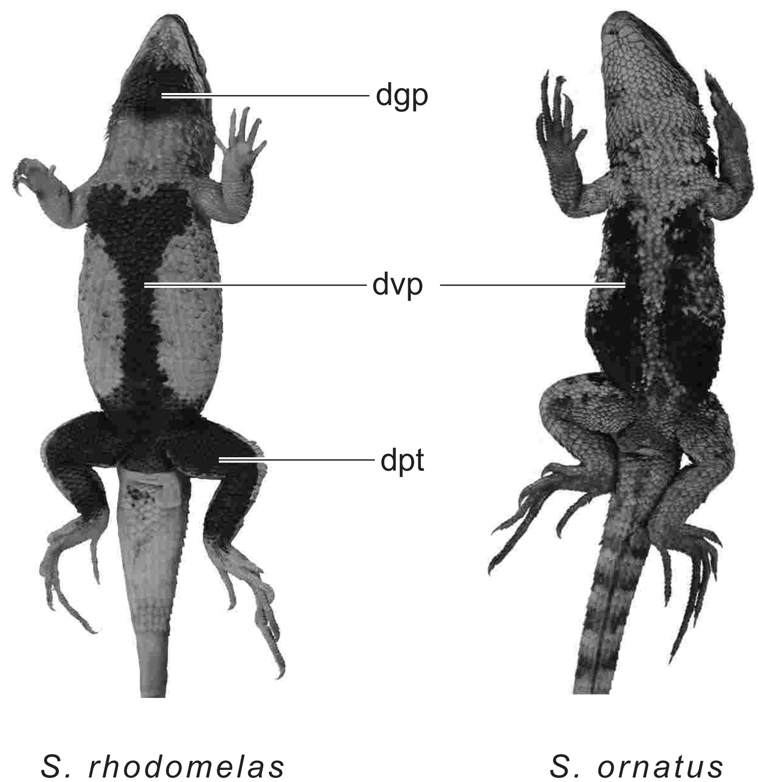

Figure 32.—Ventral color pattern in *Stenocercus rhodomelas* (left; Characters 1886: 1, 1888: 1, 1889: 1) and *S. ornatus* (right; Characters 1886: 0, 1888: 0/1, 1889: 1) adult males. dgp, dark gular patch; dvp, dark ventral patch; dpt, dark patches on ventral surface of thighs.

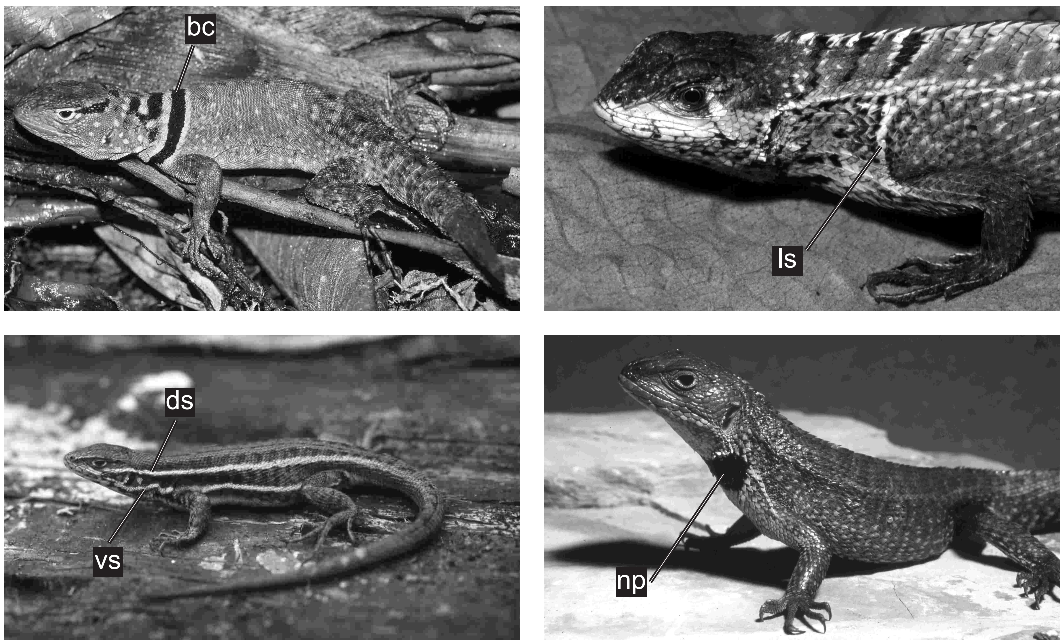

Figure 33.— *Stenocercus torquatus* (top left), *S. iridescens* (top right), *S. stigmosus* (bottom left), and *S. trachycephalus* (bottom right) (Characters 1887, 1891, 1892, 1896, 1897). bc, black collar; ds, dorsal stripe between tympanum and forelimb; vs, ventral stripe between tympanum and forelimb; ls, light vertical stripe on shoulder; np, black patch on neck.

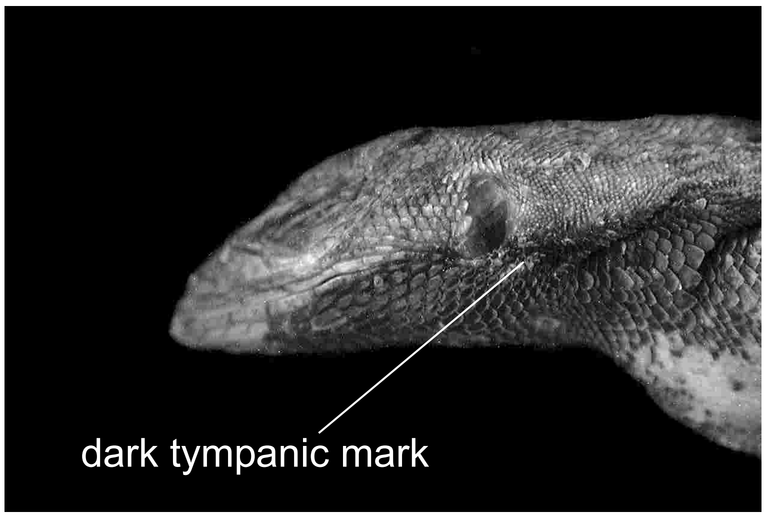

Figure 34.—Head of adult female of *Stenocercus frittsi* in lateral view (Character 1900: 1).

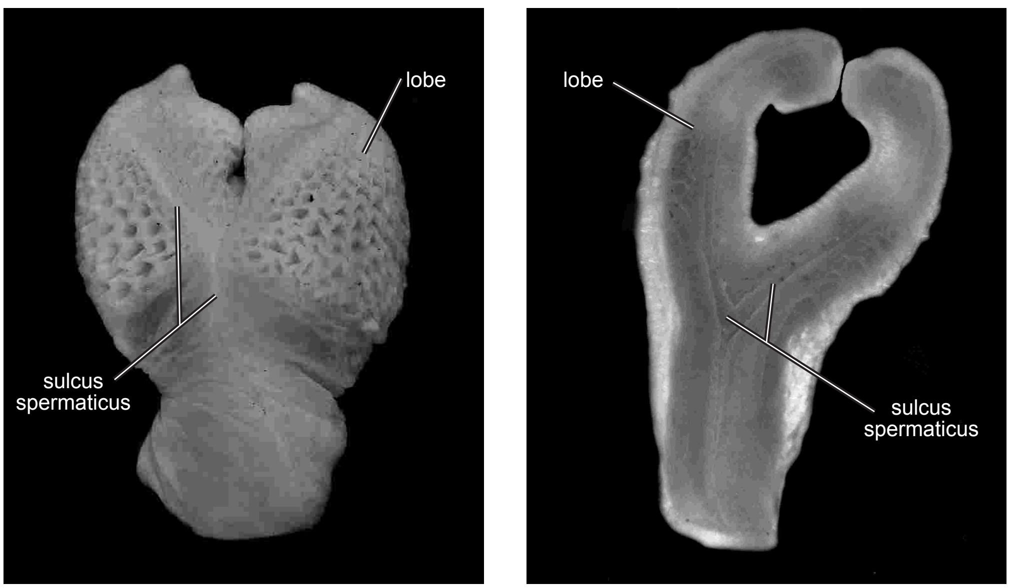

Figure 35.—Everted hemipenes of *Stenocercus doellojuradoi* (left; Character 1901: 1) and *Tropidurus hispidus* (right; Character 1901: 0).

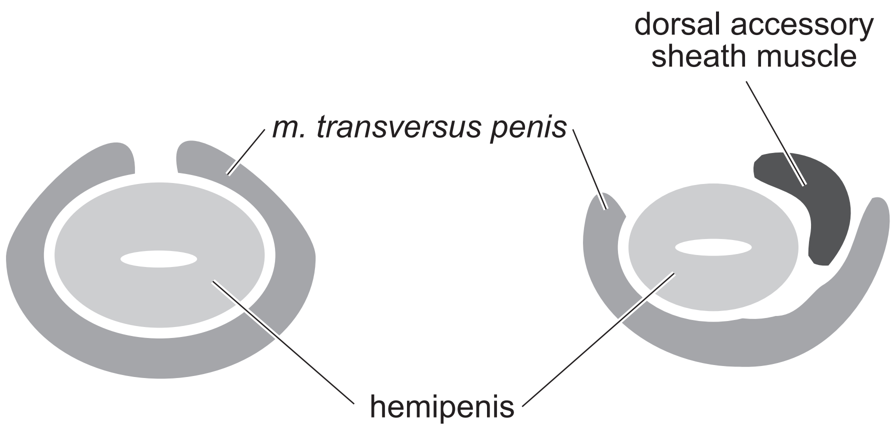

Figure 36.—Cross section of inverted hemipenis and hemipenial sheath muscles in *Stenocercus* (left; Characters 1902: 1, 1903: 1) and members of the *Tropidurus* group (right; Characters 1902: 0, 1903: 0).

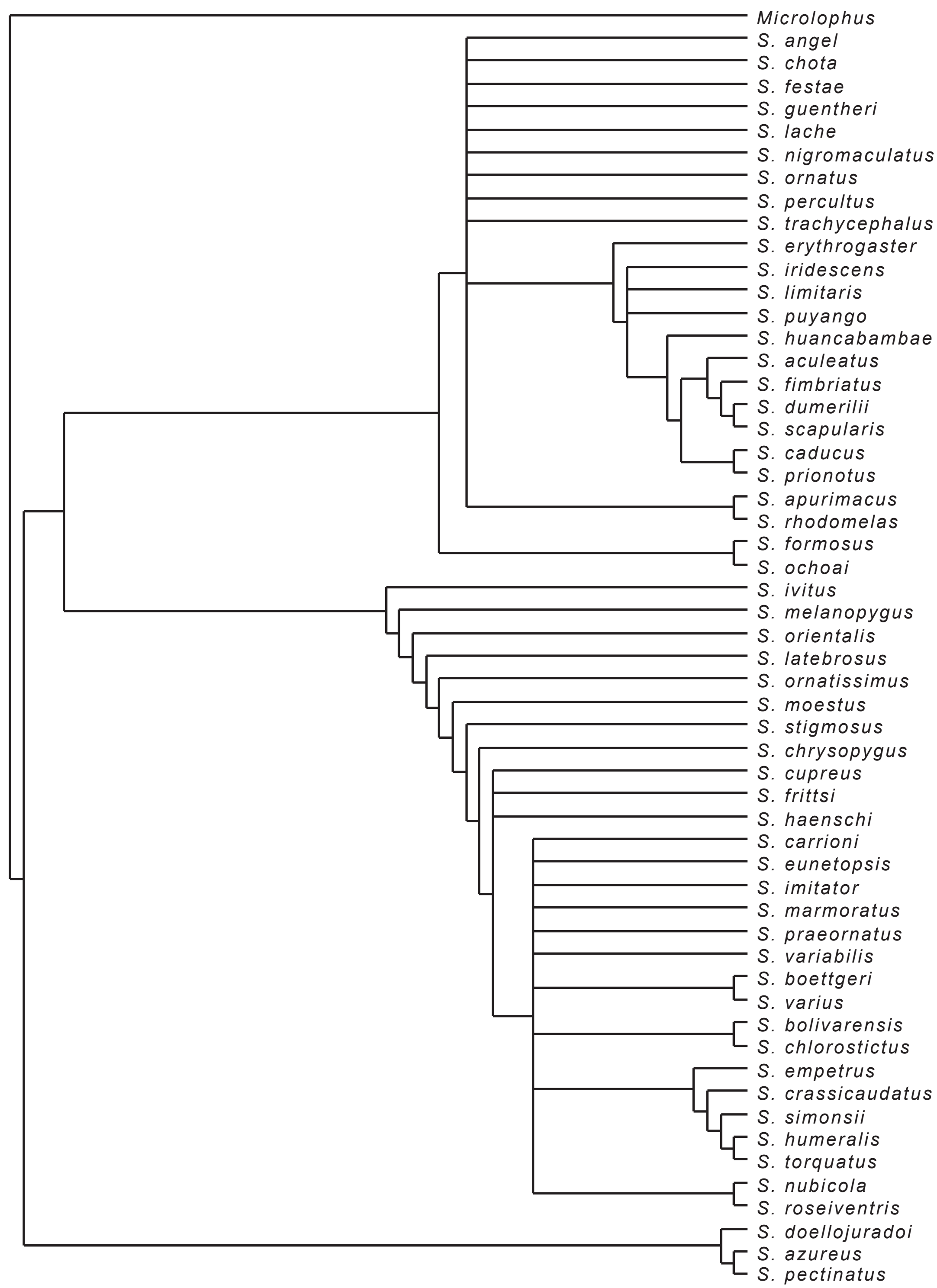

Figure 37.—Strict consensus of 1261 equally most-parsimonious trees generated from analysis of 56 taxa and 91 fixed morphological characters (length = 302; consistency index = 0.334; retention index = 0.755). The dataset includes 74 parsimony informative characters.

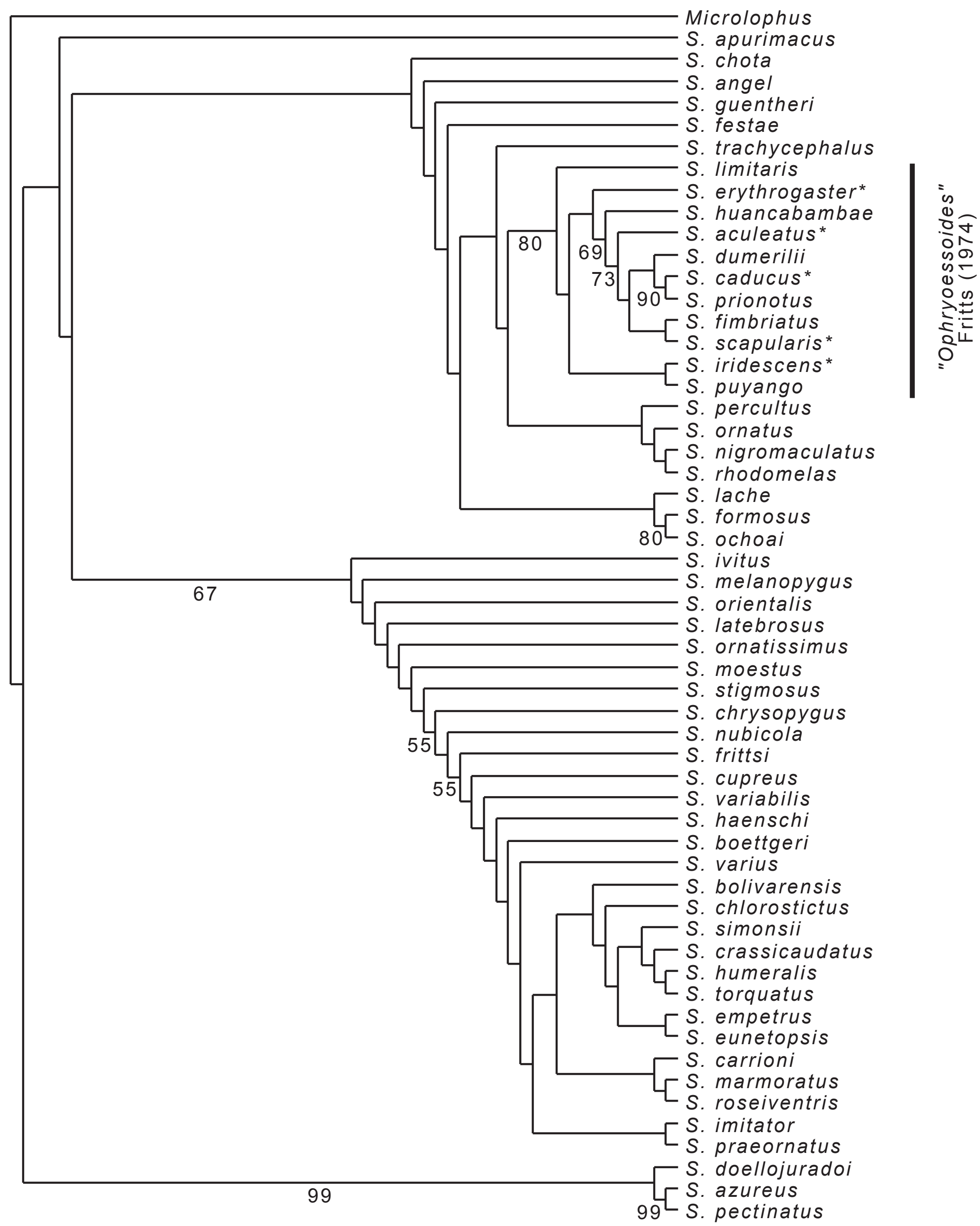

Figure 38.—Most parsimonious tree generated from analysis of 56 taxa and 123 morphological characters (length = 455.945; consistency index = 0.289; retention index = 0.700). Numbers below branches correspond to bootstrap values (< 50% not shown). The dataset includes 103 parsimony informative characters.

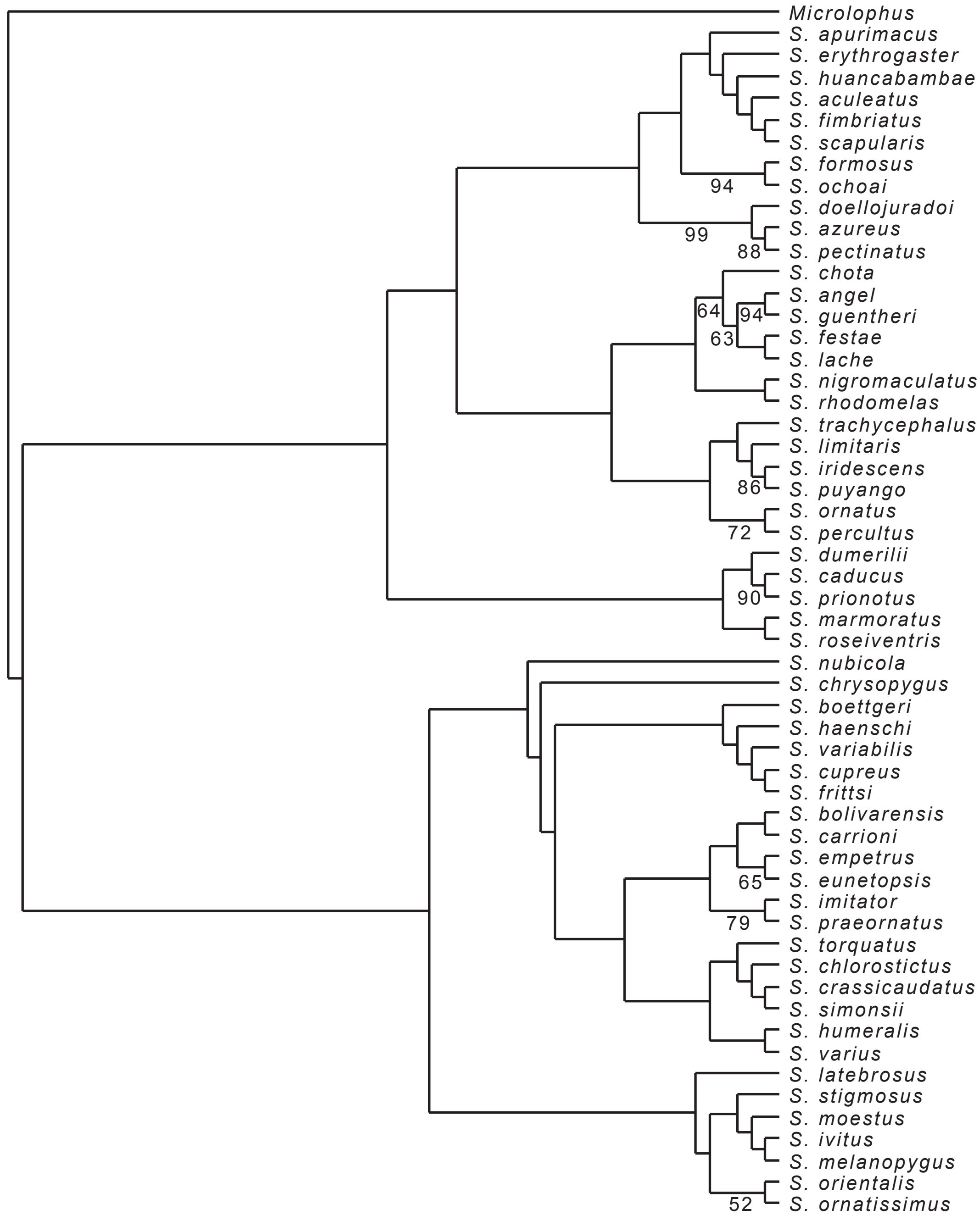

Figure 39.—Most parsimonious tree generated from analysis of 56 taxa, 123 morphological (fixed, polymorphic, and continuous) and 1641 molecular characters (length = 4938.3765; consistency index = 0.2855; retention index = 0.4442). Numbers below branches correspond to bootstrap values (< 50% not shown). The dataset includes 818 parsimony informative characters.

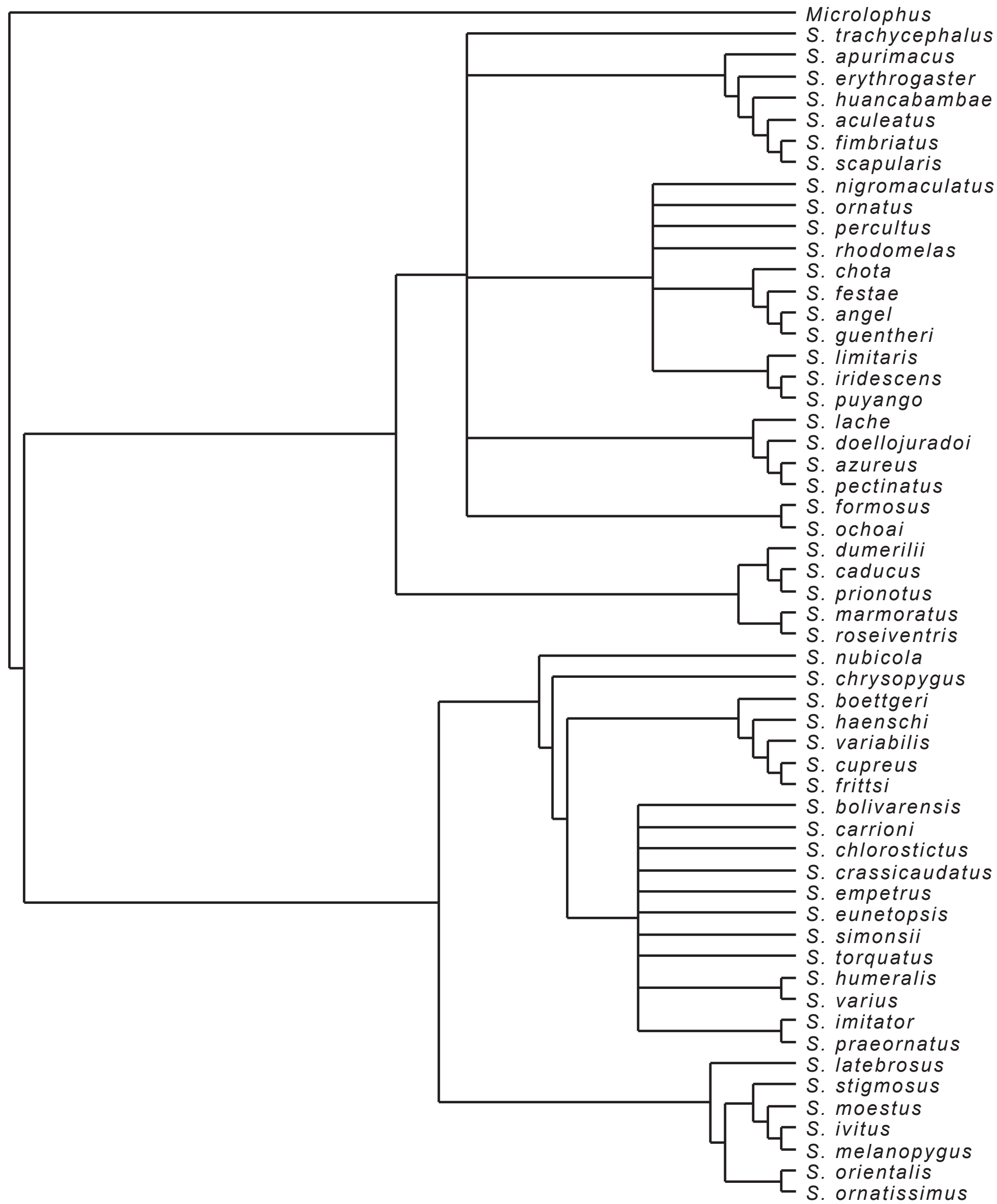

Figure 40.—Strict consensus of 161 equally most-parsimonious trees generated from analysis of 56 taxa, 91 morphological (fixed only) and 1641 molecular characters (length = 4795; consistency index = 0.327; retention index = 0.447). The dataset includes 789 parsimony informative characters.

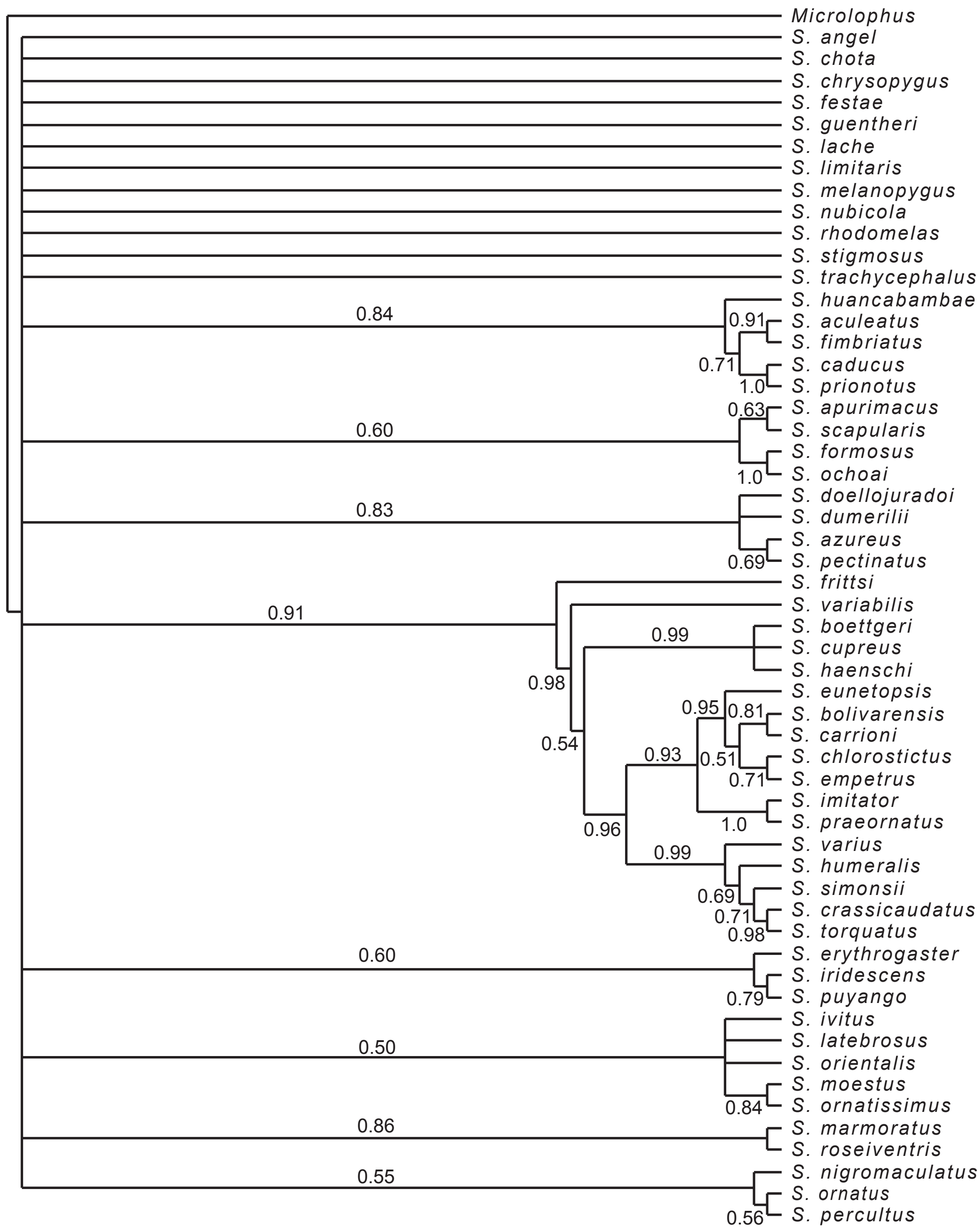

Figure 41.—Bayesian tree generated from analysis of 56 taxa, 123 morphological, and 1641 molecular characters using the Mkv model for morphological data. Dataset includes 854 and 113 unique site patterns for molecular and morphological partitions, respectively. Number on branches are posterior probabilities.

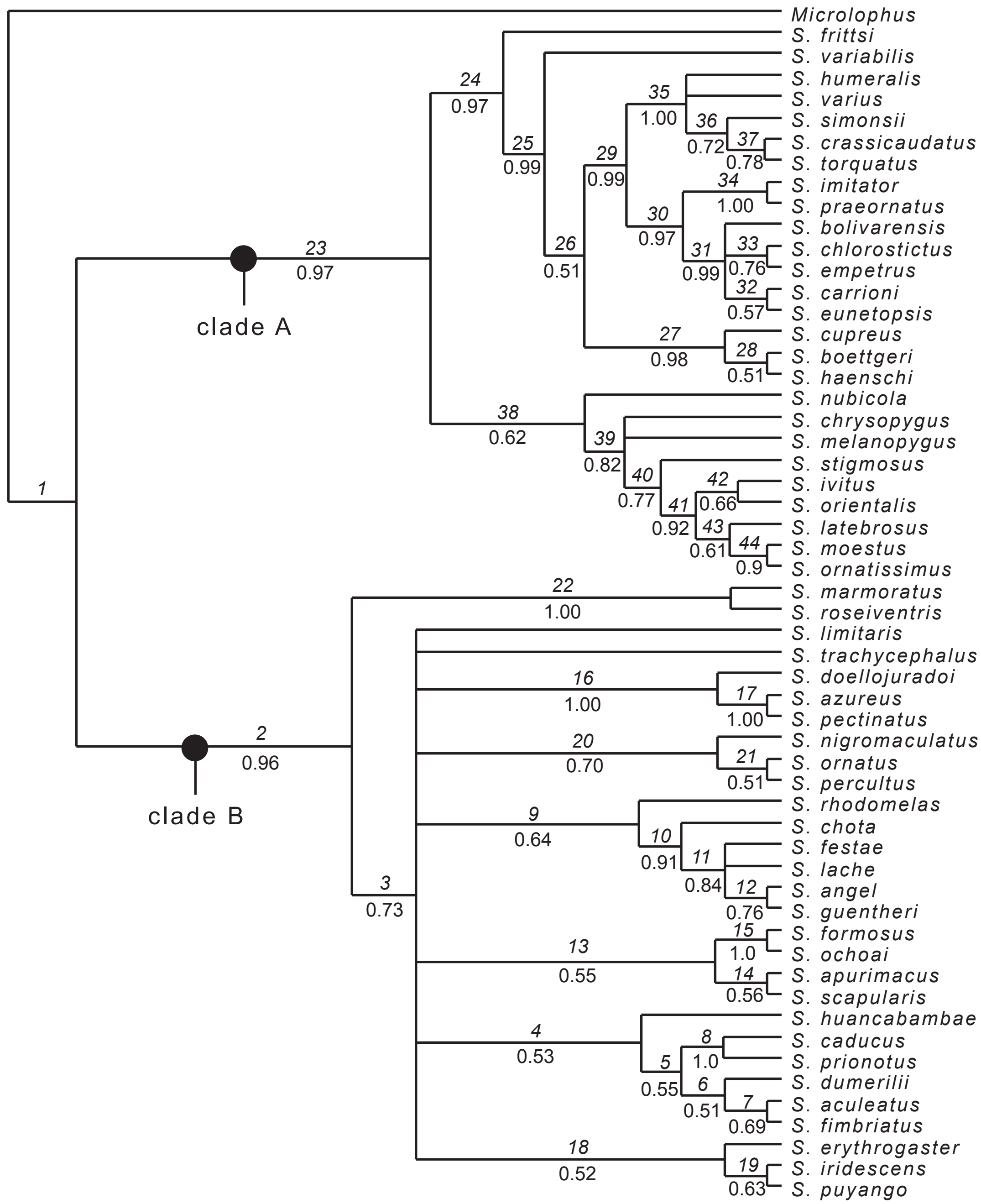

Figure 42.—Bayesian tree generated from analysis of 56 taxa, 123 morphological, and 1641 molecular characters using the Mkv + gamma model for morphological data. Dataset includes 854 and 113 unique site patterns for molecular and morphological partitions, respectively. Number below branches are posterior probabilities. Stem numbers from Appendix VI are indicated in italics above branches.

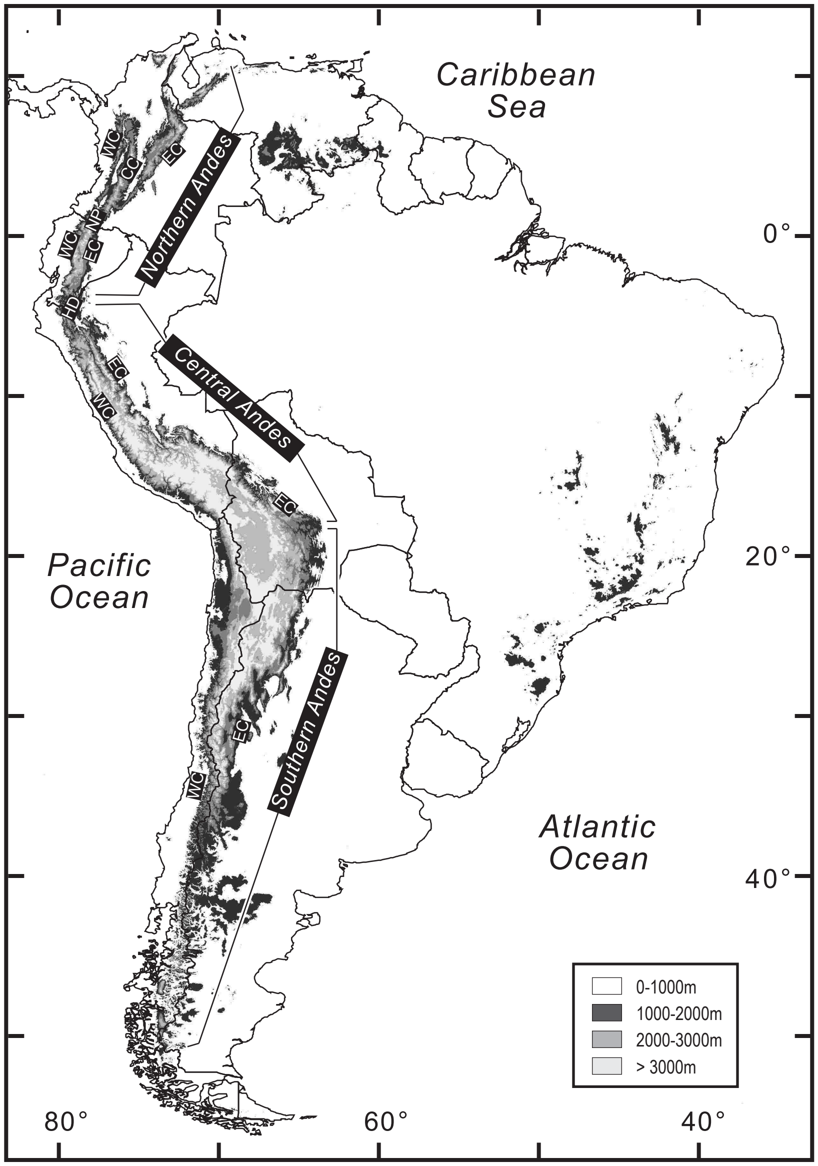

Figure 43.—Main geographical regions in the Andes. CC, central cordillera; EC, eastern cordillera; HP, Huancabamba depression; NP, nudo de Pasto; WC, western cordillera.

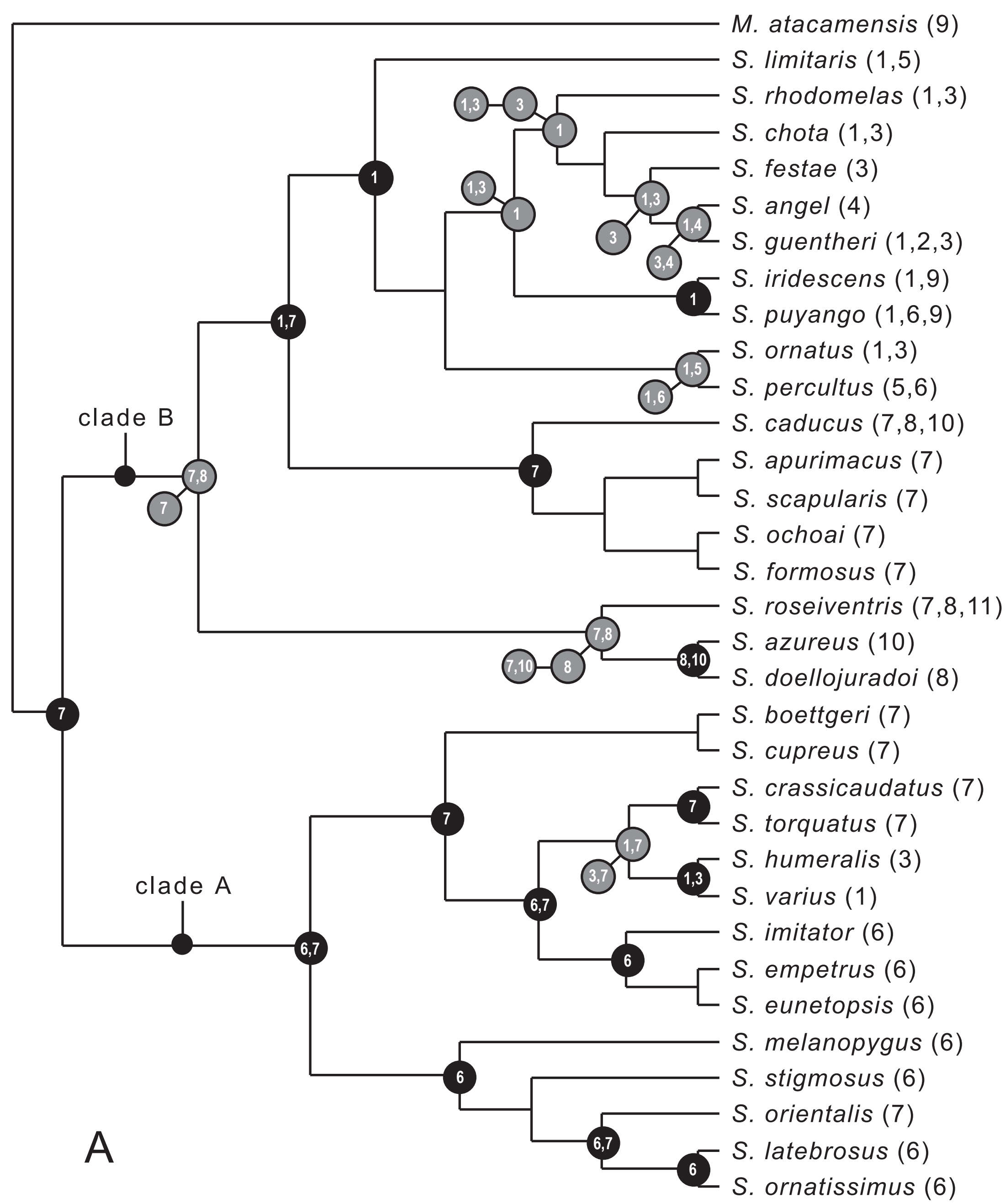

Figure 44.—Optimal reconstructions of ancestral distributions in *Stenocercus* using the ML (A) and Bayesian (B) molecular trees. For each tree, distributions recovered in all optimal reconstructions are indicated in black circles; otherwise, all alternative optimal reconstructions are in grey circles. Numbers in parentheses refer to present known distribution of each species. Areas are (1) western and (2) eastern cordilleras of northern Andes, (3) interandean basins of northern Andes, (4) Nudo de Pasto, (5) Huancabamba depression, (6) western and (7) eastern cordilleras of central Andes, (8) eastern cordillera of southern Andes, (9) Pacific lowlands, (10) Atlantic lowlands, (11) Amazon basin.

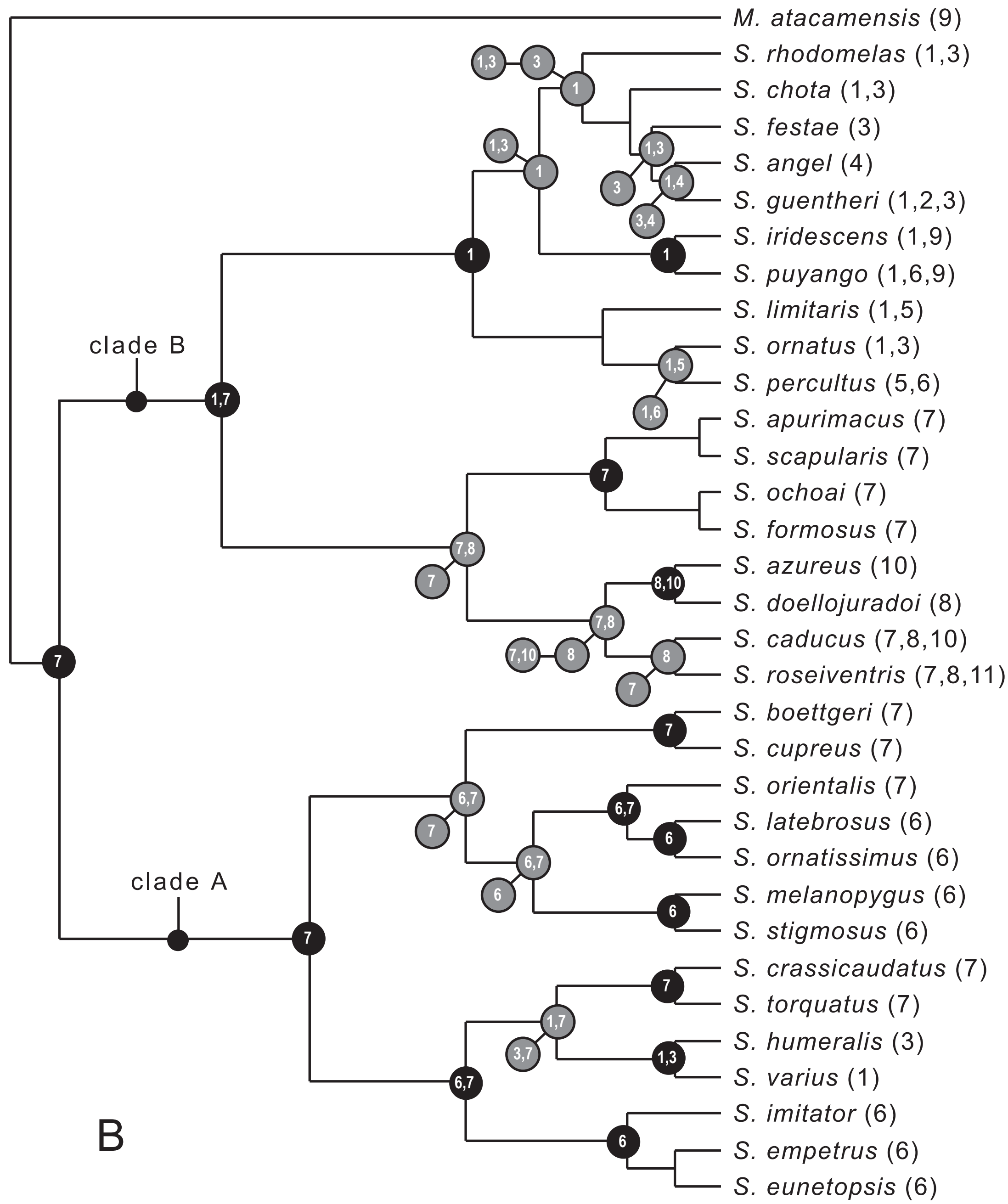

Figure 44.—*Continued.*

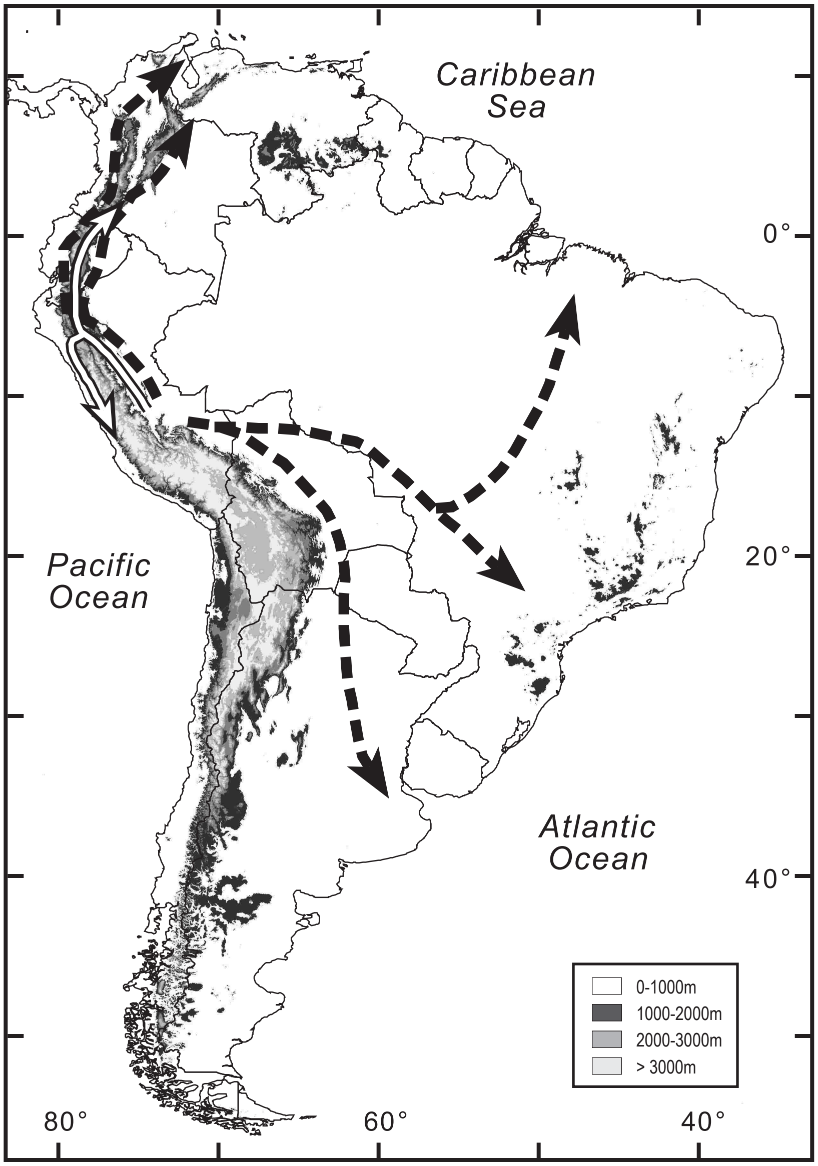

Figure 45.—Center of origin and radiation of *Stenocercus*. White arrow and black broken arrow correspond to Clades A and B, respectively.

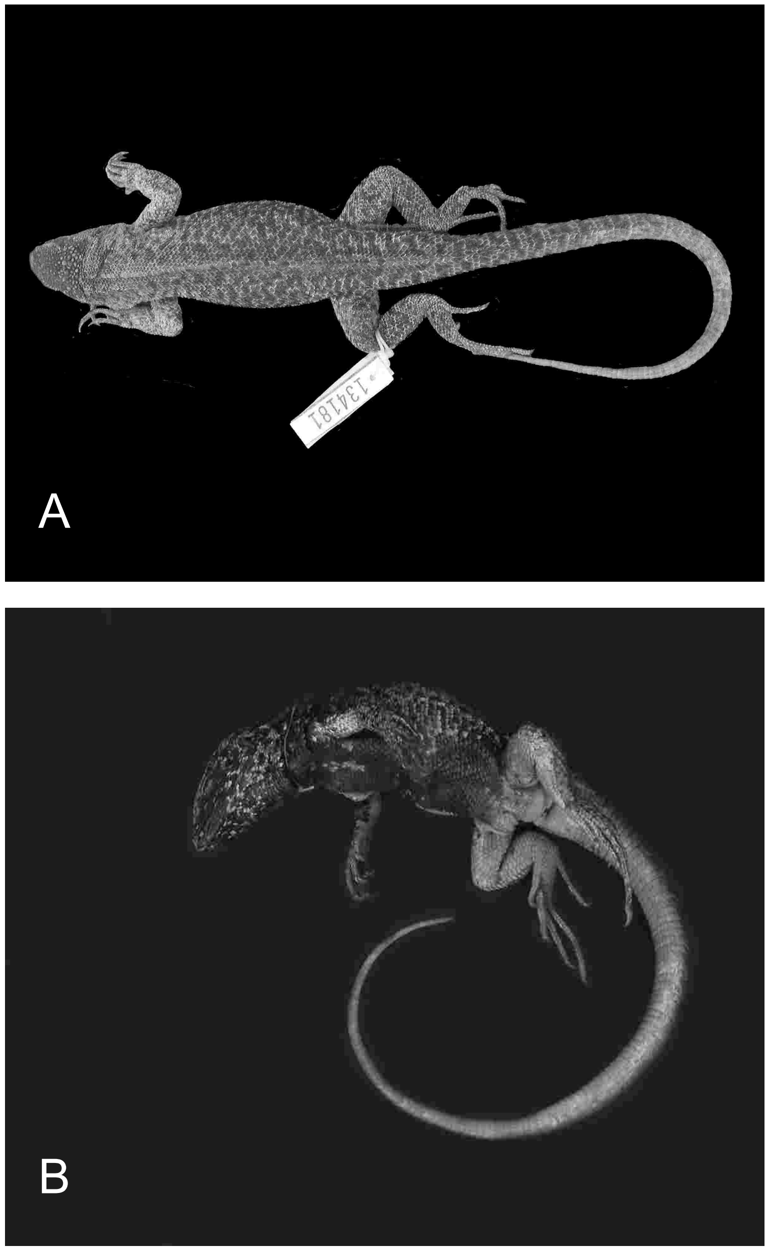

Figure 46.—(A) *Stenocercus frittsi*, holotype, KU 134181, male, 75 mm SVL; (B) *S. variabilis*, syntype, BMNH 1946.8.11.89, male, 83 mm SVL.

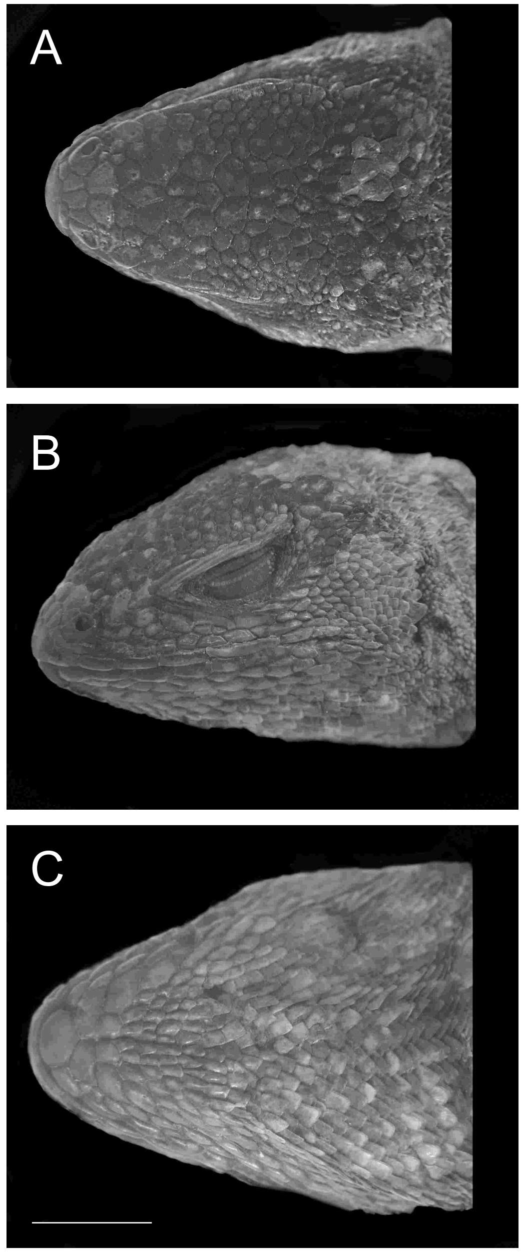

Figure 47.—Dorsal (A), lateral (B), and ventral (C) views of the head of *Stenocercus frittsi*. Holotype, KU 134181, male. Scale bar = 5 mm.

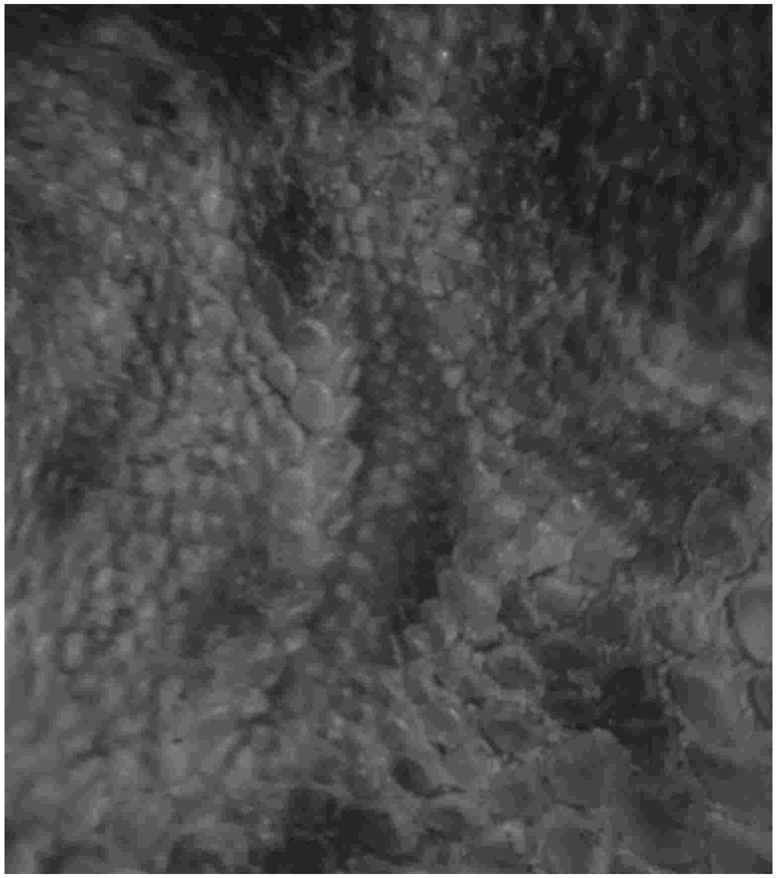

Figure 48.—Lateral view of left axilla of *Stenocercus frittsi*. Holotype, KU 134181, male. Scale bar = 2 mm.

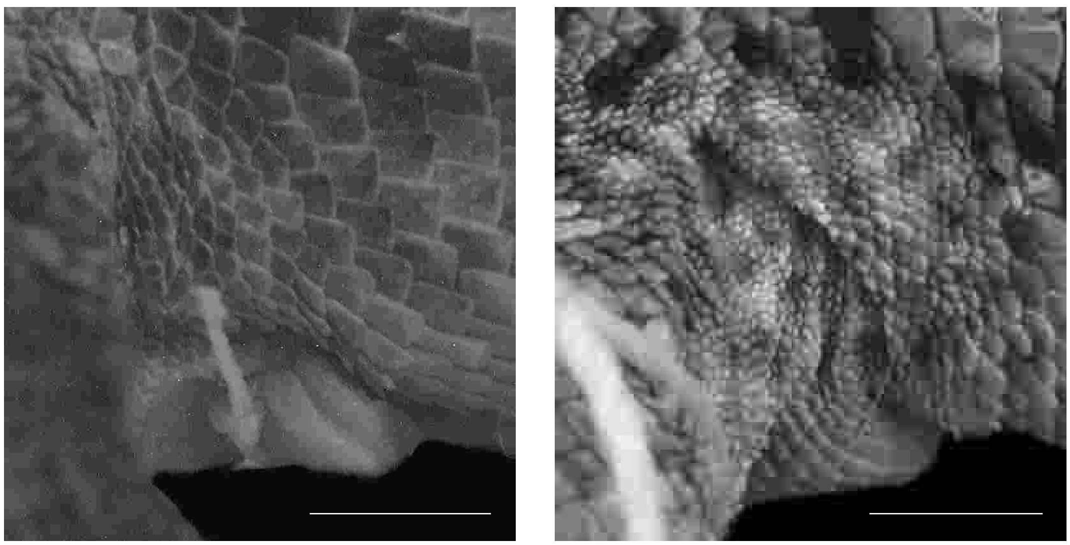

Figure 49.—Lateral view of left postfemoral region of *Stenocercus frittsi* (left) and *S. variabilis* (right). KU 134181 (Holotype, male) and BMNH 1946.8.11.89 (Syntype, male), respectively. Scale bars = 3 mm.

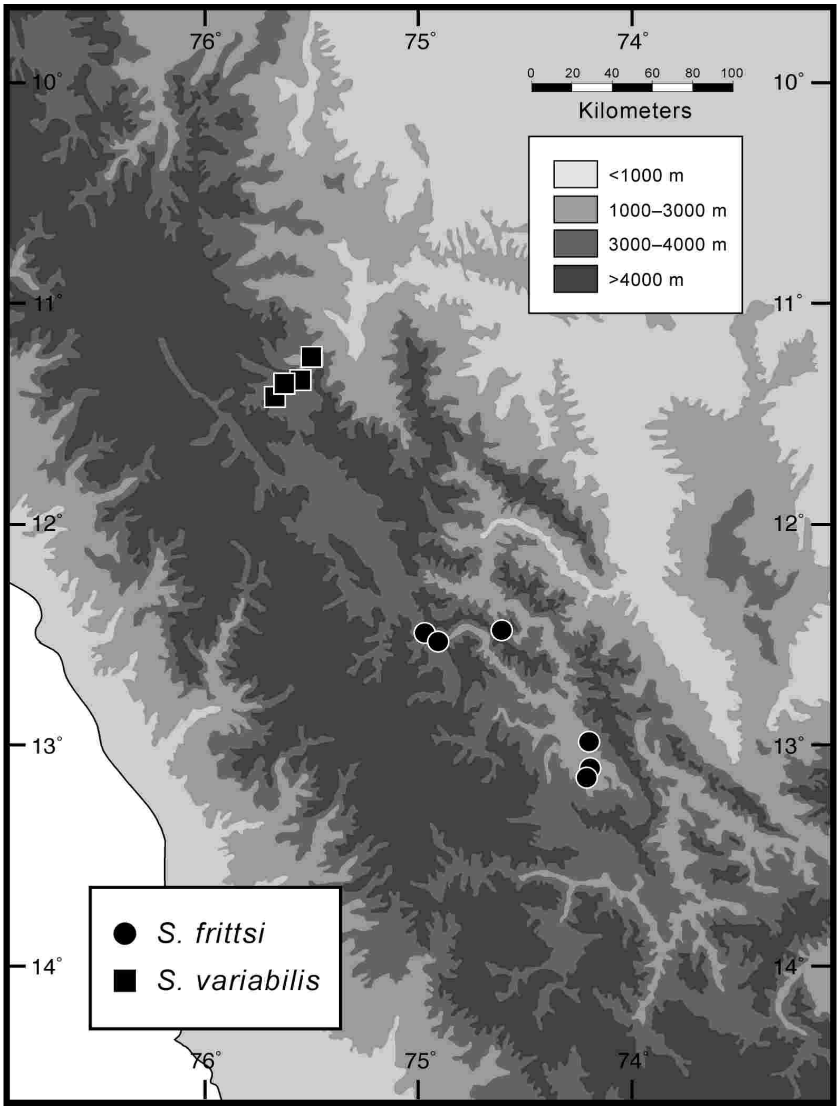

Figure 50.—Distribution of *Stenocercus frittsi* and *S. variabilis*.

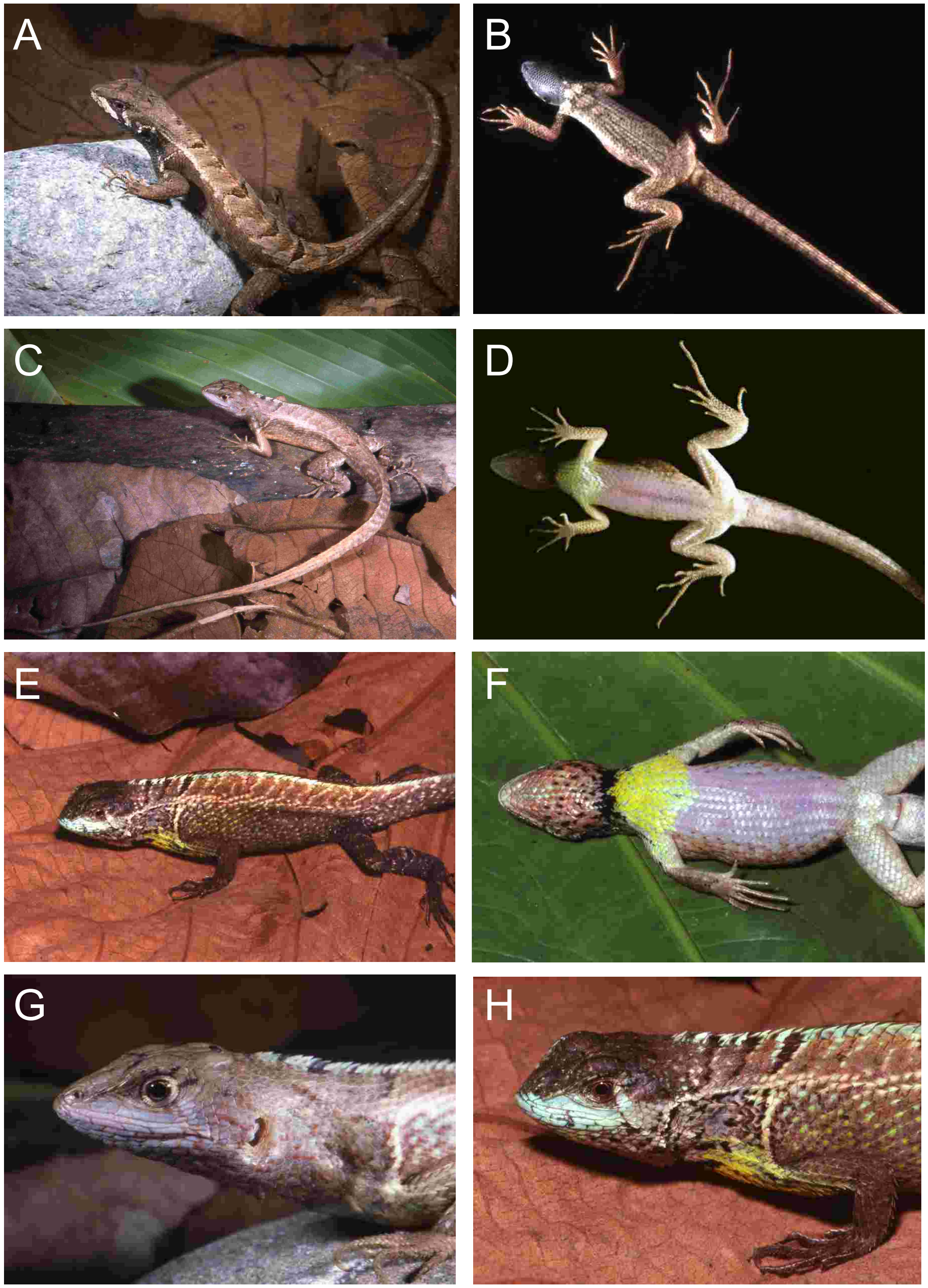

Figure 51.—(A–B) *Stenocercus puyango*, paratype, QCAZ 6721, female, 65 mm SVL (LAC); (C–D, G) *S. puyango*, holotype, QCAZ 6723, male, 88 mm SVL (LAC); (E, H) *S. iridescens*, MCZ 156849, male, 85.7 mm SVL (KIM); (F) *S. iridescens*, USNM 285780, male, 88 mm SVL (RWM).

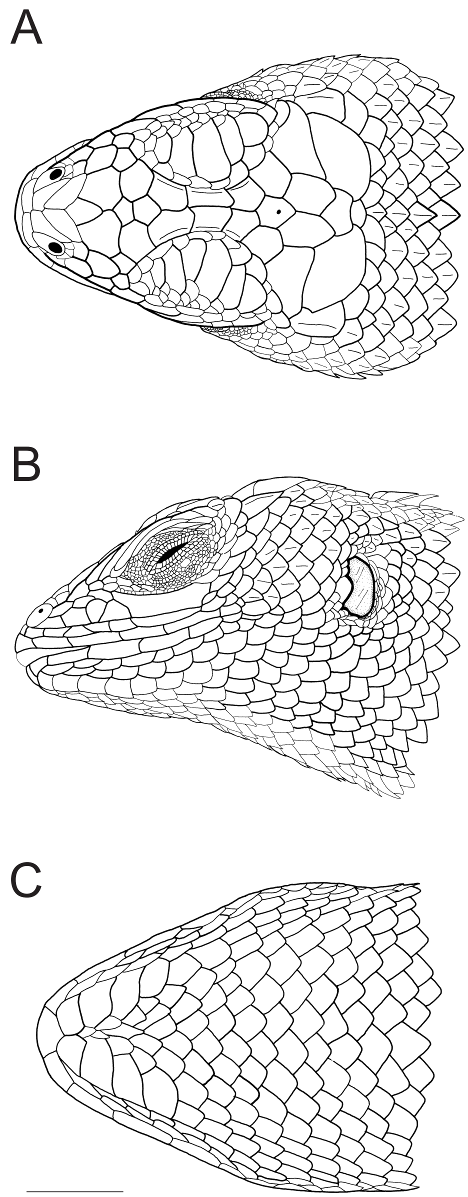

Figure 52.— Dorsal (A), lateral (B), and ventral (C) views of the head of *Stenocercus puyango*. Holotype, QCAZ 6723, male. Scale bar = 5 mm.

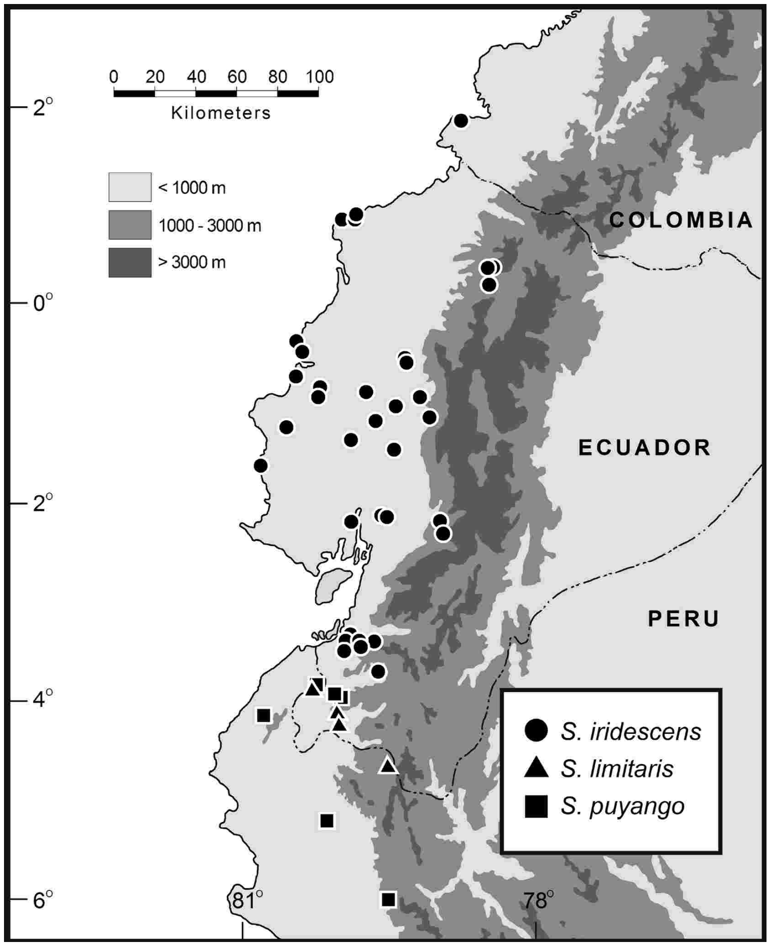

Figure 53.—Distribution of *Stenocercus puyango*, *S. iridescens*, and *S. limitaris*.

Figure 54.—*S. santander*, holotype, UIS-R-478, male, 96 mm SVL.

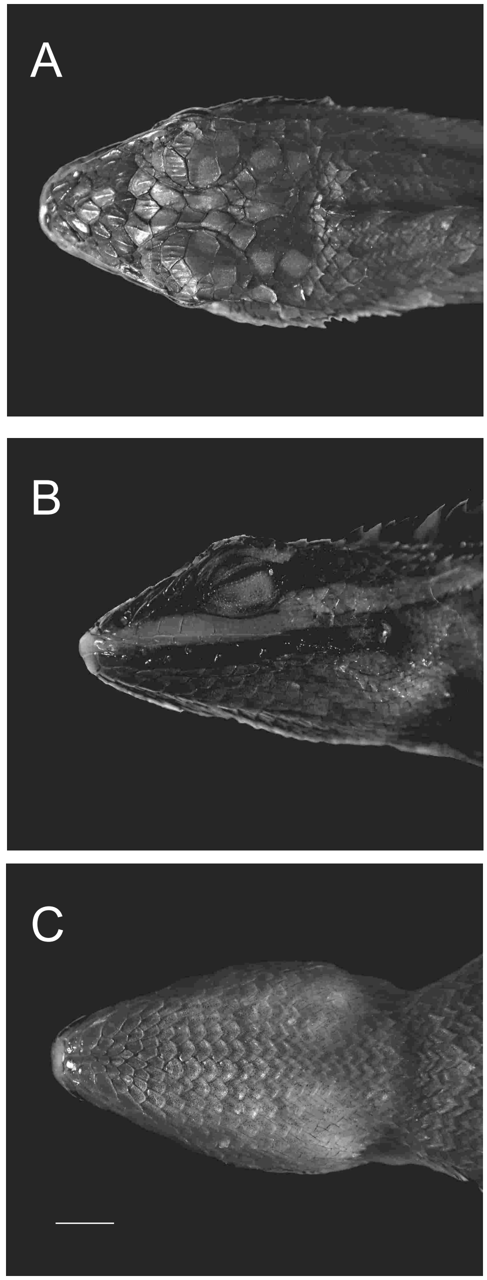

Figure 55.— Dorsal (A), lateral (B), and ventral (C) views of the head of *Stenocercus santander*. Holotype, UIS-R-478, male. Scale bar = 5 mm.

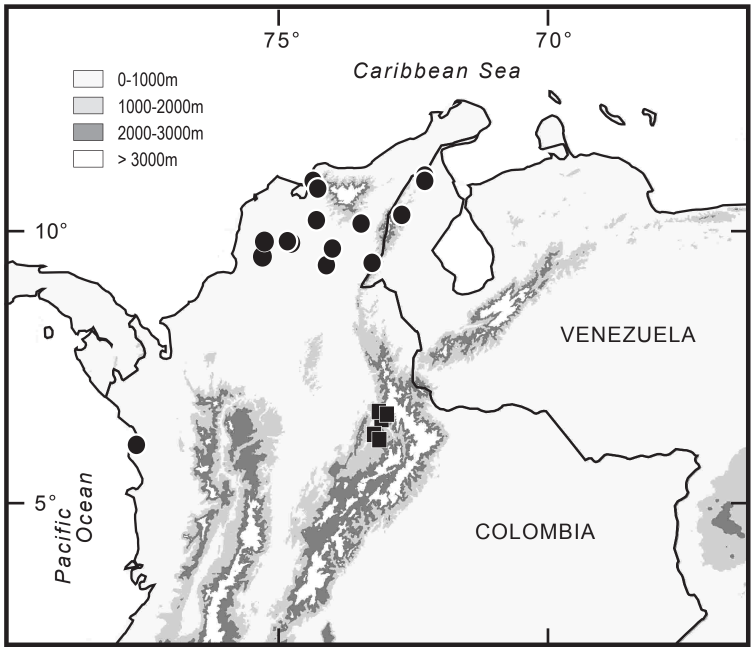

Figure 56.— Distribution of *Stenocercus erythrogaster* (circles) and *S. santander* (squares).

Figure 57.—Dorsal (top) and ventral (bottom) views of *Stenocercus sinesaccus*. Holotype, BMNH 1903.3.26.7, male, 73 mm SVL.

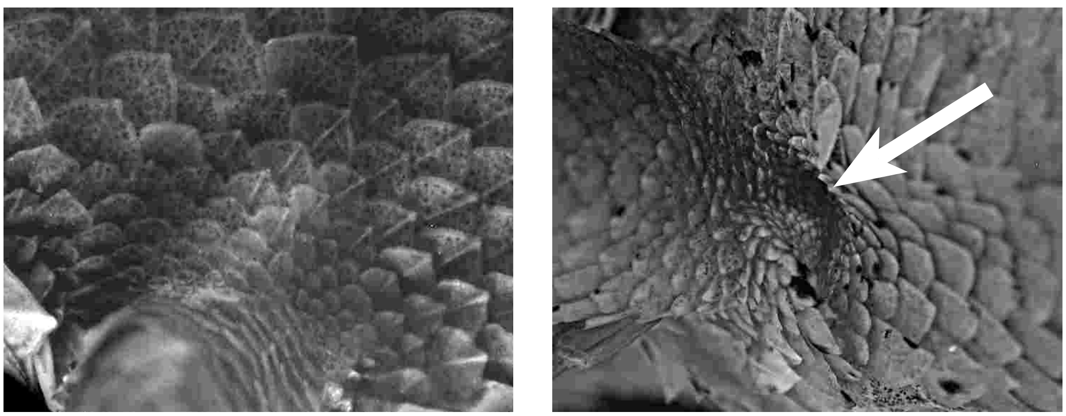

Figure 58.—Left axillae of *Stenocercus sinesaccus* (left, holotype, BMNH 1903.3.26.7) and *Stenocercus caducus* (right, UTA 38046) in lateral view. Posthumeral mite pocket in *S. caducus* is indicated by white arrow.

Figure 59.—Dorsal (top), lateral (middle), and ventral (bottom) views of the head of *Stenocercus sinesaccus*. Holotype, BMNH 1903.3.26.7, male. Scale bars = 5 mm.

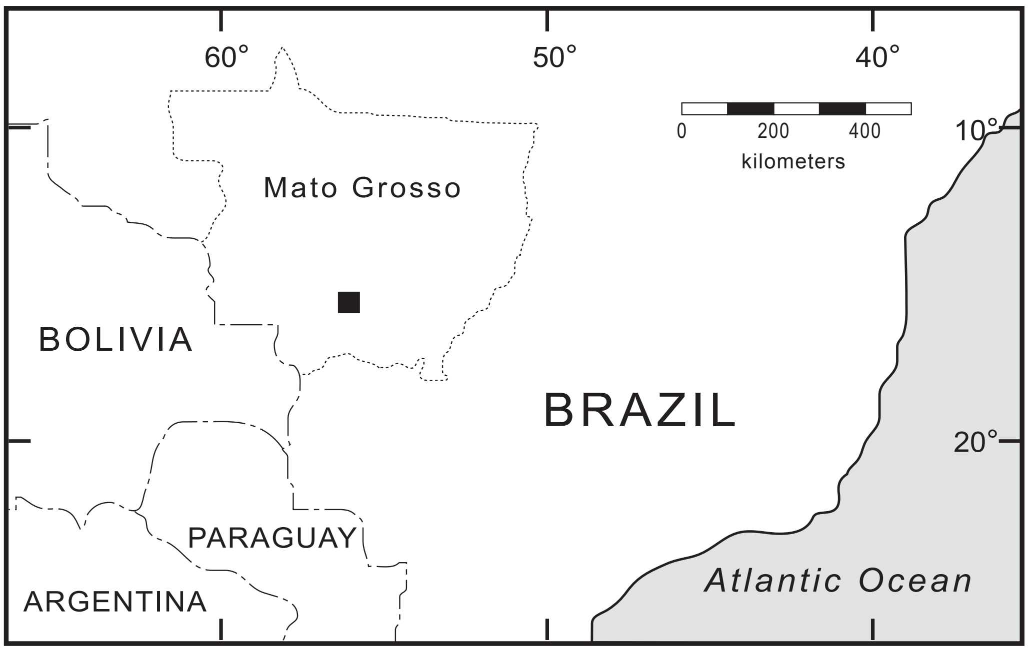

Figure 60.—Distribution of *Stenocercus sinesaccus*.

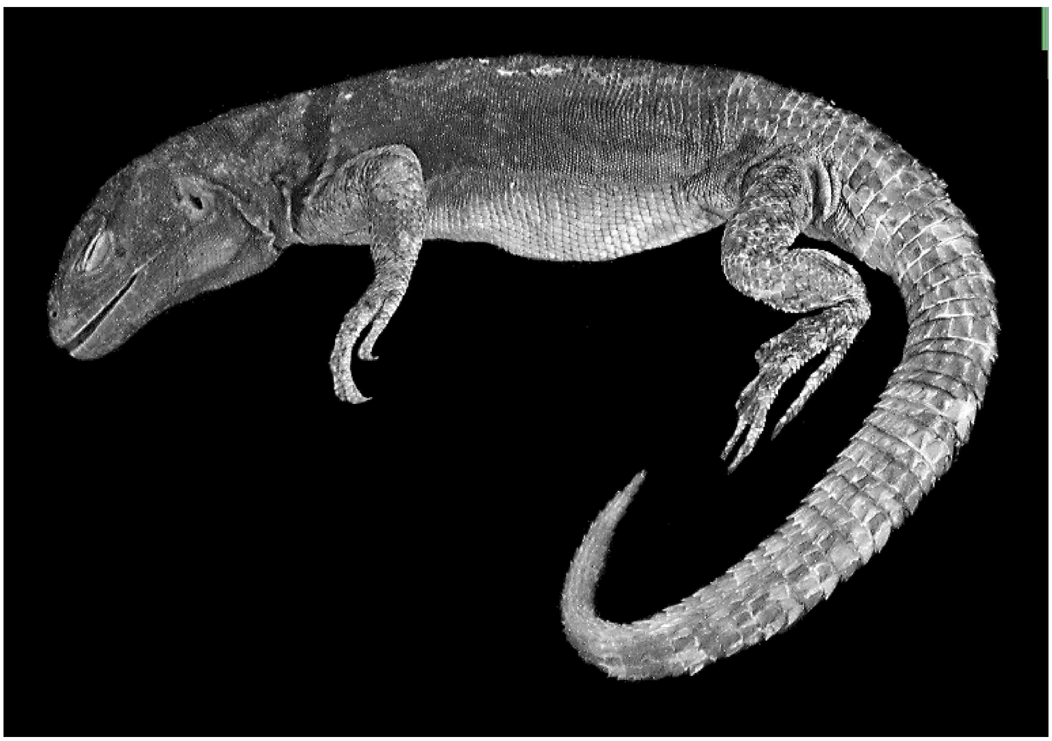

Figure 61.—*Stenocercus torquatus*, holotype, BM 61.5.22.4, male, 80 mm SVL.

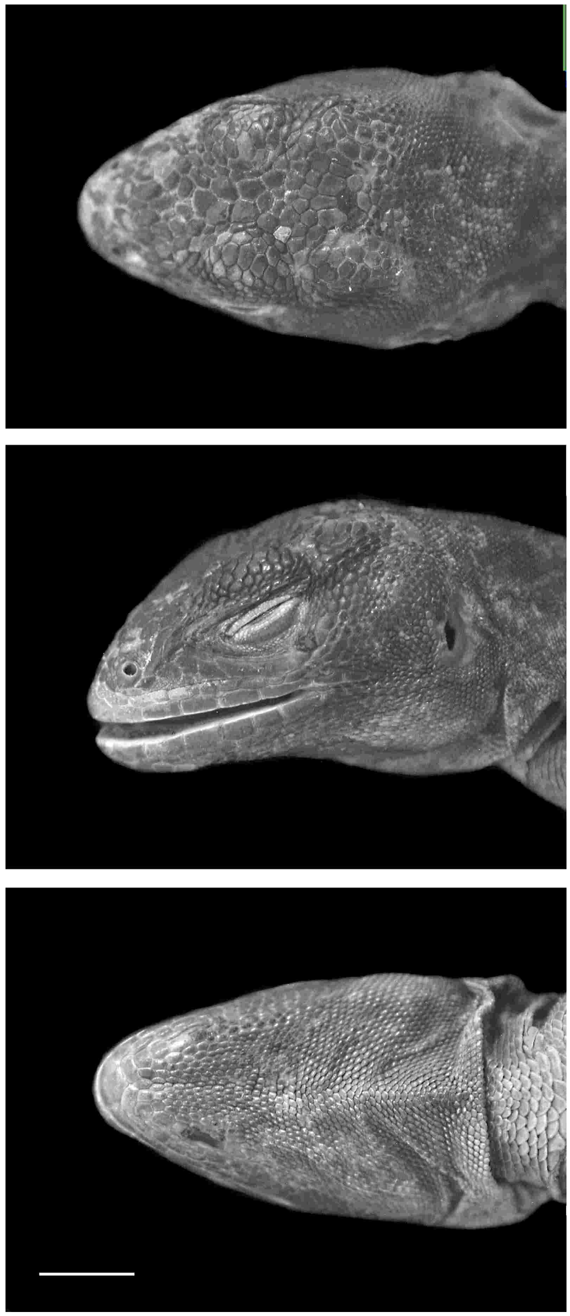

Figure 62.—Dorsal (top), lateral (middle), and ventral (bottom) views of the head of *Stenocercus torquatus*. Holotype, BM 61.5.22.4, male. Scale bar = 5 mm.

Figure 63.—*S. torquatus*, MTD 45921, male, 74 mm SVL; ac = antehumeral collar; nb = nuchal transverse bands.

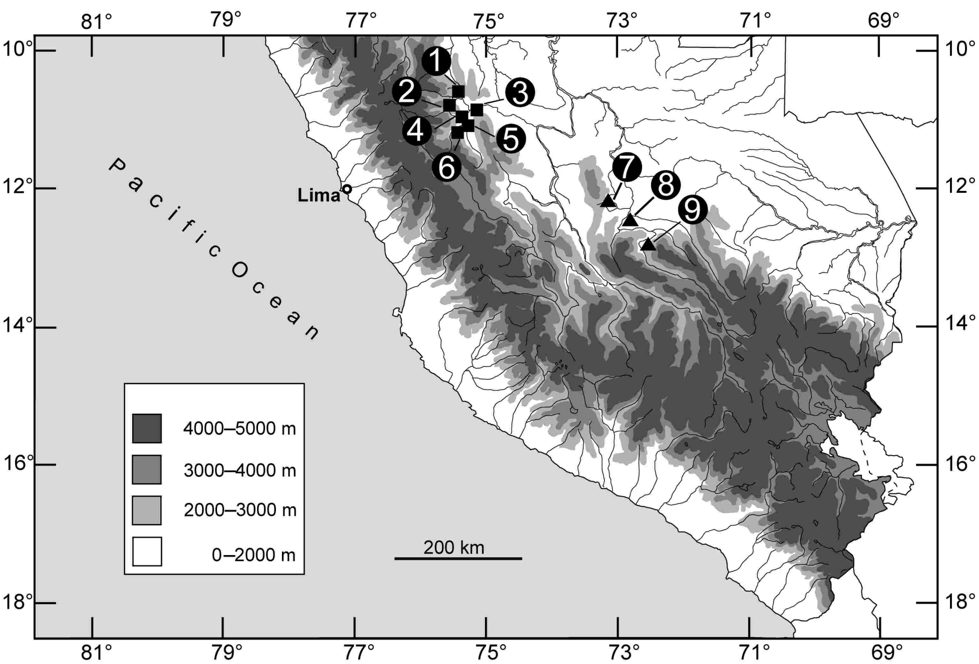

Figure 64.—Distribution of *Stenocercus crassicaudatus* (triangles) and *S. torquatus* (squares); 1 = María Teresa; 2 = Llaupi; 3 = Perene; 4 = La Merced; 5 = San Ramón; 6 = Huacapistana; 7 = Río Cosireni; 8 = Santa Ana; 9 = Machu Picchu.

APPENDICES

APPENDIX I

ND1, tRNA^{Ile}, tRNA^{Gln}, tRNA^{Met}, ND2, tRNA^{Trp}, tRNA^{Ala}, tRNA^{Asn}, tRNA^{Cys}, tRNA^{Tyr}, and COI mtDNA data matrix of 32 ingroup taxa and 12 outgroup taxa

CROT = Crotaphytus collaris, OPLU = Oplurus cuvieri, LEIO = Leiocephalus carinatus, LIOL = Liolaemus pictus, SCEL = Sceloporus magister, ANOL = Anolis paternus, MICR = Microlophus atacamensis, TROE = Tropidurus etheridgei, TROS = Tropidurus spinulosus, PLIC = Plica plica, URAC = Uracentron azureum, URAN = Uranoscodon superciliosus, ANGE = S. angel, APUR = S. apurimacus, AZUR = S. azureus, BOET = S. boettgeri, CADU = S. caducus, CHOT = S. chota, CRAS = S. crassicaudatus, CUPR = S. cupreus, DOEL = S. doellojuradoi, EMPE = S. empetrus, EUNE = S. eunetopsis, FEST = S. festae, FORM = S. formosus, GUEN = S. guentheri, HUME = S. humeralis, IMIT = S. imitator, IRID = S. iridescens, LATE = S. latebrosus, LIMI = S. limitaris, MELA = S. melanopygus, OCHO = S. ochoai, ORIE = S. orientalis, ORTI = S. ornatissimus, ORNA = S. ornatus, PERC = S. percultus, PUYA = S. puyango, RHOD = S. rhodomelas, ROSE = S. roseiventris, SCAP = S. scapularis, STIG = S. stigmosus, TORQ = S. torquatus, VARI = S. varius, Uninf = uniformative characters.

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Taxon/Node        123456789012345678901234567890123456789012345678901234567890123456789012345678901234567
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  Excluded:                                                                                         ***
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OPLU              CAATTTCTTCCAATCACATTAGCCCTATGCCTATGGTATACCTCACTCCCAACAATAACCTTCACCCTACCCCCACAACAATA----
LEIO              CAATTTTTACCAATTACATTAGCCATGTGCCTATGACACACCACACTTCCAATCGCAATATTTGCTTTTCCCCCACAA---TAACA-
LIOL              CAATTTTTACCATTAACACTAGCAATGTGTCTATGACACACCTCAATACCAATTTCACTACTAGCCACCCCCCCCATAACATA----
SCEL              CAATTTTTACCAATAACACTCGCTATGTGCCTTTGGCATACAGCTCTACCAATCTCAATATTTAGCTTACCACCACTACAATAA---
ANOL              CAATTTCTCCCAATTACTTTAGCTTTATGCCTATGACACACAACACTTTTAACGTCCATATCTTTTATTCCTCCACAA---T-----
MICR              CAATTTCTACCTATAACATTAGCCCTATGCCTATGACACACCTCCCTACCAATTTCAACTTTCGGACTCCCCCCACAAGAATA----
TROE              CAATTCCTCCCAATCACACTAGCCATATGCATATGACATATTGCATTACCAACTTCAATATTTGGTCTTCCCCCCCAAAACTAA---
TROS              CAATTCCTTCCAATTACCCTAGCCCTATGCCTATGATACACCTCATTACCCACTTCAACATTCGGACTCCCCCCACAAGAATAA---
PLIC              CAATTTCTTCCCATAACACTAGCCCTCTGCCTATGATACACTGCCATGCCAACTTCAATATTTGGACTCCCCCCACAAGAATA----
URAC              CAATTCTTACCTATCACATTAGCCCTGCTCATTTGACACACCTCATTTCCTGTCTCAATATTCGGTCTACCCCCTCAAGAATA----
URAN              CAATTTTTACCAATAACTTTAGCCCTTTTAATCTGACATATCTCCATACCCATTACCACATTTGGACTCCCACCACAAGATTAACAC
ANGE              CAATTCCTACCCCTAACACTTGCCCTATGCTTATGACACACCTCTCTCCCAATCTCTATATTTCTACTTCCCCCACAACAATAATCA
APUR              CAATTCCTACCAATTACCCTTGCCCTCTGCCTATGGCACACCTCCATGCCAATCACTATATTTTTACTCCCCCCCCAACAATAGTTG
AZUR              CAATTCTTACCTATAACACTAGCCCTATGCCTTTGACACATCTCCTTCCCAATTTCAATATTTTCCCTTCCCCCACAACAATAATC-
BOET              CAATTCTTACCAATAACACTGGCCCTGTGCCTATGACATGTCGCCCTCCCAACCTCAATATTCTTACTCCCACCGCAACAATAATAT
CADU              CAGTTCCTGCCAATAACACTAGCAATGTGCTTATGACACACCTCAATCCCAATTTCAATATTCTTTCTCCCCCCACAACCCTAACCA
CHOT              CAATTTCTCCCAATAACACTTGCCCTGTGCCTATGACACACCTCTTTCCCAATCTCTATATTTCTCCTCCCCCCACAACAATAATAT
CRAS              CAATTCCTACCAATCACACTTGCCCTGTGCTTATGACACACGTCCCTCCCAATCGCAATATTTTCCCTCCCCCCACAA---TAACCA
CUPR              CAGTTTTTACCAATAACACTGGCCCTATGCCTATGACATGTTGCTTTCCCAACCTCAATATTCCTACTCCCACCACAACAATAAACT
DOEL              CAATTTTTACCAATAACATTAGCCCTATGTCTTTGACACATCTCCCTACCAATCTCAATATTCTCCCTTCCCCCACAACAATAATT-
EMPE              CAATTCTTACCAATTACACTAGCCCTCTGCTTATGACACATCGCCCTTCCAATCTCTATATTCTCCCTCCCACCACAACAATAACAT
EUNE              CAATTCCTGCCAATCACACTAGCCATGTGCCTATGACACACCATCCTACCAGTATCAATATTTTCCCTCCCCCCACAACAATAATCT
FEST              CAATTTCTTCCCCTAACACTTGCCATATGCCTATGACACACCTCTCTACCTGTCTCTATATTTCTTCTCCCCCCACAACAATAATTC
FORM              CAATTCCTCCCAATAACCCTCGCCCTATGCCTGTGACACACCTCCTTCCCAATCTCAATATTCTCCTTGCCTCCTCAGCTATAACAT
GUEN              CAATTTCTACCCCTAACACTTGCCCTATGCCTATGACACACCTCTCTCCCAATCTCTATATTTCTACTTCCCCCACAACAATAATCA
HUME              CAATTTCTACCAATAACACTCGCCCTATGCCTATGACACACCACCCTTCCAATCTCAATATTCTCCCTCCCCCCACAACAATAATCT
IMIT              CAGTTCCTGCCAATTACACTAGCCCTATGCTTGTGACACACCTCCTTCCCAATCTCAATATTCTCCCTACCCCCACAACAGTAACTC
IRID              CAATTTCTACCCCTAACACTGGCCCTCTGCCTATGACACACCTCCCTCCCAACCTCCATATTCTTTCTACCCCCACAACAATAACAT
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MELA        CAATTTTTACCAATCACACTTGCCATGTGCCTATGACACACTGCCCTCCCAATTTCAATATTCTCCCTACCACCACAACAATAAACC
OCHO        CAATTCCTCCCAGTAACCTTAGCCCTATGTCTATGACACACCTCCCTGCCAATCTCAATATTCTCACTCCCCCCACAACTATAAACC
ORIE        CAGTTCCTTCCAATCACACTAGCCCTATGCTTATGACACACCGCTATACCAATTACAACATTTGCCCTCCCCCCACAATAATAGCCA
ORTI        CAATTCCTACCAATCACACTAGCCCTATGCCTATGACACACCGCCCTACCAATTACCACTTTTTCCCTACCACCACAATAATAACAC
ORNA        CAATTCTTACCACTAACACTAGCACTATGCTTATGACACACCTCCCTCCCAACATCACTATTCTTACTTCCCCCACAACAATAAACC
PERC        CAATTCCTACCACTAACACTTGCACTATGCTTATGACACACCTCCCTTCCAACATCAATATTTTTACTCCCCCCACAACAATAACTA
PUYA        CAATTCCTACCAATAACACTAGCCCTATGCCTATGACACACCTCTCTCCCAACCTCATTATTCCTCCTTCCACCACAACAATAATAC
RHOD        CAATTCCTACCAATCACTCTAGCCCTATGCCTGTGACACACCTCCCTTCCAGTCTCAATATTTCTACTCCCCCCACAACAATAACC-
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SCAP        CAATTCTTACCAATCACCTTGGCACTCTGCCTATGGCACACCTCCTTACCAATCTCAATATCCCTACTTCCCCCCCAACAATAAA--
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TORQ        CAATTCCTACCAATCACACTAGCCCTGTGCCTATGACACACCGCCCTACCAATCGCAATATTCTCTCTCCCCCCACAACAATAACCG
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LEIO        -----GGAAATGTGCCCGAGAACC--AAGGACCACTTTGATAGAGTGTTACACAGGGGTGAAACTCCCCTCATCTCCT--------T
LIOL        -----GGAAATGTGCCCGAGATACT-AAGGGATACTTTGATAGAGTATATTACAGAGACTAAAC-CCTCTCATTTCCT--------T
SCEL        -----GGATGTGTGCCCGAATGTTTTAAGGATTACTTTGATAGAGTAAACAACAGAGGCTAAAATCCTCTCACCTCCT--------T
ANOL        -----GAAAATGTGCCTGAAATTT--AAGGATAACTTTGATAGAGTTAACAATAGAGGCTAGAACCCTCTCATTTTC---------T
MICR        -----GGAAATGTGCCCGAGATACT-AAGGATTACTTTGATAGAGTAAAACACAGAGAATAAAA-CCTCTCATTTCC---------T
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CHOT        -----GGAAATATGCCCGAACTATA-AAGGACTACTTTGATAAAGTACACTACAGAGGTTAAAATCCTCTTATTTCCTATAATTC-T
CRAS        T----GGAAGCGTGCCTGAGCTAC--AAGGATTACTTTGATAGAGTAAACCACAGAGGTCTAAACCCTCTCACTTCCT--------T
CUPR        T----GGAAGCGTGCCCGAATTTT--AAGGACTACTTTGATAGAGTAACCCACAGAGGTTCAAATCCTCTCACTTCCT--------T
DOEL        -----GGAAATATGCCCGAATTT---AAGGACTACTTTGATAGAGTAAACAATAGAGGTTCAAATCCTCTTATTTCCT--------T
EMPE        C----GGAAGCGTGCCTGAATTAC--AAGGACTACTTTGATAGAGTAGACTACAGAGACT-AAGCCCTCTCACTTCCT--------T
EUNE        -----GGAAGCGTGCCCGAATTAC--AAGGACTACTTTGATAGAGTAGACTACAGAGGCC-AAACCCTCTCTCTTCCC--------T
FEST        -----GGAAATATGCCCGAACTAC--AAGGACTACTTTGATAAAGTACACCACAGAGGTTAAAATCCTCTTATTTCCTCTCTCCCCT
FORM        -----GGAAATATGCCCGAATTATT-AAGGACTACTTTGATAGAGTAAATTACAGAGGTTTGAACCCTCTTATTTCCT--------T
GUEN        -----GGAAATATGCCCGAACTACA-AAGGACTACTTTGATAAAGTACACCACAGAGGTTAAAATCCTCTTATTTCCTCCAAC---T
HUME        A----GGAAGCGTGCCCGAATTAT--AAGGACTACTTTGATAGAGTAGACTACAGAGACTAGC-CCCTCTCACTTCCT--------T
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LIMI        -----GGAAATATGCCTGAACTATT-AAGGACTGCTTTGATAGAGCATACCACAGAGGTTAAAATCCTCTTATTTCCT--------T
MELA        C----GGAAGTGTGCCTGAATTACC-AAGGATTACTTTGATAGAGTAAATCACAGAGGTTCAAATCCTCTCACTTCCC--------T
OCHO        -----GGAAATATGCCCGAGCCATT-AAGGAATACTTTGATAGAGTACACCACAGGGGTTAAACTCCCCTTGTTTCCT--------T
ORIE        -----GGAAGCGTGCCTGAATTACC-AAGGGCTACTTTGATAGAGTAGACCATAGAGGTTCAAGCCCTCTCACTTCCC--------T
ORTI        C----GGAAGTGTGCCTGAACTACC-AAGGGCTACTTTGATAGAGTAGACCATAGAGGTTCAAACCCTCTCACTTCCT--------T
ORNA        -----GGAAATATGCCCGAATCTT--AAGGACTACTTTGATAGAGTAAACAATAGAGGTTAAAATCCTCTTATTTCCTA-------T
PERC        -----GGAAATATGCCCGAATTAC--AAGGACTACTTTGATAGAGTAAACAACAGAGGTTAAAATCCTCTTATTTCCTAT------T
PUYA        C----GGAAATATGCCCGAGCCA---TGGGGCTACTTTGATAGAGTAGACCACAGAGATTTAAACCCTCTTATTTCCT--------T
RHOD        -----GGAAATATGCCCGAGCTATTTAAGGACTACTTTGATAGAGTAAACTACAGAGGTTAAAACCCTCTTATTTCCC--------T
ROSE        -----GGAAATATGCCCGAACTAC--AAGGATTACTTTGATAGAGTAAACAATAGAGACTCAAACCCTCTTATTTCCT--------T
SCAP        -----GGAAATATGCCTGAATTATA-AAGGACTACTTTGATAGAGTAAACAAAAGGGGTTAAAGCCCCCTTATTTCCT--------T
STIG        C----GGAAGCGTGCCTGAATTACT-AAGGGCTACTTTGATAGAGTAGACCACAGAGGTTCAAACCCTCTCACTTCCT--------T
TORQ        C----GGAAGCGTGCCTGAGCTAC--AAGGATTACTTTGATAGAGTAAATCACAGAGGACAAAACCCTCTCACTTCCT--------T
VARI        CC---GGAAGCGTGCCTGAGCTAT--AAGGACTACTTTGATAGAGTAGACTACAGAGACTCAACCCCTCTCACTTCCT--------T
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Taxon/Node  5678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901
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OPLU        AGGAAGACAGGATTCGAACCTGCACTTAGAAACTCAAAATTACTTGTACTCCATTACTACAACCTCCTAGTAAAGTCAGCTAAAC-A
LEIO        AGAAGAACAGGAATTGAACCCGCACTTAAAGACTCAAAACCTTTTGTACTCCAT-TATACTATCTCCTAGTAAAGTCAGCTAACCTA
LIOL        AGAAGGACAGGACTCGAACCCGCACCTAGAAGCTCAAAACTTCCAGCACTCCAT-TATACTACCATCTAGTAAAGTCAGCTAAAC-A
SCEL        AGAAAAACAGGACTCGAACCTGCACATAAAGACTCAAAATCTTCAGAACTTCAT-TATTCTATCTCCTAGTAGAGTCAGCTAACT-A
ANOL        AGAAAACCAGGACTCGAACCTGTACCTAAAAACTCAAAATCATTTGTACTTCTT-TATACTATTTTCTAGTAAAGTCAGCTAAAA-A
MICR        AGAAAGACAGGCCTCGCACCCGCACCTAAAAACTCAAAATTTTTAGCACTCCAT-TATGCTACTTCCTAGTAGTGTCAGCTAAAC-A
TROE        AGAAAGATAGGTCTTGCACCTACACCTAAAAACTCAAAATCTTTAGCACTCCAT-TATGCTACTCTCTAGTAAAGTCAGCTAATT-A
TROS        AGAAAGATGGGAATTGCACCCACACCTAAAAACTCAAAATTCTTAGCACTCCAT-TATGCTACTTCCTAGTAGAGTCAGCTAAAC-A
PLIC        AGAAAAATAGGACTTGCACCTACACCTAAAGACCCAAAATCTTCAGCACTCCTC-TATGCTATTTTCTAATAAGGTCAGCTAAAC-A
URAC        AGAAAAATAGGACTTGCACCTACACTTAAAAACTCAAAATTTTTAGCACTCCAT-TATGCTATTTCCTAGTAGAGTAAGCTAAAC-A
URAN        AGAAAAACAGGACTCGCACCTGCACTTAAAAATTCAAAACTTTTAGCACTCCAT-TATGCTATTCTCTAGCAAAGTCAGCTAAAC-A
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APUR        AGAAAAATGGGAATCGAACCCACACCTAAAGACTCAAAACCTTTAGCACTACGT-TATGCTATTTCCTAGTAAAGTCAGCTAATT-A
AZUR        AGAAAAATGGGACTCGAACCCACACCTAAAAACTCAAAATCTTTAGCACTCCAT-TATGCTATCTTCTAGTAAAGTCAGCTAATT-A
BOET        AGAAAAATGGGACTTGAACCCACACCAAAAGACTCAAAACCTTTAGCACTTCAT-TATGCTATTTTCTAGTAAAGTCAGCTAACA-A
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DOEL        AGAAAAATGGGACTTGAACCCACACCTAAAAACTCAAAATCTTTAGCACTACAT-TATGCTATCTTCTAGTAAAGTCAGCTAATT-A
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FEST        AGAAAGATGGGACTTGAACCCACACCTAAAAACTCAAAATCTTTAGCACTCCAT-TATGCTACTCCCTAGTAAAGTCAGC?AATTCA
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IMIT        AGAAAAACGGGACTCGAACCCGCACCTAAAGGCCCAAAACCTTTAGCACTCCAT-TATGCTATCCTCTAGTAAAGTCAGCTAACT-A
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Taxon/Node  567890123456789012345678901234567890123456789012345678901234567890123456789012345678901
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IRID        AGAAAGATGGGACACGACCCCACACCAAAAGACTCAAAATCTTTAGCACTCCAT-TATGCTACTTCCTAGTAAAGTCAGCTAACT-A
LATE        AGAAAAACGGGACTTGAACCCGCACCAAAAGACTCAAAACCTTTAGCACTCCAT-TATGCTACTTCCTAGTAAAGTCAGCTAATC-A
LIMI        AGAAAAATGGGACTTGCACCCACACCTAAAAACTCAAAATCTTTAGCACTTCAT-TATGCTACTTCCTAGTAAAGTCAGCTAATT-A
MELA        AGAAAAACGGGACTTGAACCCGCACCTAAAGACCCAAAACCTTTAGCACTTCCT-TATGCTACTTCCTAGTAAAGTCAGCTAATC-A
OCHO        AGAAAGATGGGACTTGAACCCACACCTAAAAACTCAAAACCTTTAGCACTACAT-TGTGCTACTTCCTAGTAAAGTCAGCTAAAT-A
ORIE        AGAAAGACGGGACACGACCCCGCACCTAAAGACTCAAAACCTTTAGCACTCCTT-TATACTACTTCCTAGTAAAGTCAGCTAATC-A
ORTI        AGAAAGACGGGACTTGAACCCACACCTAAAGACTCAAAACCTTTAGCACTCCGT-TATGCTACTTCCTAGTAAAGTCAGCTAAGC-A
ORNA        AGAAAGATGGGACTTGAACCCACACCTAAAAACTCAAAATTTTTAGCACTTCAT-TATACTACTTCCTAGTAAAGTCAGCTAATT-A
PERC        AGAAAGATGGGACTCGAACCCACACCTAAAAACTCAAAATCTTTAGCACTCCCATTACACTACTTCCTAGTAAAGTCAGCTAATA-A
PUYA        AGAAAGATGGGACACGACCCCACACCAAAAGACTCAAAATCTTTAGCACTCCAT-TATACTACTTCCTAGTAAAGTCAGCTAATC-A
RHOD        AGAAAAATGGGACTTGAACCCACACCTAAAGACTCAAAATCTTCAGCACTCCAT-TATGCTACTCCCTAGTAAAGTCAGCTAATT-A
ROSE        AGAAAAATGGGACTCGAACCCACACCTAAAAACTCAAAATCTTTAGCACTTCAT-TATACTATTTCCTAGTAAAGTCAGCTAACA-A
SCAP        AGAAAAATGGGACTCGAACCCACACCTAAAAACTCAAAACTTTTAGCACTACAT-TATGCTATTTCCTAGTAAAGTCAGCTAATT-A
STIG        AGAAAAACGGGACTTGAACCCGCACCTAAAGACTCAAAACCTTTAGCACTCCAT-TATGCTACTTCCTAGTAAAGTCAGCTAACA-A
TORQ        AGAAAAACGGGACTCGAACCCACACCTAAAGACTCAAAACCTTCAGCACTACAT-TATGCTATTTCCTAGTAAAGTCAGCTAACT-A
VARI        AGAAAAACGGGACTCGAACCCACACCTAAAGACTCAAAACCTTTAGCACTCCAT-TATGCTATTTCCTAGTAAAGTCAGCTAATA-A
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Taxon/Node  234567890123456789012345678901234567890123456789012345678901234567890123456789012345678
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 Constant:  ****** ************* ** * *  **    *  **  **  *  *****   **                 *  *
    Uninf:  ****** ************* ** ***  ***  **  ** ***  *********  **              *  *  *    *
 Excluded:                                 *******
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CROT        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTAAATCCCTCCTGTACTAATGAGCCCCACCACATTAATAATTCTAATTTCAAGC
OPLU        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTAAATCCCTCCTCTACTAATGAGCCCAATAACAACTACACTACTAATCTCAAGC
LEIO        AGCTATCGGGCCCATACCCCGAAAATGTTGGCCAAACCCCTTCCTTTACTAATGAGCCCGCTTACAACAACAATCCTTCTATCCAGC
LIOL        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTCAACTCCTTCCTATACTAATGAGCCCAACAACCACAACAATCTTAATCTCAACC
SCEL        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTTAATCCCTCCTATACTAATGAGCCCAACAACAACCTCAATTATTATCTCAAGC
ANOL        AGCTATTGGGCCCATACCCCAAAAATGTTGGTTTAAACCCTTCCTATACTAATGAGCCCATTTATTCTTACAATTATTTTTTCAAGC
MICR        AGCTATTGGGCCCATACCCCGAAAATGTTGGTTTAAACCCTTCCTCTACTAATGAGCCCCCTCACAACATCAATCATCTTATCAAGC
TROE        AGCTATTGGGCCCATACCCCGAAAATGTTGGTTTAATACCTTCCTCTACTAATGAGCCCCCTCACAACATCCATTTTAATCTCAAGC
TROS        AGCTATTGGGCCCATACCCCAAAAATGTTGGTT-AACACCTTCCACTACTAATGAGCCCTGCCACAACATCCATTTTCATCTCTTCC
PLIC        AGCTATTGGGCCCATACCCCGAAAATGTTGGTTCAACACCTTCCCTTATTAATGAGCCCCCTCACAACATCAATCATCATCTCCAGC
URAC        AGCTATTGGGCCCATACCCCAAAAATGTTGGTAAAACACCTTCCCCTACTAATGAGCCCACTCACAACATCAATTATTTTATCCAGC
URAN        AGCTATTGGGCCCATACCCCAAAAATGTTGGTT-AACACCCTCCTATGCTAATGAGTCCCATTATGACCTCAATTATTGTCTCAAGT
ANGE        AGCTATCGGGCCCATACCCCGAACATGTTGGTTTAAATCCCTCCTATACTAATGAACCCAACCGTCACCCTACTAATCATATCCAGC
APUR        AGCTATCGGGCCCATACCCCGAACATGTTGGTTTAAATCCCTCCTATACTAATGCATCCAACAACAACCATAATTATACTAATCAGC
AZUR        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTAAACCCCTCCTATACTAATGAGCCCTACAACTACTATAATTATTATTTCTAGC
BOET        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTAAATCCCTCCTATACTAATGAGCCCCGCCACCTACACCATTCTTCTCTCCAGC
CADU        AGCTATCGGGCCCATACCCCGAATATGTTGGTTTAAACCCCTCCTATACTAATGAGCCCCCAAACTACAACAATCCTTATATTTAGC
CHOT        AGCTATCGGGCCCATACCCCGAACATGTTGGTTTAAATCCCTCCTGTACTAATGAACCCAACCATCGCCCTACTAATCTTATCCAGC
CRAS        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTAAACCCCTCCTTTACTAATGAACCCAGCCACCTCAACCATCATCCTATCTAGC
CUPR        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTAAATCCCTCCTATACTAATGAGCCCTATCACTTACACCCTCCTCCTATCTAGC
DOEL        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTAAATCCCTCCTATACTAATGAACCCCATAACCACCATAATTATTATTTCTAGC
EMPE        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTAAACCCCGCCTATACTAATGAACCCAACCACCTCCACCATCATCGTGTCCAGC
EUNE        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTAAACCCCTCCTATACTAATGAACCCAGCCACCGCCGCCATCCTCCTATCCAGC
FEST        AGCTATCGGGCCCATACCCCGAACATGGTGGTTTAAATCCCTCCTATACTAATGAACCCAACCATCACCCTGCTAATTATGTCCAGC
FORM        AGCTATCGGGCCCATACCCCGAACATGTTGGTTCAAACCCTTCCTATACTAATGAGCCCAACAACTACCATAATCATTATATCCAGT
GUEN        AGCTATCGGGCCCATACCCCGAACATGTTGGTTTAAATCCCTCCTTTACTAATGAACCCAACCGTCACCCTACTAATCATATCCAGC
HUME        AGCTATCGGGCCCATACCCCGAAAATGTCGGTTCAAATCCCTCCTATACTAATGAACCCCACTACCTCCACCATCATTCTGTTTAGC
IMIT        AGCTATCGGGCCCATACCCCGAAAATGGTGGTTTAAA-CCCTCCTATACTAATGAACCCAACCACCTCCACCATCATCTTGTCCAGT
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Taxon/Node  234567890123456789012345678901234567890123456789012345678901234567890123456789012345678
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  Constant: ****** ************* ** * *  **    *  **  **  *  *****   **                 *  *
     Uninf: ****** ************* ** ***  ***  **  ** ***  *********  **              *  *  *    *
  Excluded:                                *******
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IRID        AGCTATCGGGCCCATACCCCGAACATGTTGGTTTAAACCCCTCCTATACTAATGAACCCCACCACCACCCTACTAATTATATCCAGC
LATE        AGCTATCGGGCCCATACCCCGAAAATGTCGGTTTAATCCCCTCCTATACTAATGAGCCCCGCCGCCTCAACCCTCCTCCTATCCAGC
LIMI        AGCTATCGGGCCCATACCCCGAACATGTTGGTTAAACCCCCACCTATACTAATGAACCCAACCACATCAATACTTATTTTACTCAGC
MELA        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTAAACCCCTCCTATACTAATGAACCCTGCCTCCATAACCATTATCTTGTCCAGC
OCHO        AGCTATCGGGCCCATACCCCGAACATGTTGGTTTAAACCCTTCCTATACTAATGAACCCAACAATCACCATGACTCTCCTATTCACC
ORIE        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTTAAACCCCTCCTATACTAATGAACCCTGCCTCATTAACTATTCTCATCTCCAGC
ORTI        AGCTATCGGGCCCATACCCCGAAAATGTTGGTTCAACCCCCTCCTGTACTAATGAACCCTGCCTCATCAACAATCCTACTATCCAGC
ORNA        AGCTATCGGGCCCATACCCCGAACATGTTGGTTTAAACCCCTCCTATACTAATGAACCCCACCATTACCACACTCATCATACTCAGC
PERC        AGCTATCGGGCCCATACCCCGAACAAGTTGGTTTAAATCCCTCCTATACTAATGAATCCCTCCACTACCACACTCATCATAATTAGC
PUYA        AGCTATCGGGCCCATACCCCGAATATGTTGGTTCAAATCCTTCCTATACTAATGAACCCAACCACTACCCTACTAATTTTATCCAGC
RHOD        AGCTATCGGGCCCATACCCCGAACATGTTGGTTTAAATCCTTCCTCTACTAATGAGCCCCACTACCACCCTATTAATTATATCCAGC
ROSE        AGCTATTGGGCCCATACCCCGAAAATGTTGGTTTAAATCCCTCCTATACTAATGAACCCCACCACCACTACAATAATTATATTCAGC
SCAP        AGCTATCGGGCCCATACCCCGAATATGTTGGTT-AAAACCTTCCTATACTAATGAACCCAACAACCTCCATAATCATCCTAACTAGC
STIG        AGCTATCGGGCCCATACCCCGAAAATGTTGGTCTAACCCCTTCCTATACTAATGAACCCAGCCTCATCAGCCATCATCCTGTCCAGT
TORQ        AGCTATCGGGCCCATACCCCGAAAATG-TGGTTTAAACCCCTCCTATACTAATGAGCCCAATAACCTCCACCATTATCCTGTCCAGC
VARI        AGCTATCGGGCCCATACCCCGAAAATGTAGGTTTGAACCCCTCCTGTACTAATGAACCCCGCCACCTCCGCCCTTCTCCTATCCAGC
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 Constant:   *  *    **  *  *  * **     * **    ** **  *  * ** **  * **  * **  * ** **  *  * **  *
    Uninf:   * ** ** ** **  *  * ** *   * ***   ** **  *  * ** **  * **  * **  * ** **  *  * **  *
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CROT        CTAGCAACCGGCACCATTATCACATTATCGAGCTACCACTGACTTCTGGCCTGAATTGGACTGGAAATCAACACCCTAGCTATCATT
OPLU        CTTGCTACAGGAACAATCATCACAGCATCAAGTTACCACTGATTAATAGCCTGAATTGGCCTAGAAATTAATACTCTATCCATCATC
LEIO        CTAGCAACAGGCACAATCATTACTGCAACCAGCTACCACTGATTAATAGCCTGAATTGGGCTAGAACTAAACACACTAGCCATCATT
LIOL        CTAACCATAGGAACAATTATTACAGCATCAAGCCACCACTGATTATTTGCCTGAATCGGGTTAGAACTAAACACTCTCTCAATCATC
SCEL        CTGGCTACCGGGACAATTATCACAGCATCAAGCCACCACTGACTAATAGCCTGAATTGGCCTAGAGATAAATACACTAGCCATGGTC
ANOL        TTAGCAACAGGCACAATTATTACTATAACCAGCTACCACTGACTTATGGCCTGAATTGGATTAGAGATAAACACACTAGCAATTATT
MICR        TTAGCCACCGGCACAATCATCACCGCCTCCAGCTACCACTGACTAATAGCCTGAGTTGGGTTAGAAATCAACACACTAGCAATCATC
TROE        CTAGCCACAGGGGCAATCATCACAGCCTCCAGCCACCACTGAATAATAGCCTGAATTGGATTAGAAATTAATACACTAGCCATCATT
TROS        TTGGCCACCGGAACAGTAATTACAGCCTCTAGCTTCCACTGAATAATAGCCTGAATCGGATTAGAAATAAACACATTAGCCATAATT
PLIC        CTGGCAACAGGCACAATTATTACCGCCTCAAGCTTCCACTGACTAATAGCCTGAATTGGATTAGAAATTAACACCCTAGCGATTATC
URAC        CTAGCAACAGGCACGATCATTACAGCCTCAAGCTTTCACTGACTGATAGCCTGAATCGGACTAGAAATTAACACCTTGGCCATTATT
URAN        CTAGCAACTGGTACAATCATCACCGCATCAAGCTACCACTGACTACTAGCCTGAATCGGCCTAGAAATCAACACCCTAGCTATCATC
ANGE        CTAGCAACAGGAACAATCATCACAGCCTCCAGCTTCCATTGATTCATGGCCTGAATCGGCCTCGAAATAAACACTCTAGCTATTATC
APUR        CTAGCAACAGGAACTATTATTACGGCCTCCAGCTTCCACTGAATCCTAGCCTGAGTGGGCCTAGAAATAAACACCCTAGCGATCATT
AZUR        CTAGCAACAGGCACTATCATCACCGCCTCCAGCTTTCACTGATTTATGGCCTGAGTTGGACTTGAAATAAACACTCTAGCCATTGTC
BOET        CTAGCAACAGGAACAGTCATTACAGCTTCCAGCTTCCACTGATTCATGGCCTGAATCGGACTAGAAATAAACACCCTAGCCATTATC
CADU        CTAGCAACAGGAACCATTATCACAGCTTCCAGCTTTCACTGATTCATAGCCTGAATTGGACTCGAAATAAACACCCTAGCTATCATC
CHOT        CTAGCAACAGGCACAGTAATCACAGCCTCAAGCTTCCACTGATTTATAGCCTGAATCGGACTTGAAATAAACACCCTAGCCATTATT
CRAS        CTAGCAACAGGAACAATTATCACCGCTTCTAGCTTTCACTGATTCATAGCCTGAATCGGACTAGAAATAAACACCCTGGCCATCATC
CUPR        CTAGCAACAGGAACAATCATTACAGCCTCCAGCTTCCACTGATTCATAGCCTGAATCGGACTAGAAATAAACACCCTAGCTATTATT
DOEL        TTAGCAACAGGCACCATCATCACCGCCTCCAGCTTTCATTGATTTATAGCCTGAATCGGACTTGAAATAAATACCCTAGCCATCATC
EMPE        CTGGCAACAGGAACAATCATCACAGCCTCAAGCTTTCACTGATTCATAGCCTGAGTTGGATTAGAGATGAACACCCTAGCCATCATC
EUNE        CTAGCAACAGGAACAATCATCACAGCCTCCAGCTTCCACTGATTCATGGCCTGAATCGGACTAGAAATAAACACCCTAGCTATTATC
FEST        CTAGCAACAGGAACAATCATTACAGCCTCCAGCTTTCATTGATTCATGGCCTGAATTGGACTCGAAATTAACACCCTAGCCATCATT
FORM        CTAGCAACAGGAACCATTATTACTGCCTCCAGCTTCCATTGACTTATAGCCTGAATTGGCCTAGAAATAAACACTTTGGCAATCATC
GUEN        CTAGCAACAGGAACAATCATCACAGCCTCCAGCTTCCATTGATTCATGGCCTGAATCGGCCTCGAAATAAACACTCTAGCCATTATC
HUME        CTGGCAACAGGAACCATCCTTACAGCCTCCAGCTTTCACTGATTTATGGCCTGAGTCGGCCTAGAAATAAACACCCTAGCCATCATC
IMIT        CTTGCAACAGGAACAATCATCACAGCCTCTAGCTTTCACTGATTCATAGCCTGAGTCGGCCTAGAAATAAACACCCTAGCTATTATC
IRID        CTAGCAACAGGAACCATTATTACAGCTTCCAGCTTCCACTGATTCATGGCCTGAATCGGACTTGAAATAAATACCCTAGCCATTTTA
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 Constant:   *  *    **  *  *  * **     * **    ** **  *  * ** **  * **  * **  * ** **  *  * **  *
    Uninf:   * ** ** ** **  *  * ** *   * ***   ** **  *  * ** **  * **  * **  * ** **  *  * **  *
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LATE        CTTGCAACAGGAACAATCATTACAGCTTCCAGCTTCCACTGATTCCTAGCTTGAATCGGACTAGAAATAAACACTCTTGCTATCATT
LIMI        CTAGCAACTGGAACCATCCTCACAGCTTCCAGCTTTCACTGATTTATAGCCTGAATCGGACTCGAAATTAATACTCTTGCCATCATT
MELA        CTGGCAACAGGAACAATTATTACAGCCTCCAGCTTTCACTGATTTATAGCCTGAATCGGATTAGAAATAAACACCCTCGCTATTGTC
OCHO        CTAGCAACAGGAACAATCATTACCGCCTCCAGCTTCCACTGATTCATGGCCTGAATTGGCCTCGAAATAAACACCCTAGCAATCATT
ORIE        CTAGCAACAGGAACAATCATTACTGCCTCCAGCTTCCACTGATTTATAGCCTGGGTCGGATTAGAAATAAATACCCTCGCCATAATC
ORTI        CTCGCAACAGGAACAATCATCACAGCCTCTAGCTTTCACTGATTCCTGGCCTGAATGGGACTAGAAATAAACACACTCTCCATTATC
ORNA        CTAGCAGCAGGAACCATCATTACAGCCTCCAGCTTTCACTGATTTATAGCCTGAGTCGGACTAGAAATTAATACCCTAGCAATTATC
PERC        CTAGCAACAGGAACCATTATTACAGCCTCCAGCTTCCACTGATTCATAGCCTGAATCGGATTAGAAATAAACACCCTAGCAATTATC
PUYA        CTAGCAACAGGAACCATTATTACAGCTTCCAGCTTCCACTGATTTATAGCTTGGATCGGACTTGAAATAAACACATTAGCAATTGTA
RHOD        TTAGCAACAGGAACCATCATTACCGCCTCCAGCTTTCACTGATTTATGGCCTGAATCGGACTTGAAATTAACACCCTGGCCATCCTT
ROSE        CTAGCAACAGGAACCATTATCACTGCCTCCAGCTTCCACTGGTTCATAGCCTGAATCGGACTTGAAATAAACACACTAGCTATTATT
SCAP        CTAGCAACAGGAACTATTATCACCGCCTCCAGCTTTCATTGATTTATAGCCTGAATCGGCCTAGAAATAAATACACTAGCAATTATT
STIG        CTAGCAACAGGAACAATTATTACAGCCTCCAGCTTCCACTGGTTTATAGCCTGAATCGGACTAGAAATAAACACCCTAGCCATTATC
TORQ        CTAGCAACAGGCACAATTATCACCGCTTCTAGCTTTCACTGATTCATAGCCTGAATCGGACTAGAAATAAACACCCTGGCCATCATC
VARI        CTGGCAACAGGCACAATTATTACAGCTTCTAGCTTTCACTGGTTCATGGCCTGAATTGGACTTGAAATGAACACCCTGGCTATCGTC
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Taxon/Node  678901234567890123456789012345678901234567890123456789012345678901234567890123456789012
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    Uninf:  **  * ** ** ***   ** ** ** **  * ** ***** ** *  ** ** **  * ** ** **  * ** ** **  * **
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CROT        CCTATTATCTCAAAACAACACCACCCGCGATCCACAGAAGCCGCAACAAAATATTTCCTAACACAAGCAGCTGCCTCTGCCCTAATC
OPLU        CCCATCATTTCAAAACAACACCACCCACGAGCTACCGAAGCAGCAACCAAATATTTCTTAACACAAGCAGCCGCCTCAGCCACAATC
LEIO        CCGATTATCTCAAAACGACACCACCCGCGAGCGACAGAGGCCGCAACTAAATACTTCTTAACCCAAGCAGCCGCCTCGGCCCTAATC
LIOL        CCACTAATTACAAAAAAACATCACCCACGAGCCACAGAAGCAGCCACAAAATATTTCCTAACACAGGCAGCCGCCTCAGCAATCATC
SCEL        CCAATAATCTCAAAACAGCACCACCCACGAGCAACAGAAGCCGCCACAAAATATTTCCTAACACAAGCAGCTGCCGCAGCTATAATC
ANOL        CCCATTATCTCAACAACACATCACCCACGAGCCACAGAAGCTTCCACAAAATATTTTCTTACACAAGCTGCAGCCTCTGCCTTAATT
MICR        CCACTTATTTCCAAAAACCACCACCCACGATCAACAGAAGCTGCCACAAAATACTTCCTTACACAAGCAGCCGCCTCAGCCCTAATC
TROE        CCAATAATTTCCAAAAAACACCACCCCCGAGCAACCGAAGCCGCCACAAAATACTTCCTAACACAAGCAATAGCCTCCGCCCTAATT
TROS        CCCCTTATTTCAAAAGAACACCACCCACGAGCAACTGAAGCCGCAACAAAATACTTCCTAACACAAGCAGCCGCCTCCGCTCTAATT
PLIC        CCACTAATCTCTAAAAAACACCACCCACGATCAACCGAAGCTGCAACAAAATACTTCTTGACACAAGCAGCAGCATCCGCCCTAATT
URAC        CCGCTAATCTCCAAAATACACCACCCACGATCAACAGAAGCTGCAACAAAGTACTTTTTAACCCAAGCTGCTGCCTCCGCCTTGATC
URAN        CCACTTATTTCTAAAATACACCACCCACGAGCTACCGAAGCAGCAACTAAGTACTTTTTAACACAAGCAACTGCCTCCGCCTTAATC
ANGE        CCAATTATCTCCAAACAACATCACCCACGAGCCACAGAAGCAGCAATTAAATACTTCTTAACACAAACAGCAGCCTCCGCCCTAATC
APUR        CCAATCTTAGCCAAACAACATCACCCACGGGCAACAGAAGCAACCACCAAATACTTCTTAACCCAAGCCACAGCCTCAGCCCTAATT
AZUR        CCAATTATTTCAAAACAACACCACCCCCGAGCCACAGAAGCAGCCACCAAGTATTTTTTAACACAAGCAGCTGCATCTGCTCTAATC
BOET        CCCATTATCTCTAAACAACACCACCCCCGAGCCACAGAAGCAGCCACCAAATACTTCTTAACACAAGCAGCAGCATCCGCCCTAATC
CADU        CCCATCATCTCCAAACAACACCACCCACGTGCCACAGAAGCAGCCACTAAATATTTCCTCACACAAGCAGCAGCCTCAGCCTTAATC
CHOT        CCAATTATCTCCAAACAACACCATCCACGAGCCACAGAAGCAGCAATCAAATACTTCCTAACACAAGCTGCAGCCTCCGCCCTAATC
CRAS        CCAATTATTTCAAAACAACATCATCCACGAGCCACAGAAGCAGCAACCAAATATTTTCTTACACAAGCAACAGCCTCCGCCATAATC
CUPR        CCTATTATTTCTAAACAACACCACCCCCGAGCCACAGAAGCAGCCACCAAATACTTCTTAACACAAGCAGCAGCATCCGCCCTAATC
DOEL        CCAATTATCTCAAAACAACACCACCCCCGAGCCACAGAAGCAGCAACCAAATATTTTCTAACACAAGCAGCCGCATCCGCCCTAATT
EMPE        CCAATAATCTCTAAACAACACCACCCCCGAGCCACAGAAGCCGCCACCAAATACTTCCTAACACAAGCAGCAGCATCCGCCCTAATC
EUNE        CCAATTATCTCTAAACAACACCACCCACGTGCCACAGAAGCCGCTACCAAATATTTCTTAACACAGGCGGCAGCATCAGCCCTAATC
FEST        CCAATTATCTCAAAACAACACCACCCACGAGCCACAGAAGCAGCAATTAAATACTTCCTAACACAGGCAACAGCCTCAGCCCTAATC
FORM        CCAATCATCTCTAAACAACATCACCCACGAGCCACAGAAGCAGCCACCAAATACTTTCTAACCCAAGCAGCAGCATCCGCCCTAATT
GUEN        CCAATTATCTCCAAACAACATCACCCACGAGCCACAGAAGCAGCAATTAAATACTTCCTAACACAAGCAGCAGCCTCCGCCCTAATC
HUME        CCCATTATCTCTAAGCATCACCACCCACGAGCCACAGAAGCAGCCACCAAATACTTTCTAACACAAGCAGCAGCATCCGCCCTGATC
IMIT        CCAATTATCTCCAAACAACACCACCCACGAGCCACAGAAGCAGCCACCAAATACTTTTTAACACAAGCAGCAGCATCAGCCATAATC
IRID        CCAATCATTTCAAAACAACACCATCCACGAGCTACAGAAGCAGCAACCAAATACTTCCTAACACAAGCAGCAGCCTCCGCCATAATC
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Taxon/Node  678901234567890123456789012345678901234567890123456789012345678901234567890123456789012
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 Constant:  **  *  *  * *     ** ** ** **  * ** ** **  * *  ** ** **  * *  **  *     **  * **    ** 
    Uninf:  **  * ** ** ***   ** ** ** **  * ** ***** ** *  ** ** **  * ** ** **  * ** ** **  * ** 
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LATE        CCAATCCTATCCAAACAACACCACCCTCGAGCTACAGAAGCAGCCACAAAATACTTTTTAACACAAGCAGCCGCCTCTGCTCTAATC
LIMI        CCAATTATCTCAAAACAACACCACCCACGAGCAACAGAAGCAGCAACAAAATACTTCTTAACCCAAGCAGCAGCCTCTGCCATAATC
MELA        CCAATTATCTCTAAACAACACCACCCCCGAGCCACAGAAGCAGCTACAAAATATTTTTTAACACAAGCAGCAGCCTCCGCCCTAATC
OCHO        CCCATTATTTCCAAACAACATCACCCACGAGCCACAGAAGCAGCTACCAAATACTTCCTAACCCAAGCAGCAGCCTCCGCCCTAATC
ORIE        CCAATTATCTCTAAACAACACCACCCGCGCGCCACAGAAGCAGCCACAAAATACTTTTTAACACAAGCAGCAGCCTCCGCTTTAATT
ORTI        CCAATCATCTCCAAACAACACCACCCCCGAGCTACAGAAGCAGCCACAAAATACTTTTTAACACAAGCGGCCGCCTCGGCCTTAATT
ORNA        CCAATTATCTCCAAACTTCACCACCCACGAGCCACAGAAGCAGCGACTAAATACTTTCTCACACAAGCAGCAGCCTCCGCCCTAATT
PERC        CCCATTATTTCCAAACTACACCATCCACGAGCCACAGAAGCAGCAACCAAATACTTCCTAACACAAGCAGCAGCCTCTGCCCTAATC
PUYA        CCAATTATCTCGAAACAACACCACCCACGAGCCACAGAAGCAGCAACCAAATACTTCTTAACACAAGCAGCCGCCTCCGCATTAATT
RHOD        CCAATTATCTCCAAACAACACCACCCACGAGCCACAGAAGCAGCAATCAAATACTTCCTCACACAAGCAGCAGCCTCCGCCCTAATC
ROSE        CCAATTATCTCCAAACAACACCACCCACGAGCCACAGAAGCAGCCACCAAGTACTTTCTAACACAAGCAACAGCATCCGCCCTAATT
SCAP        CCAATTATCTCCAAACAACATCACCCCCGATCTACAGAAGCAGCTACCAAGTACTTTTTAATCCAAGCAGCAGCCTCTGCCCTTATC
STIG        CCTATTATCTCCAAACAACACCACCCCCGAGCTACAGAAGCAGCCACAAAATACTTCTTAACACAAGCAGCAGCTTCTGCCCTAATC
TORQ        CCCATTATTTCAAAACAACACCACCCACGAGCCACAGAAGCTGCCACCAAATACTTCCTAACACAAGCAACAGCATCAGCCATAATC
VARI        CCAATCATATCTAAACAACACCACCCACGAGCCACTGAAGCAGCCACAAAGTACTTTCTAACACAAGCAGCAGCATCCGCCCTAATC
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  Constant:  * **  * **       **             **    **   *  *                       *           *
     Uninf:  * ** ** **       ** **   *      **    **   * **                       *    *   *  *
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CROT        TTATTCTCAAGCACAGTCAACGCATGAGAAACAGGAACCTGAAACATCCTATCGATAACCAATCCACAAGCCAATATTTTATTAACA
OPLU        CTCTTCTCAAGCACATTAAACGCCTGACAAACAGGCTCATGAGACATTACCCAAATAAATTATATTCCATCCAACATTTTACTAACA
LEIO        CTATTCTCAAGTACAATTAATGCCTGACACTCAGGAACCTGAGACATTACACAAACAACTAATAATATATCAAACATTCTACTAACA
LIOL        CTATTTTCAAGCACAATTAATGCTTGACAAACCGGAACTTGAGACATTATACAACTCACCAACCCAATAGCATCAATCCTACTAACC
SCEL        CTATTCTCAAGCACTATAAACGCATGACTAACCGGAACTTGAGATATTATCAACTCAGCCGACCCAATAGCAAACATATTACTAACA
ANOL        TTATTTTCTAGTATAACCAATGCATGACATACGGGATCTTGAGACATTACTCAAATATTATTTTCTCCATCAAACACCATGCTAACC
MICR        CTGTTTTCAAGCACAATAAATGCACAACAAACCGGAACATGAGACATTACCCAACTAACCACCACACAATCAAACATCCTCCTATTC
TROE        TTATTCTCAAGCATCATAAACGCACAAATGACAGGATCATGAAACATTACCCAAATCACAACCACACAACCCACCATTATCTTATCA
TROS        ATCTTTTCAAGCGCAACAAACGCCCAACTTACAGGCTCCTGAGACATTACACAACCCGCCTCAACACAATCAGCTATTTTACTACTC
PLIC        TTATTCTCAAGTACAATAAATGCACAATTAACAGGATCATGAGACATTACACAACTATCCATAACACAAGCAACTATTCCTCTTTCA
URAC        CTATTCTCCAGCACTATAAACGCACAACTAACAGGATCATGAGACATCACCCATCTCACTTCTATACAATCAGCCACCTTACTTACA
URAN        CTATTCTCAAGTACCATTAACGCACAACAAACTGGATCATGAGACATCCTACAACTCACGACACCACAATCAACAATTCTACTAACA
ANGE        CTATTCTCCAGCACAATAAACGCATGACATTCAGGAACATGAGATATCACCCAACCAACAAACCCAGCCTCCTCTATCCTATTAACA
APUR        TTGTTTTCTAGTGTACTTAACGTATGACACTCAGGAATATGAGATGTAACCACACCAACAACCACAACAGCCACCATTCTATTCACA
AZUR        CTATTTGCCAGCATAATTAACGCATGACACTCAGGAACATGAAACATTACTCAAACCACAAACCAAATTCCATCCATCCTACTTACA
BOET        CTATTTTCTAGCATAATTAACGCATGACAATCAGGAATATGGGACATCACCCAACCCACCAACCCCCTTTCCTCCATCCTTCTTACA
CADU        CTGTTCTCAAGTATAACTAATGCTTGACAATCAGGAATTTGAGACATCACCCAACCCACAAACCAAACCTCCTCCATCCTCATCACA
CHOT        CTCTTCTCTAGCACAATAAACGCATGACAATTAGGAACATGAGATATTACTCAACCAACAAACCCAACATCATCCATCCTATTAACT
CRAS        CTATTCTCCAGCATAATCAACGCATGACAATCAGGAATATGAAACATTACCCAGCCATTAAGCCCAACATCCTCCATCCTACTTACA
CUPR        CTATTTTCTAGCACAATCAATGCATGACAATCAGGAATATGAGACATCACCCAACCTACAAACCCACTATCCTCCATCCTCTTCACA
DOEL        TTATTCTCCAGCATAATTAATTCATGACACTTAGGAACCTGGGACATCACTCAAACCATAAACCAAACTTCCTCTATTCTACTTACA
EMPE        CTGTTCTCCAGCATAATTAACGCATGACAGTCAGGAATATGAGACATCACCCAACCCATAAGCCCCGCATCTTCCATCCTATTCACA
EUNE        CTATTCTCTAGCACAATTAACGCATGACAAACAGGAATATGAGACATTACCCAACCCATAACCCCCGCATCCTCCATCCTATTTACA
FEST        CTATTCTCTAGTACAATAAACGCATGAC?ATCAGGAACATGAGACATCACCCAACCAACAACCCCCATATCCTCCATCCTATTAACA
FORM        CTATTCTCTAGCACAATCAATGCATGACACTCAGGAATATGGGACATTACCCAACCAACAACCCCCGCCTCCTCCATTTTACTCACA
GUEN        CTATTCTCCAGCACAATAAACGCATGACAATCAGGAACATGAGACATCACCCAACCAACAAACCCAACCTCCTCTATCCTATTAACA
HUME        CTATTCTCCAGCACAATCAATGCATGACAATCAGGAATGTGAAACATCACTCAACCAATAGGCCCCCTCTCCTCAATCCTACTTACA
IMIT        CTATTCTCTAGCATAATCAACGCATGACAATCAGGAATATGGGACATCACCCAGCCTATAAATCCAACATCCTCTGTATTACTTACT
IRID        CTATTTTCTAGCATAATCAACGCATGACAATCAGGAATATGAGACATCACTCAACCAACCAACCAAACATCATCAATTCTACTAACA
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Taxon/Node  345678901234567890123456789012345678901234567890123456789012345678901234567890123456789
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LIMI        CTATTTTCTAGCATAATAAATGCATGACAATCAGGAACCTGAGACATCACCCAACCAACAAACACAATATCCTCCATCCTATTAACA
MELA        CTATTTTCTAGCACAATCAACGCATGACAATCAGGAATATGAGACATCACCCAGCCCACAAACCCACTCTCCTCCATCCTAATTACA
OCHO        CTGTTCTCCAGCATAATTAATGCATGAAACTCAGGAATATGAAACATCACCCAACCAACCACCCCCATATCTTCCATTCTACTTACA
ORIE        CTGTTTTCAAGCACAATTAATGCATGACAATCTGGAATATGAGACATCACTCAACCCACAAACCAATTTTCATCCATCCTATTCACA
ORTI        CTGTTCTCTAGTACAATCAACGCATGACAATCAGGAATATGAGACATTACCCAGCCCTCAAACCCCTTCTCCTCCCTACTACTCACA
ORNA        CTATTTTCCAGCATAATCAACGCATGGCAATCAGGAATATGAGATATTACTCAACCTTCAAACCCCACATCATCTATCTTACTCACA
PERC        CTATTCTCCAGTATAATCAATGCATGACAATCAGGAATATGAGACATTACCCAACCTTCAAACCCAACATCTTCTATCTTATTTACA
PUYA        TTATTTTCTAGCATAATAAACGCATGACAATCAGGAATATGGGACATTACACAGCCAACCAACCAAACATCATCTATTTTACTCACA
RHOD        CTATTCTCCAGCACAATTAATGCATGACAATCAGGAACATGAGATATTACCCAACCAACAAACACAATATCCTCTATCCTATTCACA
ROSE        CTATTTTCTAGCATAATTAATGCCTGACAATCAGGAATATGAGACATTACACAACCAACAAACCAATTCTCATCTATCCTATTCACA
SCAP        CTATTCTCTAGCATAATCAACGCATGACATTCAGGAATATGAGACATAACCCAACCAACAACCCCCACATCCTCCATTCTATTCACA
STIG        CTATTTTCTAGCACAATCAACGCATGACAATCAGGAATATGAGACATCACCCAGCCCGCAAACTCACTCTCCTCTATTTTATTCACA
TORQ        CTCTTCTCCAGCATAGTCAACGCGTGACAATCAGGAATATGAGATATTACCCAACCCTCAAACCCACTATCATCCATCCTATTTACA
VARI        CTATTCTCCAGCATAATCAACGCATGACAAACAGGAACATGAGACATCACCCAACCAACAAACCCCACATCATCGATCCTATTTACA
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Taxon/Node  012345678901234567890123456789012345678901234567890123456789012345678901234567890123456
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LEIO        ACAGCCTTAGCCATAAAACTAGGCCTAGCACCCACACACTTCTGACTACCAGAAGTCCTACAAGGGACCTCGATGATAACAGCCCTA
LIOL        ATAGCCCTCGCTATAAAACTAGGACTTGCCCCAGCCCACTTCTGACTTACCGAAGTAATACAAGGAACAACAACAGAAACAGCAATA
SCEL        ATGGCTATCGCAATAAAACTAGGCCTAGCCCCAGTACATTTCTGACTACCAGAAGCACTCCAAGGCTCAACACTAAAAACAGCCACA
ANOL        ATAGCCCTAGCCATAAAACTAGGGTTAGCTCCACTTCACTTCTGGCTACCAGAAGTAATTCAAGGATCAACAATACTAACTGCCTTT
MICR        ATGGCCCTAGCCATAAAACTAGGCCTAGCACCCGCACACTTCTGACTCCCAGAGGTCTTACAAGGGTCAACAATACACACCGCACTA
TROE        TTAGCATTAGCCATAAAACTAGGACTCGCCCCAGCACACTTCTGACTACCCGAAGTCCTACAAGGCTCCACAATACAAACCGCACTA
TROS        ACCGCCCTGGCTATAAAACTTGGCCTTGCCCCACTACACTTCTGACTCCCAGAAGTACTGCAAGGAGCATCACTACTAACCGCCACA
PLIC        ATGGCACTTGCCATAAAACTAGGTCTTGCCCCCGCACACTTCTGATTACCAGAAGTCCTACAAGGCTCAACAATAACTACTGCACTA
URAC        ATAGCACTAGCCATAAAACTAGGTCTCGCACCCACACATTTCTGACTCCCCGAAGTTCTGCAAGGATCCACAATACTTTCAGCATTA
URAN        ATAGCACTGGCACTAAAACTAGCCTTAGCACCCACCCACTTCTGACTTCCGGAGGTCCTACAAGGCTCTACCATAATAACAGCCATA
ANGE        ATTGCCATCGCAATAAAATTAGGCCTTGCTCCAACACACTTTTGACTCCCAGAAGTCCTCCAAGGGACCACCCTAACAACTGCCCTC
APUR        ATCGCCCTAGCAATAAAACTAGGCCTCGCCCCAACCCACTTCTGACTACCAGAAGTACTTCAAGGCACCACAATAACAGCCGCCCTA
AZUR        ATCGCCCTTGCAATAAAACTAGGCCTTGCCCCAACACACTTCTGACTCCCAGAAGTCCTTCAAGGTACCACAATAACAACCGCCCTA
BOET        ATGGCCCTAACAATAAAACTAGGGCTCGCCCCTGCACACTTCTGACTACCAGAAGTCCTTCAAGGCACTACAATCCCCACCGCCCTA
CADU        GTCGCCATTACAATAAAACTAGGCCTTGCCCCAACACACTTTTGACTCCCAGAAGTACTCCAAGGCACCACCACAACAACCGCCCTA
CHOT        ATTGCCCTCGCAATAAAACTAGGCCTTGCCCCAACACACTTTTGACTCCCGGAAGTTCTACAAGGCACTACTATAACAACTGCCCTC
CRAS        ATCGCCCTAATAATAAAACTAGGTCTCGCCCCAGCTCACTTTTGACTACCAGAAGTCCTACAAGGCACCACAACACCCACCGCCCTA
CUPR        ATGGCCCTAGTAATAAAACTAGGCCTAGCCCCCGCCCACTTCTGGCTACCAGAAGTCCTACAAGGCACCACAATCCACACAGCCCTT
DOEL        ATCGCCCTAGCAATAAAACTAGGCCTAGCCCCAACACACTTTTGACTCCCAGAAGTTCTTCAAGGTACTACAATAACAACTGCCCTA
EMPE        ATAGCTCTGACAATAAAACTAGGCCTAGCCCCTACACACTTCTGACTGCCAGAAGTCCTACAAGGTACTACAATGACAACCGCACTA
EUNE        ACCGCCCTGATAATAAAACTAGGCCTGGCCCCCGCACACTTCTGACTACCAGAAGTCCTCCAAGGTACCACAATACCAGCCGCCTTG
FEST        GTCGCCATTGCAATAAAAGTAGGCCTTGCCCCAACACACTTTTGACTCCCAGAAGTCCTCCAAGGCACCACATTAACAACC?CCCTT
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GUEN        ATCGCCATTGCAATAAAATTGGGCCTTGCTCCAACACACTTTTGACTCCCAGAAGTCCTTCAAGGAACCACCCTAACGACTGCCCTC
HUME        ATAGCTCTAACAATAAAACTAGGCCTGGCCCCAGCACACTTCTGACTACCAGAAGTACTACAGGGCACCACACTACATACCGCCCTA
IMIT        GCCGCCCTAACAATAAAACTCGGCCTCGCCCCAGCACACTTCTGACTACCAGAAGTCCTACAAGGCACCACAATGCCCACAGCCCTC
IRID        ATCGCTATTGCAATAAAACTAGGCCTCGCCCCAAGCCATTTTTGACTTCCAGAAGTTCTCCAAGGCACCACAATAATAACTGCCTTA
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Taxon/Node  012345678901234567890123456789012345678901234567890123456789012345678901234567890123456
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LATE        ATCGCACTAGCAATAAAGCTGGGCCTAGCCCCAACACATTTCTGACTACCAGAAGTACTTCAAGGCACTACAATTTATACTGCCCTA
LIMI        ATTGCCATTGCAATAAAACTAGGCCTCGCCCCAACTCACTTTTGACTACCAGAAGTCTTACAAGGCACTACACTAACAACCGCCCTA
MELA        ATGGCACTAGCAATAAAACTAGGCCTCGCCCCAGCACATTTTTGATTACCAGAAGTACTACAAGGCACCACAATACACACTGCCTTA
OCHO        ATTGCCATCGCAACAAAACTAGGCCTGGCCCCAACCCATTTCTGACTACCAGAAGTCCTACAAGGCACCACAATAACAACCGCCCTC
ORIE        ATAGCACTAGCAATAAAATTAGGACTAGCCCCAGCACACTTCTGACTGCCAGAAGTACTACAAGGAACCACAATACTCACTGCCTTG
ORTI        ATAGCACTAGCAATAAAACTCGGCCTCGCCCCCACACACTTCTGACTACCAGACGTCCTTCAAGGCACCACAATACCCGCCGCCTTA
ORNA        ATCGCCATTGCAATAAAACTAGGGCTCGCCCCAACACACTTTTGACTACCAGAAGTCCTACAAGGAACCACCCTAACAACCGCCCTA
PERC        ATTGCCATTGCAATAAAACTAGGACTCGCCCCAACACACTTCTGACTGCCAGAAGTCCTCCAAGGGGTCACCATAACAACTGCCCTA
PUYA        GTTGCCATCGCAATAAAACTCGGACTTGCCCCCAGCCACTTTTGACTCCCAGAAGTTCTCCAAGGCACAACAATAACAACAGCCCTG
RHOD        GTCGCCCTAGCAATAAAACTAGGTCTTGCTCCAATACACTTTTGATTACCAGAAGTACTTCAAGGCACCACAATAACAACTGCCCTA
ROSE        GCCGCCCTTGCAATAAAACTAGGCCTTGCCCCAACACACTTCTGATTCCCAGAAGTTCTACAAGGCACTACAACCACAACAGCCTTA
SCAP        ATGGCCATTTCAATAAAACTCGGCCTTGCCCCAACCCACTTCTGACTACCAGAAGTCTTACAAGGCACCACAATAAAAACTGCACTT
STIG        ATAGCACTAGCAATAAAACTAGGCCTTGCTCCAGCACATTTCTGACTCCCAGAAGTACTACAAGGCACCACAATACCTGCCGCCTTA
TORQ        ATGGCCCTAATAATAAAACTAGGCCTAGCCCCAGCACACTTCTGACTACCAGAAGTCCTACAAGGCACCACAACATCCACCGCCTTA
VARI        ATAGCCCTGGCAATAAAACTAGGCTTAGCCCCAGCACACTTCTGACTTCCAGAGGTCCTACAGGGCACCACCATACCCACCGCCTTA
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Taxon/Node  789012345678901234567890123456789012345678901234567890123456789012345678901234567890123
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    Uninf:  **  *    ** ********  * ** ** *   *  *  * *     **    ** *   *  *  *        *  *
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CROT        ATTATTAGTACCTGACAAAAACTAGCCCCCACAGCCCTAATATTCCTTACCATTAATAACCTATCGCCAAAAATCCTATTAACAATA
OPLU        ATCATTACCACCTGACAAAAACTGGCTCCAATAGCCTTAATTTACCAAACAATAAACAACCTATCACCAACATTACTATTTATACTA
LEIO        ATTATCAGCACCTGACAAAAACTAGCACCAATAGCCCTTATCGTACTAACAAACAATAACTTATCTTCAACCGTGCTGATAACAATA
LIOL        ATCATCGCAACATGACAAAAATTAGCCCCAATAGCAATTATCTTTTTAACCGCTAACTCCCTAACACCAACAATTCTATTAACAATA
SCEL        ATCATTGCAACCTGACAAAAACTAGCCCCAATAGCACTAATAATCCAAACATCTAATAACTTATCAACAACAGCCCTACTAACCTTA
ANOL        ATTATTACTACATGACAAAAACTAGCCCCAATATCTCTAATTTTTTTAACTATAAATAGTATGTCCACAACAATTCTTCTACTAATG
MICR        ATCATCAGCACATGACAAAAGCTAGCCCCAATAGCCCTACTTTACATAACCACCAATAAACTTCCCCCCTCAATGCTACTAACCATG
TROE        ATCATCAGCACTTGACAAAAACTAGCCCCGATTGCTCTACTATACCTAACTGCAAATAATATATCAGCCCTAATCATCCTAACCCTA
TROS        ATCATCGCCACCTGACAAAAGCTAGCCCCCACAACCCTACTATACCTCTCCATCAACAATATCCCAACAACAGCCCTACTAACACTG
PLIC        ATCATTTCAACATGACAAAAACTAGCCCCAATATCTCTTCTTTATTTAACAGCAAACAATATACCAACAATAATACTACTAAGCCTA
URAC        ATTATTACCACCTGACAAAAACTAGCCCCAATAACACTTCTATATTTAACAGTAAACAACATACCAACAGTACTTCTCTTAAGTCTT
URAN        ATCATTAGTACCTGACAAAAACTAGCCCCAATAACAATCATTTATCTAGTAGCAGATAACCTACAAACAACAGTACTACTAACCCTG
ANGE        ATCATTAGCACCTGACAAAAACTAGCCCCCATGGCACTAATCTACTTAACAACAAACAACTTATCACCAACCACCTTAATCCTAATA
APUR        ATCCTAAGCACCTGACAAAAACTAGCCCCAATAGCCCTAATCTATATCACAGCAAACAACCTGTCCCCCACCACCCTAATCCTAATA
AZUR        ATCATTAGCACCTGACAAAAATTAGCTCCAATAACCCTTATTTATTTAACAGCAAACAACCTATCCCCTATAACTTTACTCCTAATA
BOET        ATCATTAGTACCTGACAAAAACTGGCCCCCATAGCCCTAATTTACCTAACAACAAACAGCCTCTCACCAACCATCCTCATTATAATT
CADU        ATCATCAGCACCTGACAAAAACTAGCTCCAATAGCCATAATTTACCTAACAACAAACAACCTATCATCAACCACCCTAATCCTAATC
CHOT        ATTATTAGCACTTGACAAAAACTAGCCCCAATAGCATTAATTTACCTAACAGCAAACAACCTATCATCTCCCACCCTAATCTTAATA
CRAS        ATTATTAGCACCTGACAAAAACTAGCTCCAATAGCCCTAATTTACCTCACAGCAAACAACCTATCACCCACCACCCTAATCCTAATA
CUPR        ATTATTAGCACCTGGCAAAAGCTAGCCCCAATAGCCCTAATCTACCTAACAACAAATAACCTCTCCCCAACTACCCTCATTTTAACC
DOEL        ATCATTAGTACTTGACAAAAACTAGCTCCAATAACCCTTATTTACCTTACAGCAAACAACCTATCCCCCACAACCCTACTCCTAATA
EMPE        ATCATTAGCACCTGACAAAAAATAGCCCCAATAGCACTAATTTACCTAACAACAAACAACCTCTCACCAACCGCCCTAATCCTAATC
EUNE        ATTATCAGCACCTGACAAAAAATAGCCCCAATAGCCCTAATCTATACCACAACAAACAACCTCTCACCCACCACCCTAATCCTAATA
FEST        ATCATTAGCACCTGACAAAAACTAGCCCCCATAGCACTAATCTACCTAACAACAAACAACCTATCACCAACCACCCTAATCTTAATA
FORM        ATCATTAGTACCTGACAAAAACTAGCCCCAATAGCACTAGTCTGCCAAACAGCAAACAATCTGTCCCCAATCACCCTCCTCCTAGTA
GUEN        ATCATTAGCACCTGACAAAAGCTCGCCCCCATAGCACTAATTTACCTAACAACAAACAACTTATCACCTACTACCCTAATCCTAATA
HUME        ATCATCAGCACCTGACAAAAACTCGCCCCAATAGCCCTTATCTTCCTAACAGCAAACAACCTCTCACCAACCACCCTAATCCTTATT
IMIT        ATCATCAGTACCTGACAAAAACTAGCCCCAATAGCCCTAATTTACCAAACAACAAACAACCTCTCACCAACCACCCTAATCCTTGTC
IRID        ATTATCAGCACCTGACAAAAATTAGCTCCAATAGCACTACTATGCTTAACAATAAACAACCTATCATCTACCACCCTAATCCTAATA
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Taxon/Node  789012345678901234567890123456789012345678901234567890123456789012345678901234567890123
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    Uninf:  **  *    ** ********* * ** ** *   *  *  * *     **    ** *   *  *  *        *  *
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LATE        ATCATTAGCACCTGACAAAAACTAGCCCCCATAGCCCTGATTTATATAACTGTAAACAACCTACCCCCCATCCCCCTAATCTTAATA
LIMI        ATCATCAGCACCTGACAAAAACTCGCCCCAATAACACTTATTTACTTAACATCAAACAACCTATCTTCAACAACTCTAATCCTAATT
MELA        ATCATCAGCACCTGACAAAAATTGGCCCCAATAACCTTAATTTATATAACAGCAAACAACCTCTCACCAACCACTATAATTTTAATT
OCHO        ATAATCAGCACCTGACAAAAACTAGCCCCCATAGCCCTAATTTGCCTAACAGCAAACAACCTATCCACACCAACCCTCTTCCTCATG
ORIE        TACATTAGCACCTGACAAAAACTAGCCCCAATAAGCCTAATTTACCTAACAGCAAACAACCTGTCACCAACCACTCTAATCCTAATT
ORTI        ATCATTAGCACTTGACAAAAACTAGCCCCAATAACCCTAATCTATCTAACAGTAAACAACCTCTCACCTACCCCCTTAATCCTAATT
ORNA        ATCATTAGCACCTGACAAAAACTAGCCCCAATAACACTAATTTATTTAACAATAAATAACCTATCCCCTACCACCCTCATCCTTATT
PERC        ATCATTAGTACTTGACAAAAACTAGCCCCAATAACACTAATCTATCTTACAACAAACAACCTATCACCAACCACTCTTATTCTAATA
PUYA        ATTATTAGCACCTGACAAAAGCTAGCCCCTATAACACTTATATGCCTAACAATAAACAACCTATCCTCCACTACCCTAATCCTAATA
RHOD        ATCATCAGCACCTGACAAAAACTTGCCCCAATAACCCTAATTTACCTAACAACAAACAACCTCTCTCCAACCACCCTAATCCTAATA
ROSE        ATCCTCTACACCTGACAAAAACTAGCCCCAATAACCCTAATCTATCTAACAACAAACAACCTATCACCATCAACACTTCTCCTAATA
SCAP        ATCATTAGCACCTGACAAAAACTAGCCCCAATAACCCTACTTTATTTAACAGCAAACAGCCTATCCCCACACACCCTACTTCTATTA
STIG        ATTATTAGCACCTGACAAAAACTAGCCCCAATAGCCCTAATCTTCCTAACAACAAACAACCTATCACCAACCACCATGATACTAATC
TORQ        ATTATCAGCACCTGACAAAAACTAGCCCCAATAGCCCTAATCTACCTAACAGCAAACAACCTATCACCAACCACCCTGATCCTAATA
VARI        ATTATCAGCACCTGACAAAAACTGGCCCCAATGTCCCTAATCTTCCTAACAGCAAACAACCTCTCATCAACCACCATAATACTGACC
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Taxon/Node  456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
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LEIO        GGTATTTTATCTGCCATCATTGGGGGCTGAGGCGGACTAAACCAGACCCAAACACGAAAAATCATAGCATACTCATCCATCGCACAC
LIOL        GGCATACTCTCCGCCGCCATCGGGGGCTGAGGTGGACTAAACCAAACTCAAATACGAAAAATCCTAGCCTACTCATCAATCGCCCAC
SCEL        GGGTTAATTTCAACAACTATCGGCGGCTGAGCCGGACTAAACCAAACACAAACTCGAAAAATTATAGCCTACTCATCAATTGCCCAC
ANOL        GGAGTCTTATCCTCACTTGTTGGTGGTTGAGGGGGGTTGAACCAAACACAGACCCGAAAAATCATAGCATACTCATCAATTGCCCAC
MICR        GGGGCCCTATCGGCCTGCATCGGAGGGTGGGGAGGAATTAACCAAACACAAACACGAAAAATCATAGCATTCTCATCAATTGCCCAC
TROE        GGAATTATTTCAGCCCTTGTAGGGGGCTGAGGGGGCATAAATCAAACCCAAACCCGAAAAATCATAGCATACTCATCTATCGCCCAC
TROS        GGCACTCTATCCGCAGTTTGAGGGGGTTGAGGTGGCTTAAACCAAACACAAACACGAAAAATCATAGCCTATTCATCAATCGCCCAT
PLIC        GGAATTACATCCACATTAATCGGAGGGTGAGGAGGAATTAATCAAACACAAACACGAAAAATCATAGCATTTTCATCTATCGCCCAC
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ANGE        GGAGCACTATCAACCTGTGTCGGTGGATGAGGCGGAATAAATCAAACACAAACACGAAAAATCATAGCATACTCATCAATCGCTCAC
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AZUR        GGCACCCTCTCTACATGCGTAGGCGGTTGAGGAGGCATCAATCAAACACAAATACGTAAAATAATAGCCTACTCATCAATCGCACAC
BOET        GGAACACTATCCACATGCATCGGGGGATGGGGCGGCCTCAACCAAACACAAACCCGCAAACTAATAGCCTACTCATCAATCGCTCAC
CADU        GGACTCCTATCAACATGCATCGGAGGATGGGGCGGCATCAATCAAACACAAACACGCAAAATCATAGCATACTCATCCATCGCCCAC
CHOT        GGCACACTCTCAACCTGCATCGGCGGATGGGGCGGTATTAATCAAACACAAACACGTAAAATTATAGCATACTCATCAATCGCCCAC
CRAS        GGAACCCTCTCCACATGGATCGGAGGCTGAGGCGGACTTAACCAAACACAAACACGCAAGCTAATAGCCTACTCATCAATCGCCCAC
CUPR        GGAACCCTATCTACATGCATTGGAGGATGGGGTGGCCTTAACCAAACACAAACCCGAAAACTAATAGCCTATTCATCAATCGCCCAT
DOEL        GGCACCCTCTCTACATGCGTAGGCGGCTGAGGGGGCATTAACCAAACACAAACACGTAAAATAATAGCCTACTCATCAATTGCACAT
EMPE        GGAACCCTTTCCACATGCGTTGGCGGATGGGGTGGCCTAAACCAAACACAAACACGAAAACTCATAGCCTACTCATCAATCGCCCAT
EUNE        GGAGTCCTCTCCACATGTGTCGGAGGATGGGGAGGCCTAAACCAAACACAAACACGCAAGCTCATAGCCTATTCATCAATCACCCAC
FEST        GGCACACTCTCAGTCTGTGTCGGCGGATGGGGCGGAGTAAATCAAACACAAACACGTAAAATTATAGCATACTCATCAATCGCTCAC
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GUEN        GGGGCTCTCTCGACCTGTGTCGGCGGATGAGGCGGCGTAAATCAAACACAAACACGAAAAATCATAGCATACTCATCAATCGCTCAC
HUME        GGAACCCTCTCCACATGCATTGGGGGCTGAGGGGGACTAAATCAAACACAAACACGAAAACTCATGGCCTACTCATCAATCGCTCAC
IMIT        GGAGTTCTATCTACATGTGTAGGAGGGTGGGGAGGCCTAAACCAGACACAAACACGCAAGCTAATAGCCTACTCGTCAATCGCCCAT
IRID        GGCACACTATCAACATGCCTAGGCGGATGAGGCGGAATCAACCAAACACAAACCCGAAAAATCATAGCCTACTCATCTATCGCCCAC
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Taxon/Node  456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
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 Constant:  *        **          ** ** ** *  **  * ** ** ** *     ** **  *  * ** *  ** ** **  * **
    Uninf:  **       **  *     * ** ** ** *  **  * ** ** ** ** *  ** **  * ** ** *  ***** **  * **
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LATE        GGGACCCTATCCGCATGCGTAGGAGGATGGGGTGGCCTAAATCAAACACAAACACGCAAACTCATAGCCTACTCATCCATCGCACAC
LIMI        GGAACCCTATCAACACTAATCGGAGGATGAGGCGGAATCAACCAAACACAAACACGAAAAATTATAGCCTACTCATCAATCGCCCAC
MELA        GGGTACCTCTCAACCTGTGTCGGAGGATGGGGCGGCCTAAATCAAACCCGAACACGAAAACTTATGGCCTACTCATCCATCACACAC
OCHO        GGCCTCCTCTCTGCCTACGTCGGCGGCTGAGGGGGGATTAACCAAACCCAGACACGAAAAATCATGGCCTACTCATCAATTGCCCAC
ORIE        GGACTCCTCTCCACATGCGTTGGGGGCTGAGGTGGACTAAACCAGACACAAACACGTAAACTCATGGCCTATTCATCTATTGCACAC
ORTI        GGCACCCTGTCCACATGCATTGGAGGCTGAGGCGGCCTCAACCAAACACAAACACGCAAACTCATAGCTTATTCATCCATCGCACAC
ORNA        GGGACCCTCTCAACATGTGTGGGAGGATGAGGGGGCATCAACCAGACACAAACACGCAAAATTATAGCCTACTCATCAATTGCCCAC
PERC        GGGGCCCTATCAACATGCATCGGGGGATGAGGGGGCATCAACCAAACACAAACACGCAAAATCATAGCCTACTCATCAATCGCCCAT
PUYA        GGAACCCTATCAACATGCCTAGGGGGGTGGGGCGGAATCAATCAAACACAAACCCGAAAAATCATAGCCTACTCATCAATCGCCCAC
RHOD        GGCGCACTCTCAACATGCATCGGCGGATGGGGCGGAATTAACCAAACACAAACCCGTAAAATCATAGCATACTCATCAATTGCCCAC
ROSE        GGCACCCTATCCACCTGCATCGGCGGTTGAGGTGGTATCAACCAAACACAAACACGAAAAATTATAGCCTACTCATCAATCGCACAC
SCAP        GGAGTCTTATCAACATGCATCGGGGGGTGAGGCGGAATCAACCAAACACAAACACGAAAAATCATAGCCTACTCATCAATCGCCCAT
STIG        GGAACCCTGTCCACATGTGTAGGTGGCTGAGGCGGCCTAAACCAAACACAGACACGCAAGCTTATGGCCTACTCATCCATCGCGCAC
TORQ        GGAACCCTATCCACATGGGTCGGAGGTTGAGGCGGACTAAACCAGACACAAACACGCAAACTCATGGCTTACTCATCAATCGCCCAC
VARI        GGCTTCCTCTCTACATGCGTAGGTGGCTGAGGCGGCCTAAACCAAACACAAACACGCAAACTCATAGCATACTCATCAATCGCCCAC
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Taxon/Node  123456789012345678901234567890123456789012345678901234567890123456789012345678901234567
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    Uninf:   * ** *****        *  *     *       **  *  *     *  * **       **         *** *   *  **
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CROT        CTTGGCTGAATCGCAGCAATCGCCCCAATAATAACTAACATCATAATCCTCAACCTCATAATCTACATTACCATAACGACATCAATA
OPLU        CTTGGTTGAATAGCAGCAATCATACCTATCATGCCTAACATTCTAATCTTAAACCTCATCATTTATCTCCTAATAACAACATCAATA
LEIO        CTAGGCTGAATGGCAATCATCACCCCACTAATAACTAACCTACTCATTTTAAACCTAATCATATATCTACTTATAACGACATCAACA
LIOL        CTAGGCTGAATAGCCGCCATCTCAACCATAATAACTAACATCCTTACACTAAACCTAATTATTTATCTATTAATAACAACATCTATA
SCEL        CTTGGATGAATAGCCGCAATCACAACAATTATACCAAATATCCTGCTACTAAACCTCCTAATTTACTTACTCATAACAACATCAATA
ANOL        CTCGGATGAATAGCTACAATTTCATCTATTATAACAAACATCTTAATTTTAAACCTAACTATTTACCTAATTATAACAACTTCCATA
MICR        ATCGGATGAATTACAACAGCTTCATTTATACTCACCAACCTCATAGTACTCAACCTAATCATCTACATCACCATAACCACAACAATA
TROE        CTAGGATGAATTGCCACAATCTCTATTATATTAACCAATATTATACTCATAAACCTAATAATCTACATCACAATAACAACCACAATA
TROS        CTTGGTTGAATTATTGTAATCTCCCCCATAATAACCAATATTATACTACTAAACCTAGCCATTTACTTAATCATAACCACAACAATA
PLIC        CTCGGCTGAATCATAACTATCTCAATAATACTTACTAATATTATACTACTCAACCTAATAATATATATTATTATAACCACCACAATA
URAC        CTTGGCTGAATTACAGCCGTCTCCCAAATACAAACCAACATCTTATGCCTCAATCTAATACTTTATCTAATTTTTACTACCACAATA
URAN        CTTGGCTGAATCACCACCATCTCATTTTTACTTAAAAACATTATACTGCTAAGCCTCACAATTTATATTGTTTTATCAACCTCAATA
ANGE        TTTGGCTGAATAGCAGCAATCTCCCCAATGCTCACTAATATCATAACACTTAACCTCATTATTTACACCACAATAACAACCACCATA
APUR        TTCGGGTGAATAGCAGCAATCGCCACAATATCCACCGACATTATACTATTCAACCTTATCATCTACATCATAATAACAACCCCAATA
AZUR        CTTGGCTGAATAGCAGCAATCTCTCCAATACTCACAAACATCTTAACACTCAATCTTACCATCTATATTCTAATAACAACTTCAATA
BOET        TTTGGATGAATAACAACAATCGCCCCCATACTCACCAACCTTATACTGCTAAACCTTATAGTCTACACCACCATAACCACCTCCCTA
CADU        TTTGGCTGAATAGCAGCCATCTCTACCATACTACCAAACACCATACTACTCTACCTCACAACATATATCTTTATAACAACCTCCCTA
CHOT        TTTGGCTGAATAGCAGCAATCTCCACAATACTCACTAACATCATGATACTTAACCTCATCATCTATATCATAATAACAATCACCATA
CRAS        TTTGGATGAATAATAACAATTACCCCGATACTAACCAACATCATACTCCTAAACCTCATAATCTACACCCTCATAACCACCTCCCTA
CUPR        TTTGGATGAATGATAACAATCTCCCCAATACTCACCAACATCATATTACTAAACCTAATAATCTACACCACCATAACCACCTCCCTA
DOEL        CTAGGTTGAATAGCTGCAATCTCTCCAATACTTACAAACATTATAATACTCAACCTCACCATTTACATCCTAATAACAACCTCAATA
EMPE        TTCGGGTGAATAATGGCAATCGCCCCGATACTTAACAACATCATACTACTAAACCTTATAATCTACACCCTAATAACCTCCTCCATA
EUNE        TTCGGATGAATAATAACAGTCTCCCCAATACTTAACAACATCATATTGCTTAATCTTATGATCTACACCATCATAACAACCTCCATA
FEST        TTTGGCTGAATAGCAGCAATCTCCCCAATACTCACAAACATTATAGCACTTAACCTCATTATTTACACCACAATAACAACAACCATA
FORM        TTCGGTTGAATAGCAGCAATCTCCCCCATACTCACCAATATCATACTACTCAACCTTTTAATCTACATTCTAATAACAACCTCTATA
GUEN        TTTGGCTGAATAGCAGCAATCTCCCCAATACTCACCAATATTATAACACTTAACCTCATTATTTACACCATAATAACAACCACCATA
HUME        TTCGGATGAATGGTGACAATCTCCCCAATACTAACCAACATCATATTGCTAAACCTTACAGTCTATATCCTTATAACCACCCCAATA
IMIT        TTAGGATGAATAATAACAATCTCCCCAATACTCAACAACATCATACTTTTAAACCTAATAATCTATACCCTCATAACCACCTCCATA
IRID        TTCGGCTGAATAGCTGCAATCTCCCCAATACTAACCAACCTCATACTACTCAACCTCACTATTTACATTCTAATAACAACCTCCATA
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Taxon/Node  123456789012345678901234567890123456789012345678901234567890123456789012345678901234567
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 Constant:   * ** ** **                 *        *     *     *    **       **           *     *   *
    Uninf:   * ** *****        *  *     *       **  *  *     *  * **       **         *** *   *  **
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LATE        CTGGGATGAATAGTAGCAATCTCACCCATACTTACCAACATCATACTATTAAATCTCATAATCTACACAATTACAACCACCCCAATA
LIMI        TTCGGCTGAATAGCAGCAATCTCCCCACTACTCACCAACATTATACTCTTAAACCTCATCATCTATATCCTAATAACAACCTCAATA
MELA        TTCGGATGAATAATAGCAATTTCCCCAATACTGACTAACATTATACTTCTAAACCTCATAATCTACATCACTATAACCACCCCAATA
OCHO        TTCGGTTGAATAGCAATAATTTCCCCCATACTCACCAACATCATGCTACTAAACCTCATAGCCTACACCCTAATAACAATCTCCGTA
ORIE        TTCGGATGAATGGTAACAGTATCCCCATTCCTCACTAACATTATACTATTGAACCTCATAATTTATATAACCACAACCACCCCGATA
ORTI        TTCGGATGAATAATAGCAATCTCCCCAATACTTACAAACATCATACTACTAAACCTCATAATCTATATAATTATAACCACCCCCATA
ORNA        TTCGGCTGAATAGCAGCAGTCTCCCCAATGCTCACTAACATTATACTACTTTACCTCATTATCTACACCCTCATAACAATCTCCATA
PERC        TTCGGCTGAATAGCAGCAATCTCACCAATACTTACCAACATCATGCTACTAAACCTTACTATCTACACCATAATGACAATCTCCATA
PUYA        CTTGGCTGAATAGCTACAATTTCCACAATAATAACCAACCTCATACTACTTAACCTCGCTATCTACATGTTAATAACAACCTCCATA
RHOD        TTTGGTTGAATGGCTGCAATCTCACCGATACTCACCAATATCATAATACTGTATCTATTTATATACATCCTAATAACAACTACCATA
ROSE        TTTGGCTGAATAGCAGCAGTCTCTACAATACTCACCAACATCATACTACTCAACCTCCTCATTTACACCATAATAACAACCACCCTA
SCAP        TTCGGTTGAATAGCAGCAATTGCCCCAATATCCACCAATATTATACTGCTTAATCTTATTATCTACACTCTAATAACAACCTCTATA
STIG        TTCGGATGAATAATAGCGATCTCCCCACTACTAACCAACATCATACTACTTGCCCTTATAGTATACATCATTATAACCACCCCGATA
TORQ        CTAGGATGAATAATAACAATCGCCCCCATACTCACCAACATCATACTCCTAAACCTCATAATCTACACCCTTATAACTACCTCCCTA
VARI        TTCGGATGGATAATAACAATCTCCCCCCTACTCACCAACATCATGCTACTTAACCTAATAATATATACCCTCATAACCACCTCCATA
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Taxon/Node     8901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
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 Constant:     **         *             * ***** *       * *
    Uninf:     **         *            ** *******   *   ** *                          ** **
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CROT           TTTTTAGCACTCATCACAACCCAATCAAAAACTATTCAAGACACAACAACATCATGAACATCCTCCCCAACCATCACCATCACCACC
OPLU           TTTACAACACTTATTTTATCAAAATCAAAAACCATCCAAGACACAATAACCTCATGAACATATTCCCCAATACTAGCCACAACAATA
LEIO           TTCTTAACCCTTACATTTTCAAAATCAAAAACATTACAAGATATCGCCACACTATGAGCCTTATCTCCTACACTAATAATTATAACG
LIOL           TTTTCCATCATAATTATAATAAAATCAAAAACAATCCAAGACCTAACACTATCATGATCTTCATCCCCAATTACTACCGTTCTAACA
SCEL           TTTTATACCCTAATTCTATTAAACTCAAAAAACATTAAAGACCTAACAACCTCATGAACAACCTCACCATCAATCGCCGCCATAACC
ANOL           TTTTTTTCCCTAATTATTTCTAAGTCAAAAACAATCCAAAACACAGCGGAGACCTGAACATTTTCACCCATACTAACGATTATAATA
MICR           TTCTCCACACTAATCCTATCAAACTCAAAAACAATTAAAGACACAACAACCCTACCAACTACTTCACCAGCACTCACCACTATTATG
TROE           TTCTCAATCCTTATTTTATCAAACTCAAAAACCATCAAAGACACAACAACACTATGATCCACCTCACCTTCACTAATTTTAACCGCA
TROS           TTTTTAGCCCTAACTGCATCTTACTCAAAAACTATTAAAGATACAATAACACTAACCAATTCCTCCCCAGCACTAGCCACAACAACA
PLIC           TTTTCAATCCTTATTACATCAAACTCAAAAACTATTAAAGATACTACAACCCTATCTACCCTCTCCCCCACAACTACAATAATTATA
URAC           TTTCTAACCCTCATTATATCCAACTCAAAGACTATCAAAGACACAACAACCCTATGAACGACCTCCCCCGCTTTAACAATCACGATG
URAN           TTTTCAACACTCATTCTATCAAACTCAAAAACAATTAAAGACACAATAACATCATGAACCACCTCCATCTCTCTAACAACCATATCA
ANGE           TTCACCGCCCTAATCATAACCAAATCAAAAACCATTCAAAACATAACAACAACCTGAGCCCTATCCCCAACCCTAACAGCAACAACC
APUR           TTCATCATATTAGCCGTCACTAAATCAAAAACTACAACAAACCTCGCAACA---TGAACATCCGCCCCCACCATAACCACAATAATC
AZUR           TTCATAGTGTTAATCATAACCAAATCAAAAACCCTCCAAAACATAATGACAATATGAACCCTCTCTCCAGCAATAACTATAATAGCC
BOET           TTCACAATACTAATTATAACTAAATCAAAAACCCTTCAAAACATAGCAACAACATGAACACTCTCACCAGCACTAACCTCCATCACC
CADU           TTCACAACACTTATTATCACTAAATCAAAAAACATCCAAAATATAACTACAATATGAACACTATCCCCAGCAACAACAACAATAACC
CHOT           TTCACCGCACTAATCATAACCAAATCAAAAACCATCCAAAACATAACAACAACATGGGCCCTATCCCCAGCCCTAACCACAGCTACC
CRAS           TTCATAACACTAATCCTAACCAAATCAAAAACCCTACAAAATATAACAACAACATGAACCCTATCACCTGCACTAACCACAATTGCC
CUPR           TTCACAACACTAATCCTGACCAAATCAAAAACCCTACAAAACATAACAACAGCATGAACCCTATCACCAGCACTAACCTCTGGCACC
DOEL           TTTATAATTCTAATTACAACCAAATCAAAAACCCTCCAAAACCTAACAACACTATGAACCCTGTCTCCAGCAATAACTACAATAACC
EMPE           TTTACAATTCTAATCCTTACCAAATCAAAAACCATCCAAAACATGACGACAACATGGGCCATTTCACCCGCACTAACCACAATCACA
EUNE           TTCGCAATACTAATCCTAACCAAATCAAAAACCCTACAAAACATAACAACTACATGAACAATCTCACCAGCACTAACCACAATCACC
FEST           TTCACCGCACTAATCACAACCAAATCAAAAACCATCCAAAACATAACACTAACCTGAACCGTATCCCCAGCCCTAACAACAACCACC
FORM           TTTTCAATACTAATCATAACCAAATCAAACACCATCCAAAATATAGCAACA---TGAGCCGCACTCCCATCAACAACCACACTTACT
GUEN           TTCACCGCCCTAATCATAACCAAATCAAAAACCATTCAAAACATAACAACAACCTGGACCCTATCCCCGACCCTAACAGCAGCTGCC
HUME           TTCATAGCACTAATCTTAACCAAATCAAAAACCCTACAAAACATAACAACAACATGGGCCCTCTCACCAGCACTTGCCGCCCTAACT
IMIT           TTCATAATACTAATCCTAACTAAATCAAAAACCCTACAAAACATAGCAACAACATGAACCATATCACCAGCAATAACTACAACCGCC
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Taxon/Node    8901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
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 Constant:    **        *           * ***** *       * *
    Uninf:    **        *          ** *******   *  ** *                      ** **
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IRID          TTTACTCTGCTAATCATAACTAAATCAAAAACCATCCAAAACATAACAACAACATGAGCACTCTCCCCAACATTAACCACAACCGCC
LATE          TTTATAGTACTAGTCTTAACTAATTCAAAAACTCTACAAAACATAACAACAACAGGAACCCTATCACCAGCACTAATCACAGCCTCC
LIMI          TTTACCATACTAATTACCACCAAATCAAAAAACATCCAAAACATCACAACAACATGACACCTATCCCCCACACTAGCCACAATAACA
MELA          TTCATAGTACTAATCATAACCAAATCAAAAACCATCCAAAACATAACAACAGCAGGAGCCCTCTCACCAGCACTAATCGCGAGCTCC
OCHO          TTTTCAGCATTAATTATCACCAAATCAAAAACCATCCAAAACATAACAACAACATGAACCACCTCCCCATCAACAACCACAATAACA
ORIE          TTCACAATACTTGCCATAACCAAATCAAAAACCCTACAAAATATAACAACAACAAACGCCCTCTCACCAGCACTAACCACAATATCC
ORTI          TTCATAATTCTAATCATGACCAAATCAAAAACCCTCCAAAACATAACAACAACAACAGCCCTCTCACCAGCACTAACCACCACCACC
ORNA          TTCACCACACTAACTATAACTAAATCAAAAACCATCCAAAACATAACAACAACATGAACACTATCCCCAGCACTAGCCACAATTACC
PERC          TTCACCACCTTAATTATAACCAAATCAAAAACCATCCAAAACCTAACAACAACATGAACACTGTCCCCAGCACTAACCGCAATTACC
PUYA          TTCACTATACTAATTCTCACTAAATCAAAAACCATCCAAAACATAACAACAACATGAGCACTTTCCCCAACACTAACTGTAACAGCA
RHOD          TTTACCGCACTAATCATAACAAAATCAAAAACCATTCAAAACATAACAACAACAGGAGCCCTATCCCCAGCCCTAATCGCAATAGCC
ROSE          TTCACAACACTCATCTTAACCAAATCAAAAACCATCCAAAACATAACAACAACCTGAGCACTATCCCCAACAATAACTGCAACAACC
SCAP          TTTTCAATACTAATTACTACCAAATCAAAAACAATCAAAAACATAACACCAACATGAACCATCTCTCCAATAATAACCTCAATAACA
STIG          TTCATAATACTAATCATAACCAAGTCAAAAACCCTCCAAAACATAACAACAACGGGGGCCATCTCACCAGCACTAACCGCGGCCTCC
TORQ          TTCATAACACTAATCCTAACCAAATCAAAAACCCTACAAAACATAACAACAACATGAACCCTATCACCAGCACTAACCACAATCGCT
VARI          TTCATAACACTAATCCTAACCAAATCAAAAACCCTTCGAAACATAACAACAGCATGAACACTTTCACCAACACTAACCTCAACCACC
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Taxon/Node  567890123456789012345678901234567890123456789012345678901234567890123456789012345678901
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 Constant:      *     *  *  *  *    **  * ** **  *  * ** **    ** **     *  *  *    **  *       **
    Uninf:      *     *  * **  *    **  * ** **  *  * ** **    ** ** **  *  *  *    **  *       **
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CROT        ATATTAACCCTCCTATCCCTAGGAGGGCTGCCCCCCTTATCAGGATTCTTACCAAAATGACTTATCCTAGAAGAACTAACAACACAA
OPLU        ATACTAACGCTCCTTTCCTTAGGTGGCCTCCCCCCACTTACAGGATTTCTGCCCAAATGGCTTATCATAGAAGAACTAACCCTACAA
LEIO        ATACTAGCCCTCCTATCACTAGGAGGACTCCCACCATTGACAGGATTTATTCCAAAGTGACTTGTCTTACAAGAACTAACAACACAA
LIOL        GCTATAACCCTCCTATCCCTAGGAGGCCTCCCTCCACTAACAGGATTTATACCAAAATGACTAATCATTGAAGAATTAACCCTACAA
SCEL        ATACTAATCTTACTATCACTAGGAGGATTACCACCTCTGACAGGATTTATTCCAAAATGATTAATTCTAGAAGAACTTACCACCCAA
ANOL        ATACTTTCACTTCTTTCACTAGGGGGACTACCACCACTAACTGGATTTGTACCAAAGTGGCTAGTTATAGAAGAATTAATTTTACAA
MICR        GCCCTGACCCTTCTGTCCCTAGGGGGACTCCCACCCCTATCCGGGTTTATACCAAAATGACTCATCATAGAAGAACTAATTAACCAA
TROE        ACCTTAACCCTACTTTCTATAGGAGGACTCCCCCCAATATCAGGCTTTATACCTAAATGATTAATCCTAGAAGAACTAACAAACCAA
TROS        GCACTAACCCTCCTCTCCATAGGCGGACTACCCCCAATATCCGGATTTATCCCAAAATGATTGATCCTAGAAGAACTAACATGCCAA
PLIC        GCCCTTACACTCCTTGCTCTCGGAGGGCTTCCCCCTCTATCAGGCTTTATCCCAAAATGACTTATCCTAGAAGAACTAATTAATCAG
URAC        GCCCTCACACTTATTTCACTAGGGGGACTCCCCCCCATATCCGGCTTTATTCCAAAGTGGCTAGTAATAGAAGAATTAACCAATCAA
URAN        CTTATAATCCTCCTATCATTAGGAGGTCTTCCCCCTCTCACAGGCTTCGCTCCAAAATGACTAATCTTAGAAGAACTAATTGCCCAA
ANGE        CTTCTAACACTCCTATCCCTAAGCGGACTTCCCCCACTCACAGGCTTTATACCAAAATGACTAATTATTAACGAACTCATTCACCAG
APUR        CTATTAACTCTTATGTCACTAGGAGGCCTACCCCCACTCTCCGGATTTACACCAAAATGACTTATTATTAACGAGCTAATTCAACAA
AZUR        CTTCTAACACTTCTATCTTTAGCAGGACTTCCCCCACTCTCAGGATTTATACCAAAATGACTTATTCTTAATGAACTGATTAATCAA
BOET        CTACTTACACTCCTCTCCCTAGGAGGACTCCCCCCACTCTCCGGCTTCATGCCAAAATGACTAATCCTTAACGAACTCGTAAACCAA
CADU        CTCCTAACACTATTATCATTAAGCGGACTTCCCCCTCTCACAGGCTTCACACCAAAATGACTAATTATTAACGAACTAATCCACCAA
CHOT        CTTCTAACACTTCTATCCCTAAGCGGACTACCCCCTCTCACAGGCTTCATACCAAAATGACTAATTATTAATGAACTTATTCACCAA
CRAS        CTACTAACACTACTCTCACTAGGAGGCCTACCCCCACTCTCAGGATTTATACCAAAATGACTCATCCTTAACGAACTAATCAACCAG
CUPR        CTACTCACACTCCTCTCCCTAGGAGGCCTCCCCCCACTCTCCGGCTTCATACCAAAGTGACTAATCCTTAATGAACTAATCAACCAG
DOEL        CTTTTAACACTCCTATCTCTAGGAGGACTTCCTCCCCTCTCAGGGTTTATACCAAAATGACTTATCCTTAATGAACTTATTAACCAA
EMPE        CTCCTAACACTCCTCTCCCTAGGGGGCCTACCCCCGCTCTCCGGCTTCATGCCAAAATGACTAATCCTTAATGAACTAACAAACCAA
EUNE        CTCCTAACCCTTCTTTCCCTCGGAGGCCTGCCTCCCCTCTCCGGATTCATACCAAAATGACTAATCCTAAACGAACTAATAAACCAA
FEST        CTTCTAACACTCCTATCCCTAAGCGGACTCCCCCCTCTCACAGGCTTCATACCAAAATGACTAATCATCAATGAACTTATTCACCAA
FORM        CTTCTCACACTCCTATCGCTTGGAGGCCTCCCACCTCTCTCAGGTTTCATACCAAAATGACTGATCTTAAACGAACTCATTAACCAA
GUEN        CTCCTAACACTCCTATCCCTAAGCGGACTTCCCCCGCTCACAGGCTTCATGCCAAAATGACTAATCATTAACGAACTTATCCACCAA
HUME        CTTCTAACCCTACTGTCAATAGGGGGCCTCCCCCCACTCTCAGGATTCATGCCAAAATGACTGATCCTTAATGAATTAATCAACCAA
IMIT        CTACTGACACTCCTCTCCCTAGGCGGCCTGCCGCCTCTTTCTGGCTTTGTGCCAAAATGGCTCATCCTCAATGAACTAATCATCCAA
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Taxon/Node  567890123456789012345678901234567890123456789012345678901234567890123456789012345678901
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 Constant:      *     *  *  *  *    **  * ** **  *  * ** **    ** **     *  *  *    **  *       **
    Uninf:      *     *  * **  *    **  * ** **  *  * ** **    ** ** **  *  *  *    **  *       **
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IRID        CTACTAATCCTACTCTCCTTAGCAGGTCTTCCACCACTCTCGGGCTTCATACCAAAATGACTAATCATCAACGAACTTATTAACCAA
LATE        CTACTATTACTCCTATCCTTAGGCGGACTCCCCCACTCTCAGGCTTCATACCAAAATGACTTATCCTCACCGAACTAATCAACCAA
LIMI        CTCCTTACACTACTCTCCCTTGGAGGACTCCCCCCCTCACAGGCTTCATACCAAAATGACTCATCCTCAATGAACTCATACACCAA
MELA        CTACTAATACTCCTATCACTAGGAGGACTTCCACCACTATCAGGCTTCATACCAAAATGACTTATTCTCACAGAACTAATTAACCAA
OCHO        CTATTAGCGCTTCTTTCACTAGGGGGGCTTCCCCCCCTATCAGGCTTTATACCAAAATGACTAATTCTAAACGAGCTCATCAACCAA
ORIE        CTCCTATTACTACTATCCTTAGGCGGCCTCCCACCACTATCTGGCTTCATGCCTAAATGACTTATTCTCACAGAACTAATCAATCAA
ORTI        CTACTTTTACTCCTATCCCTGGGAGGCCTGCCACCACTTTCCGGCTTCATGCCAAAATGACTAATTCTTACCGAATTAATCAACCAA
ORNA        CTACTAACACTCCTATCTCTTGGCGGACTACCACCACTCTCAGGCTTTGCCCCAAAACTACTTATCCTAAACGAACTAATCCACCAA
PERC        CTCTTAACACTTCTATCTCTTGGCGGACTCCCACCACTCTCCGGCTTCACCCCAAAATGACTCATCCTAAACGAACTAATTCACCAA
PUYA        CTCTTAACACTCCTTTCCCTAGCAGGCCTCCCGCCACTCTCTGGCTTTATGCCAAAATGACTAATTATCAACGAACTTATTAACCAA
RHOD        CTTCTGACACTTCTATCTCTAGCAGGACTACCCCCACTCTCTGGCTTTATACCAAAATGACTAATCATTAATGAACTAATCCACCAA
ROSE        CTATTAACACTCCTATCTCTCGGAGGACTCCCCCACTCTCAGGATTTATACCAAAATGACTCATCCTCAACGAACTCGTCAATCAA
SCAP        CTGCTTACACTCATATCACTAGGGGGGCTTCCCCCCCTATCAGGATTCACACCAAAATGGCTCATTCTCAACGAATTAACCCACCAA
STIG        CTCCTACTACTCCTATCCCTAGGCGGCCTCCCGCCCCTCTCCGGCTTCATACCAAAATGACTCATTCTCACAGAACTAATCAACCAA
TORQ        CTACTAACACTACTCTCCATAGGAGGCTTACCCCCGCTCTCAGGATTCATACCAAAGTGACTCATTCTTAACGAACTAGTAAACCAA
VARI        CTACTAACTTTACTCTCCCTAGGAGGCCTGCCCCCACTATCAGGCTTCATACCAAAATGACTTATCCTCAATGAACTAATAAACCAA
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Taxon/Node  234567890123456789012345678901234567890123456789012345678901234567890123456789012345678
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 Constant:      *           *        *  *     *     *  * **  * *  ** **  * **  *  * **        *  *
    Uninf:      *           *        *  *  *  *  *  *  * **  * *  ** **  * **  * ** **        *  *
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CROT        AACCTAACCCTAATAGCCACACTTTTAGCTATAACCTCCCTACTTAGCCTATTTTTTTATTTACGACTAACCTACACCACAACACTA
OPLU        AGTTTAATCCCAATTACAACCTTATTAGCCATAGCCTCATTACTCAGCCTATTCTTCTATCTCCGACTAACCTACACAACATCTCTA
LEIO        AACATAACTATAATAGCCACTATCATAGCACTATCAGCCCTCCTTAGCCTCTTCTTCTACTTACGCCTAACATACATTATAACCCTA
LIOL        AACCTAGCACCAATAGCAACCGTACTAGCCATATCATCCCTGCTTAGCCTATACTTCTACTTACGATTAACATACACCTCAACATTA
SCEL        AACCTAACAATCACAGCTACAATCCTAGCTATATCCTCCCTACTCAGCCTTTTCTTCTACCTACGACTAACCTACTCATCCACAATT
ANOL        AATTTTAATCTTCCAGCTATTTTAATAGCTATATCTTCCCTACTAAGCCTATTTTTTTACCTTCGAATTTCCTACACAGCCACACTC
MICR        AGCCTAATCCCAGCAGCTTCCCTAATAGCCATATCGGCACTACTTAGCCTATTCTTCTACCTACGACTAACATATACAACAACCATA
TROE        AACCTAACCCTAATAGCAGTAACCCTAGCTCTATCAGCACTACTTAGCCTTTACTTCTACTTACGACTTACCTACACAACAACCATA
TROS        AACCTAGTCGCACTAGCTGCCACCATGGCCCTTTCAGCCCTACTAAGCCTATTCTTCTACCTACGCTTAACATACGTCTCCGCCCTT
PLIC        AACTTAATTTTAACAGCAATTCTCCTTGCCATGTCTGCACTATTAAGCTTGTTCTTCTACTTACGACTTACATATACAACAACCTTA
URAC        AACCTAATACTAATTACAACTTTACTAGCCCTTTCATCACTACTAAGCCTCTTTTTTTACCTCCGATTAACGTATACAACTACACTC
URAN        AAGCTAACAACAGCAGCCTCAATTATAGCAGCCGCAACCCTACTCAGCCTATTTTTTTACCTACGACTAACTTACACAACAGCCCTA
ANGE        AACTTTATTATCACAACATCCCTAATAACCATATCAACATTACTCAGCCTATTCTTCTACCTCCGACTCACATACACCACAACCCTC
APUR        AACCTCATCCTCACAACAACAATTATGACAATATCCTCCCTACTAAGCCTTTTCTTCTACCTTCGAATTACATACACCACAACACTC
AZUR        AAACTAATTATCACAACAACTATCATAACCATAGCCACCCTACTCAGCCTATTCTTCTACCTACGTCTTACATACATTACAACCCTA
BOET        AACCTTATCCTAGTATCCTCTATCATAGCAATATCCACCCTTCTCAGCCTATTCTTTTACCTCCGCCTCACATACATCACAGCCCTT
CADU        AATCTCCTACTAACAACAACAATCATAACCATATCAACTCTCCTAAGCCTATTCTTTTACCTACGTCTTACATATATCACAGCCCTA
CHOT        AACTTTATTATTACAACATCATTAATAACAATATCCACCCTACTAAGCCTATTCTTCTACCTTCGACTTACATACACCACAACACTA
CRAS        AACCTCATCATCGTATCTGCCCTCCTAGCAATATCCACCCTCCTTAGCTTATTCTTCTACCTCCGCCTCACATACATTACAGCCCTC
CUPR        AACCTTATCCTAGTCTCAACAATTATAGCAATATCCACCCTCCTAAGCCTATTCTTCTATCTCCGCCTTACATATATCACAGCCCTC
DOEL        AAATTTATTATCACAACAACCATTATAACCATAGCCACCTTACTCAGCCTATTCTTTTATTTACGCCTTACATATATTACAACCCTA
EMPE        CACCTAATCCTCACATCAACCATCATAGCCATATCCACACTCCTCAGCCTATTCTTTTACCTTCGCCTCACATACATCACCACCCTC
EUNE        GACCTAATCCTCATTTCAACCATCATAGCCATATCCACGCTCCTCAGCCTATTCTTCTACCTCCGCCTTACATACATCACCGCCCTC
FEST        AACCTCATTATTACAACATCCCTAATAACCATATCCACCCTACTAAGCTTATTCTTCTACCTCCGACTCACATATACCACAACACTT
FORM        AATCTCATTCTTTCAGCAACCATTTTAGCACTTTCATCTCTTCTCAGCCTCTTCTTTTACCTTCGTCTGACATACATTACAACTCTT
GUEN        AACTTTATTATCACAACATCCCTAATAACCATATCAACATTACTCAGCCTATTCTTCTACCTCCGACTCACATACACCACAACCCTA
HUME        AACCTAATCCTTGTATCCACCATCATGGCAATATCCACCCTACTAAGCTTGTTCTTCTATCTCCGCCTTACATACATCACCGCCCTA
IMIT        AACCTAGTCCTCGCATCCACCATCATAGCAATATCAACCCTGCTTAGCCTATTTTTCTACCTGCGCCTTACATATATTACAGCCCTC
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Taxon/Node  234567890123456789012345678901234567890123456789012345678901234567890123456789012345678
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    Uninf:      *           *        *  *  *  *  *  *  * **  * *  ** **  * **  * ** **        *  *
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IRID        AACCTCATTATCACAACATCCGTAATAACAATATCTACACTACTCAGTTTATTCTTTTACCTACGACTCACATACATCACATCCCTC
LATE        GGCCTAATCATAATCTCTACCATCATAGCAATATCAACCCTTCTAAGCCTATTCTTTTACCTCCGCCTAACATACATTACAACTCTC
LIMI        AACCTCATCATCACAGCCACTGTCATATCAATATCCACACTACTAAGCCTATTCTTCTACCTTCGACTCACATATATAATAACCCTA
MELA        AACCTAATCATAATTTCCACCATCATAGCAATATCAACCCTTCTTAGCCTATTCTTTTACCTCCGACTAACATACATTACAACCCTT
OCHO        GACCTTGCCCCCACAGCAACAGCCCTGGCCTTATCCACCCTCCTAAGTCTATTCTTCTACTTACGTCTTACATACACTACAGCCCTA
ORIE        GACCTAATTATAATTTCCACCATCATGGCAATATCAACCCTGCTTAGCCTATTCTTTTATATACGCCTAACATATGTCTCCGCCCTT
ORTI        GACCTAATTATAATCTCCACCATCATAGCAATATCAACCCTACTCAGCCTCTTCTTCTACCTCCGCCTAACGTACATTACCGCCCTC
ORNA        AACTTTATCATCACCACAACCATCATAACCATATCTACCCTCCTAAGCCTATTCTTCTACCTACGACTCACATACACCATAGCCCTA
PERC        AAATTTATTATCCCCACAACCATTATAGCTCTATCCAGCCTCCTCAGCCTATTCTTCTACCTACGACTTACATACACCACAGCCCTT
PUYA        AATCTTATTATTACAACATCCGTAATAACAATATCTACACTACTTAGTCTATTTTTCTACTTACGACTTACATATACCACATCCCTA
RHOD        AACCTCATTACCACAACCTCCCTAATAACAATATCCACCCTATTAAGCCTATTCTTTTACCTACGACTTACATATGCCACATCCCTC
ROSE        GACCTCACACTTACAGCAACCATCATAGCAATATCCTCACTATTAAGCCTATTTTTCTACTTACGCCTTACTTACACTACAACCCTA
SCAP        AATCTTATTTTTACAACACTTATTATAACTATATCCACCCTTCTAAGCCTATTTTTCTACCTCCGCCTAACATATACAACAACCCTA
STIG        AACCTAATCATAATATCAACCATCATAGCAATATCAACCCTACTTAGCCTCTTCTTTTACCTCCGCCTAACATACATTACAACGCTC
TORQ        AACCTCACTGTTGTATCCACCCTTCTAGCAATATCCACCCTGCTCAGCCTATTCTTCTACCTCCGTCTCACATACATCACCGCCCTC
VARI        AACCTGATCCTAATATCCACCGCCATAGCAATATCCACCCTTCTCAGCCTATTCTTCTACCTTCGCCTAACATACATCACAGCCCTC
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Taxon/Node  901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
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 Constant:   *       **                      *  ** **  *                                         *
    Uninf:  **     * ** *                  * ********  *         *                               *
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CROT        ACACTTTCACCAAACACACCACCAATCAAACATAAATGACGATTCAAACCCAAAACCTCAAAACTACTGACCATCACA---CTTCA
OPLU        ACCCTATCCCCAAACACAACCTCATCCCAACACAAATGACGATTTAAATCAATGCAAACACCCCTATTACTGAGCATAACTGCCCCA
LEIO        ACCACCCCACCAAACACAACAACATTCAAGCACAAATGACGATTTAATTACACAAATAATACTAATCCACTGTCTATCACTCTAACC
LIOL        ACTCTTTCACCAAACTCCACAACAACTAAACACAAATGACGTTTCAAAACGAAATCCCCCTCACTCCTACTTACAACTTCATTACCA
SCEL        ACACTATCCCCTAATACCACTACAACAATGCACAAATGACGATTTAAACAGTCACCAAACACACTACTACTATCACTAACACTACCC
ANOL        TCACTATCACCTAATACAACTCAAATAAAATTCAAATGACGATTTTATCCAAAAACTACAACCACCTTAACCTCTTCCACCACAACA
MICR        ACACTCTCCCCAAACCAAACAACAGCCATGCACAAATGACGTTTCCCCAATCAAAACATAAACGTATTAATCTCCACAACAACACCA
TROE        ACACTAGCCCCAAACACAACAACCTCAAAACACAAATGACGATTTAAAACAACAAACAAAACCGCTATAATCACCGCTACTGCTACC
TROS        ACCCTTGCCCCTACCACAATGACCATAAAACACAAATGGCGGTTCAAGCCCTTAAACAAAGTAAAATTAATTACAACAATCACACCA
PLIC        ACACTAGGCCCAAATCAAACAACCTCAAAACATAAATGACGATTTAACACTAATACCTCAACCAAACTAATATCAACAACAGCCCCC
URAC        ACACTCGCCCCAAACACAACAACCTCCAAACACACATGACGATTCAAACCAAACACCCCAACAAATCTAATAACAACCCTAACCCCA
URAN        ACATCTCCACCAACCACCTTCTCCTCAACCTACAAATGACGATTTCGAATATCAAACCTAACACTACTAATCACAATAACAGGACCT
ANGE        ACCCTCACCCCAACCACCCCAAACACTACCTACAAATGACGCTTTACCCCC---ACCCTATCCTCACCAATAACCATAACAATCCCA
APUR        ACCCTCACCCCAAACACCCCTAACACATCCTATAAATGACGCTTCAAACCT---CAAACACACCAACTACTTACCACGCTACTTCCA
AZUR        ACCTTAGCCCCAAACACCCCAAACACCACCTATAAATGACGTTTCAAACCA---AACTCCCCAATATTATTAACCACCACAATTCCA
BOET        ACCCTCGCCCCAAACACTCTAAACACCACCCACAAATGACGATTCCTACCC---AACTCCCCCCGCCTCCTAACCATTACAGTCCCT
CADU        ACCTTAACCCCAGGCACAACAAACTCAACCCATAAATGACGATTCAAAATA---CCCGCACCAATACTCCTCACCACAACAACACCC
CHOT        ACCCTTGCCCCAAGTACCCCAAACACCACCTACAAATGACGCTTCCCCCCA---ACCCTCTCCACACCCATAACCACTACAATCCCA
CRAS        ACCCTACCACCAAACACCCCCAACACCACCTACAAATGACGATTCATACCC---CCCATACCACTCCTTCTAACCTCCACACTCCCA
CUPR        ACTTTAGCCCCTATTACCCCAAACACCACCTACAAATGACGATTCCTGCCC---CCCTCACCCATCCTCCTAACACTCACAATCCCA
DOEL        ACCTTGCCCCCAAACACCCCAAATACTACCTACAAATGACGCTTTAAACCA---ATTTCCCCAATATTATTAACCATCACAATCCCC
EMPE        ACCCTTGCCCCAAACACCCCAAACACCACCTACAAATGACGATTCACACTC---ACACCCCCGCTCCTCATAACTATCACAATCCCA
EUNE        ACTCTTGCCCCAAACACCCCAAACACTACATACAAATGACGATTCACACTC---ACACCACCCATCCTCCTAACCGCCACAATCCCA
FEST        ACCATAGCCCCAAACACCCCAAACACCACCTACAAGTGACGCTTTATCCCC---ACCCAATCTACACTAATAACCACAACAATCCCA
FORM        ACCCTCGCCCCAAATACCCCAAACACCACCTACAAATGACGATTTAAGCCA---ACCACCTACCAACTTCTTACTACAACAATCCCA
GUEN        ACCCTCACCCCAACCACCCCAAACACCACCTACAAATGACGCTTTACCCCA---GCCCTATCCTCACCAATAACCATAACAATTCCA
HUME        ACCCTGGCCCCAAACACACAAAACACCACCTACAAATGACGATTTACACCC---ATCATGCCCACCATCCTAGTAACCACAATTCCA
IMIT        ACCCTAGCCCCAAACACCCAAAACACCGCCTATAAATGACGATTTACACTA---ACCCCCCCCCACCTTCTAACCACCACAATACCA
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Taxon/Node  901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
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 Constant:   *       **                      *  ** **  *                                         *
    Uninf:  **     * ** *                  * ********  *         *                               *
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IRID        ACACTCGCCCCAAGCACCCCCAACACCACCTACAAATGACGCCTTAATCCA---AACCCATCATCACCACTGACCACAACAATCCCA
LATE        ACCCTCGCCCCAAGTACCCCAAATATCACCTACAAATGACGACTCACACCA---AAAACACCCATACTCCTAACCACCACAATCCCA
LIMI        ACACTAACCCCACACACCACAAACACAACCTACAAATGACGCTTTAAACCC---ACAATATATACACCACTAACAATAACAATCCCA
MELA        ACCCTAGCCCCAAGCACTCCAAACACCACCTACAAATGACGACTCACATCA---AACACACCCATACTACTAACCACCACAATCCCA
OCHO        ACTCTCGCCCCTAACACCCCAAATGTCACCTACAAATGACGCTTCAAGCCC---ACCACACACCAGCTCCTCACCACAACAATCCCC
ORIE        ACCATCCCCCCAAGCACTCCAAACACCACCTACAAATGACGACTTACACCA---AAAACACCAACCCTACTAACCACCACAATCCCA
ORTI        ACCCTCGCCCCAAGCACTCCAAACACCACCCACAAATGACGATTCTCACCA---AAAGCCCCCCTCCTCCTCACCTCCCCAATCCCA
ORNA        ACCATTACCCCAAATTCCCCAAACACCACCTACAAATGACGCCTTACCCCC---CCACCCTCCATATCACTAACAACAACAATCCCA
PERC        ACACTTGCCCCAAACACCCCAAACACTACCTATAAATGACGCTTTTCCACC---CAACTCTCCACACCACTAACAACAACAATCCCA
PUYA        ACCCTAGCCCCAAGCACCCCCAACACAACCTACAAATGACGACTCACCCCA---AACCCATCACTACCACTAACAACAACAATTCCA
RHOD        ACCATGGCCCCATGTACTCCTAACACAACCTACAAATGACGCCTCATTTCC---ACTTCCCCAATACTTATAACAATAACAATCCCA
ROSE        ACCATAGCACCAAATACAACCAACACCACCTACAAATGACGCTTCAACCTC---ATCACTTCAACACTACTAACCACAATAATCCCC
SCAP        ACTCTCACCCCAAGTACCCCAAATTCAACCCACAAATGACGATTCAAACCC---ACCACACACCTACTTTTAACCACAACAATTCCA
STIG        ACCCTGGCCCCAAACACCCTAAACACCACCTACAAATGACGACTCACACCA---AATACTCCAGCACTCCTAACCGCCGCAATCCCA
TORQ        ACCCTACCCCCAAACACCCCCAACACCACCTACAAATGACGATTCATACCC---ACCATACCGCTCCTCTTAACCTCCACACTCCCA
VARI        ACCCTTGCCCCAAACACTCCAAACACCGCCTACAAATGACGATTTACACCA---GCCCCGCCCACCATCATAACCGCCACAATCCCA
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 Constant:      *     *     * **     *  *     *       *****     ***** * *       *****     ********
    Uninf:      *     *     * **  * **  *     *    *  *****   * ***** * *       ****** *  *********
 Excluded:                                             ***             **********
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CROT        GCCTCAACTATAATTCTACCACTAACCCCAATAATACTGCTCT---AGAAACTTAGGATTAAACCTA--AACCAAGGGCCTTCAAAT
OPLU        ATAACCATCTTAATACTACCAATCTCCCCACTAATCCTACAATAACAGAAACTTAGGTTAACTCA----AACCAAGGGCCTTCAAAG
LEIO        ATGTCAATTCTACTACTGCCAATTACACCTTTAATTCTGATAT---AGGGACTTAGGATAATATTA---AACCAAGGGCCTTCAAAG
LIOL        GCCACCATCCTATTCCTACCAATAACCCCCCTAATCTTAGCCTA--AAGAGTTTAGGATAATTTACA--AACCATAGACCTTCAAAG
SCEL        ATATCAACCCTAATACTACCACTGACTCCAATATTATGC---T---AGGAACTTAGGATAATCTTTA--AACCAAGGGCCTTCAAAG
ANOL        ATAACAATCTTCCTCCTACCACTTACACCCATAATTTTATTAT---AAAAACTTAGGATCAAATA----AACCAAGGGCCTTCAAAG
MICR        CTAACGCTTCTACTACTTCCAATAACCCCCCTACTGATA---TAA-AGAAACTTAGGATAAAACTTTTAAACCAGGGGCCTTCAAAG
TROE        CCATCCCTAATACTACTCCCAATCACCCCCCTACTACTA---T---AGAAACTTAGGATAATACTA---AACCAAGGGCCTTCAAAG
TROS        ATAACCCTCCTCCTTCTCCCCCTAACTCCAATTTTAACA---T---AGAAATTTAGGTTAAATCA----AACCAAGAGCCTTCAAAG
PLIC        CTCTCACTATTATTACTACCAATGACCCCCCTACTAATA---T---AGAAACTTAGGATAAGATA----AACCAAGGACCTTCAAAG
URAC        ATCTCCCTATTCCTCCTACCAATGACCCCACTACTACTA---TA--AGAAACTTAGGATAATGTA----AACCAAGGACCTTCAAAG
URAN        ATCGCCCTACTTATCCTACCCATTACCCCCATACTCATA---T---AGAAACTTAGGATAATCA-----AACCAAGGACCTTCAAAG
ANGE        ATCACCCTTATAACCCTACCTATAACCCCCCTCATAATCCAAT---AGAAACTTAGGATAATACCT--AAACCAAGGACCTTCAAAG
APUR        ACAGCCCTACTTATACTGCCAATCACCCCAACGATAATACAAT---AGAGACTTAGGATAACACATGTAAACCAAGGACCTTCAAAG
AZUR        ATAACCCTCTTAATCTTACCAATAACCCCCATCCTAACCCAAT---AGAAACTTAGGCTAATACTT--AAACCAAGGGCCTTCAAAG
BOET        ACAACCCTCCTCCTCCTCCCAATGACCCCAACCATAATCCAAT---AGAAACTTAGGATAATAC----AAACCAAGGGCCTTCAAAG
CADU        CTCACCCTCCTAATACTACCGATCACCCCCACCCTAATCCAATA--AGAAACTTAGGATAACCCATTTAAACCAAGGGCCTTCAAAG
CHOT        ATCACCCTAATAACACTACCAATTACCCCACTCATTATCCAAT---AGAAACTTAGGATAACATCTTA-AACCAAGGACCTTCAAAG
CRAS        ATGACCCTACTAATACTCCCAATCACCCCAATCATAACCCAAT---AGAAACTTAGGATAACACA----AACCAAGAGCCTTCAAAG
CUPR        ATAACACTCCTCCTCCTCCCAATAACCCCAACCCTGATCCAAT---AGAAACTTAGGATAATAT----AAACCAAGAGCCTTCAAAG
DOEL        ATAACCCTCATAATTCTACCCATAACTCCAACCATCACCCAAT---AGAAACTTAGGCTAATACTA---AACCAAGGGCCTTCAAAG
EMPE        ATAACCCTACTAATGCTCCCAATCACCCCAATTATAATCCAATA--AGAAACTTAGGATAATACA----AACCAAGAGCCTTCAAAG
EUNE        ATAGCCCTACTAATGCTCCCAATTACCCCAATCATAATCCAAT---AGAAACTTAGGATAACAC----AAACCAAGGACCTTCAAAG
FEST        ATCACCCTACTTACACTACCCATCACCCCTCTCATAACCCAAT---AGAAACTTAGGATAACACCT--AAACCAAGGACCTTCAAAG
FORM        GGGGCCCTCCTAATACTACCAATAACCCCCACCCTTACACAATAACAGAAACTTAGGATAATACTA---AACCAAGAGCCTTCAAAG
GUEN        ATCACCCTTATAGCCCTACCTATGACCCCCCTCATAATCCAAT---AGAAACTTAGGATAACACCT--AAACCAAGGACCTTCAAAG
HUME        GCCGCCATCCTCATACTCCCCATCACCCCAATTTTAACCCAAT---AGAAACTTAGGATTAACCTA---AACCGAGGGCCTTCAAAG
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    Uninf:      *     *     * **  * **  *     *    *  *****   * ***** * *       ****** *  *********
 Excluded:                                             ***             **********
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IMIT        ATGGCCCTATTAACACTACCAATAACCCCAATACTAATCCAAT---AGAAACTTAGGATAACAC----AAACCAAGGGCCTTCAAAG
IRID        ACAGCCTTACTAGCCCTACCAATCACCCCCATCTTAACCCACT---AGAAACTTAGGATAACTTTCTA-AACCAAGAGCCTTCAAAG
LATE        ATTGCCCTATTAGCCTTACCAATCACCCCAATTATAATACAAT---AGAAACTTAGGATAATACTA---AACCAAGGACCTTCAAAG
LIMI        ACTACCTTATTAACCCTACCAATCACCCCCCTCCTAACTCAAT---AGAAACTTAGGATAACACTA---AACCAAGAGCCTTCAAAG
MELA        ATAGCCCTTCTAGCACTACCAATCACCCCCATGATAACACAAT---AGAAACTTAGGATAATACA----AACCAAGGGCCTTCAAAG
OCHO        GCAACCCTTCTAATACTGCCTACAACCCCCGCCCTCATACAAT---AGAAACTTAGGATAACACTA---AACCAAGGGCCTTCAAAG
ORIE        ATAGCCCTCTTAGCCCTCCCAATCACCCCAACCCTAATCCAAT---AGAAACTTAGGATAACACA----AACCAAGGACCTTCAAAG
ORTI        ATCGCCCTATTTACCCTACCAATCACCCCAATTATAATCCAAT---AGAAACTTAGGATAACACA----AACCAGGGGCCTTCAAAG
ORNA        ATTACCCTTCTAATACTACCCATCACCCCCATTTTAACCCAAT---AGAAACTTAGGATAAACACT--AAACCAAGGACCTTCAAAG
PERC        ATGGCCCTACTAACACTACCTATCACTTCAATTTTAACCCAATA--AGAAACTTAGGATAATAGT---AAACCAAGGACCTTCAAAG
PUYA        GGGTCCCTTCTAACTCTACCCATCACACCAATCCTAACACAAT---AGAAACTTAGGATAATCTACTA-AACCAAGAGCCTTCAAAG
RHOD        ATAGCCATCCTAGCACTCCCCATCACCCCGATCCTAACCCAAT---AGAAACTTAGGATAATACCTTA-AACCAAGGACCTTCAAAG
ROSE        CCAACCCTTCTAATACTACCAATTACCCCCGTCCTAATACAAT---AGGAACTTAGGATAACCA-----AACCATGAGCCTTCAAAG
SCAP        ACAACTACCCTAATACTACCAATTACCTCAACCATAATCCAAT---AGAAACTTAGGATAATGTATTA-AACCAAGGGCCTTCAAAG
STIG        GCAGCCCTTTTAGCCCTACCAATCACCCCAATCATAACACAAT---AGAAACTTAGGATAATAC----AAACCAAGGGCCTTCAAAG
TORQ        ATAGCCCTCCTAATACTACCAATCACCCCAATTATAACCCAAT---AGAAACTTAGGATCAACACA---AACCAAGGACCTTCAAAG
VARI        ATAACCCTACTCACCCTCCCCATAACCCCAATTATTATCCAAT---AGAAACTTAGGATAACATA----AACCAGGGGCCTTCAAAG
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Taxon/Node  345678901234567890123456789012345678901234567890123456789012345678901234567890123456789
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    Uninf:        * **            * ***     **    ** ** ** * **   **  ** ****   **** ****  **    **
 Excluded:      *****     *******             ***             *******
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CROT        CCCAAAAC-AGGGGTGAAAACCCCCTAGTTTCTGCT-TAAAACCTGTGGAACACTAAACCACATCTTCTGAATGCAAATCAGACACT
OPLU        CCCTAAACGAAGCCAAGC---CCCTTAGTTCCTGC--CAAGACCTGCGAATTACTATAACGCATCAACTGAATGCAACCCAGACACT
LEIO        CCCAAAAC-AGGAGTGAAACCCCCCTAGCCCCTGA--TAAGACTTGTGATATTCTAAAACACATCTTCTGAATGCAACTCAAACACT
LIOL        TCTAAAAA-AAAGGTGCAAACCCTCTAACTCTTGA--TAAGACCTGTGTAACTCTATAACACATCTCCTGAATGCAACTCAGACACT
SCEL        CCCTAAA--AGGGACCAA-AACCCCTAGCCTCTGAC-TAAGACCTGTATAACATTACTACACATCAAATGAACGCAAATCAAACACT
ANOL        CCCAAAAT-ATGGGTTAAACACCCATAGTTTTTG---TAAGACTTGTGAAACACTATTACACATCTCCTGAATGCAACTCAAGCACT
MICR        CCCAAAAT-AGGGACAC-ACCCCCCTAGTTTCTGACATAAGACTTGCGAAACACTATAACGCATACCCTGATTGCAACTCAAGTGCT
TROE        TCCTAAAT-AGGGATC-AAC-CCCCTAGTTTCTG---CAAAACCTGTGAAACTCTA-AACACATCTCCTGAATGCAACTCAGACGCT
TROS        CTCTAAAT-AGGGACT--AC-TCCCTAATCTCTG---CAAGAC-TGCGAAATACTA-AACGCATCTCCTGAATGCAACTCAGACACT
PLIC        CCCTAAAC-AGGGACACCA--CCCCTAGTTTCTG---CAAGACCTGCGAAATACTA-AACGCATCTTCTGAATGCAACTCAAACACT
URAC        CCCTAAAT-AGGGAAG-AATCCCCCTAGTTTCTG---CAAAACCTGCGAAACACTA-AACGCATCTCCTGAATGCAACTCAGACACT
URAN        CCCTAAAC-AGGAGAA-AACACTCCTAGTTTCTGCCTTAAGACCTGCGAAATATTACAACGCAACCTCTGAATGCAACTCAGATACT
ANGE        CCCTCAAT-AGGGGCAAAACTCCCCTAGTTTCTGC--CAAGACCTGTGAAATTTTA-AACACATCACCTGAATGCAAATCAGATACT
APUR        CCCAAGAT-AGAGGAGAAACCCCTCTAGTCTCTGCCATAAGGCTTGTGAAACTCTA-AACACATCTTCTGAATGCAACTCAAACACT
AZUR        CCCAAAAT-AGAGGTGAAATTCCCCTAGTTTCTGC--TAAGACCTGTGAAATTCTA-AACACATCTCCTGAATGCAACCCAGGCACT
BOET        TCCTAAAT-AGAGAC--AGCCCCTCTAGTTTCTG---CAAGACCTGTGAAATTCTA-AACACATCTCCTGAATGCAACTCAGACACT
CADU        CCCAAAAT-AGGGGTGAAACCCCCCTAGTTTCTGC--TAAGACCTGTGAAACTCTA-AACACATCTCCTGAATGCAACTCAGACACT
CHOT        CCCTCAAC-AGGGGCGCAATCCCCCTAGTTTCTGC--TAAGACCTGTGAAATTTTA-AACACATCACCTGAATGCAAATCAAGCACT
CRAS        CCCAAAAT-AGAGACA-AACCCCTCTAGTTTCTGC--TAAGACCTGTGAAATTCTA-AACACATCTTCTGAATGCAACTCAAACACT
CUPR        CCCTAAAT-AGAGACAAACCCCCTCTAGTTTCTG---CAAGACCTGTGAAATTCTA-AACACATCTCCTGAATGCAACTCAGACACT
DOEL        CCTAAAAT-AGAGGTGAAACTCCCCTAGTTTCTGC--TAAGACCTGTGAAATTCTA-AACACATCTCCTGAATGCAACCCAGGCACT
EMPE        CCCAAAAC-AGAGATGAAACCTCTCTAGTTTCTG----AAGACCTGTGAAACTCTA-AACACATCTCCTGAATGCAACTCAGACACT
EUNE        CCCCAAAC-AGAGATGAAACCTCTCTAGTTTCTG---CAAGACCTGTGAAACTCTA-AACACATCTCCTGAATGCAACTCAAGCACT
FEST        CCCTTAAT-AGGGGCGAAACCCCCCTAGTTTCTGC-CTAAGACCTGTGAAATTTCA-AACACATCACCTGAATGCAAATCAGACACT
FORM        CCCAAAAT-AGGAGTGAAATCCCCCTAGTTTCTG---CAAGACCTGTGAAATTCTA-AACACATCTCCTGAATGCAACTCAGACACT
GUEN        CCCTTAAT-AGGGGCGAAACTCCCCTAGTTTCTGC--TAAGACCTGTGAAATTTTA-AACACATCACCTGAATGCAAATCAGATACT
HUME        CCCAAAAC-AGAGATGAAACCACTCTAGTTTCTGC--CAAGACCTGTGAAATTCTA-AACACATCTCCTGAATGCAACTCAGACACT
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Taxon/Node  345678901234567890123456789012345678901234567890123456789012345678901234567890123456789
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 Constant:        * **               **     **    **  * **         *   * **     ***  ****  **     *
    Uninf:        * **            * ***     **    ** ** ** * **   **  ** ****   **** ****  **    **
 Excluded:      *****     *******             ***             *******
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IMIT        CCCAAAAT-AGAGATGAAACTTCTCTAGTTTCTG---CAAGACCTGTGAAACTCTA-AACACATCTCTTGAATGCAACTCAAACACT
IRID        CTCATAAT-AGGGATTAAATCTCCCTAGTTTCTGAC-TAAGACCTGTGAAATTCTA-AACACATCACCTGAATGCAACTCAGACACT
LATE        CCCAAAAT-AGAGACCG--CCTCTCTAGTTTCTG---CAAGACCTGTGAAACTCTA-AACACATCTCCTGAATGCAACTCAAGCACT
LIMI        CCCAAAAT-AGGGATGAAATTACCCTAGTTTCTGC--CAAGACCTGTGAAACTTTA-AACACATCTCCTGAATGCAACTCAAGCACT
MELA        CCCAAAAC-AGAGATGTGATCTCTCTAGTTTCTG---CAAGACCTGTGAAATTCTA-AACACATCTCATGAATGCAACTCAAGCACT
OCHO        TCCAAAAT-AGAGGTGAAACCCCCCTAGTTTCTG---CAAGACCTGTGAAATTCTA-AACACATCCTCTGAATGCAACTCAGACACT
ORIE        CCCAAAAT-AGAGGTGAAACCCCCCTAGTTTCTG---TAAAACCTGTGAAATTCTA-AACACATCTCCTGAATGCAACTCAAGCACT
ORTI        CCCAAAAT-AGAGACGGAAGCCCTCTAGTTTCTG---CAAGACCTGTGAAATTCTA-AACACATCTCCTGAATGCAACTCAGACACT
ORNA        TCCAAAAT-AGAGGTGAAACCCCCCTAGTTTCTGC--TAAGACCTGTGAAATTCTA-AACACATCCCCTGAATGCAACTCAGGCGCT
PERC        TCCAAAAC-AGGAGTGAAACCCCCCTAGTTTCTG---CAAGACCTGTGAAATTCTA-AACACATCCCCTGAATGCAACTCAGATGTT
PUYA        CTCCTAAT-AGGGATGAAACCACCCTAGTTTCTGCC-TAAGACCTGTGAAATTCTA-AACACATCACCTGAATGCAACTCAGACACT
RHOD        CCCTTAAT-AGGAGTGAAACCCCCCTAGTTTCTGTT-TAAGACTTGTGAAATTCTA-AACACATCACCTGAACGCAAATCAAGCACT
ROSE        CCCAAAAT-AGGAGTAAAACTCCCCTAGTTTCTGC-CTAAAACCTGTGAAATTCTA-AACACATCTCCTGAATGCAACTCAGACACT
SCAP        CCCAAAAC-AGGGACCAAACCTCCCTAGTTTCTG---TAAGACCTGCGAAACTCTA-AACGCATCTTCTGAATGCAACTCAAACACT
STIG        CCCAAAAC-AGAGATGAAACCCCTCTAGTTTCTG---TAAGACCTGTGGAATTCTA-AACACATCTCTTGAATGCAACTCAAACACT
TORQ        CCCTAGAT-AGAGATA-AGCCCCTCTAGTTTCTGTT-TAAGACCTGTGAAATTTTA-AACACATCTCCTGAATGCAACTCAAACACT
VARI        CCCAAAAC-AGAGATGAAACCCCTCTAGTTTCTG---CAAGACCTGTGAAATCCTA-AACACATCTCCTGAATGCAACTCAAGCACT
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Taxon/Node  012345678901234567890123456789012345678901234567890123456789012345678901234567890123456
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 Constant:  **    *** * ** *  *  *          * *       **    *   *  ** **********     ** * **** ** **
    Uninf:  ***  **** * ** ** ** *   * *   **** * ** ***   * * *  ** ***********   *** * **** *****
 Excluded:   *****              *                         ******
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CROT        TTAA-TTAAGCTAAGGCCTCTCTAGATAGGAGGGCCTTGATCCCACAAAAA-TTTAGTTAACAGCTAAACACCCAATCCAGCGGGCT
OPLU        TTAA-TTAAGCTAAGGCCTCCCTAGATAGGAGGGCCTTGATCCCACGAACA-ATTAGTTAACAGCTAAACACCCAAACCAGCGGGCT
LEIO        TTAA-TTAAGCTAAAGCCTC-CAGAATAGGTGGGCCTCGATCCCACAACAC-ACTAGTTAACAGCTAATTATCCAATCCAGCGGACT
LIOL        TTAA-TTAAGCTAAGGCCTCCCTAGATAGGCGGGCCTTGATCCCACAATAA-CTTAGTTAACAGCTAAACACCCAAACCAGCGGGCT
SCEL        TTAA-TTAAGCTAAGGCCTCACTAGACAGGCGGGCCTCGATCCCGCAAAAA-ATTAATTAACAGCTAAACACCCAATCCAGCGGGCT
ANOL        TTTA-TTAAGCTAAAGCCTCACTGAATAGGCGGGCTTTGATCCCACGACAA-ATTAATTAACAGCTAATTACCCAAACCAGCGGGCT
MICR        TTAACTTAAGCTAAAGCCTC-CCAGACAGATGGGCCTCGATCCCACAAAAA-ATTAATTAACAGCTAACTACCCAAACCAGCGGGCT
TROE        TTAA-TTAAACTAAGGCTTC-CCAGACAGATGGGCCTCGATCCCACAAAA--ATTAATTAACAGCTAACTACCCAAACCAGCGGGCT
TROS        TTAA-CTAAGCTAAGGCCTCACCAGACAGATGGGCCTTGATCCCACGAAAA-ATTAATTAACAGCTAATCACCCTATCCAGCGGGCT
PLIC        TTAA-TTAAGCTAAGGCCTTCCCAGACAGATAGGCTTTGATCCTACGAAAA-ATTAATTAACAGCTAACTACCCAAACCAGCGGGCT
URAC        TTAATTTAAGCTAAGGTCTC-CCAAGAGAGTGGGCCTCGATCCCACAAAA--ACTAATTAACAGCTAGCTGCCCAAACCAGCGGGCT
URAN        TTAA-TTAAGCTAAAGCCTC-CCAGATAAATGGGCCTCGATCCCATAAAAAAATTAATTAACAGCTAACTACCCAAACCAGCGGGCT
ANGE        TTAC-TTAAGCTAAAGCCTCCCCAGACAGACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAACTACCCAAACCAGAGGGCT
APUR        TTAC-TTAAGCTAAAGCCTC-CCAGACAGACGGGCCTCGATCCCGTAAAAA-TTTAATTAACAGCTAAATACCCAAACCAGAGGGCT
AZUR        TTAA-TTAAGCTAAAGCCTC-CCAGACAAACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAATTACCCAAACCAGAGGGCT
BOET        TTAA-TTAAGCCAAGGCCTCCCCAAACAAACGGGCCTCGATCCCGTAAAAA-GTTAATTAACAGCTAACTACCCAAACCAGAGGGCT
CADU        TTAACTTAAGCTAAGGCCTCCCCAGACAAACGGGCCTTGATCCCGTAAAAA-TTTAATTAACAGCTAAACACCCAAACCAGAGGGCT
CHOT        TTAC-TTAAGCTAAAGCCTC-CCAGACAGACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAACTACCCAAACCAGAGGGCT
CRAS        TTAACTTAAGCTAAGGCCTCCCCAGACAGACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAACCACCCAAACCAGCGGGCT
CUPR        TTAA-TTAAGCCAAGGCCTCCCCAGACAGACGGGCCTCGATCCCGTAAAAA-GTTAATTAACAGCTAACTACCCAAACCAGAGGGCT
DOEL        TTAA-TTAAGCTAAAGCTTC-CCAGACAAACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAATTACCCAAACCAGAGGGCT
EMPE        TTAA-TTAAGCTAAGGCCTCCCCAGACAAACGGGCCTCGACCCCGTAAAAA-ATTAATTAACAGCTAACTACCCAAACCAGCGGGCT
EUNE        TTAA-TTAAGCTAAGGCCTCCCCAGACAAACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAATTACCCAAACCAGAGGGCT
FEST        TTAC-TTAAGCTAAAGCCTCCCCAAACAGACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAACTACCCAAACCAGCGGGCT
FORM        TTAC-TTAAGCTAAAGCCTC-CCAGACAGACGGGCCTCGATCCCGTAAAGA-TTTAATTAACAGCTAACCACCCAAACCAGAGGGCT
GUEN        TTAC-TTAAGCTAAAGCCTCCCCAGACAGACGGGCCTTGATCCCGTAAAAA-ATTAATTAACAGCTAACTACCCAAACCAGAGGGCT
HUME        TTAA-TTAAGCCAAGGCCTCACCAGACAGACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAACCACCCAAACCAGCGGGCT
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Taxon/Node  012345678901234567890123456789012345678901234567890123456789012345678901234567890123456
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 Constant:  **    *** * ** *  *  *          * *      **    *   *  ** **********     ** * **** ** **
    Uninf:  ***  **** * ** ** ** *   * *   **** * ** ***   * * *  ** ************  *** * **** *****
 Excluded:   *****              *                         ******
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IMIT        TTAACTTAAGCTAAGGCCTC-CCAGACAAACGGGCCTCGATCCCGTAAAA--ATTAATTAACAGCTAACTACCCAAACCAGAGGGCT
IRID        TTAC-TTAAGCTAAAGCCTCCCAGACAAACGGGCCTCGATCCCGTAAAAA--ATTAATTAACAGCTAACTACCCAAACCAGAGGGCT
LATE        TTAACTTAAGCTAAGGCCTC-CCAGACAAACGGGCCTCGATCCCGTAAAAA-GTTAATTAACAGCTAACCACCCAAACCAGAGGGCT
LIMI        TTAC-TTAAGCTAAGGCCTC-CCAGACAGACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAACTACCCAAACCAGAGGGCT
MELA        TTAA-TTAAGCTAAGGCCTC-CCAGACAAACGGGCCTCGATCCCGTAAAAA-GTTAATTAACAGCTAACTACCCAAACCAGAGGGCT
OCHO        TTAC-TTAAGCTAAAGCCTC-CCAGACAGACGGGCCTCGATCCCGTAAAAA-TTTAATTAACAGCTAACTACCCAAACCAGAGGGCT
ORIE        TTAA-TTAAGCTAAGGCCTC-CCAGACAAACGGGCCTCGATCCCGTAAAAA-GTTAATTAACAGCTAACTACCCAAACCAGAGGGCT
ORTI        TTAACTTAAGCTAAGGCCTCCCCAGACAAACGGGCCTCGATCCCGTAAAAA-GTTAATTAACAGCTAACTACCCAAACCAGAGGGCT
ORNA        TTAC-TTAAACTAAAGCCTC-CCAGACAAACGGGCCTTGATCCCGTAAAA--ATTAATTAACAGCTAACTGCCCAAACCAGCGGGCT
PERC        TTA-CTTAAACTAAGGCCTC-CCAGACAGACGGGCCTTGATCCCGTAAAAA-ATTAATTAACAGCTAACTACCCAAACCAGAGGGCT
PUYA        TTAATTTAAGCTAAAGCCTC-CCAGACAAACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAACTGCCCTAACCAGAGGGCT
RHOD        TTAC-TTAAGCTAAAGCCTC-CCAGACAGACGGGCCTTGATCCCGTAAAAC-ATTAATTAACAGCTAATTACCCAAACCAGCGGGCT
ROSE        TTAACTTAAGCTAAGGCCTC-CCAGACAGACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAACTACCCAAACCAGAGGGCT
SCAP        TTAC-TTAAGCTAAAGCCTC-CCAGACAGACGGGCCTCGATCCCGTAAAAA-TTTAATTAACAGCTAACTACCCAAACCAGAGGGCT
STIG        TTAATTTAAGCTAAGGCCTCCCCAGACAAACGGGCCTCGATCCCGTAAAAA-GTTAATTAACAGCTAACTACCCAAACCAGAGGGCT
TORQ        TTAACTTAAGCTAAGGCCTCCCCAGACAGACGGGCCTCGATCCCGTAAAAA-ATTAATTAACAGCTAACCACCCAAACCAGCGGGCT
VARI        TTAATTTAAGCTAAGGCCTCCCCAGACAGACGGGCCTTGATCCCGTAAAAA-ATTAATTAACAGCTAATCACCCAAACCAGCGGGCT
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Taxon/Node  789012345678901234567890123456789012345678901234567890123456789012345678901234567890123
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 Constant:  *       ***********        * ****************  *         *  *    *  ** *****  *  * **
    Uninf:  *      ************       ******************* **       * ** * *  ***** ***** *** * ***
 Excluded:         **         **********                     *******
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OPLU        TCTATCCG-CTTCTCCCGTTAGTTAAAAAACGGGAGAAGCCCCGGAGCCTATTA-GGGCTCGTCCTCGAATTTGCATTTCGATGTGA
LEIO        TCTACTCAGCTTCTCCCGTCTGGGAAA-AACGGGAGAAGCCCCGGAGCCTTAAA-GGGCTCATCCTTAAACTTGCATTTTAATGTGT
LIOL        TCTATCCG-CTTCTCCCGTTGGTAAA--AACGGGAGAAGCCCCGGAGCCTTTTG-GGGCTCGTCTTCAAACTTGCATTTTGACGTGT
SCEL        TCTGTCTG-CTTCTCCCGTCGTCAAA--AACGGGAGAAGCCCCGGGGCTCTACG-TGGCCCTACTTCAAACTTGCAATTTGATGTGT
ANOL        TCTATTCG-CTTCTCCCGTCGGTGAAGAAACGGGAGAAGCCCCGGAGCCTTTAG--GGCTCTTCTTCAAACTTGCATTTTGATGTGG
MICR        TCTATCTG-CTTCTCCCGTCGCCTTA-AGACGGGAGAAGCCCCGGGGCCGCCAC--GGCCCTTCTTCAAAGTTGCATTTTGACGTGA
TROE        TCTATCTG-CTTCTCCCGTTTTTTAGT-AACGGGAGAAGCCCCGGAGCCTTTTC-GGGCTCTTTTTCAAACTTGCAATTTGATGTGA
TROS        TCTATCTG-CTTCTCCCGTCGGTTAAA-AACGGGAGAAGCCCCGGAGCTCTTTAGGAGCTCTTTTTCAAACTTGCATTTTGACGTGG
PLIC        TCCATCTG-CTTCTCCCGTTGGAAAGA-AACGGGAGAAGCCCCGGAGCTCTATTTGAGCTCTTCTTCAAACTTGCATTTTGATGTGA
URAC        TCCATCCTGCTTCTCCCGTCAAGGAAA-AACGGGAGAAGCCCCGGGGCTCTTTA-GAGCTCTTTTTCAAATTTGCACTTTGATGTGA
URAN        TTCATCTG-CTTCTCCCGTGTTCTGAAAAACGGGAGAAGCCCCGGAGCTCTTTTTGAGCTCGGTTTCAAACTTGCAATTTGATGTGG
ANGE        TCTGCCTG-CTTCTCCCGTCGGAGAAA-AACGGGAGAAGCCCCGGAGCCTTTTA-GGGCTCGTCTTCAAACTTGCAATTTGATGTGT
APUR        TCTGCCTG-CTTCTCCCGTTGGAGAAA-AACGGGAGAAGCCCCGGAGCCCTTTT-GGGCTCGTCTTCAAACTTGCATTTTGATGTGT
AZUR        TCTGTCTG-CTTCTCCCGTTGAGAAAAAAACGGGAGAAGCCCCGGAGCCCTTTTTGGGCTCGTCTTCAAACTTGCAATTTGATGTGT
BOET        TTTGTCTG-CTTCTCCCGTTGAGAAA--AACGGGAGAAGCCCCGGAGCCCTTTATGGGCTCGTCTTCAAATTTGCAATTTGACGTGA
CADU        TCTGCCTG-CTTCTCCCGTCTGGAAAA-AACGGGAGAAGCCCCGGAGCCCTTTTGGGGCTCATCTTCAAACTTGCAATTTGATGTGT
CHOT        TCTGCCTG-CTTCTCCCGTTGAAAAAAAAACGGGAGAAGCCCCGGAGCCCTTTTTGGGCTCTTCTTCAAACTTGCAATTTGACGTGC
CRAS        TCTATCTG-CTTCTCCCGTTGAAAAAA-AACGGGAGAAGCCCCGGAGCCCTTTATGGGCTCGTCTTCAAACTTGCAATTTGACGTGG
CUPR        TCTACCTG-CTTCTCCCGTTGAAAAAAAAACGGGAGAAGCCCCGGAGCCCTTTATGGGCTCGTCTTCAAATTTGCAATTTGACGTGA
DOEL        TCTGCCTG-CTTCTCCCGTTGAAAAAA-AACGGGAGAAGCCCCGGAGCCCTTTT-GGGCTCATCTTCAAACTTGCAATTTGATGTGT
EMPE        TTTGTCTG-CTTCTCCCGTTAAAGAAAAAACGGGAGAAGCCCCGGAGCCCTTTT-GGGCTCATCTTCAAACTTGCATTTTGACGTGA
EUNE        TTTGTCTG-CTTCTCCCGTTGAGAAAA-AACGGGAGAAGCCCCGGAGCCTTTT--GGGCTCGTCTTCAAACTTGCAATTTGACGTGA
FEST        TCTGTCTG-CTTCTCCCGTTGGAGAAA-AACGGGAGAAGCCCCGGAGCCTTTTT-GGGCTCTTCTTCAAACTTGCAATTTGATGTGT
FORM        TCTGCCTG-CTTCTCCCGTTGGGGAAA-AACGGGAGAAGCCCCGGAGCCCTTTTGGGGCTCATCTTCAAATTTGCAATTTGATGTGT
GUEN        TCTGCCTG-CTTCTCCCGTTGGAGAAAAAACGGGAGAAGCCCCGGAGCCTTTTA-GGGCTCGTCTTCAAACTTGCAATTTGACGTGT
HUME        TCTATCTG-CTTCTCCCGTTGGGAAAA-AACGGGAGAAGCCCCGGAGCCTTTAT-GGGCTCGTTTTCAAACTTGCAATTTGACGTGG
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Taxon/Node  7890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123
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 Constant:  *       ***********        * *****************  *         *  *    *  ** *****  *  * **
    Uninf:  *      ************       ******************** **       * ** * *  ***** ***** *** * ***
 Excluded:         **         **********                      *******
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IMIT        TTTGTCTG-CTTCTCCCGTTGAGAAAA-AACGGGAGAAGCCCCGGAGCCCTTTTTGGGCTCTTCTTCAAACTTGCATTTTGACGTGA
IRID        TTTGCCTG-CTTCTCCCGTTGGGGAAA-AACGGGAGAAGCCCCGGAGCCCTTTGTGGGCTCATCCTCAAACTTGCAATTTGATGTGT
LATE        TTTGCCTG-CTTCTCCCGTTGAGAAAA-AACGGGAGAAGCCCCGGAGCCTTTAT-GGGCTCTTCTTCAAACTTGCAATTTGATGTGA
LIMI        TCTGCCTG-CTTCTCCCGTTGGGGGAAAAACGGGAGAAGCCCCGGAGCCCTTTA-GGGCTCATCTTCAAACTTGCAATTTAATGTGT
MELA        TCTGCCTG-CTTCTCCCGTTGAAGAAA-AACGGGAGAAGCCCCGGAGCCCCTTATGGGCTCGTTTTCAAATTTGCAATTTGACGTGA
OCHO        TCTGCCTG-CTTCTCCCGTTGGGGAAA-AACGGGAGAAGCCCCGGAGCCCTTTTGGGGCTCATCTTCAAATTTGCAACTTGATGTGA
ORIE        TTTGTCTG-CTTCTCCCGTTGGGGAAA-AACGGGAGAAGCCCCGGAGCCCTTTGTGGGCTCGTCTTCAAACTTGCAATTTGACGTGG
ORTI        TCTGCCTG-CTTCTCCCGTTGGGAAAA-AACGGGAGAAGCCCCGGAGCCCTTTATGGGCTCGTCTTCAAACTTGCAATTTGACGTGA
ORNA        TCTGCCTG-CTTCTCCCGTTAGGGAAAAAACGGGAGAAGCCCCGGAGCCTTTTG-GGGCTCATCCTCAAACTTGCAATTTGATGTGT
PERC        TCTGCCTG-CTTCTCCCGTCTGGGAAAAAACGGGAGAAGCCCCGGAGCCCTTTT-GGGCTCATCTTCAAACTTGCAATTTGATGTGT
PUYA        TTTGCCTG-CTTCTCCCGTTGGGGGAAAAACGGGAGAAGCCCCGGAGCCCTTTGTGGGCTCATCCTCAAACTTGCAATTTGATGTGG
RHOD        TCCATCTG-CTTCTCCCGTCGGAGAAA-AACGGGAGAAGCCCCGGAGCCCTTTATGGGCTCATCCTCAAACTTGCAATTTGATGTGA
ROSE        TCTGCCTG-CTTCTCCCGTTGAGAAAAAAACGGGAGAAGCCCCGGAGCCCTTTATGGGCTCATCTTCAAACTTGCAATTTGATGTGG
SCAP        TCTGCCTG-CTTCTCCCGTTGGGGAAA-AACGGGAGAAGCCCCGGAGCCCTTTATGGGCTCATCTTCAAATTTGCAGTTTGACGTAA
STIG        TCTGCCTG-CTTCTCCCGTTGGGAAAA-AACGGGAGAAGCCCCGGAGCCCTTTT-GGGCTCATTTTCAAACTTGCAATTTGACGTGA
TORQ        TCTATCTG-CTTCTCCCGTTAGAGAAAAAACGGGAGAAGCCCCGGAGCCCTTTATGGGCTCGTCTTCAAATTTGCAATTTGACGTGA
VARI        TCTATCTG-CTTCTCCCGTCTGGAAAA-AACGGGAGAAGCCCCGGAGCCCTCTT-GGGCTCGTCTTCAAACTTGCATTTTGACGTGA
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Taxon/Node  456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
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 Constant:    *** ***  *    *      *****  **             *  *       *         ****          *
    Uninf:    *** ***  *    **   ******** **  ***        *  * *     *         ****     *  ***
 Excluded:  *****             ************             *******                               ******
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CROT        TC---ACACCCCGAGGCT-----------TTGGTAAAAATAGGAATTAAACCCATCTAAATAGTTCTACAGACTACCACCTATACAC
OPLU        TA---ACACCCCGAGACT----------TATGGTAAAAAAAGGAATTAAACCTCTCTCAATAGGACTACAGCCTACCGCTTAAACAC
LEIO        TGCTTACACTACGGGGCT------------TGGTGAAGAGAGGAATTAAACCTCCATGAATAGGTCTACAGCCTACCGTCTAAACAC
LIOL        A----ACACCTCGGGACTTAAATATAGCAATGGTAAAAAGAGGAATTAAACCCCTGTTGATGGGACTACAGCCCACCACCTAAACAT
SCEL        AA---ACACCTCGAGGCTA----------CTGGTAAAAAGAGGAGTTAAACCCCTATAAATAGGACTACAGCCTACCACCTGACA-T
ANOL        A----ACACTTCGGGACT-----------TTGATAAAGAAAGGAATTAAACCAATGTAAATAGGACTACAGCCTACTGCCTAACA-C
MICR        A----CCACCTCGAGACTT-----------TGATAAAAAGAGGAATTAAACCCCTGTGGGTGAAACTACACTTCACTGCCTCAGACA
TROE        A----ACACTTCGAAGCTGCC--------ATGGTAAAAAGAGGGCTTAAACCCCTATAAACGGAGCTACAATCCGCCGCCTGCACCT
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PLIC        A----TCACTTCAGGACTCCCC-------GTGATAAAAGAGGAA-TCAAACCCC-GTTAATGAAACTACAGTCCACCGCCTAACAC-
URAC        A----ACACTTCAGGACTTC---------TTGATAAAAGGGGGAATTGAGCCCTCATTAATAGATTTACAATCTACCGCCTATCAT-
URAN        G----CCACTTCGGGGCTATG---------TGGTAAAAAGAGGAGTCAAACCCCTGTGAATGAAACTACAAACCATTGCCTGATCGC
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DOEL        AA---CCACCACGAGACTCT----------TGGTAAAAGAAAGATTCTAACTCCCCTAAACGGGATTACAGCCCGCCGCCTATGCTC
EMPE        AC---TCACCACGAGACTTT----------TGGTAAAAGAGAGACTTAAACTCCCCTTGGTGAATTTACAGCTCACCGCCTGAACCC
EUNE        AC---TCACCACGGAGCT------------TGGTAAAAGAGAGACTCTAACTCCCCTTAATGAGTTTACAACTCACCGCCTAACCC-
FEST        TA---TCACCACGAAGCT------------TGGTAAAAAGAAGACTTGAACTTCCCTCAACGGATTTACAGCCCGCCACCTGTTCTC
FORM        TA---ACACCACGAAGCTTC----------TGGTAAAGAGAAGGTTCAAACTTCCCTGGGCAGATTTACAGTCCGCCGCCTAAAC--
GUEN        TC---CCACCACGAAGCTTT----------TGGTAAAAAGAAGACTCAAACTTCCCTTGGCGGATTTACAGCCCGCCACCTATTCTC
HUME        GC---TCACCACGGGGCTT-----------TGGTAAAAGGAAGGCTCAAACTCCCCTTGGTGGGATTACAGCCCACCGCCTAAACTC
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Taxon/Node  45678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
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 Constant:    *** ***  *    *      *****  **             *  *        *         ****          *
    Uninf:    *** ***  *    **   ******** **  ***        *  * *      *         ****     *  ***
 Excluded:  *****             ************             *******                              ******
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IMIT        C----TCACCCCGGGACCC-----------TGATAAAAGGAAGACTTAAACTTCCCTTGATGAGTTTACAACTCACCGCCTAGACCC
IRID        TC---TCACCACGAAGCTTTT---------TGGTAAAAGGAGA-CTA---TCTCCGTAAACGAATTTACAGCTCGCCACCTAAACTC
LATE        AC---TCACCACGGGACTT----------CTGGTAAAAGAGAGGCTC-AACTCCCCTGAATGAATTTACAGCTCACCGCCTAAC---
LIMI        CA---CCACCACGGAACTT----------CTGGTAAAAAGGAGATTCAAACTCCCATAAACAAATTTACAGTCCACCGCCTAATCC-
MELA        AC---TCACCACGGAGCTTG----------TGGTAAAGGAGAGACTCAAACTCCCCTTGATGAGTTTACAACTCACCGCCTAA-CCC
OCHO        TA---ACACTACGAAGCTTC----------TGGTAAAAAGAAGATTCAAACTTCCCTAGGCGAATTTACAATCCGCCGCCTACTAC-
ORIE        AC---TCACTACGGAGCTTC----------TGGTAAAAGAGAGACTTAAACTCCCCTTAATGAATTTACAGCTCACCGCCTAGACCC
ORTI        AC---TCACTACGAAGCTTC----------TGGTAAAAAAGAGACTCAAACTCCCCTGAATGAATTTACAACTCACCGCCTAATCCC
ORNA        TC---TCACCACGAAGCTTC----------TGGTAAAAAGGAGACTTAAACTCCTCTTAGCGAATTTACAATCCGCCACCTAAACTC
PERC        CA---TCACCACGAAGCTTC----------TGGTAAAAGGAAGACTTAAACTCCCCTTGACGAATTTACAATCCGCCGCCTAATCTC
PUYA        TT---TCACTACGAAGCTTC----------TGGTAAAAGGAGGGG--GA-CCTCCGTAAGCGAATTTACAGCTCGCCACCTAAACTC
RHOD        TC---TCACCACGGAACTC-----------TGGTAAAAAGAAGACTTGAACTTCCGTTAACAGATTTACAGTCTGCCGCCTACCCTC
ROSE        TG---TCACCTCGAAGCTCC----------TGGTAAAAGAGAGACTTGAACTCCCCTTAACGAATTTACAATCCACCGCCTATACTC
SCAP        TC---TCACCACGGGACTTG----------TGGTAAAGGGAAGACTTAA-CCCCCATAAACGAATTTACAATTCGCCACCTATTC--
STIG        AC---TCACCACGAAGCTTTTA--------TGGTAAAAGAGAGACTTAAACTCCCCTCAGTGAGTTTACAGCTCACCGCCTAAACCC
TORQ        AC---TCACCACGAAGCTC-----------TGGTAAAAGGAAGACTCGAACTCCCGTTGGTGAATTTACAGCTCACCGCCTAAACTC
VARI        TC---TCACCACGAGGCTCTT--------TTGGTAAAAGGGAGACTTAAACTCCCCTTGGTGAGTTTACAGCTCACCGCCTAACCC-
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Taxon/Node  1234567890123456789012345678901234567890123456
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    Uninf:  *** * **   ****  ***  ** *  ****** * ** *****
 Excluded:  *
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CROT        -TCGGCCATTTTACCTGTGTCCATTACCCGTTGATTCTTCTCAACC
OPLU        -TCAGCCATTTTACCTGTGTTTATTAATCGTTGATTTTTCTCAACA
LEIO        -TCGACCACTTTACCTGTGTTCATTACCCGTTGACTATTTTCAACC
LIOL        -TCGGTCATTTTACCCGTGTCTATTAATCGTTGATTCTTCTCAACT
SCEL        -TCGGCCATTTTACCTGTGTCCATTAACCGTTGATTTTTCTCAACA
ANOL        -TCGGCTACTTTACCTGTGTTTATTAACCGTTGATTCTTCTCAACC
MICR        TTCGGCCATTTTACCCGTGTCCATTAATCGTTGATTCTTCTCAACC
TROE        -TCGGCCACTTTACCTGTGTTTATCAATCGTTGACTATTCTCAACC
TROS        -TCGGTCATTTTACCTATGTTTATCAATCGTTGACTATTTTCAACC
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ANGE        CTCGGCCACTTTACCTGTGTTTATTAATCGTTGATTTTTCTCAACC
APUR        -TCGGCCACTTTACCTGTGTTTATCTCCCGTTGATTCTTCTCAACC
AZUR        -TCGGCCACTTTACCTGTGTTTATTAACCGTTGATTCTTCTCAACT
BOET        -TCGGCCACTTTACCAGTGTTTATCAATCGTTGACTATTCTCAACT
CADU        -TCGGCCACCTTACCTATGTTTATAAATCGTTGACTTTTCTCAACC
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GUEN        -TCGGCCACTTTACCTGTGTTTATTAATCGTTGATTTTTCTCAACC
HUME        -TCGGCCATTTTACCTGTGTTTATCAATCGTTGACTCTTCTCAACC
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ORIE        -TCGGCCACTTTACCTGTGTTTATTAATCGTTGACTCTTCTCAACC
ORTI        -TCGGCCACTTTACCTGTGTTTATTAACCGTTGATTTTTCTCAACC
ORNA        -TCGGCCACTTTACCTGTGTTCATCAATCGTTGACTCTTCTCAACC
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PUYA        -TCGGCCACTTTACCTGTGTTTATCACCCGTTGACTATTCTCAACC
RHOD        -TCGGCCACTTTACCTGTGTCTATCAATCGTTGATTTTTCTCAACC
ROSE        -TCGGCCATTTTACCTGTGTTTATCAATCGTTGATTTTTCTCAACC
SCAP        -TCGGCCACTTTACCTGTGTTCATTAACCGTTGATTTTTCTCAACT
STIG        -TCGGCCACTTTACCTGTGTTTATTAACCGTTGACTCTTCTCAACC
TORQ        -TCGGCCACCTTACCCGTGTTTATCAATCGTTGACTCTTCTCAACC
VARI        -TCGGCCATTTTACCCGTGTTCATCAATCGTTGACTATTCTCAACC
```

APPENDIX II

MORPHOLOGICAL TRANSFORMATION SERIES CODED FOR 55 INGROUP TAXA AND ONE OUTGROUP TAXON.

MICR = *Microlophus atacamensis*, ACUL = *Stenocercus aculeatus*, ANGE = *S. angel*, APUR = *S. apurimacus*, AZUR = *S. azureus*, BOET = *S. boettgeri*, BOLI = *S. bolivarensis*, CADU = *S. caducus*, CARR = *S. carrioni*, CHLO = *S. chlorostictus*, CHOT = *S. chota*, CHRY = *S. chrysopygus*, CRAS = *S. crassicaudatus*, CUPR = *S. cupreus*, DOEL = *S. doellojuradoi*, DUME = *S. dumerilii*, EMPE = *S. empetrus*, ERYT = *S. erythrogaster*, EUNE = *S. eunetopsis*, FEST = *S. festae*, FIMB = *S. fimbriatus*, FORM = *S. formosus*, FRIT = *S. frittsi*, GUEN = *S. guentheri*, HAEN = *S. haenschi*, HUAN = *S. huancabambae*, HUME = *S. humeralis*, IMIT = *S. imitator*, IRID = *S. iridescens*, IVIT = *S. ivitus*, LACH = *S. lache*, LATE = *S. latebrosus*, LIMI = *S. limitaris*, MARM = *S. marmoratus*, MELA = *S. melanopygus*, MOES = *S. modestus*, NIGR = *S. nigromaculatus*, NUBI = *S. nubicola*, OCHO = *S. ochoai*, ORIE = *S. orientalis*, ORTI = *S. ornatissimus*, ORNA = *S. ornatus*, PECT = *S. pectinatus*, PERC = *S. percultus*, PRAE = *S. praeornatus*, PRIO = *S. prionotus*, PUYA = *S. puyango*, RHOD = *S. rhodomelas*, ROSE = *S. roseiventris*, SCAP = *S. scapularis*, SIMO = *S. simonsii*, STIG = *S. stigmosus*, TORQ = *S. torquatus*, TRAC = *S. trachycephalus*, VARB = *S. variabilis*, VARI = *S. varius*. Uninf = uniformative characters.

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APPENDIX III

FLUID-PRESERVED SPECIMENS EXAMINED

Stenocercus aculeatus.—**ECUADOR**: ***Provincia Morona Santiago***: Chiguaza, 2°1'0"S, 77°58'0"W, 1077 m, USNM 200882; Macas, Río Yagupi, 2°19'0"S, 78°7'0"W, 1214 m, USNM 200880; Macas, Río Yagupi, 2°19'0"S, 78°7'0"W, 1214 m, USNM 200881. ***Provincia Pastaza***: 10 km E Veracruz, 1°30'0"S, 77°54'59"W, 997 m, USNM 200889; 10 km E Veracruz, 1°30'0"S, 77°54'59"W, 997 m, USNM 200890; 2.5 km downstream Río Bobonaza headwaters, 1°28'0"S, 77°53'0"W, 652 m, USNM 200885; 3 km S Puyo, 1°30'0"S, 77°58'0"W, 920 m, KU 127094; Abitagua, 1°25'0"S, 78°10'0"W, 1200 m, FMNH 25804–5, 26892, 28011–12; Canelos, 1°34'59"S, 77°45'0"W, 631 m, MCZ 38530; Mera, 1°28'0"S, 78°7'60"W, 1123 m, EPN 1153, 4050–51, 8620; Montalvo, Río Bobonaza, 2°4'0"S, 76°58'0"W, 266 m, USNM 200892; near Arajuno, 1°13'60"S, 77°40'0"W, 537 m, USNM 200898; Palanda, E Sarayacu, 1°44'0"S, 77°29'0"W, USNM 200897; Puyo, 1°28'0"S, 77°58'59"W, 981 m, USNM 200891; Puyo, Santana, EPN 6499, 6505; Río Bobonaza headwaters, 1°28'0"S, 77°53'0"W, USNM 200886–8; Río Licuna, tributary of Río Villano, USNM 200896; Río Liguino, USNM 200899; Río Oglán Alto, USNM 200893; Río Pastaza, Alpayaca, MCZ 8061; Río Pucuyacu, USNM 200895; Río Solís, EPN 5902–4; Río Villano, USNM 200894; Veracruz, 1°30'0"S, 77°56'0"W, 950 m, KU 121092. ***Provincia Tungurahua***: Río Negro, 1°24'0"S, 78°12'0"W, QCAZ 1635. ***No specific locality***: AMNH 5821, ZMB 16594. **PERU**: ***Departamento***

La Libertad: Pampa Seca, Río Mixiollo valley, upper Huallaga region, AMNH 57085. ***Departamento Loreto***: front range btw Moyobamba & Cahuapanas, 1000 m, AMNH 57083; Icuta, on trail Balsapuerto-Moyobamba, 1061 m, AMNH 56413. ***Departamento San Martín***: Moyobamba, 6°2'60"S, 76°58'0"W, 723 m, BMNH 1946.8.12.33–34 (**syntypes**).

Stenocercus angel.—**COLOMBIA**: ***Departamento Nariño***: 2 km S Tangua, 1°4'45"N, 77°24'53"W, 2300 m, ICN 4218; 3 km N Tangua, 1°7'28"N, 77°24'53"W, 2300 m, ICN 4214–17; Funes, 1°0'0"N, 77°27'0"W, 2044 m, ICN 4221; Hacienda La Joya, NE Funes, ICN 4219; La Joya, Funes, 1°0'0"N, 77°27'0"W, 2044 m, MCZ 159591–2; Laguna de Cumbal, ICN 2227; Pasto, 1°12'49"N, 77°16'52"W, 3040 m, ICN 4220; no specific locality, ICN 4222–3, 9041–3, UV 11167, UV 11169. **ECUADOR**: ***Provincia Carchi***: 10 km WNW El Carmelo, 0°42'5"N, 77°43'0"W, 3182 m, USNM 201218–9; 13.6 km W Tulcán on road Tulcán-Tufiño, 0°49'0"N, 77°49'0"W, 3040 m, QCAZ 3792 (**paratype**); 8 km NE El Angel on road El Angel-Tulcán, 0°40'0"N, 77°52'0"W, 3560 m, 3732 (**paratype**), 3733 (**holotype**), 4117–9 (**paratypes**); ca. 2 km (by road) SW of Cocha Seca, 0°38'25"N, 77°40'50"W, 3770 m, USNM 325114, 325112; El Angel, 0°37'0"N, 77°56'0"W, 3015 m, QCAZ 1358 (**paratype**); Estación Biológica Guanderas, QCAZ 3777 (**paratype**). ***Provincia Sucumbíos***: Caldera of Páramo Mirador, 3700 m, USNM 325113; El Playón de San Francisco, 0°37'59"N, 77°37'0"W, 3300 m, QCAZ 1322 (**paratype**).

Stenocercus apurimacus.—**PERU**: ***Departamento Apurimac***: Carahuasi, 13°32'26"S, 72°41'39"W, 2700 m, KU 134244; Hacienda Matara, 13°45'0"S, 72°54'0"W, MCZ 62253; Provincia Gran, Villacabamba, 14°4'32"S, 72°37'33"W, MCZ 156900; Puente Pachachaca, 13°25'30"S, 73°8'46"W, 1800 m, KU 134270–72, 134277, 134279–83, 134285–96, 134298, 134300–3, 134305, 134307 (**paratypes**). ***Departamento Ayacucho***: Ocros, Hacienda Pajonal, 12°39'0"S, 73°55'0"W, 2000 m, FMNH 81496–97, 81411, 81420. ***Departamento Cusco***: 8 km E Puente Cunyac, 13°33'0"S, 72°38'0"W, 2300 m, KU 134261.

Stenocercus azureus.—**BRAZIL**: ***Estado Paraná***: no specific locality, AMNH 131858. ***Estado Rio Grande do Sul***: Cruz Alta, 28°38'60"S, 53°36'0"W, 378 m, MCZ 133257; no specific locality, BMNH 85.2.3.3. **URUGUAY**: ***Departamento Cerro Largo***: no specific locality, USNM 65535. ***Departamento Soriano***: no specific locality, BMNH 74.10.9.5. ***No specific locality***: AMNH 17013.

Stenocercus boettgeri.—**PERU**: ***Departamento Huánuco***: Divisoria, 9°3'0"S, 75°35'0"W, FMNH 56058–60; Hacienda Pampayacu, MCZ 43765. ***Departamento Junín***: Chanchamayo, MCZ 45881; Huachon, MCZ 45842. ***Departamento Pasco***: 1–3 km NE Paucartambo, 10°52'14"S, 75°56'13"W, 2920 m, KU 139476–7; Auquimarca, 10°44'58.4"S, 75°42'20.7"W, 2600 m, MTD 45226; Huancabamba, 10°20'60"S, 75°31'60"W, 2686 m, AMNH 5279, 13504–9, 13502–3, BMNH 1946.8.11.92–93 (**syntypes**), FMNH 3945–6, MCZ 8085, UMMZ 51277; María Teresa (km 19 on road Yaupi-Oxapampa), 10°42'5.6"S, 75°27'22.2"W, 1470 m, MTD 46357; Oxapampa, 10°34'0"S, 75°24'0"W, 3025 m, AMNH 13625–8; Paucartambo, 10°52'59"S, 75°56'59"W, 3000 m, KU 134011–3, 134015–7. ***In error***: *Departamento*

Madre de Dios: Buena Vista, Valle de Chimchao, 11°31'0"S, 69°46'0"W, 303 m, FMNH 5584–86.

Stenocercus bolivarensis.—**COLOMBIA**: ***Departamento Cauca***: Bolívar, 1°58'15"N, 76°58'10"W, 1101 m, MCZ 151477; Municipio Bolívar, 1800 m, AMNH 130551; surroundings of Municipio Bolívar, 1°50'0"N, 76°58'0"W, 1650–1750 m, ICN 4205, 4207–9 (**paratypes**), 4210 (**holotype**), 4211 (**paratype**), KU 181994, 182812 (**paratype**), UV 5152, 13983.

Stenocercus caducus.—**BOLIVIA**: ***Departamento Beni***: 6 km W Casarabe, 14°48'0"S, 64°17'21"W, 230 m, AMNH 143054. ***Departamento Chuquisaca***: Sud Cinti, trail from Rinconada Bufete to El Palmer, 20°50'0"S, 64°21'0"W, 1170–2000 m, UTA 39102. ***Departamento Cochabamba***: 6.5 km N Chipiri, 260 m, KU 133890; no specific locality, BMNH 1946.8.29.76. ***Departamento Santa Cruz***: Buena Vista, 17°27'0"S, 63°40'0"W, 450 m, FMNH 16165, 21486, 21511, 37813–4, MCZ 20625, 29023, BMNH 1927.8.1.163; Chiquitos, Cantón-El Cerro, Finca Dos Milanos, 17°27'30"S, 62°20'0"W, UTA 38046; Santiago, Serranía and nearby, 18°19'0"S, 59°34'0"W, 700–750 m, FMNH 195983; Velasco, El Refugio, UTA 38047; Velasco, Inselburgs near Florida, 14°38'0"S, 61°15'0"W, UTA 38048. ***Departamento Tarija***: Villa Montes, 21°15'0"S, 63°30'0"W, 450 m, KU 136354–5. ***Departamento Alto Paraguay***: Parque Nacional Defensores del Chaco, 15 km N Tribu Nueva, Cerro León, USNM 347911; Primavera, BMNH 1960.1.2.62. ***Departamento Amambay***: Estancia Paicuara, ca. 47 km W Capitán Bado, 3 km S Cerro Guaqu at Arroyo Blanco, 23°13'0"S, 55°57'0"W, USNM 342020; Parque Nacional Cerro Cora, ca. 32

km WSW Pedro Juan Caballero, 22°38'0"S, 56°3'30"W, USNM 342019. ***Departamento Caaguazu***: Pastoreo, 25°23'0"S, 55°52'0"W, MCZ 34214–5. ***Departamento Canindeyu***: Colonia Chupa Pou, apx. 35 km NE (or NW) Curuguaty, AMNH 143306–11. ***Departamento Central***: Asunción, 25°16'0"S, 57°40'0"W, 54 m, BMNH 94.3.14.4, FMNH 9496; Colonia Nueva Italia, 25°37'0"S, 57°30'0"W, 129 m, FMNH 42281. ***Departamento Itapua***: Parabel, KU 290963. ***Departamento Paraguari***: Parque Nacional Ybycui, 1 km E Administración, 26°1'0"S, 57°3'0"W, USNM 342021–3. ***No specific locality***: USNM 5852 (**holotype**), 69874. **NO SPECIFIC LOCALITY**: SDSU 1689–90.

Stenocercus carrioni.—**ECUADOR**: ***Provincia El Oro***: Llano de Guavos, Cordillera Chilla, AMNH 18308. ***Provincia Loja***: 10 km N Celica, 4°3'0"S, 79°58'0"W, 1900 m, MCZ 93589; Alamor, 4°2'0"S, 80°2'0"W, 1325 m, AMNH 21847, 22136–7, 22140, 22154, 22156, 22169–70, 22172–3, 22175, 22177, 22187, 22192–7, 22199, 22201–2, 22207–8, 22210; Guainche, 8 km S Alamor, 4°6'20"S, 80°2'0"W, AMNH 22120; Río Lunamá, E Cerro Guachanamá, AMNH 22185; Seboyal, 8 km NW Alamor, 3°59'0"S, 80°5'0"W, AMNH 21848.

Stenocercus chlorostictus.—**PERU**: ***Departamento Piura***: 15 km E Canchaque on Huancabamba road, 5°24'0"S, 79°27'53"W, 1740 m, SDSU 1535 (**paratype**).

Stenocercus chota.—**ECUADOR**: ***Provincia Carchi***: Valle del Chota, USNM 201161–72, 201175–8, 201180–1, 201183–4, 201187–9, 201194–6; La Concepción, 0°35'0"N, 78°7'0"W, 1575 m, MZUT R2154.1–5, R2154.25–29 (**paratypes**); Río

Chota, near village El Chota, 0°28'0"N, 78°4'0"W, 1580 m, USNM 211338, 211340, 211345, 211347, 211349. ***Provincia Esmeraldas***: Río Cachabí, EPN 5858–5860, 5862–5864 (**paratypes**). ***Provincia Imbabura***: 5 km E Chota on Panamerican hwy, 0°28'0"N, 78°1'0"W, QCAZ 2768 (**paratype**), 3755 (**paratype**), 3757 (**paratype**), 3762–3767 (**paratypes**), 3769–3776 (**paratypes**), 3768 (**holotype**); 6.5 km E Panamerican hwy on road Ambuquí-Monte Olivo, 0°25'0"N, 77°55'0"W, 1940 m, QCAZ 806, 897–902, 3791, 3794 (**paratypes**); Ambuquí, 0°27'0"N, 78°1'0"W, 1780 m, QCAZ 799 (**paratype**); Chota, 0°28'0"N, 78°4'0"W, QCAZ 2654–5, 2773–2778 (**paratypes**); El Juncal, Valle del Chota, USNM 201197, 201200, 201202, 201204; Palma Real, 0°20'0"N, 78°56'0"W, 574 m, USNM 201131–2; Salinas, 0°30'0"N, 78°8'0"W, QCAZ 4162; Tumbabiro, 0°28'0"N, 78°12'0"W, QCAZ 4161; surroundings of Yaguarcocha, EPN 5848 (**paratype**).

Stenocercus chrysopygus.—**PERU**: ***Departamento Ancash***: 5 km N Recuay, 9°43'0"S, 77°25'19"W, 3450 m, KU 133918–54; Caraz, 9°3'59"S, 77°48'59"W, 2265 m, BMNH 1946.8.9.33–4 (**syntypes**), KU 133915–7; Chavín de Huantar, 9°34'59"S, 77°15'0"W, 3230 m, KU 134334–50; Chiquián, 10°8'59"S, 77°11'0"W, 3200 m, KU 134320–33, 134509; Huaraz, 9°31'59"S, 77°31'59"W, 3200 m, BMNH 1946.8.11.84 (**syntype**), KU 133891–4, 133896–905, 133907–14; Recuay, 9°43'0"S, 77°28'0"W, 3400 m, BMNH 1946.8.5.98 (**syntype**). ***Departamento Huánuco***: 5 km NE La Unión, 9°44'5"S, 76°46'4"W, 3100 m, KU 134310–9.

Stenocercus crassicaudatus.—**PERU**: ***Departamento Cusco***: Huadquiña, 13°7'0"S, 72°39'0"W, 2027 m, USNM 49550; Machu Picchu, 13°9'30"S, 72°31'53"W, 2404 m, KU 133955–71, 139264–66, 163596–601; Río Cosireni, near Yuvini, 12°33'0"S, 73°4'0"W, 1500 m, USNM 60731–32; San Fernando, 13°1'59"S, 73°12'0"W, 1500 m, USNM 60710, 60712; Santa Ana, 12°52'0"S, 72°43'0"W, 1060 m, USNM 60725.

Stenocercus cupreus.—**PERU**: ***Departamento Huánuco***: 5 km N La Esperanza, 9°26'31"S, 75°59'57"W, 1900 m, KU 133994; Ambo, 10°7'51"S, 76°12'17"W, 1900 m, FMNH 5612–3; Huánuco, 9°56'0"S, 76°14'0"W, 1900 m, AMNH 63474, BMNH 76.7.4.4 (**holotype**), FMNH 3547, 16169, 16171, 16179, KU 133972–3, 133975, 133977–93, 133995–9, MCZ 43790–2; Pachachupán, slightly above Acomayo, Huánuco-Tingo María road, 9°45'0"S, 76°6'0"W, 2300 m, USNM 193681; W Ichocán, MTD 44380.

Stenocercus doellojuradoi.—**ARGENTINA**: ***Provincia Córdoba***: Departamento Cruz del Eje, El Brete, 30°40'0"S, 64°54'0"W, 404 m, SDSU 3646; Departamento Pocho, border with Provincia La Rioja on route 20, SDSU 3645; Departamento Tulumba, Lucio V. Mansilla, 29°48'0"S, 64°43'0"W, 194 m, FML 2680. ***Provincia Formosa***: Departamento Matacos, Ingeniero G. Juárez surroundings, 23°53'60"S, 61°51'0"W, 154 m, FML 8285. ***Provincia Salta***: Departamento Anta, Finca Los Colorados centro, 100 km NE Joaquín V. González, 24°26'42"S, 63°28'56"W, FML 2708–1, 3099, 3106, 3152, 3189, 3390, 6320; Departamento Anta, Finca Los Colorados, 97 km NE Joaquín V. González, 24°27'51"S, 63°30'12"W, FML 2953; Departamento Anta, Finca Los Colorados, campo grande, 100 km NE Joaquín V. González, 24°26'42"S, 63°28'56"W, FML 3137, 6536, 6544, 6548, 6561–2, 6706;

Departamento Anta, Finca Pozo Largo, 12 km E Finca San Javier, 8 km S Joaquín V. González, 25°9'20"S, 64°10'60"W, FML 3767. ***Provincia Santiago del Estero***: Departamento Figueroa, Caspi Corral, 27°22'0"S, 63°31'60"W, 151 m, AMNH 140450, FML 1347 (3 specimens); Departamento Figueroa, Caspi Corral-Bandera Bajada, FML 1082; no specific locality, USNM 166542. ***Provincia Tucumán***: Departamento Trancas, Choromoro, 26°23'60"S, 65°19'60"W, 815 m, FML 2629; Departamento Trancas, Uturunco, 4 km to Sierra de Medina, 26°13'60"S, 65°7'0"W, 1042 m, FML 3521 (2 specimens). **NO SPECIFIC LOCALITY**: SDSU 1678.

Stenocercus dumerilii.—**BRAZIL**: ***Estado Pará***: Igarape-Assu, 1°7'0"S, 47°37'0"W, 16 m, BMNH 1904.7.26.5; km 23 road to Maracanã (PA-127), 0°59'0"S, 47°30'0"W, MPEG 6032, 6036, 6082–3, 6085, 6252, 6254, 7322–23, 7325, 7327–8; Vigia, Santa Rosa (PA-140), Estrada da Vigia, 0°57'0"S, 48°10'0"W, MPEG 7376, 7386.

Stenocercus empetrus.—**PERU**: ***Departamento Cajamarca***: 10 km SSE Namora, 7°15'0"S, 78°19'0"W, KU 212633; 12 km S Cajamarca, N slope Abra El Gavilán, 7°13'30"S, 78°29'30"W, KU 181905–7; 13 km N San Juan, S slope Abra El Gavilán, 7°15'0"S, 78°28'20"W, KU 181909; 15 km SW Encanada, 7°8'15"S, 78°22'30"W, 3110 m, MCZ 172059; 2 km NW Namora, 7°10'35"S, 78°20'30"W, KU 212634–5; 3 km E Celendín, 6°50'0"S, 78°7'0"W, KU 134414, 134423–4; 9 km S Celendin, 6°55'0"S, 78°7'30"W, KU 212636; Baños, 7°10'0"S, 78°28'0"W, MCZ 8084; Cajamarca, 7°10'0"S, 78°31'0"W, 2800 m, FMNH 3942; no specific locality FMNH 5710. ***Departamento La Libertad***: Huamachuco, 7°48'0"S, 78°4'0"W, 3350 m, AMNH 116328–9, KU 134380–91 (**paratypes**), 134394 (**holotype**), 134395–400 (**paratypes**); Laguna Sacsacocha, 12 km E Huamachuco, 7°47'30"S, 77°59'15"W, KU 134406; Otuzco, 7°54'0"S, 78°34'59"W, FMNH 5708.

Stenocercus erythrogaster.—**COLOMBIA**: ***Departamento Bolívar***: Carmen de Bolívar, 9°43'20"N, 75°7'59"W, 153 m, ICN 4224; San Juan Nepomuceno, Vereda Los Chivos, 9°57'24"N, 75°5'12"W, 142 m, ICN (number not assigned). ***Departamento El César***: El Limón, 9°34'0"N, 74°0'0"W, 91 m, ICN 7950, 7973; La Victoria de San Isidro, 9°35'7"N, 73°11'8"W, 393 m, ICN 7970, 7972; Santa Marta mountains, Valencia, 10°18'0"N, 73°24'0"W, 182 m, UMMZ 54740. ***Departamento Magdalena***: Parque Nacional Natural Tairona, El Cedro, 9°56'60"N, 74°38'39"W, 360–420 m, ICN 9098–9, IND-R 0269; Río Frío, 10°55'0"N, 74°10'0"W, 43 m, MCZ 29707; Río Toribio, Hacienda Papare, second river on road Ciénega-Santa Marta, 11°3'0"N, 74°13'60"W, 17 m, FMNH 165153; Santa Marta mountains, MCZ 11303; Santa Marta mountains, between Mamatoca and La Tigrera, UMMZ 45468; Santa Marta mountains, near Bolívar, 10°20'60"N, 74°9'0"W, 125 m, UMMZ 54739; Santa Marta mountains, Río Tamocal, UMMZ 45466.

Stenocercus eunetopsis.—**PERU**: ***Departamento Cajamarca***: 1 km S (airline) Udima, 6°48'46"S, 79°5'8"W, MCZ 176917–8 (=ANSP 31755–6, respectively; **paratypes**); 1 km SSW Udima, Río Udima (tributary of Río Zaña), 6°48'46"S, 79°5'8"W, 2500 m, FMNH 232534–6 (**paratypes**), 232537 (**holotype**), 232538 (**paratype**), 232540–2 (**paratypes**), 232544–54 (**paratypes**), 232573 (**paratype**).

Stenocercus festae.—**ECUADOR**: ***Provincia Azuay***: 1 km SE Cuenca, 2°54'0"S, 78°59'0"W, USNM 20121–3; 3.2 km E Sigsig, Sigsig-Shuso road, Río Santa Bárbara, 3°1'0"S, 78°47'0"W, 2450 m, QCAZ 3789; 4 km E Cuenca, 2°53'0"S, 78°58'0"W, 2540 m, KU 134574–134579, 134582, 134583, 134585–134592, 134594; 4 km W San Cristóbal, 2°50'0"S, 78°52'0"W, 2500 m, KU 121095; 6 km N Cuenca, 2°51'0"S, 78°56'0"W, 2612 m, AMNH 91819, 91823; Contrayerbas, W Cuenca, 2°47'60"S, 79°16'60"W, 3957 m, AMNH 23439, 23441–4; Cuenca, 2°53'0"S, 78°59'0"W, 2530 m, UDAR 11, USNM 201208–10; Sigsig, 3°3'0"S, 78°48'0"W, QCAZ 5599; Laguna Zurucuchu, 3200 m, KU 121094; Sevilla de Oro, 02˚48' S, 78˚39' W, 2630 m, QCAZ 4059 (**neotype**); Sigsig-Shiguinda road, 3200 m, QCAZ 1337; Sinincay, 2°49'60"S, 79°0'0"W, 2515 m, AMNH 23416, 23419, 23421, 23436, 23448–53; Ucubamba, 02˚52' S, 78˚54' W, 2530 m, UDAR 5; no specific locality, USNM 201222–3. ***Provincia Cañar***: 3 km S Azogues, 2°46'0"S, 78°51'0"W, 2500 m, KU 134602, 134604–134607, 134609; Cañar, 2°33'0"S, 78°56'0"W, QCAZ 1409; Cebadas, Pacupala, EPN 2700; La Carbonería, 2°30'0"S, 79°1'0"W, QCAZ 3117; Laguna Culebrillas, 2°25'0"S, 78°51'0"W, QCAZ 1346–48. ***Provincia El Oro***: Salvias, 3°45'0"S, 79°40'0"W, 1050 m, AMNH 18313–4. ***Provincia Loja***: 14 km NE Urdaneta, 3°32'3"S, 79°10'33"W, 3050 m, KU 179419; Chuquiribamba, 3°50'0"S, 79°20'0"W, 2700 m, QCAZ 1340; Loja, 3°59'45"S, 79°11'58"W, 2064 m, QCAZ 1367; Loja-Zamora road, QCAZ 5526–7; Manú, 3°29'0"S, 79°24'0"W, 2200 m, QCAZ 3599–602; Saraguro, 3°36'0"S, 79°13'0"W, 2500 m, KU 134120, 134122–134126, QCAZ 3113. ***Provincia Zamora-Chinchipe***: Cajanuma, Sendero Mirador, QCAZ 4039. ***No specific locality***: Llapín, 8 km S Mollendo, 3151 m, AMNH 23422–4.

Stenocercus fimbriatus.—**PERU**: ***Departamento La Libertad***: La Piñita, Río Mixiolla, tributary of upper Río Huallaga, 8°16'0"S, 76°58'0"W, 1067 m, AMNH 56797–8 (**paratypes**); ***Departamento Loreto***: Contamana, Río Ucayali valley, 7°15'0"S, 74°54'0"W, 134 m, AMNH 56803 (**paratype**); E Contamana on trail to Contaya, 7°15'0"S, 74°54'0"W, 213 m, AMNH 56781–2 (**paratypes**); Iquitos, 3°44'53"S, 73°14'50"W, 100 m, AMNH 56786–7, 56793 (**paratypes**); Mishana, 3°53'0"S, 73°27'0"W, 150 m, KU 212628; Pampa Hermosa, mouth of Río Cushabatay, 7°12'0"S, 75°17'0"W, 152 m, AMNH 56788, 56790–1, 56794–6, 56801–2 (**paratypes**); Río Itaya, Iquitos region, 3°44'53"S, 73°14'50"W, 100 m, AMNH 56778–80, 56783–4 (**paratypes**). ***Departamento Ucayali***: Alto Río Purús, Alto Río Curanja, Igarape Champuiaco, 9°34'0"S, 70°36'0"W, MCZ 61226 (**paratype**); Peru-Brazil border, Utoquinia region, 8°0'0"S, 74°0'0"W, 305 m, AMNH 56789, 56799–800 (**paratype**). **NO SPECIFIC LOCALITY**: FMNH 56070.

Stenocercus formosus.—**PERU**: ***Departamento Junín***: Chanchamayo, MCZ 11295; La Merced, Río Perené, 11°3'0"S, 75°19'0"W, 985 m, BMNH 1946.8.29.81–2; San Ramón, 11°8'0"S, 75°20'0"W, 800 m, FMNH 40588, 40590–4; San Ramón, Río Chanchamayo, Pichita, FML 335. ***Departamento Pasco***: María Teresa (km 19 on road Yaupi-Oxapampa), 10°42'5.6"S, 75°27'22.2"W, 1470 m, MTD 46278; Río Paucartambo, Yaupi, 10°44'30"S, 75°32'0"W, 1600 m, KU 134109, 134111–5. **NO SPECIFIC LOCALITY**: SDSU 1688.

Stenocercus frittsi.—**PERU**: ***Departamento Ayacucho***: 20 km N Ayacucho, 13°9'29"S, 74°13'26"W, KU 134208–10 (**paratypes**); 4 km N Ayacucho, 13°9'29"S, 74°13'26"W, KU 134211–12 (**paratypes**); Ayacucho, 13°9'29"S, 74°13'26"W, 2804 m, KU 134199–207, 134215–23 (**paratypes**); vicinity of Ayacucho, USNM 306935–40 (**paratypes**). ***Departamento Huancavelica***: Izcuchaca, 12°29'0"S, 75°1'0"W, 3327 m, KU 134191–92 (**paratypes**); Mariscal Cáceres, 12°34'0"S, 74°57'0"W, 3966 m, KU 134180 (**paratype**), 134181 (**holotype**), 134182–90 (**paratypes**); Villa Azul, 17 km by road NE Colcabamba, 12°24'0"S, 78°35'0"W, 2350–2400 m, KU 134193–97 (**paratypes**).

Stenocercus guentheri.—**ECUADOR**: ***Provincia Chimborazo***: 14.5 km N Tixán on Panamerican Highway, 2°3'0"S, 78°44'0"W, 3200 m, QCAZ 3659–61. ***Provincia Cotopaxi***: Panamerican Highway near Parque Nacional Cotopaxi, 3200 m, FHGO 629; Parque Nacional Cotopaxi, ca. 4000 m, QCAZ 1109. ***Provincia Imbabura***: 7.5 km N Otavalo on Panamerican Highway, QCAZ 3761; Atuntaqui, 0°20'1"N, 78°18'8"W, 2387 m, QCAZ 776; Tabacundo-Mojanda road, 3150 m, QCAZ 3793. ***Provincia Pichincha***: 1.6 km ENE Quito, 0°13'12"S, 78°30'0"W, 2879 m, USNM 201236–7; 2.4 km SSE Quito, 0°13'12"S, 78°30'0"W, 2879 m, USNM 201234, 201238; Cayambe, SMF 11162; Cayambe volcano slopes, 0°2'10"N, 77°59'30"W, 3500 m, FHGO 1136; Guayllabamba, 0°3'20"S, 78°20'25"W, 2139 m, QCAZ 718, 777, 779, 782; Ilaló, Hacienda Chuspiyacu, QCAZ 722; Illiniza Sur, 0°39'34"S, 78°42'48"W, QCAZ 730; Jerusalem, 0°17'54"S, 78°25'0"W, 2578 m, QCAZ 1323; Lloa, 0°15'0"S, 78°35'0"W, 3060 m, QCAZ 4108; Machachi, 0°30'28"S, 78°33'46"W, 2940 m, QCAZ 720, 736, 758, 775, 778, 780–1, 783–4; below Pacto, 0°9'0"N, 78°45'0"W, USNM 201239; Pintag-Antisana road, 0°22'12"S, 78°22'18"W, 2880 m, QCAZ 2808; Pusuquí, 0°4'0"S, 78°27'0"W, 2747 m, QCAZ 4153; Quito, 0°11'22"S, 78°29'38"W, 2810 m, EPN 5900, QCAZ 432, 728, 737, 2857, SMF 60592, USNM 201226, 201230–3; San Antonio, 0°1'0"S, 78°27'9"W, QCAZ 713–6, 738, 740–54, 1357, 1400, 2163, 2199, BMNH 58.7.25.16, 58.7.25.16a, 58.7.25.18, 59.9.20.6, 60.6.16.18, 60.6.16.20–21 (**syntypes**); Uyumbicho, 0°23'0"S, 78°31'0"W, QCAZ 760. ***Provincia Tungurahua***: Ambato, 1°15'0"S, 78°37'0"W, 2575 m, EPN 5898, 5899; Picaihua, 1°16'0"S, 78°35'0"W, EPN 5887–5889; Urbina, 0°2'54"S, 78°46'21"W, QCAZ 2858. ***No specific locality***: FHGO 522, 852, 1493, SMF 53199.

Stenocercus haenschi.—**ECUADOR**: Bolívar: Balsapamba, 1°46'0"S, 79°11'0"W, 750 m, ZMB 16595 (**holotype**).

Stenocercus huancabambae.—**PERU**: ***Departamento Amazonas***: Bagua, La Peca, 5°36'40"S, 78°26'5"W, 920 m, KU 212630 (**paratype**); San José (Bagua Grande), 5°45'22"S, 78°26'28"W, MCZ 165319 (**holotype**), 165322 (**paratype**). ***Departamento Cajamarca***: Bellavista, 5°39'54"S, 78°40'37"W, AMNH 28529–30 (**paratypes**), MCZ 18791–3, 18795, 60040, 60042 (**paratypes**); Fundo Atapaca, Río Chinchipe, E of San Ignacio, 5°8'45"S, 79°0'5"W, 450 m, KU 209513–5 (**paratypes**); Perico, 5°20'38"S, 78°47'41"W, AMNH 28637–46 (**paratypes**), MCZ 59277–8, 59281, 59284, 59287, 59290, 59296–7 (**paratypes**).

Stenocercus humeralis.—**ECUADOR**: ***Provincia Loja***: 2 km E Loja, 4°0'0"S, 79°11'55"W, 2200 m, KU 121137; 2.7 km E Loja on road NE Zamora road, 4°0'0"S, 79°11'32"W, 2135 m, KU 141162; 12.2 km S Loja, Río Malacatos valley on road to Vilcabamba, 4°6'37"S, 79°13'0"W, 2275 m, KU 141163; 27 km W Loja on road Loja-Zamora, 4°0'0"S, 78°58'25"W, 2080 m, KU 291508, QCAZ 5524; 5 km N Loja, 3°57'17"S, 79°13'0"W, 2150 m, KU 134003, 134005; 6 km N Loja, 3°57'17"S, 79°13'0"W, 2150 m, KU 134005; Catamayo-Jimbilla road, EPN 5824–43; Loja, 4°0'0"S, 79°12'0"W, 2064 m, BMNH 1946.8.11.76 (**syntype**), EPN 1343, 5807–8, 5810–3, 5815, FHGO 1494–5, KU 121136, 121138, 134000, 134002; Malacatos, EPN 1270, 5809.

Stenocercus imitator.—**PERU**: ***Departamento Cajamarca***: ca. 1 km (airline) S to SSW Udima, Río Udima, 6°48'46"S, 79°5'8"W, 2500 m, FMNH 232629, 232636, 232638, 232645 (**paratypes**); El Chorro-Udima road, ca. 3 km (airline) N Monte Seco, 6°51'32"S, 79°6'42"W, 2200–2400 m, FMNH 231780 (**paratype**); Monte Seco-Udima road, ca. 2.5 km (airline) N Monte Seco, 6°51'32"S, 79°6'42"W, 2100–2300 m, MCZ 176913–5; road above Monte Seco toward Chorro Blanco, ca. 1.5 km (airline) NE Monte Seco, 6°51'32"S, 79°6'42"W, 1450 m, FMNH 232634 (**holotype**), 232648 (**paratype**); trail between Quebrada Chorro Blanco S toward Monte Chico, ca. 2 km ENE Monte Seco, 6°51'32"S, 79°6'42"W, 1580–1640 m, FMNH 232627, 232646 (**paratypes**); trail Monte Seco-Chorro Blanco, ca. 15 km (airline) NE Monte Seco, 6°51'32"S, 79°6'42"W, 1600 m, MCZ 176916; trail Monte Seco-Chorro Blanco, ca. 2 km (airline) NE Monte Seco, 6°51'32"S, 79°6'42"W, 1550–1570 m, FMNH 232628, 232632, 232647, 232649, 232652 (**paratypes**); trail Monte Seco-Chorro Blanco, ca. 2.5 km (airline) NE Monte Seco, 6°51'32"S, 79°6'42"W, FMNH 232620, 232624, 232641–3, 232651, 232656 (**paratypes**), MCZ 176912; vicinity of Monte Seco, FMNH 232639 (**paratype**). ***Departamento Piura***: 15 km E Canchaque, 5°24'0"S, 79°35'59"W, 1740 m, KU 181912–6 (**paratypes**), MCZ 174163 (**paratype**), SDSU 1534 (**paratype**).

Stenocercus iridescens.—**COLOMBIA**: ***Departamento Nariño***: Boca Grande, Tumaco, 1°47'55"N, 78°48'56"W, 0 m, ICN 4225. **ECUADOR**: ***Provincia Azuay***: Tamarindo, FHGO 416. ***Provincia Chimborazo***: Chimbo bridge, near Bucay, 2°41'0"S, 79°40'0"W, AMNH 24337; Huigra, 2°16'60"S, 78°58'60"W, 1799 m, USNM 61755; Recinto Sacramento, 2°10'1"S, 79°0'57"W, 1566 m, QCAZ (number not assigned). ***Provincia Cotopaxi***: La Maná, 0°55'60"S, 79°13'0"W, 889 m, QCAZ 2767, 3052. ***Provincia El Oro***: 15 km E Pasaje, 3°20'0"S, 79°41'13"W, QCAZ 3620, USNM 200955; 2 km S Pasaje, 3°21'5"S, 79°49'0"W, 100 m, USNM 200946; Pasaje, 3°19'60"S, 79°49'0"W, 105 m, AMNH 21861–2, 21867–8, 21975–8, 21987–1; Piñas, 3°40'0"S, 79°39'0"W, 876 m, FHGO 1089; Río Jubones, AMNH 21944; road Santa Rosa-Chonta, AMNH 22121; Santa Rosa, 3°27'0"S, 79°58'0"W, 80 m, USNM 200977, 200980. ***Provincia Esmeraldas***: Atacames, 0°52'0"N, 79°50'60"W, 0 m, EPN 5909; La Unión, 0°49'0"N, 79°52'0"W, 49 m, FHGO 97; Río Tiaone EPN 5906, 5908; Same, 0°49'20"N, 79°59'38"W, 0 m, QCAZ 721; Tonsupa, 0°53'"N, 79°45'"W, 0 m, QCAZ 762, 763, 804–5. ***Provincia Guayas***: 21 km SW El Empalme, 1°8'3"S, 79°8'0"W, USNM 200995; 5 km E Milagro, 2°7'0"S, 79°33'18"W, USNM 200984; Balzar, 1°22'0"S, 79°54'0"W, 59 m, EPN 5925–5927, 5929–5931; Cerro Blanco, EPN 5005, 5007–5009; Guayaquil, 2°10'0"S, 79°54'0"W, 46 m, AMNH 13510, 22184, 22221, USNM 200992; Milagro, 2°7'0"S, 79°35'60"W, 71 m, USNM 200982, 200989. ***Provincia Imbabura***: 1 km E Apuela, 0°21'0"N, 78°29'28"W, 1950 m, USNM 200902; 1 km SW Peñaherrera, 0°20'37"N, 78°32'23"W, 1950–2000 m, USNM 200912; 10 km S Peñaherrera, 0°10'41"N, 78°31'60"W, USNM 200919; 2 km W Apuela, 0°21'0"N, 78°31'5"W, 1850 m, USNM 200911; 3 km SW Peñaherrera, 0°19'51"N, 78°33'9"W, 1825 m, USNM 200914; Apuela, 0°21'0"N, 78°30'0"W, 2185 m, USNM 200901. ***Provincia Los Ríos***: 1 km E Jauneche, 1°10'0"S, 79°39'28"W, 40–70 m, USNM 285780; Jauneche, 1°10'0"S, 79°40'0"W, EPN 5004, USNM 222801; Patricia Pilar, 0°33'0"S, 79°22'0"W, QCAZ 97; Quevedo, 1°2'0"S, 79°27'0"W, 111 m, USNM 200934; Río Palenque, 0°35'0"S, 79°22'0"W, QCAZ 431, 2205, 2206, 2212; Ventanas, 1°26'60"S, 79°28'0"W, 370 m, QCAZ 1655. ***Provincia Manabí***: 12 km NNE Jipijapa, 1°13'59"S, 80°32'31"W, USNM 200935; 2 km N San Clemente, 0°43'55"S, 80°30'0"W, 0 m, USNM 200940; 27 km N San Vicente, 0°22'0"S, 80°26'0"W, 50 m, QCAZ 3329, 3330, 3343; 4 km W Calceta, 0°51'0"S, 80°12'9"W, USNM 200936; 9 km N San Vicente, 0°30'7"S, 80°24'0"W, 0 m, USNM 200942–3, 200945; 32 km N San Vicente on road San Vicente-Pedernales, 00˚20'0"S, 80˚21'0"W, 183 m, QCAZ 3314; Cabo Pasado, 0°22'0"S, 80°29'0"W, QCAZ 3322; Cerro San Sebastián, EPN 5014; Junín, 0°56'0"S, 80°13'0"W, 184 m, USNM 200939; Puerto Rico, 1°37'0"S, 80°50'0"W, 123 m, QCAZ 1634. ***Western Ecuador***: BMNH 60.6.16.2–4 (**syntypes**).

Stenocercus ivitus.—**PERU**: ***Departamento Piura***: summit Cordillera btw Canchaque & Huancabamba, 5°19'0"S, 79°29'0"W, 3100 m, KU 134653 (**holotype**).

Stenocercus lache.—**COLOMBIA**: ***Departamento Boyacá***: Guicán, 6°27'55"N, 72°24'54"W, 2908 m, ICN 6712; Parque Nacional Natural El Cocuy, eastern flank Río Lagunillas, 13 km SE Municipio El Cocuy, 4000 m, IND-R 3054–63; Parque Nacional Natural El Cocuy, Trail La Esperanza-Púlpito del Diablo, close to Quebrada Pantanogrande (tributary of Río Nevado), 6°19'0"N, 72°20'0"W, 3700–4000 m, ICN 5749 (**holotype**), 5750–62 (**paratypes**); Sierra Nevada del Cocuy, Finca La Esperanza, IND-R 2178; Sierra Nevada del Cocuy, páramo Concavo, 3700 m, IND-R 550.

Stenocercus latebrosus.—**PERU**: ***Departamento Cajamarca***: Cachil forest, ca. 3 km (airline) SE Contumazá, 7°23'0"S, 78°47'0"W, 2400–2420 m, MCZ 178040–4, 178048–9, 178268–70, 182236–41 (**paratypes**); Carabamba, 7°33'0"S, 78°15'0"W, MCZ 154240 (**paratype**). ***Departamento La Libertad***: Mountain ridge above Sinsicap, 7°50'0"S, 78°45'0"W, 2400–2600 m, MCZ 182242–4; Otuzco, 7°54'0"S, 78°34'59"W, 2730 m, KU 134352–9, 134361–78; San Pablo, 7°7'0"S, 78°50'0"W, 2400 m, BMNH 1900.3.30.14 (**paratype**).

Stenocercus limitaris.—**ECUADOR**: ***Provincia El Oro***: Salvias, 3°45'0"S, 79°40'0"W, 1050 m, AMNH 18311 (**paratype**). ***Provincia Loja***: 12.8 km N Alamor, 3°55'3"S, 80°1'60"W, 1097 m, AMNH 22215 (**paratype**); Alamor, 4°1'60"S, 80°1'60"W, 930 m, AMNH 18319, 22113–8, 22131–2, 22158–62, 22165–7, 22178–82, 22223–9 (**paratypes**); Cruzpamba, 4°10'0"S, 80°1'0"W, 1000 m, MCZ 85083 (**paratype**). **PERU**: ***Departamento Piura***: Toronche, base of Cerro Ayapate, ca. 16

km (airline) SE Ayabaca, 4°35'0"S, 79°32'0"W, 1950–2100 m, MCZ 182245–8 (**paratypes**).

Stenocercus marmoratus.—**BOLIVIA**: ***Departamento Cochabamba***: Totora, 17°43'19"S, 65°8'49"W, 2600 m, USNM 94093. ***Departamento Santa Cruz***: La Yunga, UTA 38064–6. ***Departamento Chuquisaca***: Cerro Bufete, 20°51'0"S, 64°22'0"W, UTA 39139–45. ***Departamento Tarija***: 12.3 km NW Entre Ríos on road to Tarija, 21°27'17"S, 64°17'2"W, UTA 41051–4.

Stenocercus melanopygus.—**PERU**: ***Departamento Cajamarca***: Baños, 7°10'0"S, 78°28'0"W, 2800 m, BMNH 1946.8.11.85, 1946.8.11.88 (**syntypes**), MCZ 126133; Cajabamba, 7°37'0"S, 78°3'0"W, 2700 m, KU 134037–40, 134047, 134050–3, 134056–7, 134059, 134061–3, 134065, 134067, 134069, 134071–3, 134076–80, 134082, 134084–5, 134087–8; Cajamarca, 7°10'0"S, 78°31'0", 2800 m, KU 221715; no specific locality, FMNH 5712 (5 specimens). ***Departamento La Libertad***: Huamachuco, 7°48'0"S, 78°4'0"W, 3350 m, KU 134019, 134021, 134023–7; Laguna Sacsacocha, 12 km E Huamachuco, 7°47'30"S, 77°59'15"W, 3200 m, KU 134029.

Stenocercus modestus.—**PERU**: ***Departamento Lima***: Chosica, 11°56'35"S, 76°42'34"W, 762–914 m, FMNH 152204–7; Chosica, 11°56'35"S, 76°42'34"W, 762–914 m, FMNH 39363 (7 specimens); 1 km N Lurin, 12°16'27"S, 76°52'0"W, 0 m, MCZ 182144–7; Lima, 12°3'0"S, 77°3'0"W, BMNH 75.2.13.3; Callao, 12°4'0"S, 77°9'0"W, 20 m, BMNH 1900.11.27.10–11. **NO DATA**: SDSU 1686.

Stenocercus nigromaculatus.—**PERU**: ***Departamento Piura***: Chumaya, AMNH 28532; Huancabamba, 5°14'40"S, 79°27'6"W, 1900 m, AMNH 28553–7, 28559, 28588–9, 28591–8, FMNH 73380 (MCZ 18769, **paratype**), KU 134090–1, 134093–106, 181911, MCZ 17975 (**holotype**), 18768 (**paratype**).

Stenocercus nubicola.—**PERU**: ***Departamento Piura***: summit Cordillera btw Canchaque & Huancabamba, 5°19'0"S, 79°29'0"W, 3100 m, KU 134107 (**holotype**), 134108 (**paratype**).

Stenocercus ochoai.—**PERU**: ***Departamento Apurimac***: Curahuasi, 13°32'26"S, 72°41'39"W, 2700 m, KU 134241, 134250. ***Departamento Cusco***: Chilca, 10 km N Ollantaytambo, 13°14'0"S, 72°17'30"W, 2760 m, KU 133877, 133879–83, 133885–7 (**paratypes**), 133888 (**holotype**), 133889, 139263 (**paratypes**); Chilca, Ollantaytambo, 13°14'0"S, 72°17'30"W, 2760 m, MCZ 41984; Hacienda Urco, near Calca, 13°19'0"S, 71°59'0"W, 2788 m, FMNH 34123–6, 34134–5, 34138; Machu Picchu, 13°10'0"S, 72°32'30"W, 2400 m, KU 117108, 134233–4, 139267–8, 163603, MCZ 145045; Río Huaracondo, 3048 m, MCZ 12410.

Stenocercus orientalis.—**PERU**: ***Departamento Amazonas***: Bongara, Pomacocha (=Florida), 5°49'60"S, 77°55'0"W, 2900 m, KU 212651–4, 212656–64; Chachapoyas, 6°13'0"S, 77°50'60"W, 2340 m, KU 134447–51, 134453–4, 134456–9, 134461–3 (**paratypes**), 134466 (**holotype**), 134467–71 (**paratypes**); Chachapoyas, 11 km W Molinopampa, 6°11'0"S, 77°42'58"W, 2200 m, KU 212774.

Stenocercus ornatissimus.—**PERU**: ***Departamento Lima***: Caccay, near Infiernillo, 11°44'0"S, 76°16'45"W, 3340 m, USNM 548174; Matucana, 11°51'0"S, 76°24'0"W, 2378 m, FMNH 41559 (8 specimens); San Pedro de Casta, 11°46'0"S, 76°35'0"W, 3400 m, MCZ 182148–54; Verrugas, 11°52'0"S, 76°29'0"W, USNM 75398; Yangas, 11°37'0"S, 76°40'0"W, USNM 5655 (**holotype**).

Stenocercus ornatus.—**ECUADOR**: ***Provincia Loja***: 10.6 km S Yangana, 4°27'0"S, 79°9'20"W, 2190 m, QCAZ 3790; 1–1.5 km E Loja, USNM 201270–1, 201273; 12 km W Loja, KU 134148; 15 km W Loja, 3°59'48"S, 79°15'18"W, KU 134140–134144, 134149; 2 km E Loja, 3°59'23"S, 79°10'42"W, 2200 m, KU 121127, 121129–121134; 3 km E Loja, 3°59'23"S, 79°10'42"W, USNM 201276–8; 3 km W Loja, 4°0'14"S, 79°12'49"W, 2150 m, KU 134127, 134129–134131, 134134, 134138, 134139; 4 km W Loja on road to Catamayo, 4°0'36"S, 79°13'12"W, 2280 m, KU 141167; 4.6 km N Loja, 3°56'8"S, 79°13'34"W, 2065 m, KU 141168–141170; 5 km N Loja, 3°56'0"S, 79°13'33"W, KU 134150, 134151, 134153, 134154; 6 km S Loja on road to Vilcabamba, 4°4'21"S, 79°11'53"W, 2300 m, FHGO 585; Celica, 4°7'0"S, 79°57'0"W, 1552 m, AMNH 18318; Cerro Uritusinga, 3000 m, QCAZ 2020; Cerro Villonaco, EPN 3540, QCAZ 2020; Loja, 4°0'0"S, 79°12'0"W, 2150 m, BMNH 1946.8.29.72 (**holotype**), KU 121126, QCAZ 6088–93; Purunuma, slopes of Cerro Colambo, 4°12'0"S, 79°24'0"W, 2464 m, QCAZ 5532; San Bartolo, 12.8 km NE Alamor, 4°2'0"S, 80°2'0"W, 2273 m, AMNH 22213; Vilcabamba, 4°15'0"S, 79°15'0"W, 1500 m, FHGO 405, 679, 1161; no specific locality, EPN 5877–5880.

Stenocercus pectinatus.—**ARGENTINA**: ***Provincia Buenos Aires***: Bahía Blanca, 38°43'0"S, 62°16'60"W, 20 m, UMMZ 94095 (2 specimens); Mar Chiquita, Camet Norte, 37°52'60"S, 57°36'0"W, 24 m, FML 1595 (2 specimens), 1696 (3 specimens); Mar del Plata, 38°0'0"S, 57°32'60"W, 38 m, AMNH 37557–9, UMMZ

98880 (3 specimens), 109838; Miramar, 38°15'59"S, 57°50'59"W, 17 m, KU 187793, 187795–7, SDSU 1679, UMMZ 98881 (3 specimens). ***Provincia Córdoba***: Achiras, 33°10'0"S, 65°0'0"W, 838 m, AMNH 65192; Punilla, Villa Giardino, 31°1'60"S, 64°28'60"W, 1119 m, FML 0853; Río Cuarto, Laguna Oscura, 33°53'0"S, 64°42'0"W, 343 m, SDSU 3643–4; no specific locality, AMNH 17012. ***Provincia Patagonia***: no specific locality, USNM 5695 (2 specimens). ***Provincia San Luis***: Soven, 34°13'60"S, 65°25'0"W, 394 m, MCZ 66989. ***No specific locality***: FML 1693.

Stenocercus percultus.—**PERU**: ***Departamento Cajamarca***: 0.5 km (airline) SW Monte Seco, 6°51'32"S, 79°6'42"W, 1170 m, FMNH 232517 (**paratype**); 1–2 km (airline) NNW Monte Seco, Río Zaña, 6°51'32"S, 79°6'42"W, 1350–1380 m, FMNH 232516, 232524 (**paratypes**), 232525 (**holotype**), 232526 (**paratype**); ca. 1 km (airline) NE Monte Seco along El Chorro-Monte Seco road, 6°51'32"S, 79°6'42"W, 1330–1370 m, FMNH 232515, 232519, 232523 (**paratypes**); ca. 1.5 km (airline) NE Monte Seco, 6°51'32"S, 79°6'42"W, 1500 m, FMNH 232518, 232521, 232527, 232529, 232637 (**paratypes**); Cerro Condoroáz, near Quebrada San Isidro, ca. 6 km (airline) WSW Monte Seco, 6°51'32"S, 79°6'42"W, 800–1000 m, FMNH 232522, 232526 (**paratypes**); Llama, 6°30'52"S, 79°7'13"W, 2095 m, MCZ 121234 (**paratype**); trail Monte Seco-Chorro Blanco, ca. 2 km (airline) NE Monte Seco, 6°51'32"S, 79°6'42"W, 1550–1570 m, FMNH 232528 (**paratype**). ***Departamento Piura***: 15 km E Canchaque, 5°24'0"S, 79°35'59"W, 1740 m, SDSU 1596 (**paratype**).

Stenocercus praeornatus.—**PERU**: ***Departamento Junín***: Comas, 11°46'0"S, 75°5'0"W, 3220 m, KU 134224–8 (**paratypes**), 134231 (**holotype**), 134232 (**paratype**).

Stenocercus prionotus.—**BOLIVIA**: ***Departamento Beni***: Vacadiez, Tumi Chucua, 11°8'0"S, 66°10'0"W, 176 m, USNM 280246–51 (**paratypes**). ***Departamento La Paz***: Barraca, Río Madidi, 12°35'0"S, 67°2'0"W, BMNH 98.6.9.4 (**paratype**). **PERU**: ***Departamento Huánuco***: Buena Vista, Valle Chimchao, 9°31'0"S, 75°52'0"W, FMNH 5582 (**paratype**); Hacienda Pampayacu, 9°33'0"S, 75°54'0"W, MCZ 43758–9, 43761–2 (**paratypes**); Río Llullapichis, 4–5 km upstream Río Pachitea, 9°37'0"S, 74°55'0"W, 200 m, KU 178998, 179058 (**paratype**). ***Departamento Madre de Dios***: Estación Biológica Cocha Cashu, Parque Nacional Manu, 11°51'0"S, 71°19'0"W, MCZ 150243 (**paratype**); Explorer´s Inn, Tambopata reserve, ca. 30 km (straight line) SSW Puerto Maldonado, 12°50'0"S, 69°17'0"W, 280 m, USNM 247468–9, 247680, 269022 (**paratypes**). ***Departamento Puno***: Tambopata, San Juan del Oro, 14°12'0"S, 69°8'0"W, 1520 m, FMNH 64788–91, 64794–802 (**paratypes**). ***Departamento San Martín***: Juanjui, 7°11'0"S, 76°45'0"W, MCZ 121233 (**paratype**); Tarapoto, 6°30'0"S, 76°25'0"W, 370 m, KU 212629 (**paratype**).

Stenocercus puyango.—**ECUADOR**: ***Provincia El Oro***: 19 km N Alamor, 3°55'12"S, 80°1'26"W, QCAZ 6355 (**paratype**); Bosque Protector Puyango, 3°52'55"S, 80°4'59"W, QCAZ 6356 (**paratype**); Puyango, 3°53'0"S, 80°4'47"W, 300 m, QCAZ 6701–3, 6705–13, 6715–19, 6721–22 (**paratypes**), 6723 (**holotype**), 6724–

5 (**paratypes**). ***Provincia Loja***: 3 km SW Malacatos, 4°13'31"S, 79°16'3"W, 1500 m, MCZ 85086, 131823. ***No specific political unit***: Río Puyango, AMNH 21934–6 (**paratypes**). **PERU**: ***Departamento Lambayeque***: 21 km E, 7 km N Olmos, 5°55'17"S, 79°33'20"W, 700 m, MVZ 82364 (**paratype**). ***Departamento Tumbes***: Quebrada Faical E El Caucho, 24 km SE Pampa de Hospital, 3°49'0"S, 80°16'0"W, LSUMZ 26989, 39446, 39451 (**paratypes**). ***No specific locality***: FMNH 81450. **NO SPECIFIC LOCALITY**: AMNH 22186 (**paratype**).

Stenocercus rhodomelas.—**ECUADOR**: ***Provincia Azuay***: 1.1–2.7 km SW Cataviña, 1310 m, KU 152188; 1.6 km W Minas at Río Minas, 3°17'6"S, 79°20'57"W, 1410 m, KU 152178, 152179; 12 km SW Girón, 3°14'0"S, 79°13'0"W, 2000 m, USNM 201285; 2.7–3.5 km SW Cataviña, 1250 m, KU 152185, 152187; 4.8 km W Abdón Calderón, 3°16'25"S, 79°18'23"W, 1435 m, KU 152183; 5 km S Nabón on road Nabón-San Isidro, 3°20'0"S, 79°4'0"W, UDAR 10; 50.5 km E Pasaje, 3°19'26"S, 79°25'51"W, 730 m, KU 152177; 7–8 km W Girón, 3°12'0"S, 79°10'0"W, 2100 m, USNM 201280–1; ca. 11 km W Santa Isabel, Río Jubones drainage, 3°16'44"S, 79°21'52"W, 1480 m, AMNH 110599–603; ca. 4 km E San Francisco, km 109 on Cuenca-Machala hwy, 1250 m, USNM 201288, 201293, 201296–8; Girón, 3°10'0"S, 79°8'0"W, EPN 3510, 3512; Girón, near Piedra Labrada, EPN 3532; Oña, 3°27'0"S, 79°10'0"W, 2522 m, BMNH 1946.8.29.77–78 (**syntypes**); N Oña, 1885 m, KU 141164, 141166; Río León, 11.8 km N Buenos Aires, 3°25'16"S, 79°9'37"W, 1940 m, KU 202945, 202946; Río León, 12.5 km N Oña, 3°25'16"S, 79°9'37"W, 1920 m, KU 142699–142701; Santa Isabel, 3°16'0"S, 79°19'0"W, QCAZ 3076, 5645, USNM 201305–8, 201310, 201316; Valle de Yunguilla, Chalcápac, 1550 m, QCAZ 3663. ***Provincia Loja***: San José, QCAZ 6095; Valle de Casanga, EPN 3507, 5910–5921.

Stenocercus roseiventris.—**ARGENTINA**: ***Provincia Jujuy***: Ledesma, Parque Nacional Calilegua, trail seccional Aguas Negras-Camping, FML 7640. ***Provincia Salta***: General J. S. Martín, Macueta-Acambuco, FML 848; Orán, Aguas Blancas, shore of Río Bermejo, 22°43'60"S, 64°22'0"W, 562 m, FML 1092; Orán, Finca Abra Grande, Quebrada Tartagal, FML 1584; Orán, Finca Yakúlica, angosto del Río Pescado, FML 3644 (3 specimens); Orán, Río Blanco, ca. 6 S km Orán, 23°7'60"S, 64°19'60"W, 336 m, FML 591 (2 specimens); Santa Victoria, Baritú, 22°16'0"S, 64°42'0"W, 239 m, FML 1727. **BOLIVIA**: ***Departamento Cochabamba***: Yungas de Cochabamba, USNM 94094; no specific locality, AMNH 6766. **BRAZIL**: ***Estado Acre***: [Rio] Alto Purus, MCZ 133219. **PERU**: ***Departamento Cusco***: 84 km (by road) NE Paucartambo, Quitacalzón bridge, km 164 on Paucartambo-Atalaya road, 13°1'34"S, 71°29'46"W, 1180 m, USNM 346178; Cashiriari-3, S of Río Camisea, 11°52'57"S, 72°46'40"W, 690 m, USNM 538336, 538338; cordillera Vilcabamba, camp 1, 12°39'0"S, 73°40'0"W, 870 m, AMNH 101384–5; Pagoreni on Río Camisea, 11°42'23"S, 72°54'11"W, 465 m, USNM 538339; San Martin-3, ca. 5 km N Río Camisea, 11°47'8"S, 72°41'57"W, 474 m, USNM 538337; Misión Coribeni, 24 km ENE Rosalina, 12°36'0"S, 72°48'0"W, 680 m, KU 134156. ***Departamento Huánuco***: Río Llullapichis, 4–5 km upstream from Río Pachitea, Finca Panguana, 9°36'0"S, 74°56'0"W, 200 m, KU 172194–5. ***Departamento Madre***

de Dios: Cusco Amazonico, 15 km E Puerto Maldonado, 12°35'0"S, 69°5'0"W, 200 m, KU 194939, 204987, 207769–70, 209967, 214964, 214966–7, 214969, 220188. ***Departamento Puno***: 1 km W (by road) Yanahuaya, 14°16'0"S, 69°12'0"W, 1630 m, USNM 299525. ***No specific political unit***: Chanchamayo, AMNH 56309, 57167, 57170; Monte Alegre, Río Pachitea, AMNH 57200.

Stenocercus santander.—**COLOMBIA**: ***Departamento Santander***: Mesa de los Santos, Vereda La Granja, Hacienda El Roble, 6°51'57.1"N, 73°2'57"W, 1570 m, MUJ 542 (**paratype**); Mesa de los Santos, Vereda La Granja, Hacienda El Roble, 6°51'57.1"N, 73°2'57"W, 1570 m, MUJ 567 (**paratype**); Piedecuesta, 6°59'22"N, 73°3'13"W, 1189 m, MLS 1220 (**paratype**); Piedecuesta, Vereda Las Amarillas, 6°58'10.6"N, 73°1'17.5"W, 1400-1500 m, UIS-R-1286, 1199 (**paratypes**); Piedecuesta, Vereda Los Monos, UIS-R-1196 (**paratype**); Piedecuesta, Vereda Tres Esquinas, UIS-R-478 (**holotype**); San Gil, 6°33'34"N, 73°8'10"W, 1247 m, ANSP 24136, MLS 22–24, 38, 39 (**paratypes**).

Stenocercus scapularis.—**PERU**: ***Departamento Junín***: Chanchamayo, 1200 m, FMNH 40608–11; Chanchamayo, AMNH 56765–9, 56771–6; Chanchamayo, 1500 m, AMNH 23154; Chanchamayo, Tarma, 1300 m, FMNH 45522; Pampa Hermosa, 10°59'33"S, 75°25'58"W, 1540 m, MTD 45664; [Río] Perené, 1200 m, AMNH 23145, 23147; [Río] Perené, AMNH 23121, 23123; [Río] Perené, 1000–1500 m, AMNH 23192, 23200; Perené, 10°58'0"S, 75°13'0"W, 827 m, BMNH 1946.8.12.37 (**syntype**). ***Departamento Puno***: Sagrario, Río Quitún, 13°55'0"S, 69°40'60"W, 1287 m, FMNH 40408–9; ***No specific locality***: Juliaca, lake Aracona (in error), AMNH 1701; FMNH 56444. **NO SPECIFIC LOCALITY**: SDSU 1691.

Stenocercus simonsii.—**ECUADOR**: ***Provincia Azuay***: 3.3 km NE Girón, 3°8'44"S, 79°6'44"W, 2255 m, KU 152189–90; Girón, 3°10'0"S, 79°7'59"W, 2240 m, KU 134157–64; Oña, 3°27'0"S, 79°10'0"W, 2522 m, BMNH 1946.8.11.73 (**syntype**). ***Provincia Loja***: Saraguro, 3°35'59"S, 79°13'0"W, 2500 m, KU 134165–74.

Stenocercus sinesaccus.—**BRAZIL**: ***Estado Mato Grosso***: Chapadá near Cuyaba [Chapada dos Guimarães], 15°26'0"S, 55°45'0"W, 690 m, ANSP 12947, 12948 (**paratypes**), BMNH 1903.3.26.7 (**holotype**), MCZ 171198 (= BMNH 1903.3.26.9, **paratype**).

Stenocercus stigmosus.—**PERU**: ***Departamento Cajamarca***: 2–3 km (airline) NW El Pargo on Llama-Huambos road, 6°29'2"S, 79°2'49"W, 3000–3100 m, MCZ 182234–5 (**paratypes**); forest at El Pargo, 8 km by road Llama-Huambos N La Colmena, then 3–4 km NW by trail, 6°28'0"S, 79°3'0"W, 2950 m, MCZ 182232–3 (**paratypes**).

Stenocercus torquatus.—**PERU**: ***Departamento Junín***: Chanchamayo, 11°3'0"S, 75°19'0"W, 1500 m, AMNH 23152–3; Chanchamayo, 11°3'0"S, 75°19'0"W, 1800 m, AMNH 56415, 57171, 57177; Chanchamayo, 1800 m, MCZ 8081, 45882; Chanchamayo, 1200 m, FMNH 40619–20; Huacapistana, 11°14'0"S, 75°29'0"W, 1300 m, FMNH 40621; La Merced, Chanchamayo, 11°3'0"S, 75°19'0"W, 1515 m, AMNH 57172; Perene, 10°52'60"S, 75°13'0"W, 1000 m, AMNH 23126–31, 23133, 23137–9, 23143–4, 23146, 23151, 23188, MCZ 29303–4; San Ramón, 11°8'0"S, 75°20'0"W, 800 m, FMNH 40622–4; Tarma, 11°25'11"S, 75°41'27"W, 1300 m, FMNH 45481–3; Ulcumayo: Llaupi, 1400 m, MTD 45921; Valle Chanchamayo, 800 m, FMNH 134451. ***Departamento Pasco***: María Teresa (km 19 on road Yaupi-Oxapampa), 10°42'5.6"S, 75°27'22.2"W, 1470 m, BMNH 61.5.22.4 (**holotype**), MHNSM 19949–54, MTD 46289–94.

Stenocercus trachycephalus.—**COLOMBIA**: ***Departamento Boyacá***: Aquitania, 5°31'11"N, 72°53'15"W, 3216 m, ICN 2821; Laguna de Tota, Las Cintas, 5°37'0"N, 72°52'0"W, 3524 m, ICN 1520–1; Moniquirá, 5°52'60"N, 73°34'29"W, 1780 m, ICN 2414; Paz del Río, 5°59'17"N, 72°45'8"W, 2365 m, ICN 691; San José de la Montaña, 3000 m, ICN 2853. ***Departamento Cundinamarca***: Arrayán, 4°33'26"N, 73°56'2"W, 1749 m, ICN 1234; Arrayán, 4°33'26"N, 73°56'2"W, 1749 m, ICN 1235; Bogotá, 4°35'60"N, 74°4'60"W, 2619 m, ICN 495, 1496, 2752, 2820, 2838, 4212–3, 4524, IND-R 312, 1097, USNM 75958, 90064, 92493, 95178, 153973; Bogotá, km 4 Suba-Cota, ICN 5732; Bogotá, páramo de Granizo, ICN 5934; Bogotá, Río Chicó, 2700–2800 m, ICN 1238–46; Guatavita, 4°56'13"N, 73°49'57"W, 2717 m, ICN 1519; Iguaqué Flora and Fauna Sanctuary, 3.5 km SE Arcabuco, 3300 m, IND-R 3051–2; km 11 road Bogotá-Choachi, 3000–3200 m, IND-R 262; NW Bogotá, UTA 3425–7; Páramo de Chingaza, ICN 2303, 2306; Parque Nacional Natural Chingaza, La Playa, 4°32'21"N, 73°45'42"W, 3219 m, IND-R 4251–2; Represa del Neusa, ICN 2201; Sabana de Bogotá, Laguna de Herrera, 3000–3100 m, ICN 1232–3, 1494; Sabana de Bogotá, Tabio, 4°55'0"N, 74°5'60"W, 2630–2650 m, ICN 1230; San Cayetano, 4°53'11"N, 73°24'20"W, 2080 m, ICN 6758; Sasaima, 4°53'53"N, 74°26'13"W, 2311 m, IND-R 276; Sibaté, 4°29'29"N, 74°15'38"W, 2730 m, IND-R 583–4; Tenjo, 4°52'27"N, 74°8'54"W, 2679 m, ICN 2415; Usaquén, 4°42'0"N, 74°1'60"W, 2727 m, ICN 1236–7; Vía a Choachi, ICN 6252; Zipaquirá, 5°1'42"N, 74°3'30"W, 2892 m, ICN 2818–9; Zipaquirá, Laguna Verde, 3670 m, ICN 6069–73; no specific locality, USNM 153972, 153987–91. ***No specific political unit***: Páramo de Sumapas, cerca de Laguna Larga, 3800 m, ICN 2378. ***No specific locality***: SDSU 1692–5.

Stenocercus variabilis.—**PERU**: ***Departamento Junín***: 16 km (by road) NNE Palca, 11°20'46"S, 75°34'7"W, 2540 m, MCZ 178166, USNM 299545–9; 28 km (by road) SW San Ramón, 11°7'59"S, 75°20'0"W, 2070 m, USNM 299612; 4 km W Palca, 11°21'0"S, 75°36'0"W, 3000 m, KU 134175; 5 km W Palca, 11°20'45"S, 75°36'30"W, 3000 m, KU 134176–9; Huacapistana, 11°13'60"S, 75°28'60"W, 1557 m, FMNH 40617; Huasqui, near Tarma, 11°25'33", 75°45'15"W, 3822 m, MCZ 45820–1; Palca, 11°20'46"S, 75°34'7"W, 2875 m, BMNH 1946.8.11.89–91 (**syntypes**); Tarma, 11°25'11"S, 75°41'27"W, 3500 m, FMNH 134425.

Stenocercus varius.—**ECUADOR**: ***Provincia Cotopaxi***: Reserva Integral de Bosque Nublado La Otonga, 0°44'0"S, 78°59'0"W, 2000–2200 m, QCAZ 3118; Peñas Coloradas, QCAZ 1695; San Francisco de Las Pampas, 0°26'0"S, 78°57'0"W, QCAZ 86–91, 2015. ***Provincia Pichincha***: 5 km E Chiriboga, 0°14'20"S, 78°43'57"W, USNM 201317; Llambo, 0°1'0"N, 78°40'0"W, USNM 201318–20, 201322; Estación Forestal La Favorita, 0°14'0"S, 78°46'0"W, 1900 m, FHGO 354, 412, 424, 445; Reserva Florística Ecológica Río Guajalito, 0°14'0"S, 78°48'0"W, 1840 m, QCAZ

717, 719, 1334, 3046, FHGO 337; Río Blanco, EPN 5932; Tandapi, 0°25'0"S, 78°47'0"W, 1460 m, QCAZ 590–1, 593–6. ***No specific political unit:*** Las Máquinas, AMNH 27135. ***[Provincia Pastaza]***: Mera, Río Pastaza **(in error)**, AMNH 60602–4. **NO SPECIFIC LOCALITY**: BMNH 71.4.16.53 (**holotype**).

Stenocercus *sp.*—**BOLIVIA**: ***Departamento Cochabamba***: Yungas de Cochabamba, UMMZ 68115 (2 specimens).

APPENDIX IV

OSTEOLOGICAL SPECIMENS EXAMINED

Leiocephalus carinatus.—**BAHAMAS**: ***Exumas***: unnamed cay, NE Leaf Cay, E. Norman's Pond Cay, S end Exuma chain, MCZ 141246.

Liolaemus pictus.—**CHILE**: ***No specific political unit***: Banos de Folhbaca Caustin Prov. (**in error?**), MCZ 18942.

Microlophus occipitalis.—**ECUADOR**: ***Provincia Guayas***: Playas, 2°37'60"S, 80°22'60"W, 6 m, KU 142714, 142721.

Microlophus peruvianus.—**PERU**: ***Departamento Moquegua***: Ilo, 17°38'22"S, 71°20'15"W, 174 m, KU 134695; Moquegua, 17°11'44"S, 70°56'7"W, 1534 m, KU 134673.

Microlophus stolzmanni.—**PERU**: ***Departamento Cajamarca***: Perico, 5°20'38"S, 78°47'41"W, MCZ 131768.

Stenocercus aculeatus.—**ECUADOR**: ***Provincia Pastaza***: Mera, 1°28'0"S, 78°7'60"W, 1123 m, KU 121093; Río Pastaza, Alpayaca, MCZ 8061.

Stenocercus angel.—**ECUADOR**: ***Provincia Carchi***: 8 km NE El Angel on road El Angel-Tulcán, 0°40'0"N, 77°52'0"W, 3560 m, QCAZ 1354 (**paratype**).

Stenocercus apurimacus.—**PERU**: ***Departamento Apurimac***: Puente Pachachaca, 13°25'30"S, 73°8'46"W, 1800 m, KU 134278, 134284 (**paratypes**).

Stenocercus azureus.—**URUGUAY**: ***No specific locality***: MCZ 17640.

Stenocercus boettgeri.—**PERU**: ***Departamento Junín***: Huachon, MCZ 45843. ***Departamento Pasco***: Paucartambo, 10°52'59"S, 75°56'59"W, 3000 m, KU 134014.

Stenocercus bolivarensis.—**COLOMBIA**: ***Departamento Cauca***: ICN 4206 (**paratype**).

Stenocercus caducus.—**BOLIVIA**: ***Departamento Beni***: 6 km W Casarabe, 14°48'0"S, 64°17'21"W, 230 m, AMNH 143053. ***Departamento Santa Cruz***: Buena Vista, 17°27'0"S, 63°40'0"W, 450 m, AMNH 37907, MCZ 24883, 29022.

Stenocercus carrioni.—**ECUADOR**: ***Provincia Loja***: 10 km N Celica, 4°3'0"S, 79°58'0"W, 1900 m, MCZ 93589; Alamor, 4°2'0"S, 80°2'0"W, 1325 m, AMNH 22157.

Stenocercus chota.—**ECUADOR**: ***Provincia Carchi***: Chota, 0°28'0"N, 78°4'0"W, QCAZ 2654 (**paratype**).

Stenocercus chrysopygus.—**PERU**: ***Departamento Ancash***: Huaraz, 9°31'59"S, 77°31'59"W, 3200 m, KU 133895, 133906.

Stenocercus crassicaudatus.—**PERU**: ***Departamento Cusco***: Machu Picchu, 13°9'30"S, 72°31'53"W, 2404 m, KU 133959, 163602.

Stenocercus cupreus.—**PERU**: ***Departamento Huánuco***: Huánuco, 9°56'0"S, 76°14'0"W, 1900 m, KU 133974, MCZ 43789.

Stenocercus doellojuradoi.—**ARGENTINA**: ***Provincia Tucumán***: Departamento Leales, 10 km S Los Puestos (12 km SE Guardamonte), 27°22'25"S, 65°0'0"W, FML 503; Departamento Trancas, Uturunco, 4 km to Sierra de Medina, 26°13'60"S, 65°7'0"W, 1042 m, FML 3521.

Stenocercus dumerilii.—**BRAZIL**: ***Estado Pará***: km 93 (BR-38), MCZ 160242.

Stenocercus empetrus.—**PERU**: ***Departamento Cajamarca***: 3 km E Celendín, 6°50'0"S, 78°7'0"W, KU 134421. ***Departamento La Libertad***: Laguna Sacsacocha, 12 km E Huamachuco, 7°47'30"S, 77°59'15"W, KU 134401, 134403–4.

Stenocercus erythrogaster.—**COLOMBIA**: ***Departamento Chocó***: Playitas de Nabugá, 6°24'0"N, 77°20'60"W, ICN 9096.

Stenocercus eunetopsis.—**PERU**: ***Departamento Cajamarca***: 1 km SSW Udima, Río Udima (tributary of Río Zaña), 6°48'46"S, 79°5'8"W, 2500 m, FMNH 232539, 232555, 232589 (**paratypes**).

Stenocercus festae.—**ECUADOR**: ***Provincia Azuay***: 4 km E Cuenca, 2°53'0"S, 78°58'0"W, 2540 m, KU 134595; Sinincay, 2°49'60"S, 79°0'0"W, 2515 m, AMNH 23418. ***Provincia Cañar***: 3 km S Azogues, 2°46'0"S, 78°51'0"W, 2500 m, KU 134603.

Stenocercus fimbriatus.—**PERU**: ***Departamento Loreto***: Pampa Hermosa, mouth of Río Cushabatay, 7°12'0"S, 75°17'0"W, 152 m, AMNH 56792.

Stenocercus formosus.—**PERU**: ***Departamento Junín***: Chanchamayo, MCZ 11295. ***Departamento Pasco***: Río Paucartambo, Yaupi, 10°44'30"S, 75°32'0"W, 1600 m, KU 134110.

Stenocercus frittsi.—**PERU**: ***Departamento Ayacucho***: 4 km N Ayacucho, 13°9'29"S, 74°13'26"W, KU 134213 (**paratype**); Ayacucho, 13°9'29"S, 74°13'26"W, 2804 m, KU 134198 (**paratype**).

Stenocercus guentheri.—**ECUADOR**: ***Provincia Cotopaxi***: Mulaló, 0°55'0"S, 78°34'0"W, 2990 m, KU 147319, 147326.

Stenocercus huancabambae.—**PERU**: ***Departamento Cajamarca***: Perico, 5°20'38"S, 78°47'41"W, AMNH 28636, MCZ 18785 (**paratypes**).

Stenocercus humeralis.—**ECUADOR**: ***Provincia Loja***: 5 km N Loja, 3°57'17"S, 79°13'0"W, 2150 m, KU 134004; Loja, 4°0'0"S, 79°12'0"W, 2064 m, 134001.

Stenocercus imitator.—**PERU**: ***Departamento Cajamarca***: 0.5 km ENE El Chorro, ca. 1 km NE (airline) NE Monte Seco, 6°51'32"S, 79°6'42"W, 1440 m, FMNH 232584–5, 232587, 232590 (**paratypes**); trail Monte Seco-Chorro Blanco, ca. 2.5 km (airline) NE Monte Seco, 6°51'32"S, 79°6'42"W, FMNH 232586, 232588 (**paratypes**).

Stenocercus iridescens.—**ECUADOR**: ***Provincia El Oro***: 10 km SE Machala, 20 m, AMNH 112989–90; Santa Rosa, 3°27'0"S, 79°58'0"W, 80 m, AMNH 21993. ***Provincia Esmeraldas***: 3 km E Atacames, 0°52'0"N, 79°49'0"W, 0 m, KU 142695.

Stenocercus lache.—**COLOMBIA**: ***No specific locality***: 9262.

Stenocercus latebrosus.—**PERU**: ***Departamento La Libertad***: Otuzco, 7°54'0"S, 78°34'59"W, 2730 m, KU 134351, 134360.

Stenocercus limitaris.—**ECUADOR**: ***Provincia Loja***: Alamor, 4°1'60"S, 80°1'60"W, 930 m, AMNH 22119 (**paratype**).

Stenocercus melanopygus.—**PERU**: ***Departamento Cajamarca***: Cajabamba, 7°37'0"S, 78°3'0"W, 2700 m, KU 134058.

Stenocercus nigromaculatus.—**PERU**: ***Departamento Piura***: Huancabamba, 5°14'40"S, 79°27'6"W, 1900 m, KU 134089, 134092, MCZ 18767 (**paratype**).

Stenocercus ochoai.—**PERU**: Chilca, 10 km N Ollantaytambo, 13°14'0"S, 72°17'30"W, 2760 m, KU 133878, 133884 (**paratypes**).

Stenocercus orientalis.—**PERU**: ***Departamento Amazonas***: Chachapoyas, 6°13'0"S, 77°50'60"W, 2340 m, KU 134452, 134460 (**paratypes**).

Stenocercus ornatus.—**ECUADOR**: ***Provincia Loja***: 2 km E Loja, 3°59'23"S, 79°10'42"W, 2200 m, KU 121128; 3 km W Loja, 4°0'14"S, 79°12'49"W, 2150 m, KU 134128.

Stenocercus pectinatus.—**ARGENTINA**: ***Provincia Buenos Aires***: Miramar, 38°15'59"S, 57°50'59"W, 17 m, KU 187794, 187798. ***No specific political unit***: Pampa Central, MCZ 17634.

Stenocercus percultus.—**PERU**: ***Departamento Cajamarca***: 1–2 km (airline) NNW Monte Seco, Río Zaña, 6°51'32"S, 79°6'42"W, 1350–1380 m, FMNH 232530 (**paratype**); ca. 1 km NE (airline) Monte Seco along El Chorro-Monte Seco road, 6°51'32"S, 79°6'42"W, 1450–1500 m, FMNH 232531–33 (**paratype**).

Stenocercus praeornatus.—**PERU**: ***Departamento Junín***: Comas, 11°46'0"S, 75°5'0"W, 3220 m, KU 134229 (**paratype**).

Stenocercus puyango.—**ECUADOR**: ***Provincia El Oro***: Puyango, 3°53'0"S, 80°4'47"W, 300 m, QCAZ 6720 (**paratype**).

Stenocercus rhodomelas.—**ECUADOR**: ***Provincia Azuay***: 1.1–2.7 km SW Cataviña, 1310 m, KU 152186; 4.8 km W Abdón Calderón, 3°16'25"S, 79°18'23"W, 1435 m, KU 152184.

Stenocercus roseiventris.—**PERU**: ***Departamento Huánuco***: Río Llullapichis, 4–5 km upstream from Río Pachitea, Finca Panguana, 9°36'0"S, 74°56'0"W, 200 m, KU 172196.

Stenocercus scapularis.—**PERU**: ***Departamento Junín***: Chanchamayo, AMNH 56770, 56777.

Stenocercus torquatus.—**PERU**: ***Departamento Junín***: Perene, 10°52'60"S, 75°13'0"W, 1000 m, AMNH 23132.

Stenocercus trachycephalus.—**COLOMBIA**: ***Departamento Cundinamarca***: 16 km N Bogotá, AMNH 91749; Bogotá, 4°35'60"N, 74°4'60"W, 2619 m, AMNH 131227; Lijacá, AMNH 131223.

Stenocercus variabilis.—**PERU**: ***Departamento Junín***: 28 km (by road) SW San Ramón, 11°7'59"S, 75°20'0"W, 2070 m, USNM 299613.

Stenocercus varius.—**ECUADOR**: ***Provincia Pichincha***: Finca Santa Lucía, 7.7 km E Chiriboga, 0°15'48"S, 78°43'30"W, 2120 m, KU 142704; Tandapi, 0°25'0"S, 78°47'0"W, 1460 m, KU 121135, 134563.

Stenocercus sp. nov.—**COLOMBIA**: ***Departamento Santander***: San Gil, 6°33'34"N, 73°8'10"W, 1247 m, MCZ 36877.

Tropidurus etheridgei.—**PARAGUAY**: ***No specific political unit***: Pilcomayo River, 580 km W Asunción, Chaco, MCZ 49527.

Uracentron azureum.—**NO SPECIFIC LOCALITY**: South America, MCZ 4691.

Uracentron flaviceps.—**ECUADOR**: ***Provincia Pastaza***: Canelos to Mariana R., MCZ 37270.

Uranoscodon superciliosus.—**SURINAM**: ***No specific locality***: MCZ 9318.

APPENDIX V

FREQPARS FILE WITH VALUES FOR CONTINUOUS AND POLYMORPHIC CHARACTERS INCLUDED IN THE MORPHOLOGICAL DATA MATRIX

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CONTINUOUS AND POLYMORPHIC DATA
56 32
        ACU     ANG     APU     AZU     BOE     BOL     CAD     CAR     CHL     CHO     CHR
        CRA     CUP     DOE     DUM     EMP     ERY     EUN     FES     FIM     FOR     FRI
        GUE     HAE     HUA     HUM     IMI     IRI     IVI     LAC     LAT     LIM     MAR
        MEL     MOE     NIG     NUB     OCH     ORI     OTI     ORN     PEC     PER     PRA
        PRI     PUY     RHO     ROS     SCA     SIM     STI     TOR     TRA     VAB     VAR
        MIC
OPTIONS
(A1,56F6.2)
'NUMBER OF POSTROSTRALS' 2
A       0.544   0.316   0.484   0.286   0.471   0.571   0.459   0.483   0.571   0.297
        0.330   0.594   0.480   0.286   0.294   0.546   0.303   0.454   0.307   0.529
        0.483   0.559   0.364   0.286   0.304   0.550   0.333   0.294   0.571   0.316
        0.413   0.297   0.429   0.493   0.404   0.297   0.286   0.541   0.463   0.327
        0.349   0.294   0.376   0.653   0.447   0.286   0.351   0.524   0.429   0.586
        0.321   0.600   0.383   0.571   0.571   0.500
B       0.456   0.684   0.516   0.714   0.529   0.429   0.541   0.517   0.429   0.703
        0.670   0.406   0.520   0.714   0.706   0.454   0.697   0.546   0.693   0.471
        0.517   0.441   0.636   0.714   0.696   0.450   0.667   0.706   0.429   0.684
        0.587   0.703   0.571   0.507   0.596   0.703   0.714   0.459   0.537   0.673
        0.651   0.706   0.624   0.347   0.553   0.714   0.649   0.476   0.571   0.414
        0.679   0.400   0.617   0.429   0.429   0.500


'NUMBER OF INTERNASALS' 2
A       0.685   0.292   0.268   0.362   0.280   0.333   0.818   0.333   0.333   0.210
        0.305   0.568   0.325   0.317   0.677   0.273   0.275   0.282   0.240   0.600
        0.355   0.337   0.203   0.167   0.620   0.333   0.318   0.075   0.167   0.298
        0.308   0.333   0.312   0.337   0.268   0.018   0.333   0.317   0.338   0.285
        0.272   0.343   0.302   0.357   0.768   0.065   0.078   0.482   0.592   0.333
        0.250   0.370   0.287   0.323   0.340   0.292
```

B	0.315	0.708	0.732	0.638	0.720	0.667	0.182	0.667	0.667	0.790
	0.695	0.432	0.675	0.683	0.323	0.727	0.725	0.718	0.760	0.400
	0.645	0.663	0.797	0.833	0.380	0.667	0.682	0.925	0.833	0.702
	0.692	0.667	0.688	0.663	0.732	0.982	0.667	0.683	0.662	0.715
	0.728	0.657	0.698	0.643	0.232	0.935	0.922	0.518	0.408	0.667
	0.750	0.630	0.713	0.677	0.660	0.708				

'NUMBER OF SUPRAOCULARS' 2

A	0.223	0.298	0.365	0.333	0.527	0.462	0.353	0.468	0.483	0.380
	0.487	0.617	0.500	0.302	0.207	0.468	0.157	0.413	0.337	0.167
	0.397	0.413	0.445	0.333	0.288	0.688	0.430	0.130	0.500	0.325
	0.473	0.230	0.467	0.378	0.268	0.430	0.417	0.490	0.422	0.353
	0.407	0.278	0.327	0.500	0.392	0.260	0.370	0.537	0.235	0.685
	0.250	0.613	0.247	0.442	0.435	0.292				
B	0.777	0.702	0.635	0.667	0.473	0.538	0.647	0.532	0.517	0.620
	0.513	0.383	0.500	0.698	0.793	0.532	0.843	0.587	0.663	0.833
	0.603	0.587	0.555	0.667	0.712	0.312	0.570	0.870	0.500	0.675
	0.527	0.770	0.533	0.622	0.732	0.570	0.583	0.510	0.578	0.647
	0.593	0.722	0.673	0.500	0.608	0.740	0.630	0.463	0.765	0.315
	0.750	0.387	0.753	0.558	0.565	0.708				

'NUMBER OF SUPRALABIALS' 2

A	0.235	0.258	0.285	0.250	0.445	0.405	0.258	0.310	0.250	0.270
	0.310	0.450	0.295	0.298	0.500	0.560	0.250	0.433	0.295	0.250
	0.265	0.268	0.350	0.250	0.265	0.520	0.313	0.258	0.750	0.270
	0.260	0.263	0.383	0.255	0.265	0.310	0.250	0.258	0.265	0.250
	0.250	0.380	0.353	0.500	0.258	0.250	0.268	0.285	0.275	0.563
	0.250	0.293	0.280	0.368	0.303	0.250				
B	0.765	0.743	0.715	0.750	0.555	0.595	0.743	0.690	0.750	0.730
	0.690	0.550	0.705	0.703	0.500	0.440	0.750	0.568	0.705	0.750
	0.735	0.733	0.650	0.750	0.735	0.480	0.688	0.743	0.250	0.730
	0.740	0.738	0.618	0.745	0.735	0.690	0.750	0.743	0.735	0.750
	0.750	0.620	0.648	0.500	0.743	0.750	0.733	0.715	0.725	0.438
	0.750	0.708	0.720	0.633	0.698	0.750				

'NUMBER OF LOREALS' 2

A	0.332	0.296	0.350	0.200	0.352	0.662	0.506	0.434	0.200	0.314
	0.192	0.460	0.416	0.336	0.424	0.464	0.364	0.364	0.338	0.718
	0.588	0.460	0.436	0.400	0.376	0.390	0.366	0.442	0.200	0.246
	0.260	0.302	0.374	0.186	0.188	0.306	0.400	0.334	0.248	0.250
	0.388	0.264	0.270	0.514	0.516	0.300	0.326	0.466	0.496	0.500
	0.200	0.456	0.312	0.494	0.472	0.400				
B	0.668	0.704	0.650	0.800	0.648	0.338	0.494	0.566	0.800	0.686
	0.808	0.540	0.584	0.664	0.576	0.536	0.636	0.636	0.662	0.282
	0.412	0.540	0.564	0.600	0.624	0.610	0.634	0.558	0.800	0.754
	0.740	0.698	0.626	0.814	0.812	0.694	0.600	0.666	0.752	0.750
	0.612	0.736	0.730	0.486	0.484	0.700	0.674	0.534	0.504	0.500
	0.800	0.544	0.688	0.506	0.528	0.600				

'NUMBER OF GULARS' 2

A	0.097	0.167	0.125	0.083	0.674	0.627	0.104	0.620	0.452	0.139
	0.175	0.677	0.190	0.061	0.062	0.499	0.102	0.574	0.180	0.131
	0.249	0.178	0.233	0.796	0.147	0.651	0.407	0.096	0.148	0.184
	0.146	0.131	0.259	0.177	0.074	0.150	0.472	0.140	0.175	0.172
	0.101	0.123	0.211	0.405	0.102	0.110	0.098	0.276	0.179	0.671
	0.191	0.761	0.185	0.283	0.668	0.194				
B	0.903	0.833	0.875	0.917	0.326	0.373	0.896	0.380	0.548	0.861
	0.825	0.323	0.810	0.939	0.938	0.501	0.898	0.426	0.820	0.869
	0.751	0.822	0.767	0.204	0.853	0.349	0.593	0.904	0.852	0.816
	0.854	0.869	0.741	0.823	0.926	0.850	0.528	0.860	0.825	0.828
	0.899	0.877	0.789	0.595	0.898	0.890	0.902	0.724	0.821	0.329
	0.809	0.239	0.815	0.717	0.332	0.806				

'NUMBER OF SCALES AROUND MIDBODY' 2

A	0.107	0.248	0.225	0.054	0.548	0.403	0.077	0.490	0.551	0.196
	0.321	0.737	0.275	0.065	0.143	0.629	0.118	0.380	0.233	0.135
	0.447	0.328	0.354	0.285	0.130	0.745	0.682	0.108	0.131	0.346
	0.133	0.162	0.206	0.196	0.048	0.209	0.593	0.297	0.211	0.211
	0.205	0.088	0.249	0.728	0.101	0.105	0.176	0.372	0.279	0.600
	0.212	0.813	0.213	0.386	0.493	0.245				
B	0.893	0.752	0.775	0.946	0.452	0.597	0.923	0.510	0.449	0.804
	0.679	0.263	0.725	0.935	0.857	0.371	0.882	0.620	0.767	0.865
	0.553	0.672	0.646	0.715	0.870	0.255	0.318	0.892	0.869	0.654

	0.867	0.838	0.794	0.804	0.952	0.791	0.407	0.703	0.789	0.789
	0.795	0.912	0.751	0.272	0.899	0.895	0.824	0.628	0.721	0.400
	0.788	0.187	0.787	0.614	0.507	0.755				

'NUMBER OF VERTEBRALS' 2

A	0.196	0.246	0.337	0.118	0.585	0.484	0.140	0.450	0.493	0.241
	0.468	0.726	0.310	0.155	0.030	0.701	0.174	0.527	0.258	0.226
	0.453	0.372	0.353	0.293	0.222	0.760	0.368	0.243	0.261	0.284
	0.274	0.247	0.348	0.342	0.207	0.321	0.478	0.343	0.307	0.352
	0.229	0.120	0.209	0.495	0.122	0.256	0.268	0.328	0.282	0.552
	0.363	0.825	0.225	0.374	0.517	0.136				
B	0.804	0.754	0.663	0.882	0.415	0.516	0.860	0.550	0.507	0.759
	0.533	0.274	0.690	0.845	0.970	0.299	0.826	0.473	0.742	0.774
	0.547	0.628	0.647	0.707	0.778	0.240	0.632	0.758	0.739	0.716
	0.726	0.753	0.652	0.658	0.793	0.679	0.522	0.657	0.693	0.648
	0.771	0.880	0.791	0.505	0.878	0.744	0.732	0.672	0.718	0.448
	0.637	0.175	0.775	0.626	0.483	0.864				

'NUMBER OF PARAVERTEBRALS' 2

A	0.132	0.199	0.228	0.038	0.543	0.400	0.094	0.404	0.451	0.215
	0.244	0.704	0.155	0.069	0.027	0.446	0.136	0.285	0.218	0.077
	0.552	0.279	0.311	0.233	0.175	0.722	0.520	0.124	0.098	0.216
	0.126	0.159	0.195	0.152	0.067	0.205	0.481	0.286	0.162	0.166
	0.203	0.076	0.281	0.468	0.103	0.133	0.166	0.308	0.256	0.558
	0.201	0.685	0.159	0.321	0.432	0.158				
B	0.868	0.801	0.772	0.962	0.457	0.600	0.906	0.596	0.549	0.785
	0.756	0.296	0.845	0.931	0.973	0.554	0.864	0.715	0.782	0.923
	0.448	0.721	0.689	0.767	0.825	0.278	0.480	0.876	0.902	0.784
	0.874	0.841	0.805	0.848	0.933	0.795	0.519	0.714	0.838	0.834
	0.797	0.924	0.719	0.532	0.897	0.867	0.834	0.692	0.744	0.442
	0.799	0.315	0.841	0.679	0.568	0.842				

'NUMBER OF LAMELLAE FINGER IV' 2

A	0.405	0.405	0.400	0.218	0.707	0.710	0.408	0.700	0.662	0.409
	0.464	0.828	0.502	0.238	0.300	0.537	0.353	0.639	0.400	0.292
	0.475	0.462	0.423	0.769	0.377	0.872	0.613	0.342	0.500	0.383

	0.473	0.488	0.385	0.375	0.473	0.405	0.481	0.445	0.434	0.415
	0.547	0.092	0.483	0.511	0.454	0.371	0.377	0.341	0.511	0.737
	0.404	0.722	0.388	0.557	0.721	0.404				
B	0.595	0.595	0.600	0.782	0.293	0.290	0.592	0.300	0.338	0.591
	0.536	0.172	0.498	0.762	0.700	0.463	0.647	0.361	0.600	0.708
	0.525	0.538	0.577	0.231	0.623	0.128	0.387	0.658	0.500	0.617
	0.527	0.512	0.615	0.625	0.527	0.595	0.519	0.555	0.566	0.585
	0.453	0.908	0.517	0.489	0.546	0.629	0.623	0.659	0.489	0.263
	0.596	0.278	0.612	0.443	0.279	0.596				

'NUMBER OF LAMELLAE TOE IV' 2

A	0.283	0.367	0.350	0.140	0.599	0.465	0.400	0.552	0.464	0.412
	0.399	0.680	0.490	0.208	0.184	0.438	0.386	0.607	0.423	0.280
	0.461	0.439	0.439	0.560	0.345	0.855	0.664	0.349	0.400	0.350
	0.368	0.460	0.160	0.320	0.433	0.370	0.400	0.417	0.392	0.324
	0.561	0.139	0.462	0.467	0.424	0.351	0.388	0.187	0.444	0.606
	0.420	0.518	0.376	0.560	0.536	0.320				
B	0.717	0.633	0.650	0.860	0.401	0.535	0.600	0.448	0.536	0.588
	0.601	0.320	0.510	0.792	0.816	0.562	0.614	0.393	0.577	0.720
	0.539	0.561	0.561	0.440	0.655	0.145	0.336	0.651	0.600	0.650
	0.632	0.540	0.840	0.680	0.567	0.630	0.600	0.583	0.608	0.676
	0.439	0.861	0.538	0.533	0.576	0.649	0.612	0.813	0.556	0.394
	0.580	0.482	0.624	0.440	0.464	0.680				

'TAIL LENGTH/TOTAL LENGTH MALES' 2

A	0.880	0.640	0.720	0.600	0.600	0.440	0.960	0.400	0.480	0.480
	0.720	0.440	0.640	0.640	0.280	0.320	0.880	0.640	0.680	0.760
	0.640	0.600	0.640	-----	0.800	0.680	0.800	0.800	-----	0.640
	0.680	0.880	0.400	0.640	0.920	0.760	0.720	0.680	0.800	0.760
	0.880	0.280	0.840	0.680	0.920	0.800	0.640	0.120	0.840	0.480
	0.640	0.120	0.800	0.640	0.600	-----				
B	0.120	0.360	0.280	0.400	0.400	0.560	0.040	0.600	0.520	0.520
	0.280	0.560	0.360	0.360	0.720	0.680	0.120	0.360	0.320	0.240
	0.360	0.400	0.360	-----	0.200	0.320	0.200	0.200	-----	0.360
	0.320	0.120	0.600	0.360	0.080	0.240	0.280	0.320	0.200	0.240
	0.120	0.720	0.160	0.320	0.080	0.200	0.360	0.880	0.160	0.520
	0.360	0.880	0.200	0.360	0.400	-----				

'TAIL LENGTH/TOTAL LENGTH FEMALES' 2

A	0.846	0.577	0.654	0.654	0.538	0.462	0.885	0.385	-----	0.577
	0.692	0.423	0.577	0.615	0.308	0.308	0.846	0.654	0.692	0.769
	0.654	0.577	0.500	-----	0.808	0.692	0.769	0.808	-----	0.577
	0.731	0.885	0.423	0.615	0.962	0.769	-----	0.692	0.692	0.654
	0.923	0.269	0.846	0.615	0.923	0.846	0.577	0.192	0.846	0.500
	0.654	0.077	0.692	0.654	0.538	0.577				
B	0.154	0.423	0.346	0.346	0.462	0.538	0.115	0.615	-----	0.423
	0.308	0.577	0.423	0.385	0.692	0.692	0.154	0.346	0.308	0.231
	0.346	0.423	0.500	-----	0.192	0.308	0.231	0.192	-----	0.423
	0.269	0.115	0.577	0.385	0.038	0.231	-----	0.308	0.308	0.346
	0.077	0.731	0.154	0.385	0.077	0.154	0.423	0.808	0.154	0.500
	0.346	0.923	0.308	0.346	0.462	0.423				

'HIND LIMB LENGTH/SVL' 2

A	0.177	0.099	0.133	0.088	0.105	0.110	0.193	0.083	0.116	0.116
	0.083	0.088	0.110	0.105	0.072	0.050	0.227	0.094	0.105	0.287
	0.160	0.133	0.105	0.155	0.155	0.116	0.155	0.215	0.055	0.083
	0.083	0.215	0.072	0.072	0.144	0.116	0.088	0.133	0.160	0.110
	0.155	0.044	0.155	0.099	0.210	0.188	0.127	0.066	0.232	0.094
	0.072	0.061	0.099	0.116	0.133	0.105				
B	0.823	0.901	0.867	0.912	0.895	0.890	0.807	0.917	0.884	0.884
	0.917	0.912	0.890	0.895	0.928	0.950	0.773	0.906	0.895	0.713
	0.840	0.867	0.895	0.845	0.845	0.884	0.845	0.785	0.945	0.917
	0.917	0.785	0.928	0.928	0.856	0.884	0.912	0.867	0.840	0.890
	0.845	0.956	0.845	0.901	0.790	0.812	0.873	0.934	0.768	0.906
	0.928	0.939	0.901	0.884	0.867	0.895				

'FORELIMB LENGTH/SVL' 2

A	0.581	0.355	0.419	0.323	0.484	0.516	0.516	0.548	0.484	0.323
	0.194	0.419	0.355	0.387	0.484	0.226	0.613	0.355	0.419	0.710
	0.516	0.387	0.387	0.581	0.387	0.484	0.452	0.581	0.355	0.323
	0.226	0.645	0.355	0.226	0.419	0.387	0.323	0.419	0.323	0.323
	0.484	0.194	0.387	0.323	0.613	0.484	0.387	0.355	0.839	0.419
	0.226	0.452	0.387	0.323	0.581	0.355				

B	0.419	0.645	0.581	0.677	0.516	0.484	0.484	0.452	0.516	0.677
	0.806	0.581	0.645	0.613	0.516	0.774	0.387	0.645	0.581	0.290
	0.484	0.613	0.613	0.419	0.613	0.516	0.548	0.419	0.645	0.677
	0.774	0.355	0.645	0.774	0.581	0.613	0.677	0.581	0.677	0.677
	0.516	0.806	0.613	0.677	0.387	0.516	0.613	0.645	0.161	0.581
	0.774	0.548	0.613	0.677	0.419	0.645				

'HEAD LENGTH/SVL' 2

A	0.706	0.647	0.647	0.588	0.706	0.706	0.647	0.647	0.765	0.706
	0.588	0.706	0.647	0.588	0.824	0.647	0.706	0.706	0.706	0.824
	0.706	0.706	0.647	1.000	0.647	0.706	0.647	0.706	0.588	0.647
	0.647	0.588	0.647	0.647	0.647	0.588	0.647	0.706	0.647	0.647
	0.647	0.588	0.588	0.647	0.647	0.647	0.647	0.765	0.706	0.706
	0.588	0.647	0.529	0.706	0.765	0.529				
B	0.294	0.353	0.353	0.412	0.294	0.294	0.353	0.353	0.235	0.294
	0.412	0.294	0.353	0.412	0.176	0.353	0.294	0.294	0.294	0.176
	0.294	0.294	0.353	0.000	0.353	0.294	0.353	0.294	0.412	0.353
	0.353	0.412	0.353	0.353	0.353	0.412	0.353	0.294	0.353	0.353
	0.353	0.412	0.412	0.353	0.353	0.353	0.353	0.235	0.294	0.294
	0.412	0.353	0.471	0.294	0.235	0.471				

'HEAD HEIGHT/HEAD LENGTH' 2

A	0.256	0.211	0.189	0.156	0.133	0.133	0.189	0.156	0.156	0.167
	0.133	0.100	0.144	0.233	0.133	0.200	0.178	0.122	0.189	0.178
	0.144	0.156	0.200	0.122	0.167	0.133	0.111	0.222	0.156	0.189
	0.144	0.178	0.078	0.189	0.111	0.189	0.156	0.178	0.178	0.144
	0.167	0.211	0.178	0.167	0.189	0.178	0.178	0.144	0.167	0.122
	0.133	0.156	0.211	0.144	0.156	0.222				
B	0.744	0.789	0.811	0.844	0.867	0.867	0.811	0.844	0.844	0.833
	0.867	0.900	0.856	0.767	0.867	0.800	0.822	0.878	0.811	0.822
	0.856	0.844	0.800	0.878	0.833	0.867	0.889	0.778	0.844	0.811
	0.856	0.822	0.922	0.811	0.889	0.811	0.844	0.822	0.822	0.856
	0.833	0.789	0.822	0.833	0.811	0.822	0.822	0.856	0.833	0.878
	0.867	0.844	0.789	0.856	0.844	0.778				

'PINEAL SCALE ORGAN' 2

A	1.000	0.243	0.111	0.000	0.950	1.000	0.033	0.759	1.000	0.081
	0.000	1.000	1.000	0.000	0.000	1.000	0.840	1.000	0.091	1.000
	1.000	1.000	0.000	1.000	0.000	1.000	1.000	0.143	1.000	0.970
	0.000	0.216	1.000	0.000	0.000	0.000	1.000	0.969	0.000	0.047
	0.056	0.000	1.000	1.000	0.000	0.029	0.000	1.000	1.000	1.000
	0.000	1.000	0.240	1.000	1.000	0.000				
B	0.000	0.757	0.889	1.000	0.050	0.000	0.967	0.241	0.000	0.919
	1.000	0.000	0.000	1.000	1.000	0.000	0.160	0.000	0.909	0.000
	0.000	0.000	1.000	0.000	1.000	0.000	0.000	0.857	0.000	0.030
	1.000	0.784	0.000	1.000	1.000	1.000	0.000	0.031	1.000	0.953
	0.944	1.000	0.000	0.000	1.000	0.971	1.000	0.000	0.000	0.000
	1.000	0.000	0.760	0.000	0.000	1.000				

'SUBNASAL-POSTROSTRAL CONTACT' 2

A	0.000	0.000	0.000	0.000	0.030	0.000	0.033	0.000	0.000	0.000
	0.010	0.400	0.000	0.097	0.890	0.000	0.000	0.000	0.000	0.074
	0.063	0.000	0.000	0.000	0.000	0.050	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.940	0.000	0.000	0.133	0.000	0.000	0.111	0.072	0.000
	0.000	0.000	0.013	0.000	0.000	0.000				
B	1.000	1.000	1.000	1.000	0.970	1.000	0.967	1.000	1.000	1.000
	0.990	0.600	1.000	0.903	0.110	1.000	1.000	1.000	1.000	0.926
	0.937	1.000	1.000	1.000	1.000	0.950	1.000	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.000	0.060	1.000	1.000	0.867	1.000	1.000	0.889	0.928	1.000
	1.000	1.000	0.987	1.000	1.000	1.000				

'ROSTRAL-NASAL CONTACT' 2

A	0.782	0.971	0.973	0.834	1.000	1.000	0.910	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	1.000	0.680	0.950	0.898	1.000
	1.000	1.000	1.000	1.000	0.901	1.000	1.000	0.973	1.000	0.970
	0.951	0.893	1.000	1.000	1.000	0.975	0.000	1.000	1.000	0.954
	1.000	0.970	1.000	1.000	0.667	0.751	1.000	1.000	0.930	1.000
	0.751	1.000	1.000	1.000	1.000	0.750				
B	0.218	0.029	0.027	0.166	0.000	0.000	0.090	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.320	0.050	0.102	0.000
	0.000	0.000	0.000	0.000	0.099	0.000	0.000	0.027	0.000	0.030

0.049	0.107	0.000	0.000	0.000	0.025	1.000	0.000	0.000	0.046
0.000	0.030	0.000	0.000	0.333	0.249	0.000	0.000	0.070	0.000
0.249	0.000	0.000	0.000	0.000	0.250				

'3RD SUBLABIAL-2ND INFRALABIAL CONTACT' 2

A	0.000	1.000	0.944	1.000	0.940	0.000	0.000	0.364	1.000	1.000
	1.000	0.434	1.000	0.904	1.000	1.000	0.160	0.950	0.975	0.040
	1.000	0.980	1.000	0.000	0.347	0.801	1.000	0.634	1.000	0.970
	1.000	0.546	0.910	1.000	1.000	1.000	1.000	1.000	0.972	1.000
	1.000	0.970	1.000	0.572	0.000	0.291	1.000	0.394	0.100	0.951
	1.000	0.190	0.961	0.940	0.440	1.000				
B	1.000	0.000	0.056	0.000	0.060	1.000	1.000	0.636	0.000	0.000
	0.000	0.566	0.000	0.096	0.000	0.000	0.840	0.050	0.025	0.960
	0.000	0.020	0.000	1.000	0.653	0.199	0.000	0.366	0.000	0.030
	0.000	0.454	0.090	0.000	0.000	0.000	0.000	0.000	0.028	0.000
	0.000	0.030	0.000	0.428	1.000	0.709	0.000	0.606	0.900	0.049
	0.000	0.810	0.039	0.060	0.560	0.000				

'1ST PAIR OF POSTMENTALS' 2

A	0.787	0.091	0.056	0.200	0.270	0.000	0.033	0.111	0.000	0.271
	0.000	0.000	0.026	0.000	0.222	0.000	0.080	0.000	0.026	0.732
	0.000	0.022	0.262	0.000	0.000	0.334	0.000	0.000	0.000	0.026
	0.000	0.135	0.200	0.000	0.000	0.048	0.000	0.273	0.000	0.118
	0.000	0.680	0.000	0.429	0.480	0.029	0.111	0.125	0.000	0.000
	0.000	0.130	0.025	0.170	0.000	0.250				
B	0.213	0.909	0.944	0.800	0.730	1.000	0.967	0.889	1.000	0.729
	1.000	1.000	0.974	1.000	0.778	1.000	0.920	1.000	0.974	0.268
	1.000	0.978	0.738	1.000	1.000	0.666	1.000	1.000	1.000	0.974
	1.000	0.865	0.800	1.000	1.000	0.952	1.000	0.727	1.000	0.882
	1.000	0.320	1.000	0.571	0.520	0.971	0.889	0.875	1.000	1.000
	1.000	0.870	0.975	0.830	1.000	0.750				

'ANTERIORMOST GULARS' 2

A	0.000	0.394	0.334	0.501	0.340	0.270	0.470	0.297	1.000	0.108
	0.597	0.300	0.659	0.300	0.389	0.649	0.240	0.592	0.513	0.074
	0.876	0.760	0.246	1.000	0.267	0.125	0.417	0.278	0.000	0.359

	0.250	0.379	0.601	0.637	0.000	0.975	1.000	0.534	0.707	0.210
	0.389	0.060	0.765	0.286	0.190	0.057	0.519	0.612	0.030	0.751
	0.250	0.300	0.414	0.650	0.608	1.000				
B	1.000	0.606	0.666	0.499	0.660	0.730	0.530	0.703	0.000	0.892
	0.403	0.700	0.341	0.700	0.611	0.351	0.760	0.408	0.487	0.926
	0.124	0.240	0.754	0.000	0.733	0.875	0.583	0.722	1.000	0.641
	0.750	0.621	0.399	0.363	1.000	0.025	0.000	0.466	0.293	0.790
	0.611	0.940	0.235	0.714	0.810	0.943	0.481	0.388	0.970	0.249
	0.750	0.700	0.586	0.350	0.392	0.000				

'BLACK PATCH NECK MALES' 2

A	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	1.000	0.930	1.000	0.072	1.000
	1.000	0.650	0.501	1.000	0.125	1.000	0.000	0.154	1.000	0.125
	1.000	0.000	1.000	1.000	1.000	1.000	1.000	0.801	1.000	1.000
	1.000	1.000	0.000	0.000	1.000	0.278	1.000	1.000	1.000	1.000
	1.000	1.000	0.091	0.910	1.000	1.000				
B	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.070	0.000	0.928	0.000
	0.000	0.350	0.499	0.000	0.875	0.000	1.000	0.846	0.000	0.875
	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.199	0.000	0.000
	0.000	0.000	1.000	1.000	0.000	0.722	0.000	0.000	0.000	0.000
	0.000	0.000	0.909	0.090	0.000	0.000				

'BLACK MIDVENTRAL STRIPE MALES' 2

A	1.000	0.429	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.177
	0.621	1.000	1.000	1.000	1.000	1.000	0.080	1.000	0.072	1.000
	0.334	1.000	0.344	1.000	1.000	1.000	0.000	0.000	1.000	0.000
	1.000	0.000	1.000	0.957	1.000	0.188	0.000	0.133	1.000	1.000
	0.083	1.000	0.000	1.000	1.000	0.000	0.000	0.435	1.000	1.000
	1.000	1.000	0.114	0.910	1.000	1.000				
B	0.000	0.571	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.823
	0.379	0.000	0.000	0.000	0.000	0.000	0.920	0.000	0.928	0.000
	0.666	0.000	0.656	0.000	0.000	0.000	1.000	1.000	0.000	1.000
	0.000	1.000	0.000	0.043	0.000	0.812	1.000	0.867	0.000	0.000
	0.917	0.000	1.000	0.000	0.000	1.000	1.000	0.565	0.000	0.000
	0.000	0.000	0.886	0.090	0.000	0.000				

'LIGHT DORSOLATERAL EYE STRIPE' 2

A	1.000	0.637	0.629	0.000	1.000	1.000	1.000	0.932	1.000	1.000
	0.200	1.000	0.470	1.000	1.000	1.000	0.140	0.000	0.896	1.000
	0.858	0.590	0.755	1.000	0.300	1.000	1.000	0.942	0.000	0.263
	0.417	0.893	0.154	0.455	1.000	0.029	0.000	0.840	0.265	0.620
	0.723	0.000	0.938	1.000	1.000	1.000	1.000	0.676	0.060	0.200
	0.000	1.000	0.694	0.930	1.000	1.000				
B	0.000	0.363	0.371	1.000	0.000	0.000	0.000	0.068	0.000	0.000
	0.800	0.000	0.530	0.000	0.000	0.000	0.860	1.000	0.104	0.000
	0.142	0.410	0.245	0.000	0.700	0.000	0.000	0.058	1.000	0.737
	0.583	0.107	0.846	0.545	0.000	0.971	1.000	0.160	0.735	0.380
	0.277	1.000	0.062	0.000	0.000	0.000	0.000	0.324	0.940	0.800
	1.000	0.000	0.306	0.070	0.000	0.000				

'LIGHT VENTROLATERAL EYE STRIPE' 2

A	1.000	0.743	0.858	0.334	1.000	1.000	1.000	1.000	1.000	1.000
	0.629	1.000	0.947	1.000	1.000	1.000	1.000	1.000	0.975	1.000
	0.930	0.930	0.925	1.000	1.000	1.000	1.000	1.000	0.000	0.421
	0.667	1.000	1.000	1.000	1.000	0.744	1.000	1.000	0.589	0.858
	0.945	0.130	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	0.501	1.000	0.814	1.000	1.000	1.000				
B	0.000	0.257	0.142	0.666	0.000	0.000	0.000	0.000	0.000	0.000
	0.371	0.000	0.053	0.000	0.000	0.000	0.000	0.000	0.025	0.000
	0.070	0.070	0.075	0.000	0.000	0.000	0.000	0.000	1.000	0.579
	0.333	0.000	0.000	0.000	0.000	0.256	0.000	0.000	0.411	0.142
	0.055	0.870	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.499	0.000	0.186	0.000	0.000	0.000				

'GULAR PATTERN FEMALES' 2

A	0.779	1.000	0.940	1.000	0.870	1.000	1.000	1.000	-----	1.000
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	0.860	0.520	1.000	-----	1.000	1.000	0.600	0.860	-----	1.000
	1.000	0.600	1.000	1.000	1.000	1.000	-----	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	0.500	1.000	0.770	1.000	1.000
	1.000	1.000	0.740	1.000	1.000	1.000				

B	0.221	0.000	0.060	0.000	0.130	0.000	0.000	0.000	-----	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.140	0.480	0.000	-----	0.000	0.000	0.400	0.140	-----	0.000
	0.000	0.400	0.000	0.000	0.000	0.000	-----	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.230	0.000	0.000
	0.000	0.000	0.260	0.000	0.000	0.000				

'GULAR PATTERN MALES' 2

A	0.400	0.860	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	1.000	0.920	1.000	0.930	1.000
	1.000	0.560	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.930	1.000	1.000
	1.000	1.000	0.000	1.000	0.930	1.000	0.000	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	1.000				
B	0.600	0.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.000	0.070	0.000
	0.000	0.440	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.070	0.000	0.000
	0.000	0.000	1.000	0.000	0.070	0.000	1.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000				

'DARK INTERORBITAL BAND' 2

A	1.000	1.000	1.000	0.000	1.000	1.000	0.480	1.000	1.000	1.000
	1.000	1.000	1.000	0.000	0.834	1.000	0.920	1.000	0.975	0.890
	0.934	1.000	0.793	1.000	0.834	1.000	1.000	0.765	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.806
	1.000	0.000	0.000	1.000	0.420	0.118	0.927	0.568	0.787	1.000
	1.000	1.000	1.000	1.000	1.000	1.000				
B	0.000	0.000	0.000	1.000	0.000	0.000	0.520	0.000	0.000	0.000
	0.000	0.000	0.000	1.000	0.166	0.000	0.080	0.000	0.025	0.110
	0.066	0.000	0.207	0.000	0.166	0.000	0.000	0.235	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.194
	0.000	1.000	1.000	0.000	0.580	0.882	0.073	0.432	0.213	0.000
	0.000	0.000	0.000	0.000	0.000	0.000				

'BLACK LIPS' 2

A	1.000	1.000	1.000	1.000	1.000	0.900	1.000	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.000	1.000	0.831	1.000	0.968	1.000	1.000	1.000	1.000	1.000
	0.667	1.000	1.000	1.000	1.000	0.595	1.000	1.000	1.000	1.000
	0.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	1.000				
B	0.000	0.000	0.000	0.000	0.000	0.100	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.169	0.000	0.032	0.000	0.000	0.000	0.000	0.000
	0.333	0.000	0.000	0.000	0.000	0.405	0.000	0.000	0.000	0.000
	1.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000				

'BLACK TYMPANIC MARK FEMALES' 2

A	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	-----	1.000
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	0.000	1.000	1.000	-----	1.000	1.000	0.667	0.906	-----	1.000
	1.000	1.000	1.000	1.000	1.000	1.000	-----	0.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	0.400	1.000	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000	1.000				
B	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	-----	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	1.000	0.000	0.000	-----	0.000	0.000	0.333	0.094	-----	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	-----	1.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000				

APPENDIX VI

STEP MATRICES WITH COSTS OF CHANGES BETWEEN STATES FOR CONTINUOUS AND POLYMORPHIC CHARACTERS

Stepmatrix "NUMBER OF POSTROSTRALS" (symmetric):

FROM: \ TO:	a	b	c	d	e	f	g	h	i	j
a	-	0.22800	0.06000	0.25800	0.07300	0.02700	0.08500	0.06100	0.24700	0.21400
b	0.22800	-	0.16800	0.03000	0.15500	0.25500	0.14300	0.16700	0.01900	0.01400
c	0.06000	0.16800	-	0.19800	0.01300	0.08700	0.02500	0.00100	0.18700	0.15400
d	0.25800	0.03000	0.19800	-	0.18500	0.28500	0.17300	0.19700	0.01100	0.04400
e	0.07300	0.15500	0.01300	0.18500	-	0.10000	0.01200	0.01200	0.17400	0.14100
f	0.02700	0.25500	0.08700	0.28500	0.10000	-	0.11200	0.08800	0.27400	0.24100
g	0.08500	0.14300	0.02500	0.17300	0.01200	0.11200	-	0.02400	0.16200	0.12900
h	0.06100	0.16700	0.00100	0.19700	0.01200	0.08800	0.02400	-	0.18600	0.15300
i	0.24700	0.01900	0.18700	0.01100	0.17400	0.27400	0.16200	0.18600	-	0.03300
j	0.21400	0.01400	0.15400	0.04400	0.14100	0.24100	0.12900	0.15300	0.03300	-
k	0.05000	0.27800	0.11000	0.30800	0.12300	0.02300	0.13500	0.11100	0.29700	0.26400
l	0.06400	0.16400	0.00400	0.19400	0.00900	0.09100	0.02100	0.00300	0.18300	0.15000
m	0.25000	0.02200	0.19000	0.00800	0.17700	0.27700	0.16500	0.18900	0.00300	0.03600
n	0.00200	0.23000	0.06200	0.26000	0.07500	0.02500	0.08700	0.06300	0.24900	0.21600
o	0.24100	0.01300	0.18100	0.01700	0.16800	0.26800	0.15600	0.18000	0.00600	0.02700
p	0.09000	0.13800	0.03000	0.16800	0.01700	0.11700	0.00500	0.02900	0.15700	0.12400
q	0.23700	0.00900	0.17700	0.02100	0.16400	0.26400	0.15200	0.17600	0.01000	0.02300
r	0.01500	0.21300	0.04500	0.24300	0.05800	0.04200	0.07000	0.04600	0.23200	0.19900
s	0.01500	0.24300	0.07500	0.27300	0.08800	0.01200	0.10000	0.07600	0.26200	0.22900
t	0.18000	0.04800	0.12000	0.07800	0.10700	0.20700	0.09500	0.11900	0.06700	0.03400
u	0.24000	0.01200	0.18000	0.01800	0.16700	0.26700	0.15500	0.17900	0.00700	0.02600
v	0.00600	0.23400	0.06600	0.26400	0.07900	0.02100	0.09100	0.06700	0.25300	0.22000
w	0.21100	0.01700	0.15100	0.04700	0.13800	0.23800	0.12600	0.15000	0.03600	0.00300
x	0.13100	0.09700	0.07100	0.12700	0.05800	0.15800	0.04600	0.07000	0.11600	0.08300
y	0.11500	0.11300	0.05500	0.14300	0.04200	0.14200	0.03000	0.05400	0.13200	0.09900
z	0.05100	0.17700	0.00900	0.20700	0.02200	0.07800	0.03400	0.01000	0.19600	0.16300
0	0.14000	0.08800	0.08000	0.11800	0.06700	0.16700	0.05500	0.07900	0.10700	0.07400
1	0.00300	0.22500	0.05700	0.25500	0.07000	0.03000	0.08200	0.05800	0.24400	0.21100
2	0.08100	0.14700	0.02100	0.17700	0.00800	0.10800	0.00400	0.02000	0.16600	0.13300
3	0.21700	0.01100	0.15700	0.04100	0.14400	0.24400	0.13200	0.15600	0.03000	0.00300
4	0.19500	0.03300	0.13500	0.06300	0.12200	0.22200	0.11000	0.13400	0.05200	0.01900
5	0.16800	0.06000	0.10800	0.09000	0.09500	0.19500	0.08300	0.10700	0.07900	0.04600
6	0.10900	0.33700	0.16900	0.36700	0.18200	0.08200	0.19400	0.17000	0.35600	0.32300
7	0.09700	0.13100	0.03700	0.16100	0.02400	0.12400	0.01200	0.03600	0.15000	0.11700
8	0.19300	0.03500	0.13300	0.06500	0.12000	0.22000	0.10800	0.13200	0.05400	0.02100
9	0.02000	0.20800	0.04000	0.23800	0.05300	0.04700	0.06500	0.04100	0.22700	0.19400
A	0.04200	0.27000	0.10200	0.30000	0.11500	0.01500	0.12700	0.10300	0.28900	0.25600
B	0.22300	0.00500	0.16300	0.03500	0.15000	0.25000	0.13800	0.16200	0.02400	0.00900
C	0.05600	0.28400	0.11600	0.31400	0.12900	0.02900	0.14100	0.11700	0.30300	0.27000
D	0.16100	0.06700	0.10100	0.09700	0.08800	0.18800	0.07600	0.10000	0.08600	0.05300
E	0.04400	0.18400	0.01600	0.21400	0.02900	0.07100	0.04100	0.01700	0.20300	0.17000

FROM: \ TO:	k	l	m	n	o	p	q	r	s	t
a	0.05000	0.06400	0.25000	0.00200	0.24100	0.09000	0.23700	0.01500	0.01500	0.18000
b	0.27800	0.16400	0.02200	0.23000	0.01300	0.13800	0.00900	0.21300	0.24300	0.04800
c	0.11000	0.00400	0.19000	0.06200	0.18100	0.03000	0.17700	0.04500	0.07500	0.12000
d	0.30800	0.19400	0.00800	0.26000	0.01700	0.16800	0.02100	0.24300	0.27300	0.07800
e	0.12300	0.00900	0.17700	0.07500	0.16800	0.01700	0.16400	0.05800	0.08800	0.10700
f	0.02300	0.09100	0.27700	0.02500	0.26800	0.11700	0.26400	0.04200	0.01200	0.20700
g	0.13500	0.02100	0.16500	0.08700	0.15600	0.00500	0.15200	0.07000	0.10000	0.09500
h	0.11100	0.00300	0.18900	0.06300	0.18000	0.02900	0.17600	0.04600	0.07600	0.11900
i	0.29700	0.18300	0.00300	0.24900	0.00600	0.15700	0.01000	0.23200	0.26200	0.06700
j	0.26400	0.15000	0.03600	0.21600	0.02700	0.12400	0.02300	0.19900	0.22900	0.03400
k	-	0.11400	0.30000	0.04800	0.29100	0.14000	0.28700	0.06500	0.03500	0.23000
l	0.11400	-	0.18600	0.06600	0.17700	0.02600	0.17300	0.04900	0.07900	0.11600
m	0.30000	0.18600	-	0.25200	0.00900	0.16000	0.01300	0.23500	0.26500	0.07000
n	0.04800	0.06600	0.25200	-	0.24300	0.09200	0.23900	0.01700	0.01300	0.18200
o	0.29100	0.17700	0.00900	0.24300	-	0.15100	0.00400	0.22600	0.25600	0.06100
p	0.14000	0.02600	0.16000	0.09200	0.15100	-	0.14700	0.07500	0.10500	0.09000

q	0.28700	0.17300	0.01300	0.23900	0.00400	0.14700	-	0.22200	0.25200	0.05700
r	0.06500	0.04900	0.23500	0.01700	0.22600	0.07500	0.22200	-	0.03000	0.16500
s	0.03500	0.07900	0.26500	0.01300	0.25600	0.10500	0.25200	0.03000	-	0.19500
t	0.23000	0.11600	0.07000	0.18200	0.06100	0.09000	0.05700	0.16500	0.19500	-
u	0.29000	0.17600	0.01000	0.24200	0.00100	0.15000	0.00300	0.22500	0.25500	0.06000
v	0.04400	0.07000	0.25600	0.00400	0.24700	0.09600	0.24300	0.02100	0.00900	0.18600
w	0.26100	0.14700	0.03900	0.21300	0.03000	0.12100	0.02600	0.19600	0.22600	0.03100
x	0.18100	0.06700	0.11900	0.13300	0.11000	0.04100	0.10600	0.11600	0.14600	0.04900
y	0.16500	0.05100	0.13500	0.11700	0.12600	0.02500	0.12200	0.10000	0.13000	0.06500
z	0.10100	0.01300	0.19900	0.05300	0.19000	0.03900	0.18600	0.03600	0.06600	0.12900
0	0.19000	0.07600	0.11000	0.14200	0.10100	0.05000	0.09700	0.12500	0.15500	0.04000
1	0.05300	0.06100	0.24700	0.00500	0.23800	0.08700	0.23400	0.01200	0.01800	0.17700
2	0.13100	0.01700	0.16900	0.08300	0.16000	0.00900	0.15600	0.06600	0.09600	0.09900
3	0.26700	0.15300	0.03300	0.21900	0.02400	0.12700	0.02000	0.20200	0.23200	0.03700
4	0.24500	0.13100	0.05500	0.19700	0.04600	0.10500	0.04200	0.18000	0.21000	0.01500
5	0.21800	0.10400	0.08200	0.17000	0.07300	0.07800	0.06900	0.15300	0.18300	0.01200
6	0.05900	0.17300	0.35900	0.10700	0.35000	0.19900	0.34600	0.12400	0.09400	0.28900
7	0.14700	0.03300	0.15300	0.09900	0.14400	0.00700	0.14000	0.08200	0.11200	0.08300
8	0.24300	0.12900	0.05700	0.19500	0.04800	0.10300	0.04400	0.17800	0.20800	0.01300
9	0.07000	0.04400	0.23000	0.02200	0.22100	0.07000	0.21700	0.00500	0.03500	0.16000
A	0.00800	0.10600	0.29200	0.04000	0.28300	0.13200	0.27900	0.05700	0.02700	0.22200
B	0.27300	0.15900	0.02700	0.22500	0.01800	0.13300	0.01400	0.20800	0.23800	0.04300
C	0.00600	0.12000	0.30600	0.05400	0.29700	0.14600	0.29300	0.07100	0.04100	0.23600
D	0.21100	0.09700	0.08900	0.16300	0.08000	0.07100	0.07600	0.14600	0.17600	0.01900
E	0.09400	0.02000	0.20600	0.04600	0.19700	0.04600	0.19300	0.02900	0.05900	0.13600

TO:	u	v	w	x	y	z	0	1	2	3
FROM: a	0.24000	0.00600	0.21100	0.13100	0.11500	0.05100	0.14000	0.00300	0.08100	0.21700
b	0.01200	0.23400	0.01700	0.09700	0.11300	0.17700	0.08800	0.22500	0.14700	0.01100
c	0.18000	0.06600	0.15100	0.07100	0.05500	0.00900	0.08000	0.05700	0.02100	0.15700
d	0.01800	0.26400	0.04700	0.12700	0.14300	0.20700	0.11800	0.25500	0.17700	0.04100
e	0.16700	0.07900	0.13800	0.05800	0.04200	0.02200	0.06700	0.07000	0.00800	0.14400
f	0.26700	0.02100	0.23800	0.15800	0.14200	0.07800	0.16700	0.03000	0.10800	0.24400
g	0.15500	0.09100	0.12600	0.04600	0.03000	0.03400	0.05500	0.08200	0.00400	0.13200
h	0.17900	0.06700	0.15000	0.07000	0.05400	0.01000	0.07900	0.05800	0.02000	0.15600
i	0.00700	0.25300	0.03600	0.11600	0.13200	0.19600	0.10700	0.24400	0.16600	0.03000
j	0.02600	0.22000	0.00300	0.08300	0.09900	0.16300	0.07400	0.21100	0.13300	0.00300
k	0.29000	0.04400	0.26100	0.18100	0.16500	0.10100	0.19000	0.05300	0.13100	0.26700
l	0.17600	0.07000	0.14700	0.06700	0.05100	0.01300	0.07600	0.06100	0.01700	0.15300
m	0.01000	0.25600	0.03900	0.11900	0.13500	0.19900	0.11000	0.24700	0.16900	0.03300
n	0.24200	0.00400	0.21300	0.13300	0.11700	0.05300	0.14200	0.00500	0.08300	0.21900
o	0.00100	0.24700	0.03000	0.11000	0.12600	0.19000	0.10100	0.23800	0.16000	0.02400
p	0.15000	0.09600	0.12100	0.04100	0.02500	0.03900	0.05000	0.08700	0.00900	0.12700
q	0.00300	0.24300	0.02600	0.10600	0.12200	0.18600	0.09700	0.23400	0.15600	0.02000
r	0.22500	0.02100	0.19600	0.11600	0.10000	0.03600	0.12500	0.01200	0.06600	0.20200
s	0.25500	0.00900	0.22600	0.14600	0.13000	0.06600	0.15500	0.01800	0.09600	0.23200
t	0.06000	0.18600	0.03100	0.04900	0.06500	0.12900	0.04000	0.17700	0.09900	0.03700
u	-	0.24600	0.02900	0.10900	0.12500	0.18900	0.10000	0.23700	0.15900	0.02300
v	0.24600	-	0.21700	0.13700	0.12100	0.05700	0.14600	0.00900	0.08700	0.22300
w	0.02900	0.21700	-	0.08000	0.09600	0.16000	0.07100	0.20800	0.13000	0.00600
x	0.10900	0.13700	0.08000	-	0.01600	0.08000	0.00900	0.12800	0.05000	0.08600
y	0.12500	0.12100	0.09600	0.01600	-	0.06400	0.02500	0.11200	0.03400	0.10200
z	0.18900	0.05700	0.16000	0.08000	0.06400	-	0.08900	0.04800	0.03000	0.16600
0	0.10000	0.14600	0.07100	0.00900	0.02500	0.08900	-	0.13700	0.05900	0.07700
1	0.23700	0.00900	0.20800	0.12800	0.11200	0.04800	0.13700	-	0.07800	0.21400
2	0.15900	0.08700	0.13000	0.05000	0.03400	0.03000	0.05900	0.07800	-	0.13600
3	0.02300	0.22300	0.00600	0.08600	0.10200	0.16600	0.07700	0.21400	0.13600	-
4	0.04500	0.20100	0.01600	0.06400	0.08000	0.14400	0.05500	0.19200	0.11400	0.02200
5	0.07200	0.17400	0.04300	0.03700	0.05300	0.11700	0.02800	0.16500	0.08700	0.04900
6	0.34900	0.10300	0.32000	0.24000	0.22400	0.16000	0.24900	0.11200	0.19000	0.32600
7	0.14300	0.10300	0.11400	0.03400	0.01800	0.04600	0.04300	0.09400	0.01600	0.12000
8	0.04700	0.19900	0.01800	0.06200	0.07800	0.14200	0.05300	0.19000	0.11200	0.02400
9	0.22000	0.02600	0.19100	0.11100	0.09500	0.03100	0.12000	0.01700	0.06100	0.19700
A	0.28200	0.03600	0.25300	0.17300	0.15700	0.09300	0.18200	0.04500	0.12300	0.25900
B	0.01700	0.22900	0.01200	0.09200	0.10800	0.17200	0.08300	0.22000	0.14200	0.00600
C	0.29600	0.05000	0.26700	0.18700	0.17100	0.10700	0.19600	0.05900	0.13700	0.27300
D	0.07900	0.16700	0.05000	0.03000	0.04600	0.11000	0.02100	0.15800	0.08000	0.05600
E	0.19600	0.05000	0.16700	0.08700	0.07100	0.00700	0.09600	0.04100	0.03700	0.17300

TO:	4	5	6	7	8	9	A	B	C	D
FROM: a	0.19500	0.16800	0.10900	0.09700	0.19300	0.02000	0.04200	0.22300	0.05600	0.16100
b	0.03300	0.06000	0.33700	0.13100	0.03500	0.20800	0.27000	0.00500	0.28400	0.06700
c	0.13500	0.10800	0.16900	0.03700	0.13300	0.04000	0.10200	0.16300	0.11600	0.10100
d	0.06300	0.09000	0.36700	0.16100	0.06500	0.23800	0.30000	0.03500	0.31400	0.09700
e	0.12200	0.09500	0.18200	0.02400	0.12000	0.05300	0.11500	0.15000	0.12900	0.08800
f	0.22200	0.19500	0.08200	0.12400	0.22000	0.04700	0.01500	0.25000	0.02900	0.18800
g	0.11000	0.08300	0.19400	0.01200	0.10800	0.06500	0.12700	0.13800	0.14100	0.07600

h	0.13400	0.10700	0.17000	0.03600	0.13200	0.04100	0.10300	0.16200	0.11700	0.10000
i	0.05200	0.07900	0.35600	0.15000	0.05400	0.22700	0.28900	0.02400	0.30300	0.08600
j	0.01900	0.04600	0.32300	0.11700	0.02100	0.19400	0.25600	0.00900	0.27000	0.05300
k	0.24500	0.21800	0.05900	0.14700	0.24300	0.07000	0.00800	0.27300	0.00600	0.21100
l	0.13100	0.10400	0.17300	0.03300	0.12900	0.04400	0.10600	0.15900	0.12000	0.09700
m	0.05500	0.08200	0.35900	0.15300	0.05700	0.23000	0.29200	0.02700	0.30600	0.08900
n	0.19700	0.17000	0.10700	0.09900	0.19500	0.02200	0.04000	0.22500	0.05400	0.16300
o	0.04600	0.07300	0.35000	0.14400	0.04800	0.22100	0.28300	0.01800	0.29700	0.08000
p	0.10500	0.07800	0.19900	0.00700	0.10300	0.07000	0.13200	0.13300	0.14600	0.07100
q	0.04200	0.06900	0.34600	0.14000	0.04400	0.21700	0.27900	0.01400	0.29300	0.07600
r	0.18000	0.15300	0.12400	0.08200	0.17800	0.00500	0.05700	0.20800	0.07100	0.14600
s	0.21000	0.18300	0.09400	0.11200	0.20800	0.03500	0.02700	0.23800	0.04100	0.17600
t	0.01500	0.01200	0.28900	0.08300	0.01300	0.16000	0.22200	0.04300	0.23600	0.01900
u	0.04500	0.07200	0.34900	0.14300	0.04700	0.22000	0.28200	0.01700	0.29600	0.07900
v	0.20100	0.17400	0.10300	0.10300	0.19900	0.02600	0.03600	0.22900	0.05000	0.16700
w	0.01600	0.04300	0.32000	0.11400	0.01800	0.19100	0.25300	0.01200	0.26700	0.05000
x	0.06400	0.03700	0.24000	0.03400	0.06200	0.11100	0.17300	0.09200	0.18700	0.03000
y	0.08000	0.05300	0.22400	0.01800	0.07800	0.09500	0.15700	0.10800	0.17100	0.04600
z	0.14400	0.11700	0.16000	0.04600	0.14200	0.03100	0.09300	0.17200	0.10700	0.11000
0	0.05500	0.02800	0.24900	0.04300	0.05300	0.12000	0.18200	0.08300	0.19600	0.02100
1	0.19200	0.16500	0.11200	0.09400	0.19000	0.01700	0.04500	0.22000	0.05900	0.15800
2	0.11400	0.08700	0.19000	0.01600	0.11200	0.06100	0.12300	0.14200	0.13700	0.08000
3	0.02200	0.04900	0.32600	0.12000	0.02400	0.19700	0.25900	0.00600	0.27300	0.05600
4	-	0.02700	0.30400	0.09800	0.00200	0.17500	0.23700	0.02800	0.25100	0.03400
5	0.02700	-	0.27700	0.07100	0.02500	0.14800	0.21000	0.05500	0.22400	0.00700
6	0.30400	0.27700	-	0.20600	0.30200	0.12900	0.06700	0.33200	0.05300	0.27000
7	0.09800	0.07100	0.20600	-	0.09600	0.07700	0.13900	0.12600	0.15300	0.06400
8	0.00200	0.02500	0.30200	0.09600	-	0.17300	0.23500	0.03000	0.24900	0.03200
9	0.17500	0.14800	0.12900	0.07700	0.17300	-	0.06200	0.20300	0.07600	0.14100
A	0.23700	0.21000	0.06700	0.13900	0.23500	0.06200	-	0.26500	0.01400	0.20300
B	0.02800	0.05500	0.33200	0.12600	0.03000	0.20300	0.26500	-	0.27900	0.06200
C	0.25100	0.22400	0.05300	0.15300	0.24900	0.07600	0.01400	0.27900	-	0.21700
D	0.03400	0.00700	0.27000	0.06400	0.03200	0.14100	0.20300	0.06200	0.21700	-
E	0.15100	0.12400	0.15300	0.05300	0.14900	0.02400	0.08600	0.17900	0.10000	0.11700

TO:	E
FROM: a	0.04400
b	0.18400
c	0.01600
d	0.21400
e	0.02900
f	0.07100
g	0.04100
h	0.01700
i	0.20300
j	0.17000
k	0.09400
l	0.02000
m	0.20600
n	0.04600
o	0.19700
p	0.04600
q	0.19300
r	0.02900
s	0.05900
t	0.13600
u	0.19600
v	0.05000
w	0.16700
x	0.08700
y	0.07100
z	0.00700
0	0.09600
1	0.04100
2	0.03700
3	0.17300
4	0.15100
5	0.12400
6	0.15300
7	0.05300
8	0.14900
9	0.02400
A	0.08600
B	0.17900
C	0.10000
D	0.11700
E	-

Stepmatrix "NUMBER OF INTERNASALS" (symmetric):

FROM: \ TO:	a	b	c	d	e	f	g	h	i	j
a	-	0.39300	0.41700	0.32300	0.40500	0.35200	0.13300	0.47500	0.38000	0.11700
b	0.39300	-	0.02400	0.07000	0.01200	0.04100	0.52600	0.08200	0.01300	0.27600
c	0.41700	0.02400	-	0.09400	0.01200	0.06500	0.55000	0.05800	0.03700	0.30000
d	0.32300	0.07000	0.09400	-	0.08200	0.02900	0.45600	0.15200	0.05700	0.20600
e	0.40500	0.01200	0.01200	0.08200	-	0.05300	0.53800	0.07000	0.02500	0.28800
f	0.35200	0.04100	0.06500	0.02900	0.05300	-	0.48500	0.12300	0.02800	0.23500
g	0.13300	0.52600	0.55000	0.45600	0.53800	0.48500	-	0.60800	0.51300	0.25000
h	0.47500	0.08200	0.05800	0.15200	0.07000	0.12300	0.60800	-	0.09500	0.35800
i	0.38000	0.01300	0.03700	0.05700	0.02500	0.02800	0.51300	0.09500	-	0.26300
j	0.11700	0.27600	0.30000	0.20600	0.28800	0.23500	0.25000	0.35800	0.26300	-
k	0.36000	0.03300	0.05700	0.03700	0.04500	0.00800	0.49300	0.11500	0.02000	0.24300
l	0.36800	0.02500	0.04900	0.04500	0.03700	0.01600	0.50100	0.10700	0.01200	0.25100
m	0.00800	0.38500	0.40900	0.31500	0.39700	0.34400	0.14100	0.46700	0.37200	0.10900
n	0.41200	0.01900	0.00500	0.08900	0.00700	0.06000	0.54500	0.06300	0.03200	0.29500
o	0.41000	0.01700	0.00700	0.08700	0.00500	0.05800	0.54300	0.06500	0.03000	0.29300
p	0.40300	0.01000	0.01400	0.08000	0.00200	0.05100	0.53600	0.07200	0.02300	0.28600
q	0.44500	0.05200	0.02800	0.12200	0.04000	0.09300	0.57800	0.03000	0.06500	0.32800
r	0.08500	0.30800	0.33200	0.23800	0.32000	0.26700	0.21800	0.39000	0.29500	0.03200
s	0.33000	0.06300	0.08700	0.00700	0.07500	0.02200	0.46300	0.14500	0.05000	0.21300
t	0.34800	0.04500	0.06900	0.02500	0.05700	0.00400	0.48100	0.12700	0.03200	0.23100
u	0.48200	0.08900	0.06500	0.15900	0.07700	0.13000	0.61500	0.00700	0.10200	0.36500
v	0.51800	0.12500	0.10100	0.19500	0.11300	0.16600	0.65100	0.04300	0.13800	0.40100
w	0.06500	0.32800	0.35200	0.25800	0.34000	0.28700	0.19800	0.41000	0.31500	0.05200
x	0.36700	0.02600	0.05000	0.04400	0.03800	0.01500	0.50000	0.10800	0.01300	0.25000
y	0.61000	0.21700	0.19300	0.28700	0.20500	0.25800	0.74300	0.13500	0.23000	0.49300
z	0.38700	0.00600	0.03000	0.06400	0.01800	0.03500	0.52000	0.08800	0.00700	0.27000
0	0.37700	0.01600	0.04000	0.05400	0.02800	0.02500	0.51000	0.09800	0.00300	0.26000
1	0.37300	0.02000	0.04400	0.05000	0.03200	0.02100	0.50600	0.10200	0.00700	0.25600
2	0.66700	0.27400	0.25000	0.34400	0.26200	0.31500	0.80000	0.19200	0.28700	0.55000
3	0.34700	0.04600	0.07000	0.02400	0.05800	0.00500	0.48000	0.12800	0.03300	0.23000
4	0.40000	0.00700	0.01700	0.07700	0.00500	0.04800	0.53300	0.07500	0.02000	0.28300
5	0.41300	0.02000	0.00400	0.09000	0.00800	0.06100	0.54600	0.06200	0.03300	0.29600
6	0.34200	0.05100	0.07500	0.01900	0.06300	0.01000	0.47500	0.13300	0.03800	0.22500
7	0.38300	0.01000	0.03400	0.06000	0.02200	0.03100	0.51600	0.09200	0.00300	0.26600
8	0.32800	0.06500	0.08900	0.00500	0.07700	0.02400	0.46100	0.14700	0.05200	0.21100
9	0.08300	0.47600	0.50000	0.40600	0.48800	0.43500	0.05000	0.55800	0.46300	0.20000
A	0.62000	0.22700	0.20300	0.29700	0.21500	0.26800	0.75300	0.14500	0.24000	0.50300
B	0.60700	0.21400	0.19000	0.28400	0.20200	0.25500	0.74000	0.13200	0.22700	0.49000
C	0.20300	0.19000	0.21400	0.12000	0.20200	0.14900	0.33600	0.27200	0.17700	0.08600
D	0.09300	0.30000	0.32400	0.23000	0.31200	0.25900	0.22600	0.38200	0.28700	0.02400
E	0.43500	0.04200	0.01800	0.11200	0.03000	0.08300	0.56800	0.04000	0.05500	0.31800
F	0.31500	0.07800	0.10200	0.00800	0.09000	0.03700	0.44800	0.16000	0.06500	0.19800
G	0.39800	0.00500	0.01900	0.07500	0.00700	0.04600	0.53100	0.07700	0.01800	0.28100
H	0.36200	0.03100	0.05500	0.03900	0.04300	0.01000	0.49500	0.11300	0.01800	0.24500
I	0.34500	0.04800	0.07200	0.02200	0.06000	0.00700	0.47800	0.13000	0.03500	0.22800

FROM: \ TO:	k	l	m	n	o	p	q	r	s	t
a	0.36000	0.36800	0.00800	0.41200	0.41000	0.40300	0.44500	0.08500	0.33000	0.34800
b	0.03300	0.02500	0.38500	0.01900	0.01700	0.01000	0.05200	0.30800	0.06300	0.04500
c	0.05700	0.04900	0.40900	0.00500	0.00700	0.01400	0.02800	0.33200	0.08700	0.06900
d	0.03700	0.04500	0.31500	0.08900	0.08700	0.08000	0.12200	0.23800	0.00700	0.02500
e	0.04500	0.03700	0.39700	0.00700	0.00500	0.00200	0.04000	0.32000	0.07500	0.05700
f	0.00800	0.01600	0.34400	0.06000	0.05800	0.05100	0.09300	0.26700	0.02200	0.00400
g	0.49300	0.50100	0.14100	0.54500	0.54300	0.53600	0.57800	0.21800	0.46300	0.48100
h	0.11500	0.10700	0.46700	0.06300	0.06500	0.07200	0.03000	0.39000	0.14500	0.12700
i	0.02000	0.01200	0.37200	0.03200	0.03000	0.02300	0.06500	0.29500	0.05000	0.03200
j	0.24300	0.25100	0.10900	0.29500	0.29300	0.28600	0.32800	0.03200	0.21300	0.23100
k	-	0.00800	0.35200	0.05200	0.05000	0.04300	0.08500	0.27500	0.03000	0.01200
l	0.00800	-	0.36000	0.04400	0.04200	0.03500	0.07700	0.28300	0.03800	0.02000
m	0.35200	0.36000	-	0.40400	0.40200	0.39500	0.43700	0.07700	0.32200	0.34000
n	0.05200	0.04400	0.40400	-	0.00200	0.00900	0.03300	0.32700	0.08200	0.06400
o	0.05000	0.04200	0.40200	0.00200	-	0.00700	0.03500	0.32500	0.08000	0.06200
p	0.04300	0.03500	0.39500	0.00900	0.00700	-	0.04200	0.31800	0.07300	0.05500
q	0.08500	0.07700	0.43700	0.03300	0.03500	0.04200	-	0.36000	0.11500	0.09700
r	0.27500	0.28300	0.07700	0.32700	0.32500	0.31800	0.36000	-	0.24500	0.26300
s	0.03000	0.03800	0.32200	0.08200	0.08000	0.07300	0.11500	0.24500	-	0.01800
t	0.01200	0.02000	0.34000	0.06400	0.06200	0.05500	0.09700	0.26300	0.01800	-
u	0.12200	0.11400	0.47400	0.07000	0.07200	0.07900	0.03700	0.39700	0.15200	0.13400
v	0.15800	0.15000	0.51000	0.10600	0.10800	0.11500	0.07300	0.43300	0.18800	0.17000
w	0.29500	0.30300	0.05700	0.34700	0.34500	0.33800	0.38000	0.02000	0.26500	0.28300
x	0.00700	0.00100	0.35900	0.04500	0.04300	0.03600	0.07800	0.28200	0.03700	0.01900
y	0.25000	0.24200	0.60200	0.19800	0.20000	0.20700	0.16500	0.52500	0.28000	0.26200

z	0.02700	0.01900	0.37900	0.02500	0.02300	0.01600	0.05800	0.30200	0.05700	0.03900
0	0.01700	0.00900	0.36900	0.03500	0.03300	0.02600	0.06800	0.29200	0.04700	0.02900
1	0.01300	0.00500	0.36500	0.03900	0.03700	0.03000	0.07200	0.28800	0.04300	0.02500
2	0.30700	0.29900	0.65900	0.25500	0.25700	0.26400	0.22200	0.58200	0.33700	0.31900
3	0.01300	0.02100	0.33900	0.06500	0.06300	0.05600	0.09800	0.26200	0.01700	0.00100
4	0.04000	0.03200	0.39200	0.01200	0.01000	0.00300	0.04500	0.31500	0.07000	0.05200
5	0.05300	0.04500	0.40500	0.00100	0.00300	0.01000	0.03200	0.32800	0.08300	0.06500
6	0.01800	0.02600	0.33400	0.07000	0.06800	0.06100	0.10300	0.25700	0.01200	0.00600
7	0.02300	0.01500	0.37500	0.02900	0.02700	0.02000	0.06200	0.29800	0.05300	0.03500
8	0.03200	0.04000	0.32000	0.08400	0.08200	0.07500	0.11700	0.24300	0.00200	0.02000
9	0.44300	0.45100	0.09100	0.49500	0.49300	0.48600	0.52800	0.16800	0.41300	0.43100
A	0.26000	0.25200	0.61200	0.20800	0.21000	0.21700	0.17500	0.53500	0.29000	0.27200
B	0.24700	0.23900	0.59900	0.19500	0.19700	0.20400	0.16200	0.52200	0.27700	0.25900
C	0.15700	0.16500	0.19500	0.20900	0.20700	0.20000	0.24200	0.11800	0.12700	0.14500
D	0.26700	0.27500	0.08500	0.31900	0.31700	0.31000	0.35200	0.00800	0.23700	0.25500
E	0.07500	0.06700	0.42700	0.02300	0.02500	0.03200	0.01000	0.35000	0.10500	0.08700
F	0.04500	0.05300	0.30700	0.09700	0.09500	0.08800	0.13000	0.23000	0.01500	0.03300
G	0.03800	0.03000	0.39000	0.01400	0.01200	0.00500	0.04700	0.31300	0.06800	0.05000
H	0.00200	0.00600	0.35400	0.05000	0.04800	0.04100	0.08300	0.27700	0.03200	0.01400
I	0.01500	0.02300	0.33700	0.06700	0.06500	0.05800	0.10000	0.26000	0.01500	0.00300

TO:	u	v	w	x	y	z	0	1	2	3
FROM: a	0.48200	0.51800	0.06500	0.36700	0.61000	0.38700	0.37700	0.37300	0.66700	0.34700
b	0.08900	0.12500	0.32800	0.02600	0.21700	0.00600	0.01600	0.02000	0.27400	0.04600
c	0.06500	0.10100	0.35200	0.05000	0.19300	0.03000	0.04000	0.04400	0.25000	0.07000
d	0.15900	0.19500	0.25800	0.04400	0.28700	0.06400	0.05400	0.05000	0.34400	0.02400
e	0.07700	0.11300	0.34000	0.03800	0.20500	0.01800	0.02800	0.03200	0.26200	0.05800
f	0.13000	0.16600	0.28700	0.01500	0.25800	0.03500	0.02500	0.02100	0.31500	0.00500
g	0.61500	0.65100	0.19800	0.50000	0.74300	0.52000	0.51000	0.50600	0.80000	0.48000
h	0.00700	0.04300	0.41000	0.10800	0.13500	0.08800	0.09800	0.10200	0.19200	0.12800
i	0.10200	0.13800	0.31500	0.01300	0.23000	0.00700	0.00300	0.00700	0.28700	0.03300
j	0.36500	0.40100	0.05200	0.25000	0.49300	0.27000	0.26000	0.25600	0.55000	0.23000
k	0.12200	0.15800	0.29500	0.00700	0.25000	0.02700	0.01700	0.01300	0.30700	0.01300
l	0.11400	0.15000	0.30300	0.00100	0.24200	0.01900	0.00900	0.00500	0.29900	0.02100
m	0.47400	0.51000	0.05700	0.35900	0.60200	0.37900	0.36900	0.36500	0.65900	0.33900
n	0.07000	0.10600	0.34700	0.04500	0.19800	0.02500	0.03500	0.03900	0.25500	0.06500
o	0.07200	0.10800	0.34500	0.04300	0.20000	0.02300	0.03300	0.03700	0.25700	0.06300
p	0.07900	0.11500	0.33800	0.03600	0.20700	0.01600	0.02600	0.03000	0.26400	0.05600
q	0.03700	0.07300	0.38000	0.07800	0.16500	0.05800	0.06800	0.07200	0.22200	0.09800
r	0.39700	0.43300	0.02000	0.28200	0.52500	0.30200	0.29200	0.28800	0.58200	0.26200
s	0.15200	0.18800	0.26500	0.03700	0.28000	0.05700	0.04700	0.04300	0.33700	0.01700
t	0.13400	0.17000	0.28300	0.01900	0.26200	0.03900	0.02900	0.02500	0.31900	0.00100
u	-	0.03600	0.41700	0.11500	0.12800	0.09500	0.10500	0.10900	0.18500	0.13500
v	0.03600	-	0.45300	0.15100	0.09200	0.13100	0.14100	0.14500	0.14900	0.17100
w	0.41700	0.45300	-	0.30200	0.54500	0.32200	0.31200	0.30800	0.60200	0.28200
x	0.11500	0.15100	0.30200	-	0.24300	0.02000	0.01000	0.00600	0.30000	0.02000
y	0.12800	0.09200	0.54500	0.24300	-	0.22300	0.23300	0.23700	0.05700	0.26300
z	0.09500	0.13100	0.32200	0.02000	0.22300	-	0.01000	0.01400	0.28000	0.04000
0	0.10500	0.14100	0.31200	0.01000	0.23300	0.01000	-	0.00400	0.29000	0.03000
1	0.10900	0.14500	0.30800	0.00600	0.23700	0.01400	0.00400	-	0.29400	0.02600
2	0.18500	0.14900	0.60200	0.30000	0.05700	0.28000	0.29000	0.29400	-	0.32000
3	0.13500	0.17100	0.28200	0.02000	0.26300	0.04000	0.03000	0.02600	0.32000	-
4	0.08200	0.11800	0.33500	0.03300	0.21000	0.01300	0.02300	0.02700	0.26700	0.05300
5	0.06900	0.10500	0.34800	0.04600	0.19700	0.02600	0.03600	0.04000	0.25400	0.06600
6	0.14000	0.17600	0.27700	0.02500	0.26800	0.04500	0.03500	0.03100	0.32500	0.00500
7	0.09900	0.13500	0.31800	0.01600	0.22700	0.00400	0.00600	0.01000	0.28400	0.03600
8	0.15400	0.19000	0.26300	0.03900	0.28200	0.05900	0.04900	0.04500	0.33900	0.01900
9	0.56500	0.60100	0.14800	0.45000	0.69300	0.47000	0.46000	0.45600	0.75000	0.43000
A	0.13800	0.10200	0.55500	0.25300	0.01000	0.23300	0.24300	0.24700	0.04700	0.27300
B	0.12500	0.08900	0.54200	0.24000	0.00300	0.22000	0.23000	0.23400	0.06000	0.26000
C	0.27900	0.31500	0.13800	0.16400	0.40700	0.18400	0.17400	0.17000	0.46400	0.14400
D	0.38900	0.42500	0.02800	0.27400	0.51700	0.29400	0.28400	0.28000	0.57400	0.25400
E	0.04700	0.08300	0.37000	0.06800	0.17500	0.04800	0.05800	0.06200	0.23200	0.08800
F	0.16700	0.20300	0.25000	0.05200	0.29500	0.07200	0.06200	0.05800	0.35200	0.03200
G	0.08400	0.12000	0.33300	0.03100	0.21200	0.01100	0.02100	0.02500	0.26900	0.05100
H	0.12000	0.15600	0.29700	0.00500	0.24800	0.02500	0.01500	0.01100	0.30500	0.01500
I	0.13700	0.17300	0.28000	0.02200	0.26500	0.04200	0.03200	0.02800	0.32200	0.00200

TO:	4	5	6	7	8	9	A	B	C	D
FROM: a	0.40000	0.41300	0.34200	0.38300	0.32800	0.08300	0.62000	0.60700	0.20300	0.09300
b	0.00700	0.02000	0.05100	0.01000	0.06500	0.47600	0.22700	0.21400	0.19000	0.30000
c	0.01700	0.00400	0.07500	0.03400	0.08900	0.50000	0.20300	0.19000	0.21400	0.32400
d	0.07700	0.09000	0.01900	0.06000	0.00500	0.40600	0.29700	0.28400	0.12000	0.23000
e	0.00500	0.00800	0.06300	0.02200	0.07700	0.48800	0.21500	0.20200	0.20200	0.31200
f	0.04800	0.06100	0.01000	0.03100	0.02400	0.43500	0.26800	0.25500	0.14900	0.25900
g	0.53300	0.54600	0.47500	0.51600	0.46100	0.05000	0.75300	0.74000	0.33600	0.22600
h	0.07500	0.06200	0.13300	0.09200	0.14700	0.55800	0.14500	0.13200	0.27200	0.38200

i	0.02000	0.03300	0.03800	0.00300	0.05200	0.46300	0.24000	0.22700	0.17700	0.28700
j	0.28300	0.29600	0.22500	0.26600	0.21100	0.20000	0.50300	0.49000	0.08600	0.02400
k	0.04000	0.05300	0.01800	0.02300	0.03200	0.44300	0.26000	0.24700	0.15700	0.26700
l	0.03200	0.04500	0.02600	0.01500	0.04000	0.45100	0.25200	0.23900	0.16500	0.27500
m	0.39200	0.40500	0.33400	0.37500	0.32000	0.09100	0.61200	0.59900	0.19500	0.08500
n	0.01200	0.00100	0.07000	0.02900	0.08400	0.49500	0.20800	0.19500	0.20900	0.31900
o	0.01000	0.00300	0.06800	0.02700	0.08200	0.49300	0.21000	0.19700	0.20700	0.31700
p	0.00300	0.01000	0.06100	0.02000	0.07500	0.48600	0.21700	0.20400	0.20000	0.31000
q	0.04500	0.03200	0.10300	0.06200	0.11700	0.52800	0.17500	0.16200	0.24200	0.35200
r	0.31500	0.32800	0.25700	0.29800	0.24300	0.16800	0.53500	0.52200	0.11800	0.00800
s	0.07000	0.08300	0.01200	0.05300	0.00200	0.41300	0.29000	0.27700	0.12700	0.23700
t	0.05200	0.06500	0.00600	0.03500	0.02000	0.43100	0.27200	0.25900	0.14500	0.25500
u	0.08200	0.06900	0.14000	0.09900	0.15400	0.56500	0.13800	0.12500	0.27900	0.38900
v	0.11800	0.10500	0.17600	0.13500	0.19000	0.60100	0.10200	0.08900	0.31500	0.42500
w	0.33500	0.34800	0.27700	0.31800	0.26300	0.14800	0.55500	0.54200	0.13800	0.02800
x	0.03300	0.04600	0.02500	0.01600	0.03900	0.45000	0.25300	0.24000	0.16400	0.27400
y	0.21000	0.19700	0.26800	0.22700	0.28200	0.69300	0.01000	0.00300	0.40700	0.51700
z	0.01300	0.02600	0.04500	0.00400	0.05900	0.47000	0.23300	0.22000	0.18400	0.29400
0	0.02300	0.03600	0.03500	0.00600	0.04900	0.46000	0.24300	0.23000	0.17400	0.28400
1	0.02700	0.04000	0.03100	0.01000	0.04500	0.45600	0.24700	0.23400	0.17000	0.28000
2	0.26700	0.25400	0.32500	0.28400	0.33900	0.75000	0.04700	0.06000	0.46400	0.57400
3	0.05300	0.06600	0.00500	0.03600	0.01900	0.43000	0.27300	0.26000	0.14400	0.25400
4	-	0.01300	0.05800	0.01700	0.07200	0.48300	0.22000	0.20700	0.19700	0.30700
5	0.01300	-	0.07100	0.03000	0.08500	0.49600	0.20700	0.19400	0.21000	0.32000
6	0.05800	0.07100	-	0.04100	0.01400	0.42500	0.27800	0.26500	0.13900	0.24900
7	0.01700	0.03000	0.04100	-	0.05500	0.46600	0.23700	0.22400	0.18000	0.29000
8	0.07200	0.08500	0.01400	0.05500	-	0.41100	0.29200	0.27900	0.12500	0.23500
9	0.48300	0.49600	0.42500	0.46600	0.41100	-	0.70300	0.69000	0.28600	0.17600
A	0.22000	0.20700	0.27800	0.23700	0.29200	0.70300	-	0.01300	0.41700	0.52700
B	0.20700	0.19400	0.26500	0.22400	0.27900	0.69000	0.01300	-	0.40400	0.51400
C	0.19700	0.21000	0.13900	0.18000	0.12500	0.28600	0.41700	0.40400	-	0.11000
D	0.30700	0.32000	0.24900	0.29000	0.23500	0.17600	0.52700	0.51400	0.11000	-
E	0.03500	0.02200	0.09300	0.05200	0.10700	0.51800	0.18500	0.17200	0.23200	0.34200
F	0.08500	0.09800	0.02700	0.06800	0.01300	0.39800	0.30500	0.29200	0.11200	0.22200
G	0.00200	0.01500	0.05600	0.01500	0.07000	0.48100	0.22200	0.20900	0.19500	0.30500
H	0.03800	0.05100	0.02000	0.02100	0.03400	0.44500	0.25800	0.24500	0.15900	0.26900
I	0.05500	0.06800	0.00300	0.03800	0.01700	0.42800	0.27500	0.26200	0.14200	0.25200

TO:	E	F	G	H	I
FROM: a	0.43500	0.31500	0.39800	0.36200	0.34500
b	0.04200	0.07800	0.00500	0.03100	0.04800
c	0.01800	0.10200	0.01900	0.05500	0.07200
d	0.11200	0.00800	0.07500	0.03900	0.02200
e	0.03000	0.09000	0.00700	0.04300	0.06000
f	0.08300	0.03700	0.04600	0.01000	0.00700
g	0.56800	0.44800	0.53100	0.49500	0.47800
h	0.04000	0.16000	0.07700	0.11300	0.13000
i	0.05500	0.06500	0.01800	0.01800	0.03500
j	0.31800	0.19800	0.28100	0.24500	0.22800
k	0.07500	0.04500	0.03800	0.00200	0.01500
l	0.06700	0.05300	0.03000	0.00600	0.02300
m	0.42700	0.30700	0.39000	0.35400	0.33700
n	0.02300	0.09700	0.01400	0.05000	0.06700
o	0.02500	0.09500	0.01200	0.04800	0.06500
p	0.03200	0.08800	0.00500	0.04100	0.05800
q	0.01000	0.13000	0.04700	0.08300	0.10000
r	0.35000	0.23000	0.31300	0.27700	0.26000
s	0.10500	0.01500	0.06800	0.03200	0.01500
t	0.08700	0.03300	0.05000	0.01400	0.00300
u	0.04700	0.16700	0.08400	0.12000	0.13700
v	0.08300	0.20300	0.12000	0.15600	0.17300
w	0.37000	0.25000	0.33300	0.29700	0.28000
x	0.06800	0.05200	0.03100	0.00500	0.02200
y	0.17500	0.29500	0.21200	0.24800	0.26500
z	0.04800	0.07200	0.01100	0.02500	0.04200
0	0.05800	0.06200	0.02100	0.01500	0.03200
1	0.06200	0.05800	0.02500	0.01100	0.02800
2	0.23200	0.35200	0.26900	0.30500	0.32200
3	0.08800	0.03200	0.05100	0.01500	0.00200
4	0.03500	0.08500	0.00200	0.03800	0.05500
5	0.02200	0.09800	0.01500	0.05100	0.06800
6	0.09300	0.02700	0.05600	0.02000	0.00300
7	0.05200	0.06800	0.01500	0.02100	0.03800
8	0.10700	0.01300	0.07000	0.03400	0.01700
9	0.51800	0.39800	0.48100	0.44500	0.42800
A	0.18500	0.30500	0.22200	0.25800	0.27500
B	0.17200	0.29200	0.20900	0.24500	0.26200

C	0.23200	0.11200	0.19500	0.15900	0.14200
D	0.34200	0.22200	0.30500	0.26900	0.25200
E	-	0.12000	0.03700	0.07300	0.09000
F	0.12000	-	0.08300	0.04700	0.03000
G	0.03700	0.08300	-	0.03600	0.05300
H	0.07300	0.04700	0.03600	-	0.01700
I	0.09000	0.03000	0.05300	0.01700	-

Stepmatrix "NUMBER OF SUPRAOCULARS" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.07500	0.14200	0.11000	0.30400	0.23900	0.13000	0.24500	0.26000	0.15700
b	0.07500	-	0.06700	0.03500	0.22900	0.16400	0.05500	0.17000	0.18500	0.08200
c	0.14200	0.06700	-	0.03200	0.16200	0.09700	0.01200	0.10300	0.11800	0.01500
d	0.11000	0.03500	0.03200	-	0.19400	0.12900	0.02000	0.13500	0.15000	0.04700
e	0.30400	0.22900	0.16200	0.19400	-	0.06500	0.17400	0.05900	0.04400	0.14700
f	0.23900	0.16400	0.09700	0.12900	0.06500	-	0.10900	0.00600	0.02100	0.08200
g	0.13000	0.05500	0.01200	0.02000	0.17400	0.10900	-	0.11500	0.13000	0.02700
h	0.24500	0.17000	0.10300	0.13500	0.05900	0.00600	0.11500	-	0.01500	0.08800
i	0.26000	0.18500	0.11800	0.15000	0.04400	0.02100	0.13000	0.01500	-	0.10300
j	0.15700	0.08200	0.01500	0.04700	0.14700	0.08200	0.02700	0.08800	0.10300	-
k	0.26400	0.18900	0.12200	0.15400	0.04000	0.02500	0.13400	0.01900	0.00400	0.10700
l	0.39400	0.31900	0.25200	0.28400	0.09000	0.15500	0.26400	0.14900	0.13400	0.23700
m	0.27700	0.20200	0.13500	0.16700	0.02700	0.03800	0.14700	0.03200	0.01700	0.12000
n	0.07900	0.00400	0.06300	0.03100	0.22500	0.16000	0.05100	0.16600	0.18100	0.07800
o	0.01600	0.09100	0.15800	0.12600	0.32000	0.25500	0.14600	0.26100	0.27600	0.17300
p	0.06600	0.14100	0.20800	0.17600	0.37000	0.30500	0.19600	0.31100	0.32600	0.22300
q	0.19000	0.11500	0.04800	0.08000	0.11400	0.04900	0.06000	0.05500	0.07000	0.03300
r	0.11400	0.03900	0.02800	0.00400	0.19000	0.12500	0.01600	0.13100	0.14600	0.04300
s	0.05600	0.13100	0.19800	0.16600	0.36000	0.29500	0.18600	0.30100	0.31600	0.21300
t	0.17400	0.09900	0.03200	0.06400	0.13000	0.06500	0.04400	0.07100	0.08600	0.01700
u	0.22200	0.14700	0.08000	0.11200	0.08200	0.01700	0.09200	0.02300	0.03800	0.06500
v	0.06500	0.01000	0.07700	0.04500	0.23900	0.17400	0.06500	0.18000	0.19500	0.09200
w	0.46500	0.39000	0.32300	0.35500	0.16100	0.22600	0.33500	0.22000	0.20500	0.30800
x	0.20700	0.13200	0.06500	0.09700	0.09700	0.03200	0.07700	0.03800	0.05300	0.05000
y	0.09300	0.16800	0.23500	0.20300	0.39700	0.33200	0.22300	0.33800	0.35300	0.25000
z	0.10200	0.02700	0.04000	0.00800	0.20200	0.13700	0.02800	0.14300	0.15800	0.05500
0	0.25000	0.17500	0.10800	0.14000	0.05400	0.01100	0.12000	0.00500	0.01000	0.09300
1	0.00700	0.06800	0.13500	0.10300	0.29700	0.23200	0.12300	0.23800	0.25300	0.15000
2	0.24400	0.16900	0.10200	0.13400	0.06000	0.00500	0.11400	0.00100	0.01600	0.08700
3	0.15500	0.08000	0.01300	0.04500	0.14900	0.08400	0.02500	0.09000	0.10500	0.00200
4	0.04500	0.03000	0.09700	0.06500	0.25900	0.19400	0.08500	0.20000	0.21500	0.11200
5	0.19400	0.11900	0.05200	0.08400	0.11000	0.04500	0.06400	0.05100	0.06600	0.03700
6	0.26700	0.19200	0.12500	0.15700	0.03700	0.02800	0.13700	0.02200	0.00700	0.11000
7	0.19900	0.12400	0.05700	0.08900	0.10500	0.04000	0.06900	0.04600	0.06100	0.04200
8	0.18400	0.10900	0.04200	0.07400	0.12000	0.05500	0.05400	0.06100	0.07600	0.02700
9	0.05500	0.02000	0.08700	0.05500	0.24900	0.18400	0.07500	0.19000	0.20500	0.10200
A	0.10400	0.02900	0.03800	0.00600	0.20000	0.13500	0.02600	0.14100	0.15600	0.05300
B	0.16900	0.09400	0.02700	0.05900	0.13500	0.07000	0.03900	0.07600	0.09100	0.01200
C	0.03700	0.03800	0.10500	0.07300	0.26700	0.20200	0.09300	0.20800	0.22300	0.12000
D	0.14700	0.07200	0.00500	0.03700	0.15700	0.09200	0.01700	0.09800	0.11300	0.01000
E	0.31400	0.23900	0.17200	0.20400	0.01000	0.07500	0.18400	0.06900	0.05400	0.15700
F	0.01200	0.06300	0.13000	0.09800	0.29200	0.22700	0.11800	0.23300	0.24800	0.14500
G	0.46200	0.38700	0.32000	0.35200	0.15800	0.22300	0.33200	0.21700	0.20200	0.30500
H	0.02700	0.04800	0.11500	0.08300	0.27700	0.21200	0.10300	0.21800	0.23300	0.13000
I	0.39000	0.31500	0.24800	0.28000	0.08600	0.15100	0.26000	0.14500	0.13000	0.23300
J	0.02400	0.05100	0.11800	0.08600	0.28000	0.21500	0.10600	0.22100	0.23600	0.13300
K	0.21900	0.14400	0.07700	0.10900	0.08500	0.02000	0.08900	0.02600	0.04100	0.06200
L	0.21200	0.13700	0.07000	0.10200	0.09200	0.02700	0.08200	0.03300	0.04800	0.05500
M	0.06900	0.00600	0.07300	0.04100	0.23500	0.17000	0.06100	0.17600	0.19100	0.08800

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.26400	0.39400	0.27700	0.07900	0.01600	0.06600	0.19000	0.11400	0.05600	0.17400
b	0.18900	0.31900	0.20200	0.00400	0.09100	0.14100	0.11500	0.03900	0.13100	0.09900
c	0.12200	0.25200	0.13500	0.06300	0.15800	0.20800	0.04800	0.02800	0.19800	0.03200
d	0.15400	0.28400	0.16700	0.03100	0.12600	0.17600	0.08000	0.00400	0.16600	0.06400
e	0.04000	0.09000	0.02700	0.22500	0.32000	0.37000	0.11400	0.19000	0.36000	0.13000
f	0.02500	0.15500	0.03800	0.16000	0.25500	0.30500	0.04900	0.12500	0.29500	0.06500
g	0.13400	0.26400	0.14700	0.05100	0.14600	0.19600	0.06000	0.01600	0.18600	0.04400
h	0.01900	0.14900	0.03200	0.16600	0.26100	0.31100	0.05500	0.13100	0.30100	0.07100
i	0.00400	0.13400	0.01700	0.18100	0.27600	0.32600	0.07000	0.14600	0.31600	0.08600
j	0.10700	0.23700	0.12000	0.07800	0.17300	0.22300	0.03300	0.04300	0.21300	0.01700
k	-	0.13000	0.01300	0.18500	0.28000	0.33000	0.07400	0.15000	0.32000	0.09000
l	0.13000	-	0.11700	0.31500	0.41000	0.46000	0.20400	0.28000	0.45000	0.22000
m	0.01300	0.11700	-	0.19800	0.29300	0.34300	0.08700	0.16300	0.33300	0.10300
n	0.18500	0.31500	0.19800	-	0.09500	0.14500	0.11100	0.03500	0.13500	0.09500

o	0.28000	0.41000	0.29300	0.09500	-	0.05000	0.20600	0.13000	0.04000	0.19000
p	0.33000	0.46000	0.34300	0.14500	0.05000	-	0.25600	0.18000	0.01000	0.24000
q	0.07400	0.20400	0.08700	0.11100	0.20600	0.25600	-	0.07600	0.24600	0.01600
r	0.15000	0.28000	0.16300	0.03500	0.13000	0.18000	0.07600	-	0.17000	0.06000
s	0.32000	0.45000	0.33300	0.13500	0.04000	0.01000	0.24600	0.17000	-	0.23000
t	0.09000	0.22000	0.10300	0.09500	0.19000	0.24000	0.01600	0.06000	0.23000	-
u	0.04200	0.17200	0.05500	0.14300	0.23800	0.28800	0.03200	0.10800	0.27800	0.04800
v	0.19900	0.32900	0.21200	0.01400	0.08100	0.13100	0.12500	0.04900	0.12100	0.10900
w	0.20100	0.07100	0.18800	0.38600	0.48100	0.53100	0.27500	0.35100	0.52100	0.29100
x	0.05700	0.18700	0.07000	0.12800	0.22300	0.27300	0.01700	0.09300	0.26300	0.03300
y	0.35700	0.48700	0.37000	0.17200	0.07700	0.02700	0.28300	0.20700	0.03700	0.26700
z	0.16200	0.29200	0.17500	0.02300	0.11800	0.16800	0.08800	0.01200	0.15800	0.07200
0	0.01400	0.14400	0.02700	0.17100	0.26600	0.31600	0.06000	0.13600	0.30600	0.07600
1	0.25700	0.38700	0.27000	0.07200	0.02300	0.07300	0.18300	0.10700	0.06300	0.16700
2	0.02000	0.15000	0.03300	0.16500	0.26000	0.31000	0.05400	0.13000	0.30000	0.07000
3	0.10900	0.23900	0.12200	0.07600	0.17100	0.22100	0.03500	0.04100	0.21100	0.01900
4	0.21900	0.34900	0.23200	0.03400	0.06100	0.11100	0.14500	0.06900	0.10100	0.12900
5	0.07000	0.20000	0.08300	0.11500	0.21000	0.26000	0.00400	0.08000	0.25000	0.02000
6	0.00300	0.12700	0.01000	0.18800	0.28300	0.33300	0.07700	0.15300	0.32300	0.09300
7	0.06500	0.19500	0.07800	0.12000	0.21500	0.26500	0.00900	0.08500	0.25500	0.02500
8	0.08000	0.21000	0.09300	0.10500	0.20000	0.25000	0.00600	0.07000	0.24000	0.01000
9	0.20900	0.33900	0.22200	0.02400	0.07100	0.12100	0.13500	0.05900	0.11100	0.11900
A	0.16000	0.29000	0.17300	0.02500	0.12000	0.17000	0.08600	0.01000	0.16000	0.07000
B	0.09500	0.22500	0.10800	0.09000	0.18500	0.23500	0.02100	0.05500	0.22500	0.00500
C	0.22700	0.35700	0.24000	0.04200	0.05300	0.10300	0.15300	0.07700	0.09300	0.13700
D	0.11700	0.24700	0.13000	0.06800	0.16300	0.21300	0.04300	0.03300	0.20300	0.02700
E	0.05000	0.08000	0.03700	0.23500	0.33000	0.38000	0.12400	0.20000	0.37000	0.14000
F	0.25200	0.38200	0.26500	0.06700	0.02800	0.07800	0.17800	0.10200	0.06800	0.16200
G	0.19800	0.06800	0.18500	0.38300	0.47800	0.52800	0.27200	0.34800	0.51800	0.28800
H	0.23700	0.36700	0.25000	0.05200	0.04300	0.09300	0.16300	0.08700	0.08300	0.14700
I	0.12600	0.00400	0.11300	0.31100	0.40600	0.45600	0.20000	0.27600	0.44600	0.21600
J	0.24000	0.37000	0.25300	0.05500	0.04000	0.09000	0.16600	0.09000	0.08000	0.15000
K	0.04500	0.17500	0.05800	0.14000	0.23500	0.28500	0.02900	0.10500	0.27500	0.04500
L	0.05200	0.18200	0.06500	0.13300	0.22800	0.27800	0.02200	0.09800	0.26800	0.03800
M	0.19500	0.32500	0.20800	0.01000	0.08500	0.13500	0.12100	0.04500	0.12500	0.10500

TO:	u	v	w	x	y	z	0	1	2	3
FROM: a	0.22200	0.06500	0.46500	0.20700	0.09300	0.10200	0.25000	0.00700	0.24400	0.15500
b	0.14700	0.01000	0.39000	0.13200	0.16800	0.02700	0.17500	0.06800	0.16900	0.08000
c	0.08000	0.07700	0.32300	0.06500	0.23500	0.04000	0.10800	0.13500	0.10200	0.01300
d	0.11200	0.04500	0.35500	0.09700	0.20300	0.00800	0.14000	0.10300	0.13400	0.04500
e	0.08200	0.23900	0.16100	0.09700	0.39700	0.20200	0.05400	0.29700	0.06000	0.14900
f	0.01700	0.17400	0.22600	0.03200	0.33200	0.13700	0.01100	0.23200	0.00500	0.08400
g	0.09200	0.06500	0.33500	0.07700	0.22300	0.02800	0.12000	0.12300	0.11400	0.02500
h	0.02300	0.18000	0.22000	0.03800	0.33800	0.14300	0.00500	0.23800	0.00100	0.09000
i	0.03800	0.19500	0.20500	0.05300	0.35300	0.15800	0.01000	0.25300	0.01600	0.10500
j	0.06500	0.09200	0.30800	0.05000	0.25000	0.05500	0.09300	0.15000	0.08700	0.00200
k	0.04200	0.19900	0.20100	0.05700	0.35700	0.16200	0.01400	0.25700	0.02000	0.10900
l	0.17200	0.32900	0.07100	0.18700	0.48700	0.29200	0.14400	0.38700	0.15000	0.23900
m	0.05500	0.21200	0.18800	0.07000	0.37000	0.17500	0.02700	0.27000	0.03300	0.12200
n	0.14300	0.01400	0.38600	0.12800	0.17200	0.02300	0.17100	0.07200	0.16500	0.07600
o	0.23800	0.08100	0.48100	0.22300	0.07700	0.11800	0.26600	0.02300	0.26000	0.17100
p	0.28800	0.13100	0.53100	0.27300	0.02700	0.16800	0.31600	0.07300	0.31000	0.22100
q	0.03200	0.12500	0.27500	0.01700	0.28300	0.08800	0.06000	0.18300	0.05400	0.03500
r	0.10800	0.04900	0.35100	0.09300	0.20700	0.01200	0.13600	0.10700	0.13000	0.04100
s	0.27800	0.12100	0.52100	0.26300	0.03700	0.15800	0.30600	0.06300	0.30000	0.21100
t	0.04800	0.10900	0.29100	0.03300	0.26700	0.07200	0.07600	0.16700	0.07000	0.01900
u	-	0.15700	0.24300	0.01500	0.31500	0.12000	0.02800	0.21500	0.02200	0.06700
v	0.15700	-	0.40000	0.14200	0.15800	0.03700	0.18500	0.05800	0.17900	0.09000
w	0.24300	0.40000	-	0.25800	0.55800	0.36300	0.21500	0.45800	0.22100	0.31000
x	0.01500	0.14200	0.25800	-	0.30000	0.10500	0.04300	0.20000	0.03700	0.05200
y	0.31500	0.15800	0.55800	0.30000	-	0.19500	0.34300	0.10000	0.33700	0.24800
z	0.12000	0.03700	0.36300	0.10500	0.19500	-	0.14800	0.09500	0.14200	0.05300
0	0.02800	0.18500	0.21500	0.04300	0.34300	0.14800	-	0.24300	0.00600	0.09500
1	0.21500	0.05800	0.45800	0.20000	0.10000	0.09500	0.24300	-	0.23700	0.14800
2	0.02200	0.17900	0.22100	0.03700	0.33700	0.14200	0.00600	0.23700	-	0.08900
3	0.06700	0.09000	0.31000	0.05200	0.24800	0.05300	0.09500	0.14800	0.08900	-
4	0.17700	0.02000	0.42000	0.16200	0.13800	0.05700	0.20500	0.03800	0.19900	0.11000
5	0.02800	0.12900	0.27100	0.01300	0.28700	0.09200	0.05600	0.18700	0.05000	0.03900
6	0.04500	0.20200	0.19800	0.06000	0.36000	0.16500	0.01700	0.26000	0.02300	0.11200
7	0.02300	0.13400	0.26600	0.00800	0.29200	0.09700	0.05100	0.19200	0.04500	0.04400
8	0.03800	0.11900	0.28100	0.02300	0.27700	0.08200	0.06600	0.17700	0.06000	0.02900
9	0.16700	0.01000	0.41000	0.15200	0.14800	0.04700	0.19500	0.04800	0.18900	0.10000
A	0.11800	0.03900	0.36100	0.10300	0.19700	0.00200	0.14600	0.09700	0.14000	0.05100
B	0.05300	0.10400	0.29600	0.03800	0.26200	0.06700	0.08100	0.16200	0.07500	0.01400
C	0.18500	0.02800	0.42800	0.17000	0.13000	0.06500	0.21300	0.03000	0.20700	0.11800
D	0.07500	0.08200	0.31800	0.06000	0.24000	0.04500	0.10300	0.14000	0.09700	0.00800

E	0.09200	0.24900	0.15100	0.10700	0.40700	0.21200	0.06400	0.30700	0.07000	0.15900
F	0.21000	0.05300	0.45300	0.19500	0.10500	0.09000	0.23800	0.00500	0.23200	0.14300
G	0.24000	0.39700	0.00300	0.25500	0.55500	0.36000	0.21200	0.45500	0.21800	0.30700
H	0.19500	0.03800	0.43800	0.18000	0.12000	0.07500	0.22300	0.02000	0.21700	0.12800
I	0.16800	0.32500	0.07500	0.18300	0.48300	0.28800	0.14000	0.38300	0.14600	0.23500
J	0.19800	0.04100	0.44100	0.18300	0.11700	0.07800	0.22600	0.01700	0.22000	0.13100
K	0.00300	0.15400	0.24600	0.01200	0.31200	0.11700	0.03100	0.21200	0.02500	0.06400
L	0.01000	0.14700	0.25300	0.00500	0.30500	0.11000	0.03800	0.20500	0.03200	0.05700
M	0.15300	0.00400	0.39600	0.13800	0.16200	0.03300	0.18100	0.06200	0.17500	0.08600

TO: / FROM:	4	5	6	7	8	9	A	B	C	D
a	0.04500	0.19400	0.26700	0.19900	0.18400	0.05500	0.10400	0.16900	0.03700	0.14700
b	0.03000	0.11900	0.19200	0.12400	0.10900	0.02000	0.02900	0.09400	0.03800	0.07200
c	0.09700	0.05200	0.12500	0.05700	0.04200	0.08700	0.03800	0.02700	0.10500	0.00500
d	0.06500	0.08400	0.15700	0.08900	0.07400	0.05500	0.00600	0.05900	0.07300	0.03700
e	0.25900	0.11000	0.03700	0.10500	0.12000	0.24900	0.20000	0.13500	0.26700	0.15700
f	0.19400	0.04500	0.02800	0.04000	0.05500	0.18400	0.13500	0.07000	0.20200	0.09200
g	0.08500	0.06400	0.13700	0.06900	0.05400	0.07500	0.02600	0.03900	0.09300	0.01700
h	0.20000	0.05100	0.02200	0.04600	0.06100	0.19000	0.14100	0.07600	0.20800	0.09800
i	0.21500	0.06600	0.00700	0.06100	0.07600	0.20500	0.15600	0.09100	0.22300	0.11300
j	0.11200	0.03700	0.11000	0.04200	0.02700	0.10200	0.05300	0.01200	0.12000	0.01000
k	0.21900	0.07000	0.00300	0.06500	0.08000	0.20900	0.16000	0.09500	0.22700	0.11700
l	0.34900	0.20000	0.12700	0.19500	0.21000	0.33900	0.29000	0.22500	0.35700	0.24700
m	0.23200	0.08300	0.01000	0.07800	0.09300	0.22200	0.17300	0.10800	0.24000	0.13000
n	0.03400	0.11500	0.18800	0.12000	0.10500	0.02400	0.02500	0.09000	0.04200	0.06800
o	0.06100	0.21000	0.28300	0.21500	0.20000	0.07100	0.12000	0.18500	0.05300	0.16300
p	0.11100	0.26000	0.33300	0.26500	0.25000	0.12100	0.17000	0.23500	0.10300	0.21300
q	0.14500	0.00400	0.07700	0.00900	0.00600	0.13500	0.08600	0.02100	0.15300	0.04300
r	0.06900	0.08000	0.15300	0.08500	0.07000	0.05900	0.01000	0.05500	0.07700	0.03300
s	0.10100	0.25000	0.32300	0.25500	0.24000	0.11100	0.16000	0.22500	0.09300	0.20300
t	0.12900	0.02000	0.09300	0.02500	0.01000	0.11900	0.07000	0.00500	0.13700	0.02700
u	0.17700	0.02800	0.04500	0.02300	0.03800	0.16700	0.11800	0.05300	0.18500	0.07500
v	0.02000	0.12900	0.20200	0.13400	0.11900	0.01000	0.03900	0.10400	0.02800	0.08200
w	0.42000	0.27100	0.19800	0.26600	0.28100	0.41000	0.36100	0.29600	0.42800	0.31800
x	0.16200	0.01300	0.06000	0.00800	0.02300	0.15200	0.10300	0.03800	0.17000	0.06000
y	0.13800	0.28700	0.36000	0.29200	0.27700	0.14800	0.19700	0.26200	0.13000	0.24000
z	0.05700	0.09200	0.16500	0.09700	0.08200	0.04700	0.00200	0.06700	0.06500	0.04500
0	0.20500	0.05600	0.01700	0.05100	0.06600	0.19500	0.14600	0.08100	0.21300	0.10300
1	0.03800	0.18700	0.26000	0.19200	0.17700	0.04800	0.09700	0.16200	0.03000	0.14000
2	0.19900	0.05000	0.02300	0.04500	0.06000	0.18900	0.14000	0.07500	0.20700	0.09700
3	0.11000	0.03900	0.11200	0.04400	0.02900	0.10000	0.05100	0.01400	0.11800	0.00800
4	-	0.14900	0.22200	0.15400	0.13900	0.01000	0.05900	0.12400	0.00800	0.10200
5	0.14900	-	0.07300	0.00500	0.01000	0.13900	0.09000	0.02500	0.15700	0.04700
6	0.22200	0.07300	-	0.06800	0.08300	0.21200	0.16300	0.09800	0.23000	0.12000
7	0.15400	0.00500	0.06800	-	0.01500	0.14400	0.09500	0.03000	0.16200	0.05200
8	0.13900	0.01000	0.08300	0.01500	-	0.12900	0.08000	0.01500	0.14700	0.03700
9	0.01000	0.13900	0.21200	0.14400	0.12900	-	0.04900	0.11400	0.01800	0.09200
A	0.05900	0.09000	0.16300	0.09500	0.08000	0.04900	-	0.06500	0.06700	0.04300
B	0.12400	0.02500	0.09800	0.03000	0.01500	0.11400	0.06500	-	0.13200	0.02200
C	0.00800	0.15700	0.23000	0.16200	0.14700	0.01800	0.06700	0.13200	-	0.11000
D	0.10200	0.04700	0.12000	0.05200	0.03700	0.09200	0.04300	0.02200	0.11000	-
E	0.26900	0.12000	0.04700	0.11500	0.13000	0.25900	0.21000	0.14500	0.27700	0.16700
F	0.03300	0.18200	0.25500	0.18700	0.17200	0.04300	0.09200	0.15700	0.02500	0.13500
G	0.41700	0.26800	0.19500	0.26300	0.27800	0.40700	0.35800	0.29300	0.42500	0.31500
H	0.01800	0.16700	0.24000	0.17200	0.15700	0.02800	0.07700	0.14200	0.01000	0.12000
I	0.34500	0.19600	0.12300	0.19100	0.20600	0.33500	0.28600	0.22100	0.35300	0.24300
J	0.02100	0.17000	0.24300	0.17500	0.16000	0.03100	0.08000	0.14500	0.01300	0.12300
K	0.17400	0.02500	0.04800	0.02000	0.03500	0.16400	0.11500	0.05000	0.18200	0.07200
L	0.16700	0.01800	0.05500	0.01300	0.02800	0.15700	0.10800	0.04300	0.17500	0.06500
M	0.02400	0.12500	0.19800	0.13000	0.11500	0.01400	0.03500	0.10000	0.03200	0.07800

TO: / FROM:	E	F	G	H	I	J	K	L	M
a	0.31400	0.01200	0.46200	0.02700	0.39000	0.02400	0.21900	0.21200	0.06900
b	0.23900	0.06300	0.38700	0.04800	0.31500	0.05100	0.14400	0.13700	0.00600
c	0.17200	0.13000	0.32000	0.11500	0.24800	0.11800	0.07700	0.07000	0.07300
d	0.20400	0.09800	0.35200	0.08300	0.28000	0.08600	0.10900	0.10200	0.04100
e	0.01000	0.29200	0.15800	0.27700	0.08600	0.28000	0.08500	0.09200	0.23500
f	0.07500	0.22700	0.22300	0.21200	0.15100	0.21500	0.02000	0.02700	0.17000
g	0.18400	0.11800	0.33200	0.10300	0.26000	0.10600	0.08900	0.08200	0.06100
h	0.06900	0.23300	0.21700	0.21800	0.14500	0.22100	0.02600	0.03300	0.17600
i	0.05400	0.24800	0.20200	0.23300	0.13000	0.23600	0.04100	0.04800	0.19100
j	0.15700	0.14500	0.30500	0.13000	0.23300	0.13300	0.06200	0.05500	0.08800
k	0.05000	0.25200	0.19800	0.23700	0.12600	0.24000	0.04500	0.05200	0.19500
l	0.08000	0.38200	0.06800	0.36700	0.00400	0.37000	0.17500	0.18200	0.32500
m	0.03700	0.26500	0.18500	0.25000	0.11300	0.25300	0.05800	0.06500	0.20800
n	0.23500	0.06700	0.38300	0.05200	0.31100	0.05500	0.14000	0.13300	0.01000
o	0.33000	0.02800	0.47800	0.04300	0.40600	0.04000	0.23500	0.22800	0.08500

p	0.38000	0.07800	0.52800	0.09300	0.45600	0.09000	0.28500	0.27800	0.13500
q	0.12400	0.17800	0.27200	0.16300	0.20000	0.16600	0.02900	0.02200	0.12100
r	0.20000	0.10200	0.34800	0.08700	0.27600	0.09000	0.10500	0.09800	0.04500
s	0.37000	0.06800	0.51800	0.08300	0.44600	0.08000	0.27500	0.26800	0.12500
t	0.14000	0.16200	0.28800	0.14700	0.21600	0.15000	0.04500	0.03800	0.10500
u	0.09200	0.21000	0.24000	0.19500	0.16800	0.19800	0.00300	0.01000	0.15300
v	0.24900	0.05300	0.39700	0.03800	0.32500	0.04100	0.15400	0.14700	0.00400
w	0.15100	0.45300	0.00300	0.43800	0.07500	0.44100	0.24600	0.25300	0.39600
x	0.10700	0.19500	0.25500	0.18000	0.18300	0.18300	0.01200	0.00500	0.13800
y	0.40700	0.10500	0.55500	0.12000	0.48300	0.11700	0.31200	0.30500	0.16200
z	0.21200	0.09000	0.36000	0.07500	0.28800	0.07800	0.11700	0.11000	0.03300
0	0.06400	0.23800	0.21200	0.22300	0.14000	0.22600	0.03100	0.03800	0.18100
1	0.30700	0.00500	0.45500	0.02000	0.38300	0.01700	0.21200	0.20500	0.06200
2	0.07000	0.23200	0.21800	0.21700	0.14600	0.22000	0.02500	0.03200	0.17500
3	0.15900	0.14300	0.30700	0.12800	0.23500	0.13100	0.06400	0.05700	0.08600
4	0.26900	0.03300	0.41700	0.01800	0.34500	0.02100	0.17400	0.16700	0.02400
5	0.12000	0.18200	0.26800	0.16700	0.19600	0.17000	0.02500	0.01800	0.12500
6	0.04700	0.25500	0.19500	0.24000	0.12300	0.24300	0.04800	0.05500	0.19800
7	0.11500	0.18700	0.26300	0.17200	0.19100	0.17500	0.02000	0.01300	0.13000
8	0.13000	0.17200	0.27800	0.15700	0.20600	0.16000	0.03500	0.02800	0.11500
9	0.25900	0.04300	0.40700	0.02800	0.33500	0.03100	0.16400	0.15700	0.01400
A	0.21000	0.09200	0.35800	0.07700	0.28600	0.08000	0.11500	0.10800	0.03500
B	0.14500	0.15700	0.29300	0.14200	0.22100	0.14500	0.05000	0.04300	0.10000
C	0.27700	0.02500	0.42500	0.01000	0.35300	0.01300	0.18200	0.17500	0.03200
D	0.16700	0.13500	0.31500	0.12000	0.24300	0.12300	0.07200	0.06500	0.07800
E	-	0.30200	0.14800	0.28700	0.07600	0.29000	0.09500	0.10200	0.24500
F	0.30200	-	0.45000	0.01500	0.37800	0.01200	0.20700	0.20000	0.05700
G	0.14800	0.45000	-	0.43500	0.07200	0.43800	0.24300	0.25000	0.39300
H	0.28700	0.01500	0.43500	-	0.36300	0.00300	0.19200	0.18500	0.04200
I	0.07600	0.37800	0.07200	0.36300	-	0.36600	0.17100	0.17800	0.32100
J	0.29000	0.01200	0.43800	0.00300	0.36600	-	0.19500	0.18800	0.04500
K	0.09500	0.20700	0.24300	0.19200	0.17100	0.19500	-	0.00700	0.15000
L	0.10200	0.20000	0.25000	0.18500	0.17800	0.18800	0.00700	-	0.14300
M	0.24500	0.05700	0.39300	0.04200	0.32100	0.04500	0.15000	0.14300	-

Stepmatrix "NUMBER OF SUPRALABIALS" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.02250	0.05000	0.01500	0.21000	0.17000	0.07500	0.03500	0.21500	0.06000
b	0.02250	-	0.02750	0.00750	0.18750	0.14750	0.05250	0.01250	0.19250	0.03750
c	0.05000	0.02750	-	0.03500	0.16000	0.12000	0.02500	0.01500	0.16500	0.01000
d	0.01500	0.00750	0.03500	-	0.19500	0.15500	0.06000	0.02000	0.20000	0.04500
e	0.21000	0.18750	0.16000	0.19500	-	0.04000	0.13500	0.17500	0.00500	0.15000
f	0.17000	0.14750	0.12000	0.15500	0.04000	-	0.09500	0.13500	0.04500	0.11000
g	0.07500	0.05250	0.02500	0.06000	0.13500	0.09500	-	0.04000	0.14000	0.01500
h	0.03500	0.01250	0.01500	0.02000	0.17500	0.13500	0.04000	-	0.18000	0.02500
i	0.21500	0.19250	0.16500	0.20000	0.00500	0.04500	0.14000	0.18000	-	0.15500
j	0.06000	0.03750	0.01000	0.04500	0.15000	0.11000	0.01500	0.02500	0.15500	-
k	0.06250	0.04000	0.01250	0.04750	0.14750	0.10750	0.01250	0.02750	0.15250	0.00250
l	0.26500	0.24250	0.21500	0.25000	0.05500	0.09500	0.19000	0.23000	0.05000	0.20500
m	0.32500	0.30250	0.27500	0.31000	0.11500	0.15500	0.25000	0.29000	0.11000	0.26500
n	0.19750	0.17500	0.14750	0.18250	0.01250	0.02750	0.12250	0.16250	0.01750	0.13750
o	0.03000	0.00750	0.02000	0.01500	0.18000	0.14000	0.04500	0.00500	0.18500	0.03000
p	0.03250	0.01000	0.01750	0.01750	0.17750	0.13750	0.04250	0.00250	0.18250	0.02750
q	0.11500	0.09250	0.06500	0.10000	0.09500	0.05500	0.04000	0.08000	0.10000	0.05500
r	0.28500	0.26250	0.23500	0.27000	0.07500	0.11500	0.21000	0.25000	0.07000	0.22500
s	0.07750	0.05500	0.02750	0.06250	0.13250	0.09250	0.00250	0.04250	0.13750	0.01750
t	0.51500	0.49250	0.46500	0.50000	0.30500	0.34500	0.44000	0.48000	0.30000	0.45500
u	0.02500	0.00250	0.02500	0.01000	0.18500	0.14500	0.05000	0.01000	0.19000	0.03500
v	0.02750	0.00500	0.02250	0.01250	0.18250	0.14250	0.04750	0.00750	0.18750	0.03250
w	0.14750	0.12500	0.09750	0.13250	0.06250	0.02250	0.07250	0.11250	0.06750	0.08750
x	0.02000	0.00250	0.03000	0.00500	0.19000	0.15000	0.05500	0.01500	0.19500	0.04000
y	0.14500	0.12250	0.09500	0.13000	0.06500	0.02500	0.07000	0.11000	0.07000	0.08500
z	0.11750	0.09500	0.06750	0.10250	0.09250	0.05250	0.04250	0.08250	0.09750	0.05750
0	0.04000	0.01750	0.01000	0.02500	0.17000	0.13000	0.03500	0.00500	0.17500	0.02000
1	0.32750	0.30500	0.27750	0.31250	0.11750	0.15750	0.25250	0.29250	0.11250	0.26750
2	0.05750	0.03500	0.00750	0.04250	0.15250	0.11250	0.01750	0.02250	0.15750	0.00250
3	0.04500	0.02250	0.00500	0.03000	0.16500	0.12500	0.03000	0.01000	0.17000	0.01500
4	0.13250	0.11000	0.08250	0.11750	0.07750	0.03750	0.05750	0.09750	0.08250	0.07250
5	0.06750	0.04500	0.01750	0.05250	0.14250	0.10250	0.00750	0.03250	0.14750	0.00750

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.06250	0.26500	0.32500	0.19750	0.03000	0.03250	0.11500	0.28500	0.07750	0.51500
b	0.04000	0.24250	0.30250	0.17500	0.00750	0.01000	0.09250	0.26250	0.05500	0.49250
c	0.01250	0.21500	0.27500	0.14750	0.02000	0.01750	0.06500	0.23500	0.02750	0.46500
d	0.04750	0.25000	0.31000	0.18250	0.01500	0.01750	0.10000	0.27000	0.06250	0.50000

e	0.14750	0.05500	0.11500	0.01250	0.18000	0.17750	0.09500	0.07500	0.13250	0.30500
f	0.10750	0.09500	0.15500	0.02750	0.14000	0.13750	0.05500	0.11500	0.09250	0.34500
g	0.01250	0.19000	0.25000	0.12250	0.04500	0.04250	0.04000	0.21000	0.00250	0.44000
h	0.02750	0.23000	0.29000	0.16250	0.00500	0.00250	0.08000	0.25000	0.04250	0.48000
i	0.15250	0.05000	0.11000	0.01750	0.18500	0.18250	0.10000	0.07000	0.13750	0.30000
j	0.00250	0.20500	0.26500	0.13750	0.03000	0.02750	0.05500	0.22500	0.01750	0.45500
k	-	0.20250	0.26250	0.13500	0.03250	0.03000	0.05250	0.22250	0.01500	0.45250
l	0.20250	-	0.06000	0.06750	0.23500	0.23250	0.15000	0.02000	0.18750	0.25000
m	0.26250	0.06000	-	0.12750	0.29500	0.29250	0.21000	0.04000	0.24750	0.19000
n	0.13500	0.06750	0.12750	-	0.16750	0.16500	0.08250	0.08750	0.12000	0.31750
o	0.03250	0.23500	0.29500	0.16750	-	0.00250	0.08500	0.25500	0.04750	0.48500
p	0.03000	0.23250	0.29250	0.16500	0.00250	-	0.08250	0.25250	0.04500	0.48250
q	0.05250	0.15000	0.21000	0.08250	0.08500	0.08250	-	0.17000	0.03750	0.40000
r	0.22250	0.02000	0.04000	0.08750	0.25500	0.25250	0.17000	-	0.20750	0.23000
s	0.01500	0.18750	0.24750	0.12000	0.04750	0.04500	0.03750	0.20750	-	0.43750
t	0.45250	0.25000	0.19000	0.31750	0.48500	0.48250	0.40000	0.23000	0.43750	-
u	0.03750	0.24000	0.30000	0.17250	0.00500	0.00750	0.09000	0.26000	0.05250	0.49000
v	0.03500	0.23750	0.29750	0.17000	0.00250	0.00500	0.08750	0.25750	0.05000	0.48750
w	0.08500	0.11750	0.17750	0.05000	0.11750	0.11500	0.03250	0.13750	0.07000	0.36750
x	0.04250	0.24500	0.30500	0.17750	0.01000	0.01250	0.09500	0.26500	0.05750	0.49500
y	0.08250	0.12000	0.18000	0.05250	0.11500	0.11250	0.03000	0.14000	0.06750	0.37000
z	0.05500	0.14750	0.20750	0.08000	0.08750	0.08500	0.00250	0.16750	0.04000	0.39750
0	0.02250	0.22500	0.28500	0.15750	0.01000	0.00750	0.07500	0.24500	0.03750	0.47500
1	0.26500	0.06250	0.00250	0.13000	0.29750	0.29500	0.21250	0.04250	0.25000	0.18750
2	0.00500	0.20750	0.26750	0.14000	0.02750	0.02500	0.05750	0.22750	0.02000	0.45750
3	0.01750	0.22000	0.28000	0.15250	0.01500	0.01250	0.07000	0.24000	0.03250	0.47000
4	0.07000	0.13250	0.19250	0.06500	0.10250	0.10000	0.01750	0.15250	0.05500	0.38250
5	0.00500	0.19750	0.25750	0.13000	0.03750	0.03500	0.04750	0.21750	0.01000	0.44750

TO:	u	v	w	x	y	z	0	1	2	3
FROM: a	0.02500	0.02750	0.14750	0.02000	0.14500	0.11750	0.04000	0.32750	0.05750	0.04500
b	0.00250	0.00500	0.12500	0.00250	0.12250	0.09500	0.01750	0.30500	0.03500	0.02250
c	0.02500	0.02250	0.09750	0.03000	0.09500	0.06750	0.01000	0.27750	0.00750	0.00500
d	0.01000	0.01250	0.13250	0.00500	0.13000	0.10250	0.02500	0.31250	0.04250	0.03000
e	0.18500	0.18250	0.06250	0.19000	0.06500	0.09250	0.17000	0.11750	0.15250	0.16500
f	0.14500	0.14250	0.02250	0.15000	0.02500	0.05250	0.13000	0.15750	0.11250	0.12500
g	0.05000	0.04750	0.07250	0.05500	0.07000	0.04250	0.03500	0.25250	0.01750	0.03000
h	0.01000	0.00750	0.11250	0.01500	0.11000	0.08250	0.00500	0.29250	0.02250	0.01000
i	0.19000	0.18750	0.06750	0.19500	0.07000	0.09750	0.17500	0.11250	0.15750	0.17000
j	0.03500	0.03250	0.08750	0.04000	0.08500	0.05750	0.02000	0.26750	0.00250	0.01500
k	0.03750	0.03500	0.08500	0.04250	0.08250	0.05500	0.02250	0.26500	0.00500	0.01750
l	0.24000	0.23750	0.11750	0.24500	0.12000	0.14750	0.22500	0.06250	0.20750	0.22000
m	0.30000	0.29750	0.17750	0.30500	0.18000	0.20750	0.28500	0.00250	0.26750	0.28000
n	0.17250	0.17000	0.05000	0.17750	0.05250	0.08000	0.15750	0.13000	0.14000	0.15250
o	0.00500	0.00250	0.11750	0.01000	0.11500	0.08750	0.01000	0.29750	0.02750	0.01500
p	0.00750	0.00500	0.11500	0.01250	0.11250	0.08500	0.00750	0.29500	0.02500	0.01250
q	0.09000	0.08750	0.03250	0.09500	0.03000	0.00250	0.07500	0.21250	0.05750	0.07000
r	0.26000	0.25750	0.13750	0.26500	0.14000	0.16750	0.24500	0.04250	0.22750	0.24000
s	0.05250	0.05000	0.07000	0.05750	0.06750	0.04000	0.03750	0.25000	0.02000	0.03250
t	0.49000	0.48750	0.36750	0.49500	0.37000	0.39750	0.47500	0.18750	0.45750	0.47000
u	-	0.00250	0.12250	0.00500	0.12000	0.09250	0.01500	0.30250	0.03250	0.02000
v	0.00250	-	0.12000	0.00750	0.11750	0.09000	0.01250	0.30000	0.03000	0.01750
w	0.12250	0.12000	-	0.12750	0.00250	0.03000	0.10750	0.18000	0.09000	0.10250
x	0.00500	0.00750	0.12750	-	0.12500	0.09750	0.02000	0.30750	0.03750	0.02500
y	0.12000	0.11750	0.00250	0.12500	-	0.02750	0.10500	0.18250	0.08750	0.10000
z	0.09250	0.09000	0.03000	0.09750	0.02750	-	0.07750	0.21000	0.06000	0.07250
0	0.01500	0.01250	0.10750	0.02000	0.10500	0.07750	-	0.28750	0.01750	0.00500
1	0.30250	0.30000	0.18000	0.30750	0.18250	0.21000	0.28750	-	0.27000	0.28250
2	0.03250	0.03000	0.09000	0.03750	0.08750	0.06000	0.01750	0.27000	-	0.01250
3	0.02000	0.01750	0.10250	0.02500	0.10000	0.07250	0.00500	0.28250	0.01250	-
4	0.10750	0.10500	0.01500	0.11250	0.01250	0.01500	0.09250	0.19500	0.07500	0.08750
5	0.04250	0.04000	0.08000	0.04750	0.07750	0.05000	0.02750	0.26000	0.01000	0.02250

TO:	4	5
FROM: a	0.13250	0.06750
b	0.11000	0.04500
c	0.08250	0.01750
d	0.11750	0.05250
e	0.07750	0.14250
f	0.03750	0.10250
g	0.05750	0.00750
h	0.09750	0.03250
i	0.08250	0.14750
j	0.07250	0.00750
k	0.07000	0.00500
l	0.13250	0.19750
m	0.19250	0.25750

n	0.06500	0.13000
o	0.10250	0.03750
p	0.10000	0.03500
q	0.01750	0.04750
r	0.15250	0.21750
s	0.05500	0.01000
t	0.38250	0.44750
u	0.10750	0.04250
v	0.10500	0.04000
w	0.01500	0.08000
x	0.11250	0.04750
y	0.01250	0.07750
z	0.01500	0.05000
0	0.09250	0.02750
1	0.19500	0.26000
2	0.07500	0.01000
3	0.08750	0.02250
4	-	0.06500
5	0.06500	-

Stepmatrix "NUMBER OF LOREALS" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.03600	0.01800	0.13200	0.02000	0.33000	0.17400	0.10200	0.01800	0.14000
b	0.03600	-	0.05400	0.09600	0.05600	0.36600	0.21000	0.13800	0.01800	0.10400
c	0.01800	0.05400	-	0.15000	0.00200	0.31200	0.15600	0.08400	0.03600	0.15800
d	0.13200	0.09600	0.15000	-	0.15200	0.46200	0.30600	0.23400	0.11400	0.00800
e	0.02000	0.05600	0.00200	0.15200	-	0.31000	0.15400	0.08200	0.03800	0.16000
f	0.33000	0.36600	0.31200	0.46200	0.31000	-	0.15600	0.22800	0.34800	0.47000
g	0.17400	0.21000	0.15600	0.30600	0.15400	0.15600	-	0.07200	0.19200	0.31400
h	0.10200	0.13800	0.08400	0.23400	0.08200	0.22800	0.07200	-	0.12000	0.24200
i	0.01800	0.01800	0.03600	0.11400	0.03800	0.34800	0.19200	0.12000	-	0.12200
j	0.14000	0.10400	0.15800	0.00800	0.16000	0.47000	0.31400	0.24200	0.12200	-
k	0.12800	0.16400	0.11000	0.26000	0.10800	0.20200	0.04600	0.02600	0.14600	0.26800
l	0.08400	0.12000	0.06600	0.21600	0.06400	0.24600	0.09000	0.01800	0.10200	0.22400
m	0.00400	0.04000	0.01400	0.13600	0.01600	0.32600	0.17000	0.09800	0.02200	0.14400
n	0.09200	0.12800	0.07400	0.22400	0.07200	0.23800	0.08200	0.01000	0.11000	0.23200
o	0.13200	0.16800	0.11400	0.26400	0.11200	0.19800	0.04200	0.03000	0.15000	0.27200
p	0.03200	0.06800	0.01400	0.16400	0.01200	0.29800	0.14200	0.07000	0.05000	0.17200
q	0.00600	0.04200	0.01200	0.13800	0.01400	0.32400	0.16800	0.09600	0.02400	0.14600
r	0.38600	0.42200	0.36800	0.51800	0.36600	0.05600	0.21200	0.28400	0.40400	0.52600
s	0.25600	0.29200	0.23800	0.38800	0.23600	0.07400	0.08200	0.15400	0.27400	0.39600
t	0.10400	0.14000	0.08600	0.23600	0.08400	0.22600	0.07000	0.00200	0.12200	0.24400
u	0.06800	0.10400	0.05000	0.20000	0.04800	0.26200	0.10600	0.03400	0.08600	0.20800
v	0.04400	0.08000	0.02600	0.17600	0.02400	0.28600	0.13000	0.05800	0.06200	0.18400
w	0.05800	0.09400	0.04000	0.19000	0.03800	0.27200	0.11600	0.04400	0.07600	0.19800
x	0.03400	0.07000	0.01600	0.16600	0.01400	0.29600	0.14000	0.06800	0.05200	0.17400
y	0.11000	0.14600	0.09200	0.24200	0.09000	0.22000	0.06400	0.00800	0.12800	0.25000
z	0.08600	0.05000	0.10400	0.04600	0.10600	0.41600	0.26000	0.18800	0.06800	0.05400
0	0.07200	0.03600	0.09000	0.06000	0.09200	0.40200	0.24600	0.17400	0.05400	0.06800
1	0.03000	0.00600	0.04800	0.10200	0.05000	0.36000	0.20400	0.13200	0.01200	0.11000
2	0.04200	0.07800	0.02400	0.17400	0.02200	0.28800	0.13200	0.06000	0.06000	0.18200
3	0.14600	0.11000	0.16400	0.01400	0.16600	0.47600	0.32000	0.24800	0.12800	0.00600
4	0.14400	0.10800	0.16200	0.01200	0.16400	0.47400	0.31800	0.24600	0.12600	0.00400
5	0.02600	0.01000	0.04400	0.10600	0.04600	0.35600	0.20000	0.12800	0.00800	0.11400
6	0.00200	0.03800	0.01600	0.13400	0.01800	0.32800	0.17200	0.10000	0.02000	0.14200
7	0.08400	0.04800	0.10200	0.04800	0.10400	0.41400	0.25800	0.18600	0.06600	0.05600
8	0.08200	0.04600	0.10000	0.05000	0.10200	0.41200	0.25600	0.18400	0.06400	0.05800
9	0.05600	0.09200	0.03800	0.18800	0.03600	0.27400	0.11800	0.04600	0.07400	0.19600
A	0.06800	0.03200	0.08600	0.06400	0.08800	0.39800	0.24200	0.17000	0.05000	0.07200
B	0.06200	0.02600	0.08000	0.07000	0.08200	0.39200	0.23600	0.16400	0.04400	0.07800
C	0.18200	0.21800	0.16400	0.31400	0.16200	0.14800	0.00800	0.08000	0.20000	0.32200
D	0.18400	0.22000	0.16600	0.31600	0.16400	0.14600	0.01000	0.08200	0.20200	0.32400
E	0.03200	0.00400	0.05000	0.10000	0.05200	0.36200	0.20600	0.13400	0.01400	0.10800
F	0.00600	0.03000	0.02400	0.12600	0.02600	0.33600	0.18000	0.10800	0.01200	0.13400
G	0.13400	0.17000	0.11600	0.26600	0.11400	0.19600	0.04000	0.03200	0.15200	0.27400
H	0.16400	0.20000	0.14600	0.29600	0.14400	0.16600	0.01000	0.06200	0.18200	0.30400
I	0.16800	0.20400	0.15000	0.30000	0.14800	0.16200	0.00600	0.06600	0.18600	0.30800
J	0.12400	0.16000	0.10600	0.25600	0.10400	0.20600	0.05000	0.02200	0.14200	0.26400
K	0.02000	0.01600	0.03800	0.11200	0.04000	0.35000	0.19400	0.12200	0.00200	0.12000
L	0.16200	0.19800	0.14400	0.29400	0.14200	0.16800	0.01200	0.06000	0.18000	0.30200
M	0.14000	0.17600	0.12200	0.27200	0.12000	0.19000	0.03400	0.03800	0.15800	0.28000

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.12800	0.08400	0.00400	0.09200	0.13200	0.03200	0.00600	0.38600	0.25600	0.10400
b	0.16400	0.12000	0.04000	0.12800	0.16800	0.06800	0.04200	0.42200	0.29200	0.14000

c	0.11000	0.06600	0.01400	0.07400	0.11400	0.01400	0.01200	0.36800	0.23800	0.08600
d	0.26000	0.21600	0.13600	0.22400	0.26400	0.16400	0.13800	0.51800	0.38800	0.23600
e	0.10800	0.06400	0.01600	0.07200	0.11200	0.01200	0.01400	0.36600	0.23600	0.08400
f	0.20200	0.24600	0.32600	0.23800	0.19800	0.29800	0.32400	0.05600	0.07400	0.22600
g	0.04600	0.09000	0.17000	0.08200	0.04200	0.14200	0.16800	0.21200	0.08200	0.07000
h	0.02600	0.01800	0.09800	0.01000	0.03000	0.07000	0.09600	0.28400	0.15400	0.00200
i	0.14600	0.10200	0.02200	0.11000	0.15000	0.05000	0.02400	0.40400	0.27400	0.12200
j	0.26800	0.22400	0.14400	0.23200	0.27200	0.17200	0.14600	0.52600	0.39600	0.24400
k	-	0.04400	0.12400	0.03600	0.00400	0.09600	0.12200	0.25800	0.12800	0.02400
l	0.04400	-	0.08000	0.00800	0.04800	0.05200	0.07800	0.30200	0.17200	0.02000
m	0.12400	0.08000	-	0.08800	0.12800	0.02800	0.00200	0.38200	0.25200	0.10000
n	0.03600	0.00800	0.08800	-	0.04000	0.06000	0.08600	0.29400	0.16400	0.01200
o	0.00400	0.04800	0.12800	0.04000	-	0.10000	0.12600	0.25400	0.12400	0.02800
p	0.09600	0.05200	0.02800	0.06000	0.10000	-	0.02600	0.35400	0.22400	0.07200
q	0.12200	0.07800	0.00200	0.08600	0.12600	0.02600	-	0.38000	0.25000	0.09800
r	0.25800	0.30200	0.38200	0.29400	0.25400	0.35400	0.38000	-	0.13000	0.28200
s	0.12800	0.17200	0.25200	0.16400	0.12400	0.22400	0.25000	0.13000	-	0.15200
t	0.02400	0.02000	0.10000	0.01200	0.02800	0.07200	0.09800	0.28200	0.15200	-
u	0.06000	0.01600	0.06400	0.02400	0.06400	0.03600	0.06200	0.31800	0.18800	0.03600
v	0.08400	0.04000	0.04000	0.04800	0.08800	0.01200	0.03800	0.34200	0.21200	0.06000
w	0.07000	0.02600	0.05400	0.03400	0.07400	0.02600	0.05200	0.32800	0.19800	0.04600
x	0.09400	0.05000	0.03000	0.05800	0.09800	0.00200	0.02800	0.35200	0.22200	0.07000
y	0.01800	0.02600	0.10600	0.01800	0.02200	0.07800	0.10400	0.27600	0.14600	0.00600
z	0.21400	0.17000	0.09000	0.17800	0.21800	0.11800	0.09200	0.47200	0.34200	0.19000
0	0.20000	0.15600	0.07600	0.16400	0.20400	0.10400	0.07800	0.45800	0.32800	0.17600
1	0.15800	0.11400	0.03400	0.12200	0.16200	0.06200	0.03600	0.41600	0.28600	0.13400
2	0.08600	0.04200	0.03800	0.05000	0.09000	0.01000	0.03600	0.34400	0.21400	0.06200
3	0.27400	0.23000	0.15000	0.23800	0.27800	0.17800	0.15200	0.53200	0.40200	0.25000
4	0.27200	0.22800	0.14800	0.23600	0.27600	0.17600	0.15000	0.53000	0.40000	0.24800
5	0.15400	0.11000	0.03000	0.11800	0.15800	0.05800	0.03200	0.41200	0.28200	0.13000
6	0.12600	0.08200	0.00200	0.09000	0.13000	0.03000	0.00400	0.38400	0.25400	0.10200
7	0.21200	0.16800	0.08800	0.17600	0.21600	0.11600	0.09000	0.47000	0.34000	0.18800
8	0.21000	0.16600	0.08600	0.17400	0.21400	0.11400	0.08800	0.46800	0.33800	0.18600
9	0.07200	0.02800	0.05200	0.03600	0.07600	0.02400	0.05000	0.33000	0.20000	0.04800
A	0.19600	0.15200	0.07200	0.16000	0.20000	0.10000	0.07400	0.45400	0.32400	0.17200
B	0.19000	0.14600	0.06600	0.15400	0.19400	0.09400	0.06800	0.44800	0.31800	0.16600
C	0.05400	0.09800	0.17800	0.09000	0.05000	0.15000	0.17600	0.20400	0.07400	0.07800
D	0.05600	0.10000	0.18000	0.09200	0.05200	0.15200	0.17800	0.20200	0.07200	0.08000
E	0.16000	0.11600	0.03600	0.12400	0.16400	0.06400	0.03800	0.41800	0.28800	0.13600
F	0.13400	0.09000	0.01000	0.09800	0.13800	0.03800	0.01200	0.39200	0.26200	0.11000
G	0.00600	0.05000	0.13000	0.04200	0.00200	0.10200	0.12800	0.25200	0.12200	0.03000
H	0.03600	0.08000	0.16000	0.07200	0.03200	0.13200	0.15800	0.22200	0.09200	0.06000
I	0.04000	0.08400	0.16400	0.07600	0.03600	0.13600	0.16200	0.21800	0.08800	0.06400
J	0.00400	0.04000	0.12000	0.03200	0.00800	0.09200	0.11800	0.26200	0.13200	0.02000
K	0.14800	0.10400	0.02400	0.11200	0.15200	0.05200	0.02600	0.40600	0.27600	0.12400
L	0.03400	0.07800	0.15800	0.07000	0.03000	0.13000	0.15600	0.22400	0.09400	0.05800
M	0.01200	0.05600	0.13600	0.04800	0.00800	0.10800	0.13400	0.24600	0.11600	0.03600

TO:	u	v	w	x	y	z	0	1	2	3
FROM: a	0.06800	0.04400	0.05800	0.03400	0.11000	0.08600	0.07200	0.03000	0.04200	0.14600
b	0.10400	0.08000	0.09400	0.07000	0.14600	0.05000	0.03600	0.00600	0.07800	0.11000
c	0.05000	0.02600	0.04000	0.01600	0.09200	0.10400	0.09000	0.04800	0.02400	0.16400
d	0.20000	0.17600	0.19000	0.16600	0.24200	0.04600	0.06000	0.10200	0.17400	0.01400
e	0.04800	0.02400	0.03800	0.01400	0.09000	0.10600	0.09200	0.05000	0.02200	0.16600
f	0.26200	0.28600	0.27200	0.29600	0.22000	0.41600	0.40200	0.36000	0.28800	0.47600
g	0.10600	0.13000	0.11600	0.14000	0.06400	0.26000	0.24600	0.20400	0.13200	0.32000
h	0.03400	0.05800	0.04400	0.06800	0.00800	0.18800	0.17400	0.13200	0.06000	0.24800
i	0.08600	0.06200	0.07600	0.05200	0.12800	0.06800	0.05400	0.01200	0.06000	0.12800
j	0.20800	0.18400	0.19800	0.17400	0.25000	0.05400	0.06800	0.11000	0.18200	0.00600
k	0.06000	0.08400	0.07000	0.09400	0.01800	0.21400	0.20000	0.15800	0.08600	0.27400
l	0.01600	0.04000	0.02600	0.05000	0.02600	0.17000	0.15600	0.11400	0.04200	0.23000
m	0.06400	0.04000	0.05400	0.03000	0.10600	0.09000	0.07600	0.03400	0.03800	0.15000
n	0.02400	0.04800	0.03400	0.05800	0.01800	0.17800	0.16400	0.12200	0.05000	0.23800
o	0.06400	0.08800	0.07400	0.09800	0.02200	0.21800	0.20400	0.16200	0.09000	0.27800
p	0.03600	0.01200	0.02600	0.00200	0.07800	0.11800	0.10400	0.06200	0.01000	0.17800
q	0.06200	0.03800	0.05200	0.02800	0.10400	0.09200	0.07800	0.03600	0.03600	0.15200
r	0.31800	0.34200	0.32800	0.35200	0.27600	0.47200	0.45800	0.41600	0.34400	0.53200
s	0.18800	0.21200	0.19800	0.22200	0.14600	0.34200	0.32800	0.28600	0.21400	0.40200
t	0.03600	0.06000	0.04600	0.07000	0.00600	0.19000	0.17600	0.13400	0.06200	0.25000
u	-	0.02400	0.01000	0.03400	0.04200	0.15400	0.14000	0.09800	0.02600	0.21400
v	0.02400	-	0.01400	0.01000	0.06600	0.13000	0.11600	0.07400	0.00200	0.19000
w	0.01000	0.01400	-	0.02400	0.05200	0.14400	0.13000	0.08800	0.01600	0.20400
x	0.03400	0.01000	0.02400	-	0.07600	0.12000	0.10600	0.06400	0.00800	0.18000
y	0.04200	0.06600	0.05200	0.07600	-	0.19600	0.18200	0.14000	0.06800	0.25600
z	0.15400	0.13000	0.14400	0.12000	0.19600	-	0.01400	0.05600	0.12800	0.06000
0	0.14000	0.11600	0.13000	0.10600	0.18200	0.01400	-	0.04200	0.11400	0.07400
1	0.09800	0.07400	0.08800	0.06400	0.14000	0.05600	0.04200	-	0.07200	0.11600

2	0.02600	0.00200	0.01600	0.00800	0.06800	0.12800	0.11400	0.07200	-	0.18800
3	0.21400	0.19000	0.20400	0.18000	0.25600	0.06000	0.07400	0.11600	0.18800	-
4	0.21200	0.18800	0.20200	0.17800	0.25400	0.05800	0.07200	0.11400	0.18600	0.00200
5	0.09400	0.07000	0.08400	0.06000	0.13600	0.06000	0.04600	0.00400	0.06800	0.12000
6	0.06600	0.04200	0.05600	0.03200	0.10800	0.08800	0.07400	0.03200	0.04000	0.14800
7	0.15200	0.12800	0.14200	0.11800	0.19400	0.00200	0.01200	0.05400	0.12600	0.06200
8	0.15000	0.12600	0.14000	0.11600	0.19200	0.00400	0.01000	0.05200	0.12400	0.06400
9	0.01200	0.01200	0.00200	0.02200	0.05400	0.14200	0.12800	0.08600	0.01400	0.20200
A	0.13600	0.11200	0.12600	0.10200	0.17800	0.01800	0.00400	0.03800	0.11000	0.07800
B	0.13000	0.10600	0.12000	0.09600	0.17200	0.02400	0.01000	0.03200	0.10400	0.08400
C	0.11400	0.13800	0.12400	0.14800	0.07200	0.26800	0.25400	0.21200	0.14000	0.32800
D	0.11600	0.14000	0.12600	0.15000	0.07400	0.27000	0.25600	0.21400	0.14200	0.33000
E	0.10000	0.07600	0.09000	0.06600	0.14200	0.05400	0.04000	0.00200	0.07400	0.11400
F	0.07400	0.05000	0.06400	0.04000	0.11600	0.08000	0.06600	0.02400	0.04800	0.14000
G	0.06600	0.09000	0.07600	0.10000	0.02400	0.22000	0.20600	0.16400	0.09200	0.28000
H	0.09600	0.12000	0.10600	0.13000	0.05400	0.25000	0.23600	0.19400	0.12200	0.31000
I	0.10000	0.12400	0.11000	0.13400	0.05800	0.25400	0.24000	0.19800	0.12600	0.31400
J	0.05600	0.08000	0.06600	0.09000	0.01400	0.21000	0.19600	0.15400	0.08200	0.27000
K	0.08800	0.06400	0.07800	0.05400	0.13000	0.06600	0.05200	0.01000	0.06200	0.12600
L	0.09400	0.11800	0.10400	0.12800	0.05200	0.24800	0.23400	0.19200	0.12000	0.30800
M	0.07200	0.09600	0.08200	0.10600	0.03000	0.22600	0.21200	0.17000	0.09800	0.28600

TO: / FROM:	4	5	6	7	8	9	A	B	C	D
a	0.14400	0.02600	0.00200	0.08400	0.08200	0.05600	0.06800	0.06200	0.18200	0.18400
b	0.10800	0.01000	0.03800	0.04800	0.04600	0.09200	0.03200	0.02600	0.21800	0.22000
c	0.16200	0.04400	0.01600	0.10200	0.10000	0.03800	0.08600	0.08000	0.16400	0.16600
d	0.01200	0.10600	0.13400	0.04800	0.05000	0.18800	0.06400	0.07000	0.31400	0.31600
e	0.16400	0.04600	0.01800	0.10400	0.10200	0.03600	0.08800	0.08200	0.16200	0.16400
f	0.47400	0.35600	0.32800	0.41400	0.41200	0.27400	0.39800	0.39200	0.14800	0.14600
g	0.31800	0.20000	0.17200	0.25800	0.25600	0.11800	0.24200	0.23600	0.00800	0.01000
h	0.24600	0.12800	0.10000	0.18600	0.18400	0.04600	0.17000	0.16400	0.08000	0.08200
i	0.12600	0.00800	0.02000	0.06600	0.06400	0.07400	0.05000	0.04400	0.20000	0.20200
j	0.00400	0.11400	0.14200	0.05600	0.05800	0.19600	0.07200	0.07800	0.32200	0.32400
k	0.27200	0.15400	0.12600	0.21200	0.21000	0.07200	0.19600	0.19000	0.05400	0.05600
l	0.22800	0.11000	0.08200	0.16800	0.16600	0.02800	0.15200	0.14600	0.09800	0.10000
m	0.14800	0.03000	0.00200	0.08800	0.08600	0.05200	0.07200	0.06600	0.17800	0.18000
n	0.23600	0.11800	0.09000	0.17600	0.17400	0.03600	0.16000	0.15400	0.09000	0.09200
o	0.27600	0.15800	0.13000	0.21600	0.21400	0.07600	0.20000	0.19400	0.05000	0.05200
p	0.17600	0.05800	0.03000	0.11600	0.11400	0.02400	0.10000	0.09400	0.15000	0.15200
q	0.15000	0.03200	0.00400	0.09000	0.08800	0.05000	0.07400	0.06800	0.17600	0.17800
r	0.53000	0.41200	0.38400	0.47000	0.46800	0.33000	0.45400	0.44800	0.20400	0.20200
s	0.40000	0.28200	0.25400	0.34000	0.33800	0.20000	0.32400	0.31800	0.07400	0.07200
t	0.24800	0.13000	0.10200	0.18800	0.18600	0.04800	0.17200	0.16600	0.07800	0.08000
u	0.21200	0.09400	0.06600	0.15200	0.15000	0.01200	0.13600	0.13000	0.11400	0.11600
v	0.18800	0.07000	0.04200	0.12800	0.12600	0.01200	0.11200	0.10600	0.13800	0.14000
w	0.20200	0.08400	0.05600	0.14200	0.14000	0.00200	0.12600	0.12000	0.12400	0.12600
x	0.17800	0.06000	0.03200	0.11800	0.11600	0.02200	0.10200	0.09600	0.14800	0.15000
y	0.25400	0.13600	0.10800	0.19400	0.19200	0.05400	0.17800	0.17200	0.07200	0.07400
z	0.05800	0.06000	0.08800	0.00200	0.00400	0.14200	0.01800	0.02400	0.26800	0.27000
0	0.07200	0.04600	0.07400	0.01200	0.01000	0.12800	0.00400	0.01000	0.25400	0.25600
1	0.11400	0.00400	0.03200	0.05400	0.05200	0.08600	0.03800	0.03200	0.21200	0.21400
2	0.18600	0.06800	0.04000	0.12600	0.12400	0.01400	0.11000	0.10400	0.14000	0.14200
3	0.00200	0.12000	0.14800	0.06200	0.06400	0.20200	0.07800	0.08400	0.32800	0.33000
4	-	0.11800	0.14600	0.06000	0.06200	0.20000	0.07600	0.08200	0.32600	0.32800
5	0.11800	-	0.02800	0.05800	0.05600	0.08200	0.04200	0.03600	0.20800	0.21000
6	0.14600	0.02800	-	0.08600	0.08400	0.05400	0.07000	0.06400	0.18000	0.18200
7	0.06000	0.05800	0.08600	-	0.00200	0.14000	0.01600	0.02200	0.26600	0.26800
8	0.06200	0.05600	0.08400	0.00200	-	0.13800	0.01400	0.02000	0.26400	0.26600
9	0.20000	0.08200	0.05400	0.14000	0.13800	-	0.12400	0.11800	0.12600	0.12800
A	0.07600	0.04200	0.07000	0.01600	0.01400	0.12400	-	0.00600	0.25000	0.25200
B	0.08200	0.03600	0.06400	0.02200	0.02000	0.11800	0.00600	-	0.24400	0.24600
C	0.32600	0.20800	0.18000	0.26600	0.26400	0.12600	0.25000	0.24400	-	0.00200
D	0.32800	0.21000	0.18200	0.26800	0.26600	0.12800	0.25200	0.24600	0.00200	-
E	0.11200	0.00600	0.03400	0.05200	0.05000	0.08800	0.03600	0.03000	0.21400	0.21600
F	0.13800	0.02000	0.00800	0.07800	0.07600	0.06200	0.06200	0.05600	0.18800	0.19000
G	0.27800	0.16000	0.13200	0.21800	0.21600	0.07800	0.20200	0.19600	0.04800	0.05000
H	0.30800	0.19000	0.16200	0.24800	0.24600	0.10800	0.23200	0.22600	0.01800	0.02000
I	0.31200	0.19400	0.16600	0.25200	0.25000	0.11200	0.23600	0.23000	0.01400	0.01600
J	0.26800	0.15000	0.12200	0.20800	0.20600	0.06800	0.19200	0.18600	0.05800	0.06000
K	0.12400	0.00600	0.02200	0.06400	0.06200	0.07600	0.04800	0.04200	0.20200	0.20400
L	0.30600	0.18800	0.16000	0.24600	0.24400	0.10600	0.23000	0.22400	0.02000	0.02200
M	0.28400	0.16600	0.13800	0.22400	0.22200	0.08400	0.20800	0.20200	0.04200	0.04400

TO: / FROM:	E	F	G	H	I	J	K	L	M
a	0.03200	0.00600	0.13400	0.16400	0.16800	0.12400	0.02000	0.16200	0.14000
b	0.00400	0.03000	0.17000	0.20000	0.20400	0.16000	0.01600	0.19800	0.17600
c	0.05000	0.02400	0.11600	0.14600	0.15000	0.10600	0.03800	0.14400	0.12200

d	0.10000	0.12600	0.26600	0.29600	0.30000	0.25600	0.11200	0.29400	0.27200
e	0.05200	0.02600	0.11400	0.14400	0.14800	0.10400	0.04000	0.14200	0.12000
f	0.36200	0.33600	0.19600	0.16600	0.16200	0.20600	0.35000	0.16800	0.19000
g	0.20600	0.18000	0.04000	0.01000	0.00600	0.05000	0.19400	0.01200	0.03400
h	0.13400	0.10800	0.03200	0.06200	0.06600	0.02200	0.12200	0.06000	0.03800
i	0.01400	0.01200	0.15200	0.18200	0.18600	0.14200	0.00200	0.18000	0.15800
j	0.10800	0.13400	0.27400	0.30400	0.30800	0.26400	0.12000	0.30200	0.28000
k	0.16000	0.13400	0.00600	0.03600	0.04000	0.00400	0.14800	0.03400	0.01200
l	0.11600	0.09000	0.05000	0.08000	0.08400	0.04000	0.10400	0.07800	0.05600
m	0.03600	0.01000	0.13000	0.16000	0.16400	0.12000	0.02400	0.15800	0.13600
n	0.12400	0.09800	0.04200	0.07200	0.07600	0.03200	0.11200	0.07000	0.04800
o	0.16400	0.13800	0.00200	0.03200	0.03600	0.00800	0.15200	0.03000	0.00800
p	0.06400	0.03800	0.10200	0.13200	0.13600	0.09200	0.05200	0.13000	0.10800
q	0.03800	0.01200	0.12800	0.15800	0.16200	0.11800	0.02600	0.15600	0.13400
r	0.41800	0.39200	0.25200	0.22200	0.21800	0.26200	0.40600	0.22400	0.24600
s	0.28800	0.26200	0.12200	0.09200	0.08800	0.13200	0.27600	0.09400	0.11600
t	0.13600	0.11000	0.03000	0.06000	0.06400	0.02000	0.12400	0.05800	0.03600
u	0.10000	0.07400	0.06600	0.09600	0.10000	0.05600	0.08800	0.09400	0.07200
v	0.07600	0.05000	0.09000	0.12000	0.12400	0.08000	0.06400	0.11800	0.09600
w	0.09000	0.06400	0.07600	0.10600	0.11000	0.06600	0.07800	0.10400	0.08200
x	0.06600	0.04000	0.10000	0.13000	0.13400	0.09000	0.05400	0.12800	0.10600
y	0.14200	0.11600	0.02400	0.05400	0.05800	0.01400	0.13000	0.05200	0.03000
z	0.05400	0.08000	0.22000	0.25000	0.25400	0.21000	0.06600	0.24800	0.22600
0	0.04000	0.06600	0.20600	0.23600	0.24000	0.19600	0.05200	0.23400	0.21200
1	0.00200	0.02400	0.16400	0.19400	0.19800	0.15400	0.01000	0.19200	0.17000
2	0.07400	0.04800	0.09200	0.12200	0.12600	0.08200	0.06200	0.12000	0.09800
3	0.11400	0.14000	0.28000	0.31000	0.31400	0.27000	0.12600	0.30800	0.28600
4	0.11200	0.13800	0.27800	0.30800	0.31200	0.26800	0.12400	0.30600	0.28400
5	0.00600	0.02000	0.16000	0.19000	0.19400	0.15000	0.00600	0.18800	0.16600
6	0.03400	0.00800	0.13200	0.16200	0.16600	0.12200	0.02200	0.16000	0.13800
7	0.05200	0.07800	0.21800	0.24800	0.25200	0.20800	0.06400	0.24600	0.22400
8	0.05000	0.07600	0.21600	0.24600	0.25000	0.20600	0.06200	0.24400	0.22200
9	0.08800	0.06200	0.07800	0.10800	0.11200	0.06800	0.07600	0.10600	0.08400
A	0.03600	0.06200	0.20200	0.23200	0.23600	0.19200	0.04800	0.23000	0.20800
B	0.03000	0.05600	0.19600	0.22600	0.23000	0.18600	0.04200	0.22400	0.20200
C	0.21400	0.18800	0.04800	0.01800	0.01400	0.05800	0.20200	0.02000	0.04200
D	0.21600	0.19000	0.05000	0.02000	0.01600	0.06000	0.20400	0.02200	0.04400
E	-	0.02600	0.16600	0.19600	0.20000	0.15600	0.01200	0.19400	0.17200
F	0.02600	-	0.14000	0.17000	0.17400	0.13000	0.01400	0.16800	0.14600
G	0.16600	0.14000	-	0.03000	0.03400	0.01000	0.15400	0.02800	0.00600
H	0.19600	0.17000	0.03000	-	0.00400	0.04000	0.18400	0.00200	0.02400
I	0.20000	0.17400	0.03400	0.00400	-	0.04400	0.18800	0.00600	0.02800
J	0.15600	0.13000	0.01000	0.04000	0.04400	-	0.14400	0.03800	0.01600
K	0.01200	0.01400	0.15400	0.18400	0.18800	0.14400	-	0.18200	0.16000
L	0.19400	0.16800	0.02800	0.00200	0.00600	0.03800	0.18200	-	0.02200
M	0.17200	0.14600	0.00600	0.02400	0.02800	0.01600	0.16000	0.02200	-

Stepmatrix "NUMBER OF GULARS" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.07000	0.02800	0.01400	0.57700	0.53000	0.00700	0.52300	0.35500	0.04200
b	0.07000	-	0.04200	0.08400	0.50700	0.46000	0.06300	0.45300	0.28500	0.02800
c	0.02800	0.04200	-	0.04200	0.54900	0.50200	0.02100	0.49500	0.32700	0.01400
d	0.01400	0.08400	0.04200	-	0.59100	0.54400	0.02100	0.53700	0.36900	0.05600
e	0.57700	0.50700	0.54900	0.59100	-	0.04700	0.57000	0.05400	0.22200	0.53500
f	0.53000	0.46000	0.50200	0.54400	0.04700	-	0.52300	0.00700	0.17500	0.48800
g	0.00700	0.06300	0.02100	0.02100	0.57000	0.52300	-	0.51600	0.34800	0.03500
h	0.52300	0.45300	0.49500	0.53700	0.05400	0.00700	0.51600	-	0.16800	0.48100
i	0.35500	0.28500	0.32700	0.36900	0.22200	0.17500	0.34800	0.16800	-	0.31300
j	0.04200	0.02800	0.01400	0.05600	0.53500	0.48800	0.03500	0.48100	0.31300	-
k	0.07800	0.00800	0.05000	0.09200	0.49900	0.45200	0.07100	0.44500	0.27700	0.03600
l	0.58000	0.51000	0.55200	0.59400	0.00300	0.05000	0.57300	0.05700	0.22500	0.53800
m	0.09300	0.02300	0.06500	0.10700	0.48400	0.43700	0.08600	0.43000	0.26200	0.05100
n	0.03600	0.10600	0.06400	0.02200	0.61300	0.56600	0.04300	0.55900	0.39100	0.07800
o	0.03500	0.10500	0.06300	0.02100	0.61200	0.56500	0.04200	0.55800	0.39000	0.07700
p	0.40200	0.33200	0.37400	0.41600	0.17500	0.12800	0.39500	0.12100	0.04700	0.36000
q	0.00500	0.06500	0.02300	0.01900	0.57200	0.52500	0.00200	0.51800	0.35000	0.03700
r	0.47700	0.40700	0.44900	0.49100	0.10000	0.05300	0.47000	0.04600	0.12200	0.43500
s	0.08300	0.01300	0.05500	0.09700	0.49400	0.44700	0.07600	0.44000	0.27200	0.04100
t	0.03400	0.03600	0.00600	0.04800	0.54300	0.49600	0.02700	0.48900	0.32100	0.00800
u	0.15200	0.08200	0.12400	0.16600	0.42500	0.37800	0.14500	0.37100	0.20300	0.11000
v	0.08100	0.01100	0.05300	0.09500	0.49600	0.44900	0.07400	0.44200	0.27400	0.03900
w	0.13600	0.06600	0.10800	0.15000	0.44100	0.39400	0.12900	0.38700	0.21900	0.09400
x	0.69900	0.62900	0.67100	0.71300	0.12200	0.16900	0.69200	0.17600	0.34400	0.65700
y	0.05000	0.02000	0.02200	0.06400	0.52700	0.48000	0.04300	0.47300	0.30500	0.00800
z	0.55400	0.48400	0.52600	0.56800	0.02300	0.02400	0.54700	0.03100	0.19900	0.51200

0	0.31000	0.24000	0.28200	0.32400	0.26700	0.22000	0.30300	0.21300	0.04500	0.26800
1	0.00100	0.07100	0.02900	0.01300	0.57800	0.53100	0.00800	0.52400	0.35600	0.04300
2	0.05100	0.01900	0.02300	0.06500	0.52600	0.47900	0.04400	0.47200	0.30400	0.00900
3	0.08700	0.01700	0.05900	0.10100	0.49000	0.44300	0.08000	0.43600	0.26800	0.04500
4	0.04900	0.02100	0.02100	0.06300	0.52800	0.48100	0.04200	0.47400	0.30600	0.00700
5	0.16200	0.09200	0.13400	0.17600	0.41500	0.36800	0.15500	0.36100	0.19300	0.12000
6	0.08000	0.01000	0.05200	0.09400	0.49700	0.45000	0.07300	0.44300	0.27500	0.03800
7	0.02300	0.09300	0.05100	0.00900	0.60000	0.55300	0.03000	0.54600	0.37800	0.06500
8	0.05300	0.01700	0.02500	0.06700	0.52400	0.47700	0.04600	0.47000	0.30200	0.01100
9	0.37500	0.30500	0.34700	0.38900	0.20200	0.15500	0.36800	0.14800	0.02000	0.33300
A	0.04300	0.02700	0.01500	0.05700	0.53400	0.48700	0.03600	0.48000	0.31200	0.00100
B	0.07500	0.00500	0.04700	0.08900	0.50200	0.45500	0.06800	0.44800	0.28000	0.03300
C	0.00400	0.06600	0.02400	0.01800	0.57300	0.52600	0.00300	0.51900	0.35100	0.03800
D	0.02600	0.04400	0.00200	0.04000	0.55100	0.50400	0.01900	0.49700	0.32900	0.01600
E	0.11400	0.04400	0.08600	0.12800	0.46300	0.41600	0.10700	0.40900	0.24100	0.07200
F	0.30800	0.23800	0.28000	0.32200	0.26900	0.22200	0.30100	0.21500	0.04700	0.26600
G	0.01300	0.05700	0.01500	0.02700	0.56400	0.51700	0.00600	0.51000	0.34200	0.02900
H	0.00100	0.06900	0.02700	0.01500	0.57600	0.52900	0.00600	0.52200	0.35400	0.04100
I	0.17900	0.10900	0.15100	0.19300	0.39800	0.35100	0.17200	0.34400	0.17600	0.13700
J	0.08200	0.01200	0.05400	0.09600	0.49500	0.44800	0.07500	0.44100	0.27300	0.04000
K	0.57400	0.50400	0.54600	0.58800	0.00300	0.04400	0.56700	0.05100	0.21900	0.53200
L	0.09400	0.02400	0.06600	0.10800	0.48300	0.43600	0.08700	0.42900	0.26100	0.05200
M	0.66400	0.59400	0.63600	0.67800	0.08700	0.13400	0.65700	0.14100	0.30900	0.62200
N	0.08800	0.01800	0.06000	0.10200	0.48900	0.44200	0.08100	0.43500	0.26700	0.04600
O	0.18600	0.11600	0.15800	0.20000	0.39100	0.34400	0.17900	0.33700	0.16900	0.14400
P	0.57100	0.50100	0.54300	0.58500	0.00600	0.04100	0.56400	0.04800	0.21600	0.52900
Q	0.09700	0.02700	0.06900	0.11100	0.48000	0.43300	0.09000	0.42600	0.25800	0.05500

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.07800	0.58000	0.09300	0.03600	0.03500	0.40200	0.00500	0.47700	0.08300	0.03400
b	0.00800	0.51000	0.02300	0.10600	0.10500	0.33200	0.06500	0.40700	0.01300	0.03600
c	0.05000	0.55200	0.06500	0.06400	0.06300	0.37400	0.02300	0.44900	0.05500	0.00600
d	0.09200	0.59400	0.10700	0.02200	0.02100	0.41600	0.01900	0.49100	0.09700	0.04800
e	0.49900	0.00300	0.48400	0.61300	0.61200	0.17500	0.57200	0.10000	0.49400	0.54300
f	0.45200	0.05000	0.43700	0.56600	0.56500	0.12800	0.52500	0.05300	0.44700	0.49600
g	0.07100	0.57300	0.08600	0.04300	0.04200	0.39500	0.00200	0.47000	0.07600	0.02700
h	0.44500	0.05700	0.43000	0.55900	0.55800	0.12100	0.51800	0.04600	0.44000	0.48900
i	0.27700	0.22500	0.26200	0.39100	0.39000	0.04700	0.35000	0.12200	0.27200	0.32100
j	0.03600	0.53800	0.05100	0.07800	0.07700	0.36000	0.03700	0.43500	0.04100	0.00800
k	-	0.50200	0.01500	0.11400	0.11300	0.32400	0.07300	0.39900	0.00500	0.04400
l	0.50200	-	0.48700	0.61600	0.61500	0.17800	0.57500	0.10300	0.49700	0.54600
m	0.01500	0.48700	-	0.12900	0.12800	0.30900	0.08800	0.38400	0.01000	0.05900
n	0.11400	0.61600	0.12900	-	0.00100	0.43800	0.04100	0.51300	0.11900	0.07000
o	0.11300	0.61500	0.12800	0.00100	-	0.43700	0.04000	0.51200	0.11800	0.06900
p	0.32400	0.17800	0.30900	0.43800	0.43700	-	0.39700	0.07500	0.31900	0.36800
q	0.07300	0.57500	0.08800	0.04100	0.04000	0.39700	-	0.47200	0.07800	0.02900
r	0.39900	0.10300	0.38400	0.51300	0.51200	0.07500	0.47200	-	0.39400	0.44300
s	0.00500	0.49700	0.01000	0.11900	0.11800	0.31900	0.07800	0.39400	-	0.04900
t	0.04400	0.54600	0.05900	0.07000	0.06900	0.36800	0.02900	0.44300	0.04900	-
u	0.07400	0.42800	0.05900	0.18800	0.18700	0.25000	0.14700	0.32500	0.06900	0.11800
v	0.00300	0.49900	0.01200	0.11700	0.11600	0.32100	0.07600	0.39600	0.00200	0.04700
w	0.05800	0.44400	0.04300	0.17200	0.17100	0.26600	0.13100	0.34100	0.05300	0.10200
x	0.62100	0.11900	0.60600	0.73500	0.73400	0.29700	0.69400	0.22200	0.61600	0.66500
y	0.02800	0.53000	0.04300	0.08600	0.08500	0.35200	0.04500	0.42700	0.03300	0.01600
z	0.47600	0.02600	0.46100	0.59000	0.58900	0.15200	0.54900	0.07700	0.47100	0.52000
0	0.23200	0.27000	0.21700	0.34600	0.34500	0.09200	0.30500	0.16700	0.22700	0.27600
1	0.07900	0.58100	0.09400	0.03500	0.03400	0.40300	0.00600	0.47800	0.08400	0.03500
2	0.02700	0.52900	0.04200	0.08700	0.08600	0.35100	0.04600	0.42600	0.03200	0.01700
3	0.00900	0.49300	0.00600	0.12300	0.12200	0.31500	0.08200	0.39000	0.00400	0.05300
4	0.02900	0.53100	0.04400	0.08500	0.08400	0.35300	0.04400	0.42800	0.03400	0.01500
5	0.08400	0.41800	0.06900	0.19800	0.19700	0.24000	0.15700	0.31500	0.07900	0.12800
6	0.00200	0.50000	0.01300	0.11600	0.11500	0.32200	0.07500	0.39700	0.00300	0.04600
7	0.10100	0.60300	0.11600	0.01300	0.01200	0.42500	0.02800	0.50000	0.10600	0.05700
8	0.02500	0.52700	0.04000	0.08900	0.08800	0.34900	0.04800	0.42400	0.03000	0.01900
9	0.29700	0.20500	0.28200	0.41100	0.41000	0.02700	0.37000	0.10200	0.29200	0.34100
A	0.03500	0.53700	0.05000	0.07900	0.07800	0.35900	0.03800	0.43400	0.04000	0.00900
B	0.00300	0.50500	0.01800	0.11100	0.11000	0.32700	0.07000	0.40200	0.00800	0.04100
C	0.07400	0.57600	0.08900	0.04000	0.03900	0.39800	0.00100	0.47300	0.07900	0.03000
D	0.05200	0.55400	0.06700	0.06200	0.06100	0.37600	0.02100	0.45100	0.05700	0.00800
E	0.03600	0.46600	0.02100	0.15000	0.14900	0.28800	0.10900	0.36300	0.03100	0.08000
F	0.23000	0.27200	0.21500	0.34400	0.34300	0.09400	0.30300	0.16900	0.22500	0.27400
G	0.06500	0.56700	0.08000	0.04900	0.04800	0.38900	0.00800	0.46400	0.07000	0.02100
H	0.07700	0.57900	0.09200	0.03700	0.03600	0.40100	0.00400	0.47600	0.08200	0.03300
I	0.10100	0.40100	0.08600	0.21500	0.21400	0.22300	0.17400	0.29800	0.09600	0.14500
J	0.00400	0.49800	0.01100	0.11800	0.11700	0.32000	0.07700	0.39500	0.00100	0.04800
K	0.49600	0.00600	0.48100	0.61000	0.60900	0.17200	0.56900	0.09700	0.49100	0.54000
L	0.01600	0.48600	0.00100	0.13000	0.12900	0.30800	0.08900	0.38300	0.01100	0.06000

M	0.58600	0.08400	0.57100	0.70000	0.69900	0.26200	0.65900	0.18700	0.58100	0.63000
N	0.01000	0.49200	0.00500	0.12400	0.12300	0.31400	0.08300	0.38900	0.00500	0.05400
O	0.10800	0.39400	0.09300	0.22200	0.22100	0.21600	0.18100	0.29100	0.10300	0.15200
P	0.49300	0.00900	0.47800	0.60700	0.60600	0.16900	0.56600	0.09400	0.48800	0.53700
Q	0.01900	0.48300	0.00400	0.13300	0.13200	0.30500	0.09200	0.38000	0.01400	0.06300

TO:	u	v	w	x	y	z	0	1	2	3
FROM: a	0.15200	0.08100	0.13600	0.69900	0.05000	0.55400	0.31000	0.00100	0.05100	0.08700
b	0.08200	0.01100	0.06600	0.62900	0.02000	0.48400	0.24000	0.07100	0.01900	0.01700
c	0.12400	0.05300	0.10800	0.67100	0.02200	0.52600	0.28200	0.02900	0.02300	0.05900
d	0.16600	0.09500	0.15000	0.71300	0.06400	0.56800	0.32400	0.01300	0.06500	0.10100
e	0.42500	0.49600	0.44100	0.12200	0.52700	0.02300	0.26700	0.57800	0.52600	0.49000
f	0.37800	0.44900	0.39400	0.16900	0.48000	0.02400	0.22000	0.53100	0.47900	0.44300
g	0.14500	0.07400	0.12900	0.69200	0.04300	0.54700	0.30300	0.00800	0.04400	0.08000
h	0.37100	0.44200	0.38700	0.17600	0.47300	0.03100	0.21300	0.52400	0.47200	0.43600
i	0.20300	0.27400	0.21900	0.34400	0.30500	0.19900	0.04500	0.35600	0.30400	0.26800
j	0.11000	0.03900	0.09400	0.65700	0.00800	0.51200	0.26800	0.04300	0.00900	0.04500
k	0.07400	0.00300	0.05800	0.62100	0.02800	0.47600	0.23200	0.07900	0.02700	0.00900
l	0.42800	0.49900	0.44400	0.11900	0.53000	0.02600	0.27000	0.58100	0.52900	0.49300
m	0.05900	0.01200	0.04300	0.60600	0.04300	0.46100	0.21700	0.09400	0.04200	0.00600
n	0.18800	0.11700	0.17200	0.73500	0.08600	0.59000	0.34600	0.03500	0.08700	0.12300
o	0.18700	0.11600	0.17100	0.73400	0.08500	0.58900	0.34500	0.03400	0.08600	0.12200
p	0.25000	0.32100	0.26600	0.29700	0.35200	0.15200	0.09200	0.40300	0.35100	0.31500
q	0.14700	0.07600	0.13100	0.69400	0.04500	0.54900	0.30500	0.00600	0.04600	0.08200
r	0.32500	0.39600	0.34100	0.22200	0.42700	0.07700	0.16700	0.47800	0.42600	0.39000
s	0.06900	0.00200	0.05300	0.61600	0.03300	0.47100	0.22700	0.08400	0.03200	0.00400
t	0.11800	0.04700	0.10200	0.66500	0.01600	0.52000	0.27600	0.03500	0.01700	0.05300
u	-	0.07100	0.01600	0.54700	0.10200	0.40200	0.15800	0.15300	0.10100	0.06500
v	0.07100	-	0.05500	0.61800	0.03100	0.47300	0.22900	0.08200	0.03000	0.00600
w	0.01600	0.05500	-	0.56300	0.08600	0.41800	0.17400	0.13700	0.08500	0.04900
x	0.54700	0.61800	0.56300	-	0.64900	0.14500	0.38900	0.70000	0.64800	0.61200
y	0.10200	0.03100	0.08600	0.64900	-	0.50400	0.26000	0.05100	0.00100	0.03700
z	0.40200	0.47300	0.41800	0.14500	0.50400	-	0.24400	0.55500	0.50300	0.46700
0	0.15800	0.22900	0.17400	0.38900	0.26000	0.24400	-	0.31100	0.25900	0.22300
1	0.15300	0.08200	0.13700	0.70000	0.05100	0.55500	0.31100	-	0.05200	0.08800
2	0.10100	0.03000	0.08500	0.64800	0.00100	0.50300	0.25900	0.05200	-	0.03600
3	0.06500	0.00600	0.04900	0.61200	0.03700	0.46700	0.22300	0.08800	0.03600	-
4	0.10300	0.03200	0.08700	0.65000	0.00100	0.50500	0.26100	0.05000	0.00200	0.03800
5	0.01000	0.08100	0.02600	0.53700	0.11200	0.39200	0.14800	0.16300	0.11100	0.07500
6	0.07200	0.00100	0.05600	0.61900	0.03000	0.47400	0.23000	0.08100	0.02900	0.00700
7	0.17500	0.10400	0.15900	0.72200	0.07300	0.57700	0.33300	0.02200	0.07400	0.11000
8	0.09900	0.02800	0.08300	0.64600	0.00300	0.50100	0.25700	0.05400	0.00200	0.03400
9	0.22300	0.29400	0.23900	0.32400	0.32500	0.17900	0.06500	0.37600	0.32400	0.28800
A	0.10900	0.03800	0.09300	0.65600	0.00700	0.51100	0.26700	0.04400	0.00800	0.04400
B	0.07700	0.00600	0.06100	0.62400	0.02500	0.47900	0.23500	0.07600	0.02400	0.01200
C	0.14800	0.07700	0.13200	0.69500	0.04600	0.55000	0.30600	0.00500	0.04700	0.08300
D	0.12600	0.05500	0.11000	0.67300	0.02400	0.52800	0.28400	0.02700	0.02500	0.06100
E	0.03800	0.03300	0.02200	0.58500	0.06400	0.44000	0.19600	0.11500	0.06300	0.02700
F	0.15600	0.22700	0.17200	0.39100	0.25800	0.24600	0.00200	0.30900	0.25700	0.22100
G	0.13900	0.06800	0.12300	0.68600	0.03700	0.54100	0.29700	0.01400	0.03800	0.07400
H	0.15100	0.08000	0.13500	0.69800	0.04900	0.55300	0.30900	0.00200	0.05000	0.08600
I	0.02700	0.09800	0.04300	0.52000	0.12900	0.37500	0.13100	0.18000	0.12800	0.09200
J	0.07000	0.00100	0.05400	0.61700	0.03200	0.47200	0.22800	0.08300	0.03100	0.00500
K	0.42200	0.49300	0.43800	0.12500	0.52400	0.02000	0.26400	0.57500	0.52300	0.48700
L	0.05800	0.01300	0.04200	0.60500	0.04400	0.46000	0.21600	0.09500	0.04300	0.00700
M	0.51200	0.58300	0.52800	0.03500	0.61400	0.11000	0.35400	0.66500	0.61300	0.57700
N	0.06400	0.00700	0.04800	0.61100	0.03800	0.46600	0.22200	0.08900	0.03700	0.00100
O	0.03400	0.10500	0.05000	0.51300	0.13600	0.36800	0.12400	0.18700	0.13500	0.09900
P	0.41900	0.49000	0.43500	0.12800	0.52100	0.01700	0.26100	0.57200	0.52000	0.48400
Q	0.05500	0.01600	0.03900	0.60200	0.04700	0.45700	0.21300	0.09800	0.04600	0.01000

TO:	4	5	6	7	8	9	A	B	C	D
FROM: a	0.04900	0.16200	0.08000	0.02300	0.05300	0.37500	0.04300	0.07500	0.00400	0.02600
b	0.02100	0.09200	0.01000	0.09300	0.01700	0.30500	0.02700	0.00500	0.06600	0.04400
c	0.02100	0.13400	0.05200	0.05100	0.02500	0.34700	0.01500	0.04700	0.02400	0.00200
d	0.06300	0.17600	0.09400	0.00900	0.06700	0.38900	0.05700	0.08900	0.01800	0.04000
e	0.52800	0.41500	0.49700	0.60000	0.52400	0.20200	0.53400	0.50200	0.57300	0.55100
f	0.48100	0.36800	0.45000	0.55300	0.47700	0.15500	0.48700	0.45500	0.52600	0.50400
g	0.04200	0.15500	0.07300	0.03000	0.04600	0.36800	0.03600	0.06800	0.00300	0.01900
h	0.47400	0.36100	0.44300	0.54600	0.47000	0.14800	0.48000	0.44800	0.51900	0.49700
i	0.30600	0.19300	0.27500	0.37800	0.30200	0.02000	0.31200	0.28000	0.35100	0.32900
j	0.00700	0.12000	0.03800	0.06500	0.01100	0.33300	0.00100	0.03300	0.03800	0.01600
k	0.02900	0.08400	0.00200	0.10100	0.02500	0.29700	0.03500	0.00300	0.07400	0.05200
l	0.53100	0.41800	0.50000	0.60300	0.52700	0.20500	0.53700	0.50500	0.57600	0.55400
m	0.04400	0.06900	0.01300	0.11600	0.04000	0.28200	0.05000	0.01800	0.08900	0.06700
n	0.08500	0.19800	0.11600	0.01300	0.08900	0.41100	0.07900	0.11100	0.04000	0.06200
o	0.08400	0.19700	0.11500	0.01200	0.08800	0.41000	0.07800	0.11000	0.03900	0.06100

p	0.35300	0.24000	0.32200	0.42500	0.34900	0.02700	0.35900	0.32700	0.39800	0.37600
q	0.04400	0.15700	0.07500	0.02800	0.04800	0.37000	0.03800	0.07000	0.00100	0.02100
r	0.42800	0.31500	0.39700	0.50000	0.42400	0.10200	0.43400	0.40200	0.47300	0.45100
s	0.03400	0.07900	0.00300	0.10600	0.03000	0.29200	0.04000	0.00800	0.07900	0.05700
t	0.01500	0.12800	0.04600	0.05700	0.01900	0.34100	0.00900	0.04100	0.03000	0.00800
u	0.10300	0.01000	0.07200	0.17500	0.09900	0.22300	0.10900	0.07700	0.14800	0.12600
v	0.03200	0.08100	0.00100	0.10400	0.02800	0.29400	0.03800	0.00600	0.07700	0.05500
w	0.08700	0.02600	0.05600	0.15900	0.08300	0.23900	0.09300	0.06100	0.13200	0.11000
x	0.65000	0.53700	0.61900	0.72200	0.64600	0.32400	0.65600	0.62400	0.69500	0.67300
y	0.00100	0.11200	0.03000	0.07300	0.00300	0.32500	0.00700	0.02500	0.04600	0.02400
z	0.50500	0.39200	0.47400	0.57700	0.50100	0.17900	0.51100	0.47900	0.55000	0.52800
0	0.26100	0.14800	0.23000	0.33300	0.25700	0.06500	0.26700	0.23500	0.30600	0.28400
1	0.05000	0.16300	0.08100	0.02200	0.05400	0.37600	0.04400	0.07600	0.00500	0.02700
2	0.00200	0.11100	0.02900	0.07400	0.00200	0.32400	0.00800	0.02400	0.04700	0.02500
3	0.03800	0.07500	0.00700	0.11000	0.03400	0.28800	0.04400	0.01200	0.08300	0.06100
4	-	0.11300	0.03100	0.07200	0.00400	0.32600	0.00600	0.02600	0.04500	0.02300
5	0.11300	-	0.08200	0.18500	0.10900	0.21300	0.11900	0.08700	0.15800	0.13600
6	0.03100	0.08200	-	0.10300	0.02700	0.29500	0.03700	0.00500	0.07600	0.05400
7	0.07200	0.18500	0.10300	-	0.07600	0.39800	0.06600	0.09800	0.02700	0.04900
8	0.00400	0.10900	0.02700	0.07600	-	0.32200	0.01000	0.02200	0.04900	0.02700
9	0.32600	0.21300	0.29500	0.39800	0.32200	-	0.33200	0.30000	0.37100	0.34900
A	0.00600	0.11900	0.03700	0.06600	0.01000	0.33200	-	0.03200	0.03900	0.01700
B	0.02600	0.08700	0.00500	0.09800	0.02200	0.30000	0.03200	-	0.07100	0.04900
C	0.04500	0.15800	0.07600	0.02700	0.04900	0.37100	0.03900	0.07100	-	0.02200
D	0.02300	0.13600	0.05400	0.04900	0.02700	0.34900	0.01700	0.04900	0.02200	-
E	0.06500	0.04800	0.03400	0.13700	0.06100	0.26100	0.07100	0.03900	0.11000	0.08800
F	0.25900	0.14600	0.22800	0.33100	0.25500	0.06700	0.26500	0.23300	0.30400	0.28200
G	0.03600	0.14900	0.06700	0.03600	0.04000	0.36200	0.03000	0.06200	0.00900	0.01300
H	0.04800	0.16100	0.07900	0.02400	0.05200	0.37400	0.04200	0.07400	0.00300	0.02500
I	0.13000	0.01700	0.09900	0.20200	0.12600	0.19600	0.13600	0.10400	0.17500	0.15300
J	0.03300	0.08000	0.00200	0.10500	0.02900	0.29300	0.03900	0.00700	0.07800	0.05600
K	0.52500	0.41200	0.49400	0.59700	0.52100	0.19900	0.53100	0.49900	0.57000	0.54800
L	0.04500	0.06800	0.01400	0.11700	0.04100	0.28100	0.05100	0.01900	0.09000	0.06800
M	0.61500	0.50200	0.58400	0.68700	0.61100	0.28900	0.62100	0.58900	0.66000	0.63800
N	0.03900	0.07400	0.00800	0.11100	0.03500	0.28700	0.04500	0.01300	0.08400	0.06200
O	0.13700	0.02400	0.10600	0.20900	0.13300	0.18900	0.14300	0.11100	0.18200	0.16000
P	0.52200	0.40900	0.49100	0.59400	0.51800	0.19600	0.52800	0.49600	0.56700	0.54500
Q	0.04800	0.06500	0.01700	0.12000	0.04400	0.27800	0.05400	0.02200	0.09300	0.07100

TO:	E	F	G	H	I	J	K	L	M	N
FROM: a	0.11400	0.30800	0.01300	0.00100	0.17900	0.08200	0.57400	0.09400	0.66400	0.08800
b	0.04400	0.23800	0.05700	0.06900	0.10900	0.01200	0.50400	0.02400	0.59400	0.01800
c	0.08600	0.28000	0.01500	0.02700	0.15100	0.05400	0.54600	0.06600	0.63600	0.06000
d	0.12800	0.32200	0.02700	0.01500	0.19300	0.09600	0.58800	0.10800	0.67800	0.10200
e	0.46300	0.26900	0.56400	0.57600	0.39800	0.49500	0.00300	0.48300	0.08700	0.48900
f	0.41600	0.22200	0.51700	0.52900	0.35100	0.44800	0.04400	0.43600	0.13400	0.44200
g	0.10700	0.30100	0.00600	0.00600	0.17200	0.07500	0.56700	0.08700	0.65700	0.08100
h	0.40900	0.21500	0.51000	0.52200	0.34400	0.44100	0.05100	0.42900	0.14100	0.43500
i	0.24100	0.04700	0.34200	0.35400	0.17600	0.27300	0.21900	0.26100	0.30900	0.26700
j	0.07200	0.26600	0.02900	0.04100	0.13700	0.04000	0.53200	0.05200	0.62200	0.04600
k	0.03600	0.23000	0.06500	0.07700	0.10100	0.00400	0.49600	0.01600	0.58600	0.01000
l	0.46600	0.27200	0.56700	0.57900	0.40100	0.49800	0.00600	0.48600	0.08400	0.49200
m	0.02100	0.21500	0.08000	0.09200	0.08600	0.01100	0.48100	0.00100	0.57100	0.00500
n	0.15000	0.34400	0.04900	0.03700	0.21500	0.11800	0.61000	0.13000	0.70000	0.12400
o	0.14900	0.34300	0.04800	0.03600	0.21400	0.11700	0.60900	0.12900	0.69900	0.12300
p	0.28800	0.09400	0.38900	0.40100	0.22300	0.32000	0.17200	0.30800	0.26200	0.31400
q	0.10900	0.30300	0.00800	0.00400	0.17400	0.07700	0.56900	0.08900	0.65900	0.08300
r	0.36300	0.16900	0.46400	0.47600	0.29800	0.39500	0.09700	0.38300	0.18700	0.38900
s	0.03100	0.22500	0.07000	0.08200	0.09600	0.00100	0.49100	0.01100	0.58100	0.00500
t	0.08000	0.27400	0.02100	0.03300	0.14500	0.04800	0.54000	0.06000	0.63000	0.05400
u	0.03800	0.15600	0.13900	0.15100	0.02700	0.07000	0.42200	0.05800	0.51200	0.06400
v	0.03300	0.22700	0.06800	0.08000	0.09800	0.00100	0.49300	0.01300	0.58300	0.00700
w	0.02200	0.17200	0.12300	0.13500	0.04300	0.05400	0.43800	0.04200	0.52800	0.04800
x	0.58500	0.39100	0.68600	0.69800	0.52000	0.61700	0.12500	0.60500	0.03500	0.61100
y	0.06400	0.25800	0.03700	0.04900	0.12900	0.03200	0.52400	0.04400	0.61400	0.03800
z	0.44000	0.24600	0.54100	0.55300	0.37500	0.47200	0.02000	0.46000	0.11000	0.46600
0	0.19600	0.00200	0.29700	0.30900	0.13100	0.22800	0.26400	0.21600	0.35400	0.22200
1	0.11500	0.30900	0.01400	0.00200	0.18000	0.08300	0.57500	0.09500	0.66500	0.08900
2	0.06300	0.25700	0.03800	0.05000	0.12800	0.03100	0.52300	0.04300	0.61300	0.03700
3	0.02700	0.22100	0.07400	0.08600	0.09200	0.00500	0.48700	0.00700	0.57700	0.00100
4	0.06500	0.25900	0.03600	0.04800	0.13000	0.03300	0.52500	0.04500	0.61500	0.03900
5	0.04800	0.14600	0.14900	0.16100	0.01700	0.08000	0.41200	0.06800	0.50200	0.07400
6	0.03400	0.22800	0.06700	0.07900	0.09900	0.00200	0.49400	0.01400	0.58400	0.00800
7	0.13700	0.33100	0.03600	0.02400	0.20200	0.10500	0.59700	0.11700	0.68700	0.11100
8	0.06100	0.25500	0.04000	0.05200	0.12600	0.02900	0.52100	0.04100	0.61100	0.03500
9	0.26100	0.06700	0.36200	0.37400	0.19600	0.29300	0.19900	0.28100	0.28900	0.28700
A	0.07100	0.26500	0.03000	0.04200	0.13600	0.03900	0.53100	0.05100	0.62100	0.04500

B	0.03900	0.23300	0.06200	0.07400	0.10400	0.00700	0.49900	0.01900	0.58900	0.01300
C	0.11000	0.30400	0.00900	0.00300	0.17500	0.07800	0.57000	0.09000	0.66000	0.08400
D	0.08800	0.28200	0.01300	0.02500	0.15300	0.05600	0.54800	0.06800	0.63800	0.06200
E	-	0.19400	0.10100	0.11300	0.06500	0.03200	0.46000	0.02000	0.55000	0.02600
F	0.19400	-	0.29500	0.30700	0.12900	0.22600	0.26600	0.21400	0.35600	0.22000
G	0.10100	0.29500	-	0.01200	0.16600	0.06900	0.56100	0.08100	0.65100	0.07500
H	0.11300	0.30700	0.01200	-	0.17800	0.08100	0.57300	0.09300	0.66300	0.08700
I	0.06500	0.12900	0.16600	0.17800	-	0.09700	0.39500	0.08500	0.48500	0.09100
J	0.03200	0.22600	0.06900	0.08100	0.09700	-	0.49200	0.01200	0.58200	0.00600
K	0.46000	0.26600	0.56100	0.57300	0.39500	0.49200	-	0.48000	0.09000	0.48600
L	0.02000	0.21400	0.08100	0.09300	0.08500	0.01200	0.48000	-	0.57000	0.00600
M	0.55000	0.35600	0.65100	0.66300	0.48500	0.58200	0.09000	0.57000	-	0.57600
N	0.02600	0.22000	0.07500	0.08700	0.09100	0.00600	0.48600	0.00600	0.57600	-
O	0.07200	0.12200	0.17300	0.18500	0.00700	0.10400	0.38800	0.09200	0.47800	0.09800
P	0.45700	0.26300	0.55800	0.57000	0.39200	0.48900	0.00300	0.47700	0.09300	0.48300
Q	0.01700	0.21100	0.08400	0.09600	0.08200	0.01500	0.47700	0.00300	0.56700	0.00900

TO:	O	P	Q
FROM: a	0.18600	0.57100	0.09700
b	0.11600	0.50100	0.02700
c	0.15800	0.54300	0.06900
d	0.20000	0.58500	0.11100
e	0.39100	0.00600	0.48000
f	0.34400	0.04100	0.43300
g	0.17900	0.56400	0.09000
h	0.33700	0.04800	0.42600
i	0.16900	0.21600	0.25800
j	0.14400	0.52900	0.05500
k	0.10800	0.49300	0.01900
l	0.39400	0.00900	0.48300
m	0.09300	0.47800	0.00400
n	0.22200	0.60700	0.13300
o	0.22100	0.60600	0.13200
p	0.21600	0.16900	0.30500
q	0.18100	0.56600	0.09200
r	0.29100	0.09400	0.38000
s	0.10300	0.48800	0.01400
t	0.15200	0.53700	0.06300
u	0.03400	0.41900	0.05500
v	0.10500	0.49000	0.01600
w	0.05000	0.43500	0.03900
x	0.51300	0.12800	0.60200
y	0.13600	0.52100	0.04700
z	0.36800	0.01700	0.45700
0	0.12400	0.26100	0.21300
1	0.18700	0.57200	0.09800
2	0.13500	0.52000	0.04600
3	0.09900	0.48400	0.01000
4	0.13700	0.52200	0.04800
5	0.02400	0.40900	0.06500
6	0.10600	0.49100	0.01700
7	0.20900	0.59400	0.12000
8	0.13300	0.51800	0.04400
9	0.18900	0.19600	0.27800
A	0.14300	0.52800	0.05400
B	0.11100	0.49600	0.02200
C	0.18200	0.56700	0.09300
D	0.16000	0.54500	0.07100
E	0.07200	0.45700	0.01700
F	0.12200	0.26300	0.21100
G	0.17300	0.55800	0.08400
H	0.18500	0.57000	0.09600
I	0.00700	0.39200	0.08200
J	0.10400	0.48900	0.01500
K	0.38800	0.00300	0.47700
L	0.09200	0.47700	0.00300
M	0.47800	0.09300	0.56700
N	0.09800	0.48300	0.00900
O	-	0.38500	0.08900
P	0.38500	-	0.47400
Q	0.08900	0.47400	-

Stepmatrix "NUMBER OF SCALES AROUND MIDBODY" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.14100	0.11800	0.05300	0.44100	0.29600	0.03000	0.38300	0.44400	0.08900

b	0.14100	-	0.02300	0.19400	0.30000	0.15500	0.17100	0.24200	0.30300	0.05200
c	0.11800	0.02300	-	0.17100	0.32300	0.17800	0.14800	0.26500	0.32600	0.02900
d	0.05300	0.19400	0.17100	-	0.49400	0.34900	0.02300	0.43600	0.49700	0.14200
e	0.44100	0.30000	0.32300	0.49400	-	0.14500	0.47100	0.05800	0.00300	0.35200
f	0.29600	0.15500	0.17800	0.34900	0.14500	-	0.32600	0.08700	0.14800	0.20700
g	0.03000	0.17100	0.14800	0.02300	0.47100	0.32600	-	0.41300	0.47400	0.11900
h	0.38300	0.24200	0.26500	0.43600	0.05800	0.08700	0.41300	-	0.06100	0.29400
i	0.44400	0.30300	0.32600	0.49700	0.00300	0.14800	0.47400	0.06100	-	0.35500
j	0.08900	0.05200	0.02900	0.14200	0.35200	0.20700	0.11900	0.29400	0.35500	-
k	0.21400	0.07300	0.09600	0.26700	0.22700	0.08200	0.24400	0.16900	0.23000	0.12500
l	0.63000	0.48900	0.51200	0.68300	0.18900	0.33400	0.66000	0.24700	0.18600	0.54100
m	0.16800	0.02700	0.05000	0.22100	0.27300	0.12800	0.19800	0.21500	0.27600	0.07900
n	0.04200	0.18300	0.16000	0.01100	0.48300	0.33800	0.01200	0.42500	0.48600	0.13100
o	0.03600	0.10500	0.08200	0.08900	0.40500	0.26000	0.06600	0.34700	0.40800	0.05300
p	0.52200	0.38100	0.40400	0.57500	0.08100	0.22600	0.55200	0.13900	0.07800	0.43300
q	0.01100	0.13000	0.10700	0.06400	0.43000	0.28500	0.04100	0.37200	0.43300	0.07800
r	0.27300	0.13200	0.15500	0.32600	0.16800	0.02300	0.30300	0.11000	0.17100	0.18400
s	0.12600	0.01500	0.00800	0.17900	0.31500	0.17000	0.15600	0.25700	0.31800	0.03700
t	0.02800	0.11300	0.09000	0.08100	0.41300	0.26800	0.05800	0.35500	0.41600	0.06100
u	0.34000	0.19900	0.22200	0.39300	0.10100	0.04400	0.37000	0.04300	0.10400	0.25100
v	0.22100	0.08000	0.10300	0.27400	0.22000	0.07500	0.25100	0.16200	0.22300	0.13200
w	0.24700	0.10600	0.12900	0.30000	0.19400	0.04900	0.27700	0.13600	0.19700	0.15800
x	0.17800	0.03700	0.06000	0.23100	0.26300	0.11800	0.20800	0.20500	0.26600	0.08900
y	0.02300	0.11800	0.09500	0.07600	0.41800	0.27300	0.05300	0.36000	0.42100	0.06600
z	0.63800	0.49700	0.52000	0.69100	0.19700	0.34200	0.66800	0.25500	0.19400	0.54900
0	0.57500	0.43400	0.45700	0.62800	0.13400	0.27900	0.60500	0.19200	0.13100	0.48600
1	0.00100	0.14000	0.11700	0.05400	0.44000	0.29500	0.03100	0.38200	0.44300	0.08800
2	0.02400	0.11700	0.09400	0.07700	0.41700	0.27200	0.05400	0.35900	0.42000	0.06500
3	0.23900	0.09800	0.12100	0.29200	0.20200	0.05700	0.26900	0.14400	0.20500	0.15000
4	0.02600	0.11500	0.09200	0.07900	0.41500	0.27000	0.05600	0.35700	0.41800	0.06300
5	0.05500	0.08600	0.06300	0.10800	0.38600	0.24100	0.08500	0.32800	0.38900	0.03400
6	0.09900	0.04200	0.01900	0.15200	0.34200	0.19700	0.12900	0.28400	0.34500	0.01000
7	0.05900	0.20000	0.17700	0.00600	0.50000	0.35500	0.02900	0.44200	0.50300	0.14800
8	0.10200	0.03900	0.01600	0.15500	0.33900	0.19400	0.13200	0.28100	0.34200	0.01300
9	0.48600	0.34500	0.36800	0.53900	0.04500	0.19000	0.51600	0.10300	0.04200	0.39700
A	0.19000	0.04900	0.07200	0.24300	0.25100	0.10600	0.22000	0.19300	0.25400	0.10100
B	0.10400	0.03700	0.01400	0.15700	0.33700	0.19200	0.13400	0.27900	0.34000	0.01500
C	0.09800	0.04300	0.02000	0.15100	0.34300	0.19800	0.12800	0.28500	0.34600	0.00900
D	0.01900	0.16000	0.13700	0.03400	0.46000	0.31500	0.01100	0.40200	0.46300	0.10800
E	0.14200	0.00100	0.02400	0.19500	0.29900	0.15400	0.17200	0.24100	0.30200	0.05300
F	0.62100	0.48000	0.50300	0.67400	0.18000	0.32500	0.65100	0.23800	0.17700	0.53200
G	0.00600	0.14700	0.12400	0.04700	0.44700	0.30200	0.02400	0.38900	0.45000	0.09500
H	0.00200	0.14300	0.12000	0.05100	0.44300	0.29800	0.02800	0.38500	0.44600	0.09100
I	0.06900	0.07200	0.04900	0.12200	0.37200	0.22700	0.09900	0.31400	0.37500	0.02000
J	0.26500	0.12400	0.14700	0.31800	0.17600	0.03100	0.29500	0.11800	0.17900	0.17600
K	0.17200	0.03100	0.05400	0.22500	0.26900	0.12400	0.20200	0.21100	0.27200	0.08300
L	0.49300	0.35200	0.37500	0.54600	0.05200	0.19700	0.52300	0.11000	0.04900	0.40400
M	0.10500	0.03600	0.01300	0.15800	0.33600	0.19100	0.13500	0.27800	0.33900	0.01600
N	0.70600	0.56500	0.58800	0.75900	0.26500	0.41000	0.73600	0.32300	0.26200	0.61700
O	0.10600	0.03500	0.01200	0.15900	0.33500	0.19000	0.13600	0.27700	0.33800	0.01700
P	0.27900	0.13800	0.16100	0.33200	0.16200	0.01700	0.30900	0.10400	0.16500	0.19000
Q	0.38600	0.24500	0.26800	0.43900	0.05500	0.09000	0.41600	0.00300	0.05800	0.29700
R	0.13800	0.00300	0.02000	0.19100	0.30300	0.15800	0.16800	0.24500	0.30600	0.04900

	TO:	k	l	m	n	o	p	q	r	s	t
FROM:	a	0.21400	0.63000	0.16800	0.04200	0.03600	0.52200	0.01100	0.27300	0.12600	0.02800
	b	0.07300	0.48900	0.02700	0.18300	0.10500	0.38100	0.13000	0.13200	0.01500	0.11300
	c	0.09600	0.51200	0.05000	0.16000	0.08200	0.40400	0.10700	0.15500	0.00800	0.09000
	d	0.26700	0.68300	0.22100	0.01100	0.08900	0.57500	0.06400	0.32600	0.17900	0.08100
	e	0.22700	0.18900	0.27300	0.48300	0.40500	0.08100	0.43000	0.16800	0.31500	0.41300
	f	0.08200	0.33400	0.12800	0.33800	0.26000	0.22600	0.28500	0.02300	0.17000	0.26800
	g	0.24400	0.66000	0.19800	0.01200	0.06600	0.55200	0.04100	0.30300	0.15600	0.05800
	h	0.16900	0.24700	0.21500	0.42500	0.34700	0.13900	0.37200	0.11000	0.25700	0.35500
	i	0.23000	0.18600	0.27600	0.48600	0.40800	0.07800	0.43300	0.17100	0.31800	0.41600
	j	0.12500	0.54100	0.07900	0.13100	0.05300	0.43300	0.07800	0.18400	0.03700	0.06100
	k	-	0.41600	0.04600	0.25600	0.17800	0.30800	0.20300	0.05900	0.08800	0.18600
	l	0.41600	-	0.46200	0.67200	0.59400	0.10800	0.61900	0.35700	0.50400	0.60200
	m	0.04600	0.46200	-	0.21000	0.13200	0.35400	0.15700	0.10500	0.04200	0.14000
	n	0.25600	0.67200	0.21000	-	0.07800	0.56400	0.05300	0.31500	0.16800	0.07000
	o	0.17800	0.59400	0.13200	0.07800	-	0.48600	0.02500	0.23700	0.09000	0.00800
	p	0.30800	0.10800	0.35400	0.56400	0.48600	-	0.51100	0.24900	0.39600	0.49400
	q	0.20300	0.61900	0.15700	0.05300	0.02500	0.51100	-	0.26200	0.11500	0.01700
	r	0.05900	0.35700	0.10500	0.31500	0.23700	0.24900	0.26200	-	0.14700	0.24500
	s	0.08800	0.50400	0.04200	0.16800	0.09000	0.39600	0.11500	0.14700	-	0.09800
	t	0.18600	0.60200	0.14000	0.07000	0.00800	0.49400	0.01700	0.24500	0.09800	-
	u	0.12600	0.29000	0.17200	0.38200	0.30400	0.18200	0.32900	0.06700	0.21400	0.31200
	v	0.00700	0.40900	0.05300	0.26300	0.18500	0.30100	0.21000	0.05200	0.09500	0.19300

w	0.03300	0.38300	0.07900	0.28900	0.21100	0.27500	0.23600	0.02600	0.12100	0.21900
x	0.03600	0.45200	0.01000	0.22000	0.14200	0.34400	0.16700	0.09500	0.05200	0.15000
y	0.19100	0.60700	0.14500	0.06500	0.01300	0.49900	0.01200	0.25000	0.10300	0.00500
z	0.42400	0.00800	0.47000	0.68000	0.60200	0.11600	0.62700	0.36500	0.51200	0.61000
0	0.36100	0.05500	0.40700	0.61700	0.53900	0.05300	0.56400	0.30200	0.44900	0.54700
1	0.21300	0.62900	0.16700	0.04300	0.03500	0.52100	0.01000	0.27200	0.12500	0.02700
2	0.19000	0.60600	0.14400	0.06600	0.01200	0.49800	0.01300	0.24900	0.10200	0.00400
3	0.02500	0.39100	0.07100	0.28100	0.20300	0.28300	0.22800	0.03400	0.11300	0.21100
4	0.18800	0.60400	0.14200	0.06800	0.01000	0.49600	0.01500	0.24700	0.10000	0.00200
5	0.15900	0.57500	0.11300	0.09700	0.01900	0.46700	0.04400	0.21800	0.07100	0.02700
6	0.11500	0.53100	0.06900	0.14100	0.06300	0.42300	0.08800	0.17400	0.02700	0.07100
7	0.27300	0.68900	0.22700	0.01700	0.09500	0.58100	0.07000	0.33200	0.18500	0.08700
8	0.11200	0.52800	0.06600	0.14400	0.06600	0.42000	0.09100	0.17100	0.02400	0.07400
9	0.27200	0.14400	0.31800	0.52800	0.45000	0.03600	0.47500	0.21300	0.36000	0.45800
A	0.02400	0.44000	0.02200	0.23200	0.15400	0.33200	0.17900	0.08300	0.06400	0.16200
B	0.11000	0.52600	0.06400	0.14600	0.06800	0.41800	0.09300	0.16900	0.02200	0.07600
C	0.11600	0.53200	0.07000	0.14000	0.06200	0.42400	0.08700	0.17500	0.02800	0.07000
D	0.23300	0.64900	0.18700	0.02300	0.05500	0.54100	0.03000	0.29200	0.14500	0.04700
E	0.07200	0.48800	0.02600	0.18400	0.10600	0.38000	0.13100	0.13100	0.01600	0.11400
F	0.40700	0.00900	0.45300	0.66300	0.58500	0.09900	0.61000	0.34800	0.49500	0.59300
G	0.22000	0.63600	0.17400	0.03600	0.04200	0.52800	0.01700	0.27900	0.13200	0.03400
H	0.21600	0.63200	0.17000	0.04000	0.03800	0.52400	0.01300	0.27500	0.12800	0.03000
I	0.14500	0.56100	0.09900	0.11100	0.03300	0.45300	0.05800	0.20400	0.05700	0.04100
J	0.05100	0.36500	0.09700	0.30700	0.22900	0.25700	0.25400	0.00800	0.13900	0.23700
K	0.04200	0.45800	0.00400	0.21400	0.13600	0.35000	0.16100	0.10100	0.04600	0.14400
L	0.27900	0.13700	0.32500	0.53500	0.45700	0.02900	0.48200	0.22000	0.36700	0.46500
M	0.10900	0.52500	0.06300	0.14700	0.06900	0.41700	0.09400	0.16800	0.02100	0.07700
N	0.49200	0.07600	0.53800	0.74800	0.67000	0.18400	0.69500	0.43300	0.58000	0.67800
O	0.10800	0.52400	0.06200	0.14800	0.07000	0.41600	0.09500	0.16700	0.02000	0.07800
P	0.06500	0.35100	0.11100	0.32100	0.24300	0.24300	0.26800	0.00600	0.15300	0.25100
Q	0.17200	0.24400	0.21800	0.42800	0.35000	0.13600	0.37500	0.11300	0.26000	0.35800
R	0.07600	0.49200	0.03000	0.18000	0.10200	0.38400	0.12700	0.13500	0.01200	0.11000

TO:	u	v	w	x	y	z	0	1	2	3
FROM: a	0.34000	0.22100	0.24700	0.17800	0.02300	0.63800	0.57500	0.00100	0.02400	0.23900
b	0.19900	0.08000	0.10600	0.03700	0.11800	0.49700	0.43400	0.14000	0.11700	0.09800
c	0.22200	0.10300	0.12900	0.06000	0.09500	0.52000	0.45700	0.11700	0.09400	0.12100
d	0.39300	0.27400	0.30000	0.23100	0.07600	0.69100	0.62800	0.05400	0.07700	0.29200
e	0.10100	0.22000	0.19400	0.26300	0.41800	0.19700	0.13400	0.44000	0.41700	0.20200
f	0.04400	0.07500	0.04900	0.11800	0.27300	0.34200	0.27900	0.29500	0.27200	0.05700
g	0.37000	0.25100	0.27700	0.20800	0.05300	0.66800	0.60500	0.03100	0.05400	0.26900
h	0.04300	0.16200	0.13600	0.20500	0.36000	0.25500	0.19200	0.38200	0.35900	0.14400
i	0.10400	0.22300	0.19700	0.26600	0.42100	0.19400	0.13100	0.44300	0.42000	0.20500
j	0.25100	0.13200	0.15800	0.08900	0.06600	0.54900	0.48600	0.08800	0.06500	0.15000
k	0.12600	0.00700	0.03300	0.03600	0.19100	0.42400	0.36100	0.21300	0.19000	0.02500
l	0.29000	0.40900	0.38300	0.45200	0.60700	0.00800	0.05500	0.62900	0.60600	0.39100
m	0.17200	0.05300	0.07900	0.01000	0.14500	0.47000	0.40700	0.16700	0.14400	0.07100
n	0.38200	0.26300	0.28900	0.22000	0.06500	0.68000	0.61700	0.04300	0.06600	0.28100
o	0.30400	0.18500	0.21100	0.14200	0.01300	0.60200	0.53900	0.03500	0.01200	0.20300
p	0.18200	0.30100	0.27500	0.34400	0.49900	0.11600	0.05300	0.52100	0.49800	0.28300
q	0.32900	0.21000	0.23600	0.16700	0.01200	0.62700	0.56400	0.01000	0.01300	0.22800
r	0.06700	0.05200	0.02600	0.09500	0.25000	0.36500	0.30200	0.27200	0.24900	0.03400
s	0.21400	0.09500	0.12100	0.05200	0.10300	0.51200	0.44900	0.12500	0.10200	0.11300
t	0.31200	0.19300	0.21900	0.15000	0.00500	0.61000	0.54700	0.02700	0.00400	0.21100
u	-	0.11900	0.09300	0.16200	0.31700	0.29800	0.23500	0.33900	0.31600	0.10100
v	0.11900	-	0.02600	0.04300	0.19800	0.41700	0.35400	0.22000	0.19700	0.01800
w	0.09300	0.02600	-	0.06900	0.22400	0.39100	0.32800	0.24600	0.22300	0.00800
x	0.16200	0.04300	0.06900	-	0.15500	0.46000	0.39700	0.17700	0.15400	0.06100
y	0.31700	0.19800	0.22400	0.15500	-	0.61500	0.55200	0.02200	0.00100	0.21600
z	0.29800	0.41700	0.39100	0.46000	0.61500	-	0.06300	0.63700	0.61400	0.39900
0	0.23500	0.35400	0.32800	0.39700	0.55200	0.06300	-	0.57400	0.55100	0.33600
1	0.33900	0.22000	0.24600	0.17700	0.02200	0.63700	0.57400	-	0.02300	0.23800
2	0.31600	0.19700	0.22300	0.15400	0.00100	0.61400	0.55100	0.02300	-	0.21500
3	0.10100	0.01800	0.00800	0.06100	0.21600	0.39900	0.33600	0.23800	0.21500	-
4	0.31400	0.19500	0.22100	0.15200	0.00300	0.61200	0.54900	0.02500	0.00200	0.21300
5	0.28500	0.16600	0.19200	0.12300	0.03200	0.58300	0.52000	0.05400	0.03100	0.18400
6	0.24100	0.12200	0.14800	0.07900	0.07600	0.53900	0.47600	0.09800	0.07500	0.14000
7	0.39900	0.28000	0.30600	0.23700	0.08200	0.69700	0.63400	0.06000	0.08300	0.29800
8	0.23800	0.11900	0.14500	0.07600	0.07900	0.53600	0.47300	0.10100	0.07800	0.13700
9	0.14600	0.26500	0.23900	0.30800	0.46300	0.15200	0.08900	0.48500	0.46200	0.24700
A	0.15000	0.03100	0.05700	0.01200	0.16700	0.44800	0.38500	0.18900	0.16600	0.04900
B	0.23600	0.11700	0.14300	0.07400	0.08100	0.53400	0.47100	0.10300	0.08000	0.13500
C	0.24200	0.12300	0.14900	0.08000	0.07500	0.54000	0.47700	0.09700	0.07400	0.14100
D	0.35900	0.24000	0.26600	0.19700	0.04200	0.65700	0.59400	0.02000	0.04300	0.25800
E	0.19800	0.07900	0.10500	0.03600	0.11900	0.49600	0.43300	0.14100	0.11800	0.09700
F	0.28100	0.40000	0.37400	0.44300	0.59800	0.01700	0.04600	0.62000	0.59700	0.38200
G	0.34600	0.22700	0.25300	0.18400	0.02900	0.64400	0.58100	0.00700	0.03000	0.24500

H	0.34200	0.22300	0.24900	0.18000	0.02500	0.64000	0.57700	0.00300	0.02600	0.24100
I	0.27100	0.15200	0.17800	0.10900	0.04600	0.56900	0.50600	0.06800	0.04500	0.17000
J	0.07500	0.04400	0.01800	0.08700	0.24200	0.37300	0.31000	0.26400	0.24100	0.02600
K	0.16800	0.04900	0.07500	0.00600	0.14900	0.46600	0.40300	0.17100	0.14800	0.06700
L	0.15300	0.27200	0.24600	0.31500	0.47000	0.14500	0.08200	0.49200	0.46900	0.25400
M	0.23500	0.11600	0.14200	0.07300	0.08200	0.53300	0.47000	0.10400	0.08100	0.13400
N	0.36600	0.48500	0.45900	0.52800	0.68300	0.06800	0.13100	0.70500	0.68200	0.46700
O	0.23400	0.11500	0.14100	0.07200	0.08300	0.53200	0.46900	0.10500	0.08200	0.13300
P	0.06100	0.05800	0.03200	0.10100	0.25600	0.35900	0.29600	0.27800	0.25500	0.04000
Q	0.04600	0.16500	0.13900	0.20800	0.36300	0.25200	0.18900	0.38500	0.36200	0.14700
R	0.20200	0.08300	0.10900	0.04000	0.11500	0.50000	0.43700	0.13700	0.11400	0.10100

TO:	4	5	6	7	8	9	A	B	C	D
FROM: a	0.02600	0.05500	0.09900	0.05900	0.10200	0.48600	0.19000	0.10400	0.09800	0.01900
b	0.11500	0.08600	0.04200	0.20000	0.03900	0.34500	0.04900	0.03700	0.04300	0.16000
c	0.09200	0.06300	0.01900	0.17700	0.01600	0.36800	0.07200	0.01400	0.02000	0.13700
d	0.07900	0.10800	0.15200	0.00600	0.15500	0.53900	0.24300	0.15700	0.15100	0.03400
e	0.41500	0.38600	0.34200	0.50000	0.33900	0.04500	0.25100	0.33700	0.34300	0.46000
f	0.27000	0.24100	0.19700	0.35500	0.19400	0.19000	0.10600	0.19200	0.19800	0.31500
g	0.05600	0.08500	0.12900	0.02900	0.13200	0.51600	0.22000	0.13400	0.12800	0.01100
h	0.35700	0.32800	0.28400	0.44200	0.28100	0.10300	0.19300	0.27900	0.28500	0.40200
i	0.41800	0.38900	0.34500	0.50300	0.34200	0.04200	0.25400	0.34000	0.34600	0.46300
j	0.06300	0.03400	0.01000	0.14800	0.01300	0.39700	0.10100	0.01500	0.00900	0.10800
k	0.18800	0.15900	0.11500	0.27300	0.11200	0.27200	0.02400	0.11000	0.11600	0.23300
l	0.60400	0.57500	0.53100	0.68900	0.52800	0.14400	0.44000	0.52600	0.53200	0.64900
m	0.14200	0.11300	0.06900	0.22700	0.06600	0.31800	0.02200	0.06400	0.07000	0.18700
n	0.06800	0.09700	0.14100	0.01700	0.14400	0.52800	0.23200	0.14600	0.14000	0.02300
o	0.01000	0.01900	0.06300	0.09500	0.06600	0.45000	0.15400	0.06800	0.06200	0.05500
p	0.49600	0.46700	0.42300	0.58100	0.42000	0.03600	0.33200	0.41800	0.42400	0.54100
q	0.01500	0.04400	0.08800	0.07000	0.09100	0.47500	0.17900	0.09300	0.08700	0.03000
r	0.24700	0.21800	0.17400	0.33200	0.17100	0.21300	0.08300	0.16900	0.17500	0.29200
s	0.10000	0.07100	0.02700	0.18500	0.02400	0.36000	0.06400	0.02200	0.02800	0.14500
t	0.00200	0.02700	0.07100	0.08700	0.07400	0.45800	0.16200	0.07600	0.07000	0.04700
u	0.31400	0.28500	0.24100	0.39900	0.23800	0.14600	0.15000	0.23600	0.24200	0.35900
v	0.19500	0.16600	0.12200	0.28000	0.11900	0.26500	0.03100	0.11700	0.12300	0.24000
w	0.22100	0.19200	0.14800	0.30600	0.14500	0.23900	0.05700	0.14300	0.14900	0.26600
x	0.15200	0.12300	0.07900	0.23700	0.07600	0.30800	0.01200	0.07400	0.08000	0.19700
y	0.00300	0.03200	0.07600	0.08200	0.07900	0.46300	0.16700	0.08100	0.07500	0.04200
z	0.61200	0.58300	0.53900	0.69700	0.53600	0.15200	0.44800	0.53400	0.54000	0.65700
0	0.54900	0.52000	0.47600	0.63400	0.47300	0.08900	0.38500	0.47100	0.47700	0.59400
1	0.02500	0.05400	0.09800	0.06000	0.10100	0.48500	0.18900	0.10300	0.09700	0.02000
2	0.00200	0.03100	0.07500	0.08300	0.07800	0.46200	0.16600	0.08000	0.07400	0.04300
3	0.21300	0.18400	0.14000	0.29800	0.13700	0.24700	0.04900	0.13500	0.14100	0.25800
4	-	0.02900	0.07300	0.08500	0.07600	0.46000	0.16400	0.07800	0.07200	0.04500
5	0.02900	-	0.04400	0.11400	0.04700	0.43100	0.13500	0.04900	0.04300	0.07400
6	0.07300	0.04400	-	0.15800	0.00300	0.38700	0.09100	0.00500	0.00100	0.11800
7	0.08500	0.11400	0.15800	-	0.16100	0.54500	0.24900	0.16300	0.15700	0.04000
8	0.07600	0.04700	0.00300	0.16100	-	0.38400	0.08800	0.00200	0.00400	0.12100
9	0.46000	0.43100	0.38700	0.54500	0.38400	-	0.29600	0.38200	0.38800	0.50500
A	0.16400	0.13500	0.09100	0.24900	0.08800	0.29600	-	0.08600	0.09200	0.20900
B	0.07800	0.04900	0.00500	0.16300	0.00200	0.38200	0.08600	-	0.00600	0.12300
C	0.07200	0.04300	0.00100	0.15700	0.00400	0.38800	0.09200	0.00600	-	0.11700
D	0.04500	0.07400	0.11800	0.04000	0.12100	0.50500	0.20900	0.12300	0.11700	-
E	0.11600	0.08700	0.04300	0.20100	0.04000	0.34400	0.04800	0.03800	0.04400	0.16100
F	0.59500	0.56600	0.52200	0.68000	0.51900	0.13500	0.43100	0.51700	0.52300	0.64000
G	0.03200	0.06100	0.10500	0.05300	0.10800	0.49200	0.19600	0.11000	0.10400	0.01300
H	0.02800	0.05700	0.10100	0.05700	0.10400	0.48800	0.19200	0.10600	0.10000	0.01700
I	0.04300	0.01400	0.03000	0.12800	0.03300	0.41700	0.12100	0.03500	0.02900	0.08800
J	0.23900	0.21000	0.16600	0.32400	0.16300	0.22100	0.07500	0.16100	0.16700	0.28400
K	0.14600	0.11700	0.07300	0.23100	0.07000	0.31400	0.01800	0.06800	0.07400	0.19100
L	0.46700	0.43800	0.39400	0.55200	0.39100	0.00700	0.30300	0.38900	0.39500	0.51200
M	0.07900	0.05000	0.00600	0.16400	0.00300	0.38100	0.08500	0.00100	0.00700	0.12400
N	0.68000	0.65100	0.60700	0.76500	0.60400	0.22000	0.51600	0.60200	0.60800	0.72500
O	0.08000	0.05100	0.00700	0.16500	0.00400	0.38000	0.08400	0.00200	0.00800	0.12500
P	0.25300	0.22400	0.18000	0.33800	0.17700	0.20700	0.08900	0.17500	0.18100	0.29800
Q	0.36000	0.33100	0.28700	0.44500	0.28400	0.10000	0.19600	0.28200	0.28800	0.40500
R	0.11200	0.08300	0.03900	0.19700	0.03600	0.34800	0.05200	0.03400	0.04000	0.15700

TO:	E	F	G	H	I	J	K	L	M	N
FROM: a	0.14200	0.62100	0.00600	0.00200	0.06900	0.26500	0.17200	0.49300	0.10500	0.70600
b	0.00100	0.48000	0.14700	0.14300	0.07200	0.12400	0.03100	0.35200	0.03600	0.56500
c	0.02400	0.50300	0.12400	0.12000	0.04900	0.14700	0.05400	0.37500	0.01300	0.58800
d	0.19500	0.67400	0.04700	0.05100	0.12200	0.31800	0.22500	0.54600	0.15800	0.75900
e	0.29900	0.18000	0.44700	0.44300	0.37200	0.17600	0.26900	0.05200	0.33600	0.26500
f	0.15400	0.32500	0.30200	0.29800	0.22700	0.03100	0.12400	0.19700	0.19100	0.41000
g	0.17200	0.65100	0.02400	0.02800	0.09900	0.29500	0.20200	0.52300	0.13500	0.73600
h	0.24100	0.23800	0.38900	0.38500	0.31400	0.11800	0.21100	0.11000	0.27800	0.32300

i	0.30200	0.17700	0.45000	0.44600	0.37500	0.17900	0.27200	0.04900	0.33900	0.26200
j	0.05300	0.53200	0.09500	0.09100	0.02000	0.17600	0.08300	0.40400	0.01600	0.61700
k	0.07200	0.40700	0.22000	0.21600	0.14500	0.05100	0.04200	0.27900	0.10900	0.49200
l	0.48800	0.00900	0.63600	0.63200	0.56100	0.36500	0.45800	0.13700	0.52500	0.07600
m	0.02600	0.45300	0.17400	0.17000	0.09900	0.09700	0.00400	0.32500	0.06300	0.53800
n	0.18400	0.66300	0.03600	0.04000	0.11100	0.30700	0.21400	0.53500	0.14700	0.74800
o	0.10600	0.58500	0.04200	0.03800	0.03300	0.22900	0.13600	0.45700	0.06900	0.67000
p	0.38000	0.09900	0.52800	0.52400	0.45300	0.25700	0.35000	0.02900	0.41700	0.18400
q	0.13100	0.61000	0.01700	0.01300	0.05800	0.25400	0.16100	0.48200	0.09400	0.69500
r	0.13100	0.34800	0.27900	0.27500	0.20400	0.00800	0.10100	0.22000	0.16800	0.43300
s	0.01600	0.49500	0.13200	0.12800	0.05700	0.13900	0.04600	0.36700	0.02100	0.58000
t	0.11400	0.59300	0.03400	0.03000	0.04100	0.23700	0.14400	0.46500	0.07700	0.67800
u	0.19800	0.28100	0.34600	0.34200	0.27100	0.07500	0.16800	0.15300	0.23500	0.36600
v	0.07900	0.40000	0.22700	0.22300	0.15200	0.04400	0.04900	0.27200	0.11600	0.48500
w	0.10500	0.37400	0.25300	0.24900	0.17800	0.01800	0.07500	0.24600	0.14200	0.45900
x	0.03600	0.44300	0.18400	0.18000	0.10900	0.08700	0.00600	0.31500	0.07300	0.52800
y	0.11900	0.59800	0.02900	0.02500	0.04600	0.24200	0.14900	0.47000	0.08200	0.68300
z	0.49600	0.01700	0.64400	0.64000	0.56900	0.37300	0.46600	0.14500	0.53300	0.06800
0	0.43300	0.04600	0.58100	0.57700	0.50600	0.31000	0.40300	0.08200	0.47000	0.13100
1	0.14100	0.62000	0.00700	0.00300	0.06800	0.26400	0.17100	0.49200	0.10400	0.70500
2	0.11800	0.59700	0.03000	0.02600	0.04500	0.24100	0.14800	0.46900	0.08100	0.68200
3	0.09700	0.38200	0.24500	0.24100	0.17000	0.02600	0.06700	0.25400	0.13400	0.46700
4	0.11600	0.59500	0.03200	0.02800	0.04300	0.23900	0.14600	0.46700	0.07900	0.68000
5	0.08700	0.56600	0.06100	0.05700	0.01400	0.21000	0.11700	0.43800	0.05000	0.65100
6	0.04300	0.52200	0.10500	0.10100	0.03000	0.16600	0.07300	0.39400	0.00600	0.60700
7	0.20100	0.68000	0.05300	0.05700	0.12800	0.32400	0.23100	0.55200	0.16400	0.76500
8	0.04000	0.51900	0.10800	0.10400	0.03300	0.16300	0.07000	0.39100	0.00300	0.60400
9	0.34400	0.13500	0.49200	0.48800	0.41700	0.22100	0.31400	0.00700	0.38100	0.22000
A	0.04800	0.43100	0.19600	0.19200	0.12100	0.07500	0.01800	0.30300	0.08500	0.51600
B	0.03800	0.51700	0.11000	0.10600	0.03500	0.16100	0.06800	0.38900	0.00100	0.60200
C	0.04400	0.52300	0.10400	0.10000	0.02900	0.16700	0.07400	0.39500	0.00700	0.60800
D	0.16100	0.64000	0.01300	0.01700	0.08800	0.28400	0.19100	0.51200	0.12400	0.72500
E	-	0.47900	0.14800	0.14400	0.07300	0.12300	0.03000	0.35100	0.03700	0.56400
F	0.47900	-	0.62700	0.62300	0.55200	0.35600	0.44900	0.12800	0.51600	0.08500
G	0.14800	0.62700	-	0.00400	0.07500	0.27100	0.17800	0.49900	0.11100	0.71200
H	0.14400	0.62300	0.00400	-	0.07100	0.26700	0.17400	0.49500	0.10700	0.70800
I	0.07300	0.55200	0.07500	0.07100	-	0.19600	0.10300	0.42400	0.03600	0.63700
J	0.12300	0.35600	0.27100	0.26700	0.19600	-	0.09300	0.22800	0.16000	0.44100
K	0.03000	0.44900	0.17800	0.17400	0.10300	0.09300	-	0.32100	0.06700	0.53400
L	0.35100	0.12800	0.49900	0.49500	0.42400	0.22800	0.32100	-	0.38800	0.21300
M	0.03700	0.51600	0.11100	0.10700	0.03600	0.16000	0.06700	0.38800	-	0.60100
N	0.56400	0.08500	0.71200	0.70800	0.63700	0.44100	0.53400	0.21300	0.60100	-
O	0.03600	0.51500	0.11200	0.10800	0.03700	0.15900	0.06600	0.38700	0.00100	0.60000
P	0.13700	0.34200	0.28500	0.28100	0.21000	0.01400	0.10700	0.21400	0.17400	0.42700
Q	0.24400	0.23500	0.39200	0.38800	0.31700	0.12100	0.21400	0.10700	0.28100	0.32000
R	0.00400	0.48300	0.14400	0.14000	0.06900	0.12700	0.03400	0.35500	0.03300	0.56800

TO:	O	P	Q	R
FROM: a	0.10600	0.27900	0.38600	0.13800
b	0.03500	0.13800	0.24500	0.00300
c	0.01200	0.16100	0.26800	0.02000
d	0.15900	0.33200	0.43900	0.19100
e	0.33500	0.16200	0.05500	0.30300
f	0.19000	0.01700	0.09000	0.15800
g	0.13600	0.30900	0.41600	0.16800
h	0.27700	0.10400	0.00300	0.24500
i	0.33800	0.16500	0.05800	0.30600
j	0.01700	0.19000	0.29700	0.04900
k	0.10800	0.06500	0.17200	0.07600
l	0.52400	0.35100	0.24400	0.49200
m	0.06200	0.11100	0.21800	0.03000
n	0.14800	0.32100	0.42800	0.18000
o	0.07000	0.24300	0.35000	0.10200
p	0.41600	0.24300	0.13600	0.38400
q	0.09500	0.26800	0.37500	0.12700
r	0.16700	0.00600	0.11300	0.13500
s	0.02000	0.15300	0.26000	0.01200
t	0.07800	0.25100	0.35800	0.11000
u	0.23400	0.06100	0.04600	0.20200
v	0.11500	0.05800	0.16500	0.08300
w	0.14100	0.03200	0.13900	0.10900
x	0.07200	0.10100	0.20800	0.04000
y	0.08300	0.25600	0.36300	0.11500
z	0.53200	0.35900	0.25200	0.50000
0	0.46900	0.29600	0.18900	0.43700
1	0.10500	0.27800	0.38500	0.13700
2	0.08200	0.25500	0.36200	0.11400

3	0.13300	0.04000	0.14700	0.10100
4	0.08000	0.25300	0.36000	0.11200
5	0.05100	0.22400	0.33100	0.08300
6	0.00700	0.18000	0.28700	0.03900
7	0.16500	0.33800	0.44500	0.19700
8	0.00400	0.17700	0.28400	0.03600
9	0.38000	0.20700	0.10000	0.34800
A	0.08400	0.08900	0.19600	0.05200
B	0.00200	0.17500	0.28200	0.03400
C	0.00800	0.18100	0.28800	0.04000
D	0.12500	0.29800	0.40500	0.15700
E	0.03600	0.13700	0.24400	0.00400
F	0.51500	0.34200	0.23500	0.48300
G	0.11200	0.28500	0.39200	0.14400
H	0.10800	0.28100	0.38800	0.14000
I	0.03700	0.21000	0.31700	0.06900
J	0.15900	0.01400	0.12100	0.12700
K	0.06600	0.10700	0.21400	0.03400
L	0.38700	0.21400	0.10700	0.35500
M	0.00100	0.17400	0.28100	0.03300
N	0.60000	0.42700	0.32000	0.56800
O	-	0.17300	0.28000	0.03200
P	0.17300	-	0.10700	0.14100
Q	0.28000	0.10700	-	0.24800
R	0.03200	0.14100	0.24800	-

Stepmatrix "NUMBER OF VERTEBRALS" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.05000	0.14100	0.07800	0.38900	0.28800	0.05600	0.25400	0.29700	0.04500
b	0.05000	-	0.09100	0.12800	0.33900	0.23800	0.10600	0.20400	0.24700	0.00500
c	0.14100	0.09100	-	0.21900	0.24800	0.14700	0.19700	0.11300	0.15600	0.09600
d	0.07800	0.12800	0.21900	-	0.46700	0.36600	0.02200	0.33200	0.37500	0.12300
e	0.38900	0.33900	0.24800	0.46700	-	0.10100	0.44500	0.13500	0.09200	0.34400
f	0.28800	0.23800	0.14700	0.36600	0.10100	-	0.34400	0.03400	0.00900	0.24300
g	0.05600	0.10600	0.19700	0.02200	0.44500	0.34400	-	0.31000	0.35300	0.10100
h	0.25400	0.20400	0.11300	0.33200	0.13500	0.03400	0.31000	-	0.04300	0.20900
i	0.29700	0.24700	0.15600	0.37500	0.09200	0.00900	0.35300	0.04300	-	0.25200
j	0.04500	0.00500	0.09600	0.12300	0.34400	0.24300	0.10100	0.20900	0.25200	-
k	0.27150	0.22150	0.13050	0.34950	0.11750	0.01650	0.32750	0.01750	0.02550	0.22650
l	0.53000	0.48000	0.38900	0.60800	0.14100	0.24200	0.58600	0.27600	0.23300	0.48500
m	0.11400	0.06400	0.02700	0.19200	0.27500	0.17400	0.17000	0.14000	0.18300	0.06900
n	0.04100	0.09100	0.18200	0.03700	0.43000	0.32900	0.01500	0.29500	0.33800	0.08600
o	0.16600	0.21600	0.30700	0.08800	0.55500	0.45400	0.11000	0.42000	0.46300	0.21100
p	0.50500	0.45500	0.36400	0.58300	0.11600	0.21700	0.56100	0.25100	0.20800	0.46000
q	0.02200	0.07200	0.16300	0.05600	0.41100	0.31000	0.03400	0.27600	0.31900	0.06700
r	0.33100	0.28100	0.19000	0.40900	0.05800	0.04300	0.38700	0.07700	0.03400	0.28600
s	0.06200	0.01200	0.07900	0.14000	0.32700	0.22600	0.11800	0.19200	0.23500	0.01700
t	0.03000	0.02000	0.11100	0.10800	0.35900	0.25800	0.08600	0.22400	0.26700	0.01500
u	0.25700	0.20700	0.11600	0.33500	0.13200	0.03100	0.31300	0.00300	0.04000	0.21200
v	0.17600	0.12600	0.03500	0.25400	0.21300	0.11200	0.23200	0.07800	0.12100	0.13100
w	0.15700	0.10700	0.01600	0.23500	0.23200	0.13100	0.21300	0.09700	0.14000	0.11200
x	0.09700	0.04700	0.04400	0.17500	0.29200	0.19100	0.15300	0.15700	0.20000	0.05200
y	0.02600	0.02400	0.11500	0.10400	0.36300	0.26200	0.08200	0.22800	0.27100	0.01900
z	0.56400	0.51400	0.42300	0.64200	0.17500	0.27600	0.62000	0.31000	0.26700	0.51900
0	0.17200	0.12200	0.03100	0.25000	0.21700	0.11600	0.22800	0.08200	0.12500	0.12700
1	0.04650	0.00350	0.09450	0.12450	0.34250	0.24150	0.10250	0.20750	0.25050	0.00150
2	0.06500	0.01500	0.07600	0.14300	0.32400	0.22300	0.12100	0.18900	0.23200	0.02000
3	0.08800	0.03800	0.05300	0.16600	0.30100	0.20000	0.14400	0.16600	0.20900	0.04300
4	0.07800	0.02800	0.06300	0.15600	0.31100	0.21000	0.13400	0.17600	0.21900	0.03300
5	0.05100	0.00100	0.09000	0.12900	0.33800	0.23700	0.10700	0.20300	0.24600	0.00600
6	0.15200	0.10200	0.01100	0.23000	0.23700	0.13600	0.20800	0.10200	0.14500	0.10700
7	0.14600	0.09600	0.00500	0.22400	0.24300	0.14200	0.20200	0.10800	0.15100	0.10100
8	0.01100	0.03900	0.13000	0.08900	0.37800	0.27700	0.06700	0.24300	0.28600	0.03400
9	0.12500	0.07500	0.01600	0.20300	0.26400	0.16300	0.18100	0.12900	0.17200	0.08000
A	0.28200	0.23200	0.14100	0.36000	0.10700	0.00600	0.33800	0.02800	0.01500	0.23700
B	0.14700	0.09700	0.00600	0.22500	0.24200	0.14100	0.20300	0.10700	0.15000	0.10200
C	0.11100	0.06100	0.03000	0.18900	0.27800	0.17700	0.16700	0.14300	0.18600	0.06600
D	0.15600	0.10600	0.01500	0.23400	0.23300	0.13200	0.21200	0.09800	0.14100	0.11100
E	0.03300	0.01700	0.10800	0.11100	0.35600	0.25500	0.08900	0.22100	0.26400	0.01200
F	0.07600	0.12600	0.21700	0.00200	0.46500	0.36400	0.02000	0.33000	0.37300	0.12100
G	0.01300	0.03700	0.12800	0.09100	0.37600	0.27500	0.06900	0.24100	0.28400	0.03200
H	0.29900	0.24900	0.15800	0.37700	0.09000	0.01100	0.35500	0.04500	0.00200	0.25400
I	0.07400	0.12400	0.21500	0.00400	0.46300	0.36200	0.01800	0.32800	0.37100	0.11900
J	0.06000	0.01000	0.08100	0.13800	0.32900	0.22800	0.11600	0.19400	0.23700	0.01500
K	0.07200	0.02200	0.06900	0.15000	0.31700	0.21600	0.12800	0.18200	0.22500	0.02700

L	0.13200	0.08200	0.00900	0.21000	0.25700	0.15600	0.18800	0.12200	0.16500	0.08700
M	0.08600	0.03600	0.05500	0.16400	0.30300	0.20200	0.14200	0.16800	0.21100	0.04100
N	0.35600	0.30600	0.21500	0.43400	0.03300	0.06800	0.41200	0.10200	0.05900	0.31100
O	0.16700	0.11700	0.02600	0.24500	0.22200	0.12100	0.22300	0.08700	0.13000	0.12200
P	0.62900	0.57900	0.48800	0.70700	0.24000	0.34100	0.68500	0.37500	0.33200	0.58400
Q	0.02900	0.02100	0.11200	0.10700	0.36000	0.25900	0.08500	0.22500	0.26800	0.01600
R	0.17800	0.12800	0.03700	0.25600	0.21100	0.11000	0.23400	0.07600	0.11900	0.13300
S	0.32100	0.27100	0.18000	0.39900	0.06800	0.03300	0.37700	0.06700	0.02400	0.27600
T	0.06000	0.11000	0.20100	0.01800	0.44900	0.34800	0.00400	0.31400	0.35700	0.10500

TO: / FROM:	k	l	m	n	o	p	q	r	s	t
a	0.27150	0.53000	0.11400	0.04100	0.16600	0.50500	0.02200	0.33100	0.06200	0.03000
b	0.22150	0.48000	0.06400	0.09100	0.21600	0.45500	0.07200	0.28100	0.01200	0.02000
c	0.13050	0.38900	0.02700	0.18200	0.30700	0.36400	0.16300	0.19000	0.07900	0.11100
d	0.34950	0.60800	0.19200	0.03700	0.08800	0.58300	0.05600	0.40900	0.14000	0.10800
e	0.11750	0.14100	0.27500	0.43000	0.55500	0.11600	0.41100	0.05800	0.32700	0.35900
f	0.01650	0.24200	0.17400	0.32900	0.45400	0.21700	0.31000	0.04300	0.22600	0.25800
g	0.32750	0.58600	0.17000	0.01500	0.11000	0.56100	0.03400	0.38700	0.11800	0.08600
h	0.01750	0.27600	0.14000	0.29500	0.42000	0.25100	0.27600	0.07700	0.19200	0.22400
i	0.02550	0.23300	0.18300	0.33800	0.46300	0.20800	0.31900	0.03400	0.23500	0.26700
j	0.22650	0.48500	0.06900	0.08600	0.21100	0.46000	0.06700	0.28600	0.01700	0.01500
k	-	0.25850	0.15750	0.31250	0.43750	0.23350	0.29350	0.05950	0.20950	0.24150
l	0.25850	-	0.41600	0.57100	0.69600	0.02500	0.55200	0.19900	0.46800	0.50000
m	0.15750	0.41600	-	0.15500	0.28000	0.39100	0.13600	0.21700	0.05200	0.08400
n	0.31250	0.57100	0.15500	-	0.12500	0.54600	0.01900	0.37200	0.10300	0.07100
o	0.43750	0.69600	0.28000	0.12500	-	0.67100	0.14400	0.49700	0.22800	0.19600
p	0.23350	0.02500	0.39100	0.54600	0.67100	-	0.52700	0.17400	0.44300	0.47500
q	0.29350	0.55200	0.13600	0.01900	0.14400	0.52700	-	0.35300	0.08400	0.05200
r	0.05950	0.19900	0.21700	0.37200	0.49700	0.17400	0.35300	-	0.26900	0.30100
s	0.20950	0.46800	0.05200	0.10300	0.22800	0.44300	0.08400	0.26900	-	0.03200
t	0.24150	0.50000	0.08400	0.07100	0.19600	0.47500	0.05200	0.30100	0.03200	-
u	0.01450	0.27300	0.14300	0.29800	0.42300	0.24800	0.27900	0.07400	0.19500	0.22700
v	0.09550	0.35400	0.06200	0.21700	0.34200	0.32900	0.19800	0.15500	0.11400	0.14600
w	0.11450	0.37300	0.04300	0.19800	0.32300	0.34800	0.17900	0.17400	0.09500	0.12700
x	0.17450	0.43300	0.01700	0.13800	0.26300	0.40800	0.11900	0.23400	0.03500	0.06700
y	0.24550	0.50400	0.08800	0.06700	0.19200	0.47900	0.04800	0.30500	0.03600	0.00400
z	0.29250	0.03400	0.45000	0.60500	0.73000	0.05900	0.58600	0.23300	0.50200	0.53400
0	0.09950	0.35800	0.05800	0.21300	0.33800	0.33300	0.19400	0.15900	0.11000	0.14200
1	0.22500	0.48350	0.06750	0.08750	0.21250	0.45850	0.06850	0.28450	0.01550	0.01650
2	0.20650	0.46500	0.04900	0.10600	0.23100	0.44000	0.08700	0.26600	0.00300	0.03500
3	0.18350	0.44200	0.02600	0.12900	0.25400	0.41700	0.11000	0.24300	0.02600	0.05800
4	0.19350	0.45200	0.03600	0.11900	0.24400	0.42700	0.10000	0.25300	0.01600	0.04800
5	0.22050	0.47900	0.06300	0.09200	0.21700	0.45400	0.07300	0.28000	0.01100	0.02100
6	0.11950	0.37800	0.03800	0.19300	0.31800	0.35300	0.17400	0.17900	0.09000	0.12200
7	0.12550	0.38400	0.03200	0.18700	0.31200	0.35900	0.16800	0.18500	0.08400	0.11600
8	0.26050	0.51900	0.10300	0.05200	0.17700	0.49400	0.03300	0.32000	0.05100	0.01900
9	0.14650	0.40500	0.01100	0.16600	0.29100	0.38000	0.14700	0.20600	0.06300	0.09500
A	0.01050	0.24800	0.16800	0.32300	0.44800	0.22300	0.30400	0.04900	0.22000	0.25200
B	0.12450	0.38300	0.03300	0.18800	0.31300	0.35800	0.16900	0.18400	0.08500	0.11700
C	0.16050	0.41900	0.00300	0.15200	0.27700	0.39400	0.13300	0.22000	0.04900	0.08100
D	0.11550	0.37400	0.04200	0.19700	0.32200	0.34900	0.17800	0.17500	0.09400	0.12600
E	0.23850	0.49700	0.08100	0.07400	0.19900	0.47200	0.05500	0.29800	0.02900	0.00300
F	0.34750	0.60600	0.19000	0.03500	0.09000	0.58100	0.05400	0.40700	0.13800	0.10600
G	0.25850	0.51700	0.10100	0.05400	0.17900	0.49200	0.03500	0.31800	0.04900	0.01700
H	0.02750	0.23100	0.18500	0.34000	0.46500	0.20600	0.32100	0.03200	0.23700	0.26900
I	0.34550	0.60400	0.18800	0.03300	0.09200	0.57900	0.05200	0.40500	0.13600	0.10400
J	0.21150	0.47000	0.05400	0.10100	0.22600	0.44500	0.08200	0.27100	0.00200	0.03000
K	0.19950	0.45800	0.04200	0.11300	0.23800	0.43300	0.09400	0.25900	0.01000	0.04200
L	0.13950	0.39800	0.01800	0.17300	0.29800	0.37300	0.15400	0.19900	0.07000	0.10200
M	0.18550	0.44400	0.02800	0.12700	0.25200	0.41900	0.10800	0.24500	0.02400	0.05600
N	0.08450	0.17400	0.24200	0.39700	0.52200	0.14900	0.37800	0.02500	0.29400	0.32600
O	0.10450	0.36300	0.05300	0.20800	0.33300	0.33800	0.18900	0.16400	0.10500	0.13700
P	0.35750	0.09900	0.51500	0.67000	0.79500	0.12400	0.65100	0.29800	0.56700	0.59900
Q	0.24250	0.50100	0.08500	0.07000	0.19500	0.47600	0.05100	0.30200	0.03300	0.00100
R	0.09350	0.35200	0.06400	0.21900	0.34400	0.32700	0.20000	0.15300	0.11600	0.14800
S	0.04950	0.20900	0.20700	0.36200	0.48700	0.18400	0.34300	0.01000	0.25900	0.29100
T	0.33150	0.59000	0.17400	0.01900	0.10600	0.56500	0.03800	0.39100	0.12200	0.09000

TO: / FROM:	u	v	w	x	y	z	0	1	2	3
a	0.25700	0.17600	0.15700	0.09700	0.02600	0.56400	0.17200	0.04650	0.06500	0.08800
b	0.20700	0.12600	0.10700	0.04700	0.02400	0.51400	0.12200	0.00350	0.01500	0.03800
c	0.11600	0.03500	0.01600	0.04400	0.11500	0.42300	0.03100	0.09450	0.07600	0.05300
d	0.33500	0.25400	0.23500	0.17500	0.10400	0.64200	0.25000	0.12450	0.14300	0.16600
e	0.13200	0.21300	0.23200	0.29200	0.36300	0.17500	0.21700	0.34250	0.32400	0.30100
f	0.03100	0.11200	0.13100	0.19100	0.26200	0.27600	0.11600	0.24150	0.22300	0.20000
g	0.31300	0.23200	0.21300	0.15300	0.08200	0.62000	0.22800	0.10250	0.12100	0.14400
h	0.00300	0.07800	0.09700	0.15700	0.22800	0.31000	0.08200	0.20750	0.18900	0.16600

i	0.04000	0.12100	0.14000	0.20000	0.27100	0.26700	0.12500	0.25050	0.23200	0.20900
j	0.21200	0.13100	0.11200	0.05200	0.01900	0.51900	0.12700	0.00150	0.02000	0.04300
k	0.01450	0.09550	0.11450	0.17450	0.24550	0.29250	0.09950	0.22500	0.20650	0.18350
l	0.27300	0.35400	0.37300	0.43300	0.50400	0.03400	0.35800	0.48350	0.46500	0.44200
m	0.14300	0.06200	0.04300	0.01700	0.08800	0.45000	0.05800	0.06750	0.04900	0.02600
n	0.29800	0.21700	0.19800	0.13800	0.06700	0.60500	0.21300	0.08750	0.10600	0.12900
o	0.42300	0.34200	0.32300	0.26300	0.19200	0.73000	0.33800	0.21250	0.23100	0.25400
p	0.24800	0.32900	0.34800	0.40800	0.47900	0.05900	0.33300	0.45850	0.44000	0.41700
q	0.27900	0.19800	0.17900	0.11900	0.04800	0.58600	0.19400	0.06850	0.08700	0.11000
r	0.07400	0.15500	0.17400	0.23400	0.30500	0.23300	0.15900	0.28450	0.26600	0.24300
s	0.19500	0.11400	0.09500	0.03500	0.03600	0.50200	0.11000	0.01550	0.00300	0.02600
t	0.22700	0.14600	0.12700	0.06700	0.00400	0.53400	0.14200	0.01650	0.03500	0.05800
u	-	0.08100	0.10000	0.16000	0.23100	0.30700	0.08500	0.21050	0.19200	0.16900
v	0.08100	-	0.01900	0.07900	0.15000	0.38800	0.00400	0.12950	0.11100	0.08800
w	0.10000	0.01900	-	0.06000	0.13100	0.40700	0.01500	0.11050	0.09200	0.06900
x	0.16000	0.07900	0.06000	-	0.07100	0.46700	0.07500	0.05050	0.03200	0.00900
y	0.23100	0.15000	0.13100	0.07100	-	0.53800	0.14600	0.02050	0.03900	0.06200
z	0.30700	0.38800	0.40700	0.46700	0.53800	-	0.39200	0.51750	0.49900	0.47600
0	0.08500	0.00400	0.01500	0.07500	0.14600	0.39200	-	0.12550	0.10700	0.08400
1	0.21050	0.12950	0.11050	0.05050	0.02050	0.51750	0.12550	-	0.01850	0.04150
2	0.19200	0.11100	0.09200	0.03200	0.03900	0.49900	0.10700	0.01850	-	0.02300
3	0.16900	0.08800	0.06900	0.00900	0.06200	0.47600	0.08400	0.04150	0.02300	-
4	0.17900	0.09800	0.07900	0.01900	0.05200	0.48600	0.09400	0.03150	0.01300	0.01000
5	0.20600	0.12500	0.10600	0.04600	0.02500	0.51300	0.12100	0.00450	0.01400	0.03700
6	0.10500	0.02400	0.00500	0.05500	0.12600	0.41200	0.02000	0.10550	0.08700	0.06400
7	0.11100	0.03000	0.01100	0.04900	0.12000	0.41800	0.02600	0.09950	0.08100	0.05800
8	0.24600	0.16500	0.14600	0.08600	0.01500	0.55300	0.16100	0.03550	0.05400	0.07700
9	0.13200	0.05100	0.03200	0.02800	0.09900	0.43900	0.04700	0.07850	0.06000	0.03700
A	0.02500	0.10600	0.12500	0.18500	0.25600	0.28200	0.11000	0.23550	0.21700	0.19400
B	0.11000	0.02900	0.01000	0.05000	0.12100	0.41700	0.02500	0.10050	0.08200	0.05900
C	0.14600	0.06500	0.04600	0.01400	0.08500	0.45300	0.06100	0.06450	0.04600	0.02300
D	0.10100	0.02000	0.00100	0.05900	0.13000	0.40800	0.01600	0.10950	0.09100	0.06800
E	0.22400	0.14300	0.12400	0.06400	0.00700	0.53100	0.13900	0.01350	0.03200	0.05500
F	0.33300	0.25200	0.23300	0.17300	0.10200	0.64000	0.24800	0.12250	0.14100	0.16400
G	0.24400	0.16300	0.14400	0.08400	0.01300	0.55100	0.15900	0.03350	0.05200	0.07500
H	0.04200	0.12300	0.14200	0.20200	0.27300	0.26500	0.12700	0.25250	0.23400	0.21100
I	0.33100	0.25000	0.23100	0.17100	0.10000	0.63800	0.24600	0.12050	0.13900	0.16200
J	0.19700	0.11600	0.09700	0.03700	0.03400	0.50400	0.11200	0.01350	0.00500	0.02800
K	0.18500	0.10400	0.08500	0.02500	0.04600	0.49200	0.10000	0.02550	0.00700	0.01600
L	0.12500	0.04400	0.02500	0.03500	0.10600	0.43200	0.04000	0.08550	0.06700	0.04400
M	0.17100	0.09000	0.07100	0.01100	0.06000	0.47800	0.08600	0.03950	0.02100	0.00200
N	0.09900	0.18000	0.19900	0.25900	0.33000	0.20800	0.18400	0.30950	0.29100	0.26800
O	0.09000	0.00900	0.01000	0.07000	0.14100	0.39700	0.00500	0.12050	0.10200	0.07900
P	0.37200	0.45300	0.47200	0.53200	0.60300	0.06500	0.45700	0.58250	0.56400	0.54100
Q	0.22800	0.14700	0.12800	0.06800	0.00300	0.53500	0.14300	0.01750	0.03600	0.05900
R	0.07900	0.00200	0.02100	0.08100	0.15200	0.38600	0.00600	0.13150	0.11300	0.09000
S	0.06400	0.14500	0.16400	0.22400	0.29500	0.24300	0.14900	0.27450	0.25600	0.23300
T	0.31700	0.23600	0.21700	0.15700	0.08600	0.62400	0.23200	0.10650	0.12500	0.14800

TO:	4	5	6	7	8	9	A	B	C	D
FROM: a	0.07800	0.05100	0.15200	0.14600	0.01100	0.12500	0.28200	0.14700	0.11100	0.15600
b	0.02800	0.00100	0.10200	0.09600	0.03900	0.07500	0.23200	0.09700	0.06100	0.10600
c	0.06300	0.09000	0.01100	0.00500	0.13000	0.01600	0.14100	0.00600	0.03000	0.01500
d	0.15600	0.12900	0.23000	0.22400	0.08900	0.20300	0.36000	0.22500	0.18900	0.23400
e	0.31100	0.33800	0.23700	0.24300	0.37800	0.26400	0.10700	0.24200	0.27800	0.23300
f	0.21000	0.23700	0.13600	0.14200	0.27700	0.16300	0.00600	0.14100	0.17700	0.13200
g	0.13400	0.10700	0.20800	0.20200	0.06700	0.18100	0.33800	0.20300	0.16700	0.21200
h	0.17600	0.20300	0.10200	0.10800	0.24300	0.12900	0.02800	0.10700	0.14300	0.09800
i	0.21900	0.24600	0.14500	0.15100	0.28600	0.17200	0.01500	0.15000	0.18600	0.14100
j	0.03300	0.00600	0.10700	0.10100	0.03400	0.08000	0.23700	0.10200	0.06600	0.11100
k	0.19350	0.22050	0.11950	0.12550	0.26050	0.14650	0.01050	0.12450	0.16050	0.11550
l	0.45200	0.47900	0.37800	0.38400	0.51900	0.40500	0.24800	0.38300	0.41900	0.37400
m	0.03600	0.06300	0.03800	0.03200	0.10300	0.01100	0.16800	0.03300	0.00300	0.04200
n	0.11900	0.09200	0.19300	0.18700	0.05200	0.16600	0.32300	0.18800	0.15200	0.19700
o	0.24400	0.21700	0.31800	0.31200	0.17700	0.29100	0.44800	0.31300	0.27700	0.32200
p	0.42700	0.45400	0.35300	0.35900	0.49400	0.38000	0.22300	0.35800	0.39400	0.34900
q	0.10000	0.07300	0.17400	0.16800	0.03300	0.14700	0.30400	0.16900	0.13300	0.17800
r	0.25300	0.28000	0.17900	0.18500	0.32000	0.20600	0.04900	0.18400	0.22000	0.17500
s	0.01600	0.01100	0.09000	0.08400	0.05100	0.06300	0.22000	0.08500	0.04900	0.09400
t	0.04800	0.02100	0.12200	0.11600	0.01900	0.09500	0.25200	0.11700	0.08100	0.12600
u	0.17900	0.20600	0.10500	0.11100	0.24600	0.13200	0.02500	0.11000	0.14600	0.10100
v	0.09800	0.12500	0.02400	0.03000	0.16500	0.05100	0.10600	0.02900	0.06500	0.02000
w	0.07900	0.10600	0.00500	0.01100	0.14600	0.03200	0.12500	0.01000	0.04600	0.00100
x	0.01900	0.04600	0.05500	0.04900	0.08600	0.02800	0.18500	0.05000	0.01400	0.05900
y	0.05200	0.02500	0.12600	0.12000	0.01500	0.09900	0.25600	0.12100	0.08500	0.13000
z	0.48600	0.51300	0.41200	0.41800	0.55300	0.43900	0.28200	0.41700	0.45300	0.40800
0	0.09400	0.12100	0.02000	0.02600	0.16100	0.04700	0.11000	0.02500	0.06100	0.01600

1	0.03150	0.00450	0.10550	0.09950	0.03550	0.07850	0.23550	0.10050	0.06450	0.10950
2	0.01300	0.01400	0.08700	0.08100	0.05400	0.06000	0.21700	0.08200	0.04600	0.09100
3	0.01000	0.03700	0.06400	0.05800	0.07700	0.03700	0.19400	0.05900	0.02300	0.06800
4	-	0.02700	0.07400	0.06800	0.06700	0.04700	0.20400	0.06900	0.03300	0.07800
5	0.02700	-	0.10100	0.09500	0.04000	0.07400	0.23100	0.09600	0.06000	0.10500
6	0.07400	0.10100	-	0.00600	0.14100	0.02700	0.13000	0.00500	0.04100	0.00400
7	0.06800	0.09500	0.00600	-	0.13500	0.02100	0.13600	0.00100	0.03500	0.01000
8	0.06700	0.04000	0.14100	0.13500	-	0.11400	0.27100	0.13600	0.10000	0.14500
9	0.04700	0.07400	0.02700	0.02100	0.11400	-	0.15700	0.02200	0.01400	0.03100
A	0.20400	0.23100	0.13000	0.13600	0.27100	0.15700	-	0.13500	0.17100	0.12600
B	0.06900	0.09600	0.00500	0.00100	0.13600	0.02200	0.13500	-	0.03600	0.00900
C	0.03300	0.06000	0.04100	0.03500	0.10000	0.01400	0.17100	0.03600	-	0.04500
D	0.07800	0.10500	0.00400	0.01000	0.14500	0.03100	0.12600	0.00900	0.04500	-
E	0.04500	0.01800	0.11900	0.11300	0.02200	0.09200	0.24900	0.11400	0.07800	0.12300
F	0.15400	0.12700	0.22800	0.22200	0.08700	0.20100	0.35800	0.22300	0.18700	0.23200
G	0.06500	0.03800	0.13900	0.13300	0.00200	0.11200	0.26900	0.13400	0.09800	0.14300
H	0.22100	0.24800	0.14700	0.15300	0.28800	0.17400	0.01700	0.15200	0.18800	0.14300
I	0.15200	0.12500	0.22600	0.22000	0.08500	0.19900	0.35600	0.22100	0.18500	0.23000
J	0.01800	0.00900	0.09200	0.08600	0.04900	0.06500	0.22200	0.08700	0.05100	0.09600
K	0.00600	0.02100	0.08000	0.07400	0.06100	0.05300	0.21000	0.07500	0.03900	0.08400
L	0.05400	0.08100	0.02000	0.01400	0.12100	0.00700	0.15000	0.01500	0.02100	0.02400
M	0.00800	0.03500	0.06600	0.06000	0.07500	0.03900	0.19600	0.06100	0.02500	0.07000
N	0.27800	0.30500	0.20400	0.21000	0.34500	0.23100	0.07400	0.20900	0.24500	0.20000
O	0.08900	0.11600	0.01500	0.02100	0.15600	0.04200	0.11500	0.02000	0.05600	0.01100
P	0.55100	0.57800	0.47700	0.48300	0.61800	0.50400	0.34700	0.48200	0.51800	0.47300
Q	0.04900	0.02200	0.12300	0.11700	0.01800	0.09600	0.25300	0.11800	0.08200	0.12700
R	0.10000	0.12700	0.02600	0.03200	0.16700	0.05300	0.10400	0.03100	0.06700	0.02200
S	0.24300	0.27000	0.16900	0.17500	0.31000	0.19600	0.03900	0.17400	0.21000	0.16500
T	0.13800	0.11100	0.21200	0.20600	0.07100	0.18500	0.34200	0.20700	0.17100	0.21600

TO:	E	F	G	H	I	J	K	L	M	N
FROM: a	0.03300	0.07600	0.01300	0.29900	0.07400	0.06000	0.07200	0.13200	0.08600	0.35600
b	0.01700	0.12600	0.03700	0.24900	0.12400	0.01000	0.02200	0.08200	0.03600	0.30600
c	0.10800	0.21700	0.12800	0.15800	0.21500	0.08100	0.06900	0.00900	0.05500	0.21500
d	0.11100	0.00200	0.09100	0.37700	0.00400	0.13800	0.15000	0.21000	0.16400	0.43400
e	0.35600	0.46500	0.37600	0.09000	0.46300	0.32900	0.31700	0.25700	0.30300	0.03300
f	0.25500	0.36400	0.27500	0.01100	0.36200	0.22800	0.21600	0.15600	0.20200	0.06800
g	0.08900	0.02000	0.06900	0.35500	0.01800	0.11600	0.12800	0.18800	0.14200	0.41200
h	0.22100	0.33000	0.24100	0.04500	0.32800	0.19400	0.18200	0.12200	0.16800	0.10200
i	0.26400	0.37300	0.28400	0.00200	0.37100	0.23700	0.22500	0.16500	0.21100	0.05900
j	0.01200	0.12100	0.03200	0.25400	0.11900	0.01500	0.02700	0.08700	0.04100	0.31100
k	0.23850	0.34750	0.25850	0.02750	0.34550	0.21150	0.19950	0.13950	0.18550	0.08450
l	0.49700	0.60600	0.51700	0.23100	0.60400	0.47000	0.45800	0.39800	0.44400	0.17400
m	0.08100	0.19000	0.10100	0.18500	0.18800	0.05400	0.04200	0.01800	0.02800	0.24200
n	0.07400	0.03500	0.05400	0.34000	0.03300	0.10100	0.11300	0.17300	0.12700	0.39700
o	0.19900	0.09000	0.17900	0.46500	0.09200	0.22600	0.23800	0.29800	0.25200	0.52200
p	0.47200	0.58100	0.49200	0.20600	0.57900	0.44500	0.43300	0.37300	0.41900	0.14900
q	0.05500	0.05400	0.03500	0.32100	0.05200	0.08200	0.09400	0.15400	0.10800	0.37800
r	0.29800	0.40700	0.31800	0.03200	0.40500	0.27100	0.25900	0.19900	0.24500	0.02500
s	0.02900	0.13800	0.04900	0.23700	0.13600	0.00200	0.01000	0.07000	0.02400	0.29400
t	0.00300	0.10600	0.01700	0.26900	0.10400	0.03000	0.04200	0.10200	0.05600	0.32600
u	0.22400	0.33300	0.24400	0.04200	0.33100	0.19700	0.18500	0.12500	0.17100	0.09900
v	0.14300	0.25200	0.16300	0.12300	0.25000	0.11600	0.10400	0.04400	0.09000	0.18000
w	0.12400	0.23300	0.14400	0.14200	0.23100	0.09700	0.08500	0.02500	0.07100	0.19900
x	0.06400	0.17300	0.08400	0.20200	0.17100	0.03700	0.02500	0.03500	0.01100	0.25900
y	0.00700	0.10200	0.01300	0.27300	0.10000	0.03400	0.04600	0.10600	0.06000	0.33000
z	0.53100	0.64000	0.55100	0.26500	0.63800	0.50400	0.49200	0.43200	0.47800	0.20800
0	0.13900	0.24800	0.15900	0.12700	0.24600	0.11200	0.10000	0.04000	0.08600	0.18400
1	0.01350	0.12250	0.03350	0.25250	0.12050	0.01350	0.02550	0.08550	0.03950	0.30950
2	0.03200	0.14100	0.05200	0.23400	0.13900	0.00500	0.00700	0.06700	0.02100	0.29100
3	0.05500	0.16400	0.07500	0.21100	0.16200	0.02800	0.01600	0.04400	0.00200	0.26800
4	0.04500	0.15400	0.06500	0.22100	0.15200	0.01800	0.00600	0.05400	0.00800	0.27800
5	0.01800	0.12700	0.03800	0.24800	0.12500	0.00900	0.02100	0.08100	0.03500	0.30500
6	0.11900	0.22800	0.13900	0.14700	0.22600	0.09200	0.08000	0.02000	0.06600	0.20400
7	0.11300	0.22200	0.13300	0.15300	0.22000	0.08600	0.07400	0.01400	0.06000	0.21000
8	0.02200	0.08700	0.00200	0.28800	0.08500	0.04900	0.06100	0.12100	0.07500	0.34500
9	0.09200	0.20100	0.11200	0.17400	0.19900	0.06500	0.05300	0.00700	0.03900	0.23100
A	0.24900	0.35800	0.26900	0.01700	0.35600	0.22200	0.21000	0.15000	0.19600	0.07400
B	0.11400	0.22300	0.13400	0.15200	0.22100	0.08700	0.07500	0.01500	0.06100	0.20900
C	0.07800	0.18700	0.09800	0.18800	0.18500	0.05100	0.03900	0.02100	0.02500	0.24500
D	0.12300	0.23200	0.14300	0.14300	0.23000	0.09600	0.08400	0.02400	0.07000	0.20000
E	-	0.10900	0.02000	0.26600	0.10700	0.02700	0.03900	0.09900	0.05300	0.32300
F	0.10900	-	0.08900	0.37500	0.00200	0.13600	0.14800	0.20800	0.16200	0.43200
G	0.02000	0.08900	-	0.28600	0.08700	0.04700	0.05900	0.11900	0.07300	0.34300
H	0.26600	0.37500	0.28600	-	0.37300	0.23900	0.22700	0.16700	0.21300	0.05700
I	0.10700	0.00200	0.08700	0.37300	-	0.13400	0.14600	0.20600	0.16000	0.43000
J	0.02700	0.13600	0.04700	0.23900	0.13400	-	0.01200	0.07200	0.02600	0.29600

K	0.03900	0.14800	0.05900	0.22700	0.14600	0.01200	-	0.06000	0.01400	0.28400
L	0.09900	0.20800	0.11900	0.16700	0.20600	0.07200	0.06000	-	0.04600	0.22400
M	0.05300	0.16200	0.07300	0.21300	0.16000	0.02600	0.01400	0.04600	-	0.27000
N	0.32300	0.43200	0.34300	0.05700	0.43000	0.29600	0.28400	0.22400	0.27000	-
O	0.13400	0.24300	0.15400	0.13200	0.24100	0.10700	0.09500	0.03500	0.08100	0.18900
P	0.59600	0.70500	0.61600	0.33000	0.70300	0.56900	0.55700	0.49700	0.54300	0.27300
Q	0.00400	0.10500	0.01600	0.27000	0.10300	0.03100	0.04300	0.10300	0.05700	0.32700
R	0.14500	0.25400	0.16500	0.12100	0.25200	0.11800	0.10600	0.04600	0.09200	0.17800
S	0.28800	0.39700	0.30800	0.02200	0.39500	0.26100	0.24900	0.18900	0.23500	0.03500
T	0.09300	0.01600	0.07300	0.35900	0.01400	0.12000	0.13200	0.19200	0.14600	0.41600

TO:	O	P	Q	R	S	T
FROM: a	0.16700	0.62900	0.02900	0.17800	0.32100	0.06000
b	0.11700	0.57900	0.02100	0.12800	0.27100	0.11000
c	0.02600	0.48800	0.11200	0.03700	0.18000	0.20100
d	0.24500	0.70700	0.10700	0.25600	0.39900	0.01800
e	0.22200	0.24000	0.36000	0.21100	0.06800	0.44900
f	0.12100	0.34100	0.25900	0.11000	0.03300	0.34800
g	0.22300	0.68500	0.08500	0.23400	0.37700	0.00400
h	0.08700	0.37500	0.22500	0.07600	0.06700	0.31400
i	0.13000	0.33200	0.26800	0.11900	0.02400	0.35700
j	0.12200	0.58400	0.01600	0.13300	0.27600	0.10500
k	0.10450	0.35750	0.24250	0.09350	0.04950	0.33150
l	0.36300	0.09900	0.50100	0.35200	0.20900	0.59000
m	0.05300	0.51500	0.08500	0.06400	0.20700	0.17400
n	0.20800	0.67000	0.07000	0.21900	0.36200	0.01900
o	0.33300	0.79500	0.19500	0.34400	0.48700	0.10600
p	0.33800	0.12400	0.47600	0.32700	0.18400	0.56500
q	0.18900	0.65100	0.05100	0.20000	0.34300	0.03800
r	0.16400	0.29800	0.30200	0.15300	0.01000	0.39100
s	0.10500	0.56700	0.03300	0.11600	0.25900	0.12200
t	0.13700	0.59900	0.00100	0.14800	0.29100	0.09000
u	0.09000	0.37200	0.22800	0.07900	0.06400	0.31700
v	0.00900	0.45300	0.14700	0.00200	0.14500	0.23600
w	0.01000	0.47200	0.12800	0.02100	0.16400	0.21700
x	0.07000	0.53200	0.06800	0.08100	0.22400	0.15700
y	0.14100	0.60300	0.00300	0.15200	0.29500	0.08600
z	0.39700	0.06500	0.53500	0.38600	0.24300	0.62400
0	0.00500	0.45700	0.14300	0.00600	0.14900	0.23200
1	0.12050	0.58250	0.01750	0.13150	0.27450	0.10650
2	0.10200	0.56400	0.03600	0.11300	0.25600	0.12500
3	0.07900	0.54100	0.05900	0.09000	0.23300	0.14800
4	0.08900	0.55100	0.04900	0.10000	0.24300	0.13800
5	0.11600	0.57800	0.02200	0.12700	0.27000	0.11100
6	0.01500	0.47700	0.12300	0.02600	0.16900	0.21200
7	0.02100	0.48300	0.11700	0.03200	0.17500	0.20600
8	0.15600	0.61800	0.01800	0.16700	0.31000	0.07100
9	0.04200	0.50400	0.09600	0.05300	0.19600	0.18500
A	0.11500	0.34700	0.25300	0.10400	0.03900	0.34200
B	0.02000	0.48200	0.11800	0.03100	0.17400	0.20700
C	0.05600	0.51800	0.08200	0.06700	0.21000	0.17100
D	0.01100	0.47300	0.12700	0.02200	0.16500	0.21600
E	0.13400	0.59600	0.00400	0.14500	0.28800	0.09300
F	0.24300	0.70500	0.10500	0.25400	0.39700	0.01600
G	0.15400	0.61600	0.01600	0.16500	0.30800	0.07300
H	0.13200	0.33000	0.27000	0.12100	0.02200	0.35900
I	0.24100	0.70300	0.10300	0.25200	0.39500	0.01400
J	0.10700	0.56900	0.03100	0.11800	0.26100	0.12000
K	0.09500	0.55700	0.04300	0.10600	0.24900	0.13200
L	0.03500	0.49700	0.10300	0.04600	0.18900	0.19200
M	0.08100	0.54300	0.05700	0.09200	0.23500	0.14600
N	0.18900	0.27300	0.32700	0.17800	0.03500	0.41600
O	-	0.46200	0.13800	0.01100	0.15400	0.22700
P	0.46200	-	0.60000	0.45100	0.30800	0.68900
Q	0.13800	0.60000	-	0.14900	0.29200	0.08900
R	0.01100	0.45100	0.14900	-	0.14300	0.23800
S	0.15400	0.30800	0.29200	0.14300	-	0.38100
T	0.22700	0.68900	0.08900	0.23800	0.38100	-

Stepmatrix "NUMBER OF PARAVERTEBRALS" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.06700	0.09600	0.09400	0.41100	0.26800	0.03800	0.27200	0.31900	0.08300
b	0.06700	-	0.02900	0.16100	0.34400	0.20100	0.10500	0.20500	0.25200	0.01600
c	0.09600	0.02900	-	0.19000	0.31500	0.17200	0.13400	0.17600	0.22300	0.01300
d	0.09400	0.16100	0.19000	-	0.50500	0.36200	0.05600	0.36600	0.41300	0.17700

e	0.41100	0.34400	0.31500	0.50500	-	0.14300	0.44900	0.13900	0.09200	0.32800
f	0.26800	0.20100	0.17200	0.36200	0.14300	-	0.30600	0.00400	0.05100	0.18500
g	0.03800	0.10500	0.13400	0.05600	0.44900	0.30600	-	0.31000	0.35700	0.12100
h	0.27200	0.20500	0.17600	0.36600	0.13900	0.00400	0.31000	-	0.04700	0.18900
i	0.31900	0.25200	0.22300	0.41300	0.09200	0.05100	0.35700	0.04700	-	0.23600
j	0.08300	0.01600	0.01300	0.17700	0.32800	0.18500	0.12100	0.18900	0.23600	-
k	0.11200	0.04500	0.01600	0.20600	0.29900	0.15600	0.15000	0.16000	0.20700	0.02900
l	0.57200	0.50500	0.47600	0.66600	0.16100	0.30400	0.61000	0.30000	0.25300	0.48900
m	0.02300	0.04400	0.07300	0.11700	0.38800	0.24500	0.06100	0.24900	0.29600	0.06000
n	0.06300	0.13000	0.15900	0.03100	0.47400	0.33100	0.02500	0.33500	0.38200	0.14600
o	0.10500	0.17200	0.20100	0.01100	0.51600	0.37300	0.06700	0.37700	0.42400	0.18800
p	0.31400	0.24700	0.21800	0.40800	0.09700	0.04600	0.35200	0.04200	0.00500	0.23100
q	0.00400	0.06300	0.09200	0.09800	0.40700	0.26400	0.04200	0.26800	0.31500	0.07900
r	0.15300	0.08600	0.05700	0.24700	0.25800	0.11500	0.19100	0.11900	0.16600	0.07000
s	0.08600	0.01900	0.01000	0.18000	0.32500	0.18200	0.12400	0.18600	0.23300	0.00300
t	0.05500	0.12200	0.15100	0.03900	0.46600	0.32300	0.01700	0.32700	0.37400	0.13800
u	0.42000	0.35300	0.32400	0.51400	0.00900	0.15200	0.45800	0.14800	0.10100	0.33700
v	0.14700	0.08000	0.05100	0.24100	0.26400	0.12100	0.18500	0.12500	0.17200	0.06400
w	0.17900	0.11200	0.08300	0.27300	0.23200	0.08900	0.21700	0.09300	0.14000	0.09600
x	0.10100	0.03400	0.00500	0.19500	0.31000	0.16700	0.13900	0.17100	0.21800	0.01800
y	0.04300	0.02400	0.05300	0.13700	0.36800	0.22500	0.08100	0.22900	0.27600	0.04000
z	0.59000	0.52300	0.49400	0.68400	0.17900	0.32200	0.62800	0.31800	0.27100	0.50700
0	0.38800	0.32100	0.29200	0.48200	0.02300	0.12000	0.42600	0.11600	0.06900	0.30500
1	0.00800	0.07500	0.10400	0.08600	0.41900	0.27600	0.03000	0.28000	0.32700	0.09100
2	0.03400	0.10100	0.13000	0.06000	0.44500	0.30200	0.00400	0.30600	0.35300	0.11700
3	0.08400	0.01700	0.01200	0.17800	0.32700	0.18400	0.12200	0.18800	0.23500	0.00100
4	0.00600	0.07300	0.10200	0.08800	0.41700	0.27400	0.03200	0.27800	0.32500	0.08900
5	0.02700	0.04000	0.06900	0.12100	0.38400	0.24100	0.06500	0.24500	0.29200	0.05600
6	0.06300	0.00400	0.03300	0.15700	0.34800	0.20500	0.10100	0.20900	0.25600	0.02000
7	0.02000	0.04700	0.07600	0.11400	0.39100	0.24800	0.05800	0.25200	0.29900	0.06300
8	0.06500	0.13200	0.16100	0.02900	0.47600	0.33300	0.02700	0.33700	0.38400	0.14800
9	0.07300	0.00600	0.02300	0.16700	0.33800	0.19500	0.11100	0.19900	0.24600	0.01000
A	0.34900	0.28200	0.25300	0.44300	0.06200	0.08100	0.38700	0.07700	0.03000	0.26600
B	0.15400	0.08700	0.05800	0.24800	0.25700	0.11400	0.19200	0.11800	0.16500	0.07100
C	0.03000	0.03700	0.06600	0.12400	0.38100	0.23800	0.06800	0.24200	0.28900	0.05300
D	0.03400	0.03300	0.06200	0.12800	0.37700	0.23400	0.07200	0.23800	0.28500	0.04900
E	0.07100	0.00400	0.02500	0.16500	0.34000	0.19700	0.10900	0.20100	0.24800	0.01200
F	0.05600	0.12300	0.15200	0.03800	0.46700	0.32400	0.01800	0.32800	0.37500	0.13900
G	0.14900	0.08200	0.05300	0.24300	0.26200	0.11900	0.18700	0.12300	0.17000	0.06600
H	0.33600	0.26900	0.24000	0.43000	0.07500	0.06800	0.37400	0.06400	0.01700	0.25300
I	0.02900	0.09600	0.12500	0.06500	0.44000	0.29700	0.00900	0.30100	0.34800	0.11200
J	0.00100	0.06600	0.09500	0.09500	0.41000	0.26700	0.03900	0.27100	0.31800	0.08200
K	0.17600	0.10900	0.08000	0.27000	0.23500	0.09200	0.21400	0.09600	0.14300	0.09300
L	0.12400	0.05700	0.02800	0.21800	0.28700	0.14400	0.16200	0.14800	0.19500	0.04100
M	0.42600	0.35900	0.33000	0.52000	0.01500	0.15800	0.46400	0.15400	0.10700	0.34300
N	0.06900	0.00200	0.02700	0.16300	0.34200	0.19900	0.10700	0.20300	0.25000	0.01400
O	0.55300	0.48600	0.45700	0.64700	0.14200	0.28500	0.59100	0.28100	0.23400	0.47000
P	0.18900	0.12200	0.09300	0.28300	0.22200	0.07900	0.22700	0.08300	0.13000	0.10600
Q	0.30000	0.23300	0.20400	0.39400	0.11100	0.03200	0.33800	0.02800	0.01900	0.21700
R	0.02600	0.04100	0.07000	0.12000	0.38500	0.24200	0.06400	0.24600	0.29300	0.05700

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.11200	0.57200	0.02300	0.06300	0.10500	0.31400	0.00400	0.15300	0.08600	0.05500
b	0.04500	0.50500	0.04400	0.13000	0.17200	0.24700	0.06300	0.08600	0.01900	0.12200
c	0.01600	0.47600	0.07300	0.15900	0.20100	0.21800	0.09200	0.05700	0.01000	0.15100
d	0.20600	0.66600	0.11700	0.03100	0.01100	0.40800	0.09800	0.24700	0.18000	0.03900
e	0.29900	0.16100	0.38800	0.47400	0.51600	0.09700	0.40700	0.25800	0.32500	0.46600
f	0.15600	0.30400	0.24500	0.33100	0.37300	0.04600	0.26400	0.11500	0.18200	0.32300
g	0.15000	0.61000	0.06100	0.02500	0.06700	0.35200	0.04200	0.19100	0.12400	0.01700
h	0.16000	0.30000	0.24900	0.33500	0.37700	0.04200	0.26800	0.11900	0.18600	0.32700
i	0.20700	0.25300	0.29600	0.38200	0.42400	0.00500	0.31500	0.16600	0.23300	0.37400
j	0.02900	0.48900	0.06000	0.14600	0.18800	0.23100	0.07900	0.07000	0.00300	0.13800
k	-	0.46000	0.08900	0.17500	0.21700	0.20200	0.10800	0.04100	0.02600	0.16700
l	0.46000	-	0.54900	0.63500	0.67700	0.25800	0.56800	0.41900	0.48600	0.62700
m	0.08900	0.54900	-	0.08600	0.12800	0.29100	0.01900	0.13000	0.06300	0.07800
n	0.17500	0.63500	0.08600	-	0.04200	0.37700	0.06700	0.21600	0.14900	0.00800
o	0.21700	0.67700	0.12800	0.04200	-	0.41900	0.10900	0.25800	0.19100	0.05000
p	0.20200	0.25800	0.29100	0.37700	0.41900	-	0.31000	0.16100	0.22800	0.36900
q	0.10800	0.56800	0.01900	0.06700	0.10900	0.31000	-	0.14900	0.08200	0.05900
r	0.04100	0.41900	0.13000	0.21600	0.25800	0.16100	0.14900	-	0.06700	0.20800
s	0.02600	0.48600	0.06300	0.14900	0.19100	0.22800	0.08200	0.06700	-	0.14100
t	0.16700	0.62700	0.07800	0.00800	0.05000	0.36900	0.05900	0.20800	0.14100	-
u	0.30800	0.15200	0.39700	0.48300	0.52500	0.10600	0.41600	0.26700	0.33400	0.47500
v	0.03500	0.42500	0.12400	0.21000	0.25200	0.16700	0.14300	0.00600	0.06100	0.20200
w	0.06700	0.39300	0.15600	0.24200	0.28400	0.13500	0.17500	0.02600	0.09300	0.23400
x	0.01100	0.47100	0.07800	0.16400	0.20600	0.21300	0.09700	0.05200	0.01500	0.15600
y	0.06900	0.52900	0.02000	0.10600	0.14800	0.27100	0.03900	0.11000	0.04300	0.09800

z	0.47800	0.01800	0.56700	0.65300	0.69500	0.27600	0.58600	0.43700	0.50400	0.64500
0	0.27600	0.18400	0.36500	0.45100	0.49300	0.07400	0.38400	0.23500	0.30200	0.44300
1	0.12000	0.58000	0.03100	0.05500	0.09700	0.32200	0.01200	0.16100	0.09400	0.04700
2	0.14600	0.60600	0.05700	0.02900	0.07100	0.34800	0.03800	0.18700	0.12000	0.02100
3	0.02800	0.48800	0.06100	0.14700	0.18900	0.23000	0.08000	0.06900	0.00200	0.13900
4	0.11800	0.57800	0.02900	0.05700	0.09900	0.32000	0.01000	0.15900	0.09200	0.04900
5	0.08500	0.54500	0.00400	0.09000	0.13200	0.28700	0.02300	0.12600	0.05900	0.08200
6	0.04900	0.50900	0.04000	0.12600	0.16800	0.25100	0.05900	0.09000	0.02300	0.11800
7	0.09200	0.55200	0.00300	0.08300	0.12500	0.29400	0.01600	0.13300	0.06600	0.07500
8	0.17700	0.63700	0.08800	0.00200	0.04000	0.37900	0.06900	0.21800	0.15100	0.01000
9	0.03900	0.49900	0.05000	0.13600	0.17800	0.24100	0.06900	0.08000	0.01300	0.12800
A	0.23700	0.22300	0.32600	0.41200	0.45400	0.03500	0.34500	0.19600	0.26300	0.40400
B	0.04200	0.41800	0.13100	0.21700	0.25900	0.16000	0.15000	0.00100	0.06800	0.20900
C	0.08200	0.54200	0.00700	0.09300	0.13500	0.28400	0.02600	0.12300	0.05600	0.08500
D	0.07800	0.53800	0.01100	0.09700	0.13900	0.28000	0.03000	0.11900	0.05200	0.08900
E	0.04100	0.50100	0.04800	0.13400	0.17600	0.24300	0.06700	0.08200	0.01500	0.12600
F	0.16800	0.62800	0.07900	0.00700	0.04900	0.37000	0.06000	0.20900	0.14200	0.00100
G	0.03700	0.42300	0.12600	0.21200	0.25400	0.16500	0.14500	0.00400	0.06300	0.20400
H	0.22400	0.23600	0.31300	0.39900	0.44100	0.02200	0.33200	0.18300	0.25000	0.39100
I	0.14100	0.60100	0.05200	0.03400	0.07600	0.34300	0.03300	0.18200	0.11500	0.02600
J	0.11100	0.57100	0.02200	0.06400	0.10600	0.31300	0.00300	0.15200	0.08500	0.05600
K	0.06400	0.39600	0.15300	0.23900	0.28100	0.13800	0.17200	0.02300	0.09000	0.23100
L	0.01200	0.44800	0.10100	0.18700	0.22900	0.19000	0.12000	0.02900	0.03800	0.17900
M	0.31400	0.14600	0.40300	0.48900	0.53100	0.11200	0.42200	0.27300	0.34000	0.48100
N	0.04300	0.50300	0.04600	0.13200	0.17400	0.24500	0.06500	0.08400	0.01700	0.12400
O	0.44100	0.01900	0.53000	0.61600	0.65800	0.23900	0.54900	0.40000	0.46700	0.60800
P	0.07700	0.38300	0.16600	0.25200	0.29400	0.12500	0.18500	0.03600	0.10300	0.24400
Q	0.18800	0.27200	0.27700	0.36300	0.40500	0.01400	0.29600	0.14700	0.21400	0.35500
R	0.08600	0.54600	0.00300	0.08900	0.13100	0.28800	0.02200	0.12700	0.06000	0.08100

TO: FROM:	u	v	w	x	y	z	0	1	2	3
a	0.42000	0.14700	0.17900	0.10100	0.04300	0.59000	0.38800	0.00800	0.03400	0.08400
b	0.35300	0.08000	0.11200	0.03400	0.02400	0.52300	0.32100	0.07500	0.10100	0.01700
c	0.32400	0.05100	0.08300	0.00500	0.05300	0.49400	0.29200	0.10400	0.13000	0.01200
d	0.51400	0.24100	0.27300	0.19500	0.13700	0.68400	0.48200	0.08600	0.06000	0.17800
e	0.00900	0.26400	0.23200	0.31000	0.36800	0.17900	0.02300	0.41900	0.44500	0.32700
f	0.15200	0.12100	0.08900	0.16700	0.22500	0.32200	0.12000	0.27600	0.30200	0.18400
g	0.45800	0.18500	0.21700	0.13900	0.08100	0.62800	0.42600	0.03000	0.00400	0.12200
h	0.14800	0.12500	0.09300	0.17100	0.22900	0.31800	0.11600	0.28000	0.30600	0.18800
i	0.10100	0.17200	0.14000	0.21800	0.27600	0.27100	0.06900	0.32700	0.35300	0.23500
j	0.33700	0.06400	0.09600	0.01800	0.04000	0.50700	0.30500	0.09100	0.11700	0.00100
k	0.30800	0.03500	0.06700	0.01100	0.06900	0.47800	0.27600	0.12000	0.14600	0.02800
l	0.15200	0.42500	0.39300	0.47100	0.52900	0.01800	0.18400	0.58000	0.60600	0.48800
m	0.39700	0.12400	0.15600	0.07800	0.02000	0.56700	0.36500	0.03100	0.05700	0.06100
n	0.48300	0.21000	0.24200	0.16400	0.10600	0.65300	0.45100	0.05500	0.02900	0.14700
o	0.52500	0.25200	0.28400	0.20600	0.14800	0.69500	0.49300	0.09700	0.07100	0.18900
p	0.10600	0.16700	0.13500	0.21300	0.27100	0.27600	0.07400	0.32200	0.34800	0.23000
q	0.41600	0.14300	0.17500	0.09700	0.03900	0.58600	0.38400	0.01200	0.03800	0.08000
r	0.26700	0.00600	0.02600	0.05200	0.11000	0.43700	0.23500	0.16100	0.18700	0.06900
s	0.33400	0.06100	0.09300	0.01500	0.04300	0.50400	0.30200	0.09400	0.12000	0.00200
t	0.47500	0.20200	0.23400	0.15600	0.09800	0.64500	0.44300	0.04700	0.02100	0.13900
u	-	0.27300	0.24100	0.31900	0.37700	0.17000	0.03200	0.42800	0.45400	0.33600
v	0.27300	-	0.03200	0.04600	0.10400	0.44300	0.24100	0.15500	0.18100	0.06300
w	0.24100	0.03200	-	0.07800	0.13600	0.41100	0.20900	0.18700	0.21300	0.09500
x	0.31900	0.04600	0.07800	-	0.05800	0.48900	0.28700	0.10900	0.13500	0.01700
y	0.37700	0.10400	0.13600	0.05800	-	0.54700	0.34500	0.05100	0.07700	0.04100
z	0.17000	0.44300	0.41100	0.48900	0.54700	-	0.20200	0.59800	0.62400	0.50600
0	0.03200	0.24100	0.20900	0.28700	0.34500	0.20200	-	0.39600	0.42200	0.30400
1	0.42800	0.15500	0.18700	0.10900	0.05100	0.59800	0.39600	-	0.02600	0.09200
2	0.45400	0.18100	0.21300	0.13500	0.07700	0.62400	0.42200	0.02600	-	0.11800
3	0.33600	0.06300	0.09500	0.01700	0.04100	0.50600	0.30400	0.09200	0.11800	-
4	0.42600	0.15300	0.18500	0.10700	0.04900	0.59600	0.39400	0.00200	0.02800	0.09000
5	0.39300	0.12000	0.15200	0.07400	0.01600	0.56300	0.36100	0.03500	0.06100	0.05700
6	0.35700	0.08400	0.11600	0.03800	0.02000	0.52700	0.32500	0.07100	0.09700	0.02100
7	0.40000	0.12700	0.15900	0.08100	0.02300	0.57000	0.36800	0.02800	0.05400	0.06400
8	0.48500	0.21200	0.24400	0.16600	0.10800	0.65500	0.45300	0.05700	0.03100	0.14900
9	0.34700	0.07400	0.10600	0.02800	0.03000	0.51700	0.31500	0.08100	0.10700	0.01100
A	0.07100	0.20200	0.17000	0.24800	0.30600	0.24100	0.03900	0.35700	0.38300	0.26500
B	0.26600	0.00700	0.02500	0.05300	0.11100	0.43600	0.23400	0.16200	0.18800	0.07000
C	0.39000	0.11700	0.14900	0.07100	0.01300	0.56000	0.35800	0.03800	0.06400	0.05400
D	0.38600	0.11300	0.14500	0.06700	0.00900	0.55600	0.35400	0.04200	0.06800	0.05000
E	0.34900	0.07600	0.10800	0.03000	0.02800	0.51900	0.31700	0.07900	0.10500	0.01300
F	0.47600	0.20300	0.23500	0.15700	0.09900	0.64600	0.44400	0.04800	0.02200	0.14000
G	0.27100	0.00200	0.03000	0.04800	0.10600	0.44100	0.23900	0.15700	0.18300	0.06500
H	0.08400	0.18900	0.15700	0.23500	0.29300	0.25400	0.05200	0.34400	0.37000	0.25200
I	0.44900	0.17600	0.20800	0.13000	0.07200	0.61900	0.41700	0.02100	0.00500	0.11300
J	0.41900	0.14600	0.17800	0.10000	0.04200	0.58900	0.38700	0.00900	0.03500	0.08300

K	0.24400	0.02900	0.00300	0.07500	0.13300	0.41400	0.21200	0.18400	0.21000	0.09200
L	0.29600	0.02300	0.05500	0.02300	0.08100	0.46600	0.26400	0.13200	0.15800	0.04000
M	0.00600	0.27900	0.24700	0.32500	0.38300	0.16400	0.03800	0.43400	0.46000	0.34200
N	0.35100	0.07800	0.11000	0.03200	0.02600	0.52100	0.31900	0.07700	0.10300	0.01500
O	0.13300	0.40600	0.37400	0.45200	0.51000	0.03700	0.16500	0.56100	0.58700	0.46900
P	0.23100	0.04200	0.01000	0.08800	0.14600	0.40100	0.19900	0.19700	0.22300	0.10500
Q	0.12000	0.15300	0.12100	0.19900	0.25700	0.29000	0.08800	0.30800	0.33400	0.21600
R	0.39400	0.12100	0.15300	0.07500	0.01700	0.56400	0.36200	0.03400	0.06000	0.05800

FROM: \ TO:	4	5	6	7	8	9	A	B	C	D
a	0.00600	0.02700	0.06300	0.02000	0.06500	0.07300	0.34900	0.15400	0.03000	0.03400
b	0.07300	0.04000	0.00400	0.04700	0.13200	0.00600	0.28200	0.08700	0.03700	0.03300
c	0.10200	0.06900	0.03300	0.07600	0.16100	0.02300	0.25300	0.05800	0.06600	0.06200
d	0.08800	0.12100	0.15700	0.11400	0.02900	0.16700	0.44300	0.24800	0.12400	0.12800
e	0.41700	0.38400	0.34800	0.39100	0.47600	0.33800	0.06200	0.25700	0.38100	0.37700
f	0.27400	0.24100	0.20500	0.24800	0.33300	0.19500	0.08100	0.11400	0.23800	0.23400
g	0.03200	0.06500	0.10100	0.05800	0.02700	0.11100	0.38700	0.19200	0.06800	0.07200
h	0.27800	0.24500	0.20900	0.25200	0.33700	0.19900	0.07700	0.11800	0.24200	0.23800
i	0.32500	0.29200	0.25600	0.29900	0.38400	0.24600	0.03000	0.16500	0.28900	0.28500
j	0.08900	0.05600	0.02000	0.06300	0.14800	0.01000	0.26600	0.07100	0.05300	0.04900
k	0.11800	0.08500	0.04900	0.09200	0.17700	0.03900	0.23700	0.04200	0.08200	0.07800
l	0.57800	0.54500	0.50900	0.55200	0.63700	0.49900	0.22300	0.41800	0.54200	0.53800
m	0.02900	0.00400	0.04000	0.00300	0.08800	0.05000	0.32600	0.13100	0.00700	0.01100
n	0.05700	0.09000	0.12600	0.08300	0.00200	0.13600	0.41200	0.21700	0.09300	0.09700
o	0.09900	0.13200	0.16800	0.12500	0.04000	0.17800	0.45400	0.25900	0.13500	0.13900
p	0.32000	0.28700	0.25100	0.29400	0.37900	0.24100	0.03500	0.16000	0.28400	0.28000
q	0.01000	0.02300	0.05900	0.01600	0.06900	0.06900	0.34500	0.15000	0.02600	0.03000
r	0.15900	0.12600	0.09000	0.13300	0.21800	0.08000	0.19600	0.00100	0.12300	0.11900
s	0.09200	0.05900	0.02300	0.06600	0.15100	0.01300	0.26300	0.06800	0.05600	0.05200
t	0.04900	0.08200	0.11800	0.07500	0.01000	0.12800	0.40400	0.20900	0.08500	0.08900
u	0.42600	0.39300	0.35700	0.40000	0.48500	0.34700	0.07100	0.26600	0.39000	0.38600
v	0.15300	0.12000	0.08400	0.12700	0.21200	0.07400	0.20200	0.00700	0.11700	0.11300
w	0.18500	0.15200	0.11600	0.15900	0.24400	0.10600	0.17000	0.02500	0.14900	0.14500
x	0.10700	0.07400	0.03800	0.08100	0.16600	0.02800	0.24800	0.05300	0.07100	0.06700
y	0.04900	0.01600	0.02000	0.02300	0.10800	0.03000	0.30600	0.11100	0.01300	0.00900
z	0.59600	0.56300	0.52700	0.57000	0.65500	0.51700	0.24100	0.43600	0.56000	0.55600
0	0.39400	0.36100	0.32500	0.36800	0.45300	0.31500	0.03900	0.23400	0.35800	0.35400
1	0.00200	0.03500	0.07100	0.02800	0.05700	0.08100	0.35700	0.16200	0.03800	0.04200
2	0.02800	0.06100	0.09700	0.05400	0.03100	0.10700	0.38300	0.18800	0.06400	0.06800
3	0.09000	0.05700	0.02100	0.06400	0.14900	0.01100	0.26500	0.07000	0.05400	0.05000
4	-	0.03300	0.06900	0.02600	0.05900	0.07900	0.35500	0.16000	0.03600	0.04000
5	0.03300	-	0.03600	0.00700	0.09200	0.04600	0.32200	0.12700	0.00300	0.00700
6	0.06900	0.03600	-	0.04300	0.12800	0.01000	0.28600	0.09100	0.03300	0.02900
7	0.02600	0.00700	0.04300	-	0.08500	0.05300	0.32900	0.13400	0.01000	0.01400
8	0.05900	0.09200	0.12800	0.08500	-	0.13800	0.41400	0.21900	0.09500	0.09900
9	0.07900	0.04600	0.01000	0.05300	0.13800	-	0.27600	0.08100	0.04300	0.03900
A	0.35500	0.32200	0.28600	0.32900	0.41400	0.27600	-	0.19500	0.31900	0.31500
B	0.16000	0.12700	0.09100	0.13400	0.21900	0.08100	0.19500	-	0.12400	0.12000
C	0.03600	0.00300	0.03300	0.01000	0.09500	0.04300	0.31900	0.12400	-	0.00400
D	0.04000	0.00700	0.02900	0.01400	0.09900	0.03900	0.31500	0.12000	0.00400	-
E	0.07700	0.04400	0.00800	0.05100	0.13600	0.00200	0.27800	0.08300	0.04100	0.03700
F	0.05000	0.08300	0.11900	0.07600	0.00900	0.12900	0.40500	0.21000	0.08600	0.09000
G	0.15500	0.12200	0.08600	0.12900	0.21400	0.07600	0.20000	0.00500	0.11900	0.11500
H	0.34200	0.30900	0.27300	0.31600	0.40100	0.26300	0.01300	0.18200	0.30600	0.30200
I	0.02300	0.05600	0.09200	0.04900	0.03600	0.10200	0.37800	0.18300	0.05900	0.06300
J	0.00700	0.02600	0.06200	0.01900	0.06600	0.07200	0.34800	0.15300	0.02900	0.03300
K	0.18200	0.14900	0.11300	0.15600	0.24100	0.10300	0.17300	0.02200	0.14600	0.14200
L	0.13000	0.09700	0.06100	0.10400	0.18900	0.05100	0.22500	0.03000	0.09400	0.09000
M	0.43200	0.39900	0.36300	0.40600	0.49100	0.35300	0.07700	0.27200	0.39600	0.39200
N	0.07500	0.04200	0.00600	0.04900	0.13400	0.00400	0.28000	0.08500	0.03900	0.03500
O	0.55900	0.52600	0.49000	0.53300	0.61800	0.48000	0.20400	0.39900	0.52300	0.51900
P	0.19500	0.16200	0.12600	0.16900	0.25400	0.11600	0.16000	0.03500	0.15900	0.15500
Q	0.30600	0.27300	0.23700	0.28000	0.36500	0.22700	0.04900	0.14600	0.27000	0.26600
R	0.03200	0.00100	0.03700	0.00600	0.09100	0.04700	0.32300	0.12800	0.00400	0.00800

FROM: \ TO:	E	F	G	H	I	J	K	L	M	N
a	0.07100	0.05600	0.14900	0.33600	0.02900	0.00100	0.17600	0.12400	0.42600	0.06900
b	0.00400	0.12300	0.08200	0.26900	0.09600	0.06600	0.10900	0.05700	0.35900	0.00200
c	0.02500	0.15200	0.05300	0.24000	0.12500	0.09500	0.08000	0.02800	0.33000	0.02700
d	0.16500	0.03800	0.24300	0.43000	0.06500	0.09500	0.27000	0.21800	0.52000	0.16300
e	0.34000	0.46700	0.26200	0.07500	0.44000	0.41000	0.23500	0.28700	0.01500	0.34200
f	0.19700	0.32400	0.11900	0.06800	0.29700	0.26700	0.09200	0.14400	0.15800	0.19900
g	0.10900	0.01800	0.18700	0.37400	0.00900	0.03900	0.21400	0.16200	0.46400	0.10700
h	0.20100	0.32800	0.12300	0.06400	0.30100	0.27100	0.09600	0.14800	0.15400	0.20300
i	0.24800	0.37500	0.17000	0.01700	0.34800	0.31800	0.14300	0.19500	0.10700	0.25000
j	0.01200	0.13900	0.06600	0.25300	0.11200	0.08200	0.09300	0.04100	0.34300	0.01400
k	0.04100	0.16800	0.03700	0.22400	0.14100	0.11100	0.06400	0.01200	0.31400	0.04300

l	0.50100	0.62800	0.42300	0.23600	0.60100	0.57100	0.39600	0.44800	0.14600	0.50300
m	0.04800	0.07900	0.12600	0.31300	0.05200	0.02200	0.15300	0.10100	0.40300	0.04600
n	0.13400	0.00700	0.21200	0.39900	0.03400	0.06400	0.23900	0.18700	0.48900	0.13200
o	0.17600	0.04900	0.25400	0.44100	0.07600	0.10600	0.28100	0.22900	0.53100	0.17400
p	0.24300	0.37000	0.16500	0.02200	0.34300	0.31300	0.13800	0.19000	0.11200	0.24500
q	0.06700	0.06000	0.14500	0.33200	0.03300	0.00300	0.17200	0.12000	0.42200	0.06500
r	0.08200	0.20900	0.00400	0.18300	0.18200	0.15200	0.02300	0.02900	0.27300	0.08400
s	0.01500	0.14200	0.06300	0.25000	0.11500	0.08500	0.09000	0.03800	0.34000	0.01700
t	0.12600	0.00100	0.20400	0.39100	0.02600	0.05600	0.23100	0.17900	0.48100	0.12400
u	0.34900	0.47600	0.27100	0.08400	0.44900	0.41900	0.24400	0.29600	0.00600	0.35100
v	0.07600	0.20300	0.00200	0.18900	0.17600	0.14600	0.02900	0.02300	0.27900	0.07800
w	0.10800	0.23500	0.03000	0.15700	0.20800	0.17800	0.00300	0.05500	0.24700	0.11000
x	0.03000	0.15700	0.04800	0.23500	0.13000	0.10000	0.07500	0.02300	0.32500	0.03200
y	0.02800	0.09900	0.10600	0.29300	0.07200	0.04200	0.13300	0.08100	0.38300	0.02600
z	0.51900	0.64600	0.44100	0.25400	0.61900	0.58900	0.41400	0.46600	0.16400	0.52100
0	0.31700	0.44400	0.23900	0.05200	0.41700	0.38700	0.21200	0.26400	0.03800	0.31900
1	0.07900	0.04800	0.15700	0.34400	0.02100	0.00900	0.18400	0.13200	0.43400	0.07700
2	0.10500	0.02200	0.18300	0.37000	0.00500	0.03500	0.21000	0.15800	0.46000	0.10300
3	0.01300	0.14000	0.06500	0.25200	0.11300	0.08300	0.09200	0.04000	0.34200	0.01500
4	0.07700	0.05000	0.15500	0.34200	0.02300	0.00700	0.18200	0.13000	0.43200	0.07500
5	0.04400	0.08300	0.12200	0.30900	0.05600	0.02600	0.14900	0.09700	0.39900	0.04200
6	0.00800	0.11900	0.08600	0.27300	0.09200	0.06200	0.11300	0.06100	0.36300	0.00600
7	0.05100	0.07600	0.12900	0.31600	0.04900	0.01900	0.15600	0.10400	0.40600	0.04900
8	0.13600	0.00900	0.21400	0.40100	0.03600	0.06600	0.24100	0.18900	0.49100	0.13400
9	0.00200	0.12900	0.07600	0.26300	0.10200	0.07200	0.10300	0.05100	0.35300	0.00400
A	0.27800	0.40500	0.20000	0.01300	0.37800	0.34800	0.17300	0.22500	0.07700	0.28000
B	0.08300	0.21000	0.00500	0.18200	0.18300	0.15300	0.02200	0.03000	0.27200	0.08500
C	0.04100	0.08600	0.11900	0.30600	0.05900	0.02900	0.14600	0.09400	0.39600	0.03900
D	0.03700	0.09000	0.11500	0.30200	0.06300	0.03300	0.14200	0.09000	0.39200	0.03500
E	-	0.12700	0.07800	0.26500	0.10000	0.07000	0.10500	0.05300	0.35500	0.00200
F	0.12700	-	0.20500	0.39200	0.02700	0.05700	0.23200	0.18000	0.48200	0.12500
G	0.07800	0.20500	-	0.18700	0.17800	0.14800	0.02700	0.02500	0.27700	0.08000
H	0.26500	0.39200	0.18700	-	0.36500	0.33500	0.16000	0.21200	0.09000	0.26700
I	0.10000	0.02700	0.17800	0.36500	-	0.03000	0.20500	0.15300	0.45500	0.09800
J	0.07000	0.05700	0.14800	0.33500	0.03000	-	0.17500	0.12300	0.42500	0.06800
K	0.10500	0.23200	0.02700	0.16000	0.20500	0.17500	-	0.05200	0.25000	0.10700
L	0.05300	0.18000	0.02500	0.21200	0.15300	0.12300	0.05200	-	0.30200	0.05500
M	0.35500	0.48200	0.27700	0.09000	0.45500	0.42500	0.25000	0.30200	-	0.35700
N	0.00200	0.12500	0.08000	0.26700	0.09800	0.06800	0.10700	0.05500	0.35700	-
O	0.48200	0.60900	0.40400	0.21700	0.58200	0.55200	0.37700	0.42900	0.12700	0.48400
P	0.11800	0.24500	0.04000	0.14700	0.21800	0.18800	0.01300	0.06500	0.23700	0.12000
Q	0.22900	0.35600	0.15100	0.03600	0.32900	0.29900	0.12400	0.17600	0.12600	0.23100
R	0.04500	0.08200	0.12300	0.31000	0.05500	0.02500	0.15000	0.09800	0.40000	0.04300

TO:	O	P	Q	R
FROM: a	0.55300	0.18900	0.30000	0.02600
b	0.48600	0.12200	0.23300	0.04100
c	0.45700	0.09300	0.20400	0.07000
d	0.64700	0.28300	0.39400	0.12000
e	0.14200	0.22200	0.11100	0.38500
f	0.28500	0.07900	0.03200	0.24200
g	0.59100	0.22700	0.33800	0.06400
h	0.28100	0.08300	0.02800	0.24600
i	0.23400	0.13000	0.01900	0.29300
j	0.47000	0.10600	0.21700	0.05700
k	0.44100	0.07700	0.18800	0.08600
l	0.01900	0.38300	0.27200	0.54600
m	0.53000	0.16600	0.27700	0.00300
n	0.61600	0.25200	0.36300	0.08900
o	0.65800	0.29400	0.40500	0.13100
p	0.23900	0.12500	0.01400	0.28800
q	0.54900	0.18500	0.29600	0.02200
r	0.40000	0.03600	0.14700	0.12700
s	0.46700	0.10300	0.21400	0.06000
t	0.60800	0.24400	0.35500	0.08100
u	0.13300	0.23100	0.12000	0.39400
v	0.40600	0.04200	0.15300	0.12100
w	0.37400	0.01000	0.12100	0.15300
x	0.45200	0.08800	0.19900	0.07500
y	0.51000	0.14600	0.25700	0.01700
z	0.03700	0.40100	0.29000	0.56400
0	0.16500	0.19900	0.08800	0.36200
1	0.56100	0.19700	0.30800	0.03400
2	0.58700	0.22300	0.33400	0.06000
3	0.46900	0.10500	0.21600	0.05800
4	0.55900	0.19500	0.30600	0.03200
5	0.52600	0.16200	0.27300	0.00100

6	0.49000	0.12600	0.23700	0.03700
7	0.53300	0.16900	0.28000	0.00600
8	0.61800	0.25400	0.36500	0.09100
9	0.48000	0.11600	0.22700	0.04700
A	0.20400	0.16000	0.04900	0.32300
B	0.39900	0.03500	0.14600	0.12800
C	0.52300	0.15900	0.27000	0.00400
D	0.51900	0.15500	0.26600	0.00800
E	0.48200	0.11800	0.22900	0.04500
F	0.60900	0.24500	0.35600	0.08200
G	0.40400	0.04000	0.15100	0.12300
H	0.21700	0.14700	0.03600	0.31000
I	0.58200	0.21800	0.32900	0.05500
J	0.55200	0.18800	0.29900	0.02500
K	0.37700	0.01300	0.12400	0.15000
L	0.42900	0.06500	0.17600	0.09800
M	0.12700	0.23700	0.12600	0.40000
N	0.48400	0.12000	0.23100	0.04300
O	-	0.36400	0.25300	0.52700
P	0.36400	-	0.11100	0.16300
Q	0.25300	0.11100	-	0.27400
R	0.52700	0.16300	0.27400	-

Stepmatrix "NUMBER OF LAMELLAE FINGER IV" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.00500	0.18700	0.30200	0.30500	0.00300	0.29500	0.25700	0.00400	0.05900
b	0.00500	-	0.18200	0.30700	0.31000	0.00800	0.30000	0.26200	0.00900	0.06400
c	0.18700	0.18200	-	0.48900	0.49200	0.19000	0.48200	0.44400	0.19100	0.24600
d	0.30200	0.30700	0.48900	-	0.00300	0.29900	0.00700	0.04500	0.29800	0.24300
e	0.30500	0.31000	0.49200	0.00300	-	0.30200	0.01000	0.04800	0.30100	0.24600
f	0.00300	0.00800	0.19000	0.29900	0.30200	-	0.29200	0.25400	0.00100	0.05600
g	0.29500	0.30000	0.48200	0.00700	0.01000	0.29200	-	0.03800	0.29100	0.23600
h	0.25700	0.26200	0.44400	0.04500	0.04800	0.25400	0.03800	-	0.25300	0.19800
i	0.00400	0.00900	0.19100	0.29800	0.30100	0.00100	0.29100	0.25300	-	0.05500
j	0.05900	0.06400	0.24600	0.24300	0.24600	0.05600	0.23600	0.19800	0.05500	-
k	0.42300	0.42800	0.61000	0.12100	0.11800	0.42000	0.12800	0.16600	0.41900	0.36400
l	0.09700	0.10200	0.28400	0.20500	0.20800	0.09400	0.19800	0.16000	0.09300	0.03800
m	0.16700	0.16200	0.02000	0.46900	0.47200	0.17000	0.46200	0.42400	0.17100	0.22600
n	0.10500	0.10000	0.08200	0.40700	0.41000	0.10800	0.40000	0.36200	0.10900	0.16400
o	0.13200	0.13700	0.31900	0.17000	0.17300	0.12900	0.16300	0.12500	0.12800	0.07300
p	0.05200	0.04700	0.13500	0.35400	0.35700	0.05500	0.34700	0.30900	0.05600	0.11100
q	0.23400	0.23900	0.42100	0.06800	0.07100	0.23100	0.06100	0.02300	0.23000	0.17500
r	0.11300	0.10800	0.07400	0.41500	0.41800	0.11600	0.40800	0.37000	0.11700	0.17200
s	0.07000	0.07500	0.25700	0.23200	0.23500	0.06700	0.22500	0.18700	0.06600	0.01100
t	0.05700	0.06200	0.24400	0.24500	0.24800	0.05400	0.23800	0.20000	0.05300	0.00200
u	0.01800	0.02300	0.20500	0.28400	0.28700	0.01500	0.27700	0.23900	0.01400	0.04100
v	0.36400	0.36900	0.55100	0.06200	0.05900	0.36100	0.06900	0.10700	0.36000	0.30500
w	0.02800	0.02300	0.15900	0.33000	0.33300	0.03100	0.32300	0.28500	0.03200	0.08700
x	0.46700	0.47200	0.65400	0.16500	0.16200	0.46400	0.17200	0.21000	0.46300	0.40800
y	0.20800	0.21300	0.39500	0.09400	0.09700	0.20500	0.08700	0.04900	0.20400	0.14900
z	0.06300	0.05800	0.12400	0.36500	0.36800	0.06600	0.35800	0.32000	0.06700	0.12200
0	0.09500	0.10000	0.28200	0.20700	0.21000	0.09200	0.20000	0.16200	0.09100	0.03600
1	0.02200	0.01700	0.16500	0.32400	0.32700	0.02500	0.31700	0.27900	0.02600	0.08100
2	0.06800	0.07300	0.25500	0.23400	0.23700	0.06500	0.22700	0.18900	0.06400	0.00900
3	0.08300	0.08800	0.27000	0.21900	0.22200	0.08000	0.21200	0.17400	0.07900	0.02400
4	0.02000	0.01500	0.16700	0.32200	0.32500	0.02300	0.31500	0.27700	0.02400	0.07900
5	0.03000	0.02500	0.15700	0.33200	0.33500	0.03300	0.32500	0.28700	0.03400	0.08900
6	0.07600	0.08100	0.26300	0.22600	0.22900	0.07300	0.21900	0.18100	0.07200	0.01700
7	0.04000	0.04500	0.22700	0.26200	0.26500	0.03700	0.25500	0.21700	0.03600	0.01900
8	0.02900	0.03400	0.21600	0.27300	0.27600	0.02600	0.26600	0.22800	0.02500	0.03000
9	0.01000	0.01500	0.19700	0.29200	0.29500	0.00700	0.28500	0.24700	0.00600	0.04900
A	0.14200	0.14700	0.32900	0.16000	0.16300	0.13900	0.15300	0.11500	0.13800	0.08300
B	0.31300	0.30800	0.12600	0.61500	0.61800	0.31600	0.60800	0.57000	0.31700	0.37200
C	0.07800	0.08300	0.26500	0.22400	0.22700	0.07500	0.21700	0.17900	0.07400	0.01900
D	0.10600	0.11100	0.29300	0.19600	0.19900	0.10300	0.18900	0.15100	0.10200	0.04700
E	0.04900	0.05400	0.23600	0.25300	0.25600	0.04600	0.24600	0.20800	0.04500	0.01000
F	0.03400	0.02900	0.15300	0.33600	0.33900	0.03700	0.32900	0.29100	0.03800	0.09300
G	0.06400	0.05900	0.12300	0.36600	0.36900	0.06700	0.35900	0.32100	0.06800	0.12300
H	0.33200	0.33700	0.51900	0.03000	0.02700	0.32900	0.03700	0.07500	0.32800	0.27300
I	0.00100	0.00400	0.18600	0.30300	0.30600	0.00400	0.29600	0.25800	0.00500	0.06000
J	0.31700	0.32200	0.50400	0.01500	0.01200	0.31400	0.02200	0.06000	0.31300	0.25800
K	0.01700	0.01200	0.17000	0.31900	0.32200	0.02000	0.31200	0.27400	0.02100	0.07600
L	0.15200	0.15700	0.33900	0.15000	0.15300	0.14900	0.14300	0.10500	0.14800	0.09300
M	0.31600	0.32100	0.50300	0.01400	0.01100	0.31300	0.02100	0.05900	0.31200	0.25700

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.42300	0.09700	0.16700	0.10500	0.13200	0.05200	0.23400	0.11300	0.07000	0.05700
b	0.42800	0.10200	0.16200	0.10000	0.13700	0.04700	0.23900	0.10800	0.07500	0.06200
c	0.61000	0.28400	0.02000	0.08200	0.31900	0.13500	0.42100	0.07400	0.25700	0.24400
d	0.12100	0.20500	0.46900	0.40700	0.17000	0.35400	0.06800	0.41500	0.23200	0.24500
e	0.11800	0.20800	0.47200	0.41000	0.17300	0.35700	0.07100	0.41800	0.23500	0.24800
f	0.42000	0.09400	0.17000	0.10800	0.12900	0.05500	0.23100	0.11600	0.06700	0.05400
g	0.12800	0.19800	0.46200	0.40000	0.16300	0.34700	0.06100	0.40800	0.22500	0.23800
h	0.16600	0.16000	0.42400	0.36200	0.12500	0.30900	0.02300	0.37000	0.18700	0.20000
i	0.41900	0.09300	0.17100	0.10900	0.12800	0.05600	0.23000	0.11700	0.06600	0.05300
j	0.36400	0.03800	0.22600	0.16400	0.07300	0.11100	0.17500	0.17200	0.01100	0.00200
k	-	0.32600	0.59000	0.52800	0.29100	0.47500	0.18900	0.53600	0.35300	0.36600
l	0.32600	-	0.26400	0.20200	0.03500	0.14900	0.13700	0.21000	0.02700	0.04000
m	0.59000	0.26400	-	0.06200	0.29900	0.11500	0.40100	0.05400	0.23700	0.22400
n	0.52800	0.20200	0.06200	-	0.23700	0.05300	0.33900	0.00800	0.17500	0.16200
o	0.29100	0.03500	0.29900	0.23700	-	0.18400	0.10200	0.24500	0.06200	0.07500
p	0.47500	0.14900	0.11500	0.05300	0.18400	-	0.28600	0.06100	0.12200	0.10900
q	0.18900	0.13700	0.40100	0.33900	0.10200	0.28600	-	0.34700	0.16400	0.17700
r	0.53600	0.21000	0.05400	0.00800	0.24500	0.06100	0.34700	-	0.18300	0.17000
s	0.35300	0.02700	0.23700	0.17500	0.06200	0.12200	0.16400	0.18300	-	0.01300
t	0.36600	0.04000	0.22400	0.16200	0.07500	0.10900	0.17700	0.17000	0.01300	-
u	0.40500	0.07900	0.18500	0.12300	0.11400	0.07000	0.21600	0.13100	0.05200	0.03900
v	0.05900	0.26700	0.53100	0.46900	0.23200	0.41600	0.13000	0.47700	0.29400	0.30700
w	0.45100	0.12500	0.13900	0.07700	0.16000	0.02400	0.26200	0.08500	0.09800	0.08500
x	0.04400	0.37000	0.63400	0.57200	0.33500	0.51900	0.23300	0.58000	0.39700	0.41000
y	0.21500	0.11100	0.37500	0.31300	0.07600	0.26000	0.02600	0.32100	0.13800	0.15100
z	0.48600	0.16000	0.10400	0.04200	0.19500	0.01100	0.29700	0.05000	0.13300	0.12000
0	0.32800	0.00200	0.26200	0.20000	0.03700	0.14700	0.13900	0.20800	0.02500	0.03800
1	0.44500	0.11900	0.14500	0.08300	0.15400	0.03000	0.25600	0.09100	0.09200	0.07900
2	0.35500	0.02900	0.23500	0.17300	0.06400	0.12000	0.16600	0.18100	0.00200	0.01100
3	0.34000	0.01400	0.25000	0.18800	0.04900	0.13500	0.15100	0.19600	0.01300	0.02600
4	0.44300	0.11700	0.14700	0.08500	0.15200	0.03200	0.25400	0.09300	0.09000	0.07700
5	0.45300	0.12700	0.13700	0.07500	0.16200	0.02200	0.26400	0.08300	0.10000	0.08700
6	0.34700	0.02100	0.24300	0.18100	0.05600	0.12800	0.15800	0.18900	0.00600	0.01900
7	0.38300	0.05700	0.20700	0.14500	0.09200	0.09200	0.19400	0.15300	0.03000	0.01700
8	0.39400	0.06800	0.19600	0.13400	0.10300	0.08100	0.20500	0.14200	0.04100	0.02800
9	0.41300	0.08700	0.17700	0.11500	0.12200	0.06200	0.22400	0.12300	0.06000	0.04700
A	0.28100	0.04500	0.30900	0.24700	0.01000	0.19400	0.09200	0.25500	0.07200	0.08500
B	0.73600	0.41000	0.14600	0.20800	0.44500	0.26100	0.54700	0.20000	0.38300	0.37000
C	0.34500	0.01900	0.24500	0.18300	0.05400	0.13000	0.15600	0.19100	0.00800	0.02100
D	0.31700	0.00900	0.27300	0.21100	0.02600	0.15800	0.12800	0.21900	0.03600	0.04900
E	0.37400	0.04800	0.21600	0.15400	0.08300	0.10100	0.18500	0.16200	0.02100	0.00800
F	0.45700	0.13100	0.13300	0.07100	0.16600	0.01800	0.26800	0.07900	0.10400	0.09100
G	0.48700	0.16100	0.10300	0.04100	0.19600	0.01200	0.29800	0.04900	0.13400	0.12100
H	0.09100	0.23500	0.49900	0.43700	0.20000	0.38400	0.09800	0.44500	0.26200	0.27500
I	0.42400	0.09800	0.16600	0.10400	0.13300	0.05100	0.23500	0.11200	0.07100	0.05800
J	0.10600	0.22000	0.48400	0.42200	0.18500	0.36900	0.08300	0.43000	0.24700	0.26000
K	0.44000	0.11400	0.15000	0.08800	0.14900	0.03500	0.25100	0.09600	0.08700	0.07400
L	0.27100	0.05500	0.31900	0.25700	0.02000	0.20400	0.08200	0.26500	0.08200	0.09500
M	0.10700	0.21900	0.48300	0.42100	0.18400	0.36800	0.08200	0.42900	0.24600	0.25900

TO:	u	v	w	x	y	z	0	1	2	3
FROM: a	0.01800	0.36400	0.02800	0.46700	0.20800	0.06300	0.09500	0.02200	0.06800	0.08300
b	0.02300	0.36900	0.02300	0.47200	0.21300	0.05800	0.10000	0.01700	0.07300	0.08800
c	0.20500	0.55100	0.15900	0.65400	0.39500	0.12400	0.28200	0.16500	0.25500	0.27000
d	0.28400	0.06200	0.33000	0.16500	0.09400	0.36500	0.20700	0.32400	0.23400	0.21900
e	0.28700	0.05900	0.33300	0.16200	0.09700	0.36800	0.21000	0.32700	0.23700	0.22200
f	0.01500	0.36100	0.03100	0.46400	0.20500	0.06600	0.09200	0.02500	0.06500	0.08000
g	0.27700	0.06900	0.32300	0.17200	0.08700	0.35800	0.20000	0.31700	0.22700	0.21200
h	0.23900	0.10700	0.28500	0.21000	0.04900	0.32000	0.16200	0.27900	0.18900	0.17400
i	0.01400	0.36000	0.03200	0.46300	0.20400	0.06700	0.09100	0.02600	0.06400	0.07900
j	0.04100	0.30500	0.08700	0.40800	0.14900	0.12200	0.03600	0.08100	0.00900	0.02400
k	0.40500	0.05900	0.45100	0.04400	0.21500	0.48600	0.32800	0.44500	0.35500	0.34000
l	0.07900	0.26700	0.12500	0.37000	0.11100	0.16000	0.00200	0.11900	0.02900	0.01400
m	0.18500	0.53100	0.13900	0.63400	0.37500	0.10400	0.26200	0.14500	0.23500	0.25000
n	0.12300	0.46900	0.07700	0.57200	0.31300	0.04200	0.20000	0.08300	0.17300	0.18800
o	0.11400	0.23200	0.16000	0.33500	0.07600	0.19500	0.03700	0.15400	0.06400	0.04900
p	0.07000	0.41600	0.02400	0.51900	0.26000	0.01100	0.14700	0.03000	0.12000	0.13500
q	0.21600	0.13000	0.26200	0.23300	0.02600	0.29700	0.13900	0.25600	0.16600	0.15100
r	0.13100	0.47700	0.08500	0.58000	0.32100	0.05000	0.20800	0.09100	0.18100	0.19600
s	0.05200	0.29400	0.09800	0.39700	0.13800	0.13300	0.02500	0.09200	0.00200	0.01300
t	0.03900	0.30700	0.08500	0.41000	0.15100	0.12000	0.03800	0.07900	0.01100	0.02600
u	-	0.34600	0.04600	0.44900	0.19000	0.08100	0.07700	0.04000	0.05000	0.06500
v	0.34600	-	0.39200	0.10300	0.15600	0.42700	0.26900	0.38600	0.29600	0.28100
w	0.04600	0.39200	-	0.49500	0.23600	0.03500	0.12300	0.00600	0.09600	0.11100
x	0.44900	0.10300	0.49500	-	0.25900	0.53000	0.37200	0.48900	0.39900	0.38400
y	0.19000	0.15600	0.23600	0.25900	-	0.27100	0.11300	0.23000	0.14000	0.12500

z	0.08100	0.42700	0.03500	0.53000	0.27100	-	0.15800	0.04100	0.13100	0.14600
0	0.07700	0.26900	0.12300	0.37200	0.11300	0.15800	-	0.11700	0.02700	0.01200
1	0.04000	0.38600	0.00600	0.48900	0.23000	0.04100	0.11700	-	0.09000	0.10500
2	0.05000	0.29600	0.09600	0.39900	0.14000	0.13100	0.02700	0.09000	-	0.01500
3	0.06500	0.28100	0.11100	0.38400	0.12500	0.14600	0.01200	0.10500	0.01500	-
4	0.03800	0.38400	0.00800	0.48700	0.22800	0.04300	0.11500	0.00200	0.08800	0.10300
5	0.04800	0.39400	0.00200	0.49700	0.23800	0.03300	0.12500	0.00800	0.09800	0.11300
6	0.05800	0.28800	0.10400	0.39100	0.13200	0.13900	0.01900	0.09800	0.00800	0.00700
7	0.02200	0.32400	0.06800	0.42700	0.16800	0.10300	0.05500	0.06200	0.02800	0.04300
8	0.01100	0.33500	0.05700	0.43800	0.17900	0.09200	0.06600	0.05100	0.03900	0.05400
9	0.00800	0.35400	0.03800	0.45700	0.19800	0.07300	0.08500	0.03200	0.05800	0.07300
A	0.12400	0.22200	0.17000	0.32500	0.06600	0.20500	0.04700	0.16400	0.07400	0.05900
B	0.33100	0.67700	0.28500	0.78000	0.52100	0.25000	0.40800	0.29100	0.38100	0.39600
C	0.06000	0.28600	0.10600	0.38900	0.13000	0.14100	0.01700	0.10000	0.01000	0.00500
D	0.08800	0.25800	0.13400	0.36100	0.10200	0.16900	0.01100	0.12800	0.03800	0.02300
E	0.03100	0.31500	0.07700	0.41800	0.15900	0.11200	0.04600	0.07100	0.01900	0.03400
F	0.05200	0.39800	0.00600	0.50100	0.24200	0.02900	0.12900	0.01200	0.10200	0.11700
G	0.08200	0.42800	0.03600	0.53100	0.27200	0.00100	0.15900	0.04200	0.13200	0.14700
H	0.31400	0.03200	0.36000	0.13500	0.12400	0.39500	0.23700	0.35400	0.26400	0.24900
I	0.01900	0.36500	0.02700	0.46800	0.20900	0.06200	0.09600	0.02100	0.06900	0.08400
J	0.29900	0.04700	0.34500	0.15000	0.10900	0.38000	0.22200	0.33900	0.24900	0.23400
K	0.03500	0.38100	0.01100	0.48400	0.22500	0.04600	0.11200	0.00500	0.08500	0.10000
L	0.13400	0.21200	0.18000	0.31500	0.05600	0.21500	0.05700	0.17400	0.08400	0.06900
M	0.29800	0.04800	0.34400	0.15100	0.10800	0.37900	0.22100	0.33800	0.24800	0.23300

TO:	4	5	6	7	8	9	A	B	C	D
FROM: a	0.02000	0.03000	0.07600	0.04000	0.02900	0.01000	0.14200	0.31300	0.07800	0.10600
b	0.01500	0.02500	0.08100	0.04500	0.03400	0.01500	0.14700	0.30800	0.08300	0.11100
c	0.16700	0.15700	0.26300	0.22700	0.21600	0.19700	0.32900	0.12600	0.26500	0.29300
d	0.32200	0.33200	0.22600	0.26200	0.27300	0.29200	0.16000	0.61500	0.22400	0.19600
e	0.32500	0.33500	0.22900	0.26500	0.27600	0.29500	0.16300	0.61800	0.22700	0.19900
f	0.02300	0.03300	0.07300	0.03700	0.02600	0.00700	0.13900	0.31600	0.07500	0.10300
g	0.31500	0.32500	0.21900	0.25500	0.26600	0.28500	0.15300	0.60800	0.21700	0.18900
h	0.27700	0.28700	0.18100	0.21700	0.22800	0.24700	0.11500	0.57000	0.17900	0.15100
i	0.02400	0.03400	0.07200	0.03600	0.02500	0.00600	0.13800	0.31700	0.07400	0.10200
j	0.07900	0.08900	0.01700	0.01900	0.03000	0.04900	0.08300	0.37200	0.01900	0.04700
k	0.44300	0.45300	0.34700	0.38300	0.39400	0.41300	0.28100	0.73600	0.34500	0.31700
l	0.11700	0.12700	0.02100	0.05700	0.06800	0.08700	0.04500	0.41000	0.01900	0.00900
m	0.14700	0.13700	0.24300	0.20700	0.19600	0.17700	0.30900	0.14600	0.24500	0.27300
n	0.08500	0.07500	0.18100	0.14500	0.13400	0.11500	0.24700	0.20800	0.18300	0.21100
o	0.15200	0.16200	0.05600	0.09200	0.10300	0.12200	0.01000	0.44500	0.05400	0.02600
p	0.03200	0.02200	0.12800	0.09200	0.08100	0.06200	0.19400	0.26100	0.13000	0.15800
q	0.25400	0.26400	0.15800	0.19400	0.20500	0.22400	0.09200	0.54700	0.15600	0.12800
r	0.09300	0.08300	0.18900	0.15300	0.14200	0.12300	0.25500	0.20000	0.19100	0.21900
s	0.09000	0.10000	0.00600	0.03000	0.04100	0.06000	0.07200	0.38300	0.00800	0.03600
t	0.07700	0.08700	0.01900	0.01700	0.02800	0.04700	0.08500	0.37000	0.02100	0.04900
u	0.03800	0.04800	0.05800	0.02200	0.01100	0.00800	0.12400	0.33100	0.06000	0.08800
v	0.38400	0.39400	0.28800	0.32400	0.33500	0.35400	0.22200	0.67700	0.28600	0.25800
w	0.00800	0.00200	0.10400	0.06800	0.05700	0.03800	0.17000	0.28500	0.10600	0.13400
x	0.48700	0.49700	0.39100	0.42700	0.43800	0.45700	0.32500	0.78000	0.38900	0.36100
y	0.22800	0.23800	0.13200	0.16800	0.17900	0.19800	0.06600	0.52100	0.13000	0.10200
z	0.04300	0.03300	0.13900	0.10300	0.09200	0.07300	0.20500	0.25000	0.14100	0.16900
0	0.11500	0.12500	0.01900	0.05500	0.06600	0.08500	0.04700	0.40800	0.01700	0.01100
1	0.00200	0.00800	0.09800	0.06200	0.05100	0.03200	0.16400	0.29100	0.10000	0.12800
2	0.08800	0.09800	0.00800	0.02800	0.03900	0.05800	0.07400	0.38100	0.01000	0.03800
3	0.10300	0.11300	0.00700	0.04300	0.05400	0.07300	0.05900	0.39600	0.00500	0.02300
4	-	0.01000	0.09600	0.06000	0.04900	0.03000	0.16200	0.29300	0.09800	0.12600
5	0.01000	-	0.10600	0.07000	0.05900	0.04000	0.17200	0.28300	0.10800	0.13600
6	0.09600	0.10600	-	0.03600	0.04700	0.06600	0.06600	0.38900	0.00200	0.03000
7	0.06000	0.07000	0.03600	-	0.01100	0.03000	0.10200	0.35300	0.03800	0.06600
8	0.04900	0.05900	0.04700	0.01100	-	0.01900	0.11300	0.34200	0.04900	0.07700
9	0.03000	0.04000	0.06600	0.03000	0.01900	-	0.13200	0.32300	0.06800	0.09600
A	0.16200	0.17200	0.06600	0.10200	0.11300	0.13200	-	0.45500	0.06400	0.03600
B	0.29300	0.28300	0.38900	0.35300	0.34200	0.32300	0.45500	-	0.39100	0.41900
C	0.09800	0.10800	0.00200	0.03800	0.04900	0.06800	0.06400	0.39100	-	0.02800
D	0.12600	0.13600	0.03000	0.06600	0.07700	0.09600	0.03600	0.41900	0.02800	-
E	0.06900	0.07900	0.02700	0.00900	0.02000	0.03900	0.09300	0.36200	0.02900	0.05700
F	0.01400	0.00400	0.11000	0.07400	0.06300	0.04400	0.17600	0.27900	0.11200	0.14000
G	0.04400	0.03400	0.14000	0.10400	0.09300	0.07400	0.20600	0.24900	0.14200	0.17000
H	0.35200	0.36200	0.25600	0.29200	0.30300	0.32200	0.19000	0.64500	0.25400	0.22600
I	0.01900	0.02900	0.07700	0.04100	0.03000	0.01100	0.14300	0.31200	0.07900	0.10700
J	0.33700	0.34700	0.24100	0.27700	0.28800	0.30700	0.17500	0.63000	0.23900	0.21100
K	0.00300	0.01300	0.09300	0.05700	0.04600	0.02700	0.15900	0.29600	0.09500	0.12300
L	0.17200	0.18200	0.07600	0.11200	0.12300	0.14200	0.01000	0.46500	0.07400	0.04600
M	0.33600	0.34600	0.24000	0.27600	0.28700	0.30600	0.17400	0.62900	0.23800	0.21000

TO:	E	F	G	H	I	J	K	L	M

FROM: a	0.04900	0.03400	0.06400	0.33200	0.00100	0.31700	0.01700	0.15200	0.31600
b	0.05400	0.02900	0.05900	0.33700	0.00400	0.32200	0.01200	0.15700	0.32100
c	0.23600	0.15300	0.12300	0.51900	0.18600	0.50400	0.17000	0.33900	0.50300
d	0.25300	0.33600	0.36600	0.03000	0.30300	0.01500	0.31900	0.15000	0.01400
e	0.25600	0.33900	0.36900	0.02700	0.30600	0.01200	0.32200	0.15300	0.01100
f	0.04600	0.03700	0.06700	0.32900	0.00400	0.31400	0.02000	0.14900	0.31300
g	0.24600	0.32900	0.35900	0.03700	0.29600	0.02200	0.31200	0.14300	0.02100
h	0.20800	0.29100	0.32100	0.07500	0.25800	0.06000	0.27400	0.10500	0.05900
i	0.04500	0.03800	0.06800	0.32800	0.00500	0.31300	0.02100	0.14800	0.31200
j	0.01000	0.09300	0.12300	0.27300	0.06000	0.25800	0.07600	0.09300	0.25700
k	0.37400	0.45700	0.48700	0.09100	0.42400	0.10600	0.44000	0.27100	0.10700
l	0.04800	0.13100	0.16100	0.23500	0.09800	0.22000	0.11400	0.05500	0.21900
m	0.21600	0.13300	0.10300	0.49900	0.16600	0.48400	0.15000	0.31900	0.48300
n	0.15400	0.07100	0.04100	0.43700	0.10400	0.42200	0.08800	0.25700	0.42100
o	0.08300	0.16600	0.19600	0.20000	0.13300	0.18500	0.14900	0.02000	0.18400
p	0.10100	0.01800	0.01200	0.38400	0.05100	0.36900	0.03500	0.20400	0.36800
q	0.18500	0.26800	0.29800	0.09800	0.23500	0.08300	0.25100	0.08200	0.08200
r	0.16200	0.07900	0.04900	0.44500	0.11200	0.43000	0.09600	0.26500	0.42900
s	0.02100	0.10400	0.13400	0.26200	0.07100	0.24700	0.08700	0.08200	0.24600
t	0.00800	0.09100	0.12100	0.27500	0.05800	0.26000	0.07400	0.09500	0.25900
u	0.03100	0.05200	0.08200	0.31400	0.01900	0.29900	0.03500	0.13400	0.29800
v	0.31500	0.39800	0.42800	0.03200	0.36500	0.04700	0.38100	0.21200	0.04800
w	0.07700	0.00600	0.03600	0.36000	0.02700	0.34500	0.01100	0.18000	0.34400
x	0.41800	0.50100	0.53100	0.13500	0.46800	0.15000	0.48400	0.31500	0.15100
y	0.15900	0.24200	0.27200	0.12400	0.20900	0.10900	0.22500	0.05600	0.10800
z	0.11200	0.02900	0.00100	0.39500	0.06200	0.38000	0.04600	0.21500	0.37900
0	0.04600	0.12900	0.15900	0.23700	0.09600	0.22200	0.11200	0.05700	0.22100
1	0.07100	0.01200	0.04200	0.35400	0.02100	0.33900	0.00500	0.17400	0.33800
2	0.01900	0.10200	0.13200	0.26400	0.06900	0.24900	0.08500	0.08400	0.24800
3	0.03400	0.11700	0.14700	0.24900	0.08400	0.23400	0.10000	0.06900	0.23300
4	0.06900	0.01400	0.04400	0.35200	0.01900	0.33700	0.00300	0.17200	0.33600
5	0.07900	0.00400	0.03400	0.36200	0.02900	0.34700	0.01300	0.18200	0.34600
6	0.02700	0.11000	0.14000	0.25600	0.07700	0.24100	0.09300	0.07600	0.24000
7	0.00900	0.07400	0.10400	0.29200	0.04100	0.27700	0.05700	0.11200	0.27600
8	0.02000	0.06300	0.09300	0.30300	0.03000	0.28800	0.04600	0.12300	0.28700
9	0.03900	0.04400	0.07400	0.32200	0.01100	0.30700	0.02700	0.14200	0.30600
A	0.09300	0.17600	0.20600	0.19000	0.14300	0.17500	0.15900	0.01000	0.17400
B	0.36200	0.27900	0.24900	0.64500	0.31200	0.63000	0.29600	0.46500	0.62900
C	0.02900	0.11200	0.14200	0.25400	0.07900	0.23900	0.09500	0.07400	0.23800
D	0.05700	0.14000	0.17000	0.22600	0.10700	0.21100	0.12300	0.04600	0.21000
E	-	0.08300	0.11300	0.28300	0.05000	0.26800	0.06600	0.10300	0.26700
F	0.08300	-	0.03000	0.36600	0.03300	0.35100	0.01700	0.18600	0.35000
G	0.11300	0.03000	-	0.39600	0.06300	0.38100	0.04700	0.21600	0.38000
H	0.28300	0.36600	0.39600	-	0.33300	0.01500	0.34900	0.18000	0.01600
I	0.05000	0.03300	0.06300	0.33300	-	0.31800	0.01600	0.15300	0.31700
J	0.26800	0.35100	0.38100	0.01500	0.31800	-	0.33400	0.16500	0.00100
K	0.06600	0.01700	0.04700	0.34900	0.01600	0.33400	-	0.16900	0.33300
L	0.10300	0.18600	0.21600	0.18000	0.15300	0.16500	0.16900	-	0.16400
M	0.26700	0.35000	0.38000	0.01600	0.31700	0.00100	0.33300	0.16400	-

Stepmatrix "NUMBER OF LAMELLAE TOE IV" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.08400	0.06700	0.14300	0.31600	0.18200	0.11700	0.26900	0.18100	0.12900
b	0.08400	-	0.01700	0.22700	0.23200	0.09800	0.03300	0.18500	0.09700	0.04500
c	0.06700	0.01700	-	0.21000	0.24900	0.11500	0.05000	0.20200	0.11400	0.06200
d	0.14300	0.22700	0.21000	-	0.45900	0.32500	0.26000	0.41200	0.32400	0.27200
e	0.31600	0.23200	0.24900	0.45900	-	0.13400	0.19900	0.04700	0.13500	0.18700
f	0.18200	0.09800	0.11500	0.32500	0.13400	-	0.06500	0.08700	0.00100	0.05300
g	0.11700	0.03300	0.05000	0.26000	0.19900	0.06500	-	0.15200	0.06400	0.01200
h	0.26900	0.18500	0.20200	0.41200	0.04700	0.08700	0.15200	-	0.08800	0.14000
i	0.18100	0.09700	0.11400	0.32400	0.13500	0.00100	0.06400	0.08800	-	0.05200
j	0.12900	0.04500	0.06200	0.27200	0.18700	0.05300	0.01200	0.14000	0.05200	-
k	0.11600	0.03200	0.04900	0.25900	0.20000	0.06600	0.00100	0.15300	0.06500	0.01300
l	0.39700	0.31300	0.33000	0.54000	0.08100	0.21500	0.28000	0.12800	0.21600	0.26800
m	0.20700	0.12300	0.14000	0.35000	0.10900	0.02500	0.09000	0.06200	0.02600	0.07800
n	0.07500	0.15900	0.14200	0.06800	0.39100	0.25700	0.19200	0.34400	0.25600	0.20400
o	0.09900	0.18300	0.16600	0.04400	0.41500	0.28100	0.21600	0.36800	0.28000	0.22800
p	0.15500	0.07100	0.08800	0.29800	0.16100	0.02700	0.03800	0.11400	0.02600	0.02600
q	0.10300	0.01900	0.03600	0.24600	0.21300	0.07900	0.01400	0.16600	0.07800	0.02600
r	0.32400	0.24000	0.25700	0.46700	0.00800	0.14200	0.20700	0.05500	0.14300	0.19500
s	0.14000	0.05600	0.07300	0.28300	0.17600	0.04200	0.02300	0.12900	0.04100	0.01100
t	0.00300	0.08700	0.07000	0.14000	0.31900	0.18500	0.12000	0.27200	0.18400	0.13200
u	0.17800	0.09400	0.11100	0.32100	0.13800	0.00400	0.06100	0.09100	0.00300	0.04900
v	0.15600	0.07200	0.08900	0.29900	0.16000	0.02600	0.03900	0.11300	0.02500	0.02700
w	0.27700	0.19300	0.21000	0.42000	0.03900	0.09500	0.16000	0.00800	0.09600	0.14800

x	0.06200	0.02200	0.00500	0.20500	0.25400	0.12000	0.05500	0.20700	0.11900	0.06700
y	0.57200	0.48800	0.50500	0.71500	0.25600	0.39000	0.45500	0.30300	0.39100	0.44300
z	0.38100	0.29700	0.31400	0.52400	0.06500	0.19900	0.26400	0.11200	0.20000	0.25200
0	0.06600	0.01800	0.00100	0.20900	0.25000	0.11600	0.05100	0.20300	0.11500	0.06300
1	0.08500	0.00100	0.01800	0.22800	0.23100	0.09700	0.03200	0.18400	0.09600	0.04400
2	0.17700	0.09300	0.11000	0.32000	0.13900	0.00500	0.06000	0.09200	0.00400	0.04800
3	0.12300	0.20700	0.19000	0.02000	0.43900	0.30500	0.24000	0.39200	0.30400	0.25200
4	0.03700	0.04700	0.03000	0.18000	0.27900	0.14500	0.08000	0.23200	0.14400	0.09200
5	0.15000	0.06600	0.08300	0.29300	0.16600	0.03200	0.03300	0.11900	0.03100	0.02100
6	0.08700	0.00300	0.02000	0.23000	0.22900	0.09500	0.03000	0.18200	0.09400	0.04200
7	0.13400	0.05000	0.06700	0.27700	0.18200	0.04800	0.01700	0.13500	0.04700	0.00500
8	0.10900	0.02500	0.04200	0.25200	0.20700	0.07300	0.00800	0.16000	0.07200	0.02000
9	0.04100	0.04300	0.02600	0.18400	0.27500	0.14100	0.07600	0.22800	0.14000	0.08800
A	0.27800	0.19400	0.21100	0.42100	0.03800	0.09600	0.16100	0.00900	0.09700	0.14900
B	0.14400	0.22800	0.21100	0.00100	0.46000	0.32600	0.26100	0.41300	0.32500	0.27300
C	0.17900	0.09500	0.11200	0.32200	0.13700	0.00300	0.06200	0.09000	0.00200	0.05000
D	0.18400	0.10000	0.11700	0.32700	0.13200	0.00200	0.06700	0.08500	0.00300	0.05500
E	0.14100	0.05700	0.07400	0.28400	0.17500	0.04100	0.02400	0.12800	0.04000	0.01200
F	0.06800	0.01600	0.00100	0.21100	0.24800	0.11400	0.04900	0.20100	0.11300	0.06100
G	0.10500	0.02100	0.03800	0.24800	0.21100	0.07700	0.01200	0.16400	0.07600	0.02400
H	0.09600	0.18000	0.16300	0.04700	0.41200	0.27800	0.21300	0.36500	0.27700	0.22500
I	0.16100	0.07700	0.09400	0.30400	0.15500	0.02100	0.04400	0.10800	0.02000	0.03200
J	0.32300	0.23900	0.25600	0.46600	0.00700	0.14100	0.20600	0.05400	0.14200	0.19400
K	0.13700	0.05300	0.07000	0.28000	0.17900	0.04500	0.02000	0.13200	0.04400	0.00800
L	0.23500	0.15100	0.16800	0.37800	0.08100	0.05300	0.11800	0.03400	0.05400	0.10600
M	0.09300	0.00900	0.02600	0.23600	0.22300	0.08900	0.02400	0.17600	0.08800	0.03600
N	0.25300	0.16900	0.18600	0.39600	0.06300	0.07100	0.13600	0.01600	0.07200	0.12400

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.11600	0.39700	0.20700	0.07500	0.09900	0.15500	0.10300	0.32400	0.14000	0.00300
b	0.03200	0.31300	0.12300	0.15900	0.18300	0.07100	0.01900	0.24000	0.05600	0.08700
c	0.04900	0.33000	0.14000	0.14200	0.16600	0.08800	0.03600	0.25700	0.07300	0.07000
d	0.25900	0.54000	0.35000	0.06800	0.04400	0.29800	0.24600	0.46700	0.28300	0.14000
e	0.20000	0.08100	0.10900	0.39100	0.41500	0.16100	0.21300	0.00800	0.17600	0.31900
f	0.06600	0.21500	0.02500	0.25700	0.28100	0.02700	0.07900	0.14200	0.04200	0.18500
g	0.00100	0.28000	0.09000	0.19200	0.21600	0.03800	0.01400	0.20700	0.02300	0.12000
h	0.15300	0.12800	0.06200	0.34400	0.36800	0.11400	0.16600	0.05500	0.12900	0.27200
i	0.06500	0.21600	0.02600	0.25600	0.28000	0.02600	0.07800	0.14300	0.04100	0.18400
j	0.01300	0.26800	0.07800	0.20400	0.22800	0.02600	0.02600	0.19500	0.01100	0.13200
k	-	0.28100	0.09100	0.19100	0.21500	0.03900	0.01300	0.20800	0.02400	0.11900
l	0.28100	-	0.19000	0.47200	0.49600	0.24200	0.29400	0.07300	0.25700	0.40000
m	0.09100	0.19000	-	0.28200	0.30600	0.05200	0.10400	0.11700	0.06700	0.21000
n	0.19100	0.47200	0.28200	-	0.02400	0.23000	0.17800	0.39900	0.21500	0.07200
o	0.21500	0.49600	0.30600	0.02400	-	0.25400	0.20200	0.42300	0.23900	0.09600
p	0.03900	0.24200	0.05200	0.23000	0.25400	-	0.05200	0.16900	0.01500	0.15800
q	0.01300	0.29400	0.10400	0.17800	0.20200	0.05200	-	0.22100	0.03700	0.10600
r	0.20800	0.07300	0.11700	0.39900	0.42300	0.16900	0.22100	-	0.18400	0.32700
s	0.02400	0.25700	0.06700	0.21500	0.23900	0.01500	0.03700	0.18400	-	0.14300
t	0.11900	0.40000	0.21000	0.07200	0.09600	0.15800	0.10600	0.32700	0.14300	-
u	0.06200	0.21900	0.02900	0.25300	0.27700	0.02300	0.07500	0.14600	0.03800	0.18100
v	0.04000	0.24100	0.05100	0.23100	0.25500	0.00100	0.05300	0.16800	0.01600	0.15900
w	0.16100	0.12000	0.07000	0.35200	0.37600	0.12200	0.17400	0.04700	0.13700	0.28000
x	0.05400	0.33500	0.14500	0.13700	0.16100	0.09300	0.04100	0.26200	0.07800	0.06500
y	0.45600	0.17500	0.36500	0.64700	0.67100	0.41700	0.46900	0.24800	0.43200	0.57500
z	0.26500	0.01600	0.17400	0.45600	0.48000	0.22600	0.27800	0.05700	0.24100	0.38400
0	0.05000	0.33100	0.14100	0.14100	0.16500	0.08900	0.03700	0.25800	0.07400	0.06900
1	0.03100	0.31200	0.12200	0.16000	0.18400	0.07000	0.01800	0.23900	0.05500	0.08800
2	0.06100	0.22000	0.03000	0.25200	0.27600	0.02200	0.07400	0.14700	0.03700	0.18000
3	0.23900	0.52000	0.33000	0.04800	0.02400	0.27800	0.22600	0.44700	0.26300	0.12000
4	0.07900	0.36000	0.17000	0.11200	0.13600	0.11800	0.06600	0.28700	0.10300	0.04000
5	0.03400	0.24700	0.05700	0.22500	0.24900	0.00500	0.04700	0.17400	0.01000	0.15300
6	0.02900	0.31000	0.12000	0.16200	0.18600	0.06800	0.01600	0.23700	0.05300	0.09000
7	0.01800	0.26300	0.07300	0.20900	0.23300	0.02100	0.03100	0.19000	0.00600	0.13700
8	0.00700	0.28800	0.09800	0.18400	0.20800	0.04600	0.00600	0.21500	0.03100	0.11200
9	0.07500	0.35600	0.16600	0.11600	0.14000	0.11400	0.06200	0.28300	0.09900	0.04400
A	0.16200	0.11900	0.07100	0.35300	0.37700	0.12300	0.17500	0.04600	0.13800	0.28100
B	0.26000	0.54100	0.35100	0.06900	0.04500	0.29900	0.24700	0.46800	0.28400	0.14100
C	0.06300	0.21800	0.02800	0.25400	0.27800	0.02400	0.07600	0.14500	0.03900	0.18200
D	0.06800	0.21300	0.02300	0.25900	0.28300	0.02900	0.08100	0.14000	0.04400	0.18700
E	0.02500	0.25600	0.06600	0.21600	0.24000	0.01400	0.03800	0.18300	0.00100	0.14400
F	0.04800	0.32900	0.13900	0.14300	0.16700	0.08700	0.03500	0.25600	0.07200	0.07100
G	0.01100	0.29200	0.10200	0.18000	0.20400	0.05000	0.00200	0.21900	0.03500	0.10800
H	0.21200	0.49300	0.30300	0.02100	0.00300	0.25100	0.19900	0.42000	0.23600	0.09300
I	0.04500	0.23600	0.04600	0.23600	0.26000	0.00600	0.05800	0.16300	0.02100	0.16400
J	0.20700	0.07400	0.11600	0.39800	0.42200	0.16800	0.22000	0.00100	0.18300	0.32600
K	0.02100	0.26000	0.07000	0.21200	0.23600	0.01800	0.03400	0.18700	0.00300	0.14000
L	0.11900	0.16200	0.02800	0.31000	0.33400	0.08000	0.13200	0.08900	0.09500	0.23800

M	0.02300	0.30400	0.11400	0.16800	0.19200	0.06200	0.01000	0.23100	0.04700	0.09600
N	0.13700	0.14400	0.04600	0.32800	0.35200	0.09800	0.15000	0.07100	0.11300	0.25600

TO: FROM:	u	v	w	x	y	z	0	1	2	3
a	0.17800	0.15600	0.27700	0.06200	0.57200	0.38100	0.06600	0.08500	0.17700	0.12300
b	0.09400	0.07200	0.19300	0.02200	0.48800	0.29700	0.01800	0.00100	0.09300	0.20700
c	0.11100	0.08900	0.21000	0.00500	0.50500	0.31400	0.00100	0.01800	0.11000	0.19000
d	0.32100	0.29900	0.42000	0.20500	0.71500	0.52400	0.20900	0.22800	0.32000	0.02000
e	0.13800	0.16000	0.03900	0.25400	0.25600	0.06500	0.25000	0.23100	0.13900	0.43900
f	0.00400	0.02600	0.09500	0.12000	0.39000	0.19900	0.11600	0.09700	0.00500	0.30500
g	0.06100	0.03900	0.16000	0.05500	0.45500	0.26400	0.05100	0.03200	0.06000	0.24000
h	0.09100	0.11300	0.00800	0.20700	0.30300	0.11200	0.20300	0.18400	0.09200	0.39200
i	0.00300	0.02500	0.09600	0.11900	0.39100	0.20000	0.11500	0.09600	0.00400	0.30400
j	0.04900	0.02700	0.14800	0.06700	0.44300	0.25200	0.06300	0.04400	0.04800	0.25200
k	0.06200	0.04000	0.16100	0.05400	0.45600	0.26500	0.05000	0.03100	0.06100	0.23900
l	0.21900	0.24100	0.12000	0.33500	0.17500	0.01600	0.33100	0.31200	0.22000	0.52000
m	0.02900	0.05100	0.07000	0.14500	0.36500	0.17400	0.14100	0.12200	0.03000	0.33000
n	0.25300	0.23100	0.35200	0.13700	0.64700	0.45600	0.14100	0.16000	0.25200	0.04800
o	0.27700	0.25500	0.37600	0.16100	0.67100	0.48000	0.16500	0.18400	0.27600	0.02400
p	0.02300	0.00100	0.12200	0.09300	0.41700	0.22600	0.08900	0.07000	0.02200	0.27800
q	0.07500	0.05300	0.17400	0.04100	0.46900	0.27800	0.03700	0.01800	0.07400	0.22600
r	0.14600	0.16800	0.04700	0.26200	0.24800	0.05700	0.25800	0.23900	0.14700	0.44700
s	0.03800	0.01600	0.13700	0.07800	0.43200	0.24100	0.07400	0.05500	0.03700	0.26300
t	0.18100	0.15900	0.28000	0.06500	0.57500	0.38400	0.06900	0.08800	0.18000	0.12000
u	-	0.02200	0.09900	0.11600	0.39400	0.20300	0.11200	0.09300	0.00100	0.30100
v	0.02200	-	0.12100	0.09400	0.41600	0.22500	0.09000	0.07100	0.02100	0.27900
w	0.09900	0.12100	-	0.21500	0.29500	0.10400	0.21100	0.19200	0.10000	0.40000
x	0.11600	0.09400	0.21500	-	0.51000	0.31900	0.00400	0.02300	0.11500	0.18500
y	0.39400	0.41600	0.29500	0.51000	-	0.19100	0.50600	0.48700	0.39500	0.69500
z	0.20300	0.22500	0.10400	0.31900	0.19100	-	0.31500	0.29600	0.20400	0.50400
0	0.11200	0.09000	0.21100	0.00400	0.50600	0.31500	-	0.01900	0.11100	0.18900
1	0.09300	0.07100	0.19200	0.02300	0.48700	0.29600	0.01900	-	0.09200	0.20800
2	0.00100	0.02100	0.10000	0.11500	0.39500	0.20400	0.11100	0.09200	-	0.30000
3	0.30100	0.27900	0.40000	0.18500	0.69500	0.50400	0.18900	0.20800	0.30000	-
4	0.14100	0.11900	0.24000	0.02500	0.53500	0.34400	0.02900	0.04800	0.14000	0.16000
5	0.02800	0.00600	0.12700	0.08800	0.42200	0.23100	0.08400	0.06500	0.02700	0.27300
6	0.09100	0.06900	0.19000	0.02500	0.48500	0.29400	0.02100	0.00200	0.09000	0.21000
7	0.04400	0.02200	0.14300	0.07200	0.43800	0.24700	0.06800	0.04900	0.04300	0.25700
8	0.06900	0.04700	0.16800	0.04700	0.46300	0.27200	0.04300	0.02400	0.06800	0.23200
9	0.13700	0.11500	0.23600	0.02100	0.53100	0.34000	0.02500	0.04400	0.13600	0.16400
A	0.10000	0.12200	0.00100	0.21600	0.29400	0.10300	0.21200	0.19300	0.10100	0.40100
B	0.32200	0.30000	0.42100	0.20600	0.71600	0.52500	0.21000	0.22900	0.32100	0.02100
C	0.00100	0.02300	0.09800	0.11700	0.39300	0.20200	0.11300	0.09400	0.00200	0.30200
D	0.00600	0.02800	0.09300	0.12200	0.38800	0.19700	0.11800	0.09900	0.00700	0.30700
E	0.03700	0.01500	0.13600	0.07900	0.43100	0.24000	0.07500	0.05600	0.03600	0.26400
F	0.11000	0.08800	0.20900	0.00600	0.50400	0.31300	0.00200	0.01700	0.10900	0.19100
G	0.07300	0.05100	0.17200	0.04300	0.46700	0.27600	0.03900	0.02000	0.07200	0.22800
H	0.27400	0.25200	0.37300	0.15800	0.66800	0.47700	0.16200	0.18100	0.27300	0.02700
I	0.01700	0.00500	0.11600	0.09900	0.41100	0.22000	0.09500	0.07600	0.01600	0.28400
J	0.14500	0.16700	0.04600	0.26100	0.24900	0.05800	0.25700	0.23800	0.14600	0.44600
K	0.04100	0.01900	0.14000	0.07500	0.43500	0.24400	0.07100	0.05200	0.04000	0.26000
L	0.05700	0.07900	0.04200	0.17300	0.33700	0.14600	0.16900	0.15000	0.05800	0.35800
M	0.08500	0.06300	0.18400	0.03100	0.47900	0.28800	0.02700	0.00800	0.08400	0.21600
N	0.07500	0.09700	0.02400	0.19100	0.31900	0.12800	0.18700	0.16800	0.07600	0.37600

TO: FROM:	4	5	6	7	8	9	A	B	C	D
a	0.03700	0.15000	0.08700	0.13400	0.10900	0.04100	0.27800	0.14400	0.17900	0.18400
b	0.04700	0.06600	0.00300	0.05000	0.02500	0.04300	0.19400	0.22800	0.09500	0.10000
c	0.03000	0.08300	0.02000	0.06700	0.04200	0.02600	0.21100	0.21100	0.11200	0.11700
d	0.18000	0.29300	0.23000	0.27700	0.25200	0.18400	0.42100	0.00100	0.32200	0.32700
e	0.27900	0.16600	0.22900	0.18200	0.20700	0.27500	0.03800	0.46000	0.13700	0.13200
f	0.14500	0.03200	0.09500	0.04800	0.07300	0.14100	0.09600	0.32600	0.00300	0.00200
g	0.08000	0.03300	0.03000	0.01700	0.00800	0.07600	0.16100	0.26100	0.06200	0.06700
h	0.23200	0.11900	0.18200	0.13500	0.16000	0.22800	0.00900	0.41300	0.09000	0.08500
i	0.14400	0.03100	0.09400	0.04700	0.07200	0.14000	0.09700	0.32500	0.00200	0.00300
j	0.09200	0.02100	0.04200	0.00500	0.02000	0.08800	0.14900	0.27300	0.05000	0.05500
k	0.07900	0.03400	0.02900	0.01800	0.00700	0.07500	0.16200	0.26000	0.06300	0.06800
l	0.36000	0.24700	0.31000	0.26300	0.28800	0.35600	0.11900	0.54100	0.21800	0.21300
m	0.17000	0.05700	0.12000	0.07300	0.09800	0.16600	0.07100	0.35100	0.02800	0.02300
n	0.11200	0.22500	0.16200	0.20900	0.18400	0.11600	0.35300	0.06900	0.25400	0.25900
o	0.13600	0.24900	0.18600	0.23300	0.20800	0.14000	0.37700	0.04500	0.27800	0.28300
p	0.11800	0.00500	0.06800	0.02100	0.04600	0.11400	0.12300	0.29900	0.02400	0.02900
q	0.06600	0.04700	0.01600	0.03100	0.00600	0.06200	0.17500	0.24700	0.07600	0.08100
r	0.28700	0.17400	0.23700	0.19000	0.21500	0.28300	0.04600	0.46800	0.14500	0.14000
s	0.10300	0.01000	0.05300	0.00600	0.03100	0.09900	0.13800	0.28400	0.03900	0.04400
t	0.04000	0.15300	0.09000	0.13700	0.11200	0.04400	0.28100	0.14100	0.18200	0.18700
u	0.14100	0.02800	0.09100	0.04400	0.06900	0.13700	0.10000	0.32200	0.00100	0.00600

v	0.11900	0.00600	0.06900	0.02200	0.04700	0.11500	0.12200	0.30000	0.02300	0.02800
w	0.24000	0.12700	0.19000	0.14300	0.16800	0.23600	0.00100	0.42100	0.09800	0.09300
x	0.02500	0.08800	0.02500	0.07200	0.04700	0.02100	0.21600	0.20600	0.11700	0.12200
y	0.53500	0.42200	0.48500	0.43800	0.46300	0.53100	0.29400	0.71600	0.39300	0.38800
z	0.34400	0.23100	0.29400	0.24700	0.27200	0.34000	0.10300	0.52500	0.20200	0.19700
0	0.02900	0.08400	0.02100	0.06800	0.04300	0.02500	0.21200	0.21000	0.11300	0.11800
1	0.04800	0.06500	0.00200	0.04900	0.02400	0.04400	0.19300	0.22900	0.09400	0.09900
2	0.14000	0.02700	0.09000	0.04300	0.06800	0.13600	0.10100	0.32100	0.00200	0.00700
3	0.16000	0.27300	0.21000	0.25700	0.23200	0.16400	0.40100	0.02100	0.30200	0.30700
4	-	0.11300	0.05000	0.09700	0.07200	0.00400	0.24100	0.18100	0.14200	0.14700
5	0.11300	-	0.06300	0.01600	0.04100	0.10900	0.12800	0.29400	0.02900	0.03400
6	0.05000	0.06300	-	0.04700	0.02200	0.04600	0.19100	0.23100	0.09200	0.09700
7	0.09700	0.01600	0.04700	-	0.02500	0.09300	0.14400	0.27800	0.04500	0.05000
8	0.07200	0.04100	0.02200	0.02500	-	0.06800	0.16900	0.25300	0.07000	0.07500
9	0.00400	0.10900	0.04600	0.09300	0.06800	-	0.23700	0.18500	0.13800	0.14300
A	0.24100	0.12800	0.19100	0.14400	0.16900	0.23700	-	0.42200	0.09900	0.09400
B	0.18100	0.29400	0.23100	0.27800	0.25300	0.18500	0.42200	-	0.32300	0.32800
C	0.14200	0.02900	0.09200	0.04500	0.07000	0.13800	0.09900	0.32300	-	0.00500
D	0.14700	0.03400	0.09700	0.05000	0.07500	0.14300	0.09400	0.32800	0.00500	-
E	0.10400	0.00900	0.05400	0.00700	0.03200	0.10000	0.13700	0.28500	0.03800	0.04300
F	0.03100	0.08200	0.01900	0.06600	0.04100	0.02700	0.21000	0.21200	0.11100	0.11600
G	0.06800	0.04500	0.01800	0.02900	0.00400	0.06400	0.17300	0.24900	0.07400	0.07900
H	0.13300	0.24600	0.18300	0.23000	0.20500	0.13700	0.37400	0.04800	0.27500	0.28000
I	0.12400	0.01100	0.07400	0.02700	0.05200	0.12000	0.11700	0.30500	0.01800	0.02300
J	0.28600	0.17300	0.23600	0.18900	0.21400	0.28200	0.04500	0.46700	0.14400	0.13900
K	0.10000	0.01300	0.05000	0.00300	0.02800	0.09600	0.14100	0.28100	0.04200	0.04700
L	0.19800	0.08500	0.14800	0.10100	0.12600	0.19400	0.04300	0.37900	0.05600	0.05100
M	0.05600	0.05700	0.00600	0.04100	0.01600	0.05200	0.18500	0.23700	0.08600	0.09100
N	0.21600	0.10300	0.16600	0.11900	0.14400	0.21200	0.02500	0.39700	0.07400	0.06900

TO:	E	F	G	H	I	J	K	L	M	N
FROM: a	0.14100	0.06800	0.10500	0.09600	0.16100	0.32300	0.13700	0.23500	0.09300	0.25300
b	0.05700	0.01600	0.02100	0.18000	0.07700	0.23900	0.05300	0.15100	0.00900	0.16900
c	0.07400	0.00100	0.03800	0.16300	0.09400	0.25600	0.07000	0.16800	0.02600	0.18600
d	0.28400	0.21100	0.24800	0.04700	0.30400	0.46600	0.28000	0.37800	0.23600	0.39600
e	0.17500	0.24800	0.21100	0.41200	0.15500	0.00700	0.17900	0.08100	0.22300	0.06300
f	0.04100	0.11400	0.07700	0.27800	0.02100	0.14100	0.04500	0.05300	0.08900	0.07100
g	0.02400	0.04900	0.01200	0.21300	0.04400	0.20600	0.02000	0.11800	0.02400	0.13600
h	0.12800	0.20100	0.16400	0.36500	0.10800	0.05400	0.13200	0.03400	0.17600	0.01600
i	0.04000	0.11300	0.07600	0.27700	0.02000	0.14200	0.04400	0.05400	0.08800	0.07200
j	0.01200	0.06100	0.02400	0.22500	0.03200	0.19400	0.00800	0.10600	0.03600	0.12400
k	0.02500	0.04800	0.01100	0.21200	0.04500	0.20700	0.02100	0.11900	0.02300	0.13700
l	0.25600	0.32900	0.29200	0.49300	0.23600	0.07400	0.26000	0.16200	0.30400	0.14400
m	0.06600	0.13900	0.10200	0.30300	0.04600	0.11600	0.07000	0.02800	0.11400	0.04600
n	0.21600	0.14300	0.18000	0.02100	0.23600	0.39800	0.21200	0.31000	0.16800	0.32800
o	0.24000	0.16700	0.20400	0.00300	0.26000	0.42200	0.23600	0.33400	0.19200	0.35200
p	0.01400	0.08700	0.05000	0.25100	0.00600	0.16800	0.01800	0.08000	0.06200	0.09800
q	0.03800	0.03500	0.00200	0.19900	0.05800	0.22000	0.03400	0.13200	0.01000	0.15000
r	0.18300	0.25600	0.21900	0.42000	0.16300	0.00100	0.18700	0.08900	0.23100	0.07100
s	0.00100	0.07200	0.03500	0.23600	0.02100	0.18300	0.00300	0.09500	0.04700	0.11300
t	0.14400	0.07100	0.10800	0.09300	0.16400	0.32600	0.14000	0.23800	0.09600	0.25600
u	0.03700	0.11000	0.07300	0.27400	0.01700	0.14500	0.04100	0.05700	0.08500	0.07500
v	0.01500	0.08800	0.05100	0.25200	0.00500	0.16700	0.01900	0.07900	0.06300	0.09700
w	0.13600	0.20900	0.17200	0.37300	0.11600	0.04600	0.14000	0.04200	0.18400	0.02400
x	0.07900	0.00600	0.04300	0.15800	0.09900	0.26100	0.07500	0.17300	0.03100	0.19100
y	0.43100	0.50400	0.46700	0.66800	0.41100	0.24900	0.43500	0.33700	0.47900	0.31900
z	0.24000	0.31300	0.27600	0.47700	0.22000	0.05800	0.24400	0.14600	0.28800	0.12800
0	0.07500	0.00200	0.03900	0.16200	0.09500	0.25700	0.07100	0.16900	0.02700	0.18700
1	0.05600	0.01700	0.02000	0.18100	0.07600	0.23800	0.05200	0.15000	0.00800	0.16800
2	0.03600	0.10900	0.07200	0.27300	0.01600	0.14600	0.04000	0.05800	0.08400	0.07600
3	0.26400	0.19100	0.22800	0.02700	0.28400	0.44600	0.26000	0.35800	0.21600	0.37600
4	0.10400	0.03100	0.06800	0.13300	0.12400	0.28600	0.10000	0.19800	0.05600	0.21600
5	0.00900	0.08200	0.04500	0.24600	0.01100	0.17300	0.01300	0.08500	0.05700	0.10300
6	0.05400	0.01900	0.01800	0.18300	0.07400	0.23600	0.05000	0.14800	0.00600	0.16600
7	0.00700	0.06600	0.02900	0.23000	0.02700	0.18900	0.00300	0.10100	0.04100	0.11900
8	0.03200	0.04100	0.00400	0.20500	0.05200	0.21400	0.02800	0.12600	0.01600	0.14400
9	0.10000	0.02700	0.06400	0.13700	0.12000	0.28200	0.09600	0.19400	0.05200	0.21200
A	0.13700	0.21000	0.17300	0.37400	0.11700	0.04500	0.14100	0.04300	0.18500	0.02500
B	0.28500	0.21200	0.24900	0.04800	0.30500	0.46700	0.28100	0.37900	0.23700	0.39700
C	0.03800	0.11100	0.07400	0.27500	0.01800	0.14400	0.04200	0.05600	0.08600	0.07400
D	0.04300	0.11600	0.07900	0.28000	0.02300	0.13900	0.04700	0.05100	0.09100	0.06900
E	-	0.07300	0.03600	0.23700	0.02000	0.18200	0.00400	0.09400	0.04800	0.11200
F	0.07300	-	0.03700	0.16400	0.09300	0.25500	0.06900	0.16700	0.02500	0.18500
G	0.03600	0.03700	-	0.20100	0.05600	0.21800	0.03200	0.13000	0.01200	0.14800
H	0.23700	0.16400	0.20100	-	0.25700	0.41900	0.23300	0.33100	0.18900	0.34900
I	0.02000	0.09300	0.05600	0.25700	-	0.16200	0.02400	0.07400	0.06800	0.09200
J	0.18200	0.25500	0.21800	0.41900	0.16200	-	0.18600	0.08800	0.23000	0.07000

K	0.00400	0.06900	0.03200	0.23300	0.02400	0.18600	-	0.09800	0.04400	0.11600
L	0.09400	0.16700	0.13000	0.33100	0.07400	0.08800	0.09800	-	0.14200	0.01800
M	0.04800	0.02500	0.01200	0.18900	0.06800	0.23000	0.04400	0.14200	-	0.16000
N	0.11200	0.18500	0.14800	0.34900	0.09200	0.07000	0.11600	0.01800	0.16000	-

Stepmatrix "TAIL LENGTH/TOTAL LENGTH MALES" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.24000	0.16000	0.28000	0.44000	0.08000	0.48000	0.40000	0.60000	0.56000
b	0.24000	-	0.08000	0.04000	0.20000	0.32000	0.24000	0.16000	0.36000	0.32000
c	0.16000	0.08000	-	0.12000	0.28000	0.24000	0.32000	0.24000	0.44000	0.40000
d	0.28000	0.04000	0.12000	-	0.16000	0.36000	0.20000	0.12000	0.32000	0.28000
e	0.44000	0.20000	0.28000	0.16000	-	0.52000	0.04000	0.04000	0.16000	0.12000
f	0.08000	0.32000	0.24000	0.36000	0.52000	-	0.56000	0.48000	0.68000	0.64000
g	0.48000	0.24000	0.32000	0.20000	0.04000	0.56000	-	0.08000	0.12000	0.08000
h	0.40000	0.16000	0.24000	0.12000	0.04000	0.48000	0.08000	-	0.20000	0.16000
i	0.60000	0.36000	0.44000	0.32000	0.16000	0.68000	0.12000	0.20000	-	0.04000
j	0.56000	0.32000	0.40000	0.28000	0.12000	0.64000	0.08000	0.16000	0.04000	-
k	0.20000	0.04000	0.04000	0.08000	0.24000	0.28000	0.28000	0.20000	0.40000	0.36000
l	0.12000	0.12000	0.04000	0.16000	0.32000	0.20000	0.36000	0.28000	0.48000	0.44000
m	0.08000	0.16000	0.08000	0.20000	0.36000	0.16000	0.40000	0.32000	0.52000	0.48000
n	0.04000	0.28000	0.20000	0.32000	0.48000	0.04000	0.52000	0.44000	0.64000	0.60000
o	0.04000	0.20000	0.12000	0.24000	0.40000	0.12000	0.44000	0.36000	0.56000	0.52000
p	0.76000	0.52000	0.60000	0.48000	0.32000	0.84000	0.28000	0.36000	0.16000	0.20000

TO:	k	l	m	n	o	p
FROM: a	0.20000	0.12000	0.08000	0.04000	0.04000	0.76000
b	0.04000	0.12000	0.16000	0.28000	0.20000	0.52000
c	0.04000	0.04000	0.08000	0.20000	0.12000	0.60000
d	0.08000	0.16000	0.20000	0.32000	0.24000	0.48000
e	0.24000	0.32000	0.36000	0.48000	0.40000	0.32000
f	0.28000	0.20000	0.16000	0.04000	0.12000	0.84000
g	0.28000	0.36000	0.40000	0.52000	0.44000	0.28000
h	0.20000	0.28000	0.32000	0.44000	0.36000	0.36000
i	0.40000	0.48000	0.52000	0.64000	0.56000	0.16000
j	0.36000	0.44000	0.48000	0.60000	0.52000	0.20000
k	-	0.08000	0.12000	0.24000	0.16000	0.56000
l	0.08000	-	0.04000	0.16000	0.08000	0.64000
m	0.12000	0.04000	-	0.12000	0.04000	0.68000
n	0.24000	0.16000	0.12000	-	0.08000	0.80000
o	0.16000	0.08000	0.04000	0.08000	-	0.72000
p	0.56000	0.64000	0.68000	0.80000	0.72000	-

Stepmatrix "TAIL LENGTH/TOTAL LENGTH FEMALE" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.26900	0.19200	0.30800	0.38400	0.03900	0.46100	0.15400	0.42300	0.23100
b	0.26900	-	0.07700	0.03900	0.11500	0.30800	0.19200	0.11500	0.15400	0.03800
c	0.19200	0.07700	-	0.11600	0.19200	0.23100	0.26900	0.03800	0.23100	0.03900
d	0.30800	0.03900	0.11600	-	0.07600	0.34700	0.15300	0.15400	0.11500	0.07700
e	0.38400	0.11500	0.19200	0.07600	-	0.42300	0.07700	0.23000	0.03900	0.15300
f	0.03900	0.30800	0.23100	0.34700	0.42300	-	0.50000	0.19300	0.46200	0.27000
g	0.46100	0.19200	0.26900	0.15300	0.07700	0.50000	-	0.30700	0.03800	0.23000
h	0.15400	0.11500	0.03800	0.15400	0.23000	0.19300	0.30700	-	0.26900	0.07700
i	0.42300	0.15400	0.23100	0.11500	0.03900	0.46200	0.03800	0.26900	-	0.19200
j	0.23100	0.03800	0.03900	0.07700	0.15300	0.27000	0.23000	0.07700	0.19200	-
k	0.53800	0.26900	0.34600	0.23000	0.15400	0.57700	0.07700	0.38400	0.11500	0.30700
l	0.07700	0.19200	0.11500	0.23100	0.30700	0.11600	0.38400	0.07700	0.34600	0.15400
m	0.34600	0.07700	0.15400	0.03800	0.03800	0.38500	0.11500	0.19200	0.07700	0.11500
n	0.03800	0.23100	0.15400	0.27000	0.34600	0.07700	0.42300	0.11600	0.38500	0.19300
o	0.11500	0.15400	0.07700	0.19300	0.26900	0.15400	0.34600	0.03900	0.30800	0.11600
p	0.11600	0.38500	0.30800	0.42400	0.50000	0.07700	0.57700	0.27000	0.53900	0.34700
q	0.07700	0.34600	0.26900	0.38500	0.46100	0.03800	0.53800	0.23100	0.50000	0.30800
r	0.57700	0.30800	0.38500	0.26900	0.19300	0.61600	0.11600	0.42300	0.15400	0.34600
s	0.65400	0.38500	0.46200	0.34600	0.27000	0.69300	0.19300	0.50000	0.23100	0.42300
t	0.76900	0.50000	0.57700	0.46100	0.38500	0.80800	0.30800	0.61500	0.34600	0.53800

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.53800	0.07700	0.34600	0.03800	0.11500	0.11600	0.07700	0.57700	0.65400	0.76900
b	0.26900	0.19200	0.07700	0.23100	0.15400	0.38500	0.34600	0.30800	0.38500	0.50000
c	0.34600	0.11500	0.15400	0.15400	0.07700	0.30800	0.26900	0.38500	0.46200	0.57700
d	0.23000	0.23100	0.03800	0.27000	0.19300	0.42400	0.38500	0.26900	0.34600	0.46100
e	0.15400	0.30700	0.03800	0.34600	0.26900	0.50000	0.46100	0.19300	0.27000	0.38500
f	0.57700	0.11600	0.38500	0.07700	0.15400	0.07700	0.03800	0.61600	0.69300	0.80800
g	0.07700	0.38400	0.11500	0.42300	0.34600	0.57700	0.53800	0.11600	0.19300	0.30800

h	0.38400	0.07700	0.19200	0.11600	0.03900	0.27000	0.23100	0.42300	0.50000	0.61500
i	0.11500	0.34600	0.07700	0.38500	0.30800	0.53900	0.50000	0.15400	0.23100	0.34600
j	0.30700	0.15400	0.11500	0.19300	0.11600	0.34700	0.30800	0.34600	0.42300	0.53800
k	-	0.46100	0.19200	0.50000	0.42300	0.65400	0.61500	0.03900	0.11600	0.23100
l	0.46100	-	0.26900	0.03900	0.03800	0.19300	0.15400	0.50000	0.57700	0.69200
m	0.19200	0.26900	-	0.30800	0.23100	0.46200	0.42300	0.23100	0.30800	0.42300
n	0.50000	0.03900	0.30800	-	0.07700	0.15400	0.11500	0.53900	0.61600	0.73100
o	0.42300	0.03800	0.23100	0.07700	-	0.23100	0.19200	0.46200	0.53900	0.65400
p	0.65400	0.19300	0.46200	0.15400	0.23100	-	0.03900	0.69300	0.77000	0.88500
q	0.61500	0.15400	0.42300	0.11500	0.19200	0.03900	-	0.65400	0.73100	0.84600
r	0.03900	0.50000	0.23100	0.53900	0.46200	0.69300	0.65400	-	0.07700	0.19200
s	0.11600	0.57700	0.30800	0.61600	0.53900	0.77000	0.73100	0.07700	-	0.11500
t	0.23100	0.69200	0.42300	0.73100	0.65400	0.88500	0.84600	0.19200	0.11500	-

Stepmatrix "HIND LIMB LENGTH/SVL" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.07800	0.04400	0.08900	0.07200	0.06700	0.01600	0.09400	0.06100	0.10500
b	0.07800	-	0.03400	0.01100	0.00600	0.01100	0.09400	0.01600	0.01700	0.02700
c	0.04400	0.03400	-	0.04500	0.02800	0.02300	0.06000	0.05000	0.01700	0.06100
d	0.08900	0.01100	0.04500	-	0.01700	0.02200	0.10500	0.00500	0.02800	0.01600
e	0.07200	0.00600	0.02800	0.01700	-	0.00500	0.08800	0.02200	0.01100	0.03300
f	0.06700	0.01100	0.02300	0.02200	0.00500	-	0.08300	0.02700	0.00600	0.03800
g	0.01600	0.09400	0.06000	0.10500	0.08800	0.08300	-	0.11000	0.07700	0.12100
h	0.09400	0.01600	0.05000	0.00500	0.02200	0.02700	0.11000	-	0.03300	0.01100
i	0.06100	0.01700	0.01700	0.02800	0.01100	0.00600	0.07700	0.03300	-	0.04400
j	0.10500	0.02700	0.06100	0.01600	0.03300	0.03800	0.12100	0.01100	0.04400	-
k	0.12700	0.04900	0.08300	0.03800	0.05500	0.06000	0.14300	0.03300	0.06600	0.02200
l	0.05000	0.12800	0.09400	0.13900	0.12200	0.11700	0.03400	0.14400	0.11100	0.15500
m	0.08300	0.00500	0.03900	0.00600	0.01100	0.01600	0.09900	0.01100	0.02200	0.02200
n	0.11000	0.18800	0.15400	0.19900	0.18200	0.17700	0.09400	0.20400	0.17100	0.21500
o	0.01700	0.06100	0.02700	0.07200	0.05500	0.05000	0.03300	0.07700	0.04400	0.08800
p	0.02200	0.05600	0.02200	0.06700	0.05000	0.04500	0.03800	0.07200	0.03900	0.08300
q	0.03800	0.11600	0.08200	0.12700	0.11000	0.10500	0.02200	0.13200	0.09900	0.14300
r	0.12200	0.04400	0.07800	0.03300	0.05000	0.05500	0.13800	0.02800	0.06100	0.01700
s	0.03300	0.04500	0.01100	0.05600	0.03900	0.03400	0.04900	0.06100	0.02800	0.07200
t	0.13300	0.05500	0.08900	0.04400	0.06100	0.06600	0.14900	0.03900	0.07200	0.02800
u	0.03300	0.11100	0.07700	0.12200	0.10500	0.10000	0.01700	0.12700	0.09400	0.13800
v	0.01100	0.08900	0.05500	0.10000	0.08300	0.07800	0.00500	0.10500	0.07200	0.11600
w	0.05000	0.02800	0.00600	0.03900	0.02200	0.01700	0.06600	0.04400	0.01100	0.05500
x	0.11100	0.03300	0.06700	0.02200	0.03900	0.04400	0.12700	0.01700	0.05000	0.00600
y	0.05500	0.13300	0.09900	0.14400	0.12700	0.12200	0.03900	0.14900	0.11600	0.16000
z	0.11600	0.03800	0.07200	0.02700	0.04400	0.04900	0.13200	0.02200	0.05500	0.01100

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.12700	0.05000	0.08300	0.11000	0.01700	0.02200	0.03800	0.12200	0.03300	0.13300
b	0.04900	0.12800	0.00500	0.18800	0.06100	0.05600	0.11600	0.04400	0.04500	0.05500
c	0.08300	0.09400	0.03900	0.15400	0.02700	0.02200	0.08200	0.07800	0.01100	0.08900
d	0.03800	0.13900	0.00600	0.19900	0.07200	0.06700	0.12700	0.03300	0.05600	0.04400
e	0.05500	0.12200	0.01100	0.18200	0.05500	0.05000	0.11000	0.05000	0.03900	0.06100
f	0.06000	0.11700	0.01600	0.17700	0.05000	0.04500	0.10500	0.05500	0.03400	0.06600
g	0.14300	0.03400	0.09900	0.09400	0.03300	0.03800	0.02200	0.13800	0.04900	0.14900
h	0.03300	0.14400	0.01100	0.20400	0.07700	0.07200	0.13200	0.02800	0.06100	0.03900
i	0.06600	0.11100	0.02200	0.17100	0.04400	0.03900	0.09900	0.06100	0.02800	0.07200
j	0.02200	0.15500	0.02200	0.21500	0.08800	0.08300	0.14300	0.01700	0.07200	0.02800
k	-	0.17700	0.04400	0.23700	0.11000	0.10500	0.16500	0.00500	0.09400	0.00600
l	0.17700	-	0.13300	0.06000	0.06700	0.07200	0.01200	0.17200	0.08300	0.18300
m	0.04400	0.13300	-	0.19300	0.06600	0.06100	0.12100	0.03900	0.05000	0.05000
n	0.23700	0.06000	0.19300	-	0.12700	0.13200	0.07200	0.23200	0.14300	0.24300
o	0.11000	0.06700	0.06600	0.12700	-	0.00500	0.05500	0.10500	0.01600	0.11600
p	0.10500	0.07200	0.06100	0.13200	0.00500	-	0.06000	0.10000	0.01100	0.11100
q	0.16500	0.01200	0.12100	0.07200	0.05500	0.06000	-	0.16000	0.07100	0.17100
r	0.00500	0.17200	0.03900	0.23200	0.10500	0.10000	0.16000	-	0.08900	0.01100
s	0.09400	0.08300	0.05000	0.14300	0.01600	0.01100	0.07100	0.08900	-	0.10000
t	0.00600	0.18300	0.05000	0.24300	0.11600	0.11100	0.17100	0.01100	0.10000	-
u	0.16000	0.01700	0.11600	0.07700	0.05000	0.05500	0.00500	0.15500	0.06600	0.16600
v	0.13800	0.03900	0.09400	0.09900	0.02800	0.03300	0.02700	0.13300	0.04400	0.14400
w	0.07700	0.10000	0.03300	0.16000	0.03300	0.02800	0.08800	0.07200	0.01700	0.08300
x	0.01600	0.16100	0.02800	0.22100	0.09400	0.08900	0.14900	0.01100	0.07800	0.02200
y	0.18200	0.00500	0.13800	0.05500	0.07200	0.07700	0.01700	0.17700	0.08800	0.18800
z	0.01100	0.16600	0.03300	0.22600	0.09900	0.09400	0.15400	0.00600	0.08300	0.01700

TO:	u	v	w	x	y	z
FROM: a	0.03300	0.01100	0.05000	0.11100	0.05500	0.11600
b	0.11100	0.08900	0.02800	0.03300	0.13300	0.03800
c	0.07700	0.05500	0.00600	0.06700	0.09900	0.07200

d	0.12200	0.10000	0.03900	0.02200	0.14400	0.02700
e	0.10500	0.08300	0.02200	0.03900	0.12700	0.04400
f	0.10000	0.07800	0.01700	0.04400	0.12200	0.04900
g	0.01700	0.00500	0.06600	0.12700	0.03900	0.13200
h	0.12700	0.10500	0.04400	0.01700	0.14900	0.02200
i	0.09400	0.07200	0.01100	0.05000	0.11600	0.05500
j	0.13800	0.11600	0.05500	0.00600	0.16000	0.01100
k	0.16000	0.13800	0.07700	0.01600	0.18200	0.01100
l	0.01700	0.03900	0.10000	0.16100	0.00500	0.16600
m	0.11600	0.09400	0.03300	0.02800	0.13800	0.03300
n	0.07700	0.09900	0.16000	0.22100	0.05500	0.22600
o	0.05000	0.02800	0.03300	0.09400	0.07200	0.09900
p	0.05500	0.03300	0.02800	0.08900	0.07700	0.09400
q	0.00500	0.02700	0.08800	0.14900	0.01700	0.15400
r	0.15500	0.13300	0.07200	0.01100	0.17700	0.00600
s	0.06600	0.04400	0.01700	0.07800	0.08800	0.08300
t	0.16600	0.14400	0.08300	0.02200	0.18800	0.01700
u	-	0.02200	0.08300	0.14400	0.02200	0.14900
v	0.02200	-	0.06100	0.12200	0.04400	0.12700
w	0.08300	0.06100	-	0.06100	0.10500	0.06600
x	0.14400	0.12200	0.06100	-	0.16600	0.00500
y	0.02200	0.04400	0.10500	0.16600	-	0.17100
z	0.14900	0.12700	0.06600	0.00500	0.17100	-

Stepmatrix "FORELIMB LENGTH/SVL" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.22600	0.16200	0.25800	0.09700	0.06500	0.03300	0.38700	0.19400	0.35500
b	0.22600	-	0.06400	0.03200	0.12900	0.16100	0.19300	0.16100	0.03200	0.12900
c	0.16200	0.06400	-	0.09600	0.06500	0.09700	0.12900	0.22500	0.03200	0.19300
d	0.25800	0.03200	0.09600	-	0.16100	0.19300	0.22500	0.12900	0.06400	0.09700
e	0.09700	0.12900	0.06500	0.16100	-	0.03200	0.06400	0.29000	0.09700	0.25800
f	0.06500	0.16100	0.09700	0.19300	0.03200	-	0.03200	0.32200	0.12900	0.29000
g	0.03300	0.19300	0.12900	0.22500	0.06400	0.03200	-	0.35400	0.16100	0.32200
h	0.38700	0.16100	0.22500	0.12900	0.29000	0.32200	0.35400	-	0.19300	0.03200
i	0.19400	0.03200	0.03200	0.06400	0.09700	0.12900	0.16100	0.19300	-	0.16100
j	0.35500	0.12900	0.19300	0.09700	0.25800	0.29000	0.32200	0.03200	0.16100	-
k	0.03200	0.25800	0.19400	0.29000	0.12900	0.09700	0.06500	0.41900	0.22600	0.38700
l	0.12900	0.35500	0.29100	0.38700	0.22600	0.19400	0.16200	0.51600	0.32300	0.48400
m	0.12900	0.09700	0.03300	0.12900	0.03200	0.06400	0.09600	0.25800	0.06500	0.22600
n	0.06400	0.29000	0.22600	0.32200	0.16100	0.12900	0.09700	0.45100	0.25800	0.41900
o	0.25800	0.48400	0.42000	0.51600	0.35500	0.32300	0.29100	0.64500	0.45200	0.61300

TO:	k	l	m	n	o
FROM: a	0.03200	0.12900	0.12900	0.06400	0.25800
b	0.25800	0.35500	0.09700	0.29000	0.48400
c	0.19400	0.29100	0.03300	0.22600	0.42000
d	0.29000	0.38700	0.12900	0.32200	0.51600
e	0.12900	0.22600	0.03200	0.16100	0.35500
f	0.09700	0.19400	0.06400	0.12900	0.32300
g	0.06500	0.16200	0.09600	0.09700	0.29100
h	0.41900	0.51600	0.25800	0.45100	0.64500
i	0.22600	0.32300	0.06500	0.25800	0.45200
j	0.38700	0.48400	0.22600	0.41900	0.61300
k	-	0.09700	0.16100	0.03200	0.22600
l	0.09700	-	0.25800	0.06500	0.12900
m	0.16100	0.25800	-	0.19300	0.38700
n	0.03200	0.06500	0.19300	-	0.19400
o	0.22600	0.12900	0.38700	0.19400	-

Stepmatrix "HEAD LENGTH/SVL" (symmetric):

TO:	a	b	c	d	e	f	g
FROM: a	-	0.05900	0.11800	0.05900	0.11800	0.29400	0.17700
b	0.05900	-	0.05900	0.11800	0.17700	0.35300	0.11800
c	0.11800	0.05900	-	0.17700	0.23600	0.41200	0.05900
d	0.05900	0.11800	0.17700	-	0.05900	0.23500	0.23600
e	0.11800	0.17700	0.23600	0.05900	-	0.17600	0.29500
f	0.29400	0.35300	0.41200	0.23500	0.17600	-	0.47100
g	0.17700	0.11800	0.05900	0.23600	0.29500	0.47100	-

Stepmatrix "HEAD HEIGHT/HEAD LENGTH" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j

FROM: a	-	0.04500	0.06700	0.10000	0.12300	0.08900	0.15600	0.11200	0.02300	0.05600
b	0.04500	-	0.02200	0.05500	0.07800	0.04400	0.11100	0.06700	0.02200	0.01100
c	0.06700	0.02200	-	0.03300	0.05600	0.02200	0.08900	0.04500	0.04400	0.01100
d	0.10000	0.05500	0.03300	-	0.02300	0.01100	0.05600	0.01200	0.07700	0.04400
e	0.12300	0.07800	0.05600	0.02300	-	0.03400	0.03300	0.01100	0.10000	0.06700
f	0.08900	0.04400	0.02200	0.01100	0.03400	-	0.06700	0.02300	0.06600	0.03300
g	0.15600	0.11100	0.08900	0.05600	0.03300	0.06700	-	0.04400	0.13300	0.10000
h	0.11200	0.06700	0.04500	0.01200	0.01100	0.02300	0.04400	-	0.08900	0.05600
i	0.02300	0.02200	0.04400	0.07700	0.10000	0.06600	0.13300	0.08900	-	0.03300
j	0.05600	0.01100	0.01100	0.04400	0.06700	0.03300	0.10000	0.05600	0.03300	-
k	0.07800	0.03300	0.01100	0.02200	0.04500	0.01100	0.07800	0.03400	0.05500	0.02200
l	0.13400	0.08900	0.06700	0.03400	0.01100	0.04500	0.02200	0.02200	0.11100	0.07800
m	0.14500	0.10000	0.07800	0.04500	0.02200	0.05600	0.01100	0.03300	0.12200	0.08900
n	0.03400	0.01100	0.03300	0.06600	0.08900	0.05500	0.12200	0.07800	0.01100	0.02200
o	0.17800	0.13300	0.11100	0.07800	0.05500	0.08900	0.02200	0.06600	0.15500	0.12200

TO:	k	l	m	n	o
FROM: a	0.07800	0.13400	0.14500	0.03400	0.17800
b	0.03300	0.08900	0.10000	0.01100	0.13300
c	0.01100	0.06700	0.07800	0.03300	0.11100
d	0.02200	0.03400	0.04500	0.06600	0.07800
e	0.04500	0.01100	0.02200	0.08900	0.05500
f	0.01100	0.04500	0.05600	0.05500	0.08900
g	0.07800	0.02200	0.01100	0.12200	0.02200
h	0.03400	0.02200	0.03300	0.07800	0.06600
i	0.05500	0.11100	0.12200	0.01100	0.15500
j	0.02200	0.07800	0.08900	0.02200	0.12200
k	-	0.05600	0.06700	0.04400	0.10000
l	0.05600	-	0.01100	0.10000	0.04400
m	0.06700	0.01100	-	0.11100	0.03300
n	0.04400	0.10000	0.11100	-	0.14400
o	0.10000	0.04400	0.03300	0.14400	-

Stepmatrix "PINEAL SCALE ORGAN" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.75700	0.88900	1.00000	0.05000	0.96700	0.24100	0.91900	0.16000	0.90900
b	0.75700	-	0.13200	0.24300	0.70700	0.21000	0.51600	0.16200	0.59700	0.15200
c	0.88900	0.13200	-	0.11100	0.83900	0.07800	0.64800	0.03000	0.72900	0.02000
d	1.00000	0.24300	0.11100	-	0.95000	0.03300	0.75900	0.08100	0.84000	0.09100
e	0.05000	0.70700	0.83900	0.95000	-	0.91700	0.19100	0.86900	0.11000	0.85900
f	0.96700	0.21000	0.07800	0.03300	0.91700	-	0.72600	0.04800	0.80700	0.05800
g	0.24100	0.51600	0.64800	0.75900	0.19100	0.72600	-	0.67800	0.08100	0.66800
h	0.91900	0.16200	0.03000	0.08100	0.86900	0.04800	0.67800	-	0.75900	0.01000
i	0.16000	0.59700	0.72900	0.84000	0.11000	0.80700	0.08100	0.75900	-	0.74900
j	0.90900	0.15200	0.02000	0.09100	0.85900	0.05800	0.66800	0.01000	0.74900	-
k	0.85700	0.10000	0.03200	0.14300	0.80700	0.11000	0.61600	0.06200	0.69700	0.05200
l	0.03000	0.72700	0.85900	0.97000	0.02000	0.93700	0.21100	0.88900	0.13000	0.87900
m	0.78400	0.02700	0.10500	0.21600	0.73400	0.18300	0.54300	0.13500	0.62400	0.12500
n	0.03100	0.72600	0.85800	0.96900	0.01900	0.93600	0.21000	0.88800	0.12900	0.87800
o	0.95300	0.19600	0.06400	0.04700	0.90300	0.01400	0.71200	0.03400	0.79300	0.04400
p	0.94400	0.18700	0.05500	0.05600	0.89400	0.02300	0.70300	0.02500	0.78400	0.03500
q	0.97100	0.21400	0.08200	0.02900	0.92100	0.00400	0.73000	0.05200	0.81100	0.06200
r	0.76000	0.00300	0.12900	0.24000	0.71000	0.20700	0.51900	0.15900	0.60000	0.14900

TO:	k	l	m	n	o	p	q	r
FROM: a	0.85700	0.03000	0.78400	0.03100	0.95300	0.94400	0.97100	0.76000
b	0.10000	0.72700	0.02700	0.72600	0.19600	0.18700	0.21400	0.00300
c	0.03200	0.85900	0.10500	0.85800	0.06400	0.05500	0.08200	0.12900
d	0.14300	0.97000	0.21600	0.96900	0.04700	0.05600	0.02900	0.24000
e	0.80700	0.02000	0.73400	0.01900	0.90300	0.89400	0.92100	0.71000
f	0.11000	0.93700	0.18300	0.93600	0.01400	0.02300	0.00400	0.20700
g	0.61600	0.21100	0.54300	0.21000	0.71200	0.70300	0.73000	0.51900
h	0.06200	0.88900	0.13500	0.88800	0.03400	0.02500	0.05200	0.15900
i	0.69700	0.13000	0.62400	0.12900	0.79300	0.78400	0.81100	0.60000
j	0.05200	0.87900	0.12500	0.87800	0.04400	0.03500	0.06200	0.14900
k	-	0.82700	0.07300	0.82600	0.09600	0.08700	0.11400	0.09700
l	0.82700	-	0.75400	0.00100	0.92300	0.91400	0.94100	0.73000
m	0.07300	0.75400	-	0.75300	0.16900	0.16000	0.18700	0.02400
n	0.82600	0.00100	0.75300	-	0.92200	0.91300	0.94000	0.72900
o	0.09600	0.92300	0.16900	0.92200	-	0.00900	0.01800	0.19300
p	0.08700	0.91400	0.16000	0.91300	0.00900	-	0.02700	0.18400
q	0.11400	0.94100	0.18700	0.94000	0.01800	0.02700	-	0.21100
r	0.09700	0.73000	0.02400	0.72900	0.19300	0.18400	0.21100	-

Stepmatrix "SUBNASAL-POSTROSTRAL CONTACT" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.03000	0.03300	0.01000	0.40000	0.09700	0.89000	0.07400	0.06300	0.05000
b	0.03000	-	0.00300	0.02000	0.37000	0.06700	0.86000	0.04400	0.03300	0.02000
c	0.03300	0.00300	-	0.02300	0.36700	0.06400	0.85700	0.04100	0.03000	0.01700
d	0.01000	0.02000	0.02300	-	0.39000	0.08700	0.88000	0.06400	0.05300	0.04000
e	0.40000	0.37000	0.36700	0.39000	-	0.30300	0.49000	0.32600	0.33700	0.35000
f	0.09700	0.06700	0.06400	0.08700	0.30300	-	0.79300	0.02300	0.03400	0.04700
g	0.89000	0.86000	0.85700	0.88000	0.49000	0.79300	-	0.81600	0.82700	0.84000
h	0.07400	0.04400	0.04100	0.06400	0.32600	0.02300	0.81600	-	0.01100	0.02400
i	0.06300	0.03300	0.03000	0.05300	0.33700	0.03400	0.82700	0.01100	-	0.01300
j	0.05000	0.02000	0.01700	0.04000	0.35000	0.04700	0.84000	0.02400	0.01300	-
k	0.94000	0.91000	0.90700	0.93000	0.54000	0.84300	0.05000	0.86600	0.87700	0.89000
l	0.13300	0.10300	0.10000	0.12300	0.26700	0.03600	0.75700	0.05900	0.07000	0.08300
m	0.11100	0.08100	0.07800	0.10100	0.28900	0.01400	0.77900	0.03700	0.04800	0.06100
n	0.07200	0.04200	0.03900	0.06200	0.32800	0.02500	0.81800	0.00200	0.00900	0.02200
o	0.01300	0.01700	0.02000	0.00300	0.38700	0.08400	0.87700	0.06100	0.05000	0.03700

TO:	k	l	m	n	o
FROM: a	0.94000	0.13300	0.11100	0.07200	0.01300
b	0.91000	0.10300	0.08100	0.04200	0.01700
c	0.90700	0.10000	0.07800	0.03900	0.02000
d	0.93000	0.12300	0.10100	0.06200	0.00300
e	0.54000	0.26700	0.28900	0.32800	0.38700
f	0.84300	0.03600	0.01400	0.02500	0.08400
g	0.05000	0.75700	0.77900	0.81800	0.87700
h	0.86600	0.05900	0.03700	0.00200	0.06100
i	0.87700	0.07000	0.04800	0.00900	0.05000
j	0.89000	0.08300	0.06100	0.02200	0.03700
k	-	0.80700	0.82900	0.86800	0.92700
l	0.80700	-	0.02200	0.06100	0.12000
m	0.82900	0.02200	-	0.03900	0.09800
n	0.86800	0.06100	0.03900	-	0.05900
o	0.92700	0.12000	0.09800	0.05900	-

Stepmatrix "ROSTRAL-NASAL CONTACT" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.18900	0.19100	0.05200	0.21800	0.12800	0.10200	0.16800	0.11600	0.11900
b	0.18900	-	0.00200	0.13700	0.02900	0.06100	0.29100	0.02100	0.07300	0.07000
c	0.19100	0.00200	-	0.13900	0.02700	0.06300	0.29300	0.02300	0.07500	0.07200
d	0.05200	0.13700	0.13900	-	0.16600	0.07600	0.15400	0.11600	0.06400	0.06700
e	0.21800	0.02900	0.02700	0.16600	-	0.09000	0.32000	0.05000	0.10200	0.09900
f	0.12800	0.06100	0.06300	0.07600	0.09000	-	0.23000	0.04000	0.01200	0.00900
g	0.10200	0.29100	0.29300	0.15400	0.32000	0.23000	-	0.27000	0.21800	0.22100
h	0.16800	0.02100	0.02300	0.11600	0.05000	0.04000	0.27000	-	0.05200	0.04900
i	0.11600	0.07300	0.07500	0.06400	0.10200	0.01200	0.21800	0.05200	-	0.00300
j	0.11900	0.07000	0.07200	0.06700	0.09900	0.00900	0.22100	0.04900	0.00300	-
k	0.18800	0.00100	0.00300	0.13600	0.03000	0.06000	0.29000	0.02000	0.07200	0.06900
l	0.16900	0.02000	0.02200	0.11700	0.04900	0.04100	0.27100	0.00100	0.05300	0.05000
m	0.11100	0.07800	0.08000	0.05900	0.10700	0.01700	0.21300	0.05700	0.00500	0.00800
n	0.19300	0.00400	0.00200	0.14100	0.02500	0.06500	0.29500	0.02500	0.07700	0.07400
o	0.78200	0.97100	0.97300	0.83400	1.00000	0.91000	0.68000	0.95000	0.89800	0.90100
p	0.17200	0.01700	0.01900	0.12000	0.04600	0.04400	0.27400	0.00400	0.05600	0.05300
q	0.11500	0.30400	0.30600	0.16700	0.33300	0.24300	0.01300	0.28300	0.23100	0.23400
r	0.03100	0.22000	0.22200	0.08300	0.24900	0.15900	0.07100	0.19900	0.14700	0.15000
s	0.14800	0.04100	0.04300	0.09600	0.07000	0.02000	0.25000	0.02000	0.03200	0.02900
t	0.03200	0.22100	0.22300	0.08400	0.25000	0.16000	0.07000	0.20000	0.14800	0.15100

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.18800	0.16900	0.11100	0.19300	0.78200	0.17200	0.11500	0.03100	0.14800	0.03200
b	0.00100	0.02000	0.07800	0.00400	0.97100	0.01700	0.30400	0.22000	0.04100	0.22100
c	0.00300	0.02200	0.08000	0.00200	0.97300	0.01900	0.30600	0.22200	0.04300	0.22300
d	0.13600	0.11700	0.05900	0.14100	0.83400	0.12000	0.16700	0.08300	0.09600	0.08400
e	0.03000	0.04900	0.10700	0.02500	1.00000	0.04600	0.33300	0.24900	0.07000	0.25000
f	0.06000	0.04100	0.01700	0.06500	0.91000	0.04400	0.24300	0.15900	0.02000	0.16000
g	0.29000	0.27100	0.21300	0.29500	0.68000	0.27400	0.01300	0.07100	0.25000	0.07000
h	0.02000	0.00100	0.05700	0.02500	0.95000	0.00400	0.28300	0.19900	0.02000	0.20000
i	0.07200	0.05300	0.00500	0.07700	0.89800	0.05600	0.23100	0.14700	0.03200	0.14800
j	0.06900	0.05000	0.00800	0.07400	0.90100	0.05300	0.23400	0.15000	0.02900	0.15100
k	-	0.01900	0.07700	0.00500	0.97000	0.01600	0.30300	0.21900	0.04000	0.22000
l	0.01900	-	0.05800	0.02400	0.95100	0.00300	0.28400	0.20000	0.02100	0.20100
m	0.07700	0.05800	-	0.08200	0.89300	0.06100	0.22600	0.14200	0.03700	0.14300
n	0.00500	0.02400	0.08200	-	0.97500	0.02100	0.30800	0.22400	0.04500	0.22500
o	0.97000	0.95100	0.89300	0.97500	-	0.95400	0.66700	0.75100	0.93000	0.75000

p	0.01600	0.00300	0.06100	0.02100	0.95400	-	0.28700	0.20300	0.02400	0.20400
q	0.30300	0.28400	0.22600	0.30800	0.66700	0.28700	-	0.08400	0.26300	0.08300
r	0.21900	0.20000	0.14200	0.22400	0.75100	0.20300	0.08400	-	0.17900	0.00100
s	0.04000	0.02100	0.03700	0.04500	0.93000	0.02400	0.26300	0.17900	-	0.18000
t	0.22000	0.20100	0.14300	0.22500	0.75000	0.20400	0.08300	0.00100	0.18000	-

Stepmatrix "3rd SUBLABIAL-2nd INFRALABIAL C" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	1.00000	0.94400	0.94000	0.36400	0.43400	0.90400	0.16000	0.95000	0.97500
b	1.00000	-	0.05600	0.06000	0.63600	0.56600	0.09600	0.84000	0.05000	0.02500
c	0.94400	0.05600	-	0.00400	0.58000	0.51000	0.04000	0.78400	0.00600	0.03100
d	0.94000	0.06000	0.00400	-	0.57600	0.50600	0.03600	0.78000	0.01000	0.03500
e	0.36400	0.63600	0.58000	0.57600	-	0.07000	0.54000	0.20400	0.58600	0.61100
f	0.43400	0.56600	0.51000	0.50600	0.07000	-	0.47000	0.27400	0.51600	0.54100
g	0.90400	0.09600	0.04000	0.03600	0.54000	0.47000	-	0.74400	0.04600	0.07100
h	0.16000	0.84000	0.78400	0.78000	0.20400	0.27400	0.74400	-	0.79000	0.81500
i	0.95000	0.05000	0.00600	0.01000	0.58600	0.51600	0.04600	0.79000	-	0.02500
j	0.97500	0.02500	0.03100	0.03500	0.61100	0.54100	0.07100	0.81500	0.02500	-
k	0.04000	0.96000	0.90400	0.90000	0.32400	0.39400	0.86400	0.12000	0.91000	0.93500
l	0.98000	0.02000	0.03600	0.04000	0.61600	0.54600	0.07600	0.82000	0.03000	0.00500
m	0.34700	0.65300	0.59700	0.59300	0.01700	0.08700	0.55700	0.18700	0.60300	0.62800
n	0.80100	0.19900	0.14300	0.13900	0.43700	0.36700	0.10300	0.64100	0.14900	0.17400
o	0.63400	0.36600	0.31000	0.30600	0.27000	0.20000	0.27000	0.47400	0.31600	0.34100
p	0.97000	0.03000	0.02600	0.03000	0.60600	0.53600	0.06600	0.81000	0.02000	0.00500
q	0.54600	0.45400	0.39800	0.39400	0.18200	0.11200	0.35800	0.38600	0.40400	0.42900
r	0.91000	0.09000	0.03400	0.03000	0.54600	0.47600	0.00600	0.75000	0.04000	0.06500
s	0.97200	0.02800	0.02800	0.03200	0.60800	0.53800	0.06800	0.81200	0.02200	0.00300
t	0.57200	0.42800	0.37200	0.36800	0.20800	0.13800	0.33200	0.41200	0.37800	0.40300
u	0.29100	0.70900	0.65300	0.64900	0.07300	0.14300	0.61300	0.13100	0.65900	0.68400
v	0.39400	0.60600	0.55000	0.54600	0.03000	0.04000	0.51000	0.23400	0.55600	0.58100
w	0.10000	0.90000	0.84400	0.84000	0.26400	0.33400	0.80400	0.06000	0.85000	0.87500
x	0.95100	0.04900	0.00700	0.01100	0.58700	0.51700	0.04700	0.79100	0.00100	0.02400
y	0.19000	0.81000	0.75400	0.75000	0.17400	0.24400	0.71400	0.03000	0.76000	0.78500
z	0.96100	0.03900	0.01700	0.02100	0.59700	0.52700	0.05700	0.80100	0.01100	0.01400
0	0.44000	0.56000	0.50400	0.50000	0.07600	0.00600	0.46400	0.28000	0.51000	0.53500

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.04000	0.98000	0.34700	0.80100	0.63400	0.97000	0.54600	0.91000	0.97200	0.57200
b	0.96000	0.02000	0.65300	0.19900	0.36600	0.03000	0.45400	0.09000	0.02800	0.42800
c	0.90400	0.03600	0.59700	0.14300	0.31000	0.02600	0.39800	0.03400	0.02800	0.37200
d	0.90000	0.04000	0.59300	0.13900	0.30600	0.03000	0.39400	0.03000	0.03200	0.36800
e	0.32400	0.61600	0.01700	0.43700	0.27000	0.60600	0.18200	0.54600	0.60800	0.20800
f	0.39400	0.54600	0.08700	0.36700	0.20000	0.53600	0.11200	0.47600	0.53800	0.13800
g	0.86400	0.07600	0.55700	0.10300	0.27000	0.06600	0.35800	0.00600	0.06800	0.33200
h	0.12000	0.82000	0.18700	0.64100	0.47400	0.81000	0.38600	0.75000	0.81200	0.41200
i	0.91000	0.03000	0.60300	0.14900	0.31600	0.02000	0.40400	0.04000	0.02200	0.37800
j	0.93500	0.00500	0.62800	0.17400	0.34100	0.00500	0.42900	0.06500	0.00300	0.40300
k	-	0.94000	0.30700	0.76100	0.59400	0.93000	0.50600	0.87000	0.93200	0.53200
l	0.94000	-	0.63300	0.17900	0.34600	0.01000	0.43400	0.07000	0.00800	0.40800
m	0.30700	0.63300	-	0.45400	0.28700	0.62300	0.19900	0.56300	0.62500	0.22500
n	0.76100	0.17900	0.45400	-	0.16700	0.16900	0.25500	0.10900	0.17100	0.22900
o	0.59400	0.34600	0.28700	0.16700	-	0.33600	0.08800	0.27600	0.33800	0.06200
p	0.93000	0.01000	0.62300	0.16900	0.33600	-	0.42400	0.06000	0.00200	0.39800
q	0.50600	0.43400	0.19900	0.25500	0.08800	0.42400	-	0.36400	0.42600	0.02600
r	0.87000	0.07000	0.56300	0.10900	0.27600	0.06000	0.36400	-	0.06200	0.33800
s	0.93200	0.00800	0.62500	0.17100	0.33800	0.00200	0.42600	0.06200	-	0.40000
t	0.53200	0.40800	0.22500	0.22900	0.06200	0.39800	0.02600	0.33800	0.40000	-
u	0.25100	0.68900	0.05600	0.51000	0.34300	0.67900	0.25500	0.61900	0.68100	0.28100
v	0.35400	0.58600	0.04700	0.40700	0.24000	0.57600	0.15200	0.51600	0.57800	0.17800
w	0.06000	0.88000	0.24700	0.70100	0.53400	0.87000	0.44600	0.81000	0.87200	0.47200
x	0.91100	0.02900	0.60400	0.15000	0.31700	0.01900	0.40500	0.04100	0.02100	0.37900
y	0.15000	0.79000	0.15700	0.61100	0.44400	0.78000	0.35600	0.72000	0.78200	0.38200
z	0.92100	0.01900	0.61400	0.16000	0.32700	0.00900	0.41500	0.05100	0.01100	0.38900
0	0.40000	0.54000	0.09300	0.36100	0.19400	0.53000	0.10600	0.47000	0.53200	0.13200

TO:	u	v	w	x	y	z	0
FROM: a	0.29100	0.39400	0.10000	0.95100	0.19000	0.96100	0.44000
b	0.70900	0.60600	0.90000	0.04900	0.81000	0.03900	0.56000
c	0.65300	0.55000	0.84400	0.00700	0.75400	0.01700	0.50400
d	0.64900	0.54600	0.84000	0.01100	0.75000	0.02100	0.50000
e	0.07300	0.03000	0.26400	0.58700	0.17400	0.59700	0.07600
f	0.14300	0.04000	0.33400	0.51700	0.24400	0.52700	0.00600
g	0.61300	0.51000	0.80400	0.04700	0.71400	0.05700	0.46400
h	0.13100	0.23400	0.06000	0.79100	0.03000	0.80100	0.28000
i	0.65900	0.55600	0.85000	0.00100	0.76000	0.01100	0.51000

j	0.68400	0.58100	0.87500	0.02400	0.78500	0.01400	0.53500
k	0.25100	0.35400	0.06000	0.91100	0.15000	0.92100	0.40000
l	0.68900	0.58600	0.88000	0.02900	0.79000	0.01900	0.54000
m	0.05600	0.04700	0.24700	0.60400	0.15700	0.61400	0.09300
n	0.51000	0.40700	0.70100	0.15000	0.61100	0.16000	0.36100
o	0.34300	0.24000	0.53400	0.31700	0.44400	0.32700	0.19400
p	0.67900	0.57600	0.87000	0.01900	0.78000	0.00900	0.53000
q	0.25500	0.15200	0.44600	0.40500	0.35600	0.41500	0.10600
r	0.61900	0.51600	0.81000	0.04100	0.72000	0.05100	0.47000
s	0.68100	0.57800	0.87200	0.02100	0.78200	0.01100	0.53200
t	0.28100	0.17800	0.47200	0.37900	0.38200	0.38900	0.13200
u	-	0.10300	0.19100	0.66000	0.10100	0.67000	0.14900
v	0.10300	-	0.29400	0.55700	0.20400	0.56700	0.04600
w	0.19100	0.29400	-	0.85100	0.09000	0.86100	0.34000
x	0.66000	0.55700	0.85100	-	0.76100	0.01000	0.51100
y	0.10100	0.20400	0.09000	0.76100	-	0.77100	0.25000
z	0.67000	0.56700	0.86100	0.01000	0.77100	-	0.52100
0	0.14900	0.04600	0.34000	0.51100	0.25000	0.52100	-

Stepmatrix "1st PAIR OF POSTMENTALS" (symmetric):

TO: FROM:	a	b	c	d	e	f	g	h	i	j
a	-	0.69600	0.73100	0.58700	0.51700	0.78700	0.75400	0.67600	0.51600	0.76100
b	0.69600	-	0.03500	0.10900	0.17900	0.09100	0.05800	0.02000	0.18000	0.06500
c	0.73100	0.03500	-	0.14400	0.21400	0.05600	0.02300	0.05500	0.21500	0.03000
d	0.58700	0.10900	0.14400	-	0.07000	0.20000	0.16700	0.08900	0.07100	0.17400
e	0.51700	0.17900	0.21400	0.07000	-	0.27000	0.23700	0.15900	0.00100	0.24400
f	0.78700	0.09100	0.05600	0.20000	0.27000	-	0.03300	0.11100	0.27100	0.02600
g	0.75400	0.05800	0.02300	0.16700	0.23700	0.03300	-	0.07800	0.23800	0.00700
h	0.67600	0.02000	0.05500	0.08900	0.15900	0.11100	0.07800	-	0.16000	0.08500
i	0.51600	0.18000	0.21500	0.07100	0.00100	0.27100	0.23800	0.16000	-	0.24500
j	0.76100	0.06500	0.03000	0.17400	0.24400	0.02600	0.00700	0.08500	0.24500	-
k	0.56500	0.13100	0.16600	0.02200	0.04800	0.22200	0.18900	0.11100	0.04900	0.19600
l	0.70700	0.01100	0.02400	0.12000	0.19000	0.08000	0.04700	0.03100	0.19100	0.05400
m	0.05500	0.64100	0.67600	0.53200	0.46200	0.73200	0.69900	0.62100	0.46100	0.70600
n	0.76500	0.06900	0.03400	0.17800	0.24800	0.02200	0.01100	0.08900	0.24900	0.00400
o	0.52500	0.17100	0.20600	0.06200	0.00800	0.26200	0.22900	0.15100	0.00900	0.23600
p	0.45300	0.24300	0.27800	0.13400	0.06400	0.33400	0.30100	0.22300	0.06300	0.30800
q	0.65200	0.04400	0.07900	0.06500	0.13500	0.13500	0.10200	0.02400	0.13600	0.10900
r	0.73900	0.04300	0.00800	0.15200	0.22200	0.04800	0.01500	0.06300	0.22300	0.02200
s	0.51400	0.18200	0.21700	0.07300	0.00300	0.27300	0.24000	0.16200	0.00200	0.24700
t	0.66900	0.02700	0.06200	0.08200	0.15200	0.11800	0.08500	0.00700	0.15300	0.09200
u	0.10700	0.58900	0.62400	0.48000	0.41000	0.68000	0.64700	0.56900	0.40900	0.65400
v	0.35800	0.33800	0.37300	0.22900	0.15900	0.42900	0.39600	0.31800	0.15800	0.40300
w	0.30700	0.38900	0.42400	0.28000	0.21000	0.48000	0.44700	0.36900	0.20900	0.45400
x	0.75800	0.06200	0.02700	0.17100	0.24100	0.02900	0.00400	0.08200	0.24200	0.00300
y	0.66200	0.03400	0.06900	0.07500	0.14500	0.12500	0.09200	0.01400	0.14600	0.09900
z	0.65700	0.03900	0.07400	0.07000	0.14000	0.13000	0.09700	0.01900	0.14100	0.10400
0	0.76200	0.06600	0.03100	0.17500	0.24500	0.02500	0.00800	0.08600	0.24600	0.00100
1	0.61700	0.07900	0.11400	0.03000	0.10000	0.17000	0.13700	0.05900	0.10100	0.14400
2	0.53700	0.15900	0.19400	0.05000	0.02000	0.25000	0.21700	0.13900	0.02100	0.22400

TO: FROM:	k	l	m	n	o	p	q	r	s	t
a	0.56500	0.70700	0.05500	0.76500	0.52500	0.45300	0.65200	0.73900	0.51400	0.66900
b	0.13100	0.01100	0.64100	0.06900	0.17100	0.24300	0.04400	0.04300	0.18200	0.02700
c	0.16600	0.02400	0.67600	0.03400	0.20600	0.27800	0.07900	0.00800	0.21700	0.06200
d	0.02200	0.12000	0.53200	0.17800	0.06200	0.13400	0.06500	0.15200	0.07300	0.08200
e	0.04800	0.19000	0.46200	0.24800	0.00800	0.06400	0.13500	0.22200	0.00300	0.15200
f	0.22200	0.08000	0.73200	0.02200	0.26200	0.33400	0.13500	0.04800	0.27300	0.11800
g	0.18900	0.04700	0.69900	0.01100	0.22900	0.30100	0.10200	0.01500	0.24000	0.08500
h	0.11100	0.03100	0.62100	0.08900	0.15100	0.22300	0.02400	0.06300	0.16200	0.00700
i	0.04900	0.19100	0.46100	0.24900	0.00900	0.06300	0.13600	0.22300	0.00200	0.15300
j	0.19600	0.05400	0.70600	0.00400	0.23600	0.30800	0.10900	0.02200	0.24700	0.09200
k	-	0.14200	0.51000	0.20000	0.04000	0.11200	0.08700	0.17400	0.05100	0.10400
l	0.14200	-	0.65200	0.05800	0.18200	0.25400	0.05500	0.03200	0.19300	0.03800
m	0.51000	0.65200	-	0.71000	0.47000	0.39800	0.59700	0.68400	0.45900	0.61400
n	0.20000	0.05800	0.71000	-	0.24000	0.31200	0.11300	0.02600	0.25100	0.09600
o	0.04000	0.18200	0.47000	0.24000	-	0.07200	0.12700	0.21400	0.01100	0.14400
p	0.11200	0.25400	0.39800	0.31200	0.07200	-	0.19900	0.28600	0.06100	0.21600
q	0.08700	0.05500	0.59700	0.11300	0.12700	0.19900	-	0.08700	0.13800	0.01700
r	0.17400	0.03200	0.68400	0.02600	0.21400	0.28600	0.08700	-	0.22500	0.07000
s	0.05100	0.19300	0.45900	0.25100	0.01100	0.06100	0.13800	0.22500	-	0.15500
t	0.10400	0.03800	0.61400	0.09600	0.14400	0.21600	0.01700	0.07000	0.15500	-
u	0.45800	0.60000	0.05200	0.65800	0.41800	0.34600	0.54500	0.63200	0.40700	0.56200
v	0.20700	0.34900	0.30300	0.40700	0.16700	0.09500	0.29400	0.38100	0.15600	0.31100
w	0.25800	0.40000	0.25200	0.45800	0.21800	0.14600	0.34500	0.43200	0.20700	0.36200

x	0.19300	0.05100	0.70300	0.00700	0.23300	0.30500	0.10600	0.01900	0.24400	0.08900
y	0.09700	0.04500	0.60700	0.10300	0.13700	0.20900	0.01000	0.07700	0.14800	0.00700
z	0.09200	0.05000	0.60200	0.10800	0.13200	0.20400	0.00500	0.08200	0.14300	0.01200
0	0.19700	0.05500	0.70700	0.00300	0.23700	0.30900	0.11000	0.02300	0.24800	0.09300
1	0.05200	0.09000	0.56200	0.14800	0.09200	0.16400	0.03500	0.12200	0.10300	0.05200
2	0.02800	0.17000	0.48200	0.22800	0.01200	0.08400	0.11500	0.20200	0.02300	0.13200

TO: FROM:	u	v	w	x	y	z	0	1	2
a	0.10700	0.35800	0.30700	0.75800	0.66200	0.65700	0.76200	0.61700	0.53700
b	0.58900	0.33800	0.38900	0.06200	0.03400	0.03900	0.06600	0.07900	0.15900
c	0.62400	0.37300	0.42400	0.02700	0.06900	0.07400	0.03100	0.11400	0.19400
d	0.48000	0.22900	0.28000	0.17100	0.07500	0.07000	0.17500	0.03000	0.05000
e	0.41000	0.15900	0.21000	0.24100	0.14500	0.14000	0.24500	0.10000	0.02000
f	0.68000	0.42900	0.48000	0.02900	0.12500	0.13000	0.02500	0.17000	0.25000
g	0.64700	0.39600	0.44700	0.00400	0.09200	0.09700	0.00800	0.13700	0.21700
h	0.56900	0.31800	0.36900	0.08200	0.01400	0.01900	0.08600	0.05900	0.13900
i	0.40900	0.15800	0.20900	0.24200	0.14600	0.14100	0.24600	0.10100	0.02100
j	0.65400	0.40300	0.45400	0.00300	0.09900	0.10400	0.00100	0.14400	0.22400
k	0.45800	0.20700	0.25800	0.19300	0.09700	0.09200	0.19700	0.05200	0.02800
l	0.60000	0.34900	0.40000	0.05100	0.04500	0.05000	0.05500	0.09000	0.17000
m	0.05200	0.30300	0.25200	0.70300	0.60700	0.60200	0.70700	0.56200	0.48200
n	0.65800	0.40700	0.45800	0.00700	0.10300	0.10800	0.00300	0.14800	0.22800
o	0.41800	0.16700	0.21800	0.23300	0.13700	0.13200	0.23700	0.09200	0.01200
p	0.34600	0.09500	0.14600	0.30500	0.20900	0.20400	0.30900	0.16400	0.08400
q	0.54500	0.29400	0.34500	0.10600	0.01000	0.00500	0.11000	0.03500	0.11500
r	0.63200	0.38100	0.43200	0.01900	0.07700	0.08200	0.02300	0.12200	0.20200
s	0.40700	0.15600	0.20700	0.24400	0.14800	0.14300	0.24800	0.10300	0.02300
t	0.56200	0.31100	0.36200	0.08900	0.00700	0.01200	0.09300	0.05200	0.13200
u	-	0.25100	0.20000	0.65100	0.55500	0.55000	0.65500	0.51000	0.43000
v	0.25100	-	0.05100	0.40000	0.30400	0.29900	0.40400	0.25900	0.17900
w	0.20000	0.05100	-	0.45100	0.35500	0.35000	0.45500	0.31000	0.23000
x	0.65100	0.40000	0.45100	-	0.09600	0.10100	0.00400	0.14100	0.22100
y	0.55500	0.30400	0.35500	0.09600	-	0.00500	0.10000	0.04500	0.12500
z	0.55000	0.29900	0.35000	0.10100	0.00500	-	0.10500	0.04000	0.12000
0	0.65500	0.40400	0.45500	0.00400	0.10000	0.10500	-	0.14500	0.22500
1	0.51000	0.25900	0.31000	0.14100	0.04500	0.04000	0.14500	-	0.08000
2	0.43000	0.17900	0.23000	0.22100	0.12500	0.12000	0.22500	0.08000	-

Stepmatrix "ANTERIORMOST GULARS" (symmetric):

TO: FROM:	a	b	c	d	e	f	g	h	i	j
a	-	0.39400	0.33400	0.50100	0.34000	0.27000	0.47000	0.29700	1.00000	0.10800
b	0.39400	-	0.06000	0.10700	0.05400	0.12400	0.07600	0.09700	0.60600	0.28600
c	0.33400	0.06000	-	0.16700	0.00600	0.06400	0.13600	0.03700	0.66600	0.22600
d	0.50100	0.10700	0.16700	-	0.16100	0.23100	0.03100	0.20400	0.49900	0.39300
e	0.34000	0.05400	0.00600	0.16100	-	0.07000	0.13000	0.04300	0.66000	0.23200
f	0.27000	0.12400	0.06400	0.23100	0.07000	-	0.20000	0.02700	0.73000	0.16200
g	0.47000	0.07600	0.13600	0.03100	0.13000	0.20000	-	0.17300	0.53000	0.36200
h	0.29700	0.09700	0.03700	0.20400	0.04300	0.02700	0.17300	-	0.70300	0.18900
i	1.00000	0.60600	0.66600	0.49900	0.66000	0.73000	0.53000	0.70300	-	0.89200
j	0.10800	0.28600	0.22600	0.39300	0.23200	0.16200	0.36200	0.18900	0.89200	-
k	0.59700	0.20300	0.26300	0.09600	0.25700	0.32700	0.12700	0.30000	0.40300	0.48900
l	0.30000	0.09400	0.03400	0.20100	0.04000	0.03000	0.17000	0.00300	0.70000	0.19200
m	0.65900	0.26500	0.32500	0.15800	0.31900	0.38900	0.18900	0.36200	0.34100	0.55100
n	0.38900	0.00500	0.05500	0.11200	0.04900	0.11900	0.08100	0.09200	0.61100	0.28100
o	0.64900	0.25500	0.31500	0.14800	0.30900	0.37900	0.17900	0.35200	0.35100	0.54100
p	0.24000	0.15400	0.09400	0.26100	0.10000	0.03000	0.23000	0.05700	0.76000	0.13200
q	0.59200	0.19800	0.25800	0.09100	0.25200	0.32200	0.12200	0.29500	0.40800	0.48400
r	0.51300	0.11900	0.17900	0.01200	0.17300	0.24300	0.04300	0.21600	0.48700	0.40500
s	0.07400	0.32000	0.26000	0.42700	0.26600	0.19600	0.39600	0.22300	0.92600	0.03400
t	0.87600	0.48200	0.54200	0.37500	0.53600	0.60600	0.40600	0.57900	0.12400	0.76800
u	0.76000	0.36600	0.42600	0.25900	0.42000	0.49000	0.29000	0.46300	0.24000	0.65200
v	0.24600	0.14800	0.08800	0.25500	0.09400	0.02400	0.22400	0.05100	0.75400	0.13800
w	0.26700	0.12700	0.06700	0.23400	0.07300	0.00300	0.20300	0.03000	0.73300	0.15900
x	0.12500	0.26900	0.20900	0.37600	0.21500	0.14500	0.34500	0.17200	0.87500	0.01700
y	0.41700	0.02300	0.08300	0.08400	0.07700	0.14700	0.05300	0.12000	0.58300	0.30900
z	0.27800	0.11600	0.05600	0.22300	0.06200	0.00800	0.19200	0.01900	0.72200	0.17000
0	0.35900	0.03500	0.02500	0.14200	0.01900	0.08900	0.11100	0.06200	0.64100	0.25100
1	0.25000	0.14400	0.08400	0.25100	0.09000	0.02000	0.22000	0.04700	0.75000	0.14200
2	0.37900	0.01500	0.04500	0.12200	0.03900	0.10900	0.09100	0.08200	0.62100	0.27100
3	0.60100	0.20700	0.26700	0.10000	0.26100	0.33100	0.13100	0.30400	0.39900	0.49300
4	0.63700	0.24300	0.30300	0.13600	0.29700	0.36700	0.16700	0.34000	0.36300	0.52900
5	0.97500	0.58100	0.64100	0.47400	0.63500	0.70500	0.50500	0.67800	0.02500	0.86700
6	0.53400	0.14000	0.20000	0.03300	0.19400	0.26400	0.06400	0.23700	0.46600	0.42600
7	0.70700	0.31300	0.37300	0.20600	0.36700	0.43700	0.23700	0.41000	0.29300	0.59900
8	0.21000	0.18400	0.12400	0.29100	0.13000	0.06000	0.26000	0.08700	0.79000	0.10200

9	0.06000	0.33400	0.27400	0.44100	0.28000	0.21000	0.41000	0.23700	0.94000	0.04800
A	0.76500	0.37100	0.43100	0.26400	0.42500	0.49500	0.29500	0.46800	0.23500	0.65700
B	0.28600	0.10800	0.04800	0.21500	0.05400	0.01600	0.18400	0.01100	0.71400	0.17800
C	0.19000	0.20400	0.14400	0.31100	0.15000	0.08000	0.28000	0.10700	0.81000	0.08200
D	0.05700	0.33700	0.27700	0.44400	0.28300	0.21300	0.41300	0.24000	0.94300	0.05100
E	0.51900	0.12500	0.18500	0.01800	0.17900	0.24900	0.04900	0.22200	0.48100	0.41100
F	0.61200	0.21800	0.27800	0.11100	0.27200	0.34200	0.14200	0.31500	0.38800	0.50400
G	0.03000	0.36400	0.30400	0.47100	0.31000	0.24000	0.44000	0.26700	0.97000	0.07800
H	0.75100	0.35700	0.41700	0.25000	0.41100	0.48100	0.28100	0.45400	0.24900	0.64300
I	0.41400	0.02000	0.08000	0.08700	0.07400	0.14400	0.05600	0.11700	0.58600	0.30600
J	0.65000	0.25600	0.31600	0.14900	0.31000	0.38000	0.18000	0.35300	0.35000	0.54200
K	0.60800	0.21400	0.27400	0.10700	0.26800	0.33800	0.13800	0.31100	0.39200	0.50000

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.59700	0.30000	0.65900	0.38900	0.64900	0.24000	0.59200	0.51300	0.07400	0.87600
b	0.20300	0.09400	0.26500	0.00500	0.25500	0.15400	0.19800	0.11900	0.32000	0.48200
c	0.26300	0.03400	0.32500	0.05500	0.31500	0.09400	0.25800	0.17900	0.26000	0.54200
d	0.09600	0.20100	0.15800	0.11200	0.14800	0.26100	0.09100	0.01200	0.42700	0.37500
e	0.25700	0.04000	0.31900	0.04900	0.30900	0.10000	0.25200	0.17300	0.26600	0.53600
f	0.32700	0.03000	0.38900	0.11900	0.37900	0.03000	0.32200	0.24300	0.19600	0.60600
g	0.12700	0.17000	0.18900	0.08100	0.17900	0.23000	0.12200	0.04300	0.39600	0.40600
h	0.30000	0.00300	0.36200	0.09200	0.35200	0.05700	0.29500	0.21600	0.22300	0.57900
i	0.40300	0.70000	0.34100	0.61100	0.35100	0.76000	0.40800	0.48700	0.92600	0.12400
j	0.48900	0.19200	0.55100	0.28100	0.54100	0.13200	0.48400	0.40500	0.03400	0.76800
k	-	0.29700	0.06200	0.20800	0.05200	0.35700	0.00500	0.08400	0.52300	0.27900
l	0.29700	-	0.35900	0.08900	0.34900	0.06000	0.29200	0.21300	0.22600	0.57600
m	0.06200	0.35900	-	0.27000	0.01000	0.41900	0.06700	0.14600	0.58500	0.21700
n	0.20800	0.08900	0.27000	-	0.26000	0.14900	0.20300	0.12400	0.31500	0.48700
o	0.05200	0.34900	0.01000	0.26000	-	0.40900	0.05700	0.13600	0.57500	0.22700
p	0.35700	0.06000	0.41900	0.14900	0.40900	-	0.35200	0.27300	0.16600	0.63600
q	0.00500	0.29200	0.06700	0.20300	0.05700	0.35200	-	0.07900	0.51800	0.28400
r	0.08400	0.21300	0.14600	0.12400	0.13600	0.27300	0.07900	-	0.43900	0.36300
s	0.52300	0.22600	0.58500	0.31500	0.57500	0.16600	0.51800	0.43900	-	0.80200
t	0.27900	0.57600	0.21700	0.48700	0.22700	0.63600	0.28400	0.36300	0.80200	-
u	0.16300	0.46000	0.10100	0.37100	0.11100	0.52000	0.16800	0.24700	0.68600	0.11600
v	0.35100	0.05400	0.41300	0.14300	0.40300	0.00600	0.34600	0.26700	0.17200	0.63000
w	0.33000	0.03300	0.39200	0.12200	0.38200	0.02700	0.32500	0.24600	0.19300	0.60900
x	0.47200	0.17500	0.53400	0.26400	0.52400	0.11500	0.46700	0.38800	0.05100	0.75100
y	0.18000	0.11700	0.24200	0.02800	0.23200	0.17700	0.17500	0.09600	0.34300	0.45900
z	0.31900	0.02200	0.38100	0.11100	0.37100	0.03800	0.31400	0.23500	0.20400	0.59800
0	0.23800	0.05900	0.30000	0.03000	0.29000	0.11900	0.23300	0.15400	0.28500	0.51700
1	0.34700	0.05000	0.40900	0.13900	0.39900	0.01000	0.34200	0.26300	0.17600	0.62600
2	0.21800	0.07900	0.28000	0.01000	0.27000	0.13900	0.21300	0.13400	0.30500	0.49700
3	0.00400	0.30100	0.05800	0.21200	0.04800	0.36100	0.00900	0.08800	0.52700	0.27500
4	0.04000	0.33700	0.02200	0.24800	0.01200	0.39700	0.04500	0.12400	0.56300	0.23900
5	0.37800	0.67500	0.31600	0.58600	0.32600	0.73500	0.38300	0.46200	0.90100	0.09900
6	0.06300	0.23400	0.12500	0.14500	0.11500	0.29400	0.05800	0.02100	0.46000	0.34200
7	0.11000	0.40700	0.04800	0.31800	0.05800	0.46700	0.11500	0.19400	0.63300	0.16900
8	0.38700	0.09000	0.44900	0.17900	0.43900	0.03000	0.38200	0.30300	0.13600	0.66600
9	0.53700	0.24000	0.59900	0.32900	0.58900	0.18000	0.53200	0.45300	0.01400	0.81600
A	0.16800	0.46500	0.10600	0.37600	0.11600	0.52500	0.17300	0.25200	0.69100	0.11100
B	0.31100	0.01400	0.37300	0.10300	0.36300	0.04600	0.30600	0.22700	0.21200	0.59000
C	0.40700	0.11000	0.46900	0.19900	0.45900	0.05000	0.40200	0.32300	0.11600	0.68600
D	0.54000	0.24300	0.60200	0.33200	0.59200	0.18300	0.53500	0.45600	0.01700	0.81900
E	0.07800	0.21900	0.14000	0.13000	0.13000	0.27900	0.07300	0.00600	0.44500	0.35700
F	0.01500	0.31200	0.04700	0.22300	0.03700	0.37200	0.02000	0.09900	0.53800	0.26400
G	0.56700	0.27000	0.62900	0.35900	0.61900	0.21000	0.56200	0.48300	0.04400	0.84600
H	0.15400	0.45100	0.09200	0.36200	0.10200	0.51100	0.15900	0.23800	0.67700	0.12500
I	0.18300	0.11400	0.24500	0.02500	0.23500	0.17400	0.17800	0.09900	0.34000	0.46200
J	0.05300	0.35000	0.00900	0.26100	0.00100	0.41000	0.05800	0.13700	0.57600	0.22600
K	0.01100	0.30800	0.05100	0.21900	0.04100	0.36800	0.01600	0.09500	0.53400	0.26800

TO:	u	v	w	x	y	z	0	1	2	3
FROM: a	0.76000	0.24600	0.26700	0.12500	0.41700	0.27800	0.35900	0.25000	0.37900	0.60100
b	0.36600	0.14800	0.12700	0.26900	0.02300	0.11600	0.03500	0.14400	0.01500	0.20700
c	0.42600	0.08800	0.06700	0.20900	0.08300	0.05600	0.02500	0.08400	0.04500	0.26700
d	0.25900	0.25500	0.23400	0.37600	0.08400	0.22300	0.14200	0.25100	0.12200	0.10000
e	0.42000	0.09400	0.07300	0.21500	0.07700	0.06200	0.01900	0.09000	0.03900	0.26100
f	0.49000	0.02400	0.00300	0.14500	0.14700	0.00800	0.08900	0.02000	0.10900	0.33100
g	0.29000	0.22400	0.20300	0.34500	0.05300	0.19200	0.11100	0.22000	0.09100	0.13100
h	0.46300	0.05100	0.03000	0.17200	0.12000	0.01900	0.06200	0.04700	0.08200	0.30400
i	0.24000	0.75400	0.73300	0.87500	0.58300	0.72200	0.64100	0.75000	0.62100	0.39900
j	0.65200	0.13800	0.15900	0.01700	0.30900	0.17000	0.25100	0.14200	0.27100	0.49300
k	0.16300	0.35100	0.33000	0.47200	0.18000	0.31900	0.23800	0.34700	0.21800	0.00400
l	0.46000	0.05400	0.03300	0.17500	0.11700	0.02200	0.05900	0.05000	0.07900	0.30100
m	0.10100	0.41300	0.39200	0.53400	0.24200	0.38100	0.30000	0.40900	0.28000	0.05800
n	0.37100	0.14300	0.12200	0.26400	0.02800	0.11100	0.03000	0.13900	0.01000	0.21200

o	0.11100	0.40300	0.38200	0.52400	0.23200	0.37100	0.29000	0.39900	0.27000	0.04800
p	0.52000	0.00600	0.02700	0.11500	0.17700	0.03800	0.11900	0.01000	0.13900	0.36100
q	0.16800	0.34600	0.32500	0.46700	0.17500	0.31400	0.23300	0.34200	0.21300	0.00900
r	0.24700	0.26700	0.24600	0.38800	0.09600	0.23500	0.15400	0.26300	0.13400	0.08800
s	0.68600	0.17200	0.19300	0.05100	0.34300	0.20400	0.28500	0.17600	0.30500	0.52700
t	0.11600	0.63000	0.60900	0.75100	0.45900	0.59800	0.51700	0.62600	0.49700	0.27500
u	-	0.51400	0.49300	0.63500	0.34300	0.48200	0.40100	0.51000	0.38100	0.15900
v	0.51400	-	0.02100	0.12100	0.17100	0.03200	0.11300	0.00400	0.13300	0.35500
w	0.49300	0.02100	-	0.14200	0.15000	0.01100	0.09200	0.01700	0.11200	0.33400
x	0.63500	0.12100	0.14200	-	0.29200	0.15300	0.23400	0.12500	0.25400	0.47600
y	0.34300	0.17100	0.15000	0.29200	-	0.13900	0.05800	0.16700	0.03800	0.18400
z	0.48200	0.03200	0.01100	0.15300	0.13900	-	0.08100	0.02800	0.10100	0.32300
0	0.40100	0.11300	0.09200	0.23400	0.05800	0.08100	-	0.10900	0.02000	0.24200
1	0.51000	0.00400	0.01700	0.12500	0.16700	0.02800	0.10900	-	0.12900	0.35100
2	0.38100	0.13300	0.11200	0.25400	0.03800	0.10100	0.02000	0.12900	-	0.22200
3	0.15900	0.35500	0.33400	0.47600	0.18400	0.32300	0.24200	0.35100	0.22200	-
4	0.12300	0.39100	0.37000	0.51200	0.22000	0.35900	0.27800	0.38700	0.25800	0.03600
5	0.21500	0.72900	0.70800	0.85000	0.55800	0.69700	0.61600	0.72500	0.59600	0.37400
6	0.22600	0.28800	0.26700	0.40900	0.11700	0.25600	0.17500	0.28400	0.15500	0.06700
7	0.05300	0.46100	0.44000	0.58200	0.29000	0.42900	0.34800	0.45700	0.32800	0.10600
8	0.55000	0.03600	0.05700	0.08500	0.20700	0.06800	0.14900	0.04000	0.16900	0.39100
9	0.70000	0.18600	0.20700	0.06500	0.35700	0.21800	0.29900	0.19000	0.31900	0.54100
A	0.00500	0.51900	0.49800	0.64000	0.34800	0.48700	0.40600	0.51500	0.38600	0.16400
B	0.47400	0.04000	0.01900	0.16100	0.13100	0.00800	0.07300	0.03600	0.09300	0.31500
C	0.57000	0.05600	0.07700	0.06500	0.22700	0.08800	0.16900	0.06000	0.18900	0.41100
D	0.70300	0.18900	0.21000	0.06800	0.36000	0.22100	0.30200	0.19300	0.32200	0.54400
E	0.24100	0.27300	0.25200	0.39400	0.10200	0.24100	0.16000	0.26900	0.14000	0.08200
F	0.14800	0.36600	0.34500	0.48700	0.19500	0.33400	0.25300	0.36200	0.23300	0.01100
G	0.73000	0.21600	0.23700	0.09500	0.38700	0.24800	0.32900	0.22000	0.34900	0.57100
H	0.00900	0.50500	0.48400	0.62600	0.33400	0.47300	0.39200	0.50100	0.37200	0.15000
I	0.34600	0.16800	0.14700	0.28900	0.00300	0.13600	0.05500	0.16400	0.03500	0.18700
J	0.11000	0.40400	0.38300	0.52500	0.23300	0.37200	0.29100	0.40000	0.27100	0.04900
K	0.15200	0.36200	0.34100	0.48300	0.19100	0.33000	0.24900	0.35800	0.22900	0.00700

TO:	4	5	6	7	8	9	A	B	C	D
FROM: a	0.63700	0.97500	0.53400	0.70700	0.21000	0.06000	0.76500	0.28600	0.19000	0.05700
b	0.24300	0.58100	0.14000	0.31300	0.18400	0.33400	0.37100	0.10800	0.20400	0.33700
c	0.30300	0.64100	0.20000	0.37300	0.12400	0.27400	0.43100	0.04800	0.14400	0.27700
d	0.13600	0.47400	0.03300	0.20600	0.29100	0.44100	0.26400	0.21500	0.31100	0.44400
e	0.29700	0.63500	0.19400	0.36700	0.13000	0.28000	0.42500	0.05400	0.15000	0.28300
f	0.36700	0.70500	0.26400	0.43700	0.06000	0.21000	0.49500	0.01600	0.08000	0.21300
g	0.16700	0.50500	0.06400	0.23700	0.26000	0.41000	0.29500	0.18400	0.28000	0.41300
h	0.34000	0.67800	0.23700	0.41000	0.08700	0.23700	0.46800	0.01100	0.10700	0.24000
i	0.36300	0.02500	0.46600	0.29300	0.79000	0.94000	0.23500	0.71400	0.81000	0.94300
j	0.52900	0.86700	0.42600	0.59900	0.10200	0.04800	0.65700	0.17800	0.08200	0.05100
k	0.04000	0.37800	0.06300	0.11000	0.38700	0.53700	0.16800	0.31100	0.40700	0.54000
l	0.33700	0.67500	0.23400	0.40700	0.09000	0.24000	0.46500	0.01400	0.11000	0.24300
m	0.02200	0.31600	0.12500	0.04800	0.44900	0.59900	0.10600	0.37300	0.46900	0.60200
n	0.24800	0.58600	0.14500	0.31800	0.17900	0.32900	0.37600	0.10300	0.19900	0.33200
o	0.01200	0.32600	0.11500	0.05800	0.43900	0.58900	0.11600	0.36300	0.45900	0.59200
p	0.39700	0.73500	0.29400	0.46700	0.03000	0.18000	0.52500	0.04600	0.05000	0.18300
q	0.04500	0.38300	0.05800	0.11500	0.38200	0.53200	0.17300	0.30600	0.40200	0.53500
r	0.12400	0.46200	0.02100	0.19400	0.30300	0.45300	0.25200	0.22700	0.32300	0.45600
s	0.56300	0.90100	0.46000	0.63300	0.13600	0.01400	0.69100	0.21200	0.11600	0.01700
t	0.23900	0.09900	0.34200	0.16900	0.66600	0.81600	0.11100	0.59000	0.68600	0.81900
u	0.12300	0.21500	0.22600	0.05300	0.55000	0.70000	0.00500	0.47400	0.57000	0.70300
v	0.39100	0.72900	0.28800	0.46100	0.03600	0.18600	0.51900	0.04000	0.05600	0.18900
w	0.37000	0.70800	0.26700	0.44000	0.05700	0.20700	0.49800	0.01900	0.07700	0.21000
x	0.51200	0.85000	0.40900	0.58200	0.08500	0.06500	0.64000	0.16100	0.06500	0.06800
y	0.22000	0.55800	0.11700	0.29000	0.20700	0.35700	0.34800	0.13100	0.22700	0.36000
z	0.35900	0.69700	0.25600	0.42900	0.06800	0.21800	0.48700	0.00800	0.08800	0.22100
0	0.27800	0.61600	0.17500	0.34800	0.14900	0.29900	0.40600	0.07300	0.16900	0.30200
1	0.38700	0.72500	0.28400	0.45700	0.04000	0.19000	0.51500	0.03600	0.06000	0.19300
2	0.25800	0.59600	0.15500	0.32800	0.16900	0.31900	0.38600	0.09300	0.18900	0.32200
3	0.03600	0.37400	0.06700	0.10600	0.39100	0.54100	0.16400	0.31500	0.41100	0.54400
4	-	0.33800	0.10300	0.07000	0.42700	0.57700	0.12800	0.35100	0.44700	0.58000
5	0.33800	-	0.44100	0.26800	0.76500	0.91500	0.21000	0.68900	0.78500	0.91800
6	0.10300	0.44100	-	0.17300	0.32400	0.47400	0.23100	0.24800	0.34400	0.47700
7	0.07000	0.26800	0.17300	-	0.49700	0.64700	0.05800	0.42100	0.51700	0.65000
8	0.42700	0.76500	0.32400	0.49700	-	0.15000	0.55500	0.07600	0.02000	0.15300
9	0.57700	0.91500	0.47400	0.64700	0.15000	-	0.70500	0.22600	0.13000	0.00300
A	0.12800	0.21000	0.23100	0.05800	0.55500	0.70500	-	0.47900	0.57500	0.70800
B	0.35100	0.68900	0.24800	0.42100	0.07600	0.22600	0.47900	-	0.09600	0.22900
C	0.44700	0.78500	0.34400	0.51700	0.02000	0.13000	0.57500	0.09600	-	0.13300
D	0.58000	0.91800	0.47700	0.65000	0.15300	0.00300	0.70800	0.22900	0.13300	-
E	0.11800	0.45600	0.01500	0.18800	0.30900	0.45900	0.24600	0.23300	0.32900	0.46200
F	0.02500	0.36300	0.07800	0.09500	0.40200	0.55200	0.15300	0.32600	0.42200	0.55500

G	0.60700	0.94500	0.50400	0.67700	0.18000	0.03000	0.73500	0.25600	0.16000	0.02700
H	0.11400	0.22400	0.21700	0.04400	0.54100	0.69100	0.01400	0.46500	0.56100	0.69400
I	0.22300	0.56100	0.12000	0.29300	0.20400	0.35400	0.35100	0.12800	0.22400	0.35700
J	0.01300	0.32500	0.11600	0.05700	0.44000	0.59000	0.11500	0.36400	0.46000	0.59300
K	0.02900	0.36700	0.07400	0.09900	0.39800	0.54800	0.15700	0.32200	0.41800	0.55100

TO:	E	F	G	H	I	J	K
FROM: a	0.51900	0.61200	0.03000	0.75100	0.41400	0.65000	0.60800
b	0.12500	0.21800	0.36400	0.35700	0.02000	0.25600	0.21400
c	0.18500	0.27800	0.30400	0.41700	0.08000	0.31600	0.27400
d	0.01800	0.11100	0.47100	0.25000	0.08700	0.14900	0.10700
e	0.17900	0.27200	0.31000	0.41100	0.07400	0.31000	0.26800
f	0.24900	0.34200	0.24000	0.48100	0.14400	0.38000	0.33800
g	0.04900	0.14200	0.44000	0.28100	0.05600	0.18000	0.13800
h	0.22200	0.31500	0.26700	0.45400	0.11700	0.35300	0.31100
i	0.48100	0.38800	0.97000	0.24900	0.58600	0.35000	0.39200
j	0.41100	0.50400	0.07800	0.64300	0.30600	0.54200	0.50000
k	0.07800	0.01500	0.56700	0.15400	0.18300	0.05300	0.01100
l	0.21900	0.31200	0.27000	0.45100	0.11400	0.35000	0.30800
m	0.14000	0.04700	0.62900	0.09200	0.24500	0.00900	0.05100
n	0.13000	0.22300	0.35900	0.36200	0.02500	0.26100	0.21900
o	0.13000	0.03700	0.61900	0.10200	0.23500	0.00100	0.04100
p	0.27900	0.37200	0.21000	0.51100	0.17400	0.41000	0.36800
q	0.07300	0.02000	0.56200	0.15900	0.17800	0.05800	0.01600
r	0.00600	0.09900	0.48300	0.23800	0.09900	0.13700	0.09500
s	0.44500	0.53800	0.04400	0.67700	0.34000	0.57600	0.53400
t	0.35700	0.26400	0.84600	0.12500	0.46200	0.22600	0.26800
u	0.24100	0.14800	0.73000	0.00900	0.34600	0.11000	0.15200
v	0.27300	0.36600	0.21600	0.50500	0.16800	0.40400	0.36200
w	0.25200	0.34500	0.23700	0.48400	0.14700	0.38300	0.34100
x	0.39400	0.48700	0.09500	0.62600	0.28900	0.52500	0.48300
y	0.10200	0.19500	0.38700	0.33400	0.00300	0.23300	0.19100
z	0.24100	0.33400	0.24800	0.47300	0.13600	0.37200	0.33000
0	0.16000	0.25300	0.32900	0.39200	0.05500	0.29100	0.24900
1	0.26900	0.36200	0.22000	0.50100	0.16400	0.40000	0.35800
2	0.14000	0.23300	0.34900	0.37200	0.03500	0.27100	0.22900
3	0.08200	0.01100	0.57100	0.15000	0.18700	0.04900	0.00700
4	0.11800	0.02500	0.60700	0.11400	0.22300	0.01300	0.02900
5	0.45600	0.36300	0.94500	0.22400	0.56100	0.32500	0.36700
6	0.01500	0.07800	0.50400	0.21700	0.12000	0.11600	0.07400
7	0.18800	0.09500	0.67700	0.04400	0.29300	0.05700	0.09900
8	0.30900	0.40200	0.18000	0.54100	0.20400	0.44000	0.39800
9	0.45900	0.55200	0.03000	0.69100	0.35400	0.59000	0.54800
A	0.24600	0.15300	0.73500	0.01400	0.35100	0.11500	0.15700
B	0.23300	0.32600	0.25600	0.46500	0.12800	0.36400	0.32200
C	0.32900	0.42200	0.16000	0.56100	0.22400	0.46000	0.41800
D	0.46200	0.55500	0.02700	0.69400	0.35700	0.59300	0.55100
E	-	0.09300	0.48900	0.23200	0.10500	0.13100	0.08900
F	0.09300	-	0.58200	0.13900	0.19800	0.03800	0.00400
G	0.48900	0.58200	-	0.72100	0.38400	0.62000	0.57800
H	0.23200	0.13900	0.72100	-	0.33700	0.10100	0.14300
I	0.10500	0.19800	0.38400	0.33700	-	0.23600	0.19400
J	0.13100	0.03800	0.62000	0.10100	0.23600	-	0.04200
K	0.08900	0.00400	0.57800	0.14300	0.19400	0.04200	-

Stepmatrix "BLACK PATCH NECK MALES" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.07000	0.92800	0.35000	0.49900	0.87500	1.00000	0.84600	0.19900	0.72200
b	0.07000	-	0.85800	0.28000	0.42900	0.80500	0.93000	0.77600	0.12900	0.65200
c	0.92800	0.85800	-	0.57800	0.42900	0.05300	0.07200	0.08200	0.72900	0.20600
d	0.35000	0.28000	0.57800	-	0.14900	0.52500	0.65000	0.49600	0.15100	0.37200
e	0.49900	0.42900	0.42900	0.14900	-	0.37600	0.50100	0.34700	0.30000	0.22300
f	0.87500	0.80500	0.05300	0.52500	0.37600	-	0.12500	0.02900	0.67600	0.15300
g	1.00000	0.93000	0.07200	0.65000	0.50100	0.12500	-	0.15400	0.80100	0.27800
h	0.84600	0.77600	0.08200	0.49600	0.34700	0.02900	0.15400	-	0.64700	0.12400
i	0.19900	0.12900	0.72900	0.15100	0.30000	0.67600	0.80100	0.64700	-	0.52300
j	0.72200	0.65200	0.20600	0.37200	0.22300	0.15300	0.27800	0.12400	0.52300	-
k	0.90900	0.83900	0.01900	0.55900	0.41000	0.03400	0.09100	0.06300	0.71000	0.18700
l	0.09000	0.02000	0.83800	0.26000	0.40900	0.78500	0.91000	0.75600	0.10900	0.63200

TO:	k	l
FROM: a	0.90900	0.09000
b	0.83900	0.02000
c	0.01900	0.83800
d	0.55900	0.26000

e	0.41000	0.40900
f	0.03400	0.78500
g	0.09100	0.91000
h	0.06300	0.75600
i	0.71000	0.10900
j	0.18700	0.63200
k	-	0.81900
l	0.81900	-

Stepmatrix "BLACK MIDVENTRAL STRIPE MALES" (symmetric):

TO: FROM:	a	b	c	d	e	f	g	h	i	j
a	-	0.57100	0.82300	0.37900	0.92000	0.92800	0.66600	0.65600	1.00000	0.04300
b	0.57100	-	0.25200	0.19200	0.34900	0.35700	0.09500	0.08500	0.42900	0.52800
c	0.82300	0.25200	-	0.44400	0.09700	0.10500	0.15700	0.16700	0.17700	0.78000
d	0.37900	0.19200	0.44400	-	0.54100	0.54900	0.28700	0.27700	0.62100	0.33600
e	0.92000	0.34900	0.09700	0.54100	-	0.00800	0.25400	0.26400	0.08000	0.87700
f	0.92800	0.35700	0.10500	0.54900	0.00800	-	0.26200	0.27200	0.07200	0.88500
g	0.66600	0.09500	0.15700	0.28700	0.25400	0.26200	-	0.01000	0.33400	0.62300
h	0.65600	0.08500	0.16700	0.27700	0.26400	0.27200	0.01000	-	0.34400	0.61300
i	1.00000	0.42900	0.17700	0.62100	0.08000	0.07200	0.33400	0.34400	-	0.95700
j	0.04300	0.52800	0.78000	0.33600	0.87700	0.88500	0.62300	0.61300	0.95700	-
k	0.81200	0.24100	0.01100	0.43300	0.10800	0.11600	0.14600	0.15600	0.18800	0.76900
l	0.86700	0.29600	0.04400	0.48800	0.05300	0.06100	0.20100	0.21100	0.13300	0.82400
m	0.91700	0.34600	0.09400	0.53800	0.00300	0.01100	0.25100	0.26100	0.08300	0.87400
n	0.56500	0.00600	0.25800	0.18600	0.35500	0.36300	0.10100	0.09100	0.43500	0.52200
o	0.88600	0.31500	0.06300	0.50700	0.03400	0.04200	0.22000	0.23000	0.11400	0.84300
p	0.09000	0.48100	0.73300	0.28900	0.83000	0.83800	0.57600	0.56600	0.91000	0.04700

TO: FROM:	k	l	m	n	o	p
a	0.81200	0.86700	0.91700	0.56500	0.88600	0.09000
b	0.24100	0.29600	0.34600	0.00600	0.31500	0.48100
c	0.01100	0.04400	0.09400	0.25800	0.06300	0.73300
d	0.43300	0.48800	0.53800	0.18600	0.50700	0.28900
e	0.10800	0.05300	0.00300	0.35500	0.03400	0.83000
f	0.11600	0.06100	0.01100	0.36300	0.04200	0.83800
g	0.14600	0.20100	0.25100	0.10100	0.22000	0.57600
h	0.15600	0.21100	0.26100	0.09100	0.23000	0.56600
i	0.18800	0.13300	0.08300	0.43500	0.11400	0.91000
j	0.76900	0.82400	0.87400	0.52200	0.84300	0.04700
k	-	0.05500	0.10500	0.24700	0.07400	0.72200
l	0.05500	-	0.05000	0.30200	0.01900	0.77700
m	0.10500	0.05000	-	0.35200	0.03100	0.82700
n	0.24700	0.30200	0.35200	-	0.32100	0.47500
o	0.07400	0.01900	0.03100	0.32100	-	0.79600
p	0.72200	0.77700	0.82700	0.47500	0.79600	-

Stepmatrix "LIGHT DORSOLATERAL EYE STRIPE" (symmetric):

TO: FROM:	a	b	c	d	e	f	g	h	i	j
a	-	0.36300	0.37100	1.00000	0.06800	0.80000	0.53000	0.86000	0.10400	0.14200
b	0.36300	-	0.00800	0.63700	0.29500	0.43700	0.16700	0.49700	0.25900	0.22100
c	0.37100	0.00800	-	0.62900	0.30300	0.42900	0.15900	0.48900	0.26700	0.22900
d	1.00000	0.63700	0.62900	-	0.93200	0.20000	0.47000	0.14000	0.89600	0.85800
e	0.06800	0.29500	0.30300	0.93200	-	0.73200	0.46200	0.79200	0.03600	0.07400
f	0.80000	0.43700	0.42900	0.20000	0.73200	-	0.27000	0.06000	0.69600	0.65800
g	0.53000	0.16700	0.15900	0.47000	0.46200	0.27000	-	0.33000	0.42600	0.38800
h	0.86000	0.49700	0.48900	0.14000	0.79200	0.06000	0.33000	-	0.75600	0.71800
i	0.10400	0.25900	0.26700	0.89600	0.03600	0.69600	0.42600	0.75600	-	0.03800
j	0.14200	0.22100	0.22900	0.85800	0.07400	0.65800	0.38800	0.71800	0.03800	-
k	0.41000	0.04700	0.03900	0.59000	0.34200	0.39000	0.12000	0.45000	0.30600	0.26800
l	0.24500	0.11800	0.12600	0.75500	0.17700	0.55500	0.28500	0.61500	0.14100	0.10300
m	0.70000	0.33700	0.32900	0.30000	0.63200	0.10000	0.17000	0.16000	0.59600	0.55800
n	0.05800	0.30500	0.31300	0.94200	0.01000	0.74200	0.47200	0.80200	0.04600	0.08400
o	0.73700	0.37400	0.36600	0.26300	0.66900	0.06300	0.20700	0.12300	0.63300	0.59500
p	0.58300	0.22000	0.21200	0.41700	0.51500	0.21700	0.05300	0.27700	0.47900	0.44100
q	0.10700	0.25600	0.26400	0.89300	0.03900	0.69300	0.42300	0.75300	0.00300	0.03500
r	0.84600	0.48300	0.47500	0.15400	0.77800	0.04600	0.31600	0.01400	0.74200	0.70400
s	0.54500	0.18200	0.17400	0.45500	0.47700	0.25500	0.01500	0.31500	0.44100	0.40300
t	0.97100	0.60800	0.60000	0.02900	0.90300	0.17100	0.44100	0.11100	0.86700	0.82900
u	0.16000	0.20300	0.21100	0.84000	0.09200	0.64000	0.37000	0.70000	0.05600	0.01800
v	0.73500	0.37200	0.36400	0.26500	0.66700	0.06500	0.20500	0.12500	0.63100	0.59300
w	0.38000	0.01700	0.00900	0.62000	0.31200	0.42000	0.15000	0.48000	0.27600	0.23800
x	0.27700	0.08600	0.09400	0.72300	0.20900	0.52300	0.25300	0.58300	0.17300	0.13500
y	0.06200	0.30100	0.30900	0.93800	0.00600	0.73800	0.46800	0.79800	0.04200	0.08000

z	0.32400	0.03900	0.04700	0.67600	0.25600	0.47600	0.20600	0.53600	0.22000	0.18200
0	0.94000	0.57700	0.56900	0.06000	0.87200	0.14000	0.41000	0.08000	0.83600	0.79800
1	0.30600	0.05700	0.06500	0.69400	0.23800	0.49400	0.22400	0.55400	0.20200	0.16400
2	0.07000	0.29300	0.30100	0.93000	0.00200	0.73000	0.46000	0.79000	0.03400	0.07200

TO:	k	l	m	n	o	p	q	r	s	t
FROM: a	0.41000	0.24500	0.70000	0.05800	0.73700	0.58300	0.10700	0.84600	0.54500	0.97100
b	0.04700	0.11800	0.33700	0.30500	0.37400	0.22000	0.25600	0.48300	0.18200	0.60800
c	0.03900	0.12600	0.32900	0.31300	0.36600	0.21200	0.26400	0.47500	0.17400	0.60000
d	0.59000	0.75500	0.30000	0.94200	0.26300	0.41700	0.89300	0.15400	0.45500	0.02900
e	0.34200	0.17700	0.63200	0.01000	0.66900	0.51500	0.03900	0.77800	0.47700	0.90300
f	0.39000	0.55500	0.10000	0.74200	0.06300	0.21700	0.69300	0.04600	0.25500	0.17100
g	0.12000	0.28500	0.17000	0.47200	0.20700	0.05300	0.42300	0.31600	0.01500	0.44100
h	0.45000	0.61500	0.16000	0.80200	0.12300	0.27700	0.75300	0.01400	0.31500	0.11100
i	0.30600	0.14100	0.59600	0.04600	0.63300	0.47900	0.00300	0.74200	0.44100	0.86700
j	0.26800	0.10300	0.55800	0.08400	0.59500	0.44100	0.03500	0.70400	0.40300	0.82900
k	-	0.16500	0.29000	0.35200	0.32700	0.17300	0.30300	0.43600	0.13500	0.56100
l	0.16500	-	0.45500	0.18700	0.49200	0.33800	0.13800	0.60100	0.30000	0.72600
m	0.29000	0.45500	-	0.64200	0.03700	0.11700	0.59300	0.14600	0.15500	0.27100
n	0.35200	0.18700	0.64200	-	0.67900	0.52500	0.04900	0.78800	0.48700	0.91300
o	0.32700	0.49200	0.03700	0.67900	-	0.15400	0.63000	0.10900	0.19200	0.23400
p	0.17300	0.33800	0.11700	0.52500	0.15400	-	0.47600	0.26300	0.03800	0.38800
q	0.30300	0.13800	0.59300	0.04900	0.63000	0.47600	-	0.73900	0.43800	0.86400
r	0.43600	0.60100	0.14600	0.78800	0.10900	0.26300	0.73900	-	0.30100	0.12500
s	0.13500	0.30000	0.15500	0.48700	0.19200	0.03800	0.43800	0.30100	-	0.42600
t	0.56100	0.72600	0.27100	0.91300	0.23400	0.38800	0.86400	0.12500	0.42600	-
u	0.25000	0.08500	0.54000	0.10200	0.57700	0.42300	0.05300	0.68600	0.38500	0.81100
v	0.32500	0.49000	0.03500	0.67700	0.00200	0.15200	0.62800	0.11100	0.19000	0.23600
w	0.03000	0.13500	0.32000	0.32200	0.35700	0.20300	0.27300	0.46600	0.16500	0.59100
x	0.13300	0.03200	0.42300	0.21900	0.46000	0.30600	0.17000	0.56900	0.26800	0.69400
y	0.34800	0.18300	0.63800	0.00400	0.67500	0.52100	0.04500	0.78400	0.48300	0.90900
z	0.08600	0.07900	0.37600	0.26600	0.41300	0.25900	0.21700	0.52200	0.22100	0.64700
0	0.53000	0.69500	0.24000	0.88200	0.20300	0.35700	0.83300	0.09400	0.39500	0.03100
1	0.10400	0.06100	0.39400	0.24800	0.43100	0.27700	0.19900	0.54000	0.23900	0.66500
2	0.34000	0.17500	0.63000	0.01200	0.66700	0.51300	0.03700	0.77600	0.47500	0.90100

TO:	u	v	w	x	y	z	0	1	2
FROM: a	0.16000	0.73500	0.38000	0.27700	0.06200	0.32400	0.94000	0.30600	0.07000
b	0.20300	0.37200	0.01700	0.08600	0.30100	0.03900	0.57700	0.05700	0.29300
c	0.21100	0.36400	0.00900	0.09400	0.30900	0.04700	0.56900	0.06500	0.30100
d	0.84000	0.26500	0.62000	0.72300	0.93800	0.67600	0.06000	0.69400	0.93000
e	0.09200	0.66700	0.31200	0.20900	0.00600	0.25600	0.87200	0.23800	0.00200
f	0.64000	0.06500	0.42000	0.52300	0.73800	0.47600	0.14000	0.49400	0.73000
g	0.37000	0.20500	0.15000	0.25300	0.46800	0.20600	0.41000	0.22400	0.46000
h	0.70000	0.12500	0.48000	0.58300	0.79800	0.53600	0.08000	0.55400	0.79000
i	0.05600	0.63100	0.27600	0.17300	0.04200	0.22000	0.83600	0.20200	0.03400
j	0.01800	0.59300	0.23800	0.13500	0.08000	0.18200	0.79800	0.16400	0.07200
k	0.25000	0.32500	0.03000	0.13300	0.34800	0.08600	0.53000	0.10400	0.34000
l	0.08500	0.49000	0.13500	0.03200	0.18300	0.07900	0.69500	0.06100	0.17500
m	0.54000	0.03500	0.32000	0.42300	0.63800	0.37600	0.24000	0.39400	0.63000
n	0.10200	0.67700	0.32200	0.21900	0.00400	0.26600	0.88200	0.24800	0.01200
o	0.57700	0.00200	0.35700	0.46000	0.67500	0.41300	0.20300	0.43100	0.66700
p	0.42300	0.15200	0.20300	0.30600	0.52100	0.25900	0.35700	0.27700	0.51300
q	0.05300	0.62800	0.27300	0.17000	0.04500	0.21700	0.83300	0.19900	0.03700
r	0.68600	0.11100	0.46600	0.56900	0.78400	0.52200	0.09400	0.54000	0.77600
s	0.38500	0.19000	0.16500	0.26800	0.48300	0.22100	0.39500	0.23900	0.47500
t	0.81100	0.23600	0.59100	0.69400	0.90900	0.64700	0.03100	0.66500	0.90100
u	-	0.57500	0.22000	0.11700	0.09800	0.16400	0.78000	0.14600	0.09000
v	0.57500	-	0.35500	0.45800	0.67300	0.41100	0.20500	0.42900	0.66500
w	0.22000	0.35500	-	0.10300	0.31800	0.05600	0.56000	0.07400	0.31000
x	0.11700	0.45800	0.10300	-	0.21500	0.04700	0.66300	0.02900	0.20700
y	0.09800	0.67300	0.31800	0.21500	-	0.26200	0.87800	0.24400	0.00800
z	0.16400	0.41100	0.05600	0.04700	0.26200	-	0.61600	0.01800	0.25400
0	0.78000	0.20500	0.56000	0.66300	0.87800	0.61600	-	0.63400	0.87000
1	0.14600	0.42900	0.07400	0.02900	0.24400	0.01800	0.63400	-	0.23600
2	0.09000	0.66500	0.31000	0.20700	0.00800	0.25400	0.87000	0.23600	-

Stepmatrix "LIGHT VENTROLATERAL EYE STRIPE" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.25700	0.14200	0.66600	0.37100	0.05300	0.02500	0.07000	0.07500	1.00000
b	0.25700	-	0.11500	0.40900	0.11400	0.20400	0.23200	0.18700	0.18200	0.74300
c	0.14200	0.11500	-	0.52400	0.22900	0.08900	0.11700	0.07200	0.06700	0.85800
d	0.66600	0.40900	0.52400	-	0.29500	0.61300	0.64100	0.59600	0.59100	0.33400
e	0.37100	0.11400	0.22900	0.29500	-	0.31800	0.34600	0.30100	0.29600	0.62900
f	0.05300	0.20400	0.08900	0.61300	0.31800	-	0.02800	0.01700	0.02200	0.94700

g	0.02500	0.23200	0.11700	0.64100	0.34600	0.02800	-	0.04500	0.05000	0.97500
h	0.07000	0.18700	0.07200	0.59600	0.30100	0.01700	0.04500	-	0.00500	0.93000
i	0.07500	0.18200	0.06700	0.59100	0.29600	0.02200	0.05000	0.00500	-	0.92500
j	1.00000	0.74300	0.85800	0.33400	0.62900	0.94700	0.97500	0.93000	0.92500	-
k	0.57900	0.32200	0.43700	0.08700	0.20800	0.52600	0.55400	0.50900	0.50400	0.42100
l	0.33300	0.07600	0.19100	0.33300	0.03800	0.28000	0.30800	0.26300	0.25800	0.66700
m	0.25600	0.00100	0.11400	0.41000	0.11500	0.20300	0.23100	0.18600	0.18100	0.74400
n	0.41100	0.15400	0.26900	0.25500	0.04000	0.35800	0.38600	0.34100	0.33600	0.58900
o	0.05500	0.20200	0.08700	0.61100	0.31600	0.00200	0.03000	0.01500	0.02000	0.94500
p	0.87000	0.61300	0.72800	0.20400	0.49900	0.81700	0.84500	0.80000	0.79500	0.13000
q	0.49900	0.24200	0.35700	0.16700	0.12800	0.44600	0.47400	0.42900	0.42400	0.50100
r	0.18600	0.07100	0.04400	0.48000	0.18500	0.13300	0.16100	0.11600	0.11100	0.81400

TO:	k	l	m	n	o	p	q	r
FROM: a	0.57900	0.33300	0.25600	0.41100	0.05500	0.87000	0.49900	0.18600
b	0.32200	0.07600	0.00100	0.15400	0.20200	0.61300	0.24200	0.07100
c	0.43700	0.19100	0.11400	0.26900	0.08700	0.72800	0.35700	0.04400
d	0.08700	0.33300	0.41000	0.25500	0.61100	0.20400	0.16700	0.48000
e	0.20800	0.03800	0.11500	0.04000	0.31600	0.49900	0.12800	0.18500
f	0.52600	0.28000	0.20300	0.35800	0.00200	0.81700	0.44600	0.13300
g	0.55400	0.30800	0.23100	0.38600	0.03000	0.84500	0.47400	0.16100
h	0.50900	0.26300	0.18600	0.34100	0.01500	0.80000	0.42900	0.11600
i	0.50400	0.25800	0.18100	0.33600	0.02000	0.79500	0.42400	0.11100
j	0.42100	0.66700	0.74400	0.58900	0.94500	0.13000	0.50100	0.81400
k	-	0.24600	0.32300	0.16800	0.52400	0.29100	0.08000	0.39300
l	0.24600	-	0.07700	0.07800	0.27800	0.53700	0.16600	0.14700
m	0.32300	0.07700	-	0.15500	0.20100	0.61400	0.24300	0.07000
n	0.16800	0.07800	0.15500	-	0.35600	0.45900	0.08800	0.22500
o	0.52400	0.27800	0.20100	0.35600	-	0.81500	0.44400	0.13100
p	0.29100	0.53700	0.61400	0.45900	0.81500	-	0.37100	0.68400
q	0.08000	0.16600	0.24300	0.08800	0.44400	0.37100	-	0.31300
r	0.39300	0.14700	0.07000	0.22500	0.13100	0.68400	0.31300	-

Stepmatrix "GULAR PATTERN FEMALES" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	0.22100	0.16100	0.09100	0.08100	0.25900	0.17900	0.27900	0.00900	0.03900
b	0.22100	-	0.06000	0.13000	0.14000	0.48000	0.40000	0.50000	0.23000	0.26000
c	0.16100	0.06000	-	0.07000	0.08000	0.42000	0.34000	0.44000	0.17000	0.20000
d	0.09100	0.13000	0.07000	-	0.01000	0.35000	0.27000	0.37000	0.10000	0.13000
e	0.08100	0.14000	0.08000	0.01000	-	0.34000	0.26000	0.36000	0.09000	0.12000
f	0.25900	0.48000	0.42000	0.35000	0.34000	-	0.08000	0.02000	0.25000	0.22000
g	0.17900	0.40000	0.34000	0.27000	0.26000	0.08000	-	0.10000	0.17000	0.14000
h	0.27900	0.50000	0.44000	0.37000	0.36000	0.02000	0.10000	-	0.27000	0.24000
i	0.00900	0.23000	0.17000	0.10000	0.09000	0.25000	0.17000	0.27000	-	0.03000
j	0.03900	0.26000	0.20000	0.13000	0.12000	0.22000	0.14000	0.24000	0.03000	-

Stepmatrix "GULAR PATTERN MALES" (symmetric):

TO:	a	b	c	d	e	f	g
FROM: a	-	0.46000	0.60000	0.52000	0.53000	0.16000	0.40000
b	0.46000	-	0.14000	0.06000	0.07000	0.30000	0.86000
c	0.60000	0.14000	-	0.08000	0.07000	0.44000	1.00000
d	0.52000	0.06000	0.08000	-	0.01000	0.36000	0.92000
e	0.53000	0.07000	0.07000	0.01000	-	0.37000	0.93000
f	0.16000	0.30000	0.44000	0.36000	0.37000	-	0.56000
g	0.40000	0.86000	1.00000	0.92000	0.93000	0.56000	-

Stepmatrix "DARK INTERORBITAL BAND" (symmetric):

TO:	a	b	c	d	e	f	g	h	i	j
FROM: a	-	1.00000	0.52000	0.16600	0.08000	0.02500	0.11000	0.06600	0.20700	0.23500
b	1.00000	-	0.48000	0.83400	0.92000	0.97500	0.89000	0.93400	0.79300	0.76500
c	0.52000	0.48000	-	0.35400	0.44000	0.49500	0.41000	0.45400	0.31300	0.28500
d	0.16600	0.83400	0.35400	-	0.08600	0.14100	0.05600	0.10000	0.04100	0.06900
e	0.08000	0.92000	0.44000	0.08600	-	0.05500	0.03000	0.01400	0.12700	0.15500
f	0.02500	0.97500	0.49500	0.14100	0.05500	-	0.08500	0.04100	0.18200	0.21000
g	0.11000	0.89000	0.41000	0.05600	0.03000	0.08500	-	0.04400	0.09700	0.12500
h	0.06600	0.93400	0.45400	0.10000	0.01400	0.04100	0.04400	-	0.14100	0.16900
i	0.20700	0.79300	0.31300	0.04100	0.12700	0.18200	0.09700	0.14100	-	0.02800
j	0.23500	0.76500	0.28500	0.06900	0.15500	0.21000	0.12500	0.16900	0.02800	-
k	0.19400	0.80600	0.32600	0.02800	0.11400	0.16900	0.08400	0.12800	0.01300	0.04100
l	0.58000	0.42000	0.06000	0.41400	0.50000	0.55500	0.47000	0.51400	0.37300	0.34500
m	0.88200	0.11800	0.36200	0.71600	0.80200	0.85700	0.77200	0.81600	0.67500	0.64700

n	0.07300	0.92700	0.44700	0.09300	0.00700	0.04800	0.03700	0.00700	0.13400	0.16200
o	0.43200	0.56800	0.08800	0.26600	0.35200	0.40700	0.32200	0.36600	0.22500	0.19700
p	0.21300	0.78700	0.30700	0.04700	0.13300	0.18800	0.10300	0.14700	0.00600	0.02200

TO:	k	l	m	n	o	p
FROM: a	0.19400	0.58000	0.88200	0.07300	0.43200	0.21300
b	0.80600	0.42000	0.11800	0.92700	0.56800	0.78700
c	0.32600	0.06000	0.36200	0.44700	0.08800	0.30700
d	0.02800	0.41400	0.71600	0.09300	0.26600	0.04700
e	0.11400	0.50000	0.80200	0.00700	0.35200	0.13300
f	0.16900	0.55500	0.85700	0.04800	0.40700	0.18800
g	0.08400	0.47000	0.77200	0.03700	0.32200	0.10300
h	0.12800	0.51400	0.81600	0.00700	0.36600	0.14700
i	0.01300	0.37300	0.67500	0.13400	0.22500	0.00600
j	0.04100	0.34500	0.64700	0.16200	0.19700	0.02200
k	-	0.38600	0.68800	0.12100	0.23800	0.01900
l	0.38600	-	0.30200	0.50700	0.14800	0.36700
m	0.68800	0.30200	-	0.80900	0.45000	0.66900
n	0.12100	0.50700	0.80900	-	0.35900	0.14000
o	0.23800	0.14800	0.45000	0.35900	-	0.21900
p	0.01900	0.36700	0.66900	0.14000	0.21900	-

Stepmatrix "BLACK LIPS" (symmetric):

TO:	a	b	c	d	e	f	g
FROM: a	-	0.10000	0.16900	0.03200	0.33300	0.40500	1.00000
b	0.10000	-	0.06900	0.06800	0.23300	0.30500	0.90000
c	0.16900	0.06900	-	0.13700	0.16400	0.23600	0.83100
d	0.03200	0.06800	0.13700	-	0.30100	0.37300	0.96800
e	0.33300	0.23300	0.16400	0.30100	-	0.07200	0.66700
f	0.40500	0.30500	0.23600	0.37300	0.07200	-	0.59500
g	1.00000	0.90000	0.83100	0.96800	0.66700	0.59500	-

Stepmatrix "BLACK TYMPANIC MARK FEMALES" (symmetric):

TO:	a	b	c	d	e
FROM: a	-	1.00000	0.33300	0.09400	0.60000
b	1.00000	-	0.66700	0.90600	0.40000
c	0.33300	0.66700	-	0.23900	0.26700
d	0.09400	0.90600	0.23900	-	0.50600
e	0.60000	0.40000	0.26700	0.50600	-

APPENDIX VII

MORPHOLOGICAL CHARACTER CHANGES SUPPORTING STEMS OF COMBINED BAYESIAN TREE

Stems and terminal taxa refer to the Bayesian tree obtained from analysis of combined dataset with GTR+*I*+Γ and Mkv+ Γ models for molecular and morphological characters, respectively (Fig. 42). For each stem and terminal taxon, the list of apomorphies with corresponding steps, consistency indices, and changes is provided under ACCTRAN and DELTRAN optimizations. Arrows with single lines indicate that changes occur in some reconstructions only, whereas arrows with double lines indicate that changes occur under both ACCTRAN and DELTRAN reconstructions.

ACCTRAN optimization

Stem	Char	Steps	CI	Change
Microlophus	1804	1	0.167	0 --> 1
	1807	1	0.182	0 --> 1
	1810	0.02900	0.094	q --> d
	1816	1	0.143	0 --> 1
	1817	0.04500	0.167	r ==> M
	1821	0.22000	0.300	k ==> t
	1824	0.01300	0.255	i --> b
	1827	0.01750	0.169	p ==> d
	1834	0.02000	0.104	l --> b
	1838	0.11500	0.158	q ==> 2
	1839	0.23500	0.103	A --> i
	1843	1	0.143	0 --> 1
	1845	1	0.222	1 --> 2
	1847	1	0.333	0 --> 2
	1850	1	0.250	2 --> 3
	1855	0.08600	0.232	y ==> T
	1858	1	0.100	0 --> 1
	1864	0.03100	0.240	F --> 4
	1884	1	0.500	0 --> 1
	1896	0.10700	0.086	q ==> a
	1905	0.05500	0.168	f ==> n
1	1790	1	1.000	0 --> 1
	1793	1	1.000	0 --> 1
	1795	1	1.000	0 --> 1

DELTRAN optimization

Stem	Char	Steps	CI	Change
Microlophus	1804	1	0.167	0 --> 1
	1807	1	0.182	0 --> 1
	1810	0.02900	0.094	q --> d
	1816	1	0.143	0 --> 1
	1817	0.04500	0.167	r ==> M
	1821	0.22000	0.300	k ==> t
	1824	0.01300	0.255	i --> b
	1827	0.01750	0.169	p ==> d
	1834	0.02000	0.104	l --> b
	1838	0.11500	0.158	q ==> 2
	1839	0.23500	0.103	A --> i
	1843	1	0.143	0 --> 1
	1845	1	0.222	1 --> 2
	1847	1	0.333	0 --> 2
	1850	1	0.250	2 --> 3
	1855	0.08600	0.232	y ==> T
	1858	1	0.100	0 --> 1
	1864	0.03100	0.240	F --> 4
	1884	1	0.500	0 --> 1
	1896	0.10700	0.086	q ==> a
	1905	0.05500	0.168	f ==> n
1	1790	1	1.000	0 --> 1
	1793	1	1.000	0 --> 1
	1795	1	1.000	0 --> 1

	1797	1	1.000	0 --> 1
	1798	1	1.000	0 --> 1
	1800	1	0.250	0 --> 1
	1809	1	1.000	0 --> 1
	1810	0.97100	0.094	q --> a
	1817	0.04300	0.167	r --> j
	1820	0.04600	0.127	E --> p
	1821	0.03000	0.300	k --> e
	1824	0.00700	0.255	i --> 1
	1838	0.05500	0.158	q --> l
	1839	0.10600	0.103	A --> m
	1840	1	1.000	0 --> 1
	1842	1	0.250	0 --> 1
	1855	0.05200	0.232	y --> 4
	1856	0.00100	0.202	R --> 5
	1864	0.01900	0.240	F --> 6
	1877	1	0.333	0 --> 1
	1881	1	0.250	0 --> 1
	1883	1	0.154	0 --> 2
	1896	0.21700	0.086	q --> z
	1901	1	1.000	0 --> 1
	1902	1	1.000	0 --> 1
	1903	1	1.000	0 --> 1
	1904	0.11800	0.216	g --> b
	1905	0.01100	0.168	f --> d
2	1788	1	0.100	1 ==> 0
	1827	0.00250	0.169	p --> h
	1828	0.02400	0.160	u ==> v
	1834	0.01900	0.104	l ==> z
	1839	0.05800	0.103	m ==> 3
	1854	0.03900	0.195	R ==> 6
	1862	0.01600	0.281	I ==> K
	1888	0.56500	0.128	a ==> n
	1891	1	0.083	0 --> 1
3	1800	1	0.250	1 --> 0
	1807	1	0.182	0 --> 1
	1810	0.85700	0.094	a --> k
	1817	0.07800	0.167	j ==> n
	1820	0.10500	0.127	p ==> 4
	1821	0.02500	0.300	e --> n
	1828	0.04400	0.160	v ==> a
	1839	0.22200	0.103	3 ==> 2
	1844	0.05500	0.247	Q ==> j
	1845	1	0.222	1 --> 2
	1846	1	0.143	1 ==> 0
	1847	1	0.333	0 --> 2
	1850	1	0.250	2 --> 3
	1854	0.03000	0.195	6 ==> I
	1855	0.02800	0.232	4 ==> b
	1864	0.00600	0.240	6 --> M
	1871	1	0.111	0 --> 1
	1872	1	0.200	1 ==> 0
	1873	1	0.500	1 ==> 0
	1875	1	0.167	1 ==> 0
	1877	1	0.333	1 --> 0
	1881	1	0.250	1 ==> 3
	1888	0.32100	0.128	n ==> o
	1896	0.01800	0.086	z --> 1
	1905	0.02200	0.168	d ==> k

	1797	1	1.000	0 --> 1
	1798	1	1.000	0 --> 1
	1809	1	1.000	0 --> 1
	1810	0.11400	0.094	q --> k
	1817	0.04300	0.167	r --> j
	1821	0.03000	0.300	k --> e
	1824	0.00700	0.255	i --> 1
	1838	0.01000	0.158	q --> y
	1839	0.10600	0.103	A --> m
	1840	1	1.000	0 --> 1
	1842	1	0.250	0 --> 1
	1855	0.05200	0.232	y --> 4
	1856	0.00100	0.202	R --> 5
	1864	0.01900	0.240	F --> 6
	1881	1	0.250	0 --> 1
	1883	1	0.154	0 --> 2
	1896	0.21700	0.086	q --> z
	1901	1	1.000	0 --> 1
	1902	1	1.000	0 --> 1
	1903	1	1.000	0 --> 1
	1904	0.11800	0.216	g --> b
2	1788	1	0.100	1 ==> 0
	1820	0.04600	0.127	E --> p
	1827	0.00250	0.169	p --> h
	1828	0.01000	0.160	u ==> w
	1834	0.01900	0.104	l ==> z
	1839	0.05100	0.103	m ==> K
	1854	0.03200	0.195	R ==> O
	1862	0.01600	0.281	I ==> K
3	1807	1	0.182	0 --> 1
	1817	0.07800	0.167	j ==> n
	1820	0.10500	0.127	p ==> 4
	1821	0.02500	0.300	e --> n
	1828	0.05400	0.160	w ==> m
	1838	0.04500	0.158	y --> l
	1839	0.22900	0.103	K ==> 2
	1844	0.05400	0.247	Q ==> A
	1845	1	0.222	1 --> 2
	1846	1	0.143	1 ==> 0
	1847	1	0.333	0 --> 2
	1850	1	0.250	2 --> 3
	1854	0.03700	0.195	O ==> I
	1855	0.02700	0.232	4 ==> 5
	1864	0.00600	0.240	6 --> M
	1872	1	0.200	1 ==> 0
	1873	1	0.500	1 ==> 0
	1875	1	0.167	1 ==> 0
	1881	1	0.250	1 ==> 3
	1888	0.88600	0.128	a ==> o
	1896	0.01800	0.086	z --> 1
	1905	0.01100	0.168	f ==> k
	1906	0.12000	0.171	b ==> l
	1907	0.11500	0.178	b ==> h
	1908	0.02800	0.170	e ==> c
	1909	0.03200	0.168	b ==> i
4	1801	1	0.200	0 ==> 1
	1805	1	0.250	0 ==> 1
	1807	1	0.182	1 ==> 2

	1906	0.12000	0.171	b ==> l
	1907	0.11500	0.178	b ==> h
	1908	0.02800	0.170	e ==> c
	1909	0.03200	0.168	b ==> I
4	1801	1	0.200	0 ==> 1
	1805	1	0.250	0 ==> 1
	1807	1	0.182	1 ==> 2
	1810	0.14300	0.094	k ==> d
	1813	1	0.182	1 ==> 2
	1817	0.00400	0.167	n --> b
	1818	1	0.333	1 ==> 0
	1821	0.06500	0.300	n --> f
	1824	0.30800	0.255	1 ==> w
	1827	0.00500	0.169	h ==> o
	1828	0.04400	0.160	a ==> v
	1834	0.61400	0.104	z ==> m
	1839	0.10100	0.103	2 ==> z
	1841	1	0.182	1 --> 2
	1842	1	0.250	1 ==> 0
	1854	0.04600	0.195	I ==> y
	1855	0.02400	0.232	b ==> y
	1857	1	0.222	0 --> 1
	1859	1	0.200	0 ==> 1
	1862	0.00500	0.281	K ==> 1
	1864	0.03100	0.240	M --> x
	1867	1	0.250	1 ==> 0
	1888	0.88600	0.128	o ==> a
	1895	1	0.200	0 ==> 1
	1898	0.16600	0.207	a ==> d
	1906	0.04000	0.171	l --> m
	1907	0.11600	0.178	h ==> n
	1908	0.02200	0.170	c ==> p
5	1819	0.07400	0.330	a ==> h
	1820	0.02700	0.127	4 ==> 5
	1822	1	0.500	0 ==> 1
	1823	1	1.000	0 ==> 1
	1824	0.05700	0.255	w ==> m
	1827	0.00750	0.169	o --> b
	1828	0.04800	0.160	v ==> n
	1829	1	0.333	0 ==> 1
	1830	1	0.500	1 --> 0
	1834	0.30700	0.104	m --> k
	1835	1	0.250	0 --> 1
	1837	1	0.500	0 ==> 1
	1838	0.12000	0.158	l --> d
	1844	0.03700	0.247	j ==> q
	1855	0.08200	0.232	y ==> g
	1856	0.06500	0.202	5 ==> g
	1857	1	0.222	1 --> 2
	1871	1	0.111	1 --> 0
	1883	1	0.154	2 --> 0
	1896	0.30600	0.086	1 ==> a
	1909	0.12900	0.168	i ==> f
6	1787	1	0.500	0 --> 1
	1789	1	0.250	0 --> 1
	1817	0.09100	0.167	b ==> o
	1821	0.09000	0.300	f --> e
	1838	0.02200	0.158	d ==> k

	1810	0.14300	0.094	k ==> d
	1813	1	0.182	1 ==> 2
	1818	1	0.333	1 ==> 0
	1824	0.30800	0.255	1 ==> w
	1827	0.00500	0.169	h ==> o
	1828	0.04000	0.160	m ==> v
	1834	0.61400	0.104	z ==> m
	1839	0.02000	0.103	2 ==> 0
	1842	1	0.250	1 ==> 0
	1854	0.04100	0.195	I ==> t
	1855	0.02500	0.232	5 ==> y
	1859	1	0.200	0 ==> 1
	1862	0.00300	0.281	K ==> 4
	1867	1	0.250	1 ==> 0
	1888	0.88600	0.128	o ==> a
	1891	1	0.083	0 --> 1
	1895	1	0.200	0 ==> 1
	1898	0.16600	0.207	a ==> d
	1907	0.11600	0.178	h ==> n
	1908	0.02200	0.170	c ==> p
5	1819	0.06300	0.330	a ==> i
	1820	0.02700	0.127	4 ==> 5
	1822	1	0.500	0 ==> 1
	1823	1	1.000	0 ==> 1
	1824	0.05700	0.255	w ==> m
	1828	0.04800	0.160	v ==> n
	1829	1	0.333	0 ==> 1
	1837	1	0.500	0 ==> 1
	1844	0.03600	0.247	A ==> g
	1855	0.02600	0.232	y ==> a
	1856	0.05600	0.202	5 ==> I
	1857	1	0.222	0 --> 2
	1896	0.30600	0.086	1 ==> a
	1909	0.09700	0.168	i ==> e
6	1817	0.07900	0.167	n ==> a
	1819	0.01100	0.330	i --> h
	1838	0.14200	0.158	l ==> k
	1844	0.00200	0.247	g --> q
	1845	1	0.222	2 ==> 0
	1850	1	0.250	3 ==> 2
	1851	1	0.222	3 ==> 1
	1853	1	0.333	0 ==> 1
	1862	0.00200	0.281	4 --> 1
	1864	0.09300	0.240	M ==> a
	1904	0.05900	0.216	b ==> a
	1907	0.03900	0.178	n --> l
7	1807	1	0.182	2 ==> 1
	1808	1	0.200	0 ==> 1
	1810	1.00000	0.094	d ==> a
	1816	1	0.143	0 ==> 1
	1820	0.15300	0.127	5 ==> r
	1827	0.01500	0.169	o ==> d
	1834	0.30700	0.104	m --> k
	1838	0.51000	0.158	k ==> m
	1839	0.28500	0.103	0 ==> s
	1898	0.05600	0.207	d ==> g
	1908	0.02200	0.170	p ==> a
	1909	0.09700	0.168	e ==> a

	1841	1	0.182	2 --> 1
	1845	1	0.222	2 ==> 0
	1850	1	0.250	3 ==> 2
	1851	1	0.222	3 ==> 1
	1853	1	0.333	0 ==> 1
	1854	0.00500	0.195	y --> t
	1862	0.03000	0.281	1 --> p
	1864	0.06500	0.240	x ==> t
	1904	0.17700	0.216	b ==> e
	1906	0.04000	0.171	m --> l
	1907	0.03900	0.178	n --> l
7	1807	1	0.182	2 ==> 1
	1808	1	0.200	0 ==> 1
	1810	1.00000	0.094	d ==> a
	1816	1	0.143	0 ==> 1
	1820	0.15300	0.127	5 ==> r
	1827	0.00750	0.169	b ==> d
	1830	1	0.500	0 --> 1
	1835	1	0.250	1 --> 0
	1838	0.51000	0.158	k ==> m
	1839	0.20400	0.103	z ==> s
	1855	0.05600	0.232	g --> a
	1883	1	0.154	0 --> 1
	1898	0.05600	0.207	d ==> g
	1908	0.02200	0.170	p ==> a
	1909	0.06500	0.168	f ==> a
S. aculeatus	1789	1	0.250	1 --> 0
	1817	0.01600	0.167	o --> a
	1819	0.07400	0.330	h ==> a
	1820	0.01500	0.127	r ==> a
	1821	0.21800	0.300	e ==> a
	1824	0.00800	0.255	m ==> a
	1827	0.01500	0.169	d ==> a
	1828	0.09200	0.160	n ==> a
	1834	0.04000	0.104	k ==> a
	1838	0.05500	0.158	m ==> a
	1839	0.07400	0.103	s ==> a
	1841	1	0.182	1 --> 2
	1844	0.00500	0.247	q ==> a
	1850	1	0.250	2 ==> 1
	1854	0.02800	0.195	t ==> a
	1856	0.03800	0.202	g ==> a
	1862	0.05200	0.281	p ==> a
	1864	0.00300	0.240	t --> a
	1871	1	0.111	0 --> 1
	1883	1	0.154	1 --> 2
	1885	0.22100	0.177	b ==> a
	1886	0.60000	0.224	c ==> a
	1898	0.11000	0.207	g ==> a
	1904	0.11800	0.216	e --> a
	1905	0.07800	0.168	k ==> a
	1906	0.12000	0.171	l ==> a
	1907	0.07700	0.178	l ==> a
S. fimbriatus	1787	1	0.500	1 --> 0
	1796	1	0.333	0 ==> 1
	1813	1	0.182	2 ==> 1
	1817	0.04000	0.167	o ==> s
	1822	1	0.500	1 ==> 0
S. aculeatus	1787	1	0.500	0 --> 1
	1819	0.07400	0.330	h ==> a
	1820	0.01500	0.127	r ==> a
	1821	0.19300	0.300	n ==> a
	1824	0.00800	0.255	m ==> a
	1827	0.01500	0.169	d ==> a
	1828	0.09200	0.160	n ==> a
	1834	0.04000	0.104	k ==> a
	1838	0.05500	0.158	m ==> a
	1839	0.07400	0.103	s ==> a
	1841	1	0.182	1 --> 2
	1844	0.00500	0.247	q ==> a
	1850	1	0.250	2 ==> 1
	1854	0.02800	0.195	t ==> a
	1856	0.02900	0.202	I ==> a
	1862	0.02200	0.281	1 ==> a
	1871	1	0.111	0 --> 1
	1885	0.22100	0.177	b ==> a
	1886	0.60000	0.224	c ==> a
	1898	0.11000	0.207	g ==> a
	1905	0.07800	0.168	k ==> a
	1906	0.12000	0.171	l ==> a
	1907	0.07700	0.178	l ==> a
S. fimbriatus	1789	1	0.250	0 --> 1
	1796	1	0.333	0 ==> 1
	1813	1	0.182	2 ==> 1
	1817	0.05600	0.167	a ==> s
	1821	0.02500	0.300	n --> e
	1822	1	0.500	1 ==> 0
	1824	0.07700	0.255	m ==> r
	1828	0.29400	0.160	n ==> r
	1844	0.02900	0.247	q ==> t
	1855	0.03000	0.232	a ==> t
	1856	0.02600	0.202	I ==> t
	1857	1	0.222	2 ==> 1
	1861	1	0.500	1 ==> 0
	1862	0.09100	0.281	1 ==> r
	1863	1	0.333	1 ==> 0
	1864	0.00300	0.240	a --> t
	1867	1	0.250	0 ==> 1
	1868	1	1.000	0 ==> 1
	1883	1	0.154	2 --> 1
	1904	0.11800	0.216	a --> e
	1908	0.11000	0.170	a ==> n
	1909	0.12900	0.168	a ==> l
S. dumerilii	1787	1	0.500	0 --> 1
	1789	1	0.250	0 --> 1
	1791	1	1.000	1 ==> 0
	1792	1	1.000	0 ==> 1
	1799	1	0.167	0 ==> 1
	1801	1	0.200	1 ==> 0
	1804	1	0.167	0 ==> 1
	1806	1	0.500	0 ==> 1
	1814	1	1.000	0 ==> 1
	1815	1	0.500	0 ==> 1
	1817	0.01600	0.167	a ==> o
	1818	1	0.333	0 ==> 1
	1819	0.81600	0.330	h ==> g

	1824	0.07700	0.255	m ==> r
	1828	0.29400	0.160	n ==> r
	1844	0.02900	0.247	q ==> t
	1855	0.03000	0.232	a ==> t
	1856	0.01700	0.202	g ==> t
	1857	1	0.222	2 ==> 1
	1861	1	0.500	1 ==> 0
	1862	0.06100	0.281	p ==> r
	1863	1	0.333	1 ==> 0
	1867	1	0.250	0 ==> 1
	1868	1	1.000	0 ==> 1
	1908	0.11000	0.170	a ==> n
	1909	0.12900	0.168	a ==> l
S. dumerilii	1791	1	1.000	1 ==> 0
	1792	1	1.000	0 ==> 1
	1799	1	0.167	0 ==> 1
	1801	1	0.200	1 ==> 0
	1804	1	0.167	0 ==> 1
	1806	1	0.500	0 ==> 1
	1814	1	1.000	0 ==> 1
	1815	1	0.500	0 ==> 1
	1818	1	0.333	0 ==> 1
	1819	0.81600	0.330	h ==> g
	1820	0.08200	0.127	5 ==> m
	1825	1	0.500	0 ==> 1
	1827	0.24250	0.169	b ==> l
	1834	0.96000	0.104	k ==> b
	1836	1	1.000	0 ==> 1
	1839	0.11100	0.103	z ==> n
	1844	0.04000	0.247	q ==> o
	1854	0.00800	0.195	t ==> o
	1855	0.11000	0.232	g ==> o
	1856	0.06700	0.202	g ==> o
	1862	0.05300	0.281	p --> n
	1864	0.09600	0.240	t ==> o
	1869	1	0.333	2 ==> 0
	1881	1	0.250	3 ==> 0
	1890	1	0.062	0 ==> 1
	1891	1	0.083	1 ==> 0
	1905	0.04500	0.168	k ==> e
	1906	0.48000	0.171	l ==> i
	1907	0.46100	0.178	l ==> k
	1908	0.08300	0.170	p ==> j
	1909	0.03200	0.168	f --> e
8	1788	1	0.100	0 --> 1
	1817	0.05500	0.167	b ==> g
	1820	0.07100	0.127	5 --> 7
	1824	0.09100	0.255	m ==> 9
	1828	0.08200	0.160	n ==> g
	1834	0.04000	0.104	k ==> a
	1854	0.02900	0.195	y ==> G
	1862	0.02500	0.281	1 ==> f
	1864	0.05500	0.240	x ==> g
	1882	1	1.000	0 ==> 1
	1898	0.35400	0.207	d ==> c
	1905	0.01100	0.168	k ==> c
	1906	0.12000	0.171	m ==> n
	1907	0.07700	0.178	n ==> f
	1908	0.03800	0.170	p ==> g
	1820	0.08200	0.127	5 ==> m
	1821	0.02500	0.300	n --> e
	1825	1	0.500	0 ==> 1
	1827	0.23500	0.169	o ==> l
	1830	1	0.500	1 --> 0
	1834	0.65300	0.104	m ==> b
	1835	1	0.250	0 --> 1
	1836	1	1.000	0 ==> 1
	1839	0.03000	0.103	0 ==> n
	1844	0.04000	0.247	q ==> o
	1854	0.00800	0.195	t ==> o
	1855	0.16600	0.232	a ==> o
	1856	0.07600	0.202	I ==> o
	1862	0.08300	0.281	1 --> n
	1864	0.09900	0.240	a ==> o
	1869	1	0.333	2 ==> 0
	1881	1	0.250	3 ==> 0
	1883	1	0.154	2 --> 0
	1890	1	0.062	0 ==> 1
	1891	1	0.083	1 ==> 0
	1904	0.11800	0.216	a --> e
	1905	0.04500	0.168	k ==> e
	1906	0.48000	0.171	l ==> i
	1907	0.46100	0.178	l ==> k
	1908	0.08300	0.170	p ==> j
8	1817	0.05100	0.167	n ==> g
	1820	0.07100	0.127	5 --> 7
	1821	0.06500	0.300	n --> f
	1824	0.09100	0.255	m ==> 9
	1827	0.00750	0.169	o --> b
	1828	0.08200	0.160	n ==> g
	1830	1	0.500	1 --> 0
	1834	0.34700	0.104	m ==> a
	1835	1	0.250	0 --> 1
	1841	1	0.182	1 --> 2
	1854	0.03400	0.195	t ==> G
	1855	0.05600	0.232	a --> g
	1862	0.02300	0.281	4 ==> f
	1864	0.02400	0.240	M ==> g
	1882	1	1.000	0 ==> 1
	1883	1	0.154	2 --> 0
	1898	0.35400	0.207	d ==> c
	1905	0.01100	0.168	k ==> c
	1906	0.16000	0.171	l ==> n
	1907	0.07700	0.178	n ==> f
	1908	0.03800	0.170	p ==> g
	1909	0.03200	0.168	e --> f
S. caducus	1788	1	0.100	0 --> 1
	1810	0.03300	0.094	d --> f
	1819	0.03000	0.330	i ==> c
	1820	0.01200	0.127	7 ==> g
	1824	0.05000	0.255	9 ==> g
	1838	0.04700	0.158	l ==> g
	1839	0.11100	0.103	0 ==> g
	1854	0.02400	0.195	G ==> g
	1856	0.00900	0.202	I --> g
	1906	0.04000	0.171	n ==> f
S. prionotus	1817	0.03900	0.167	g ==> B

S. caducus	1810	0.03300	0.094	d --> f
	1819	0.04100	0.330	h ==> c
	1820	0.01200	0.127	7 ==> g
	1824	0.05000	0.255	9 ==> g
	1838	0.16700	0.158	d ==> g
	1839	0.19200	0.103	z ==> g
	1844	0.00200	0.247	q --> g
	1854	0.02400	0.195	G ==> g
	1906	0.04000	0.171	n ==> f
S. prionotus	1817	0.03900	0.167	g ==> B
	1819	0.05900	0.330	h ==> l
	1821	0.24300	0.300	f ==> q
	1828	0.01000	0.160	g ==> D
	1838	0.28000	0.158	d ==> w
	1839	0.08800	0.103	z ==> C
	1855	0.01800	0.232	g ==> I
	1856	0.00900	0.202	g --> I
	1862	0.04600	0.281	f ==> E
	1864	0.02400	0.240	g ==> E
	1871	1	0.111	0 --> 1
	1886	0.07000	0.224	c ==> e
	1898	0.06000	0.207	c ==> l
	1907	0.03800	0.178	f ==> q
	1908	0.01700	0.170	g ==> u
	1909	0.09700	0.168	f ==> k
S. huancabambae	1808	1	0.200	0 ==> 1
	1816	1	0.143	0 ==> 1
	1817	0.01000	0.167	b ==> v
	1820	0.04500	0.127	4 ==> u
	1821	0.00900	0.300	f ==> j
	1838	0.08000	0.158	l ==> f
	1839	0.01100	0.103	z ==> w
	1844	0.00800	0.247	j ==> y
	1856	0.01600	0.202	5 ==> y
	1862	0.00600	0.281	1 ==> w
	1887	0.87500	0.124	a ==> f
	1890	1	0.062	0 ==> 1
	1896	0.39400	0.086	1 ==> m
	1899	0.03200	0.380	a ==> d
	1905	0.01100	0.168	k ==> f
9	1810	0.05200	0.094	k ==> j
	1817	0.06300	0.167	n ==> c
	1821	0.02500	0.300	n --> e
	1824	0.07200	0.255	1 ==> q
	1828	0.00600	0.160	a --> F
	1834	0.03900	0.104	z ==> b
	1838	0.03100	0.158	l ==> h
	1855	0.00100	0.232	b --> 5
	1856	0.00700	0.202	5 --> D
	1858	1	0.100	0 --> 1
	1864	0.01200	0.240	M ==> G
	1888	0.03400	0.128	o --> e
	1890	1	0.062	0 --> 1
	1896	0.16400	0.086	1 ==> j
	1906	0.12000	0.171	l ==> b
	1907	0.11500	0.178	h ==> b
	1908	0.00600	0.170	c --> w

	1819	0.07000	0.330	i ==> l
	1821	0.24300	0.300	f ==> q
	1828	0.01000	0.160	g ==> D
	1838	0.40000	0.158	l ==> w
	1839	0.16900	0.103	0 ==> C
	1844	0.00200	0.247	g --> q
	1855	0.01800	0.232	g ==> I
	1862	0.04600	0.281	f ==> E
	1864	0.02400	0.240	g ==> E
	1871	1	0.111	0 --> 1
	1886	0.07000	0.224	c ==> e
	1898	0.06000	0.207	c ==> l
	1907	0.03800	0.178	f ==> q
	1908	0.01700	0.170	g ==> u
	1909	0.09700	0.168	f ==> k
S. huancabambae	1808	1	0.200	0 ==> 1
	1816	1	0.143	0 ==> 1
	1817	0.01400	0.167	n ==> v
	1820	0.04500	0.127	4 ==> u
	1821	0.07400	0.300	n ==> j
	1838	0.08000	0.158	l ==> f
	1839	0.09200	0.103	0 ==> w
	1841	1	0.182	1 --> 2
	1844	0.00700	0.247	A ==> y
	1854	0.00500	0.195	t --> y
	1856	0.01600	0.202	5 ==> y
	1857	1	0.222	0 --> 1
	1862	0.00800	0.281	4 ==> w
	1864	0.03100	0.240	M --> x
	1871	1	0.111	0 --> 1
	1887	0.87500	0.124	a ==> f
	1890	1	0.062	0 ==> 1
	1896	0.39400	0.086	1 ==> m
	1899	0.03200	0.380	a ==> d
	1905	0.01100	0.168	k ==> f
	1906	0.04000	0.171	l --> m
9	1810	0.05200	0.094	k ==> j
	1817	0.05100	0.167	n ==> g
	1821	0.02500	0.300	n --> e
	1824	0.07200	0.255	1 ==> q
	1828	0.01000	0.160	m --> F
	1834	0.03900	0.104	z ==> b
	1838	0.03100	0.158	l ==> h
	1844	0.00100	0.247	A --> j
	1856	0.00700	0.202	5 --> D
	1864	0.01200	0.240	M ==> G
	1896	0.14600	0.086	1 ==> u
	1906	0.12000	0.171	l ==> b
	1907	0.11500	0.178	h ==> b
	1908	0.00600	0.170	c --> w
10	1820	0.03300	0.127	4 ==> b
	1839	0.02000	0.103	2 --> 0
	1854	0.02000	0.195	I ==> j
	1856	0.04900	0.202	D ==> j
	1862	0.01200	0.281	K ==> b
	1864	0.00400	0.240	G ==> 8
	1881	1	0.250	3 ==> 2
	1908	0.01100	0.170	w ==> i

10	1820	0.03300	0.127	4 ==> b
	1828	0.01200	0.160	F --> i
	1839	0.02000	0.103	2 --> 0
	1854	0.02000	0.195	I ==> j
	1856	0.04900	0.202	D ==> j
	1862	0.01200	0.281	K ==> b
	1864	0.02400	0.240	G ==> j
	1871	1	0.111	1 --> 0
	1881	1	0.250	3 ==> 2
	1891	1	0.083	1 --> 0
	1908	0.01100	0.170	w ==> i
	1909	0.03200	0.168	i --> b
11	1817	0.02800	0.167	c --> r
	1821	0.03000	0.300	e ==> k
	1838	0.06300	0.158	h --> r
	1844	0.04100	0.247	j ==> s
	1854	0.05200	0.195	j ==> b
	1855	0.01100	0.232	5 ==> s
	1856	0.00100	0.202	j ==> 3
	1858	1	0.100	1 --> 0
	1887	0.87500	0.124	a ==> f
	1896	0.01800	0.086	j --> u
	1897	0.02500	0.228	a ==> g
	1905	0.01100	0.168	k ==> c
	1908	0.01100	0.170	i ==> e
12	1821	0.00100	0.300	k --> b
	1838	0.04300	0.158	r ==> b
	1862	0.00500	0.281	b ==> a
	1887	0.37600	0.124	f --> e
	1888	0.26400	0.128	e ==> h
	1890	1	0.062	1 --> 0
	1896	0.08500	0.086	u --> l
	1897	0.05000	0.228	g --> i
	1905	0.01100	0.168	c ==> j
S. angel	1804	1	0.167	0 ==> 1
	1810	0.15200	0.094	j ==> b
	1817	0.03900	0.167	r ==> b
	1824	0.05200	0.255	q ==> b
	1827	0.01250	0.169	h ==> b
	1828	0.01800	0.160	i ==> b
	1839	0.03500	0.103	0 ==> b
	1844	0.01300	0.247	s ==> b
	1855	0.01200	0.232	s ==> b
	1856	0.01700	0.202	3 ==> b
	1864	0.04500	0.240	j ==> b
	1886	0.14000	0.224	c ==> b
	1887	0.49900	0.124	e ==> a
	1888	0.08500	0.128	h ==> b
	1896	0.11800	0.086	l ==> b
	1897	0.18200	0.228	i ==> b
	1905	0.01100	0.168	j ==> b
	1908	0.00600	0.170	e ==> b
S. guentheri	1810	0.09100	0.094	j ==> d
	1817	0.10800	0.167	r ==> u
	1820	0.04800	0.127	b ==> t
	1821	0.02900	0.300	b ==> e

11	1817	0.01600	0.167	g --> r
	1821	0.03000	0.300	e ==> k
	1838	0.03100	0.158	h --> l
	1844	0.04100	0.247	j ==> s
	1854	0.03700	0.195	j ==> s
	1855	0.01100	0.232	5 ==> s
	1856	0.00100	0.202	j ==> 3
	1887	0.49900	0.124	a ==> e
	1888	0.03100	0.128	o --> m
	1897	0.02500	0.228	a ==> g
	1905	0.01100	0.168	k ==> c
	1908	0.01100	0.170	i ==> e
12	1821	0.00100	0.300	k --> b
	1838	0.01100	0.158	l ==> b
	1854	0.01500	0.195	s --> b
	1862	0.00500	0.281	b ==> a
	1888	0.26100	0.128	m ==> h
	1896	0.08500	0.086	u --> l
	1897	0.05000	0.228	g --> i
	1905	0.01100	0.168	c ==> j
S. angel	1804	1	0.167	0 ==> 1
	1810	0.15200	0.094	j ==> b
	1817	0.03900	0.167	r ==> b
	1824	0.05200	0.255	q ==> b
	1827	0.01250	0.169	h ==> b
	1828	0.03000	0.160	F ==> b
	1839	0.03500	0.103	0 ==> b
	1844	0.01300	0.247	s ==> b
	1855	0.01200	0.232	s ==> b
	1856	0.01700	0.202	3 ==> b
	1864	0.02500	0.240	8 ==> b
	1886	0.14000	0.224	c ==> b
	1887	0.49900	0.124	e ==> a
	1888	0.08500	0.128	h ==> b
	1896	0.11800	0.086	l ==> b
	1897	0.18200	0.228	i ==> b
	1905	0.01100	0.168	j ==> b
	1908	0.00600	0.170	e ==> b
	1909	0.03200	0.168	i --> b
S. guentheri	1810	0.09100	0.094	j ==> d
	1817	0.10800	0.167	r ==> u
	1820	0.04800	0.127	b ==> t
	1821	0.02900	0.300	b ==> e
	1824	0.03700	0.255	q ==> u
	1827	0.08000	0.169	h ==> q
	1828	0.11000	0.160	F ==> t
	1838	0.17100	0.158	b ==> o
	1839	0.11300	0.103	0 ==> v
	1844	0.05300	0.247	s ==> w
	1854	0.10600	0.195	b ==> w
	1855	0.09500	0.232	s ==> w
	1856	0.09500	0.202	3 ==> w
	1862	0.01800	0.281	a ==> u
	1864	0.04700	0.240	8 ==> v
	1898	0.20700	0.207	a ==> i
	1899	0.16900	0.380	a ==> c
	1907	0.07700	0.178	b ==> m

	1824	0.03700	0.255	q ==> u
	1827	0.08000	0.169	h ==> q
	1828	0.12200	0.160	i ==> t
	1838	0.17100	0.158	b ==> o
	1839	0.11300	0.103	0 ==> v
	1844	0.05300	0.247	s ==> w
	1854	0.10600	0.195	b ==> w
	1855	0.09500	0.232	s ==> w
	1856	0.09500	0.202	3 ==> w
	1862	0.01800	0.281	a ==> u
	1864	0.02700	0.240	j ==> v
	1898	0.20700	0.207	a ==> i
	1899	0.16900	0.380	a ==> c
	1907	0.07700	0.178	b ==> m
	1909	0.03200	0.168	b --> I
S. festae	1820	0.00900	0.127	b ==> q
	1821	0.07200	0.300	k ==> i
	1827	0.02500	0.169	h ==> j
	1828	0.02400	0.160	i ==> q
	1834	0.02500	0.104	b --> j
	1838	0.02200	0.158	r --> j
	1839	0.15400	0.103	0 ==> r
	1854	0.01500	0.195	b ==> s
	1856	0.00200	0.202	3 ==> s
	1864	0.01100	0.240	j ==> s
	1886	0.07000	0.224	c ==> e
	1887	0.05300	0.124	f ==> c
	1888	0.00800	0.128	e ==> f
	1896	0.05600	0.086	u ==> i
	1898	0.02500	0.207	a ==> f
	1904	0.05900	0.216	b ==> a
	1906	0.04000	0.171	b ==> k
	1907	0.11500	0.178	b ==> h
	1909	0.06400	0.168	b ==> c
S. lache	1794	1	0.250	1 ==> 0
	1796	1	0.333	0 ==> 1
	1802	1	1.000	0 ==> 1
	1810	0.87900	0.094	j ==> l
	1817	0.01200	0.167	r ==> z
	1824	0.05800	0.255	q ==> z
	1828	0.06800	0.160	i ==> z
	1834	0.03000	0.104	b ==> p
	1838	0.02200	0.158	r --> j
	1844	0.00400	0.247	s ==> 3
	1854	0.09800	0.195	b ==> 3
	1855	0.02600	0.232	s ==> 3
	1862	0.01700	0.281	b ==> 1
	1864	0.06200	0.240	j ==> c
	1881	1	0.250	2 ==> 0
	1888	0.08000	0.128	e ==> i
	1896	0.57700	0.086	u ==> o
	1897	0.55400	0.228	g ==> k
	1908	0.02200	0.170	e ==> h
	1909	0.03200	0.168	b ==> d
S. chota	1810	0.01000	0.094	j ==> h
	1817	0.01500	0.167	c ==> j
	1820	0.01900	0.127	b ==> i
	1824	0.03000	0.255	q --> h

S. festae	1820	0.00900	0.127	b ==> q
	1821	0.07200	0.300	k ==> i
	1827	0.02500	0.169	h ==> j
	1828	0.01200	0.160	F ==> q
	1834	0.02500	0.104	b --> j
	1838	0.05400	0.158	l --> j
	1839	0.15400	0.103	0 ==> r
	1856	0.00200	0.202	3 ==> s
	1864	0.03100	0.240	8 ==> s
	1886	0.07000	0.224	c ==> e
	1887	0.42900	0.124	e ==> c
	1888	0.01100	0.128	m ==> f
	1890	1	0.062	0 --> 1
	1896	0.05600	0.086	u ==> i
	1898	0.02500	0.207	a ==> f
	1904	0.05900	0.216	b ==> a
	1906	0.04000	0.171	b ==> k
	1907	0.11500	0.178	b ==> h
	1909	0.03200	0.168	i ==> c
S. lache	1794	1	0.250	1 ==> 0
	1796	1	0.333	0 ==> 1
	1802	1	1.000	0 ==> 1
	1810	0.87900	0.094	j ==> l
	1817	0.01200	0.167	r ==> z
	1824	0.05800	0.255	q ==> z
	1828	0.08000	0.160	F ==> z
	1834	0.03000	0.104	b ==> p
	1838	0.05400	0.158	l --> j
	1844	0.00400	0.247	s ==> 3
	1854	0.11300	0.195	s ==> 3
	1855	0.02600	0.232	s ==> 3
	1862	0.01700	0.281	b ==> 1
	1864	0.04200	0.240	8 ==> c
	1881	1	0.250	2 ==> 0
	1887	0.37600	0.124	e --> f
	1888	0.08300	0.128	m ==> i
	1890	1	0.062	0 --> 1
	1896	0.57700	0.086	u ==> o
	1897	0.55400	0.228	g ==> k
	1908	0.02200	0.170	e ==> h
	1909	0.06400	0.168	i ==> d
S. chota	1810	0.01000	0.094	j ==> h
	1817	0.02700	0.167	g ==> j
	1820	0.01900	0.127	b ==> i
	1824	0.03000	0.255	q --> h
	1828	0.01200	0.160	F --> i
	1838	0.16000	0.158	h ==> i
	1839	0.25100	0.103	0 ==> j
	1855	0.00600	0.232	5 ==> j
	1858	1	0.100	0 --> 1
	1862	0.00900	0.281	b ==> i
	1864	0.02000	0.240	8 --> j
	1888	0.06300	0.128	o ==> c
	1896	0.16000	0.086	u ==> a
	1904	0.05900	0.216	b ==> a
	1905	0.01100	0.168	k ==> f
	1906	0.16000	0.171	b ==> h
	1909	0.06400	0.168	i ==> d

	1838	0.16000	0.158	h ==> i
	1839	0.25100	0.103	0 ==> j
	1855	0.00600	0.232	5 ==> j
	1862	0.00900	0.281	b ==> i
	1888	0.09700	0.128	e ==> c
	1890	1	0.062	1 --> 0
	1896	0.14200	0.086	j ==> a
	1904	0.05900	0.216	b ==> a
	1905	0.01100	0.168	k ==> f
	1906	0.16000	0.171	b ==> h
	1909	0.03200	0.168	b ==> d
S. rhodomelas	1810	0.09100	0.094	j ==> d
	1817	0.00500	0.167	c --> D
	1820	0.00200	0.127	4 ==> 8
	1824	0.16200	0.255	q ==> B
	1827	0.00250	0.169	h --> p
	1839	0.14000	0.103	2 ==> E
	1843	1	0.143	0 ==> 1
	1844	0.04100	0.247	j ==> H
	1855	0.02100	0.232	5 ==> K
	1862	0.01100	0.281	K ==> w
	1886	1.00000	0.224	c ==> g
	1888	0.08000	0.128	e ==> i
	1889	1	0.333	0 ==> 1
	1896	0.14200	0.086	j ==> a
	1898	0.07300	0.207	a ==> n
	1899	1.00000	0.380	a ==> g
13	1810	0.82600	0.094	k --> n
	1817	0.06300	0.167	n ==> c
	1820	0.13400	0.127	4 ==> h
	1824	0.00500	0.255	1 --> l
	1828	0.01800	0.160	a --> c
	1838	0.02400	0.158	l --> c
	1854	0.10300	0.195	I ==> K
	1855	0.09100	0.232	b ==> c
	1856	0.09700	0.202	5 ==> L
	1862	0.02700	0.281	K ==> 9
	1864	0.03600	0.240	M ==> j
	1871	1	0.111	1 --> 0
	1888	0.06300	0.128	o ==> c
	1900	1.00000	0.341	a --> b
	1904	0.05900	0.216	b --> a
	1906	0.04000	0.171	l --> c
	1909	0.03200	0.168	i ==> c
14	1821	0.00200	0.300	n ==> c
	1827	0.00500	0.169	h ==> 0
	1834	0.01700	0.104	z --> c
	1839	0.04500	0.103	2 ==> c
	1888	0.82300	0.128	c ==> a
	1890	1	0.062	0 ==> 1
	1896	0.06500	0.086	1 ==> c
S. apurimacus	1788	1	0.100	0 ==> 1
	1807	1	0.182	1 ==> 0
	1808	1	0.200	0 ==> 1
	1810	0.85800	0.094	n ==> c
	1820	0.00100	0.127	h ==> c
	1824	0.04900	0.255	l ==> c

S. rhodomelas	1810	0.09100	0.094	j ==> d
	1817	0.01700	0.167	g --> D
	1820	0.00200	0.127	4 ==> 8
	1824	0.16200	0.255	q ==> B
	1827	0.00250	0.169	h --> p
	1839	0.14000	0.103	2 ==> E
	1843	1	0.143	0 ==> 1
	1844	0.04100	0.247	j ==> H
	1855	0.02100	0.232	5 ==> K
	1858	1	0.100	0 --> 1
	1862	0.01100	0.281	K ==> w
	1871	1	0.111	0 --> 1
	1886	1.00000	0.224	c ==> g
	1888	0.11400	0.128	o ==> i
	1889	1	0.333	0 ==> 1
	1890	1	0.062	0 --> 1
	1891	1	0.083	0 --> 1
	1896	0.16000	0.086	u ==> a
	1898	0.07300	0.207	a ==> n
	1899	1.00000	0.380	a ==> g
13	1820	0.08000	0.127	4 ==> y
	1854	0.04900	0.195	I ==> c
	1855	0.03500	0.232	5 ==> M
	1856	0.06900	0.202	5 ==> c
	1862	0.01200	0.281	K ==> b
	1864	0.02300	0.240	M ==> k
	1888	0.06300	0.128	o ==> c
	1909	0.03200	0.168	i ==> c
14	1821	0.00200	0.300	n ==> c
	1827	0.00500	0.169	h ==> 0
	1828	0.01400	0.160	m --> c
	1834	0.01700	0.104	z --> c
	1838	0.02400	0.158	l --> c
	1839	0.04500	0.103	2 ==> c
	1888	0.82300	0.128	c ==> a
	1890	1	0.062	0 ==> 1
	1891	1	0.083	0 --> 1
	1896	0.06500	0.086	1 ==> c
S. apurimacus	1788	1	0.100	0 ==> 1
	1807	1	0.182	1 ==> 0
	1808	1	0.200	0 ==> 1
	1810	0.03200	0.094	k ==> c
	1817	0.06300	0.167	n --> c
	1820	0.05500	0.127	y ==> c
	1824	0.04400	0.255	1 ==> c
	1827	0.01000	0.169	0 ==> c
	1843	1	0.143	0 ==> 1
	1844	0.01500	0.247	A ==> c
	1855	0.05500	0.232	M ==> c
	1858	1	0.100	0 ==> 1
	1864	0.04900	0.240	k ==> c
	1871	1	0.111	0 --> 1
	1883	1	0.154	2 ==> 0
	1885	0.06000	0.177	b ==> c
	1897	0.14200	0.228	a ==> c
	1900	1.00000	0.341	a --> b
	1905	0.01100	0.168	k ==> c

	1827	0.01000	0.169	0 ==> c
	1843	1	0.143	0 ==> 1
	1844	0.01400	0.247	j ==> c
	1854	0.05400	0.195	K --> c
	1856	0.02800	0.202	L --> c
	1858	1	0.100	0 ==> 1
	1862	0.01500	0.281	9 --> b
	1864	0.06200	0.240	j ==> c
	1871	1	0.111	0 --> 1
	1883	1	0.154	2 ==> 0
	1885	0.06000	0.177	b ==> c
	1897	0.14200	0.228	a ==> c
	1904	0.05900	0.216	a --> b
	1905	0.01100	0.168	k ==> c
	1907	0.03800	0.178	h ==> c
S. scapularis	1794	1	0.250	1 ==> 0
	1805	1	0.250	0 ==> 1
	1806	1	0.500	0 ==> 1
	1810	0.03100	0.094	n ==> a
	1813	1	0.182	1 ==> 2
	1815	1	0.500	0 ==> 1
	1816	1	0.143	0 ==> 1
	1817	0.13000	0.167	c ==> F
	1818	1	0.333	1 ==> 0
	1819	0.07200	0.330	a ==> n
	1820	0.05400	0.127	h --> y
	1821	0.04300	0.300	c ==> s
	1824	0.27500	0.255	l ==> D
	1828	0.14600	0.160	c ==> H
	1829	1	0.333	0 ==> 1
	1834	0.84400	0.104	c ==> w
	1835	1	0.250	0 ==> 1
	1837	1	0.500	0 ==> 1
	1838	0.05600	0.158	c ==> f
	1839	0.30400	0.103	c ==> G
	1841	1	0.182	1 ==> 2
	1844	0.04000	0.247	j ==> J
	1845	1	0.222	2 ==> 0
	1851	1	0.222	3 ==> 1
	1853	1	0.333	0 ==> 1
	1855	0.05500	0.232	c --> M
	1857	1	0.222	0 ==> 2
	1859	1	0.200	0 ==> 1
	1861	1	0.500	1 ==> 0
	1862	0.09600	0.281	9 ==> D
	1863	1	0.333	1 ==> 0
	1864	0.03200	0.240	j ==> I
	1869	1	0.333	2 ==> 0
	1895	1	0.200	0 ==> 1
	1896	0.56900	0.086	c ==> 0
	1898	0.21300	0.207	a ==> p
	1900	1.00000	0.341	b --> a
	1905	0.01100	0.168	k ==> f
	1906	0.12000	0.171	c ==> o
	1907	0.15400	0.178	h ==> a
	1908	0.09900	0.170	c ==> y
	1909	0.42000	0.168	c ==> o
15	1800	1	0.250	0 ==> 1
	1817	0.03200	0.167	c ==> t
	1906	0.04000	0.171	l ==> c
	1907	0.03800	0.178	h ==> c
S. scapularis	1794	1	0.250	1 ==> 0
	1805	1	0.250	0 ==> 1
	1806	1	0.500	0 ==> 1
	1810	0.85700	0.094	k ==> a
	1813	1	0.182	1 ==> 2
	1815	1	0.500	0 ==> 1
	1816	1	0.143	0 ==> 1
	1817	0.06700	0.167	n ==> F
	1818	1	0.333	1 ==> 0
	1819	0.07200	0.330	a ==> n
	1821	0.04300	0.300	c ==> s
	1824	0.28000	0.255	1 ==> D
	1828	0.14600	0.160	c ==> H
	1829	1	0.333	0 ==> 1
	1834	0.84400	0.104	c ==> w
	1835	1	0.250	0 ==> 1
	1837	1	0.500	0 ==> 1
	1838	0.05600	0.158	c ==> f
	1839	0.30400	0.103	c ==> G
	1841	1	0.182	1 ==> 2
	1844	0.03900	0.247	A ==> J
	1845	1	0.222	2 ==> 0
	1851	1	0.222	3 ==> 1
	1853	1	0.333	0 ==> 1
	1854	0.05400	0.195	c --> K
	1856	0.02800	0.202	c --> L
	1857	1	0.222	0 ==> 2
	1859	1	0.200	0 ==> 1
	1861	1	0.500	1 ==> 0
	1862	0.11100	0.281	b ==> D
	1863	1	0.333	1 ==> 0
	1864	0.04500	0.240	k ==> I
	1869	1	0.333	2 ==> 0
	1895	1	0.200	0 ==> 1
	1896	0.56900	0.086	c ==> 0
	1898	0.21300	0.207	a ==> p
	1904	0.05900	0.216	b --> a
	1905	0.01100	0.168	k ==> f
	1906	0.08000	0.171	l ==> o
	1907	0.15400	0.178	h ==> a
	1908	0.09900	0.170	c ==> y
	1909	0.42000	0.168	c ==> o
15	1800	1	0.250	0 ==> 1
	1810	0.82600	0.094	k --> n
	1817	0.09500	0.167	n ==> t
	1820	0.05400	0.127	y --> h
	1821	0.02500	0.300	n --> e
	1824	0.00500	0.255	1 --> l
	1827	0.00500	0.169	h ==> o
	1834	0.03900	0.104	z ==> b
	1839	0.15500	0.103	2 ==> 6
	1854	0.07200	0.195	c ==> A
	1855	0.06100	0.232	M ==> B
	1856	0.05800	0.202	c ==> B
	1862	0.04500	0.281	b ==> 7
	1864	0.01800	0.240	k ==> 7
	1872	1	0.200	0 ==> 1

	1821	0.02500	0.300	n --> e
	1827	0.00500	0.169	h ==> o
	1834	0.03900	0.104	z ==> b
	1839	0.15500	0.103	2 ==> 6
	1844	0.00100	0.247	j ==> A
	1854	0.01800	0.195	K ==> A
	1855	0.00600	0.232	c ==> B
	1856	0.03000	0.202	L ==> B
	1862	0.03000	0.281	9 ==> 7
	1864	0.00500	0.240	j ==> 7
	1872	1	0.200	0 ==> 1
	1875	1	0.167	0 ==> 1
	1879	1	0.250	0 ==> 1
	1881	1	0.250	3 ==> 0
	1891	1	0.083	1 --> 0
	1895	1	0.200	0 ==> 2
	1896	0.14600	0.086	1 ==> u
	1906	0.04000	0.171	c ==> k
S. formosus	1788	1	0.100	0 ==> 1
	1789	1	0.250	0 ==> 1
	1799	1	0.167	0 ==> 1
	1810	0.03100	0.094	n ==> a
	1819	0.06300	0.330	a ==> i
	1824	0.03800	0.255	l ==> s
	1828	0.23800	0.160	c ==> s
	1838	0.05600	0.158	c ==> f
	1839	0.34200	0.103	6 ==> t
	1844	0.10900	0.247	A ==> u
	1854	0.15000	0.195	A ==> u
	1855	0.11000	0.232	B ==> u
	1856	0.26600	0.202	B ==> u
	1862	0.03000	0.281	7 ==> s
	1864	0.04400	0.240	7 ==> u
	1867	1	0.250	1 ==> 0
	1869	1	0.333	2 ==> 3
	1874	1	0.167	0 ==> 1
	1878	1	0.250	0 ==> 1
	1885	0.14000	0.177	b ==> e
	1888	0.15700	0.128	c ==> g
	1896	0.01800	0.086	u ==> j
	1897	0.07000	0.228	a ==> h
	1898	0.06600	0.207	a ==> h
	1905	0.03400	0.168	k ==> h
	1906	0.04000	0.171	k ==> b
	1907	0.03800	0.178	h ==> c
	1908	0.02700	0.170	c ==> o
	1909	0.09700	0.168	c ==> f
S. ochoai	1807	1	0.182	1 ==> 0
	1817	0.09300	0.167	t ==> 6
	1820	0.05800	0.127	h ==> 1
	1827	0.00750	0.169	o ==> b
	1828	0.01600	0.160	c --> 6
	1838	0.21700	0.158	c ==> s
	1841	1	0.182	1 ==> 0
	1846	1	0.143	0 ==> 1
	1886	0.07000	0.224	c ==> e
	1887	0.19900	0.124	a ==> i
	1888	0.04400	0.128	c ==> l

	1875	1	0.167	0 ==> 1
	1879	1	0.250	0 ==> 1
	1881	1	0.250	3 ==> 0
	1895	1	0.200	0 ==> 2
	1896	0.14600	0.086	1 ==> u
	1900	1.00000	0.341	a --> b
	1904	0.05900	0.216	b --> a
	1906	0.08000	0.171	l ==> k
S. formosus	1788	1	0.100	0 ==> 1
	1789	1	0.250	0 ==> 1
	1799	1	0.167	0 ==> 1
	1810	0.03100	0.094	n ==> a
	1819	0.06300	0.330	a ==> i
	1824	0.03800	0.255	l ==> s
	1828	0.25200	0.160	m ==> s
	1838	0.08000	0.158	l ==> f
	1839	0.34200	0.103	6 ==> t
	1844	0.10900	0.247	A ==> u
	1854	0.15000	0.195	A ==> u
	1855	0.11000	0.232	B ==> u
	1856	0.26600	0.202	B ==> u
	1862	0.03000	0.281	7 ==> s
	1864	0.04400	0.240	7 ==> u
	1867	1	0.250	1 ==> 0
	1869	1	0.333	2 ==> 3
	1874	1	0.167	0 ==> 1
	1878	1	0.250	0 ==> 1
	1885	0.14000	0.177	b ==> e
	1888	0.15700	0.128	c ==> g
	1896	0.01800	0.086	u ==> j
	1897	0.07000	0.228	a ==> h
	1898	0.06600	0.207	a ==> h
	1905	0.03400	0.168	k ==> h
	1906	0.04000	0.171	k ==> b
	1907	0.03800	0.178	h ==> c
	1908	0.02700	0.170	c ==> o
	1909	0.09700	0.168	c ==> f
S. ochoai	1807	1	0.182	1 ==> 0
	1817	0.09300	0.167	t ==> 6
	1820	0.05800	0.127	h ==> 1
	1827	0.00750	0.169	o ==> b
	1828	0.00200	0.160	m --> 6
	1838	0.19300	0.158	l ==> s
	1841	1	0.182	1 ==> 0
	1846	1	0.143	0 ==> 1
	1886	0.07000	0.224	c ==> e
	1887	0.19900	0.124	a ==> i
	1888	0.04400	0.128	c ==> l
16	1788	1	0.100	0 ==> 1
	1796	1	0.333	0 ==> 1
	1807	1	0.182	1 ==> 2
	1810	0.14300	0.094	k ==> d
	1820	0.05500	0.127	4 ==> m
	1824	0.00500	0.255	1 --> l
	1825	1	0.500	0 ==> 1
	1826	1	1.000	0 ==> 1
	1829	1	0.333	0 ==> 1
	1831	1	0.500	0 ==> 1

16	1788	1	0.100	0 ==> 1
	1796	1	0.333	0 ==> 1
	1807	1	0.182	1 ==> 2
	1810	0.14300	0.094	k ==> d
	1819	0.01300	0.330	a --> o
	1820	0.06300	0.127	4 ==> d
	1824	0.00500	0.255	1 --> l
	1825	1	0.500	0 ==> 1
	1826	1	1.000	0 ==> 1
	1829	1	0.333	0 ==> 1
	1831	1	0.500	0 ==> 1
	1839	0.07900	0.103	2 ==> l
	1843	1	0.143	0 --> 1
	1844	0.03800	0.247	j ==> C
	1854	0.08800	0.195	I ==> D
	1855	0.09100	0.232	b ==> n
	1856	0.09000	0.202	5 ==> n
	1858	1	0.100	0 --> 1
	1859	1	0.200	0 ==> 1
	1862	0.15000	0.281	K ==> m
	1864	0.16800	0.240	M ==> n
	1869	1	0.333	2 ==> 1
	1871	1	0.111	1 --> 0
	1881	1	0.250	3 ==> 0
	1883	1	0.154	2 ==> 0
	1888	0.88600	0.128	o ==> a
	1891	1	0.083	1 --> 0
	1893	1	1.000	0 ==> 1
	1898	1.00000	0.207	a ==> b
	1904	0.05900	0.216	b ==> c
	1905	0.03300	0.168	k --> b
	1906	0.12000	0.171	l ==> b
	1907	0.07700	0.178	h ==> j
	1908	0.02800	0.170	c ==> e
17	1821	0.00500	0.300	n ==> k
	1824	0.02600	0.255	l ==> 6
	1828	0.06800	0.160	a ==> A
	1833	1	1.000	0 ==> 1
	1834	0.00900	0.104	z ==> p
	1835	1	0.250	0 ==> 1
	1838	0.12000	0.158	l ==> d
	1853	1	0.333	0 ==> 1
	1855	0.03500	0.232	n ==> F
	1862	0.02000	0.281	m ==> c
	1864	0.06800	0.240	n ==> d
	1872	1	0.200	0 ==> 1
	1894	1	1.000	0 ==> 1
	1896	0.69400	0.086	1 ==> d
	1897	0.66600	0.228	a ==> d
	1906	0.04000	0.171	b ==> d
	1908	0.01700	0.170	e ==> d
	1909	0.06400	0.168	i ==> d
S. azureus	1817	0.03100	0.167	n ==> d
	1819	0.01300	0.330	o --> a
	1821	0.13600	0.300	k ==> d
	1824	0.01900	0.255	6 ==> d
	1827	0.02000	0.169	h ==> d
	1828	0.06400	0.160	A ==> d
	1834	0.03000	0.104	p ==> b

	1839	0.02000	0.103	2 ==> 0
	1844	0.03000	0.247	A ==> G
	1854	0.08800	0.195	I ==> D
	1855	0.09200	0.232	5 ==> n
	1856	0.09000	0.202	5 ==> n
	1859	1	0.200	0 ==> 1
	1862	0.15000	0.281	K ==> m
	1864	0.16800	0.240	M ==> n
	1869	1	0.333	2 ==> 1
	1881	1	0.250	3 ==> 0
	1883	1	0.154	2 ==> 0
	1888	0.88600	0.128	o ==> a
	1893	1	1.000	0 ==> 1
	1898	1.00000	0.207	a ==> b
	1904	0.05900	0.216	b ==> c
	1906	0.12000	0.171	l ==> b
	1907	0.03800	0.178	h ==> c
	1908	0.02800	0.170	c ==> e
17	1821	0.00500	0.300	n ==> k
	1824	0.02600	0.255	l ==> 6
	1828	0.07200	0.160	m ==> A
	1833	1	1.000	0 ==> 1
	1834	0.00900	0.104	z ==> p
	1835	1	0.250	0 ==> 1
	1838	0.12000	0.158	l ==> d
	1853	1	0.333	0 ==> 1
	1855	0.03500	0.232	n ==> F
	1862	0.02000	0.281	m ==> c
	1864	0.06800	0.240	n ==> d
	1872	1	0.200	0 ==> 1
	1894	1	1.000	0 ==> 1
	1896	0.69400	0.086	1 ==> d
	1897	0.66600	0.228	a ==> d
	1906	0.04000	0.171	b ==> d
	1908	0.01700	0.170	e ==> d
	1909	0.06400	0.168	i ==> d
S. azureus	1817	0.03100	0.167	n ==> d
	1820	0.00800	0.127	m --> d
	1821	0.13600	0.300	k ==> d
	1824	0.01900	0.255	6 ==> d
	1827	0.02000	0.169	h ==> d
	1828	0.06400	0.160	A ==> d
	1834	0.03000	0.104	p ==> b
	1839	0.14200	0.103	0 ==> d
	1841	1	0.182	1 ==> 2
	1842	1	0.250	1 ==> 0
	1844	0.02700	0.247	G ==> d
	1854	0.03400	0.195	D ==> d
	1855	0.00200	0.232	F ==> d
	1856	0.03100	0.202	n ==> d
	1857	1	0.222	0 ==> 2
	1905	0.02200	0.168	k ==> d
S. pectinatus	1803	1	1.000	0 ==> 1
	1813	1	0.182	1 ==> 0
	1817	0.02400	0.167	n ==> 9
	1819	0.94000	0.330	a ==> k
	1827	0.11000	0.169	h ==> y
	1838	0.48000	0.158	d ==> u

	1839	0.20100	0.103	l ==> d
	1841	1	0.182	1 ==> 2
	1842	1	0.250	1 ==> 0
	1843	1	0.143	1 --> 0
	1844	0.01800	0.247	C ==> d
	1854	0.03400	0.195	D ==> d
	1855	0.00200	0.232	F ==> d
	1856	0.03100	0.202	n ==> d
	1857	1	0.222	0 ==> 2
	1858	1	0.100	1 --> 0
	1905	0.05500	0.168	b ==> d
	1907	0.03900	0.178	j --> c
S. pectinatus	1803	1	1.000	0 ==> 1
	1813	1	0.182	1 ==> 0
	1817	0.02400	0.167	n ==> 9
	1819	0.92700	0.330	o ==> k
	1820	0.00800	0.127	d --> m
	1827	0.11000	0.169	h ==> y
	1838	0.48000	0.158	d ==> u
	1839	0.24000	0.103	l ==> 9
	1844	0.02200	0.247	C ==> D
	1856	0.00700	0.202	n --> F
	1862	0.12600	0.281	c ==> B
	1864	0.00100	0.240	d ==> B
	1891	1	0.083	0 --> 1
	1897	0.20400	0.228	d ==> p
	1906	0.32000	0.171	d ==> i
	1907	0.34600	0.178	j ==> r
	1908	0.04400	0.170	d ==> t
	1909	0.12900	0.168	d ==> h
S. doellojuradoi	1789	1	0.250	0 ==> 1
	1819	0.08400	0.330	o ==> f
	1821	0.02500	0.300	n --> e
	1827	0.02750	0.169	h ==> k
	1828	0.00400	0.160	a --> m
	1834	0.05700	0.104	z ==> g
	1838	0.08000	0.158	l ==> f
	1844	0.04000	0.247	C ==> n
	1854	0.02300	0.195	D --> n
	1895	1	0.200	0 ==> 1
	1896	0.30600	0.086	1 ==> a
	1905	0.02200	0.168	b ==> I
18	1801	1	0.200	0 --> 1
	1816	1	0.143	0 ==> 1
	1817	0.14500	0.167	n ==> p
	1820	0.04600	0.127	4 ==> o
	1821	0.02100	0.300	n ==> p
	1824	0.03700	0.255	1 ==> o
	1827	0.02000	0.169	h ==> d
	1828	0.02000	0.160	a --> e
	1834	0.61400	0.104	z ==> m
	1839	0.12900	0.103	2 ==> 1
	1844	0.03700	0.247	j ==> q
	1854	0.05800	0.195	I ==> q
	1856	0.02300	0.202	5 ==> q
	1859	1	0.200	0 ==> 1
	1862	0.03500	0.281	K ==> p
	1867	1	0.250	1 ==> 0

	1839	0.29900	0.103	0 ==> 9
	1843	1	0.143	0 --> 1
	1844	0.01300	0.247	G ==> D
	1856	0.00700	0.202	n --> F
	1858	1	0.100	0 --> 1
	1862	0.12600	0.281	c ==> B
	1864	0.00100	0.240	d ==> B
	1891	1	0.083	0 --> 1
	1897	0.20400	0.228	d ==> p
	1905	0.03300	0.168	k --> b
	1906	0.32000	0.171	d ==> i
	1907	0.38500	0.178	c ==> r
	1908	0.04400	0.170	d ==> t
	1909	0.12900	0.168	d ==> h
S. doellojuradoi	1789	1	0.250	0 ==> 1
	1819	0.09700	0.330	a ==> f
	1820	0.00800	0.127	m --> d
	1821	0.02500	0.300	n --> e
	1827	0.02750	0.169	h ==> k
	1834	0.05700	0.104	z ==> g
	1838	0.08000	0.158	l ==> f
	1839	0.05900	0.103	0 --> l
	1843	1	0.143	0 --> 1
	1844	0.04900	0.247	G ==> n
	1854	0.02300	0.195	D --> n
	1858	1	0.100	0 --> 1
	1895	1	0.200	0 ==> 1
	1896	0.30600	0.086	1 ==> a
	1905	0.05500	0.168	k ==> i
	1907	0.03900	0.178	c --> j
18	1816	1	0.143	0 ==> 1
	1817	0.04200	0.167	n ==> C
	1820	0.04600	0.127	4 ==> o
	1821	0.02100	0.300	n ==> p
	1824	0.03700	0.255	1 ==> o
	1827	0.01250	0.169	h ==> b
	1834	0.32700	0.104	z ==> o
	1839	0.10100	0.103	2 ==> z
	1844	0.03000	0.247	A ==> G
	1854	0.05800	0.195	I ==> q
	1855	0.00100	0.232	5 --> b
	1856	0.02300	0.202	5 ==> q
	1859	1	0.200	0 ==> 1
	1862	0.01700	0.281	K ==> F
	1867	1	0.250	1 ==> 0
	1871	1	0.111	0 --> 1
	1881	1	0.250	3 ==> 2
	1887	0.07000	0.124	a ==> b
	1888	0.03400	0.128	o ==> e
	1891	1	0.083	0 --> 1
	1895	1	0.200	0 ==> 1
	1898	0.08000	0.207	a ==> e
	1906	0.04000	0.171	l --> m
	1907	0.11600	0.178	h ==> n
	1908	0.05500	0.170	c ==> v
	1909	0.09700	0.168	i ==> e
S. erythrogaster	1801	1	0.200	0 --> 1
	1810	0.69700	0.094	k ==> i

	1881	1	0.250	3 ==> 2
	1883	1	0.154	2 --> 0
	1887	0.07000	0.124	a ==> b
	1888	0.03400	0.128	o ==> e
	1895	1	0.200	0 ==> 1
	1898	0.08000	0.207	a ==> e
	1904	0.05900	0.216	b --> a
	1906	0.04000	0.171	l --> m
	1907	0.15400	0.178	h ==> a
	1908	0.08200	0.170	c ==> q
	1909	0.19400	0.168	i ==> a
S. erythrogaster	1810	0.69700	0.094	k ==> i
	1821	0.27400	0.300	p ==> g
	1828	0.01200	0.160	e ==> p
	1834	0.18700	0.104	m ==> h
	1839	0.01000	0.103	1 ==> p
	1842	1	0.250	1 ==> 0
	1850	1	0.250	3 ==> 2
	1851	1	0.222	3 ==> 2
	1855	0.07200	0.232	b ==> q
	1857	1	0.222	0 ==> 2
	1864	0.01000	0.240	M ==> q
	1886	0.08000	0.224	c ==> d
	1896	0.55400	0.086	1 ==> h
	1906	0.08000	0.171	m ==> a
	1908	0.01200	0.170	q ==> l
	1909	0.03200	0.168	a ==> k
19	1799	1	0.167	0 ==> 1
	1807	1	0.182	1 ==> 0
	1808	1	0.200	0 ==> 1
	1820	0.00900	0.127	o ==> m
	1824	0.20000	0.255	o ==> y
	1838	0.05100	0.158	l ==> x
	1854	0.01000	0.195	q ==> 1
	1856	0.00300	0.202	q ==> J
	1864	0.02500	0.240	M ==> F
	1885	0.14000	0.177	b ==> e
	1887	0.65200	0.124	b ==> j
	1888	0.08000	0.128	e ==> i
	1896	0.24800	0.086	1 ==> n
	1898	0.15500	0.207	e ==> j
	1900	0.09400	0.341	a ==> d
S. iridescens	1817	0.02700	0.167	p ==> y
	1821	0.01900	0.300	p --> c
	1827	0.00750	0.169	d --> b
	1828	0.09000	0.160	e ==> y
	1834	0.28700	0.104	m ==> o
	1838	0.02900	0.158	x ==> f
	1839	0.02800	0.103	1 --> z
	1841	1	0.182	1 ==> 2
	1844	0.00600	0.247	q ==> 1
	1855	0.00350	0.232	b --> 1
	1856	0.00900	0.202	J ==> 1
	1857	1	0.222	0 ==> 1
	1862	0.01100	0.281	p ==> z
	1864	0.00200	0.240	F ==> 0
	1887	0.12400	0.124	j ==> h
	1905	0.04400	0.168	k ==> n
	1817	0.10300	0.167	C --> p
	1821	0.27400	0.300	p ==> g
	1827	0.00750	0.169	b --> d
	1828	0.02800	0.160	m ==> p
	1834	0.47400	0.104	o ==> h
	1839	0.03800	0.103	z ==> p
	1842	1	0.250	1 ==> 0
	1844	0.00800	0.247	G --> q
	1850	1	0.250	3 ==> 2
	1851	1	0.222	3 ==> 2
	1855	0.07200	0.232	b ==> q
	1857	1	0.222	0 ==> 2
	1862	0.01800	0.281	F --> p
	1864	0.01000	0.240	M ==> q
	1883	1	0.154	2 --> 0
	1886	0.08000	0.224	c ==> d
	1896	0.55400	0.086	1 ==> h
	1904	0.05900	0.216	b --> a
	1906	0.08000	0.171	m ==> a
	1907	0.03800	0.178	n --> a
	1908	0.03900	0.170	v ==> l
	1909	0.12900	0.168	e ==> k
19	1799	1	0.167	0 ==> 1
	1807	1	0.182	1 ==> 0
	1808	1	0.200	0 ==> 1
	1820	0.00900	0.127	o ==> m
	1824	0.20000	0.255	o ==> y
	1838	0.05100	0.158	l ==> x
	1854	0.01000	0.195	q ==> 1
	1856	0.00300	0.202	q ==> J
	1864	0.02500	0.240	M ==> F
	1885	0.14000	0.177	b ==> e
	1887	0.65200	0.124	b ==> j
	1888	0.08000	0.128	e ==> i
	1896	0.24800	0.086	1 ==> n
	1898	0.15500	0.207	e ==> j
	1900	0.09400	0.341	a ==> d
S. iridescens	1801	1	0.200	0 --> 1
	1817	0.13000	0.167	C ==> y
	1821	0.01900	0.300	p --> c
	1828	0.10600	0.160	m ==> y
	1838	0.02900	0.158	x ==> f
	1841	1	0.182	1 ==> 2
	1844	0.01400	0.247	G ==> 1
	1855	0.00350	0.232	b --> 1
	1856	0.00900	0.202	J ==> 1
	1857	1	0.222	0 ==> 1
	1862	0.02900	0.281	F ==> z
	1864	0.00200	0.240	F ==> 0
	1883	1	0.154	2 --> 0
	1887	0.12400	0.124	j ==> h
	1904	0.05900	0.216	b --> a
	1905	0.04400	0.168	k ==> n
	1908	0.02700	0.170	v --> q
	1909	0.09700	0.168	e --> a
S. puyango	1810	0.11400	0.094	k ==> q
	1813	1	0.182	1 ==> 0
	1820	0.00800	0.127	m ==> d

	1907	0.03800	0.178	a --> n
S. puyango	1801	1	0.200	1 --> 0
	1810	0.11400	0.094	k ==> q
	1813	1	0.182	1 ==> 0
	1817	0.10300	0.167	p --> C
	1820	0.00800	0.127	m ==> d
	1821	0.20300	0.300	p --> r
	1824	0.01000	0.255	y ==> A
	1828	0.05200	0.160	e ==> E
	1834	0.05600	0.104	m ==> u
	1839	0.19300	0.103	1 ==> D
	1844	0.00800	0.247	q --> G
	1854	0.00300	0.195	1 ==> H
	1855	0.01000	0.232	b ==> J
	1862	0.01800	0.281	p --> F
	1883	1	0.154	0 --> 2
	1885	0.36000	0.177	e ==> h
	1896	0.05800	0.086	n ==> a
	1898	0.64700	0.207	j ==> m
	1900	0.50600	0.341	d ==> e
	1904	0.05900	0.216	a --> b
	1908	0.02700	0.170	q ==> v
	1909	0.09700	0.168	a --> e
S. limitaris	1799	1	0.167	0 ==> 1
	1801	1	0.200	0 ==> 1
	1807	1	0.182	1 ==> 2
	1808	1	0.200	0 ==> 1
	1810	0.07300	0.094	k ==> m
	1816	1	0.143	0 ==> 1
	1817	0.07200	0.167	n ==> 1
	1820	0.05200	0.127	4 ==> i
	1821	0.08200	0.300	n ==> m
	1824	0.02100	0.255	1 ==> f
	1827	0.00750	0.169	h ==> v
	1828	0.03000	0.160	a ==> 1
	1834	0.41500	0.104	z ==> q
	1838	0.05500	0.158	l ==> q
	1844	0.00800	0.247	j ==> t
	1845	1	0.222	2 ==> 1
	1850	1	0.250	3 ==> 2
	1854	0.01400	0.195	I ==> 5
	1855	0.00100	0.232	b ==> 5
	1857	1	0.222	0 ==> 1
	1859	1	0.200	0 ==> 1
	1862	0.10000	0.281	K ==> 3
	1864	0.08400	0.240	M ==> 2
	1885	0.40000	0.177	b ==> g
	1887	1.00000	0.124	a ==> g
	1888	0.11400	0.128	o ==> i
	1895	1	0.200	0 ==> 1
	1896	0.19900	0.086	1 ==> q
	1904	0.05900	0.216	b ==> c
	1906	0.12000	0.171	l ==> a
	1907	0.19300	0.178	h ==> f
	1908	0.08200	0.170	c ==> q
	1909	0.25800	0.168	i ==> n
20	1799	1	0.167	0 ==> 1
	1810	0.08700	0.094	k --> p
	1821	0.20300	0.300	p --> r
	1824	0.01000	0.255	y ==> A
	1827	0.00750	0.169	b --> d
	1828	0.03600	0.160	m ==> E
	1834	0.34300	0.104	o ==> u
	1839	0.22100	0.103	z ==> D
	1854	0.00300	0.195	1 ==> H
	1855	0.01000	0.232	b ==> J
	1885	0.36000	0.177	e ==> h
	1896	0.05800	0.086	n ==> a
	1898	0.64700	0.207	j ==> m
	1900	0.50600	0.341	d ==> e
	1907	0.03800	0.178	n --> a
S. limitaris	1799	1	0.167	0 ==> 1
	1801	1	0.200	0 ==> 1
	1807	1	0.182	1 ==> 2
	1808	1	0.200	0 ==> 1
	1810	0.07300	0.094	k ==> m
	1816	1	0.143	0 ==> 1
	1817	0.07200	0.167	n ==> 1
	1820	0.05200	0.127	4 ==> i
	1821	0.08200	0.300	n ==> m
	1824	0.02100	0.255	1 ==> f
	1827	0.00750	0.169	h ==> v
	1828	0.03400	0.160	m ==> 1
	1834	0.41500	0.104	z ==> q
	1838	0.05500	0.158	l ==> q
	1844	0.00900	0.247	A ==> t
	1845	1	0.222	2 ==> 1
	1850	1	0.250	3 ==> 2
	1854	0.01400	0.195	I ==> 5
	1857	1	0.222	0 ==> 1
	1859	1	0.200	0 ==> 1
	1862	0.10000	0.281	K ==> 3
	1864	0.08400	0.240	M ==> 2
	1871	1	0.111	0 --> 1
	1885	0.40000	0.177	b ==> g
	1887	1.00000	0.124	a ==> g
	1888	0.11400	0.128	o ==> i
	1891	1	0.083	0 --> 1
	1895	1	0.200	0 ==> 1
	1896	0.19900	0.086	1 ==> q
	1904	0.05900	0.216	b ==> c
	1906	0.12000	0.171	l ==> a
	1907	0.19300	0.178	h ==> f
	1908	0.08200	0.170	c ==> q
	1909	0.25800	0.168	i ==> n
20	1799	1	0.167	0 ==> 1
	1817	0.02500	0.167	n ==> A
	1824	0.01000	0.255	1 ==> 7
	1827	0.02250	0.169	h --> 2
	1834	0.03900	0.104	z ==> b
	1838	0.03200	0.158	l ==> r
	1839	0.01500	0.103	2 ==> b
	1854	0.02900	0.195	I ==> C
	1856	0.04400	0.202	5 ==> E
	1862	0.01700	0.281	K ==> a
	1872	1	0.200	0 ==> 1
	1897	0.02500	0.228	a --> g

	1817	0.02500	0.167	n ==> A
	1824	0.01000	0.255	1 ==> 7
	1827	0.02250	0.169	h --> 2
	1828	0.02600	0.160	a --> 5
	1834	0.03900	0.104	z ==> b
	1838	0.03200	0.158	l ==> r
	1839	0.03500	0.103	2 ==> I
	1844	0.00100	0.247	j --> A
	1854	0.03300	0.195	I ==> 8
	1856	0.04600	0.202	5 ==> 9
	1862	0.01700	0.281	K ==> a
	1872	1	0.200	0 ==> 1
	1889	1	0.333	0 --> 1
	1890	1	0.062	0 --> 1
	1897	0.05500	0.228	a --> o
	1899	0.40500	0.380	a ==> f
	1904	0.05900	0.216	b --> c
	1907	0.07700	0.178	h ==> l
S. nigromaculatus	1788	1	0.100	0 ==> 1
	1810	0.05600	0.094	p ==> d
	1817	0.10300	0.167	A ==> x
	1820	0.05200	0.127	4 ==> i
	1824	0.28400	0.255	7 ==> 2
	1827	0.01750	0.169	2 ==> g
	1839	0.56100	0.103	I ==> 5
	1844	0.01000	0.247	A ==> 8
	1855	0.07500	0.232	b ==> 9
	1864	0.00600	0.240	M ==> 6
	1871	1	0.111	1 --> 0
	1888	0.07400	0.128	o ==> k
	1896	0.66500	0.086	1 ==> t
	1897	0.20100	0.228	o ==> m
	1905	0.01100	0.168	k ==> c
	1908	0.01700	0.170	c ==> I
21	1821	0.02500	0.300	n --> e
	1838	0.04800	0.158	r ==> f
	1855	0.01700	0.232	b ==> E
	1862	0.07800	0.281	a ==> C
	1864	0.08600	0.240	M ==> C
	1888	0.03100	0.128	o ==> m
	1891	1	0.083	1 --> 0
	1896	0.02900	0.086	1 ==> x
	1899	0.59500	0.380	f ==> g
	1906	0.08000	0.171	l ==> o
	1907	0.07700	0.178	l ==> a
	1908	0.02200	0.170	c ==> p
S. ornatus	1817	0.08000	0.167	A --> 8
	1824	0.03000	0.255	7 --> 5
	1827	0.04250	0.169	2 ==> d
	1828	0.08200	0.160	5 ==> 9
	1839	0.02500	0.103	I --> n
	1844	0.03900	0.247	A ==> C
	1854	0.00400	0.195	8 --> C
	1856	0.00200	0.202	9 --> E
	1862	0.06400	0.281	C ==> A
	1864	0.09900	0.240	C ==> A
	1904	0.05900	0.216	c --> b
	1905	0.01100	0.168	k ==> f

	1899	0.40500	0.380	a ==> f
	1907	0.07700	0.178	h ==> l
S. nigromaculatus	1788	1	0.100	0 ==> 1
	1810	0.14300	0.094	k ==> d
	1817	0.10300	0.167	A ==> x
	1820	0.05200	0.127	4 ==> i
	1824	0.28400	0.255	7 ==> 2
	1827	0.01750	0.169	2 ==> g
	1828	0.03000	0.160	m --> 5
	1839	0.58100	0.103	b ==> 5
	1844	0.01000	0.247	A ==> 8
	1854	0.00400	0.195	C --> 8
	1855	0.07400	0.232	5 ==> 9
	1856	0.00200	0.202	E --> 9
	1864	0.00600	0.240	M ==> 6
	1888	0.07400	0.128	o ==> k
	1889	1	0.333	0 --> 1
	1890	1	0.062	0 --> 1
	1891	1	0.083	0 --> 1
	1896	0.66500	0.086	1 ==> t
	1897	0.23100	0.228	g ==> m
	1904	0.05900	0.216	b --> c
	1905	0.01100	0.168	k ==> c
	1908	0.01700	0.170	c ==> i
21	1821	0.02500	0.300	n --> e
	1838	0.04800	0.158	r ==> f
	1855	0.01800	0.232	5 ==> E
	1862	0.07800	0.281	a ==> C
	1864	0.08600	0.240	M ==> C
	1871	1	0.111	0 --> 1
	1888	0.03100	0.128	o ==> m
	1896	0.02900	0.086	1 ==> x
	1899	0.59500	0.380	f ==> g
	1906	0.08000	0.171	l ==> o
	1907	0.07700	0.178	l ==> a
	1908	0.02200	0.170	c ==> p
S. ornatus	1810	0.08700	0.094	k --> p
	1817	0.08000	0.167	A --> 8
	1824	0.03000	0.255	7 --> 5
	1827	0.04250	0.169	2 ==> d
	1828	0.05200	0.160	m ==> 9
	1839	0.00500	0.103	b --> n
	1844	0.03900	0.247	A ==> C
	1862	0.06400	0.281	C ==> A
	1864	0.09900	0.240	C ==> A
	1889	1	0.333	0 --> 1
	1890	1	0.062	0 --> 1
	1897	0.03000	0.228	g --> o
	1905	0.01100	0.168	k ==> f
	1906	0.04000	0.171	o ==> a
	1907	0.07700	0.178	a ==> q
	1909	0.09700	0.168	i ==> e
S. percultus	1805	1	0.250	0 ==> 1
	1810	0.85700	0.094	k ==> a
	1820	0.02700	0.127	4 ==> 5
	1827	0.06000	0.169	2 ==> z
	1828	0.06600	0.160	m ==> B

	1906	0.04000	0.171	o ==> a
	1907	0.07700	0.178	a ==> q
	1909	0.09700	0.168	i ==> e
S. percultus	1805	1	0.250	0 ==> 1
	1810	0.94400	0.094	p ==> a
	1820	0.02700	0.127	4 ==> 5
	1827	0.06000	0.169	2 ==> z
	1828	0.03600	0.160	5 ==> B
	1839	0.35100	0.103	I --> A
	1844	0.07100	0.247	A ==> E
	1846	1	0.143	0 ==> 1
	1849	1	0.333	0 ==> 1
	1854	0.04000	0.195	8 ==> E
	1855	0.02000	0.232	E ==> G
	1856	0.07600	0.202	9 ==> G
	1886	1.00000	0.224	c ==> g
	1887	1.00000	0.124	a ==> g
	1888	0.08300	0.128	m ==> i
	1889	1	0.333	1 --> 0
	1890	1	0.062	1 --> 0
	1896	0.21500	0.086	x ==> y
	1897	0.05500	0.228	o --> a
	1898	1.00000	0.207	a ==> b
S. trachycephalus	1810	0.09700	0.094	k ==> r
	1817	0.05500	0.167	n ==> J
	1819	0.01300	0.330	a ==> o
	1820	0.03400	0.127	4 ==> D
	1821	0.02500	0.300	n --> e
	1824	0.02500	0.255	1 ==> G
	1827	0.01000	0.169	h ==> 3
	1828	0.02000	0.160	a ==> K
	1838	0.05500	0.158	l ==> 0
	1839	0.03500	0.103	2 ==> I
	1844	0.04600	0.247	j ==> N
	1854	0.03700	0.195	I ==> O
	1855	0.02100	0.232	b ==> Q
	1857	1	0.222	0 ==> 1
	1881	1	0.250	3 ==> 0
	1885	0.26000	0.177	b ==> j
	1887	0.90900	0.124	a ==> k
	1891	1	0.083	1 --> 0
	1897	0.18600	0.228	a ==> r
	1904	0.11800	0.216	b ==> g
	1905	0.03300	0.168	k ==> b
	1906	0.04000	0.171	l --> m
	1908	0.03400	0.170	c ==> b
22	1813	1	0.182	1 ==> 0
	1817	0.08700	0.167	j ==> 2
	1827	0.01500	0.169	h ==> c
	1834	0.05100	0.104	z ==> r
	1838	0.04500	0.158	l --> y
	1844	0.06500	0.247	Q ==> 5
	1855	0.05400	0.232	4 ==> L
	1856	0.03600	0.202	5 --> 6
	1860	1	0.250	0 ==> 1
	1862	0.00300	0.281	K ==> 4
	1864	0.18300	0.240	6 ==> H
	1869	1	0.333	2 ==> 1

	1839	0.37100	0.103	b --> A
	1844	0.07100	0.247	A ==> E
	1846	1	0.143	0 ==> 1
	1849	1	0.333	0 ==> 1
	1854	0.04400	0.195	C ==> E
	1855	0.02000	0.232	E ==> G
	1856	0.07800	0.202	E ==> G
	1886	1.00000	0.224	c ==> g
	1887	1.00000	0.124	a ==> g
	1888	0.08300	0.128	m ==> i
	1896	0.21500	0.086	x ==> y
	1897	0.02500	0.228	g --> a
	1898	1.00000	0.207	a ==> b
	1904	0.05900	0.216	b --> c
S. trachycephalus	1810	0.09700	0.094	k ==> r
	1817	0.05500	0.167	n ==> J
	1819	0.01300	0.330	a ==> o
	1820	0.03400	0.127	4 ==> D
	1821	0.02500	0.300	n --> e
	1824	0.02500	0.255	1 ==> G
	1827	0.01000	0.169	h ==> 3
	1828	0.02400	0.160	m ==> K
	1838	0.05500	0.158	l ==> 0
	1839	0.03500	0.103	2 ==> I
	1844	0.04500	0.247	A ==> N
	1854	0.03700	0.195	I ==> O
	1855	0.02200	0.232	5 ==> Q
	1857	1	0.222	0 ==> 1
	1871	1	0.111	0 --> 1
	1881	1	0.250	3 ==> 0
	1885	0.26000	0.177	b ==> j
	1887	0.90900	0.124	a ==> k
	1897	0.18600	0.228	a ==> r
	1904	0.11800	0.216	b ==> g
	1905	0.03300	0.168	k ==> b
	1906	0.04000	0.171	l --> m
	1908	0.03400	0.170	c ==> b
22	1810	0.85700	0.094	k --> a
	1813	1	0.182	1 ==> 0
	1817	0.08700	0.167	j ==> 2
	1827	0.01500	0.169	h ==> c
	1834	0.05100	0.104	z ==> r
	1844	0.06500	0.247	Q ==> 5
	1855	0.05400	0.232	4 ==> L
	1856	0.03600	0.202	5 --> 6
	1860	1	0.250	0 ==> 1
	1862	0.00300	0.281	K ==> 4
	1864	0.18300	0.240	6 ==> H
	1869	1	0.333	2 ==> 1
	1870	1	0.333	0 ==> 1
	1874	1	0.167	0 ==> 1
	1876	1	0.400	0 ==> 1
	1877	1	0.333	0 --> 1
	1878	1	0.250	0 ==> 1
	1905	0.02300	0.168	f ==> h
	1906	0.24000	0.171	b ==> g
	1907	0.15400	0.178	b ==> i
	1908	0.03300	0.170	e ==> j

	1870	1	0.333	0 ==> 1
	1874	1	0.167	0 ==> 1
	1876	1	0.400	0 ==> 1
	1878	1	0.250	0 ==> 1
	1905	0.01200	0.168	d ==> h
	1906	0.24000	0.171	b ==> g
	1907	0.15400	0.178	b ==> i
	1908	0.03300	0.170	e ==> j
S. marmoratus	1820	0.02500	0.127	p ==> y
	1827	0.09750	0.169	c ==> w
	1828	0.00200	0.160	v ==> 2
	1832	1	0.200	0 ==> 1
	1838	0.07500	0.158	y ==> d
	1841	1	0.182	1 ==> 0
	1851	1	0.222	3 ==> 2
	1855	0.02000	0.232	L ==> 6
	1864	0.02700	0.240	H ==> 3
	1880	1	0.333	0 ==> 1
	1888	0.56500	0.128	n ==> a
	1891	1	0.083	1 --> 0
	1896	0.52200	0.086	z ==> r
	1905	0.06600	0.168	h ==> o
S. roseiventris	1811	1	0.250	0 ==> 1
	1812	1	0.200	0 ==> 1
	1817	0.07000	0.167	2 ==> E
	1819	0.11100	0.330	a ==> m
	1820	0.07000	0.127	p ==> 9
	1824	0.17000	0.255	1 ==> C
	1828	0.09000	0.160	v ==> G
	1834	0.51600	0.104	r ==> v
	1839	0.01100	0.103	3 --> F
	1844	0.01700	0.247	5 ==> I
	1845	1	0.222	1 --> 0
	1849	1	0.333	0 ==> 1
	1854	0.16600	0.195	6 ==> J
	1856	0.11300	0.202	6 ==> K
	1862	0.04400	0.281	4 ==> G
	1879	1	0.250	0 ==> 1
	1885	0.23000	0.177	b ==> i
	1890	1	0.062	0 ==> 1
	1895	1	0.200	0 ==> 2
	1898	0.43200	0.207	a ==> o
	1904	0.11800	0.216	b ==> d
	1906	0.28000	0.171	g ==> p
	1907	0.23100	0.178	i ==> s
	1908	0.00600	0.170	j ==> x
23	1799	1	0.167	0 ==> 1
	1817	0.03700	0.167	j ==> 5
	1838	0.05400	0.158	l ==> j
	1854	0.03000	0.195	R ==> m
	1855	0.08900	0.232	4 ==> O
	1856	0.12000	0.202	5 ==> v
	1862	0.06000	0.281	I ==> j
	1864	0.03000	0.240	6 ==> g
	1865	1	1.000	1 ==> 0
	1866	1	1.000	2 ==> 0
	1896	0.05600	0.086	z --> w

S. marmoratus	1820	0.02500	0.127	p ==> y
	1827	0.09750	0.169	c ==> w
	1828	0.01600	0.160	w ==> 2
	1832	1	0.200	0 ==> 1
	1838	0.07500	0.158	y ==> d
	1839	0.00700	0.103	K --> 3
	1841	1	0.182	1 ==> 0
	1851	1	0.222	3 ==> 2
	1854	0.00700	0.195	O --> 6
	1855	0.02000	0.232	L ==> 6
	1864	0.02700	0.240	H ==> 3
	1880	1	0.333	0 ==> 1
	1896	0.52200	0.086	z ==> r
	1905	0.06600	0.168	h ==> o
S. roseiventris	1800	1	0.250	0 --> 1
	1811	1	0.250	0 ==> 1
	1812	1	0.200	0 ==> 1
	1817	0.07000	0.167	2 ==> E
	1819	0.11100	0.330	a ==> m
	1820	0.07000	0.127	p ==> 9
	1824	0.17000	0.255	1 ==> C
	1828	0.07600	0.160	w ==> G
	1834	0.51600	0.104	r ==> v
	1839	0.00400	0.103	K --> F
	1844	0.01700	0.247	5 ==> I
	1845	1	0.222	1 --> 0
	1849	1	0.333	0 ==> 1
	1854	0.15900	0.195	O ==> J
	1856	0.11300	0.202	6 ==> K
	1862	0.04400	0.281	4 ==> G
	1879	1	0.250	0 ==> 1
	1885	0.23000	0.177	b ==> i
	1888	0.56500	0.128	a --> n
	1890	1	0.062	0 ==> 1
	1891	1	0.083	0 --> 1
	1895	1	0.200	0 ==> 2
	1898	0.43200	0.207	a ==> o
	1904	0.11800	0.216	b ==> d
	1906	0.28000	0.171	g ==> p
	1907	0.23100	0.178	i ==> s
	1908	0.00600	0.170	j ==> x
23	1799	1	0.167	0 ==> 1
	1800	1	0.250	0 --> 1
	1817	0.03700	0.167	j ==> 5
	1838	0.10300	0.158	y ==> n
	1854	0.03000	0.195	R ==> m
	1855	0.08900	0.232	4 ==> O
	1856	0.12000	0.202	5 ==> v
	1862	0.05800	0.281	I ==> t
	1864	0.03000	0.240	6 ==> g
	1865	1	1.000	1 ==> 0
	1866	1	1.000	2 ==> 0
	1877	1	0.333	0 --> 1
	1905	0.01100	0.168	f --> d
24	1810	0.85700	0.094	k ==> a
	1813	1	0.182	1 ==> 0
	1820	0.05900	0.127	E ==> s
	1824	0.01100	0.255	1 ==> H

24	1813	1	0.182	1 ==> 0
	1820	0.10500	0.127	p ==> s
	1824	0.01300	0.255	1 ==> k
	1828	0.06000	0.160	u ==> k
	1849	1	0.333	0 ==> 1
	1854	0.05300	0.195	m ==> v
	1855	0.00900	0.232	O --> v
	1860	1	0.250	0 --> 1
	1864	0.03900	0.240	g ==> v
	1876	1	0.400	0 ==> 1
	1878	1	0.250	0 ==> 1
	1904	0.05900	0.216	b ==> a
	1906	0.04000	0.171	b --> d
	1908	0.01100	0.170	e ==> i
	1909	0.03200	0.168	b --> i
25	1788	1	0.100	1 --> 0
	1804	1	0.167	0 --> 1
	1817	0.02500	0.167	5 ==> K
	1820	0.01200	0.127	s --> f
	1827	0.04500	0.169	p ==> s
	1832	1	0.200	0 ==> 1
	1834	0.04000	0.104	l ==> d
	1839	0.00900	0.103	m --> J
	1844	0.08900	0.247	Q ==> O
	1854	0.05200	0.195	v ==> r
	1855	0.00200	0.232	v --> R
	1856	0.04200	0.202	v ==> P
	1862	0.09300	0.281	j ==> L
	1864	0.12100	0.240	v ==> w
	1874	1	0.167	0 --> 1
	1879	1	0.250	0 ==> 1
	1880	1	0.333	0 ==> 1
	1896	0.31000	0.086	w ==> 2
	1905	0.01200	0.168	d ==> h
26	1817	0.02600	0.167	K ==> h
	1844	0.29100	0.247	O --> r
	1850	1	0.250	2 --> 0
	1862	0.05600	0.281	L ==> y
	1876	1	0.400	1 --> 2
	1896	0.07000	0.086	2 --> a
	1907	0.03900	0.178	b --> d
	1908	0.00600	0.170	i --> f
	1909	0.09700	0.168	i --> e
27	1817	0.03200	0.167	h ==> m
	1820	0.09100	0.127	f ==> l
	1827	0.01000	0.169	s --> 5
	1828	0.04400	0.160	k ==> l
	1839	0.00900	0.103	J --> m
	1845	1	0.222	1 --> 2
	1854	0.02600	0.195	r ==> w
	1855	0.06400	0.232	R --> m
	1874	1	0.167	1 --> 0
	1883	1	0.154	2 ==> 1
28	1820	0.00900	0.127	l ==> e
	1824	0.04500	0.255	k ==> e
	1828	0.01600	0.160	l ==> u
	1844	0.10000	0.247	r ==> e

	1828	0.06000	0.160	u ==> k
	1849	1	0.333	0 ==> 1
	1854	0.05300	0.195	m ==> v
	1855	0.00900	0.232	O --> v
	1864	0.03900	0.240	g ==> v
	1876	1	0.400	0 ==> 1
	1878	1	0.250	0 ==> 1
	1904	0.05900	0.216	b ==> a
	1908	0.00500	0.170	e ==> f
25	1817	0.02500	0.167	5 ==> K
	1827	0.03500	0.169	p ==> 5
	1832	1	0.200	0 ==> 1
	1834	0.04000	0.104	l ==> d
	1838	0.00400	0.158	n --> j
	1844	0.08900	0.247	Q ==> O
	1854	0.05200	0.195	v ==> r
	1856	0.04200	0.202	v ==> P
	1862	0.09500	0.281	t ==> L
	1864	0.05100	0.240	v ==> m
	1879	1	0.250	0 ==> 1
	1880	1	0.333	0 ==> 1
	1896	0.25400	0.086	z ==> 2
	1905	0.01200	0.168	d ==> h
26	1804	1	0.167	0 --> 1
	1817	0.02600	0.167	K ==> h
	1860	1	0.250	0 --> 1
27	1817	0.00500	0.167	h ==> 0
	1820	0.07900	0.127	s ==> l
	1828	0.04400	0.160	k ==> l
	1854	0.02600	0.195	r ==> w
	1883	1	0.154	2 ==> 1
28	1820	0.00900	0.127	l ==> e
	1824	0.04300	0.255	H ==> e
	1828	0.01600	0.160	l ==> u
	1844	0.39100	0.247	O ==> e
	1862	0.15000	0.281	L ==> d
	1864	0.07000	0.240	m --> w
	1876	1	0.400	1 --> 2
	1896	0.07000	0.086	2 --> a
	1905	0.01100	0.168	h ==> e
	1909	0.12900	0.168	b --> e
S. boettgeri	1788	1	0.100	1 --> 0
	1810	0.05000	0.094	a ==> e
	1811	1	0.250	0 ==> 1
	1812	1	0.200	0 ==> 1
	1817	0.05400	0.167	0 ==> e
	1819	0.03000	0.330	a ==> b
	1827	0.14250	0.169	5 ==> e
	1828	0.04800	0.160	u ==> e
	1838	0.24400	0.158	j ==> e
	1839	0.31900	0.103	m ==> e
	1841	1	0.182	1 ==> 0
	1850	1	0.250	2 --> 0
	1851	1	0.222	3 ==> 2
	1854	0.19400	0.195	w ==> e
	1855	0.21300	0.232	v ==> e

	1862	0.09400	0.281	y ==> d
	1885	0.13000	0.177	b --> d
	1905	0.01100	0.168	h ==> e
S. boettgeri	1810	0.05000	0.094	a ==> e
	1811	1	0.250	0 ==> 1
	1812	1	0.200	0 ==> 1
	1817	0.02700	0.167	m ==> e
	1819	0.03000	0.330	a ==> b
	1827	0.14250	0.169	5 ==> e
	1828	0.04800	0.160	u ==> e
	1838	0.24400	0.158	j ==> e
	1839	0.31900	0.103	m ==> e
	1841	1	0.182	1 ==> 0
	1845	1	0.222	2 --> 1
	1851	1	0.222	3 ==> 2
	1854	0.19400	0.195	w ==> e
	1855	0.27500	0.232	m ==> e
	1856	0.22200	0.202	P ==> e
	1864	0.03900	0.240	w ==> e
	1908	0.00500	0.170	f ==> e
S. haenschi	1816	1	0.143	0 ==> 1
	1817	0.16700	0.167	m ==> d
	1820	0.18500	0.127	e ==> d
	1824	0.11300	0.255	e ==> v
	1827	0.05250	0.169	5 ==> d
	1832	1	0.200	1 ==> 0
	1834	0.94000	0.104	d ==> a
	1838	0.02600	0.158	j ==> f
	1839	0.34100	0.103	m ==> i
	1844	0.12200	0.247	e ==> x
	1850	1	0.250	0 --> 2
	1854	0.06900	0.195	w ==> x
	1855	0.01700	0.232	m ==> x
	1856	0.08800	0.202	P ==> x
	1862	0.06200	0.281	d ==> v
	1863	1	0.333	1 ==> 0
	1875	1	0.167	1 ==> 0
	1890	1	0.062	0 ==> 1
	1904	0.29400	0.216	a ==> f
	1905	0.01100	0.168	e ==> l
	1908	0.04500	0.170	f ==> p
	1909	0.09700	0.168	e ==> a
S. cupreus	1788	1	0.100	0 --> 1
	1827	0.00750	0.169	5 --> j
	1834	0.06000	0.104	d ==> b
	1844	0.38400	0.247	r ==> m
	1847	1	0.333	0 ==> 2
	1850	1	0.250	0 ==> 3
	1852	1	0.250	1 ==> 0
	1854	0.07900	0.195	w ==> m
	1856	0.16600	0.202	P ==> m
	1858	1	0.100	0 ==> 1
	1862	0.11100	0.281	y ==> l
	1864	0.07000	0.240	w ==> m
	1869	1	0.333	2 ==> 1
	1876	1	0.400	2 --> 1
	1880	1	0.333	1 ==> 0
	1896	0.53000	0.086	a ==> g

	1856	0.22200	0.202	P ==> e
	1864	0.03900	0.240	w ==> e
	1885	0.13000	0.177	b --> d
	1906	0.04000	0.171	b --> d
	1907	0.03900	0.178	b --> d
	1908	0.00500	0.170	f ==> e
S. haenschi	1816	1	0.143	0 ==> 1
	1817	0.14000	0.167	0 ==> d
	1820	0.18500	0.127	e ==> d
	1824	0.11300	0.255	e ==> v
	1827	0.05250	0.169	5 ==> d
	1832	1	0.200	1 ==> 0
	1834	0.94000	0.104	d ==> a
	1838	0.02600	0.158	j ==> f
	1839	0.34100	0.103	m ==> i
	1844	0.12200	0.247	e ==> x
	1845	1	0.222	1 --> 2
	1854	0.06900	0.195	w ==> x
	1855	0.07900	0.232	v ==> x
	1856	0.08800	0.202	P ==> x
	1862	0.06200	0.281	d ==> v
	1863	1	0.333	1 ==> 0
	1875	1	0.167	1 ==> 0
	1890	1	0.062	0 ==> 1
	1904	0.29400	0.216	a ==> f
	1905	0.01100	0.168	e ==> l
	1908	0.04500	0.170	f ==> p
	1909	0.09700	0.168	e ==> a
S. cupreus	1817	0.02700	0.167	0 --> m
	1824	0.00200	0.255	H --> k
	1827	0.00750	0.169	5 --> j
	1834	0.06000	0.104	d ==> b
	1844	0.09300	0.247	O ==> m
	1845	1	0.222	1 --> 2
	1847	1	0.333	0 ==> 2
	1850	1	0.250	2 ==> 3
	1852	1	0.250	1 ==> 0
	1854	0.07900	0.195	w ==> m
	1855	0.06200	0.232	v --> m
	1856	0.16600	0.202	P ==> m
	1858	1	0.100	0 ==> 1
	1862	0.05500	0.281	L ==> l
	1869	1	0.333	2 ==> 1
	1880	1	0.333	1 ==> 0
	1896	0.46000	0.086	2 ==> g
	1897	0.05300	0.228	a ==> f
	1904	0.05900	0.216	a ==> b
29	1788	1	0.100	1 --> 0
	1811	1	0.250	0 ==> 1
	1812	1	0.200	0 ==> 1
	1824	0.01000	0.255	H ==> f
	1827	0.10250	0.169	5 ==> f
	1834	0.03000	0.104	d ==> r
	1838	0.02600	0.158	j ==> f
	1839	0.05100	0.103	m ==> K
	1841	1	0.182	1 ==> 0
	1844	0.12400	0.247	O --> 0
	1850	1	0.250	2 --> 0

	1897	0.05300	0.228	a ==> f
	1904	0.05900	0.216	a ==> b
	1906	0.04000	0.171	d --> b
	1907	0.03900	0.178	d --> b
	1909	0.12900	0.168	e --> b
29	1811	1	0.250	0 ==> 1
	1812	1	0.200	0 ==> 1
	1824	0.00800	0.255	k ==> f
	1827	0.09250	0.169	s ==> f
	1834	0.03000	0.104	d ==> r
	1838	0.02600	0.158	j ==> f
	1839	0.05800	0.103	J ==> q
	1841	1	0.182	1 ==> 0
	1851	1	0.222	3 ==> 2
	1854	0.11300	0.195	r ==> Q
	1855	0.11900	0.232	R ==> i
	1856	0.14700	0.202	P ==> H
	1862	0.02600	0.281	y --> q
	1892	1	0.167	0 --> 1
30	1864	0.00800	0.240	w --> h
	1890	1	0.062	0 --> 1
31	1854	0.00300	0.195	Q --> h
	1856	0.06400	0.202	H --> h
	1864	0.01600	0.240	h --> N
	1869	1	0.333	2 ==> 1
	1870	1	0.333	0 ==> 1
	1906	0.12000	0.171	d ==> h
	1907	0.07600	0.178	d ==> e
S. bolivarensis	1817	0.00600	0.167	h ==> f
	1828	0.20200	0.160	k ==> f
	1834	0.91000	0.104	r ==> a
	1839	0.32200	0.103	q ==> f
	1844	0.05300	0.247	r ==> f
	1850	1	0.250	0 ==> 2
	1854	0.08700	0.195	h ==> f
	1855	0.00900	0.232	i ==> f
	1856	0.00400	0.202	h ==> f
	1862	0.07100	0.281	q ==> e
	1864	0.07100	0.240	N --> f
	1883	1	0.154	2 ==> 1
	1899	0.10000	0.380	a ==> b
	1905	0.01100	0.168	h ==> e
	1906	0.04000	0.171	h ==> e
	1909	0.03200	0.168	e ==> f
32	1804	1	0.167	1 --> 0
	1820	0.08800	0.127	f ==> h
	1828	0.02600	0.160	k ==> h
	1864	0.01600	0.240	N ==> h
	1876	1	0.400	2 ==> 1
	1890	1	0.062	1 --> 0
	1896	0.06800	0.086	a ==> e
	1908	0.01600	0.170	f ==> m
S. carrioni	1810	0.24100	0.094	a ==> g
	1827	0.09500	0.169	f ==> g
	1834	0.54600	0.104	r ==> e

	1851	1	0.222	3 ==> 2
	1854	0.11000	0.195	r ==> h
	1855	0.12100	0.232	v ==> i
	1856	0.12500	0.202	P ==> p
	1862	0.05600	0.281	L --> y
	1874	1	0.167	0 --> 1
	1876	1	0.400	1 --> 2
	1896	0.07000	0.086	2 --> a
	1909	0.09700	0.168	b --> m
30	1839	0.01600	0.103	K --> q
31	1844	0.09200	0.247	0 --> p
	1862	0.02600	0.281	y --> q
	1869	1	0.333	2 ==> 1
	1870	1	0.333	0 ==> 1
	1906	0.16000	0.171	b ==> h
	1907	0.11500	0.178	b ==> e
S. bolivarensis	1817	0.00600	0.167	h ==> f
	1820	0.01200	0.127	s --> f
	1828	0.20200	0.160	k ==> f
	1834	0.91000	0.104	r ==> a
	1839	0.32200	0.103	q ==> f
	1844	0.12800	0.247	p ==> f
	1850	1	0.250	0 ==> 2
	1854	0.08700	0.195	h ==> f
	1855	0.00900	0.232	i ==> f
	1856	0.04600	0.202	p ==> f
	1862	0.07100	0.281	q ==> e
	1864	0.02500	0.240	m --> f
	1883	1	0.154	2 ==> 1
	1890	1	0.062	0 --> 1
	1892	1	0.167	0 --> 1
	1899	0.10000	0.380	a ==> b
	1905	0.01100	0.168	h ==> e
	1906	0.04000	0.171	h ==> e
	1909	0.06400	0.168	m ==> f
32	1820	0.07600	0.127	s ==> h
	1828	0.02600	0.160	k ==> h
	1844	0.07500	0.247	p --> r
	1856	0.04200	0.202	p ==> h
	1864	0.06200	0.240	m ==> h
	1876	1	0.400	2 ==> 1
	1896	0.06800	0.086	a ==> e
	1908	0.01600	0.170	f ==> m
S. carrioni	1804	1	0.167	1 --> 0
	1810	0.24100	0.094	a ==> g
	1827	0.09500	0.169	f ==> g
	1834	0.54600	0.104	r ==> e
	1838	0.11100	0.158	f ==> h
	1839	0.29500	0.103	q ==> h
	1844	0.04600	0.247	r ==> h
	1855	0.04300	0.232	i ==> h
	1862	0.06100	0.281	q ==> g
	1904	0.05900	0.216	a ==> b
	1905	0.01200	0.168	h ==> d
	1906	0.08000	0.171	h ==> g
	1907	0.07700	0.178	e ==> g

	1838	0.11100	0.158	f ==> h
	1839	0.29500	0.103	q ==> h
	1844	0.04600	0.247	r ==> h
	1855	0.04300	0.232	i ==> h
	1862	0.06100	0.281	q ==> g
	1892	1	0.167	1 --> 0
	1904	0.05900	0.216	a ==> b
	1905	0.01200	0.168	h ==> d
	1906	0.08000	0.171	h ==> g
	1907	0.07700	0.178	e ==> g
	1908	0.01100	0.170	m ==> h
	1909	0.06400	0.168	e ==> g
S. eunetopsis	1811	1	0.250	1 ==> 0
	1817	0.05500	0.167	h ==> q
	1820	0.02900	0.127	h ==> p
	1821	0.05000	0.300	e ==> h
	1824	0.05100	0.255	f ==> p
	1827	0.02750	0.169	f ==> n
	1828	0.07000	0.160	h ==> p
	1834	0.04000	0.104	r ==> i
	1852	1	0.250	1 ==> 0
	1854	0.11000	0.195	h ==> r
	1855	0.03400	0.232	i ==> r
	1856	0.11900	0.202	h ==> r
	1864	0.05500	0.240	h ==> r
	1891	1	0.083	0 ==> 1
	1896	0.93200	0.086	e ==> d
	1905	0.02200	0.168	h ==> l
	1906	0.16000	0.171	h ==> b
	1907	0.19200	0.178	e ==> c
	1909	0.12900	0.168	e ==> b
33	1834	0.09000	0.104	r ==> b
	1839	0.05700	0.103	q ==> o
	1844	0.07500	0.247	r --> p
	1848	1	0.500	2 ==> 0
	1854	0.06100	0.195	h --> i
	1856	0.04200	0.202	h ==> p
	1864	0.07200	0.240	N ==> i
	1905	0.01200	0.168	h ==> d
	1907	0.15400	0.178	e --> k
S. chlorostictus	1817	0.01500	0.167	h ==> i
	1827	0.15500	0.169	f ==> d
	1828	0.26000	0.160	k ==> d
	1839	0.35100	0.103	o ==> i
	1844	0.04700	0.247	p ==> i
	1856	0.00500	0.202	p ==> i
	1862	0.02300	0.281	q --> h
	1904	0.05900	0.216	a ==> d
	1908	0.00600	0.170	f ==> I
S. empetrus	1820	0.02500	0.127	f ==> n
	1824	0.06000	0.255	f ==> n
	1827	0.15500	0.169	f ==> m
	1828	0.00400	0.160	k ==> o
	1851	1	0.222	2 ==> 1
	1852	1	0.250	1 ==> 0
	1854	0.07800	0.195	i ==> p
	1855	0.20800	0.232	i ==> p

	1908	0.01100	0.170	m ==> h
	1909	0.09600	0.168	m ==> g
S. eunetopsis	1811	1	0.250	1 ==> 0
	1817	0.05500	0.167	h ==> q
	1820	0.02900	0.127	h ==> p
	1821	0.05000	0.300	e ==> h
	1824	0.05100	0.255	f ==> p
	1827	0.02750	0.169	f ==> n
	1828	0.07000	0.160	h ==> p
	1834	0.04000	0.104	r ==> i
	1852	1	0.250	1 ==> 0
	1854	0.11000	0.195	h ==> r
	1855	0.03400	0.232	i ==> r
	1856	0.11900	0.202	h ==> r
	1864	0.05500	0.240	h ==> r
	1891	1	0.083	0 ==> 1
	1892	1	0.167	0 --> 1
	1896	0.93200	0.086	e ==> d
	1905	0.02200	0.168	h ==> l
	1906	0.16000	0.171	h ==> b
	1907	0.19200	0.178	e ==> c
	1909	0.09700	0.168	m ==> b
33	1834	0.09000	0.104	r ==> b
	1839	0.05700	0.103	q ==> o
	1848	1	0.500	2 ==> 0
	1854	0.06100	0.195	h --> i
	1864	0.02600	0.240	m ==> i
	1905	0.01200	0.168	h ==> d
S. chlorostictus	1817	0.01500	0.167	h ==> i
	1820	0.01200	0.127	s --> f
	1827	0.15500	0.169	f ==> d
	1828	0.26000	0.160	k ==> d
	1839	0.35100	0.103	o ==> i
	1844	0.04700	0.247	p ==> i
	1856	0.00500	0.202	p ==> i
	1862	0.02300	0.281	q --> h
	1890	1	0.062	0 --> 1
	1892	1	0.167	0 --> 1
	1904	0.05900	0.216	a ==> d
	1908	0.00600	0.170	f ==> i
	1909	0.03200	0.168	m --> e
S. empetrus	1820	0.01300	0.127	s ==> n
	1824	0.06000	0.255	f ==> n
	1827	0.15500	0.169	f ==> m
	1828	0.00400	0.160	k ==> o
	1851	1	0.222	2 ==> 1
	1852	1	0.250	1 ==> 0
	1854	0.07800	0.195	i ==> p
	1855	0.20800	0.232	i ==> p
	1862	0.10200	0.281	q ==> o
	1864	0.02600	0.240	i ==> p
	1891	1	0.083	0 ==> 1
	1904	0.05900	0.216	a ==> b
	1905	0.04400	0.168	d ==> j
	1906	0.16000	0.171	h ==> j
	1907	0.15400	0.178	e --> k
	1908	0.06000	0.170	f ==> k

	1862	0.10200	0.281	q ==> o
	1864	0.02600	0.240	i ==> p
	1890	1	0.062	1 --> 0
	1891	1	0.083	0 ==> 1
	1892	1	0.167	1 --> 0
	1904	0.05900	0.216	a ==> b
	1905	0.04400	0.168	d ==> j
	1906	0.16000	0.171	h ==> j
	1908	0.06000	0.170	f ==> k
	1909	0.25800	0.168	e ==> j
34	1804	1	0.167	1 ==> 0
	1839	0.17500	0.103	q ==> y
	1844	0.16700	0.247	r ==> 0
	1854	0.18900	0.195	Q ==> 0
	1862	0.02600	0.281	q ==> y
	1887	1.00000	0.124	a ==> g
	1891	1	0.083	0 ==> 1
	1892	1	0.167	1 --> 0
	1895	1	0.200	0 ==> 2
	1904	0.05900	0.216	a ==> b
	1906	0.08000	0.171	d ==> k
	1907	0.07700	0.178	d ==> j
	1909	0.03200	0.168	e --> m
S. imitator	1805	1	0.250	0 ==> 1
	1817	0.03800	0.167	h ==> x
	1820	0.23800	0.127	f ==> w
	1824	0.01500	0.255	f ==> x
	1827	0.09250	0.169	f ==> s
	1828	0.09400	0.160	k ==> x
	1834	0.09000	0.104	r ==> b
	1855	0.12500	0.232	i ==> 0
	1856	0.05200	0.202	H ==> 0
	1864	0.11200	0.240	h ==> z
	1885	0.40000	0.177	b ==> g
	1888	1.00000	0.128	a ==> i
	1900	0.33300	0.341	a ==> c
	1905	0.03300	0.168	h ==> m
	1906	0.12000	0.171	k ==> m
	1907	0.15400	0.178	j ==> l
	1908	0.04500	0.170	f ==> p
S. praeornatus	1788	1	0.100	0 ==> 1
	1794	1	0.250	1 ==> 0
	1800	1	0.250	1 ==> 0
	1817	0.03200	0.167	h ==> m
	1820	0.08200	0.127	f ==> 6
	1824	0.02400	0.255	f ==> 8
	1827	0.09500	0.169	f ==> l
	1828	0.05400	0.160	k ==> C
	1834	0.33800	0.104	r ==> t
	1838	0.42900	0.158	f ==> v
	1839	0.13100	0.103	y ==> B
	1844	0.00200	0.247	0 ==> F
	1854	0.04600	0.195	0 ==> F
	1855	0.00200	0.232	i ==> H
	1862	0.10200	0.281	y ==> D
	1864	0.08500	0.240	h ==> D
	1905	0.02300	0.168	h ==> f
	1908	0.01100	0.170	f ==> b

	1909	0.22600	0.168	m ==> j
34	1804	1	0.167	1 ==> 0
	1839	0.17500	0.103	q ==> y
	1854	0.19200	0.195	h ==> 0
	1856	0.02200	0.202	p --> H
	1887	1.00000	0.124	a ==> g
	1890	1	0.062	0 --> 1
	1891	1	0.083	0 ==> 1
	1895	1	0.200	0 ==> 2
	1904	0.05900	0.216	a ==> b
	1906	0.04000	0.171	b ==> k
	1907	0.03800	0.178	b ==> j
S. imitator	1805	1	0.250	0 ==> 1
	1817	0.03800	0.167	h ==> x
	1820	0.22600	0.127	s ==> w
	1824	0.01500	0.255	f ==> x
	1827	0.09250	0.169	f ==> s
	1828	0.09400	0.160	k ==> x
	1834	0.09000	0.104	r ==> b
	1855	0.12500	0.232	i ==> 0
	1856	0.05200	0.202	H ==> 0
	1864	0.17400	0.240	m ==> z
	1885	0.40000	0.177	b ==> g
	1888	1.00000	0.128	a ==> i
	1900	0.33300	0.341	a ==> c
	1905	0.03300	0.168	h ==> m
	1906	0.12000	0.171	k ==> m
	1907	0.15400	0.178	j ==> l
	1908	0.04500	0.170	f ==> p
S. praeornatus	1788	1	0.100	0 ==> 1
	1794	1	0.250	1 ==> 0
	1800	1	0.250	1 ==> 0
	1817	0.03200	0.167	h ==> m
	1820	0.09400	0.127	s ==> 6
	1824	0.02400	0.255	f ==> 8
	1827	0.09500	0.169	f ==> l
	1828	0.05400	0.160	k ==> C
	1834	0.33800	0.104	r ==> t
	1838	0.42900	0.158	f ==> v
	1839	0.13100	0.103	y ==> B
	1844	0.00200	0.247	0 ==> F
	1854	0.04600	0.195	0 ==> F
	1855	0.00200	0.232	i ==> H
	1862	0.10200	0.281	y ==> D
	1864	0.02300	0.240	m ==> D
	1905	0.02300	0.168	h ==> f
	1908	0.01100	0.170	f ==> b
	1909	0.12900	0.168	m ==> d
35	1794	1	0.250	1 ==> 0
	1820	0.01200	0.127	s --> f
	1834	0.10900	0.104	r ==> n
	1844	0.24400	0.247	0 ==> z
	1848	1	0.500	2 ==> 0
	1854	0.00300	0.195	h --> Q
	1855	0.05900	0.232	i ==> N
	1856	0.02200	0.202	p --> H
	1862	0.10800	0.281	y ==> M

	1909	0.12900	0.168	m ==> d
35	1794	1	0.250	1 ==> 0
	1834	0.10900	0.104	r ==> n
	1844	0.09400	0.247	r ==> P
	1846	1	0.143	1 --> 0
	1848	1	0.500	2 ==> 0
	1854	0.05800	0.195	Q --> i
	1855	0.05900	0.232	i ==> N
	1856	0.05200	0.202	H --> 0
	1862	0.08300	0.281	q ==> J
	1864	0.00100	0.240	w --> A
36	1817	0.14500	0.167	h ==> I
	1820	0.01500	0.127	f ==> A
	1827	0.02750	0.169	f --> n
	1844	0.00300	0.247	P ==> K
	1854	0.04900	0.195	i ==> L
	1856	0.03800	0.202	0 --> M
	1862	0.01500	0.281	J --> H
	1864	0.04500	0.240	A --> J
	1869	1	0.333	2 --> 1
	1870	1	0.333	0 ==> 1
	1906	0.12000	0.171	d ==> h
	1907	0.03800	0.178	d ==> m
	1908	0.01600	0.170	f ==> m
	1909	0.06500	0.168	e --> c
37	1820	0.00800	0.127	A ==> k
	1824	0.03700	0.255	f ==> F
	1834	0.36700	0.104	n ==> f
	1839	0.29200	0.103	q ==> l
	1844	0.00600	0.247	K ==> l
	1854	0.13700	0.195	L ==> l
	1855	0.17400	0.232	N ==> l
	1856	0.12700	0.202	M ==> O
	1906	0.04000	0.171	h ==> e
	1907	0.07700	0.178	m ==> i
	1908	0.00600	0.170	m ==> d
S. crassicaudatus	1817	0.00400	0.167	I ==> l
	1819	0.40000	0.330	a ==> e
	1824	0.19800	0.255	F ==> j
	1827	0.01750	0.169	n --> i
	1856	0.01900	0.202	O ==> l
	1862	0.09100	0.281	H ==> k
	1864	0.07400	0.240	J ==> l
	1892	1	0.167	1 --> 0
	1905	0.04400	0.168	h ==> g
S. torquatus	1820	0.00600	0.127	k ==> C
	1827	0.14000	0.169	n ==> 2
	1828	0.00400	0.160	k ==> J
	1834	0.24400	0.104	f ==> y
	1838	0.13000	0.158	f ==> z
	1844	0.08400	0.247	l ==> M
	1846	1	0.143	0 --> 1
	1854	0.07600	0.195	l ==> N
	1855	0.09900	0.232	l ==> P
	1862	0.01500	0.281	H --> J
	1864	0.08800	0.240	J ==> L
	1864	0.04600	0.240	m --> N
	1906	0.04000	0.171	b --> d
	1907	0.03900	0.178	b --> d
36	1817	0.14500	0.167	h ==> I
	1820	0.01500	0.127	f ==> A
	1844	0.02000	0.247	z ==> K
	1854	0.10700	0.195	Q ==> L
	1856	0.09000	0.202	H --> M
	1862	0.00100	0.281	M --> J
	1870	1	0.333	0 ==> 1
	1906	0.12000	0.171	d ==> h
	1907	0.03800	0.178	d ==> m
	1908	0.01600	0.170	f ==> m
37	1820	0.00800	0.127	A ==> k
	1824	0.03700	0.255	f ==> F
	1834	0.36700	0.104	n ==> f
	1839	0.30800	0.103	K ==> l
	1844	0.00600	0.247	K ==> l
	1854	0.13700	0.195	L ==> l
	1855	0.17400	0.232	N ==> l
	1856	0.12700	0.202	M ==> O
	1906	0.04000	0.171	h ==> e
	1907	0.07700	0.178	m ==> i
	1908	0.00600	0.170	m ==> d
S. crassicaudatus	1817	0.00400	0.167	I ==> l
	1819	0.40000	0.330	a ==> e
	1824	0.19800	0.255	F ==> j
	1827	0.04500	0.169	f --> i
	1846	1	0.143	1 --> 0
	1856	0.01900	0.202	O ==> l
	1862	0.10600	0.281	J ==> k
	1864	0.14400	0.240	N ==> l
	1869	1	0.333	2 --> 1
	1905	0.04400	0.168	h ==> g
	1909	0.03300	0.168	m --> c
S. torquatus	1820	0.00600	0.127	k ==> C
	1827	0.11250	0.169	f ==> 2
	1828	0.00400	0.160	k ==> J
	1834	0.24400	0.104	f ==> y
	1838	0.13000	0.158	f ==> z
	1844	0.08400	0.247	l ==> M
	1854	0.07600	0.195	l ==> N
	1855	0.09900	0.232	l ==> P
	1864	0.01800	0.240	N ==> L
	1892	1	0.167	0 --> 1
	1904	0.05900	0.216	a ==> b
	1905	0.01200	0.168	h ==> d
	1906	0.32000	0.171	e ==> p
	1907	0.34600	0.178	i ==> t
	1908	0.02700	0.170	d ==> z
S. simonsii	1817	0.07200	0.167	I ==> G
	1827	0.15750	0.169	f ==> 1
	1828	0.04000	0.160	k ==> I
	1834	0.15000	0.104	n ==> x
	1839	0.14300	0.103	K ==> H
	1846	1	0.143	1 --> 0

	1869	1	0.333	1 --> 2
	1904	0.05900	0.216	a ==> b
	1905	0.01200	0.168	h ==> d
	1906	0.32000	0.171	e ==> p
	1907	0.34600	0.178	i ==> t
	1908	0.02700	0.170	d ==> z
	1909	0.03300	0.168	c --> m
S. simonsii	1817	0.07200	0.167	I ==> G
	1827	0.13000	0.169	n ==> 1
	1828	0.04000	0.160	k ==> I
	1834	0.15000	0.104	n ==> x
	1839	0.15900	0.103	q ==> H
	1896	0.80000	0.086	a ==> f
	1905	0.02200	0.168	h ==> l
S. humeralis	1817	0.22000	0.167	h ==> w
	1819	0.05000	0.330	a ==> j
	1820	0.02100	0.127	f ==> v
	1827	0.11500	0.169	f ==> r
	1828	0.07000	0.160	k ==> w
	1832	1	0.200	1 ==> 0
	1838	0.33400	0.158	f ==> p
	1839	0.46700	0.103	q ==> x
	1844	0.01700	0.247	P --> z
	1854	0.19400	0.195	i ==> z
	1855	0.20800	0.232	N ==> z
	1856	0.20200	0.202	0 ==> z
	1862	0.15000	0.281	J ==> x
	1864	0.29400	0.240	A ==> y
	1905	0.01100	0.168	h ==> e
	1906	0.08000	0.171	d ==> k
	1907	0.15400	0.178	d ==> h
	1908	0.00600	0.170	f --> i
S. varius	1817	0.03300	0.167	h ==> L
	1824	0.00700	0.255	f ==> I
	1827	0.10250	0.169	f ==> 5
	1828	0.01200	0.160	k ==> M
	1834	0.36100	0.104	n ==> 0
	1839	0.01600	0.103	q --> K
	1846	1	0.143	0 --> 1
	1854	0.05800	0.195	i ==> Q
	1855	0.03500	0.232	N ==> S
	1856	0.08800	0.202	0 --> Q
	1862	0.00100	0.281	J --> M
	1864	0.02500	0.240	A --> N
	1874	1	0.167	1 ==> 0
	1890	1	0.062	0 ==> 1
	1892	1	0.167	1 --> 0
	1904	0.05900	0.216	a ==> d
	1905	0.01200	0.168	h ==> d
	1908	0.02300	0.170	f ==> c
	1909	0.09700	0.168	e ==> a
S. variabilis	1824	0.00200	0.255	k --> H
	1827	0.05500	0.169	s ==> 4
	1828	0.03400	0.160	k ==> L
	1838	0.14400	0.158	j ==> 1
	1854	0.00600	0.195	r ==> P
	1860	1	0.250	1 --> 0

	1862	0.01500	0.281	J --> H
	1864	0.07000	0.240	N --> J
	1869	1	0.333	2 --> 1
	1892	1	0.167	0 --> 1
	1896	0.80000	0.086	a ==> f
	1905	0.02200	0.168	h ==> l
	1909	0.03300	0.168	m --> c
S. humeralis	1817	0.22000	0.167	h ==> w
	1819	0.05000	0.330	a ==> j
	1820	0.02100	0.127	f ==> v
	1827	0.11500	0.169	f ==> r
	1828	0.07000	0.160	k ==> w
	1832	1	0.200	1 ==> 0
	1838	0.33400	0.158	f ==> p
	1839	0.48300	0.103	K ==> x
	1846	1	0.143	1 --> 0
	1854	0.25200	0.195	Q ==> z
	1855	0.20800	0.232	N ==> z
	1856	0.25400	0.202	H ==> z
	1862	0.15100	0.281	M ==> x
	1864	0.31900	0.240	N ==> y
	1892	1	0.167	0 --> 1
	1905	0.01100	0.168	h ==> e
	1906	0.08000	0.171	d ==> k
	1907	0.15400	0.178	d ==> h
	1908	0.00600	0.170	f --> i
	1909	0.03200	0.168	m --> e
S. varius	1817	0.03300	0.167	h ==> L
	1824	0.00700	0.255	f ==> I
	1827	0.10250	0.169	f ==> 5
	1828	0.01200	0.160	k ==> M
	1834	0.36100	0.104	n ==> 0
	1844	0.01700	0.247	z --> P
	1855	0.03500	0.232	N ==> S
	1856	0.03600	0.202	H --> Q
	1874	1	0.167	1 ==> 0
	1890	1	0.062	0 ==> 1
	1904	0.05900	0.216	a ==> d
	1905	0.01200	0.168	h ==> d
	1908	0.02300	0.170	f ==> c
	1909	0.12900	0.168	m ==> a
S. variabilis	1820	0.01200	0.127	s --> f
	1827	0.06500	0.169	5 ==> 4
	1828	0.03400	0.160	k ==> L
	1838	0.14400	0.158	j ==> 1
	1839	0.00900	0.103	m --> J
	1854	0.00600	0.195	r ==> P
	1855	0.00200	0.232	v --> R
	1864	0.07000	0.240	m --> w
	1874	1	0.167	0 --> 1
	1887	0.09000	0.124	a --> l
	1888	0.09000	0.128	a ==> p
	1907	0.07700	0.178	b ==> c
	1908	0.00600	0.170	f --> i
	1909	0.03200	0.168	b ==> d
S. frittsi	1817	0.00400	0.167	5 --> q
	1824	0.01400	0.255	H ==> t

	1887	0.09000	0.124	a --> l
	1888	0.09000	0.128	a ==> p
	1906	0.04000	0.171	d --> b
	1907	0.07700	0.178	b ==> c
	1909	0.06400	0.168	i ==> d
S. frittsi	1817	0.00400	0.167	5 --> q
	1824	0.01200	0.255	k ==> t
	1838	0.00400	0.158	j ==> n
	1839	0.10100	0.103	m ==> u
	1844	0.01600	0.247	Q ==> v
	1862	0.00200	0.281	j --> t
	1883	1	0.154	2 ==> 0
	1885	0.48000	0.177	b ==> f
	1886	0.44000	0.224	c ==> f
	1887	0.35000	0.124	a ==> d
	1896	0.03000	0.086	w ==> k
	1897	0.07000	0.228	a ==> h
	1908	0.01700	0.170	i ==> c
38	1812	1	0.200	0 ==> 1
	1820	0.12400	0.127	p ==> j
	1827	0.00750	0.169	p ==> u
	1834	0.02000	0.104	l --> b
	1838	0.02600	0.158	j ==> f
	1841	1	0.182	1 ==> 0
	1888	0.04300	0.128	a ==> j
	1896	0.42000	0.086	w ==> f
	1906	0.04000	0.171	b --> k
	1907	0.03800	0.178	b --> j
	1908	0.01700	0.170	e ==> d
	1909	0.03200	0.168	b ==> d
39	1810	1.00000	0.094	a ==> d
	1824	0.00400	0.255	1 ==> 0
	1828	0.20800	0.160	u ==> j
	1839	0.06200	0.103	m ==> k
	1843	1	0.143	0 ==> 1
	1844	0.01700	0.247	Q ==> 6
	1847	1	0.333	0 --> 1
	1852	1	0.250	1 ==> 0
	1854	0.02700	0.195	m --> b
	1856	0.07800	0.202	v --> N
	1864	0.00100	0.240	g --> k
	1873	1	0.500	1 ==> 0
	1897	0.07500	0.228	a ==> i
	1905	0.01200	0.168	d --> h
	1908	0.00500	0.170	d ==> h
	1909	0.09700	0.168	d ==> j
S. chrysopygus	1788	1	0.100	1 ==> 0
	1813	1	0.182	1 ==> 0
	1817	0.07000	0.167	5 ==> k
	1819	0.01000	0.330	a ==> d
	1824	0.00300	0.255	0 ==> i
	1827	0.05000	0.169	u ==> g
	1844	0.00200	0.247	6 ==> k
	1847	1	0.333	1 --> 0
	1851	1	0.222	3 ==> 2
	1854	0.07300	0.195	b ==> k
	1855	0.10450	0.232	O ==> k
	1839	0.10100	0.103	m ==> u
	1844	0.01600	0.247	Q ==> v
	1860	1	0.250	0 --> 1
	1883	1	0.154	2 ==> 0
	1885	0.48000	0.177	b ==> f
	1886	0.44000	0.224	c ==> f
	1887	0.35000	0.124	a ==> d
	1896	0.08600	0.086	z ==> k
	1897	0.07000	0.228	a ==> h
	1906	0.04000	0.171	b --> d
	1908	0.02300	0.170	f ==> c
	1909	0.03200	0.168	b --> i
38	1812	1	0.200	0 ==> 1
	1820	0.08700	0.127	E ==> x
	1827	0.00750	0.169	p ==> u
	1834	0.02000	0.104	l --> b
	1838	0.02200	0.158	n ==> f
	1841	1	0.182	1 ==> 0
	1888	0.04300	0.128	a ==> j
	1896	0.41100	0.086	z ==> v
	1908	0.01700	0.170	e ==> d
	1909	0.03200	0.168	b ==> d
39	1810	0.14300	0.094	k ==> d
	1824	0.00400	0.255	1 ==> 0
	1828	0.20800	0.160	u ==> j
	1839	0.06200	0.103	m ==> k
	1843	1	0.143	0 ==> 1
	1844	0.01700	0.247	Q ==> 6
	1852	1	0.250	1 ==> 0
	1854	0.02600	0.195	m --> E
	1856	0.04600	0.202	v --> x
	1864	0.00100	0.240	g --> k
	1873	1	0.500	1 ==> 0
	1897	0.07500	0.228	a ==> i
	1905	0.01200	0.168	d --> h
	1907	0.03800	0.178	b --> j
	1908	0.00500	0.170	d ==> h
	1909	0.09700	0.168	d ==> j
S. chrysopygus	1788	1	0.100	1 ==> 0
	1813	1	0.182	1 ==> 0
	1817	0.07000	0.167	5 ==> k
	1819	0.01000	0.330	a ==> d
	1820	0.08300	0.127	x --> j
	1824	0.00300	0.255	0 ==> i
	1827	0.05000	0.169	u ==> g
	1844	0.00200	0.247	6 ==> k
	1851	1	0.222	3 ==> 2
	1854	0.07200	0.195	E ==> k
	1855	0.10450	0.232	O ==> k
	1856	0.01100	0.202	x --> k
	1860	1	0.250	0 ==> 1
	1862	0.00200	0.281	t --> j
	1878	1	0.250	0 ==> 1
	1879	1	0.250	0 ==> 1
	1883	1	0.154	2 ==> 1
	1888	0.33600	0.128	j ==> d
	1896	0.06500	0.086	v --> f
	1897	0.29600	0.228	i ==> e

	1856	0.04300	0.202	N --> k
	1860	1	0.250	0 ==> 1
	1878	1	0.250	0 ==> 1
	1879	1	0.250	0 ==> 1
	1883	1	0.154	2 ==> 1
	1888	0.33600	0.128	j ==> d
	1897	0.29600	0.228	i ==> e
	1904	0.05900	0.216	b ==> c
	1905	0.01100	0.168	h ==> e
	1906	0.04000	0.171	k ==> c
	1907	0.07700	0.178	j ==> h
	1909	0.03200	0.168	j ==> h
40	1812	1	0.200	1 ==> 0
	1821	0.03000	0.300	e --> k
	1824	0.00300	0.255	0 ==> i
	1828	0.00800	0.160	j ==> d
	1839	0.34700	0.103	k ==> 1
	1854	0.03600	0.195	b ==> M
	1877	1	0.333	1 ==> 0
	1888	0.04300	0.128	j ==> a
	1897	0.29600	0.228	i ==> e
	1907	0.03900	0.178	j --> c
41	1807	1	0.182	0 ==> 1
	1817	0.00500	0.167	5 ==> 7
	1820	0.07400	0.127	j --> 0
	1844	0.02700	0.247	6 ==> 8
	1847	1	0.333	1 --> 2
	1850	1	0.250	2 ==> 3
	1854	0.05000	0.195	M ==> 5
	1855	0.08100	0.232	O ==> M
	1856	0.07500	0.202	N ==> 4
	1862	0.00900	0.281	j --> 2
	1896	0.06500	0.086	f --> v
	1907	0.03800	0.178	c ==> h
	1909	0.09700	0.168	j --> d
42	1820	0.05900	0.127	0 ==> 2
	1821	0.03000	0.300	k ==> e
	1827	0.00500	0.169	u ==> o
	1858	1	0.100	0 ==> 1
	1897	0.04000	0.228	e --> n
	1905	0.01200	0.168	h --> d
	1906	0.12000	0.171	k --> m
S. ivitus	1810	1.00000	0.094	d ==> a
	1813	1	0.182	1 ==> 0
	1817	0.07800	0.167	7 ==> m
	1820	0.10800	0.127	2 ==> f
	1824	0.13800	0.255	i ==> v
	1827	0.48500	0.169	o ==> t
	1839	0.25000	0.103	1 ==> a
	1844	0.00200	0.247	8 ==> 2
	1846	1	0.143	1 ==> 0
	1854	0.03100	0.195	5 ==> 2
	1855	0.02100	0.232	M ==> 2
	1856	0.02800	0.202	4 ==> 2
	1862	0.02700	0.281	2 ==> 0
	1864	0.00100	0.240	k ==> g
	1872	1	0.200	1 ==> 0

	1904	0.05900	0.216	b ==> c
	1905	0.01100	0.168	h ==> e
	1906	0.08000	0.171	b ==> c
	1907	0.07700	0.178	j ==> h
	1909	0.03200	0.168	j ==> h
40	1812	1	0.200	1 ==> 0
	1821	0.02700	0.300	e --> c
	1824	0.00300	0.255	0 ==> i
	1828	0.00800	0.160	j ==> d
	1839	0.34700	0.103	k ==> 1
	1854	0.03700	0.195	E ==> M
	1856	0.03200	0.202	x --> N
	1877	1	0.333	1 ==> 0
	1888	0.04300	0.128	j ==> a
	1897	0.25800	0.228	i ==> l
	1907	0.03900	0.178	j --> c
41	1807	1	0.182	0 ==> 1
	1844	0.00200	0.247	6 ==> k
	1847	1	0.333	0 --> 2
	1850	1	0.250	2 ==> 3
	1854	0.03600	0.195	M ==> I
	1855	0.05600	0.232	O ==> C
	1856	0.03900	0.202	N ==> C
	1906	0.04000	0.171	b --> k
	1907	0.03800	0.178	c ==> h
42	1817	0.00500	0.167	5 --> 7
	1820	0.05000	0.127	x ==> 2
	1821	0.02700	0.300	c ==> e
	1827	0.00500	0.169	u ==> o
	1858	1	0.100	0 ==> 1
	1897	0.07800	0.228	l --> n
	1905	0.01200	0.168	h --> d
	1909	0.09700	0.168	j --> d
S. ivitus	1810	1.00000	0.094	d ==> a
	1813	1	0.182	1 ==> 0
	1817	0.07800	0.167	7 ==> m
	1820	0.10800	0.127	2 ==> f
	1824	0.13800	0.255	i ==> v
	1827	0.48500	0.169	o ==> t
	1839	0.25000	0.103	1 ==> a
	1844	0.02700	0.247	k ==> 2
	1846	1	0.143	1 ==> 0
	1854	0.04500	0.195	I ==> 2
	1855	0.04600	0.232	C ==> 2
	1856	0.06400	0.202	C ==> 2
	1862	0.03800	0.281	t ==> 0
	1864	0.00100	0.240	k ==> g
	1872	1	0.200	1 ==> 0
	1875	1	0.167	1 ==> 0
	1881	1	0.250	1 ==> 0
	1896	0.26500	0.086	v ==> d
	1897	0.58900	0.228	n ==> j
	1904	0.05900	0.216	b ==> c
	1908	0.02800	0.170	h ==> r
	1909	0.03200	0.168	d ==> b
S. orientalis	1824	0.03300	0.255	i ==> 3

	1875	1	0.167	1 ==> 0
	1881	1	0.250	1 ==> 0
	1896	0.26500	0.086	v ==> d
	1897	0.58900	0.228	n ==> j
	1904	0.05900	0.216	b ==> c
	1908	0.02800	0.170	h ==> r
	1909	0.03200	0.168	d ==> b
S. orientalis	1824	0.03300	0.255	i ==> 3
	1828	0.04800	0.160	d ==> 7
	1834	0.02800	0.104	b ==> s
	1839	0.45700	0.103	1 ==> 7
	1844	0.02500	0.247	8 ==> k
	1854	0.04900	0.195	5 ==> B
	1855	0.02500	0.232	M --> C
	1856	0.03600	0.202	4 --> C
	1862	0.03900	0.281	2 ==> 8
	1864	0.00700	0.240	k --> 8
	1905	0.02200	0.168	d ==> k
	1908	0.07700	0.170	h ==> o
43	1821	0.01600	0.300	k --> p
	1844	0.00400	0.247	8 ==> 4
	1854	0.02700	0.195	5 --> t
	1864	0.02300	0.240	k ==> M
	1884	1	0.500	0 ==> 1
	1896	0.15200	0.086	v ==> p
	1897	0.03800	0.228	e ==> l
	1907	0.03900	0.178	h --> o
S. latebrosus	1817	0.05100	0.167	7 ==> 0
	1820	0.00900	0.127	0 --> x
	1821	0.00300	0.300	p ==> l
	1824	0.00300	0.255	i ==> 0
	1828	0.06000	0.160	d ==> 0
	1843	1	0.143	1 ==> 0
	1854	0.00200	0.195	t --> 4
	1855	0.00800	0.232	M ==> 4
	1864	0.00800	0.240	M ==> 1
	1890	1	0.062	0 ==> 1
	1895	1	0.200	0 ==> 2
	1899	0.33300	0.380	a ==> e
	1909	0.09700	0.168	d --> j
44	1817	0.06900	0.167	7 ==> g
	1824	0.02000	0.255	i ==> 4
	1839	0.04000	0.103	1 ==> 8
	1883	1	0.154	2 ==> 1
	1896	0.20300	0.086	p ==> w
	1897	0.19100	0.228	l ==> c
	1906	0.08000	0.171	k --> l
	1908	0.02700	0.170	h ==> f
S. modestus	1807	1	0.182	1 ==> 0
	1813	1	0.182	1 ==> 0
	1817	0.08500	0.167	g ==> 4
	1821	0.04600	0.300	p ==> e
	1824	0.01700	0.255	4 ==> c
	1827	0.00500	0.169	u ==> o
	1828	0.01200	0.160	d ==> 4
	1832	1	0.200	0 ==> 1
	1828	0.04800	0.160	d ==> 7
	1834	0.02800	0.104	b ==> s
	1839	0.45700	0.103	1 ==> 7
	1854	0.03500	0.195	I ==> B
	1862	0.02800	0.281	t ==> 8
	1864	0.00700	0.240	k --> 8
	1905	0.02200	0.168	d ==> k
	1906	0.12000	0.171	k --> m
	1908	0.07700	0.170	h ==> o
43	1844	0.00300	0.247	k ==> B
	1854	0.01400	0.195	I --> 5
	1864	0.02300	0.240	k ==> M
	1884	1	0.500	0 ==> 1
	1896	0.15200	0.086	v ==> p
S. latebrosus	1817	0.05600	0.167	5 ==> 0
	1821	0.02200	0.300	c ==> l
	1824	0.00300	0.255	i ==> 0
	1828	0.06000	0.160	d ==> 0
	1843	1	0.143	1 ==> 0
	1844	0.02600	0.247	B --> 4
	1854	0.02900	0.195	5 --> 4
	1855	0.03300	0.232	C ==> 4
	1856	0.03600	0.202	C --> 4
	1862	0.01100	0.281	t --> 2
	1864	0.00800	0.240	M ==> 1
	1890	1	0.062	0 ==> 1
	1895	1	0.200	0 ==> 2
	1899	0.33300	0.380	a ==> e
	1907	0.03900	0.178	h --> o
44	1817	0.06400	0.167	5 ==> g
	1820	0.00900	0.127	x --> 0
	1824	0.02000	0.255	i ==> 4
	1839	0.04000	0.103	1 ==> 8
	1883	1	0.154	2 ==> 1
	1896	0.20300	0.086	p ==> w
	1897	0.19100	0.228	l ==> c
	1906	0.08000	0.171	k --> l
	1908	0.02700	0.170	h ==> f
	1909	0.09700	0.168	j --> d
S. modestus	1807	1	0.182	1 ==> 0
	1813	1	0.182	1 ==> 0
	1817	0.08500	0.167	g ==> 4
	1821	0.02700	0.300	c ==> e
	1824	0.01700	0.255	4 ==> c
	1827	0.00500	0.169	u ==> o
	1828	0.01200	0.160	d ==> 4
	1832	1	0.200	0 ==> 1
	1839	0.21000	0.103	8 ==> a
	1844	0.09800	0.247	B ==> 7
	1845	1	0.222	1 ==> 2
	1854	0.11400	0.195	5 ==> 7
	1855	0.10000	0.232	C ==> 8
	1856	0.09500	0.202	C ==> 8
	1858	1	0.100	0 ==> 1
	1862	0.01100	0.281	t --> 2
	1864	0.05700	0.240	M ==> 5
	1875	1	0.167	1 ==> 0

	1839	0.21000	0.103	8 ==> a
	1844	0.07200	0.247	4 ==> 7
	1845	1	0.222	1 ==> 2
	1854	0.08700	0.195	t ==> 7
	1855	0.07500	0.232	M ==> 8
	1856	0.05900	0.202	4 ==> 8
	1858	1	0.100	0 ==> 1
	1864	0.05700	0.240	M ==> 5
	1875	1	0.167	1 ==> 0
	1896	0.38000	0.086	w ==> a
	1897	0.14200	0.228	c ==> a
	1905	0.03300	0.168	h ==> m
	1906	0.16000	0.171	l ==> n
	1907	0.23100	0.178	o ==> p
	1908	0.03400	0.170	f ==> s
	1909	0.09600	0.168	d ==> c
S. ornatissimus	1810	0.04700	0.094	d ==> o
	1820	0.07700	0.127	0 ==> 3
	1827	0.01000	0.169	u ==> d
	1828	0.05000	0.160	d ==> 8
	1838	0.11800	0.158	f ==> t
	1844	0.02600	0.247	4 --> B
	1854	0.07600	0.195	t --> B
	1855	0.07000	0.232	M ==> D
	1856	0.04000	0.202	4 ==> D
	1862	0.05800	0.281	2 ==> 9
	1864	0.05200	0.240	M ==> 9
	1898	0.19400	0.207	a ==> k
	1907	0.07700	0.178	o ==> c
S. stigmosus	1813	1	0.182	1 ==> 0
	1817	0.16700	0.167	5 ==> H
	1820	0.00900	0.127	j ==> B
	1821	0.21900	0.300	k ==> r
	1824	0.05500	0.255	i ==> E
	1827	0.01000	0.169	u ==> d
	1831	1	0.500	0 ==> 1
	1844	0.01400	0.247	6 ==> L
	1862	0.06000	0.281	j ==> I
	1864	0.02100	0.240	k ==> K
	1896	0.20000	0.086	f ==> d
	1897	0.12800	0.228	e ==> q
	1904	0.05900	0.216	b ==> c
	1905	0.01100	0.168	h ==> e
	1906	0.04000	0.171	k --> b
	1908	0.01100	0.170	h ==> j
S. melanopygus	1817	0.03900	0.167	5 ==> 3
	1820	0.16300	0.127	j ==> z
	1824	0.02900	0.255	0 ==> t
	1827	0.00500	0.169	u ==> x
	1828	0.00600	0.160	j ==> 3
	1839	0.04000	0.103	k ==> 4
	1850	1	0.250	2 ==> 3
	1854	0.05200	0.195	b ==> j
	1855	0.02100	0.232	O ==> 7
	1856	0.04900	0.202	N ==> 7
	1858	1	0.100	0 ==> 1
	1862	0.08900	0.281	j ==> 5
	1864	0.07900	0.240	k ==> 4
	1896	0.38000	0.086	w ==> a
	1897	0.14200	0.228	c ==> a
	1905	0.03300	0.168	h ==> m
	1906	0.16000	0.171	l ==> n
	1907	0.27000	0.178	h ==> p
	1908	0.03400	0.170	f ==> s
	1909	0.09600	0.168	d ==> c
S. ornatissimus	1810	0.04700	0.094	d ==> o
	1820	0.07700	0.127	0 ==> 3
	1821	0.01900	0.300	c --> p
	1827	0.01000	0.169	u ==> d
	1828	0.05000	0.160	d ==> 8
	1838	0.11800	0.158	f ==> t
	1854	0.04900	0.195	5 --> B
	1855	0.04500	0.232	C ==> D
	1856	0.00400	0.202	C ==> D
	1862	0.04700	0.281	t ==> 9
	1864	0.05200	0.240	M ==> 9
	1898	0.19400	0.207	a ==> k
	1907	0.03800	0.178	h ==> c
S. stigmosus	1813	1	0.182	1 ==> 0
	1817	0.16700	0.167	5 ==> H
	1820	0.09200	0.127	x ==> B
	1821	0.22200	0.300	c ==> r
	1824	0.05500	0.255	i ==> E
	1827	0.01000	0.169	u ==> d
	1831	1	0.500	0 ==> 1
	1844	0.01400	0.247	6 ==> L
	1847	1	0.333	0 --> 1
	1862	0.05800	0.281	t ==> I
	1864	0.02100	0.240	k ==> K
	1896	0.26500	0.086	v ==> d
	1897	0.16600	0.228	l ==> q
	1904	0.05900	0.216	b ==> c
	1905	0.01100	0.168	h ==> e
	1908	0.01100	0.170	h ==> j
S. melanopygus	1817	0.03900	0.167	5 ==> 3
	1820	0.08000	0.127	x ==> z
	1824	0.02900	0.255	0 ==> t
	1827	0.00500	0.169	u ==> x
	1828	0.00600	0.160	j ==> 3
	1839	0.04000	0.103	k ==> 4
	1847	1	0.333	0 --> 1
	1850	1	0.250	2 ==> 3
	1854	0.05300	0.195	E ==> j
	1855	0.02100	0.232	O ==> 7
	1856	0.08100	0.202	x ==> 7
	1858	1	0.100	0 ==> 1
	1862	0.08700	0.281	t ==> 5
	1864	0.07900	0.240	k ==> 4
	1875	1	0.167	1 ==> 0
	1881	1	0.250	1 ==> 0
	1896	0.19000	0.086	v ==> s
	1897	0.07500	0.228	i ==> a
	1905	0.04500	0.168	h ==> c
	1908	0.01100	0.170	h ==> j
S. nubicola	1810	0.85700	0.094	k --> a

	1875	1	0.167	1 ==> 0
	1881	1	0.250	1 ==> 0
	1896	0.25500	0.086	f ==> s
	1897	0.07500	0.228	i ==> a
	1905	0.04500	0.168	h ==> c
	1906	0.04000	0.171	k --> b
	1908	0.01100	0.170	h ==> j
S. nubicola	1820	0.04400	0.127	j ==> d
	1821	1.00000	0.300	e ==> o
	1824	0.02100	0.255	1 ==> f
	1827	0.01000	0.169	u ==> d
	1839	0.34100	0.103	m ==> i
	1844	0.27800	0.247	Q ==> 9
	1851	1	0.222	3 ==> 2
	1854	0.31800	0.195	m ==> 9
	1855	0.11500	0.232	O ==> A
	1856	0.20200	0.202	v ==> A
	1862	0.01700	0.281	j ==> 6
	1874	1	0.167	0 ==> 1
	1881	1	0.250	1 ==> 2
	1886	1.00000	0.224	c ==> g
	1888	0.95700	0.128	j ==> i
	1890	1	0.062	0 ==> 1
	1895	1	0.200	0 ==> 2
	1896	0.20000	0.086	f ==> d
	1906	0.04000	0.171	k ==> c

1820	0.12700	0.127	x ==> d
1821	1.00000	0.300	e ==> o
1824	0.02100	0.255	1 ==> f
1827	0.01000	0.169	u ==> d
1839	0.34100	0.103	m ==> i
1844	0.27800	0.247	Q ==> 9
1851	1	0.222	3 ==> 2
1854	0.31800	0.195	m ==> 9
1855	0.11500	0.232	O ==> A
1856	0.20200	0.202	v ==> A
1862	0.01900	0.281	t ==> 6
1874	1	0.167	0 ==> 1
1881	1	0.250	1 ==> 2
1886	1.00000	0.224	c ==> g
1888	0.95700	0.128	j ==> i
1890	1	0.062	0 ==> 1
1895	1	0.200	0 ==> 2
1896	0.26500	0.086	v ==> d
1906	0.08000	0.171	b ==> c

APPENDIX VIII

TAXON/AREA MATRIX FOR 32 INGROUP TAXA AND ONE OUTGROUP TAXON (SEE TEXT FOR AREA NAMES).

Taxon/Node	11 12345678901
Microlophus occipitalis	00000000100
Stenocercus limitaris	10001000000
S. rhodomelas	10100000000
S. chota	10100000000
S. festae	00100000000
S. angel	00010000000
S. guentheri	11100000000
S. iridescens	10000000100
S. puyango	10000100100
S. ornatus	10100000000
S. percultus	00001100000
S. caducus	00000011010
S. apurimacus	00000010000
S. scapularis	00000010000
S. ochoai	00000010000
S. formosus	00000010000
S. roseiventris	00000011001
S. azureus	00000000010
S. doellojuradoi	00000001000
S. boettgeri	00000010000
S. cupreus	00000010000
S. crassicaudatus	00000010000
S. torquatus	00000010000
S. humeralis	00100000000
S. varius	10000000000
S. imitator	00000100000
S. empetrus	00000100000
S. eunetopsis	00000100000
S. melanopygus	00000100000
S. stigmosus	00000100000
S. orientalis	00000010000
S. latebrosus	00000100000
S. ornatissimus	00000100000

APPENDIX IX

TAXONOMIC CHECKLIST OF SPECIES OF *STENOCERCUS*

Stenocercus aculeatus (O'Shaughnessy)

Leiocephalus aculeatus O'Shaughnessy, 1879:303. Syntypes: BMNH 1946.8.12.33-36, from "Moyobamba, [Departamento San Martín], Peru."
Liocephalus aculeatus—Boulenger, 1885a:167.
Leiocephalus angulifer Werner, 1901:595. Holotype: ZMB 16594, from "Ecuador." Synonymy fide Burt and Burt, 1931.
Leiocephalus iridescens aculeatus—Burt and Burt (part), 1931:269; Burt and Burt, 1933:27; Burt and Myers, 1942:302; Cunha, 1961:85.
Ophryoessoides aculeatus—Etheridge, 1966:88; Peters and Donoso-Barros, 1970:213.
Stenocercus aculeatus—Frost, 1992:43; Cadle, 2001:184.

Stenocercus angel Torres-Carvajal

Stenocercus angel Torres-Carvajal, 2000:9. Holotype: QCAZ 3733, a male from "8 km NE El Angel on road to Tulcán, 00˚40' N, 77˚52' W, Provincia Carchi, Ecuador."

Stenocercus apurimacus Fritts

Stenocercus apurimacus Fritts, 1972:2. Holotype: KU 134273, a male from "Puente Pachachaca, 15 km W Abancay, 1800 m, Departamento Apurimac, Peru"; Fritts, 1974:39.

Stenocercus azureus (Müller)

Tropidocephalus azureus Müller, 1882:161. Holotype: NMB 3601 from "Uruguay"; Müller 1885:107.
Liolaemus azureus—Boulenger, 1885b:192.
Saccodeira azurea—Boulenger, 1885a:160.
Proctotretus azureus—Burt and Burt, 1930:21; Burt and Burt, 1931:286; Burt and Burt, 1933:41; Peters and Donoso-Barros, 1970:241.
Stenocercus azureus—Frost, 1992:43; Cei, 1993:304.

Stenocercus boettgeri Boulenger

Stenocercus boettgeri Boulenger, 1911:22. Syntypes: BMNH 1911.12.13.25–32 (RR 1946.8.11.92–99) from "Huancabamba [Departamento Piura], Peru" (restricted to Huancabamba [10°20'60"S, 75°31'60"W, 2686 m], Departamento Pasco, Peru, by Cadle [1991]); Burt and Burt, 1930:22; Burt and Burt, 1931:287; Burt and Burt, 1933:42; Peters and Donoso-Barros, 1970:255; Fritts, 1974:39.

Stenocercus bolivarensis Castro and Ayala

Stenocercus bolivarensis Castro and Ayala, 1982:474. Holotype: ICN 4210, a male from "surroundings of Municipio Bolívar, 1°50"N, 76°58'W, 1650–1750 m, Departamento Cauca, Colombia"; Ayala, 1986:563.

Stenocercus caducus (Cope)

Scartiscus caducus Cope, 1862:182. Holotype: USNM 5852, a female from "Paraguay"; Boulenger 1885:127.

Liocephalus bolivianus Boulenger, 1890:82. Holotype: BMNH 89.12.16.25 (RR 1946.8.29.76), a female from "Bolivia." Synonymy fide Boulenger, 1894.

Liocephalus caducus—Boulenger, 1894:342.

Scartiscus liocephaloides—Werner, 1910:23. Synonymy fide Etheridge in Peters and Donoso-Barros, 1970.

Leiocephalus liocephaloides—Burt and Burt, 1933:28.

Leiocephalus caducus—Burt and Burt, 1930:12; Burt and Burt, 1931:269; Burt and Burt, 1933:26.

Ophryoessoides leiocephaloides—Etheridge, 1966:88.

Ophryoessoides caducus—Etheridge, 1966:88; Peters and Donoso-Barros, 1970:213.

Stenocercus caducus—Frost, 1992:43; Cei, 1993:302; Cadle, 2001:184.

Stenocercus carrioni Parker

Stenocercus carrioni Parker, 1934:268. Holotype: BMNH 1933.6.24.75 (RR 1946.8.11.83), a male from "Zamora, 3250 ft (= 990.6 m), [Provincia Zamora Chinchipe] Ecuador"; Peters and Donoso-Barros, 1970:256; Fritts, 1974:41.

Stenocercus chlorostictus Cadle

Stenocercus chlorostictus Cadle, 1991:71. Holotype: ANSP 31760, a male from "El Chorro, a village 1 km N (airline) Monte Seco, Río Zaña, 1350 m, Departamento Cajamarca, Perú".

Stenocercus chota Torres-Carvajal

Stenocercus chota Torres-Carvajal, 2000:13. Holotype: QCAZ 3768, a male from "Panamerican hwy 5 km E Chota, 00˚28' N, 78˚01' W, Valle del Chota, Provincia Imbabura, Ecuador."

Stenocercus chrysopygus Boulenger

Stenocercus chrysopygus Boulenger, 1900:183. Syntypes: BMNH 1900.6.20.8–17 (RR 1946.8.9.33–46 from “Carao (Caraz), 8000 ft, Peru”, BMNH 1900.6.20.18 (RR 1946.8.11.84) from “Huaraz, 10000 ft, Peru”, and BMNH 1900.6.20.19 (RR 1946.8.5.98) from “Recuay, 11000 ft, Peru” (restricted to Huaraz, 10000 ft, Departamento Ancash, Peru, by Fritts [1974]); Burt and Burt, 1933:42; Peters and Donoso-Barros, 1970:256; Fritts, 1974:42.

Stenocercus crassicaudatus (Tschudi)

Scelotrema crassicaudatum Tschudi, 1845:155. Holotype: MHNN unnumbered, from “Peru.” (restricted to Urubamba, Peru, by Tschudi [1846]). Lectotype: MHNN 2267, a juvenile from “mountains in central Peru, Urubamba”, designated by Ortiz (1989). Type locality restricted to surroundings of Río Perené, 10º55'S, 75º13'W, Peru, by Ortiz (1989).

Stenocercus torquatus Boulenger, 1885b:133. Holotype: BMNH 61.5.22.4 from “Peru.” Synonymy fide Burt and Burt, 1931:287.

Urocentrum meyeri Werner, 1900:4. Holotype: unnumbered, from “Lima, Peru.” Synonymy fide Fritts, 1974:45.

Stenocercus ervingi Stejneger, 1913:545. Holotype: USNM 49550, a juvenile from “Huadquinia, 5000 ft [Departamento Cuzco], Peru.” Synonymy fide Burt and Burt, 1931:287.

Stenocercus crassicaudatus—Burt and Burt, 1930:22; Burt and Burt, 1931:287; Peters and Donoso-Barros, 1970:256; Fritts, 1974:45.

Stenocercus cupreus Boulenger

Stenocercus cupreus Boulenger, 1885a:135. Holotype: BMNH 76.7.4.4 from “Huanuco [Departamento Huánuco], Peru”; Burt and Burt, 1933:43; Peters and Donoso-Barros, 1970:256; Fritts, 1974:47.

Stenocercus doellojuradoi (Freiberg)

Proctotretus doello-juradoi Freiberg, 1944:473. Holotype: MACN 1670 from “La Rioja [Provincia La Rioja], Argentina”; Peters and Donoso-Barros, 1970:241; Cei, 1986:278.

Stenocercus doellojuradoi—Frost, 1992:43; Cei, 1993:306.

Stenocercus dumerilii (Steindachner)

Ophryoessoides dumerilii Steindachner, 1867:33. Holotype: NMW 16363, a female from "Brazilien bei Pará" (restricted to surroundings of Belém, Pará, Brazil, by Cunha [1981]); Etheridge, 1966:88.
Liocephalus dumerilii—Boulenger, 1885a:170.
Liocephalus dumerili—Müller, 1912:14.
Leiocephalus dumerilii—Burt and Burt, 1933:27; Cunha, 1961:86.
Ophryoessoides tricristatus (part)—Etheridge in Peters and Donoso-Barros, 1970:215; Cunha, 1981:106.
Stenocercus dumerilii—Frost, 1992:43; Avila-Pires, 1995:143; Cadle, 2001:184.

Stenocercus empetrus Fritts

Stenocercus empetrus Fritts, 1972:7. Holotype: KU 134394, a male from "Huamachuco, 3350 m, Departamento La Libertad, Perú"; Fritts, 1974:47.

Stenocercus erythrogaster (Hallowell)

Brachysaurus erythrogaster Hallowell, 1856:232. Holotype: ANSP 8607, a male from "New Grenada [Colombia]."
Liocephalus erythrogaster—Boulenger, 1885a:168; Ruthven, 1922:59.
Leiocephalus erythrogaster—Burt and Burt, 1933:27.
Ophryoessoides erythrogaster—Etheridge, 1966:88; Peters and Donoso-Barros, 1970:213; Fritts, 1974:35; Ayala, 1986:563.
Stenocercus erythrogaster—Frost, 1992:43; Cadle, 2001:184; Harvey *et al*., 2004:941.

Stenocercus eunetopsis Cadle

Stenocercus eunetopsis Cadle, 1991:60. Holotype: FMNH 232537, a male from "approximately 1 km SSW Udima, Río de Udima (tributary of Río Zaña), 2500 m, Departamento Cajamarca, Perú".

Stenocercus festae (Peracca)

Liocephalus festae Peracca, 1897:6. Neotype: QCAZ 4059, an adult male from "Sevilla de Oro (02˚48' S, 78˚39' W), 2630 m, Provincia Azuay, Ecuador" designated by Torres-Carvajal (2000).
Leiocephalus ornatus ornatus—Burt and Burt (part), 1931:271.
Ophryoessoides festae—Etheridge, 1966:88; Peters and Donoso-Barros, 1970:213.
Stenocercus festae—Fritts, 1974:49.

Stenocercus fimbriatus Avila-Pires

Stenocercus fimbriatus Avila-Pires, 1995:151. Holotype: TCWC 41795, a male from "Mishana, Iquitos Region, Departamento Loreto, Peru"; Cadle, 2001:184.
Ophryoessoides aculeatus (part)—Dixon and Soini, 1975:32, 1986:37.

Stenocercus formosus (Tschudi)

Scelotrema formosum Tschudi, 1845:155. Syntypes (2): MHNN unnumbered from "Perú" (restricted to Tullumayo [Río Tulumayo, Departamento Junín], Montañas des Mittlern Perú, by Tschudi [1846]). Lectotype: MHNN 2266 designated by Ortiz (1989).
Liocephalus rhodogaster Boulenger, 1901:547. Syntypes: BMNH 1900.11.27.24–25 (RR 1946.8.29.81–2) from "La Merced, 3250 ft, Río Perene [Departamento Junín], Perú. Synonymy fide Fritts, 1974:51.
Liocephalus lineogularis Werner, 1901:3. Holotype: D 1781 from "Chanchamayo [Departamento Junín], Perú". Synonymy fide Fritts, 1974:51.
Stenocercus seydi Andersson, 1908:301. Holotype: WNM unnumbered from "La Merced [Departamento Junín], 1000 m, Peru"; Burt and Burt, 1933:44. Synonymy fide Fritts, 1974:51.
Leiocephalus formosus—Burt and Burt, 1933:27.
Ophryoessoides formosus—Etheridge, 1966:88; Peters and Donoso-Barros, 1970:214.
Stenocercus formosus—Fritts, 1974:51.

Stenocercus frittsi **sp. nov.**

Stenocercus variabilis (part); Fritts, 1974:65.

Stenocercus guentheri (Boulenger)

Liocephalus guentheri Boulenger 1885a:169. Syntypes: BMNH 58.7.25.16-18; 59.9.20.6; 60.6.16.18-21; 71.2.7.7-10; 71.4.16.53; 80.12.8.53, from "Guayaquil [Provincia Guayas, Ecuador], Sarayacu [Provincia Pastaza] Ecuador, Western Ecuador, and Colombia" (restricted to San Antonio de Pichincha, 2500 m, Provincia Pichincha, by Fritts [1974]).
Leiocephalus ornatus ornatus—Burt and Burt (part), 1931:271.
Ophryoessoides guentheri—Etheridge, 1966:88; Peters and Donoso-Barros, 1970:214.
Stenocercus guentheri—Fritts, 1974:54; Ayala, 1986:563.

Stenocercus haenschi (Werner)

Liocephalus formosus Boulenger, 1880:43. Holotype: MRHN 2007 from "Andes of Ecuador" (restricted to Balsapamba, 750 m, Provincia Bolívar, Ecuador, by Fritts [1974]); Boulenger, 1885a:168. Replacement of the name *Liocephalus* *formosus* with the junior synonym *Liocephalus haenschi* was necessary because *L. formosus* became a junior secondary homonym of *Scelotrema formosum* when both taxa were combined into *Stenocercus*. Synonymy fide Fritts, 1974:55.

Liocephalus haenschi Werner, 1901:595. Holotype: ZMB 16595 from "Balsapamba [Provincia Bolívar], 750 m, Ecuador".

Leiocephalus haenchi—Burt and Burt, 1933:27.

Ophryoessoides haenschi—Etheridge, 1966:88; Peters and Donoso-Barros, 1970:214.

Stenocercus haenschi—Fritts, 1974:55.

Stenocercus huancabambae Cadle

Stenocercus huancabambae Cadle, 1991:30. Holotype: MCZ 165319, a male from "San José (Bagua Grande), Departamento Amazonas, Perú"; Cadle, 2001:184.

Stenocercus humeralis (Günther)

Microphractus humeralis Günther, 1859a:90. Syntypes: BMNH 1946.8.11.76-77, from "Andes of Ecuador" (restricted to Loja, 2150 m, Provincia Loja, Ecuador, by Fritts [1974]).

Stenocercus humeralis—Boulenger, 1885a:134; Burt and Burt, 1931:288; Burt and Burt, 1933:43; Peters, 1967:34; Peters and Donoso-Barros, 1970:256; Fritts, 1974:56.

Stenocercus imitator Cadle

Stenocercus imitator Cadle, 1991:38. Holotype: FMNH 232634, a male from "road above Monte Seco toward Chorro Blanco, approximately 1.5 km (airline) NE Monte Seco, 1450 m, Río Zaña, Departamento Cajamarca, Perú".

Stenocercus iridescens (Günther)

Liocephalus iridescens Günther, 1859b:409. Syntypes: BMNH 60.6.16.2-7, from "Andes of western Ecuador"; Boulenger, 1885a:167.

Leiocephalus iridescens iridescens—Burt and Burt, 1930:12; Burt and Burt (part), 1931:269; Burt and Burt, 1933:28; Burt and Myers, 1942:302.

Ophryoessoides iridescens—Etheridge, 1966:88; Peters and Donoso-Barros, 1970:214; Ayala, 1986:563.

Stenocercus iridescens—Frost, 1992:43; Cadle, 2001:184.

Stenocercus ivitus Fritts

Stenocercus ivitus Fritts, 1972:10. Holotype: KU 134654, a female from "summit of Cordillera Huancabamba between Canchaque and Huancabamba, 3100 m, Departamento Piura, Perú"; Fritts, 1974:56.

Stenocercus lache Corredor

Stenocercus lache Corredor, 1983:2. Holotype: ICN 5749, a male from "La Esperanza-Púlpito del Diablo trail, quebrada Pantanogrande (tributary of Río Nevado), Municipio Güicán, 3700-4000 m, Departamento Boyacá, Colombia"; Ayala, 1986:563.

Stenocercus latebrosus Cadle

Stenocercus latebrosus Cadle, 1998:268. Holotype: MHNSM 16744, a male from "Bosque de Cachil, approximately 3 km (airline) SE Contumazá, 7º23'S, 78º47'W, 2500 m, Departamento Cajamarca, Peru."

Stenocercus limitaris Cadle

Stenocercus limitaris Cadle, 1998:261. Holotype: AMNH 22183, a male from "Alamor, 04˚02'S, 80˚02'W, 1325 m, Provincia Loja, Ecuador"; Cadle, 2001:184.

Stenocercus marmoratus (Duméril and Bibron)

Trachycyclus marmoratus Duméril and Bibron, 1837:356. Holotype: MHNP 2513, a juvenile from "province de Rio-Grande" (restricted to Pampa Ruiz, between Valle Grande and El Pescado, Provincia de La Laguna, east of Chuquisaca, [Departamento Chuquisaca], Bolivia, by d'Orbigny [1847].)

Heterotropis (*Trachycylus) marmoratus* Fitzinger, 1843:71.

Stenocercus marmoratus—Boulenger, 1885a:132; Burt and Burt, 1933:43; Peters and Donoso-Barros, 1970:256.

Stenocercus difficilis Werner, 1910:23. Holotype: ZMH number unknown, a male from "Cochabamba [Departamento Cochabamba], Bolivia"; Burt and Burt, 1933:43; Fritts, 1974:57.

Stenocercus melanopygus Boulenger

Stenocercus melanopygus Boulenger, 1900:182. Syntypes: BMNH 1900.3.30.6–8 (RR 1946.8.11.85–88), MCZ 126133 (BMNH 1900.3.30.6–9), 1900.3.30.10–13 (RR 1946.8.11.78–81) from "Baños, 9000 ft, [Departamento] Cajamarca, Peru"; Burt and Burt, 1933:43; Peters and Donoso-Barros, 1970:257; Fritts, 1974:57.

Stenocercus modestus Boulenger

Liolaemus (*Sauridis) modestus* Tschudi, 1845:157. Holotype: BMNH 75.2.13.3from "Peru" (restricted to Miraflores [Departamento Lima], Peru by Tschudi [1846]).

Stenocercus moestus Boulenger, 1885:136. Holotype: BMNH 75.2.13.3, a male from "Lima [Departamento Lima], Peru"; Burt and Burt, 1933:43; Burt and Myers, 1942:307; Peters and Donoso-Barros, 1970:257; Fritts, 1974:58. Synonymy fide Laurent, 1984:367.

Stenocercus modestus—Laurent, 1984:367.

Stenocercus nigromaculatus Noble

Stenocercus nigromaculatus Noble, 1924:112. Holotype: MCZ 17975, a male from "Huancabamba, Province of Piura [Departamento Piura], Peru"; Burt and Burt, 1931:288; Burt and Burt, 1933:43; Fritts, 1974:59.

Stenocercus nubicola Fritts

Stenocercus nubicola Fritts, 1972:11. Holotype: KU 134107, a male from "summit of Cordillera Huancabamba between Canchaque and Huancabamba, 3100 m, Departamento Piura, Perú"; Fritts, 1974:59.

Stenocercus ochoai Fritts

Stenocercus ochoai Fritts, 1972:13. Holotype: KU 133888, a male from "Chilca, 10 km NW Ollantaytambo, 2700 m, Departamento Cuzco, Perú"; Fritts, 1974:60.

Stenocercus orientalis Fritts

Stenocercus orientalis Fritts, 1972:14. Holotype: KU 134466, a male from "Chachapoyas, 2340 m, Departamento Amazonas, Perú"; Fritts, 1974:60.

Stenocercus ornatissimus (Girard)

Saccodeira ornatissima Girard, 1857:198. Holotype: USNM 5655, a female from "Obrajillo and Yanga, Peru."; Boulenger 1885a:159.

Proctotretus ornatissimus—Burt and Burt, 1930:22; Burt and Burt, 1931:287; Burt and Burt, 1933:42; Burt and Myers, 1942:304.

Stenocercus ornatissimus—Peters and Donoso-Barros, 1970:257; Fritts, 1974:61.

Stenocercus ornatus (Gray)

Leiocephalus ornatus Gray, 1845:219. Holotype: BMNH 1946.8.29.72 from "Guayaquil [Provincia Guayas, Ecuador]" (restricted to Loja, 2150 m, Provincia Loja, Ecuador, by Fritts [1974]).
Liocephalus ornatus—Boulenger, 1885a:168.
Leiocephalus ornatus ornatus—Burt and Burt, 1930:12; Burt and Burt (part), 1931:271; Burt and Burt (part), 1933:28; Burt and Myers, 1942:303.
Ophryoessoides ornatus—Etheridge, 1966:88; Peters and Donoso-Barros, 1970:214.
Stenocercus ornatus—Fritts, 1974:62.

Stenocercus pectinatus (Duméril and Bibron)

Proctotretus pectinatus Duméril and Bibron, 1837:292. Holotype: MHNP ?, from "Chili"; Burt and Burt, 1930:22; Burt and Burt, 1931:287; Burt and Burt, 1933:42; Peters and Donoso-Barros, 1970:241; Cei, 1986:277.
Liolaemus (Proctotretus) pectinatus—Fitzinger, 1843:74.
Ptygoderus pectinatus—Gray, 1845:216.
Proctotretus splendidus Girard, 1857:198. From "Patagonia [Argentina]." Synonymy fide Boulenger, 1885a:159.
Saccodeira pectinata—Boulenger, 1885a:159.
Stenocercus pectinatus—Frost, 1992:43; Cei, 1993:308.

Stenocercus percultus Cadle

Stenocercus percultus Cadle, 1991:18. Holotype: FMNH 232525, a male from "approximately 1–2 km (airline) NNW Monte Seco, along an acequia [irrigation ditch] running between El Chorro and La Montañita, 1350–1380 m, Río Zaña, Departamento Cajamarca, Perú".

Stenocercus praeornatus Fritts

Stenocercus praeornatus Fritts, 1972:16. Holotype: KU 134231, a male from "Comas, 3220 m, Departamento Junín, Perú"; Fritts, 1974:62.

Stenocercus prionotus Cadle

Stenocercus prionotus Cadle, 1998:187. Holotype: USNM 193683, a male from "Jardín Botánico de la Universidad Agraria de La Selva, Tingo María, vicinity of Río Huallaga, 9º18'S, 75º59'W, 670 m, Departamento Huánuco, Perú".

Stenocercus puyango Torres-Carvajal

Stenocercus puyango Torres-Carvajal, 2005:79. Holotype: QCAZ 6723, a male from "Puyango, 03º53'S, 80º04'W, 300 m, Provincia El Oro, Ecuador."

Stenocercus rhodomelas (Boulenger)

Liocephalus rhodomelas Boulenger, 1899:455. Syntypes: BMNH 1946.8.29.77 - 80, from "Oña [Provincia Azuay], Ecuador."

Leiocephalus rhodomelas—Burt and Burt, 1933:29.

Ophryoessoides rhodomelas—Etheridge, 1966:88; Peters and Donoso-Barros, 1970:214.

Stenocercus rhodomelas—Fritts, 1974:63.

Stenocercus roseiventris Duméril and Bibron

Stenocercus rosei-ventris Duméril and Bibron, 1837:350. Holotype: MHNP 6879 from "Bolivia" (restricted to the slopes of the Irupana mountains, in the province of Yungas, toward the valley of Rio de la Paz [Departamento La Paz], Bolivia, by d'Orbigny [1847]).

Stenocercus atrigularis Werner, 1913:11. Holotype: ZMH missing male specimen, probably destroyed during World War II (Hallerman, 1998:216), from "Provinz [Departamento] Beni, Bolivia"; Burt and Burt, 1933:42. Synonymy fide Etheridge in Peters and Donoso-Barros, 1970:257.

Stenocercus roseiventris —Gray, 1845:219; Boulenger, 1885a:133; Burt and Burt, 1931:288; Burt and Burt, 1933:43; Peters and Donoso-Barros, 1970:257; Fritts, 1974:63; Cei, 1993:309; Avila-Pires, 1995:159.

Stenocercus santander **sp. nov.**

Stenocercus erythrogaster (part); Ayala, 1986:563; Cadle, 2001:217; Harvey *et al.*, 2004:941.

Stenocercus scapularis (Boulenger)

Liocephalus scapularis Boulenger, 1901:548. Holotype: BMNH 1900.11.27.26 (RR 1946.8.12.37), a male from "Perené [Departamento Junín], 2600 ft, Peru."

Leiocephalus scapularis—Burt and Burt, 1931:273; Burt and Burt, 1933:29.

Ophryoessoides scapularis—Etheridge, 1966:89; Peters and Donoso-Barros, 1970:214.

Stenocercus scapularis—Frost, 1992:43; Cadle, 2001:184.

Stenocercus simonsii Boulenger

Stenocercus simonsii Boulenger, 1899:454. Syntypes: BMNH 1946.8.11.73 - 74, from "Oña, 6500 ft (= 1981.2 m), [Provincia Azuay] Ecuador"; Burt and Burt, 1933:44; Peters and Donoso-Barros, 1970:257; Fritts, 1974:64.

Stenocercus sinesaccus **sp. nov.**

Stenocercus caducus (part); Cope, 1887:55; Peters and Donoso-Barros, 1970:213; Cei, 1993:302.

Stenocercus stigmosus Cadle

Stenocercus stigmosus Cadle, 1998:280. Holotype: MHNSM 10243, a male from "[forest at] El Pargo, 8 km by road (Llama to Huambos) N of La Colmena, then 3–4 km NW by trail, 6º28'S, 79º3'W, 2950 m, Departamento Cajamarca, Peru."

Stenocercus torquatus Boulenger

Stenocercus torquatus Boulenger, 1885a:133. Holotype: BMNH 61.5.22.4, a male from "Peru." Type locality herein restricted to María Teresa, 19 km on road Oxapampa-Llaupi (10°42'05"S, 75°27'22"W), 1470 m, Departamento Pasco, Peru.

Stenocercus crassicaudatus (part) Burt and Burt, 1931:287; Peters and Donoso-Barros, 1970; Fritts, 1974:45. Synonymy fide Burt and Burt, 1931.

Stenocercus trachycephalus (Duméril)

Holotropis trachycephalus Duméril, in Duméril and Duméril, 1851:70. Syntypes: MHNP 1787 (2), 2393 (2), 2394 (2) from "Nouvelle-Grenade, et en particulier Santa-Fé de Bogota [Departamento Cundinamarca, Colombia]."

Liocephalus trachycephalus—Boulenger, 1885:169.

Leiocephalus ornatus trachycephalus—Burt and Burt, 1930:12; Burt and Burt, 1931:272; Burt and Burt, 1933:28; Burt and Myers, 1942:303.

Ophryoessoides trachycephalus—Etheridge, 1966:89; Peters and Donoso-Barros, 1970:214.

Stenocercus trachycephalus—Fritts, 1974:65; Ayala, 1986:563; 1986; Frost, 1992:43.

Stenocercus tricristatus (Duméril)

Ophryoessoides tricristatus Duméril, in Duméril and Duméril, 1851:66. Holotype: MHNP 6825, a male from "Brésil [Brazil]"; Etheridge, 1966:89; Peters and Donoso-Barros, 1970:215.

Liocephalus tricristatus—Boulenger, 1885a:170.

Leiocephalus tricristatus—Burt and Burt, 1933:29.

Stenocercus tricristatus—Frost, 1992:43; Cadle, 2001:184.

Stenocercus variabilis Boulenger

Stenocercus variabilis Boulenger, 1901:546. Syntypes: BMNH 1946.8.11.89–91, from "Palca, 1000 ft., Bolivia" (restricted to Palca [2875 m], Departamento Junín, Peru by Fritts [1974:65]); Fritts (part), 1974:65.

Stenocercus juninensis Shreve, 1941:75. Holotype: MCZ 45820, from "Huasqui [3822 m], near Tarma, Departamento Junín, Peru." Synonymy fide Fritts, 1974:65.

Stenocercus varius Boulenger

Stenocercus varius Boulenger, 1885a:134. Holotype: BMNH 71.4.16.53, male, "unknown locality" (restricted to Tandapi, 1460 m, Provincia Pichincha, Ecuador, by Fritts [1974]); Burt and Burt, 1931:288; Burt and Burt, 1933:44; Peters and Donoso-Barros, 1970:257; Fritts, 1974:67.