

The Probable Larva of an Undescribed Species of *Edrabius* (Coleoptera: Staphylinidae) and its Implications for the Systematics of the Tribe Amblyopinini

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ABSTRACT: Larval staphylinids collected from the nest of the Chilean tuco-tuco, *Ctenomys maulinus brunneus*, are presumed to be those of an undescribed species of *Edrabius*, adults of which are known to occur on this host. These larvae are described and illustrations are provided for their identification. The larvae are characteristic of the subfamily Staphylininae; however, they do not have a combination of characteristics which allows unambiguous placement into one of the described tribes of this subfamily. *Edrabius* larvae share the greatest number of characteristics with larvae of the tribe Staphylinini, and, among these, with members of the subtribe Xanthopygina. Importantly, they differ from larvae of the tribe Quediini, to which the amblyopinines were believed to be related, in a number of significant ways. However, *Edrabius* may not be a part of a monophyletic lineage with the remainder of the South American amblyopinines.

Six genera have been described in the staphylinid beetle tribe Amblyopinini. Five of these are restricted to the Neotropical region (*Amblyopinus* Solsky, *Amblyopinodes* Seevers, *Chilamblyopinus* Ashe and Timm, *Edrabius* Fauvel, and *Megamblyopinus* Seevers), and a single monotypic genus (*Myotyphlus* Fauvel), is restricted to Australia and Tasmania (Ashe and Timm, 1988; Seevers, 1955). All known species have been found only in close association with mammals, and are most often found attached to the fur of the host, or more rarely in the host's nest. Amblyopinines previously were assumed to be obligate, blood-sucking ectoparasites (Seevers, 1955; Kim and Adler, 1985). However, we (Ashe and Timm, 1987a, b) recently demonstrated that at least two species of Central American *Amblyopinus* are most likely mutualistic rather than parasitic, and that the conclusion that other amblyopinines are parasitic is not supported by the evidence available.

Though adults have been collected frequently, primarily by mammalogists, no larvae of any member of the Amblyopinini have been described, and larvae have only been mentioned once in the rather extensive taxonomic literature of the tribe (see Fauvel, 1900). Recently, larval staphylinids were obtained from the nest of a Chilean tuco-tuco, *Ctenomys maulinus brunneus*, by Milton H. Gallardo and made available to us for study. For reasons outlined below, we believe these larvae to be those of an undescribed species of *Edrabius*.

The purpose of this paper is to describe and provide illustrations for these larvae, and to discuss the implications of their characteristics for the systematics of the tribe Amblyopinini.

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Description of the Larvae of *Edrabius*, undescribed sp.

GENERAL HABITUS: Size 12 to 14 mm in length, 1.0 to 1.2 mm in width. General shape typical of staphylinine larvae, body more or less parallel-sided, abdomen tapering caudad. Head and prothorax dark yellowish brown, body white to yellowish-white, legs, abdominal tergum X and urogomphi yellowish to brown. Vestiture of simple and frayed setae, frayed setae primarily limited to abdominal terga and sterna.

HEAD (Figs. 1, 2): Prognathous; darkly pigmented; heavily sclerotized; dorso-ventrally flattened; quadrate, ratio of length from apex of nasale to base of neck to greatest width of head about one to one; with a distinct neck (Fig. 1). Epicranial suture present, coronal stem about 0.52 times length of head from apex of nasale to base of neck; frontal arms broadly divergent near middle, frontoclypeus more or less transverse; setation as in Figs. 1, 2; one stemma (ocellus), unpigmented, minute and inconspicuous, located about one-fifth distance from anterolateral margin of head capsule.

Nasale (Figs. 1, 3) with seven teeth, middle tooth shortest, setae at base of teeth as in Fig. 3.

Frontoclypeus with two pairs of setae and one pair of pores.

Antenna four articulated (Fig. 4); article I more or less quadrate; article II more or less cylindrical, about 2.0-times the length of article I; article III about 1.1 times as long as article II with three large setae, three small, spiniform, sensory structures (solenidea IIS1–IIS3 of Ashe and Watrous, 1984), and a small acorn-shaped sensory appendage; article IV about 0.6 times as long as article III with three large subapical setae and four small, apical, spiniform sensory structures of varying sizes.

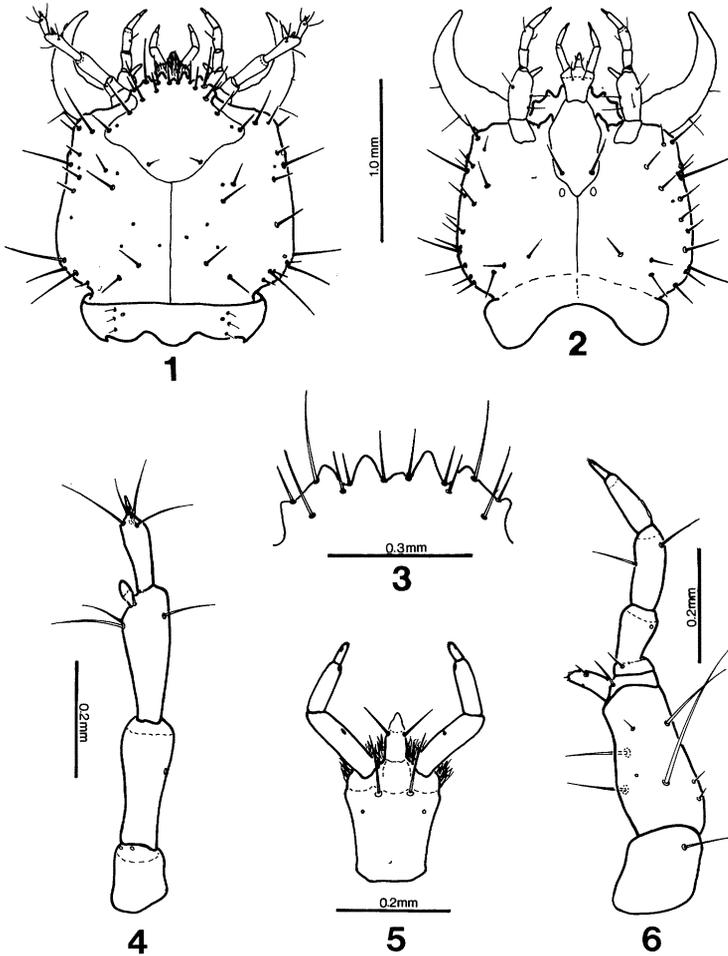
Ventral surface of head capsule as in Fig. 2; apotome not extended basal of tentorial pits.

Mandibles symmetrical, falciform, without internal teeth, with two lateral setae. Maxilla (Fig. 6) well developed; cardo subquadrate, with one seta; stipes more or less elongate with four large and several minute setae; mala articulated, digitiform with one subapical seta; maxillary palpus four-articled in addition to basal palpifer; palpifer with one seta and one sensory pore, article I about 1.5 times as long as greatest width, without setae and with sensory pore, article II about 1.3 times as long as article I with two large setae, article III slightly shorter than article II with a small digitiform sensory appendage near base, article IV about 0.4 times as long as article III.

Labium as in Fig. 5; labial palpi long and cylindrical, of three articles; article I elongate, about 1.5 times as long as article II; article II about 2.6 times as long as article III. Ligula about 0.6 times as long as labial palpomere I; more or less cone-shaped, less sclerotized in apical 0.3, with a large seta on each side about one-third distance from apex; adoral surface of ligula and prementum densely covered with long, fine hairs.

THORAX: Pronotum as in Fig. 7, more or less quadrate with apex narrower than broadest point, all setae simple, not frayed. Mesothorax transverse, all setae are simple, not frayed. Metathorax (Fig. 10) transverse, a few frayed setae present.

LEGS: As in Figs. 8, 9. Anterior tibia with tibial comb of small, bifid setae arranged in an irregular longitudinal row in apical one-third of tibia (Fig. 9). Tarsungulus with three setae.



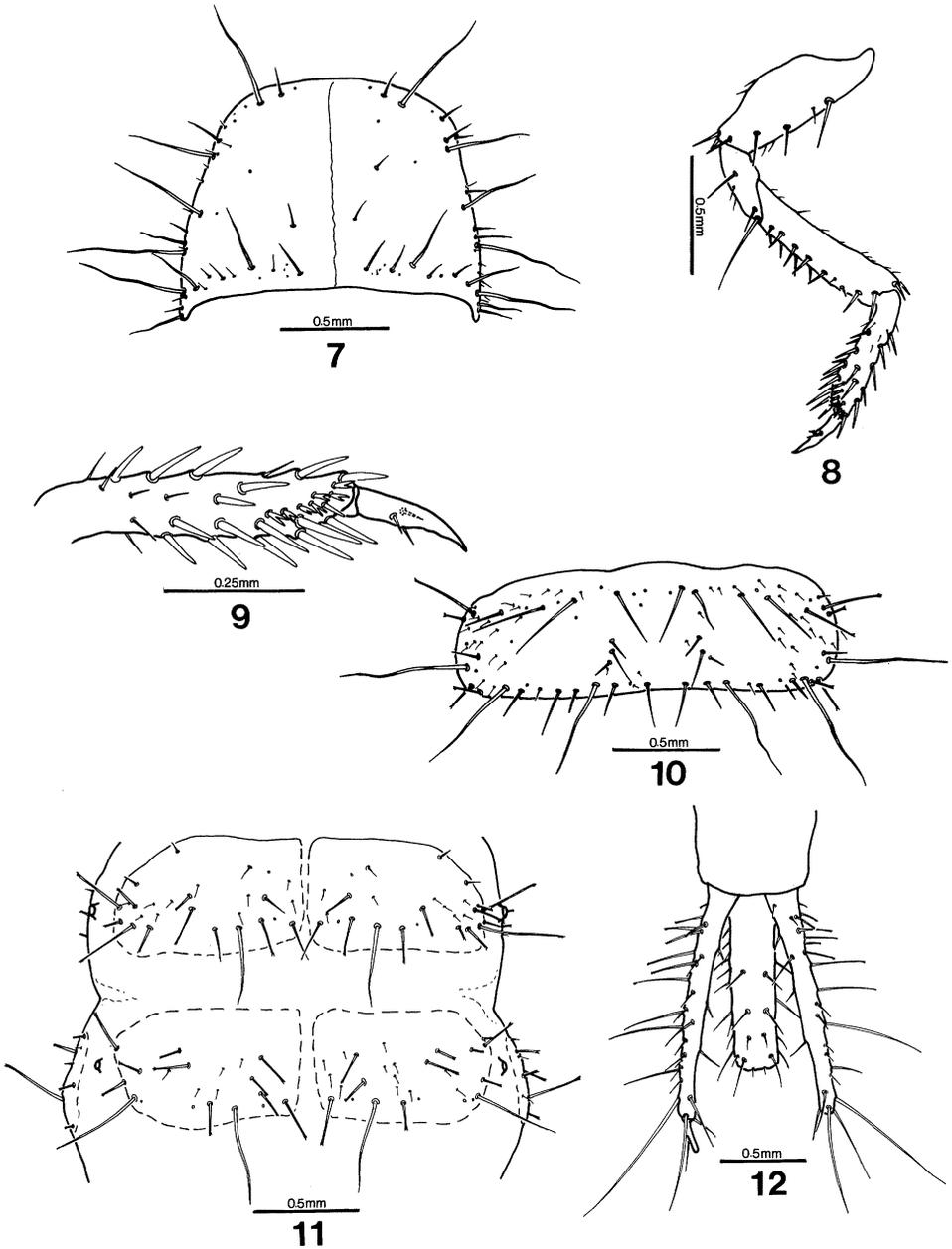
Figs. 1-6. *Edrabius*, undes. sp., larva, late instar. 1. Head, dorsal aspect. 2. Head, ventral aspect. 3. Nasale, detail. 4. Antenna, ventral aspect. 5. Labium, ventral aspect. 6. Maxilla, ventral aspect.

ABDOMEN: Abdominal terga (Fig. 11) divided, very weakly sclerotized, most setae frayed, including ventral setae, except for a few large, major setae and very small, simple, appressed, accessory setae.

Segment X (Fig. 12) elongate, cylindrical. Urogomphi elongate, two-segmented; first segment about 1.3 times as long as abdominal segment X, with numerous setae, basal setae more or less frayed, apical setae more or less simple. Apical segment of urogomphi very short, about 0.15 times as long as basal segment.

MATERIAL EXAMINED: Two probably mature larvae, collected from the nest of *Ctenomys maulinus brunneus* (Rodentia: Ctenomyidae), from Chile: Prov. Malleco; Río Colorado, Lonquimay, 24-XI-1986, collected by Milton H. Gallardo. These specimens are deposited in the Field Museum of Natural History, Chicago, Illinois.

COMMENTS: We are not the first to report the collection of larval *Edrabius*. Fauvel (1900) reported that Philippi had found both larvae and adults of *Edrabius*



Figs. 7-12. *Edrabius*, undes. sp., larva, late instar. 7. Pronotum. 8. Anterior leg. 9. Anterior tibia, detail. 10. Metanotum. 11. Abdominal terga I-II. 12. Abdominal tergum X and urogomphi, dorsal aspect.

philippianus around the anus of *Ctenomys* species. Fauvel, however, did not receive these larvae and made no further mention of them. All subsequent workers, including many who have collected large series of *Edrabius* from various species of *Ctenomys* on numerous occasions, have failed to collect or report larval am-

blyopinines from numerous mammal hosts. Additionally, we have not found larvae on any host in our own field efforts which included the collection of several hundred adult *Amblyopinus* and the handling of large numbers of hosts. These considerations suggest that the original report of larval *Edrabius* by Fauvel may have been in error.

Adults of *Edrabius* were not collected at the time the larvae described here were collected. However, we believe these larvae to be correctly identified as *Edrabius*, undes. sp. because: 1) adults of *Edrabius* are common inhabitants of *Ctenomys* species, and no other amblyopinines are known to be associated with *Ctenomys* in Chile (Seevers, 1955; Ashe and Timm, unpubl. data), 2) we have several collections of *Edrabius* including adults of an undescribed species (to which these larvae are tentatively assigned) from this same subspecies of *Ctenomys* (collected at Petronquines, Laguna Laja, 21-III-1987 by the same collector), 3) the unique combination of characteristics of these larvae highlights their unusual systematic position, and suggests that they cannot be appropriately assigned to other groups of known nest-inhabiting staphylinids, such as philonthines, quediines, and others (see below), 4) the single, minute, unpigmented stemma is reminiscent of the size and position of the similarly greatly reduced eyes (to a single facet) of adult *Edrabius*, and 5) their size is well within the range of that which would be expected of mature larvae of *Edrabius*.

The unusual combination of characteristics found on these larvae are outside of the bounds of those character combinations which are presently used to define tribes of the subfamily Staphylininae (see, for example, Paulian, 1941; Kasule, 1970; Newton, in press). If these larvae are correctly identified, then larvae of *Edrabius* can be recognized by the unique combination of: more or less quadrate head; single, minute, unpigmented stemma; maxillary and labial palpi four- and three-articled, respectively; ligula more or less cone-shaped with a pair of large, subapical setae; body vestiture of simple and frayed setae; tibial comb present, of bifid setae, arranged in an irregular, longitudinal row on the anterior 0.25 of the tibia; tarsungulus with three setae (at least in late instars); and, first segment of urogomphus longer than the abdominal tergum X.

Among previously known Staphylininae, only larvae of the tribe Xantholinini have a single stemma. Previously known larvae of all other tribes have four stemmata, although these may be closely clustered, unpigmented, and extremely minute. However, xantholinines have a unique combination of characters including: antenna with sensory appendage placed ventrally; tibial comb of simple setae; tarsungulus of only two setae in all instars; vestiture of simple setae only; and others (Kasule, 1970). The larvae described herein do not have this combination of characters.

Larvae of the tribe Quediini share many features with *Edrabius* larvae, especially the presence and arrangement of split setae in the tibial comb; however, all known quediine larvae have markedly to slightly elongate heads, and first segments of the urogomphi which are shorter (in most), or very rarely as long as, the abdominal segment X (Kasule, 1970; Newton, in press; Newton, pers. comm.).

The larvae described here will key to the tribe Staphylinini in Kasule (1970) if stemmata number and arrangement of setae in the tibial comb are not considered. Within the tribe Staphylinini, the subtribal placement of *Edrabius* based on these larvae is ambiguous. The combination of first segment of urogomphi longer than

abdominal segment X, quadrate head, and bifid setae in the tibial comb is shared with members of the subtribe Xanthopygina. However, these *Edrabi* larvae are not very similar to known larvae of genera in this subtribe.

Discussion

The relationships of the tribe Amblyopinini within the family Staphylinidae and the relationships among genera of amblyopinines have been problematic. Ashe and Timm (1988) reviewed the taxonomic history of the tribal placement of amblyopinines. The most recent treatment of the systematic position of amblyopinines gave them tribal rank and indicated their close relationship to the tribe Quediini (Seevers, 1955). Seevers (1955) believed that the Amblyopinini were derived from quediine ancestors. This ancestor-descendent relationship between quediines and amblyopinines has been generally accepted by coleopterists. If true, then contemporary phylogenetic classification of amblyopinines would include them within the tribe Quediini.

In contrast to these findings based on studies of adults, the presumed larvae of *Edrabi* do not support the conclusion that amblyopinines were derived from quediine ancestors (see discussion of larval characteristics above). Rather, they suggest that *Edrabi* is more appropriately placed among members of the tribe Staphylinini. This conclusion is surprising since no previous worker has suggested a staphylinine relationship for amblyopinines. While it seems possible that these larvae may not be correctly identified, we believe them to be *Edrabi* for the reasons outlined above. The possibility of misidentification can only be confirmed or refuted by subsequent rearing of larvae.

If these larvae are correctly identified, then the conclusion that *Edrabi* is a staphylinine and not a quediine is difficult to deny. However, this does not necessarily indicate that other amblyopinines are also staphylinines. Previously, it was assumed that all amblyopinines formed a monophyletic group. However, Ashe and Timm (1988) questioned the assumption of monophyly for this lineage. We showed that *Myotyphlus* from Australia and Tasmania shared derived characters with other Australian quediines which were not found among any other amblyopinines, and concluded that *Myotyphlus* was not an amblyopinine. In addition, we showed that *Edrabi* shared few characteristics other than reductions with other South American amblyopinines. We were not able to conclude at that time that *Edrabi* was not a member of the Amblyopinini; however, few characters supported this relationship. Under these circumstances, the conclusion that *Edrabi* is not a quediine does not automatically refute the possibility of a quediine relationship for other South American amblyopinines, which seem to form a well supported monophyletic lineage (Ashe and Timm, 1988).

The problem of amblyopinine relationships is not resolved by discovery of these larvae. The need for larval representatives of other South American amblyopinine genera is critical for resolution of the presently conflicting hypotheses. Equally important will be our continuing studies of the phylogenetic relationships among amblyopinines based on studies of adults.

Resumen

Larvas de Staphylinidae colectadas en un nido del tuco-tuco chileno, *Ctenomys maulinus brunneus*, corresponden probablemente a una especie no descrita de

Edrabius, cuyos adultos son conocidos por su presencia en este huésped. Se proporcionan descripción e ilustraciones de estas larvas, para su identificación. Las larvas son características de la subfamilia Staphylininae; sin embargo, ellas no poseen una combinación de características que permitan una colocación definitiva dentro del alguna de las tribus descritas de esta subfamilia. Las larvas del género *Edrabius* comparten el mayor número de características con las larvas de la tribu Staphylinini, y entre éstas, con los miembros de la subtribu Xanthopygina. Estas larvas difieren de aquellas de la tribu Quediini, lo que es importante porque se creía que los amblyopininos y los quediinios estaban relacionados en varios modos significantes. No obstante, es posible que *Edrabius* no sea parte del linaje monofilético de los amblyopininos sudamericanos.

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