A REVISION OF THE TRIBE SCAPHYTOPINI (HOMOPTERA, CICADELLIDAE) IN AMERICA NORTH OF MEXICO.

by

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Advisory Committee:

[Signatures]

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INTRODUCTION

This paper is a revision of the tribe Scaphytopini in America North of Mexico and includes the following genera: Platymetopius Burmeister, Japananus Ball and Scapytopius Ball. The genus Scaphytopius is divided into four sub-genera: Scaphytopius Ball, Cloanthanus Ball, Tumeus DeLong and Vertanus, a new sub-genus.

More than twenty-five thousand specimens have been examined, including types, paratypes or compared with type specimens of all but the following species: hyalinus (Osb.), osborni (V. D.), magdalensis (Prov.), modestus (Stal), castranus (Ball), rubellus (Sanders and DeLong), acutus (Say) and abbreviatus (DeLong).

Platymetopius Burmeister was named in 1838 with rostratus (Herrich-Schaeffer) listed first and no genotype designated, but undatus (DeGeer) was later designated as logotype; Japananus Ball in 1931 with hyalinus (Osborn) as genotype, and Scaphytopius Ball in 1931 with elegans (Van Duzee) as genotype. Among the sub-genera of Scaphytopius, Cloanthanus Ball was named in 1931 with angustatus (Osborn) as genotype, Tumeus DeLong in 1943 with serrellus DeLong as genotype and a new sub-genus, Vertanus is erected for ulcus, a new species.

In 1910, E. P. VanDuzee published a revision of the genus Platymetopius in America. He included twenty-
eight species, subspecies and varieties found north of
Mexico.

In 1931, R. D. Ball described seven new genera, 
Japananus, Scaphytopius, Deltopinus, Convelinus, 
Nasutoideus, Platymoideus and Cloanthanus, in which he 
placed the species formerly considered in Platymetopius. 
However, studies of the internal male genitalia showed 
definitely that these genera, as limited, did not satis-
factorily show the proper relation of, or group the species. 
For example, castranus, placed in Convelinus, was more 
closely related to those species in Nasutoideus; heldoranus, 
named in Nasutoideus, proved more like Platymoideus; 
dorsalis fitted into no genus as limited. Japananus and 
Scaphytopius are the two genera retained of those erected 
by Ball in 1931, with Cloanthanus retained as a sub-
genus. Scaphytopius (Scaphytopius) is retained to include 
elegans, ritanus and catalinus just as Ball did, plus 
huachmous, named later by DeLong (1944). All the other 
Species have been placed in Scaphytopius (Cloanthanus) 
with the exception of majestus, placed in Scaphytopius 
(Tumeus) DeLong.

Host plants are known for a great many of the 
information 
species, and this is given for each individual species in 
the description.
ACKNOWLEDGMENTS

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TECHNIQUE OF STUDY

Equipment used: Dissecting microscope, for dissection and study of specimens; art gum eraser with a hole, one-sixteenth inch in diameter and one-half inch deep; at least two dissecting needles, one with the tip bent at a one-hundred degree angle; metal loop for transferring genitalia; a casserole for heating caustic potash or soda; a small glass container for distilled water; well slide for dissection in glycerine; slides and cover slips for mounting; slide labels; specimen dissection
labels; wax pencil for temporary labels on slide; small
jugs and corks for staining and placing unmounted
genitalia on the same pin with the specimen; a bottle
of diaphane for permanent slides; a silk or linen cloth
for cleaning slides; tweezers for placing the coverslip
on the slide; photographic equipment for making negative
prints; photographic paper; eight by five inch cards;
photographic mounting paper.

**Dissection of male genitalia:** The head of the
insect pin is inserted into the hole in the art gum
eraser so that the insect is upside down with the dorsal
part of the insect against the eraser. By using a
dissecting needle, the entire abdomen is separated from
the rest of the insect. The abdomen is transferred to
the casserole of caustic potash or soda by a moistened
metal loop, where it is boiled slowly for two to ten
minutes. As the solution evaporates, distilled water
and caustic solution are alternately added to retain
about the same amount in the casserole.

Upon removal from the caustic solution, the
abdomen is rinsed in distilled water and placed in a drop
of glycerine on a slide, ready for dissection. The
genital capsule is removed by holding the abdomen with
the bent needle in the left hand and using the other
needle to pull the capsule loose at its point of attachment.
The capsule is then placed so that the tip of the plates
and pygoferes are directed away from the dissector.

In order to see the parts more easily, the pygoferes are separated from the rest of the capsule. To do this, the bent needle is placed along the anterior margin where the pygofer and plate join, holding this part against the slide while the straight needle is used to tear gently the connection between the two parts. The anal tube is held by the bent needle and torn out, care being taken that the aedeagus is not pulled off with it.

In many species of *Scaphytopius* the aedeagus is more strongly attached to the base of the anal tube and pygofer lining than to the other genital parts. It has been found necessary to tear loose the inner lining of the pygofer with the aedeagus in order that the aedeagus remain with the other genital parts. This is done by holding the pygofer with the bent needle and gently tearing loose this lining, along with the connectives of the base of the aedeagus. This lining is then teased or cut away so as not to interfere with the genital parts. If possible, the other connective between the plate and pygofer is best left intact until the permanent slide is made. If no slide is desired, the opened capsule is put in a small jug with a drop of glycerine and the pin of the dissected specimen stuck through the cork so that the genitalia are on the same pin as the specimen from which it was taken.
Staining: If slides are to be made, it is best to stain the parts. For this purpose a one and one-half per cent aqueous mercurochrome solution is used. The genitalia are rinsed in distilled water to remove the glycerine and put in a small jug containing the stain. The jug is then put on the same pin as the dissected specimen as described above, so there will be no danger of confusion where several genitalia are being stained at the same time. The genitalia are left in the stain from one to twenty-four hours, depending on the darkness of the specimen and intensity of stain desired.

Temporary slides: Whenever possible, permanent slides should be made, but in some cases it is necessary to make temporary slides so that the genitalia may be placed on the same pin as the dissected insect after the genitalia are studied or photographed. In this case the genitalia are rinsed in water to remove all surplus stain and then mounted in glycerine. In most cases negative prints are made of the parts and the prints studied. The cover slip should not be left on the slide any longer than necessary, as this tends to flatten the parts.

Permanent slides: The genitalia are rinsed in distilled water to remove surplus stain and then placed in a drop of glycerine on a slide (a well slide is best) and any surplus tissue is removed and the plates are separated so that the aedeagus may be seen between them. The
genitalia are then put in clean water so that the glycerine is completely removed. A slide and cover slip are then cleaned so that no dirt or lint is present, especially if prints are to be made. A silk or linen cloth is best for this purpose.

The genital parts are then placed in 95% alcohol for thirty seconds to one minute for dehydration. If left longer than this, the paraphyses, especially if coiled, tend to break near the base when the cover slip is put on, and the genitalia are flattened. A drop of diaphane is put in the middle of the slide and the genital parts put in it with the metal loop. The dissecting needles are then used to separate the pygofer from the rest of the capsule and the parts are arranged as desired. The cover slip is then placed slowly on the diaphane so that no bubbles will be formed. This is best done with tweezers, one side of the cover slip being placed on the slide and the other side slowly lowered until the cover slip touches the diaphane. The cover slip is pressed down slowly and evenly until the parts are flattened. Not over forty-five seconds should be allowed from the time the diaphane is put on the slide until the cover slip is inserted. The slide should remain in a horizontal position for several days—until the diaphane has completely dried.

The slide is numbered and the insect given a corresponding number. If the last ventral segment of the
female is mounted, the same procedure is used and mounted on the same slide with a male of the same species.

Photographing and studying genitalia: In studying the male genitalia, negative prints are made and studied. This consists of directing a strong light through the slide, an objective and an ocular, onto sensitive paper, using a magnification of ninety times for the male genitalia and sixty times for the last ventral segment of the female. The prints, four by five inches for the males, four by two and one-half inches for the females, are then mounted, by using photographic mounting paper, onto five by eight inch cards. These cards are given the same number as the slide and filed for study. In determining variation in a species, or differences in the genitalia of different species, these cards are of inestimable value. Any additional information regarding a specimen or species is written on the back side of the card. When specimens are determined, the species name is written on each card.

Prints similar to those used for study were made for this publication, but a dark amber filter was used to allow for a longer exposure, resulting in a clearer image.

CHARACTERS USED IN CLASSIFICATION

The characters used most in separating species were differences in the male genitalia—the paraphyses,
aedeagus, and to a lesser degree, the valve, plates and pygofers.

External structural features used were the length and shape of crown; length of pronotum at middle and behind eye in relation to width; length and shape of clypeus, shape of face in lateral view and arrangement of veins in forewing. The variation in color and color pattern was helpful, if accompanied by some structural difference.

TERMINOLOGY

The terminology used by P. W. Oman (1936) is followed in this paper. The crown is that part often termed "vertex" and is the most anterior part of the part of head between eyes dorsum; the median suture is the line down the center of the crown, terminating anteriorly in the "wedge." By length of crown is meant the length on median line and width between eyes is the shortest width between the eyes. Width of pronotum refers to the distance from one lateral margin to the other; length behind eyes refers to the distance from the most posterior portion of the eye to the margin of the pronotum directly posterior to it. The clypeus is that part sometimes termed the "frons," length refers to the greatest length and width at ocelli refers to the shortest distance between the margins of the clypeus
at ocelli. The "sharkmouth" is the inverted V-shaped marking found near the base of clypeus in almost all species of Scaphytopius. The clypellus is the sclerite extending from the apex of clypeus to the external mouthparts. Lorae are the small, circular sclerites on each side of clypellus. The genae refers to all the rest of the face. The forewing refers to the outer wing, often called the tegmina. The brachial cell is that cell in the corium bordering the claval vein.

In regard to the genitalia, Mr. R. E. Snodgrass was consulted in regard to the name of various parts. The copulatory organ is termed aedeagus; processes of the aedeagus, the genital paraphyses; the parameres, the styles; the ventral plate of the male, the valve; the ventral apical processes, the plates; and the apical dorsal processes, the pygofera.

SYNOPSIS OF TRIBE SCAPHYTOPINI

Crown relatively flat with anterior margin distinct; pronotum convex anteriorly and concave posteriorly; forewing with distinct appendix and either one or two cross-veins; clypeus broadest along posterior margin, sinuate or straight at antennae; clypellus usually broadest near apex; genae expanded and extending behind eyes, visible from above; ocelli on margin of crown, near eyes.
KEY TO GENERA OF TRIBE SCAPHYTOPINI

1. Crown with shortest width between eyes greater than length at middle; lateral margin of genae with small concavity beneath eye—**Platymetopius** Burmeister

   - Crown as long as or longer at middle than shortest width between eyes — — — — — — — — — — — — — — 2

2.(1) Only one cross-vein in costal cell; claval veins united at middle — — — — — **Japananus** Ball

   - More than one cross-vein in costal cell; claval veins usually not united at middle—**Scaphytopius** Ball

SYNOPSIS OF GENUS **PLATYMETOPIUS** BURMEISTER

The original designation of the genus **Platymetopius** is as follows:

"Subgenus 4. Platymetopius

"37. J. rostratus **Herr. Schaeff.** Fn 122. 2.

"38. J. vittatus **Fabr. Germ. C. undata Pz. Fn. Germ. C.** flammigera de **Vill. Ent.** (tab. nostra fig. 4 caput cum pronoto et scutello, fig. 5 caput infra.) Spec. complures, huic subgeneri adscriptae, in Mus. Germari Halae asservantur, quarum nomina haec:

J. impluviatius **Germ.**, e Pennsylvania
J. meta **Germ.**, e Pennsylvania
J. costalis **Germ.**, Brasilia."
In this designation, there is no description nor designation of genotype.

Crown much wider than length at middle, anterior margin rounded to a bluntly pointed apex; pronotum almost parallel-margined on median half; forewing with numerous veins to costa; clypeus almost as broad between ocelli as median length and over three times as wide at base as at apex, sinuate at antennal sockets; clypeus more than one-third as long as clypeus, only slightly broadest at apex and barely reaching genae; lateral margin with small concavity beneath eye; relatively deep pit from antennal socket to ventral margin of eye; face convex in lateral view.

KEY TO SPECIES OF PLATYMETOPIUS BURMEISTER

1. Forewing fulvus to brown with milky spots - - - - - - - - - - - - - 1. vitellinus (Fitch)
   - Forewing green with thin brown area along mesal margin - - - - - - - - - - - - 2. palliolatus (Ball)

1. Platymetopius vitellinus (Fitch)

Resembling *palliolatus* but with shorter, yellow crown and brownish forewings. Length: female 6 mm., male 5 mm.

**Color:** Crown and face ivory to yellow and without darker markings. Pronotum brown, yellowish along anterior margin, indications of three pale vittaæ, one on median line and another on each side. Scutellum about same color as crown, with a large orange to brown spot near each basal corner. Forewing pale hyaline amber with darker clouded areas in clavus and an irregular, oblique, clouded vitta from apex of clavus to costal margin; veins light.

**Structural characteristics:** Crown about half as long at middle as width between eyes, only slightly longer at middle than next eyes; shallow transverse furrow near rounded anterior margin. Pronotum almost twice length of crown, slightly more than twice as wide as length at middle. Clypeus only slightly longer than width at ocelli, distinctly sinuate at antennæ. Clypellus relatively broad and only slightly enlarged near apex. Lateral margins of genæ concave near eye, convex on apical two-thirds. Face in lateral view distinctly convex, except for slight arcuate concavity joining antennal sockets. Forewing with four or five recurved veins to costa.

**Genitalia:** Valve triangular, about one and one-half times as wide as length at middle, posterior margin
slightly convex on each side of a rounded apex. Aedeagus in ventral view broadest at base, narrowest on apical third; two pairs of lateral processes, one pair from near base extending beyond apex of shaft, and another pair at apex about two-fifths length of shaft. Styles less than one and one-half times as long as basal width, apical half slender and almost parallel-margined. Pygofer roughly triangular, with hook somewhat falcate and sharply pointed.

The last ventral segment of female about twice as wide as length at middle, lateral margins convex, posterior margin with a large, rounded lobe on each side of a small median lobe which may or may not be notched at middle.

Types: Holotype male, #762, allotype female, #763, in the New York State Museum, Albany, N.Y.

Host plants: Ball (1932) writes "The writer has reported this species as curling and reddening the leaves of roses. Later at Woods Hole it was found curling and coloring the leaves of blackberry and dewberry." Lowry (1933) gives grasses, sedges and shrubs in collection data regarding this species.

Comparative notes: This species has a wide range but shows little variation except that the specimens from Tennessee were slightly larger.

2. Platymetopus palliolatus (Ball)


Resembling vitellinus but green with brown pronotum, scutellum and area along clavus. Length female 5.5 mm., male 5 mm.

Color: Crown green and without markings. Pronotum dark reddish-brown, a pair of irregular broad orange vittae on disc and extreme lateral margin white. Scutellum about same color as pronotum, indication of two oblique light vittae near disc. Face greenish-yellow without definite markings. Forewing hyaline green except for white-margined, narrow brown area from near base of wing, along scutellar and sutural margin to apex of wing; two or three white aeroles in clavus and a like number in apical cells.
Structural characteristics: Crown about two-thirds as long as width between eyes, slightly more pointed than in vitellinus, with transverse furrow indistinct or absent. Pronotum slightly longer than crown, about twice as wide as length at middle. Clypeus only slightly longer than width at ocelli, sinuate at antennae. Clypellus relatively stout and somewhat enlarged near apex. Face distinctly convex in lateral view. Forewing with three or four recurved veins to costa, especially near apex.

Genitalia: Valve almost twice as wide as length at middle, posterior margin almost straight on each side of a bluntly pointed apex. Plates long and slender. Aedeagus in lateral view short, broadest at base, almost parallel-marginined on apical two-thirds with a pair of short, slender apical processes. Styles short, less than twice as long as basal width, slightly sinuate on basal third, short, rounded apical process.

Last ventral segment of female somewhat converging on lateral margins; posterior margin almost straight except for median lobe, notched at middle.

Types: Holotype female "Tex. Collection C. V. Riley" collected by Belfrage, in the National Museum, Washington, D.C. Allotype male and 48 male parallotypes, Seymour, Texas, June 30, 1936, R. H. Beamer, in the Francis Huntington Snow Entomological Collection, University
of Kansas, Lawrence, Kansas. Additional male parallotypes from Texas as follows: 2, Concan, July 6, 1936, R. H. Beamer; 1, San Saba Camp, July 1, 1936, R. H. Beamer; 1, Palopinto Co., July 14, 1928, R. H. Beamer; 2, Castroville, July 5, 1936, R. H. Beamer; 1, San Antonio, July 4, 1936, R. H. Beamer; 1, Seguin, June 26, 1938, R. H. Beamer; 1, Loyal Valley, July 2, 1936, R. H. Beamer.

Hosts: Fletcher (1930) writes regarding this species, "on wild sunflower at Dallas."

Comparative notes: This species is evidently restricted to Texas and is easily recognized by its distinctive color markings.

SYNOPSIS OF GENUS JAPONANUS BALL

The original description of Japananus is as follows:

"Resembling Platymetopus (sens. strict.) in the narrow head the single cross nervure and the lack of vermiculations but also lacking the supernumerary costal veinlets of that genus.

"A narrow headed form with a long acute vertex in the female a short and but slightly acute one in the male, a broad pronotum strongly constricted and advanced between the eyes, a large scutellum, broad elytra with simple venation and no reticulations, a single cross nervure between the sectors. Three large cells occupy
the apical portion of the elytra, the first apical forming a long narrow cell against the costa bounded by two short veinlets at right angles to costa. The posterior veinlet is in line with the apex of the outer antepapical, the second apical therefore triangular as in the fifth. Face in profile acutely angled with vertex, front narrow, in the female, produced in a triangle with the vertex. A hair-line dark line just beneath the margin.

"Type of the genus, Platymetopius hyalinus Osb.

"This introduced species has no close relationships with any other North American form and while lacking the second sector it does not belong in Platymetopius proper nor even close to that group as indicated by the widely different head characters and genital patterns.

"The remainder of the American groups agree in possessing the narrow head with the pronotum narrowed between the eyes, the second cross nervure, a large number of reflexed veinlets to costa, the white triangle or "shark's-mouth" marking on the front and more or less of reticulations and vermiculations. None of these groups are represented in the European fauna as far as known."

Crown flat, sharply pointed, longer than shortest width between eyes, median suture and wedge distinct; pronotum very convex on anterior margin, much wider at
middle than behind eyes; forewing with claval veins joined near middle, only two veins to costa and one cross-vein in discal cell; clypeus long and slender, lateral margins hardly sinuate at antennae; clypellus over one-third length of clypeus, enlarged near apex, reaching slightly beyond genae. Shallow concavity on genae from antennae to ventral part of eye.

3. *Japananus hyalinus* (Osborn)


Yellow to greenish, sharply pointed crown, resembling no other species in the group. Length: female 5.5 mm., male 4.5 mm.

**Color:** Crown pale green to greenish-brown along margin, becoming darker on disc; apical wedge light. Pronotum mottled dark gray in male, dark green in female, darkest on disc. Scutellum slightly lighter than pronotum with dark markings, if present, irregular in shape. Face pale fulvous fading to gray on lateral margin of genae in male, greenish-yellow in female; irregular dark line just below base, connecting ocelli. Forewings pale greenish hyaline (almost colorless in male), with following dark markings: four or five lines or dots near middle and a
mark in apex of clavus; cross vein on anterior margin of
discal cell; area where apical and anteapical cells join;
and a dot on costa opposite apex of clavus.

Structural characteristics: Crown about one and
one-third times as long as width between eyes in male,
twice as long as width between eyes in female, almost
straight on each side of a sharply pointed apex; concavity
on disc; distinct wedge. Pronotum about as long as crown
in male; two-thirds length of crown in female, two and
one-third times as wide as length at middle and five times
length behind eyes, extending beyond eye on each side,
posterior margin with shallow notch at middle. Clypeus
about twice as long as width at ocelli, not sinuate at
antennae. Clypellus large, enlarged near apex. Face in
lateral view slightly convex in male, concave between
anterior margin of eyes in female. Forewing with the two
claval veins united except at ends and only one cross vein
to costa.

Genitalia: Genital parts long and slender.
Valve triangular, about twice as wide as length at middle.
Shaft of aedeagus short, base long and with a pair of
slender processes, each bifid on outer fifth, one part
straight, the other acutely recurved at base and recurved
again on apical two-thirds. Plates with a parallel-margined
apical process longer than the remainder of the plate.
Styles long, broadest near basal third, slightly lobed on
on outer margin before blunt outward-projecting apical process.

Last ventral segment of female slightly longer than greatest width, latero-posterior margin convex on basal third, broadly concave on each side of a long median lobe on apical two-thirds.

Types: Holotype male, allotype female, Washington, D.C., 1897, J. S. Hine, here designated, in the Osborn Collection, Ohio State University, Columbus, Ohio.


Host plants: Ball (1932) writes: "--feeds both as nymphs and adults, on the Japanese maple. DeLong (1923) writes "apparently an imported species occurring on Japanese and sugar maples, and perhaps other species of the same group."

Comparative notes: Evidently this easily recognized, evidently introduced species is fairly well distributed in many parts of the United States.

SYNOPSIS OF GENUS SCAPHYTOPIUS BALL

The original description of Scaphytopius is as follows:
"Resembling Platymetopius as formerly recognized but lacking most of the vermiculations. Allied to Scaphoideus Van Duzee, relatively short and stout species with two cross nervures, numerous oblique veinlets to costa and about three or four lines on face paralleling the vertex margins.

"Vertex rather broad and flat, slightly acutely angled and nearly the same length in both sexes—eyes large oblique and enclosing one-half of the pronotum. Face convex, the profile straight and acutely angled with vertex. Front narrow and almost parallel margined below antennae. The "shark's mouth" marking and the vertex margin both narrowly edged with black, often a line between these. Pronotum much broader than head, the anterior half constricted by the oblique eyes. Elytra as in Scaphoideus except for two cross nervures, the venation regular and strongly emphasized on posterior half.

"Type of the genus, Platymetopius elegans Van Duzee."

Crown pointed, longer at middle than shortest width between eyes; pronotum much longer at middle than behind eyes, shortest on lateral margins; forewing with several veins to costa and either one or two veins in discal cell; clypeus narrow, usually slightly sinuate at antennae, broadest at ocelli; clypellus broadest near apex, extending to or beyond margin of genae."
KEY TO SUBGENERA OF SCAPHYTOPIUS BALL

1. Broad, irregular, whitish, sunken band near apex of crown; sharp carina on basal half of clypeus - - - - - - - - - - - Vertanus n. sub gen.

   No band nor carina as described above - - - - 2

2.(1) Crown fulvus without distinct dark markings, with light markings on disc consisting of a long light vitta on each side of median suture posterior to light wedge; distinctly convex on each side of an acutely angled apex. Clypeus uniform brown to black with distinct white line along posterior margin between ocelli and thin shark-mouth reading to or almost to margin of clypeus - - Tumeus De Long

   Crown and clypeus not as above - - - - - - 3

3.(2) Clypellus with apical fourth reaching beyond normal curve of genae - - - - Scaphytopius Ball

   Clypellus with less than apical fourth reaching beyond normal curve of genae - - Cloanthanus Ball

SYNOPSIS OF SUBGENUS VERTANUS N. SUB GEN.

Crown broadly convex on each side of a sharp apex, irregular, sunken, unmarked band before eyes; forewings broad with wide costal cell and several strongly recurved
veins to costa; clypeus long, much wider on basal third
with a thin median carina on basal half, strongly sinuate
at antennae; clypellus slender, slightly enlarged near
apex and extending beyond normal curve of genae; loriae
oval; lateral margins of genae convex, small pit at base
of antennae.

Type of subgenus—Scaphytopius (Vertanus) ulcus
n. sp.

4. Scaphytopius (Vertanus) ulcus n. sp.

A striking species unlike any other north of
Mexico, with broad colorless band on crown and sharply
carinate clypeus. Length: female 5.2 mm., male 5 mm.

Color: Crown with apical fifth mottled brown to
fuscus, excepting wedge; broad irregular, colorless band
across crown on apical third, remainder with vittae as
follows: ivory along outer margin, broad brown, fuscus-
margined vitta just inside this, with narrow ivory, fuscus
and white lines in that order before thin fuscus line on
each side of median suture; slightly lighter in female.
Pronotum with broad light and dark alternating vittae, the
light ones lined with fuscus. Scutellum about same color as
pronotum. Clypeus mottled brown and yellow on apical half,
basal half brown on lateral margins, remainder black except
white sharksamouth and irregular oblique broad white vitta
from near sharksmouth to basal margin. Remainder of face mottled brown and yellow except for white vitta behind eye and dot near ocellus and antenna. Forewing semihyaline yellow, at least on disc of clavus, in apical cells, and along some of veins; remainder semihyaline white or colorless, excepting black clouded areas in clavus and especially in disca1 and anteaapical cells, one conspicuous mark through outer anteaapical to costal margin; distinct hyaline spot in posterior end on middle and outer anteaapicals.

**Structural characteristics:** Crown slightly over twice as long as width between eyes, anterior margin strongly convex on each side of a sharply pointed apex; concave on disc. Pronotum slightly over half as long as crown, two and one-fourth times as wide as length at middle, and three and one-half times length behind eyes, broadly concave on posterior margin. Clypeus about two and one-fourth times as long as width at antennae, sharp median carina on apical half and rather strong concavity on each side, lateral margins sinuate at antennae. Clypellus relatively stout, enlarged at apex. Face in lateral view strongly concave. Forewing with several vein-like marks in brachial cell, sometimes extra veins on clavus and six or seven strongly reflexed veins to costa.

**Genitalia:** Valve triangular, about two-thirds as long as greatest width, posterior margin slightly concave on each side of a sharply pointed apex. Aedeagus large,
basal portion roughly cone shaped with a large "U"-shaped apical portion about as long as base but about twice as wide. Plates short and truncate. Styles projecting mesally, about twice as long as basal width, large lobe on outer margin just before short, blunt, outward-projecting apical process.

Last ventral segment of female convex and converging on lateral margins; posterior margin with a distinct, blunt lobe on each side of a small median notch.

Types: Holotype male, allotype female and 2 female and 3 male paratypes, Hidalgo, Texas, Dec. 28, 1945, R. H. Beamer, in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas.

Additional paratypes as follows: 3 female, 1 male, Brownsville, Texas, June 29, 1938, 1 pair, July 3, 1938, R. H. Beamer; 1 pair, Brownsville, Texas, May 25, 1939, D. J. and J. M. Knell; 1 pair, Progresso, Texas, July 1, 1939, R. H. Beamer. 1 male, Taxco, Mexico, Aug. 22, 1936, W. E. Stone; 1 male, Mexico, April 10, 1939.

Host plants: The specimen labelled "Mexico" was collected from cantaloup.

Comparative notes: The white band on crown and carina on clypeus easily separates this species from any other. There is evidently much variation in the length of the crown as one of the specimens from Mexico had a longer
crown and the other a shorter one than the type, but the internal genitalia proved to be the same.

SYNOPSIS OF SUBGENUS TUMBUS DELONG

The original description of the subgenus is as follows:

"Related to Cloanthanus but with a flat, more broadened and bluntly angled vertex with the sides convexly rounded to form a narrow, rounded tip. The face is broader than in Cloanthanus, but the angled line just beneath the apex of vertex resembles the markings of that genus. The venation is similar in type to Cloanthanus, the costal veinlets are of the same type and the first anteapical cell is usually decidedly shorter than the second anteapical cell. Genotype Tumeus serrellus n. sp."

Crown broad, anterior margin convex on each side of a sharply pointed apex, markings consisting of a light vitta on each side of median suture from base to wedge; light vitta on pronotum very faint or absent; forewings relatively long and slender, outer anteapical short, central anteapical narrowed near apex; clypeus dark, without dots, a light line along basal margin joining ocelli and a long slender sharkamouth; slightly sinuate at antennae; clypellus slightly enlarged near apex, barely reaching to normal curve of genae.
KEY TO SPECIES OF SCAPHYTOPIUS (TUMEUS) DELONG

1. Frons mostly black; California — — 5. majestus (Ball)
   — Frons brown; Texas — — — 6. texanus DeLong

5. Scaphytopius (Tumeus) majestus (Ball)

Resembling Scaphytopius elegans somewhat but without the broad dorsal yellow stripe, with crown much broader and with anterior margin distinctly convex on each side of pointed apex. Length: female 5 mm., male 4.5 mm.

Color: Crown yellow and orange with a broad, light vitta on each side of median suture on basal four-fifths, light wedge on apical fifth. Pronotum usually darker than crown, lightest along anterior margin. Scutellum about same color as crown. Clypeus with narrow light band along base between eyes and a long, light sharksmouth; remainder dark chocolate brown, except for lighter brown area between sharksmouth and basal margin. Genae lighter than clypeus. Clypellus and lorae either color of clypeus or genae, or varying between the two colors; light vitta behind eye and dots before eye usually present. Forewing semihyaline brown to fuscus, lightest on clavus and costa, darkest on outer anteapical cell and apex of corium and clavus.
Structural characteristics: Crown about twice as long as width between eyes, anterior margin definitely and broadly convex on each side of a pointed apex. Pronotum half as long as crown in female, proportionately longer in male, about two and one-half times as wide as length at middle and three and one-half times length behind eye; posterior margin convex behind outer margin of eye, concave at middle with a small median notch. Clypeus about twice as long as width at ocelli, lateral margin sinuate at antennae. Clypellus much larger near apex. Face in lateral view definitely concave. Forewing with six or seven recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin rounded, anterior margin with relatively long lobe on median two-fifths. Single paraphysis, "hinge" at basal third, bifid on outer third, each branch of which is bifid, with the outer branch longer than the inner. Aedeagus very short and broad, resembling a ring. Styles slightly more than twice as long as basal width, slightly sinuate near middle, small lobe on outer margin before curved, outward-projecting apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margin straight near base, convergent on apical three-fifths; posterior margin straight except for median lobe with a notch at middle.
Types: Holotype male, Pasadena, California, June 17, 1908, in the National Museum, Washington, D.C.
Allotype female and 9 female parallotypes, Miramar, California, July 28, 1938, R. H. Beamer, in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas. Additional female parallotypes from California as follows: 7, Irvine Park, Aug. 4, 1939, R. H. Beamer; 1, Boulevard, July 26, 1938, R. H. Beamer; 1, San Antonio Canyon, Aug. 4, 1938, R. I. Sailer; 1, San Antonio Canyon, Aug. 4, 1938, R. H. Beamer; 2 Mt. Tamalpais, Aug. 15, 1938, R. H. Beamer; 5, La Jolla, July 13, 1941, R. H. Beamer; 1, Arroyo Seco River, Aug. 8, 1938, R. H. Beamer; 2, Mint Canyon, July 6, 1933, R. H. Beamer; 2, San Diego, Aug. 7, 1935, 1 Dec. 24, 1941, R. H. Beamer; 1, Nipomo, July 24, 1935, R. H. Beamer.

Host plants: Ball (1932) writes "--taken in June by the writer on a tall Rhus growing in isolated clumps at Pasadena." Specimens were collected on Photinia arbutifolia at Mt. Tamalpais, California, and on Rhus integrifolia at Miramar, California.

Comparative notes: This dark, slender species can hardly be confused with any other species in California, and the male genitalia is distinctly different from any other, with the single, twice bifid paraphysis.
6. Scaphytoptus (Tumeus) texanus DeLong


Resembles *majestus* somewhat, but with shorter crown and light brown dorsum. Length: female 5 mm., male 4.5 mm.

**Color:** Crown pale greenish-fulvus, thin dark line along anterior margin, pale vitta on each side of median suture on basal three-fourths, median vitta on apical fourth; pale areas bordered by dark. Pronotum darker than crown, lightest on anterior and lateral margins, usually some vermiculations on disc; vittae sometimes evident on lateral margins. Scutellum about same color as crown, light in each basal corner and an irregular, slightly oblique line from lateral margin to anterior margin, usually fuscus lined. Face chocolate brown excepting light markings as follows: thin line along anterior margin, long sharksmouth, three or four pairs of short, oblique lines on disc of clypeus, line behind eye and a dot before eye. Forewing semihyaline greenish-fulvus, large milky aeroles in clavus, antapical and apical cells, most cells in corium, except middle apical cell, with large hyaline area, dark vermiculations throughout; veins light except on apex and costal margin.

**Structural characteristics:** Crown one and two-third times as long as width between eyes in male, slightly
longer in female, anterior margin slightly convex on each side of bluntly pointed apex in male, more strongly convex in female. Pronotum about three-fifths length of crown in male, relatively shorter in female, two and one-half times as wide as length at middle and four times length behind eyes, posterior margin only slightly concave. Clypeus about twice as long as width at ocelli, lateral margins constricted at antennae, shallow concavity along shark-mouth. Clypellus stout and enlarged near apex. Face in lateral view concave between anterior margin of eyes, especially in female. Forewing with numerous vein-like marks in brachial cell and about seven recurved veins to costa.

Genitalia: Valve about four-fifths as long as greatest width, posterior margin convex on each side of a bluntly pointed apex; anterior margin with short, broad median lobe. Plates short but sharply pointed. Paraphysis single, bulb-like at base with a slender hair-like apical part. Aedeagus attached to base of paraphysis; shaft in lateral view, straight, narrowing to apex with a pair of short, slender apical processes. Styles slightly more than twice as long as basal width, outer margin with pointed lobe before long, slender, curved process on apical half.

Last ventral segment of female almost twice as wide as length at middle, lateral margins straight,
posterior margin convergent to a median lobe with a small notch at middle.

Types: holotype male, allotype female, Brownsville, Texas, May 8, 1935, J. N. Knell, in the DeLong Collection, Ohio State University, Columbus, Ohio.

Material on hand: (Texas) Concan, Progresso, Brownsville.

Host plants: Not known.

Comparative notes: This species is easily recognized in southern Texas by the clouded dark face and distinctive crown.

SYNOPSIS OF SUBGENUS SCAPHYTOPIUS BALL

For original description of subgenus, see description of genus Scaphytopius.

Crown straight to slightly convex on each side of apex, markings light, but sometimes lined with dark; pronotum with vittae absent or indistinct on disc; forewing with several recurved veins to costa; clypeus sinuate at antennae, light sharksmouth near posterior margin between eyes typically present; clypellus relatively long with apical fourth extending beyond normal curve of genae; loral margins oval; genae with shallow pits for antennae.
KEY TO SPECIES OF SCAPHYTOPIUS (SCAPHYTOPIUS) BALL

1. Color hyaline brown except for wide yellowish area covering crown, middle half of pronotum, all of scutellum and mesal margin of clavus — — — — — — — 7. elegans (Van Duzee)
— Markings different than above — — — — — 2

2. (1) Face unicolor; last ventral segment of female not split on posterior margin; male paraphysis roughly "T"-shaped — — — 8. ritanus Ball
Frons usually darker than rest of face; last ventral segment of female split on posterior margin; male paraphysis not "T"-shaped. — — — — — — 3

3. (3) Paraphysis of male and last ventral segment of female split to near base — — 9. catalinus (Ball)
— Paraphysis of male and last ventral segment of female split only partly to base — 10. huachucus (DeLong)

7. Scaphytopius (Scaphytopius) elegans (Van Duzee)

Platymetopius elegans, Van Duzee, E. P. Ent. Amer., VI: p. 94, 1890.


Scaphytopius floridanus var. roseus, Ball, E.D., Can. Ent., LXIII: p. 221, 1931.

Resembling ritanus but more slender, with longer crown, and forewings unclouded on corium except for apical cells. Length: female 5 mm., male 4.7 mm.

Color: Crown white to yellow with brown markings as follows: broad "Y"-shaped mark before each eye and a thin line on each side of median suture on apical two-thirds. Pronotum yellow on disc, brown on each side, excepting one or two light vittae near lateral margin. Scutellum yellow. Face yellow, excepting fuscus-bordered broad sharksmouth, a line along basal margin between ocelli, and in darkly marked specimens a vitta behind eye and shorter one near ocellus. Forewing hyaline except for opaque yellow area in clavus and smaller, lighter area in apical cells; veins concolorous in clavus, dark brown to fuscus in corium.

Structural characteristics: Crown one and one-half times as long as width between eyes in male, slightly longer in female, anterior margin straight to slightly convex on each side of a sharp apex; wedge about two-fifths length of crown. Pronotum almost as long as crown, slightly more than twice as wide as length at middle, and four times length behind eye; posterior margin slightly concave. Clypeus slightly more than twice as long as width at ocelli,
somewhat sinuate at antennae. Glypellus long and slender and about one and one-half times as wide near apex as narrowest point. Face in lateral view straight to slightly concave between anterior margin of eyes. Forewing with about eight recurved veins to costa and claval veins sometimes joined near middle.

Genitalia: Valve about two-thirds as long as greatest width, posterior margin bell-shaped, anterior margin with broad, short median lobe. Paraphysis "T"-shaped, broadest near base, apical, laterally-projecting processes sharp at apex, and with tiny teeth along the edges. Aedeagus small, about as wide as greatest width, notched at middle of flattened apical margin. Plates short and bluntly pointed. Styles about three times as long as basal width, sinuate on basal third, large lobe on outer margin on median third and bluntly pointed process on apical third.

Last ventral segment of female about twice as wide as length at middle, lateral margins straight and converging, posterior margin slightly convex.

Types: Holotype female "California, Coquillet," in the Iowa State College collection, Amex, Iowa, here designated. Allotype male and one parallotype male, Idyllwild, California, Aug. 3, 1935, R. H. Beamer, here designated, in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas.
Additional male parallotypes as follows: (California) 1, San Margarita, Aug. 6, 1912, E. D. Ball; 1, Dulzura, Aug. 9, 1935, R. H. Beamer; 1, Lompoc, Aug. 7, 1938, R. I. Sailer; 2, Santa Rosa, Aug. 16, 1938, R. H. Beamer; 1, Campo, Aug. 10, 1935, R. H. Beamer; 1, Pine Valley, July 27, 1938, R. H. Beamer; 11, La Jolla, July 13, 1941, R. H. Beamer; 2, Excondido, July 15, 1941, R. H. Beamer. (Arizona) 1, Arivaca, July 26, 1941, R. H. Beamer; 1, Oak Creek Canyon, July 9, 1941, 1, Aug. 9, 1932, 1, Aug. 14, 1927, R. H. Beamer; 1, Oak Creek Canyon, Aug. 14, 1927, L. D. Anderson; 3, Chiricahua Mts., Aug. 7, 1941, 3, July 8, 1932, 1, July 14, 1938, R. H. Beamer; 1, Yarnell, July 27, 1933, 1, July 25, 1932, R. H. Beamer; 1, Jerome, July 30, 1933, R. H. Beamer; 1, Ruby, July 22, 1938, R. H. Beamer. (Utah) 2, Pintura, Aug. 11, 1929, R. H. Beamer; 1, Zion National Park, Aug. 13, 1929, R. H. Beamer. (Texas) 1, Sutton Co., July 16, 1928, R. H. Beamer. (Florida) 3, Sanford, Aug. 8, 1939, R. H. Beamer; 1, Sanford, Aug. 22, 1933, C. O. Bare; 1, La Belle, July 16, 1939, R. H. Beamer; 2, Old Town, July 11, 1939, 1, Aug. 10, 1939, R. H. Beamer; 1, Ocala, Aug. 17, 1930, L. D. Tuthill; 1, Ocala, Aug. 17, 1930, P. W. Oman; 1, Yankeetown, July 17, 1934, R. H. Beamer; 1, Bradford, July 16, 1934, R. H. Beamer.

In addition to the types listed above, the following paratypes were on hand for study: 1 female, floridanus,

*Host plants:* Ball (1932) writes "Scaphytopius elegans* Van Duzee is a Pacific coast form which the writer has found feeding exclusively on the live oaks of that region. Var. *glennanus* Ball was found by the writer throughout southern Arizona feeding, both nymphs and adults, on the different live oaks, especially *Q. turbinella* and *oblongifolia*.

"*S. floridanus* Ball with its var. *roseus* Ball are strictly confined to the under side of the live oak (*Q. virginiana*) in the Florida region. The margins of the leaves are revolute and furnish a fine hiding place for the young nymphs."

*Comparative notes:* *S. elegans* was named from California, darker specimens from Arizona were named the variety *glennanus* and lighter specimens from Florida named *floridanus*. There are intermediate forms both in color and distribution, specimens having been studied from New Mexico, Texas and Mexico. Specimens collected in Florida in the winter are often as dark as the typical California specimens. The variety *roseus* is a reddish form, evidently specimens in which the yellow color is replaced by red, a rather common occurrence in other species of the group.
The broad, yellow vitta on dorsum readily separates this species from any other in the genus.

8. Scaphytopius (Scaphytopius) ritanus Ball

Resembling elegans but broader, with shorter crown, and with more clouded area on corium. Length: female 5 mm., male 5 mm.

Color: Crown yellow to orange, a thin, wavy brown line along anterior margin; wedge, long vitta on each side of median suture and small irregular area inside each eye, lighter. Pronotum about same color as crown, often gray on disc and broad, irregular vittae formed by absence of pigment. Scutellum about same color as crown, usually somewhat darker just inside each basal angle. Clypeus reddish-fulvus, thin black line along base between ocelli; sharksmouth and three or four pairs of short, oblique lines beneath, light. Remainder of face about same color as clypeus, sometimes darkest on lateral margins, white spot near each ocellus and antenna and sometimes vitta behind eye. Forewing hyaline to semihyaline brown, light band before apex of clavus extending across anterior ends of antepapical cells to costa and another light band just before apex. These light bands may be white or devoid of color. Veins light brown anteriorly, becoming dark on costa and at apex.
Structural characteristics: Crown one and one-third times as long as width between eyes, straight on each side of a pointed apex; wedge about one-third length of crown. Pronotum about as long as crown, two and one-fourth times as wide as length at middle and about four and one-half times length behind eyes, posterior margin almost straight. Clypeus about twice as long as width at ocelli, lateral margins slightly sinuate at antennae. Clypellus long and enlarged near apex. Face convex in lateral view. Forewing with five or six recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin rounded, anterior margin with rather narrow, median lobe. Plates short and sharply pointed. Paraphysis "T"-shaped, broadest at base, with apical, laterally projecting processes margined with tiny teeth. Aedeagus slender, about half as long as style, and with a pair of short apical processes. Style about three times as long as basal width, sinuate near middle, a large lobe on outer margin just before slender, pointed, outwardly curved, apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margin almost straight and convergent, posterior margin with a wide short median lobe.

Types: Holotype female, Tuscon, Arizona, June 19,
1929, allotype male, Santa Rita Mts., May 12, 1929, E. D. Bell, in the National Museum, Washington, D.C.


Host plants: Ball (1932) writes "taken as nympha and adults from the live oaks of southern Arizona, especially Q. oblongifolia and emoryi."

Comparative notes: The female of this species is easily separated from catarinus and huachucus by the last ventral segment being unnotched, the male has the distinctive "T"-shaped paraphysis. This species was placed in Hebenerus DeLong but the great similarity of the genitalia of ritanus and elegans shows these two species very closely related and undoubtedly in the same genus.

9. Scaphytopius (Scaphytopius) catalinus (Ball)
Scaphoideus catalinus, Ball, E. D., Can. Ent., IXL: p. 82, 1909.

Resembling ritanus but smaller, clypeus somewhat darker than adjoining area of face and more distinct band on forewing. Length: female 5 mm., male 4 mm.

Color: Crown light fulvus with wedge and broad vitta on each side of median suture usually faintly indicated; faint black line along anterior margin. Pronotum slightly darker than crown, lightest along anterior margin; vittae
usually indicated on margin. Scutellum orange with white spot at apex and another on each side near middle. Clypeus slightly darker than remainder of face, white line along basal margin between eyes; sharksmouth and two or three pairs of oblique lines beneath, light. Lorae, genae next clypeus below antennae and apical half of clypellus, ivory to light fulvus. Lateral margins of genae about same color as clypeus; light vittae behind eye and much shorter ones near ocellus and antennae usually at least indicated. Forewing hyaline or semihyaline brown on basal half, across middle of anteapical cells and apex, white to colorless in a band across base and apex of anteapicals, giving a two-banded appearance.

**Structural characteristics:** Crown about as long as width between eyes, anterior margin straight to slightly convex on each side of bluntly pointed apex; wedge about one-fourth length of crown. Pronotum about as long as crown, two and one-half times as wide as length at middle and five times length behind eye; posterior margin concave with a small median notch. Clypeus slightly over one and one-half times as long as width at ocelli, lateral margin definitely sinuate at antennae. Clypeus long and enlarged near apex. Face in lateral view convex. Forewing with a few vein-like markings in brachial cell and eight or nine recurred veins to costa.
Genitalia: Valve almost one and one-half times as wide as length at middle, rounded on posterior margin, anterior margin with broad median lobe. Plates short but sharply pointed. Paraphysis bifid almost to base, each fork curved, long and sharply pointed. Aedeagus almost as long as basal width, a sharp median process at apex, and a pair of lateral, apical processes, truncate and slightly produced anteriorly. Styles about three times as long as basal width, sinuate on basal third, large lobe on outer margin before a blunt, outward-projecting process on apical third.

Last ventral segment of female about twice as wide as greatest length, median notch on posterior margin reaching almost to base, forming two oval lobes.


Host plants: Ball (1932) writes, "—taken as nymphs and adults from the live oaks of southern Arizona, especially Q. oblongifolia and emoryi."
Comparative notes: The deeply emarginate last ventral segment of the female is the best external criterion for separating this species from any other. This species has been listed in Hebenarus but the similarity of the genatalia of this species to elegans and ritanus would warrant it remaining in this genus.

10. Scaphytopius (Scaphytopius) huachucus (DeLong)
Hebenarus huachucus, DeLong, Pan-Pac. Ent., XXII, p. 41, 1944.

Reassembling catalinus but larger, with darker clypeus and paraphysis bent near middle. Length: female 5.5 mm., male 5 mm.

Color: Crown yellow to orange with light markings, if present, as follows: thin line along anterior margin, wedge, long vitta on each side of median suture and an irregular area inside each eye. In many specimens collected in the summer, these markings are absent, while if fall or winter collected specimens, the markings are fuscus-lined and distinct. Pronotum usually slightly darker than crown, lightest along anterior margin; vittae usually absent, but sometimes indicated along lateral margins. Scutellum yellow to dark orange with white dot at apex and another on each lateral margin. Clypeus much darker than remainder of face, orange, excepting fuscus-
bordered white line along basal margin between eyes, and white sharksmouth; sometimes oblique lines on disc faintly indicated. Remainder of face yellow to fulvus with vitta behind eye and spot near ocellus and antennae usually evident. In fall and winter specimens, the orange is replaced by dark brown and the remainder by light brown. Forewing hyaline brown on basal half, across middle of anteapical cells and in middle apical cell, remainder semi-hyaline white or colorless, giving a faintly two-banded appearance across apex of and base of anteapical cells.

**Structural characteristics:** Crown only slightly longer than width between eyes, slightly convex on each side of a bluntly pointed apex; wedge about one-third length of crown. Pronotum almost as long as crown, about two and one-half times as wide as length at middle and four and one-half times length behind eyes; posterior margin convex and with a small, broad median notch. Clypeus about one and two-thirds times as long as width at ocelli, lateral margin only slightly, if any, sinuate at antennae. Clypellus long and enlarged at apex. Forewings with numerous veins in brachial cell and numerous recurved veins on costa and usually extra veins on clavus.

**Genitalia:** Valve about as long as greatest width, posterior margin rounded; anterior margin with long median lobe. Paraphysis long, curved and almost parallel margined on basal two-thirds, split on apical two-thirds,
with two pairs of short apical processes, one pair straight and the other recurved; another pair of short, straight processes on ventral margin on apical third where the paraphysis curves. Aedeagus small, ring-like, almost separated dorsally. Style less than three times as long as basal width, sinuate near middle, conspicuous lobe on outer margin before short, bluntly pointed, finger-like, apical process.

Last ventral segment of female straight on lateral margins; posterior margin with a deep median notch reaching almost to middle, forming two distinct lobes.

Types: Holotype male, allotype female, Huachucua Mts., Arizona, July 20, 1936, and June 9, 1935, J. N. Knell, in the DeLong Collection, Ohio State University, Columbus, Ohio.


Host plants: Unknown, but probably live oaks.

Comparative notes: This species is placed in Scaphytopius because of its similarity to other members of this genus, most nearly related to catarinus, but larger and with darker frons.
SYNOPSIS OF SUBGENUS CLOANTHANUS BALL

The original description of this subgenus is as follows:

"Resembling Platymetopius (sens. strict.) but with a narrower vertex, a shark’s mouth marking on frons, and two cross nervures. Closely related to Platymoideus but without the vermiculations on the anterior portion of elytra.

"Vertex flat, acutely angular, longer than wide, narrowing from the front of the eye to the base where it is very narrow. Face long, convex, acutely angled with vertex as seen from side. Front long and narrow especially below the antennae. Pronotum much broader than head. Venation regular, two cross nervures between sectors and numerous short reflexed veinlets to costa. The claval nervures are united by a cross nervure and usually tied to the suture by another one. The vertex, pronotum and anterior portion of elytra are usually unicolorous in sharp contrast to the dark venation on the posterior portion of elytra.

"Type of the genus Platymetopius angustatus Osb."

Crown flat or depressed, usually pointed; forewing with anteaapical cells almost the same length; numerous recurved veins to costa, darkest on outer anteaapical and adjacent area of costa; lateral margins of clypeus straight to sinuate at antennae, sharksmouth
usually present; clypellus parallel-margined or enlarged near apex, extending to, or slightly beyond, normal curve of genae; antennae in shallow pits near ventral margin of eyes.

**Typical color pattern if present:** Crown with light markings as follows: wedge; line along anterior margin; two pairs of spots on posterior margin, one pair near median suture and one spot next each eye; either three pairs of spots in a band across crown before eyes, or long straight or arcuate mark, on each side of median suture (the band before eyes is usually present in short-crowned species, the long or arcuate markings usually in long-crowned species). Pronotum with seven vittae, one on median line and three on each side, usually more pronounced nearest lateral margins. Scutellum with light mark at apex, in each basal corner and on lateral margin half-way between apex and base; dark area inside each basal corner and line across middle. Forewing variable, darkest on apical cells, outer anteanical cell and adjacent area of costal cell.

 Clypeus with light, fuscus-marginated sharksmouth near base. Genae darkest on lateral margins, fuscus-marginated white vitta behind eye, two short vittae before eye, one near ocellus and another near base of antenna.

**KEY TO SPECIES OF SCAPHYTOPIUS (CLOANTHANUS) BALL**

1. Crown pattern absent, indistinct or consisting of
two to three distinct light spots on disc of crown, sometimes coalesced or reduced, or forming a transverse band before the eyes, more or less complete, the median pair of spots often elongate; usually relatively short crown — 2

Markings on crown taking the form of lineations, often arcuate, usually one long mark on each side of median suture; usually long crown — 43

2.(1) Dorsum opaque yellow or fulvus to reddish, crown often darkest; scutellum without large dark area; crown parallel-margined or at most slightly angled; aedeagus long and with short, anteriorly projecting apical processes — — — — — — 3

Color and shape of crown not as above, or if so,
aedeagus much different — — — — — — 4

3.(2) Color yellow — — — — — ll. nigricollis (Ball)

Color fulvus to reddish — 12. torridus (Ball)

4.(2) Dorsum opaque white with fuscus markings; crown with irrorate dark area at apex and broken band between anterior half of eyes — 13. desertanus (Ball)

Dorsum and crown not as above — — — — — — 5

5.(4) Four mm. or less in length; light markings on crown usually thin, the median pair often extending to base; last ventral segment of female much lighter
than rest of venter; aedeagus with two short, erect apical processes on dorsal margin

- - - - - - - 14. irroratus (Van Duzee)

- More than four mm. in length; or if not, light markings on crown larger and shorter or aedeagus variable, but not as above - - - - - 6

6.(5) Light face, face with darker markings, especially in male; Arizona - - - - - - - - - 15. irrorantus sub. sp. xanthanus (Ball)

- Not light fulvus; or if so, face without darker markings or not from Arizona - - - - - - - 7

7.(6) Crown fulvus and short; face irroratete with brown throughout; Arizona - - - - - - - - 16. irroratus sub. sp. nogalimus (Ball)

8.(7) Entire face white or yellow in sharp contrast to much darker venter; no genital paraphysis in male - 9

- Face not as above; or if so, with genital paraphysis, although often small - - - - - - - 12

9.(8) Processes at apex of aedeagus at least half as long as shaft - - - - - - 17. albifrons n. sp.

- Processes at apex of aedeagus less than half as long as shaft - - - - - - - - - - 10
10. (9) Light markings on crown slender; general color fuscus to black; aedeagus with short, erect apical processes at apex; Texas to California

- - - - - - 18. loricatus (Van Duzee)

- Light markings on crown broader; general color lighter; aedeagus not as above; southern Texas - - - - - - - - - - 11

11. (10) Aedeagus with wing-like apical processes - - - - - - - - 19. pennatus n. sp.

- Aedeagus with more slender, laterally-projecting apical processes - - - 20. flavifrons n. sp.

12. (8) Light band on crown before eyes complete except for two or three fine dark lines; many tiny fine dots and vermiculations more or less evenly distributed throughout forewing; aedeagus long and abruptly curved on apical third - - - - - - 21. anisacanus (Ball)

- Crown and forewing not as above; or if so, aedeagus much different - - - - - - 13

13. (12) Forewings translucent greenish-fulvus, crown mostly light except for irregular brown band between anterior margin of eyes; southern Texas - - - - - - 22. contractus n. sp.

- Forewings and crown not as above; or if so, not from southern Texas - - - - - - 14
14.(13) Dorsum brown with ivory markings; face infuscated on lateral margins; aedeagus broad and enlarged at apex, small paraphyses  -23. brunneus n. sp. Dorsum and face not as above, or if so, with different genitalia  - 15

15.(14) Male plates truncate at apex; female last ventral segment broadly concave with a slender median notch; face dark  - 16 External genitalia not as above, or if so, face not dark  - 18

16.(15) Crown evenly irrorate with light, no band before eyes  - 24. fuscifrons (Van Duzee) Crown with a band before the eyes  - 17

17.(16) Area of crown next pronotum with some dark markings, especially next eye, four and one-half mm. or more in length  - 25. fuscifrons sub. sp. compactus (Ball) Area of crown next pronotum without dark markings, less than four and one-half mm. in length  - 26. fuscifrons sub. sp. minutus n. sub. sp.

18.(15) Face bright yellow throughout, dorsum light fulvus  - 27. dodonanus (Ball) Face not bright yellow throughout; or if so, dorsum not light fulvus  - 19
19. (18) Crown with light band before eyes and at base
giving a more or less distinct four-banded
appearance—two ivory and two fuscus; fore-
wings not distinctly darkened at apex — — — — — — — — 28. celticus (Ball)
—
Crown not as above; or if so, forewings
darkened at apex — — — — — — — — — — 20

20. (19) Forewings semihyaline white with many dark dots
throughout; scutellum with large area next
each basal corner; erect genital paraphyses
extending slightly beyond simple aedeagus — — — — — — — — 29. californiensis n. sp.
—
Forewings and scutellum not as above, or if so,
genitalia different — — — — — — — — — — 21

21. (20) Light band before eyes broad, distinct and
almost complete; remainder of crown black
except for apical wedge and irrorations next
pronotum — — — — — — — — — — 22
—
Crown not as above — — — — — — — — — — 23

22. (21) Scutellum primarily black — — — — — — — — — — 30. diabolus (Van Duzee)
—
Scutellum with few, if any, black markings — — — — — — — — — — 31. pallidiscutus n. sp.

23. (21) Clavus of forewing semihyaline fulvus without
darker markings; genital paraphyses of male
bifid on outer third - - - - - - - - 24
- Clavus not as above, or if so, paraphyses different - - - - - - - - - - 25
24.(23) Pronotum fulvus - - - - - - 32. fulvus (Osborn)
- Pronotum fuscus - - - - - - - - - -
- 33. fulvus sub. sp. collaris (Sanders and DeLong)
25.(23) Clypeus bright yellow and without markings on apical two-thirds; outer margin of loriae infuscated; forewings blackish - - - - - - - - - - 34. frontalis (Van Duzee)
- Face and forewings not as above - - - - - - 26
26.(25) Crown heavily irrorate, but without definite pattern - - - - - - - - - - - - 27
- Crown not heavily irrorate; or if so, with pattern - - - - - - - - - - 28
27.(26) Scutellum fulvus and with few or no fuscus or black markings - - - 35. cinammonenis (Osborn)
- Scutellum dark, with fuscus or black markings throughout - - - - - 36. deltensis n. sp.
28.(26) Crown and face ivory and without markings - - - - - - - - - - 37. dorsalis (Ball)
- Crown or face with darker markings - - - 29
29.(28) Entirely dark fuscus to blackish, except for
small light marks on crown — — — — — — — —
— — — — — — — — 38. nigrifrons (DeLong)
Not entirely fuscus to blackish — — — — 30
30.(29) Forewings fulvus with large milky spots through-
out — — — — — — 39. amplinotus n. sp.
Forewings not as above — — — — — — — 31
31.(30) Crown only slightly longer at middle than next
eye and only slightly longer than width
between eyes — — 40. osborni (Van Duzee)
Crown distinctly longer at middle than next
eye — — — — — — — — — — — — 32
32.(31) Crown fulvus and without dark markings and
with a distinct spot on each side of median
suture on disc; entire dorsum about same color;
Florida — — — — — 41. andromus (Ball)
Crown and dorsum not as above, or if so,
not from Florida — — — — — — — — 33
33.(32) Crown more than twice as long as width between
eyes — — — — 42. verecundus (Van Duzee)
Crown shorter than above — — — — — — 34
34.(33) Dorsum reddish-brown, markings on crown small,
but distinct — — 43. insolitus n. sp.
Dorsum and crown not as above — — — 35
35. (34) Aedeagus notched along dorsal margin; eastern — 36
Aedeagus tube-like; western (except angustatus) 38

36. (35) Genital paraphysis with small pointer, lateral
lobe near middle — 44. magdalensis (Provancher)
Genital paraphysis without lobe; or if present,
nearer apex — — — — — — — — — — 37

37. (36) Light band before eyes only about half complete;
not Florida — — — — 45. scriptus (Ball)
Light band before eyes on crown almost complete;
Florida — — — — — — — —
— — 46. scriptus sub. sp. meridiana n. sub. sp.

38. (35) Color greenish-yellow; eastern — — — —
— — — — — — — — 47. angustatus (Osborn)
Color not greenish-yellow; western — — — 39

39. (38) Scutellum primarily ivory to orange, with black
markings; remainder of dorsum dark — —
— — — — — — — — 48. calliandrus (Ball)
Scutellum not marked as above; dorsum lighter — 40

40. (39) Dorsum white with dark dots; face with only
scattered dark dots — — — — — — — —
— — — — — — 49. analis var. castranus (Ball)
Dorsum and face not as above — — — — — 41
41.(40) Crown dark brown with marks before the eyes thin and directed toward apex; aedeagus relatively long - - - - - - 50. radiatus n. sp.
- Crown and aedeagus not as above - - - 42

42.(41) Aedeagus very short; styles more than twice as long as greatest width; crown almost same color throughout - - - 51. modicus n. sp.
- Aedeagus longer; styles less than twice as long greatest width - 52. pallidicapitatus n. sp.

43.(1) Forewing with only green or brown clouded area on anterior half; usually four or less dark reflexed veins to costa - - - - - - 44
- Forewings with vermiculations or dots on anterior half; usually more than four reflexed veins to costa - - - - - - 45

44.(43) Color greenish - - - 53. nigriviridis (Ball)
- Color brownish - - - - - - - - - - - - - - - - 54. nigriviridis s. sp. dixianus (Ball)

45.(43) Crown white, with a large black mark around and behind wedge; forewings opaque white with sparse fuscus vermiculations - - - - - - - - - - - - - - - - - - - - - - - 55. heldoranus (Ball)
- Crown and forewings not as above - - - - 46
46. (45) General color pale gray; crown short; Southwest
- - - - - 49. analis var. castranum (Ball)
- Color nor crown as above, or if so, not
Southwest - - - - - - - - - 47

47. (46) Fuscus-margined, light vitta on clypeus from
near sharksmouth to near apex - - - - - - - - - - - - - 56. vittifrons n. sp.
- Without such a line on clypeus - - - - 48

48. (47) Color pale fulvus, except for dark area over
most of pronotum and basal half of scutellum -
33. fulvus s. sp. collaris (Sanders and DeLong)
- Color various, but not as above - - - - 49

49. (48) Arcuate markings very indistinct or absent - 50
- Arcuate or long discal markings more
distinct - - - - - - - - - - - - - - - 51

50. (49) Forewings greenish-fulvus with dark veins
restricted to apical half - - - - - - - - - - - - - - - - - - - - - - 47. angustatus (Osborn)
- Forewings brownish - -35. cinnamomeus (Osborn)

51. (49) Crown light fulvus with few or no fuscus markings;
crown of female at least two and one-half times
as long as width between eyes; that of male
almost as long - - 57. slossonae (Van Duzee)
52. (51) Color dark reddish brown; face dark and in lateral view distinctly concave - - - - - - - 58. rubellus (Sanders and DeLong)

- Color not as above - - - - - - - 53

53. (52) Pronotum yellowish, forewing semihyaline light with veins and markings consisting primarily of dots; crown with many vermiculations - - - - - 59. cinereus (Osborn and Ball)

- Pronotum, forewing and crown not as above - 54

54. (53) Face unmarked yellow, at least on disc of clypeus - - - - - - - - - - 55

- Face dark, even on disc of clypeus - - - 64

55. (54) Dorsum white with veins and markings consisting primarily of dots; crown with many vermiculations - - - - - 60. gutterranus (Ball)

- Dorsum and crown not as above - - - - 56

56. (55) Pygofer of male broadly concave on basal half of outer margin - - - 61. acutus (Say)

- Pygofer of male not as above - - - - 57

57. (56) Entire dorsum fulvus; crown less than one and one-half times width between eyes - - - - - - - - - - 63. oregonensis (Baker)
Dorsum and crown not as above - - - - - 58

58.(57) Crown long, darkest on disc with arcuate
markings pale or indistinct- 63. latus (Baker)

- Crown not as above - - - - - - - 59

59.(52) Aedeagus in ventral view much smaller at apex
than at base; eastern - 64. argutus DeLong

- Aedeagus not as above, or if so, not
eastern - - - - - - - 60

60.(59) Crown primarily dark brown to fuscus - - - - - - - 65. fuscicephalus n. sp.

- Crown lighter colored - - - - - - 61

61.(60) Crown greenish or light fulvus; southern - - - - - - - 66. viridicephalus n. sp.

- Crown not as above, or if so, not southern - 62

62.(61) Aedeagus broad; genital paraphyses enlarged
on apical two-fifths - 67. utahensis n. sp.

- Aedeagus slender; genital paraphyses, if
enlarged, only on outer fourth - - - 63

63.(62) Less than five and one-half mm. in length -

- - - - - - - 68. graneticus (Ball)

- More than five and one-half mm. in length -

- - - - - - - 69. canus n. sp.
64. (54) Crown at least two and one-half times as long as width in female; twice as long as width in male, very slender; crown mottled, with three to five distinct lines — — — 65
- Crown not as above — — — — — — — — — — 66
65. (64) Plates truncate, aedeagus long — — — — — — — — — — 70. trilineatus (Ball)
- Plates pointed, aedeagus — — — — — — — — — —
- 71. trilineatus s. sp. spicatus n. sub. sp.
66. (64) Less than four mm. in length; face lighter on disc of clypeus than on genae — — — — — — — — — — — 72. abbreviatus (DeLong)
- More than four mm. in length; face about same color throughout — — — — — — — — — — — 73. triangularis DeLong
11. Scaphytopius (Cloanthanus) nigricollis (Ball)

Resembles torridus but yellow with a dark crown and mottled face. Length: male 3.5 mm., female 4 mm.

Color: Crown yellow and brown mottled, area next pronotum, apical wedge and a spot on each side, light. Sometimes the dark is somewhat reduced. Pronotum and scutellum bright yellow with sometimes a few scattered dark spots. Face yellow and brown mottled, sharksmouth small, vitta behind eye, distinct. Forewings semi-hyaline white to yellow, usually with small dark dots throughout; veins yellow, usually darker at apex and along costal margin.

Structural characteristics: Crown only slightly longer than width between eyes, almost parallel-margined in male, more produced in female. Pronotum about as long as crown, two and one-half times as wide as length at middle and five times as wide as length behind eyes. Clypeus about twice as long as width at ocelli, only slightly broader at base than at antennae. Face distinctly convex in lateral view. Forewing with venation typical; about nine recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin somewhat convex on each side of a rounded apex; anterior margin with a broad, rather flat,
median lobe. Plates slender. Aedeagus "J"-shaped, with dorsal portion quite broad and about two-thirds as long as shaft, which is slender and with a pair of short, anterio-dorsally projecting, sharply pointed processes; base short. Styles about four times as long as basal width, sinuate at middle, only slightly lobed on outer margin before short, curved, finger-like apical process.

Last ventral segment of female about one and two-thirds times as wide as length at middle, lateral margins straight and slightly converging, posterior margin straight to slightly concave on each side of a prominent median lobe, notched at middle.

Types: Lectotype female, Mojave, California, July 30, 1912, lectoallotype male, St. George, Utah, E. D. Ball here designated, in the National Museum, Washington, D. C.

Material studied: (Utah) St. George (Arizona) Vail, Tuscon, Congress Junction, Alamo, Yarnell, Black Mountains, Santa Rita Mountains, Chiricahua Mountains, Empire Mountains, Mt. Graham. (New Mexico) Alamogordo, Rodeo, Socorro Co. (Texas) Presidio Co., Ft. Stockton, 65 miles south of Marathon.

Host plants: Ball (1932) writes "—found as nymphs and adults on the creosote bush (Larrea tridentata) in southern Utah and Arizona."
Comparative notes: In some specimens the dark dots are absent, only the crown being colored. This species might possibly be confused with a male nigriviridis, but is much broader, with a shorter crown and more dark on the crown.

Nigricollis was made genotype for the genus Convelinus, but there is no good structural difference to separate it from other Cloanthanus. In fact, castranus, mentioned by Dr. Bell as being in Convelinus, has genital structures like typical Cloanthanus, with paraphyses. Although nigricollis and torridus have similar genital structures and feed on the same host plant, no evidence of hybridization has been noted.

12. Scaphytopius (Cloanthanus) torridus (Ball)


Resembles nigricollis but dark fulvus to reddish-brown with different pattern on crown. Length: female 3.5 mm., male 3.2 mm.

Color: Crown usually tan and white mottled; spot on posterior margin next each eye, line on each side median suture broadest at base, irregular band before eye, and small apical wedge, light. Pronotum about same color as crown, sometimes a series of white marks along anterior
margin. Scutellum same color as crown, with typical light markings at least indicated. Face mottled brown and fulvus, lightest on loriæ; small sharkamouth and light vitta behind eye, distinct. Some specimens are mottled brown and red.

**Structural characteristics:** Crown about as long as width between eyes in male, slightly longer in female; wedge very short. Pronotum only slightly shorter than crown, about two and one-half times as broad as length at middle, five times as broad as length behind eyes. Clypeus about twice as long as width at ocelli; only slightly sinuate at antennae. Clypellus stout, only slightly enlarged at apex. Forewing with typical venation, seven or eight indistinct, recurved veins to costa.

**Genitalia:** Valve about as long as greatest width, posterior margin somewhat convex on each side of a bluntly pointed apex; anterior margin with a broad, short median lobe. Plates slender. Aedeagus "J"-shaped with dorsal portion quite broad and about two-thirds as long as shaft, which is slender and a pair of dorso-anteriorly projecting, short, apical processes; base short. Styles about four times as long as greatest width, almost parallel-marginened to finger-like apical process.

Last ventral segment of female almost twice as wide as length at middle, lateral margins slightly convex,
posterior margin distinctly convex.

Types: Lectotype female, Calexico, California, June 18, 1909, R. D. Ball hereby designated, in the
National Museum, Washington, D. C. Allotype male, Big
Bear Lake, California, July 26, 1932, R. H. Beamer here
designated, in the Francis Huntington Snow Entomological
Collection, University of Kansas, Lawrence, Kansas.
Parallotype males as follows: (Utah) 2, St. George,
Sept. 8, 1930, R. W. Davis; 1, "Dixie", Utah, Aug. 8, 1916,
E. D. Ball. (Arizona) 2, Black Mts., July 13, 1932, R. H.
Beamer; 1, Cochise, Aug. 24, 1935, R. H. Beamer; 1, Pima
Co., July 27, 1927, R. H. Beamer; 1, Littlefield, Sept. 10,
1930, 1, June 7, 1931, R. W. Davis; 1, Yuma, Aug. 25, 1929,
1, Oct. 30, 1931, 2, Nov. 1, 1931, E. D. Ball; 4, Tuscon,
May 31, 1929, 1, July 24, 1930, R. D. Ball; 1, Gila Bend,
June 8, 1931; 2, Mohawk, Oct. 29, 1931; 1, Wickenburg,
May 31, 1935 P. W. Oman; 1, Ajo Mts., April 20, 1935, 4,
July 22, 1937, E. D. Ball; 2, Empire Mts., Aug. 18, 1935,
E. D. Ball; 1, Congress Jct., Aug. 27, 1935, E. D. Ball;
3, Congress Jct., June 14, 1937, D. J. and J. N. Knall;
1, Santa Rita Mts., June 8, 1937, D. J. and J. N. Knall.
(California) 1, Ontario, June 12, 1908; 1, San Diego Co.,
Coquillet; 3, Jacumba, Aug. 12, 1935, R. H. Beamer; 7,
Kelso, June 9, 1908, E. D. Ball; 1, Palm Spgs., Sept. 2,
Hubbard; 2, Holtville, June 1, 1935, P. W. Oman; 1, Indio,
June 4, 1935, P. W. Oman; 2, Barstow, June 1, 1935,
P. W. Oman; 1, El Centro, June 1, 1935, P. W. Oman;
1, Jacumba, May 18, 1941, D. J. and J. N. Knutti. (Nevada)
2, Las Vegas, March 7, 1934, I, April 28, 1934, E. W.
Davis.

Host plants: Ball (1932) writes "confined to
the creosote bush." The author has examined specimens
collected from Larrea tridentata, Larrea mexicana and
Covillea tridentata, possibly different names for the
creosote bush.

Comparative notes: Unlike nigricollis, this
species is about the same color throughout. It varies
considerably both in size and color. It was originally
described as a variety of brevis, a Jamaica species, but
apparently differs considerably from that species.

13. Scaphytopius (Cloanthanus) desertanus (Ball)
Nasutoideus desertanus, Ball, E. D., Can. Ent., LXIII,

Resembles heldoranus, but with irregular black
markings between anterior part of eyes, forming a dark,
incomplete band; without genital paraphyses. Length:
female, 3.5 mm., male 3.3 mm.

Color: Crown white except for irregular black
markings around wedge, irregular black markings inside
anterior margin of each eye and usually two to four lines
connecting these two dark areas. Pronotum milky semi-hyaline, sparsely marked with dark dots, vittae usually faintly indicated. Scutellum white to fulvus with usually a few dark vermiculations on basal half. Face ivory with a few dark dots or vermiculations in area of small shark-mouth and along lateral margin; apex of clypellus dark. Forewing milky transluscent with sparsely-spaced fuscous dots, especially along veins; apical cells clouded; veins in costa dark.

Structural characteristics: Crown almost twice as long as width between eyes in female, shorter in male, anterior margin somewhat convex on each side of a bluntly pointed apex. Pronotum two-thirds as long as crown in female, three-fourths as long in male; about two and one-half times as wide as length at middle, slightly over four times as wide as length behind eyes. Clypeus about twice as long as width at ocelli in male, slightly longer in female, only slightly sinuate near antennae. Face convex in lateral view. Forewing with venation typical and about nine or ten recurved veins to costa.

Genitalia: Valve about two-thirds as long as greatest width, posterior margin rounded; anterior margin with broad, short, median lobe. Aedeagus "J"-shaped, dorsal part broadest, shaft narrowed and slightly curved to a pair of small, apical processes. Styles only slightly over twice as long as basal width, outer margin with
distinct lobe before laterally projecting, finger-like apical processes.

Last ventral segment of female about twice as wide as length at middle, latero-posterior margin rounded, without median lobe or notch.


Additional material studied: (Arizona) Wickenburg, Sentinel, Coolidge Dam, Granite Dell, Glenn Oaks, Apache Junction, Phoenix, Littlefield. One specimen collected by Dr. Ball at Brownsville, Texas, on the same pin with a specimen of castranus may be mislabeled, as no other specimens have been seen from east of Arizona.

Host plants: Dr. Ball (1932) writes "--found breeding abundantly on the gray bur sage (Franseria deltoides) in Arizona."

Comparative notes: This small gray species is easily recognized by its small size and color. It can be easily separated from heldoranus by the dark irrorate area at apex of crown, whereby heldoranus has a solid black area at apex of crown.

14. Scaphytopius (Cloanthanus) irroratus (Van Duzee)

Resembles loricatus, but with dark face and with aedeagus produced on dorsal margin. Length: female, 4 mm., male, 3.6 mm.

**Color:** Crown mottled brown and light with light markings as follows: wedge, thin line along anterior margin; three pairs of elongate spots forming an incomplete band before eyes, and two pairs of spots on posterior margin, one pair next median suture (often joined to median spots of band before eyes) and one next each eye. Pronotum about same color as crown, light vittae usually at least faintly indicated. Scutellum fulvus to brown with typical light markings. Face of male fulvus with brown to fuscus markings throughout, darkest on lateral margins of genae, lightest in area next loreae and broad line behind eye; sharksmouth small but usually distinct. Face of female usually lighter. Forewing brown to fuscus, veins and irrorations darker at apex and costal area opposite apex of clavus. Often the fulvus coloration is lacking and forewing is merely white with dark markings.

**Structural characteristics:** Crown about as long as width between eyes in male, longer in female, margins slightly convex to a dull point in male, margins more convex in female; wedge one-third to one-fourth as long as crown. Pronotum about three-fourths as long as crown, about two and one-half times as broad as length at middle. Clypeus over twice as long as width at ooelli, only
slightly sinuate at antennae. Forewing with eleven or twelve recurved veins to costa.

**Genitalia:** Valve about three-fourths as long as greatest width, posterior margin somewhat convex on each side to a bluntly pointed apex; anterior margin concave on each side of a relatively narrow median lobe. Plates broadest near base, apices relatively short and slender. Aedeagus roughly "U" shaped with a broad process and smaller shaft, slightly narrowed to apex with a pair of dorsal apical processes; base shorter than shaft. Styles distinctly less than twice as long as greatest width, narrowest near middle, large lobe on outer margin before finger-like apical process.

Last ventral segment of female somewhat over half as long as greatest width, latero-posterior margin rounded.

**Types:** Lectotype male, Ti Juana, Mexico, June 15, 1908, lectoallotype female, San Diego, California, June 16, 1908, E. D. Ball, hereby designated, in the National Museum, Washington, D. C. These were on hand for study.

**Additional material studied:** (California) Irvine Hills, Orange Co., San Diego Co., Anaheim, Sunset Beach, Bonsall, La Jolla, Monrovia, Alpine, Laguna Beach, Otay, Lemon Cove, Escondido, Quatay, Lakeside, Los Angeles, Riverside, Pasadena, Santa Barbara, Oxnard, Ontario, Redding, Santa Monica. (Arizona) Tuscon, Phoenix, Patagonia,

**Host plants:** A large series was collected at Bonsall, California by R. H. Beamer on *Ambrosia* sp. Other collection data give *Eysenhardtia texana* at Sanderson, Texas, peach foliage at El Paso and Bexar Co., Texas, *Amaranthus* sp. in Bexar Co., Texas, and adults and nymphs on *Hetero theca subaxillaris* in Bexar County. The large series from *Ambrosia* in California and the presence of nymphs on *H. subaxillaris* in Texas would suggest one of these two plants as the normal host.

**Comparative notes:** As might be expected from its wide distribution, this species varies considerably both in color and size. Color varies from fulvus to dark gray, with the entire dorsum about the same color; the face varies from total infuscation to markings only along the lateral margins. The small size and usually dark face will separate it from most species found along the southern part.
of the United States from California to Texas, where it is one of the most common species of the genus.

15. Scaphy. (Cloanthanus) irroratus s. sp. xanthanus (Ball)


Resembles irroratus but light in color, larger and with a blunter crown. Length: female, 4.2 mm., male, 4 mm.

Color: Crown fulvus with light markings as follows: wedge, narrow line along anterior margin, two pairs of large, rather elongate spots on each side before eye; a long, broad line from near wedge to base on each side of median suture and a small spot on posterior margin next each eye. Pronotum lighter than crown, vittae usually faintly visible. Scutellum ivory to fulvus with typical light markings usually evident, especially in male. Face of male pale fulvus with brown irrorations, especially behind eyes and on basal half of clypeus, lighter in female; sharksmouth and line behind eye usually distinct. Forewing semihyaline pale fulvus with large Milky aeroles throughout, usually a few brown dots scattered throughout; veins darkest on posterior and costal margins.

Structural characteristics: Crown about one and two-thirds times as long as width between eyes, anterior margin convex on each side of a blunt apex, less convex
and more pointed in the female; wedge short. Pronotum somewhat shorter than crown; about two and one-half times as wide as length at middle and about four and one-half times as wide as length behind eyes. Clypeus somewhat over twice as long as width at ocelli, only slightly sinuate near antennae. Clypellus relatively slender and broadest near apex. Face in lateral view slightly convex. Forewing with venation typical and nine or ten recurved veins to costa.

Genitalia: Valve about two-thirds as long as greatest width, posterior margin broadly rounded, very broad at middle; anterior margin distinctly concave on each side of a rounded median lobe. Plates relatively narrow. Aedeagus "j" shaped with dorsal portion slightly largest, shaft slender, almost parallel-margined to apex, which bears a pair of slender dorsal processes and smaller, spine-like dorsal processes; base short. Styles less than twice as long as greatest width, narrowest on basal third, broadly lobed on median third before an apical, finger-like process.

Last ventral segment of female almost twice as wide as length at middle, latero-posterior margin almost evenly rounded.


Host plants: Ball (1932) writes "--exclusively on the bur sage (Franseria ambrosioides) in Arizona."

Comparative notes: This species resembles nogalinus rather closely, but may be separated by its lighter color, slightly larger size and longer crown.

16. Scaphy. (Clecanthenus) irroratus s. sp. nogalinus (Ball)


Resembles irroratus but larger, lighter in color and with a shorter crown. Length: female, 4 mm., male, 3.8 mm.

Color: Crown fulvus irrorate with light, with white markings as follows: narrow line along anterior margin, wedge, two or three pairs of elongate dots in an area around wedge, two pairs of dots on posterior margin, a small pair next eyes and a longer pair near median suture. Pronotum fulvus with dark dots, milky vittae usually distinct. Scutellum yellow to fulvus with typical ivory markings. Face ivory to fulvus with brown irrorations, usually lightest in area of clypellus and lorae; sharks-mouth and vitta behind eye distinct. Forewing semihyaline, pale fulvus with large milky aeroles throughout, veins dark, especially in costal area.
Structural characteristics: Crown over two-thirds as wide as length at middle, almost parallel-margined in male, longer in female; wedge short. Pronotum almost as long as crown, about two and one-half times as wide as length at middle and four times as wide as length behind eyes. Clypeus slightly over twice as long as width at ocelli, only slightly sinuate at antennae. Clypellus relatively slender and only slightly enlarged at apex. Forewing with several vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve slightly less than two-thirds as long as greatest width, posterior margin rounded; anterior margin with long median lobe. Plates broadest near base, narrow on outer half. Aedeagus "U" shaped, base slender, dorsal part broadest, shaft curved, with a pair of erect apical processes from dorsal margin. Styles slightly less than twice as long as greatest width, sinuate near middle, lobed on outer margin just before outward projecting, finger-like apical process.

Last ventral segment of female about half as long as greatest width, latero-posterior margin rounded.


Host plants: Bell (1932) writes "...beaten in small numbers from oaks on the lower slopes of the mountains in southern Arizona. The small numbers and lack of nymphs would suggest that the adults may have flown up from some plant growing beneath the trees."

Comparative notes: This species is easily recognized by its short, light crown and dark face.

17. Scaphytopius (Cloanthanus) albifrons n. sp.

Resembles loricatus but smaller, lighter in color, and with long processes at apex of aedeagus.

Length: female, 4.1 mm., male, 3.9 mm.

Color: Crown mottled brown with light markings as follows: wedge, narrow line along anterior margin, three pairs of spots before eyes, the outer largest and the inner long and slender; two pairs of spots along posterior margin, a large pair next median suture and another pair behind eyes. Pronotum fulvus semihyaline with fuscus dots throughout except for distinct vittae. Scutellum yellow to dark fulvus with typical markings light. Face ivory to yellow with sometimes a few brown marks in area of sharksmouth and dots along lateral margins
of genae, especially behind eyes; apex of clypellus black. Strangely enough, the dark specimens from Florida lack all facial color except black tip of clypellus. Specimens collected in Texas in the winter usually have the facial markings. Forewing fulvus semihyaline with brown veins and large milky aeroles throughout. In most specimens from Florida, the fulvus is replaced by brown to black.

**Structural characteristics:** Crown one and two-thirds as long as width between eyes in female, somewhat shorter in male, slightly convex on outer margins, rather sharp-pointed at apex, especially in female. Pronotum about three-fifths as long as crown in female, slightly longer in male, almost three times as wide as length at middle and four times length behind eye. Clypeus over twice as long as width at ocelli, lateral margin broadly concave near middle. Clypellus broadest near apex. Face in lateral view slightly concave between anterior margin of eyes. Forewing with outer claval vein approaching second claval vein at cross-vein, usually numerous vein-like markings in brachial cell; about ten recurved veins to costa.

**Genitalia:** Valve almost as long as greatest width, posterior margin rounded; anterior margin narrowed to a broadly rounded lobe at middle. Plates wide near base, apical portion relatively short and slender. Aedeagus "J" shaped, shaft longer than base, broadly curved, almost
parallel-margined with a pair of long slender, apical processes, almost two-thirds as long as shaft. Styles about twice as long as greatest width, outer margin concave on basal third, small lobe before finger-like process on apical third.

Last ventral segment of female slightly less than twice as wide as length at middle, lateral margins slightly convex, posterior margin evenly produced, but only slightly longer at middle than at sides.

**Types:** Holotype male, allotype female, 24 female and 9 male paratypes, Brownsville, Texas, Dec. 27, 1945, R. H. Beamer, in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas. Additional paratypes as follows: (Texas) 1 female, 3 male, Brownsville, Jan. 2, 1932, 1 male, Jan. 3, 1932, R. D. Ball; 7 female, 8 male, Brownsville, May 31, 1933, P. W. Oman; 11 female, Brownsville, Dec. 29, 1945, (in palm forest), R. H. Beamer; 1 male, Brownsville, Aug. 8, 1937, D. J. and J. N. Knoll; 1 male, Hidalgo, July 30, 1938, 19 female, 1 male, Dec. 28, 1945, R. H. Beamer; 1 female, Hidalgo, July 28, 1928, A. M. James; 2 female, 1 male, Cameron Co., Aug. 3, 1928, R. H. Beamer. (Florida) 1 female, La Belle, July 16, 1939, R. H. Beamer; 1 female, La Belle, July 16, 1939, P. E. Lawson; 2 female, La Belle, July 16, 1939, P. W. Oman; 1 male, April 21, 1921, D. M. DeLong; 2 male, 1 female, Wakulla, July 10,
1939, R. H. Beamer; 1 male, Fruitland, Aug. 11, 1930, R. H. Beamer; 1 male, Likely, July 24, 1934, R. H. Beamer; 2 male, Sanford, Nov. 18, 1926, 1 male, June 22, 1926, E. D. Ball; 1 pr., Miami Beach, Sept. 10, 1938, P. W. Oman; 2 male, Miami, April 1, 1921, D. M. DeLong; 1 female, Paradise Key, April 8, 1921, D. M. DeLong; 1 male, Naples, Oct. 8, 1938, P. W. Oman; 1 male, Naples, May 14, 1928, E. D. Ball; 1 male, 4 female, Tampa, Oct. 17, 1925, E. D. Ball; 1 male, Homestead, May 16, 1926, E. D. Ball; 1 female, Coco, May 5, 1926, E. D. Ball.

**Host plants:** No host plant is known.

**Comparative notes:** This is apparently the only species in Florida in which the face is entirely light. In Texas, however, this species is easily confused with *loricatus* and *pennatus* but the male genitalia easily separate them. *Albifrons* was described by DeLong (1943) as *loricatus* but that species, described from California, extends only into Texas, and this species, distinctly different, is also found in Florida.

18. *Scaphytopius* (Cloanthanus) *loricatus* (Van Duzee)


Resembles *frontalis*, but more slender, with a sharper crown, face with few or no dark markings and without
genital paraphyses in the male. Length: female, 4.5 mm, male, 4 mm.

**Color:** Crown brown with light markings as follows: wedge, a thin line along anterior margin, two pairs of slender marks before eyes and a line on each side of median suture joining or almost joining a pair of spots at base next median suture; a spot on posterior margin next each eye. Pronotum irrorate with brown, slightly darker than crown, with pale vittae distinct. Scutellum yellow to brown with typical light markings. Face yellow to light fulvus, much lighter than adjoining area of venter, sometimes a few indistinct darker markings in area of sharksmouth and at apex; line behind eye sometimes faintly indicated; apex of clypellus dark. Forewing brown to fuscus with milky aeroles throughout, especially in costal cell.

**Structural characteristics:** Crown in male about one and two-thirds times as long as width between eyes, slightly longer in female, almost straight on each side of a rather blunt apex. Pronotum about three-fourths as long as crown, about two and one-half times as wide as length at middle and about three and one-half times as wide as length behind eyes. Clypeus slightly over twice as long as width at ocelli, narrowing evenly to clypellus on apical three-fourths; clypellus broadest near apex. Face almost straight in lateral view, sometimes slightly concave between
anterior margin of eyes in female. Forewing venation typical, a few marks in brachial cell and about ten recurved veins to costa.

**Genitalia:** Valve over two-thirds as long as greatest width, posterior margin broadly rounded; anterior margin concave on each side of a truncate median process. Aedeagus "J" shaped, shaft almost as long as plates, parallel-margined to abrupt curved portion on apical two-fifths, then narrowed to a pair of erect processes on ventral side and a much shorter process on dorsal side; base short. Styles less than twice as long as greatest width, evenly narrowed from base to middle, distinct lobe on outer margin before outwardly-projecting, bluntly pointed, apical process.

Last ventral segment of female about one and one-half times as wide as length at middle, posterior margin broadly convex without lobes or notches.

**Types:** Lectotype male, California, Coquillet, hereby designated, in the Iowa State College collection, Ames, Iowa. Allotype female, Brea, California, July 29, 1935, R. H. Beamer, hereby designated in the Francis Huntington Snow Entomological Museum, University of Kansas, Lawrence, Kansas. Parallotypes as follows: (California) 1, Alpine, July 9, 1929, R. H. Beamer; 1, Lompoc, Aug. 7, 1938, R. I. Sailer; 4, Laguna Beach, Orange Co., Aug. 10, 1931, Billie Moore; 1, San Diego Co., July 4, 1929, R. H.

Additional material studied: Numerous points in southern Texas.

Host plants: Ball writes (1932) "...a few nymphs and many adults were taken on the Water-Wally (Baccharis glutinosa) which grows so abundantly in the washes in Arizona." Other records on specimens examined were white clover at Tuscon, Arizona, peach foliage in Bexar Co., Texas, Amaranthus sp. in Bexar Co., Texas, and Willow from Tuscon, Arizona.
Comparative notes: This species varies considerably in color—from almost black in southern California to light brown in southern Texas. In some few cases the face becomes reddish and it resembles irroratus somewhat, but the darkness of irroratus is due to dark dots—that of loricatus is a cloudiness. In Texas this species resembles albifrons but can be easily separated by the male genitalia.

One male co-type of irroratus, with a reddish face, collected at Tia Juana, Mexico, June 15, 1908, proved to be this species. Dr. Ball had already realized this and has so placed it in his collection. Osborn (1921) in listing loricatus from Florida was evidently referring to albifrons.

19. Scaphytopius (Cloanthanus) pennatus n. sp.

Resembles loricatus but slightly smaller, larger markings on crown and wing-like processes at apex of aedeagus. Length: female, 4 mm., male, 3.6 mm.

Color: Crown dark brown to fuscus, except for light markings as follows: narrow line along anterior margin, wedge, two pairs of large spots forming an incomplete band before eyes, a pair of large spots at base next median suture and a smaller pair next eyes. Pronotum same color as crown with vittae usually distinct. Scutellum yellow to brown with typical light markings usually distinct. Face yellow with a few dark spots along lateral margins of
genae and in area of shark's mouth; vitta behind eye sometimes faintly indicated. Face broadly convex in lateral view, except for slight concavity between anterior margin of eyes. Forewing semi-hyaline fulvus with brown veins and irroration throughout, except for light aerole.

**Structural characteristics:** Crown about one and two-thirds as long as width between eyes, slightly convex on each side of a bluntly pointed apex. Pronotum less than three-fourths as long as crown, about three times as wide as length at middle. Clypeus about twice as long as width at ocelli, margins slightly concave near base of antennae. Forewing with typical venation in clavus, several vein-like marks in brachial cell and about ten recurved veins to costa.

**Genitalia:** Valve almost as long as greatest width, posterior margin rounding to a blunt point; anterior margin concave on each side of a broad, rounded median lobe. Plate relatively broad near base, apical portion relatively short and slender. Aedeagus roughly "L" shaped, shaft almost parallel-margined to a pair of wing-like processes at apex; base almost as long as shaft. Styles about twice as long as greatest width, almost parallel-margined to lobe on outer margin before finger-like process on apical third.

Last ventral segment of female slightly less than twice as wide as length at middle, lateral margins
slightly convex; posterior margin slightly produced to a broad, oval median lobe.


**Host plant:** No host plant is known.

**Comparative notes:** This species is apparently restricted to southern Texas. It is nearest *loricatus*, but has more distinct spots on crown and wing-like processes at apex of aedeagus.

20. *Scaphytopius* (*Cleothanmus*) *flavifrons* n. sp.

Resembles *pennatus* but broader and with longer apical processes at apex of aedeagus. Length: female, 4 mm., male, 3.8 mm.

**Color:** Crown dark brown with light marks as follows: wedge, two spots on each side of wedge along
anterior margin, the one nearest eye smallest; a spot on each side of median suture on disc; on posterior margin a large spot on each side of median suture and a smaller one next each eye. Pronotum light brown with many fuscus dots throughout; typical light vittae indicated. Scutellum ivory to yellow with dark color restricted primarily to basal half. Face bright yellow, sometimes flecked on clypeus and outer margins of genae; much lighter than venter. Forewings translucent brown and white, the white primarily restricted to aeroles in the male; darkest on outer antepapical cell and adjacent area of costa.

**Structural characteristics:** Crown about one and one-half times as long as width between eyes, margins convex on each side of rounded apex. Pronotum about three-fourths length of crown, about two and one-half times as wide as length at middle and four and one-half times length behind eyes. Clypeus about twice as long as width at ocelli, slightly sinuate at antennae. Clypellus broadest near apex. Face distinctly convex in lateral view. Forewing with ten to twelve recurved veins to costa and often extra cross veins in clavus.

**Genitalia:** Valve about as long as greatest width, posterior margin distinctly convex on each side of bluntly-pointed apex; anterior margin with long, slender, median lobe. Aedeagus roughly "L" shaped, dorsal part broadest but slightly shortest, shaft slightly curved near.
base, a pair of pointed apical processes, each about
two-fifths length of shaft. Styles about two and one-
half times basal width, distinct lobe on outer margin
before outwardly projecting, finger-like, apical process.

Last ventral segment of female about twice as
wide as length at middle, lateral margins convex;
posterior margin convex, slightly lobed at middle.

Types: Holotype male, Brownsville, Texas,
May 25, 1939, D. J. and J. N. Knoll, in the Knoll
Collection, Ohio State University, Columbus, Ohio.
Allotype female, Brownsville, Texas, Dec. 29, 1945, R.
H. Beamer, in the Francis Huntington Snow Entomological
Collection, University of Kansas, Lawrence, Kansas.
One female paratype, Cameron Co., Texas, Aug. 3, 1938,
R. H. Beamer.

Host plant: No host plant is known.

Comparative notes: This species is apparently
restricted to the extreme southern part of Texas and is
relatively rare. Its broadness and distinct genitalia
separate it from any other species in the area.

21. *Scaphytopius* (Cloanthanus) *anisacanus* (Ball)

*Neautoideus anisacanus*, Ball, E. D., Can. Ent., LXIII,
p. 222, Sept., 1931.

Resembles *loricatus* but larger, with a different
pattern on crown and with long aedeagus and small paraphyses. Length: female, 4.5 mm., male, 4.5 mm.

Color: Crown with area between eyes ivory with brown irrorations, irregular brown markings around wedge and usually dark lines connecting these two dark areas; this leaves a more or less complete light band before the eyes and the remainder of crown consisting primarily of alternating thin light and dark irregular lines. Pronotum milky with fuscus irrorations excepting typical light lines. Scutellum brown with typical light markings. Face creamy yellow with apex of clypellus black and sometimes light markings on clypeus and a few marks behind eye.

Structural characteristics: Crown about one and two-third times as long as width between eyes, slightly concave on disc, margins slightly convex to a bluntly-pointed apex. Pronotum almost three-fourths as long as crown, two and one-half times as wide as length at middle and about four and one-half times length behind eye. Clypeus over twice as long as width at ocelli, slightly sinuate near base of antennae. Clypellus broadest near apex. Face almost straight in lateral view. Forewing with vein-like markings in brachial cell, about eleven recurved veins to costa.

Genitalia: Valve almost as long as greatest width, oval on posterior margin with a small apical lobe;
anterior margin somewhat concave on each side of median lobe. Paraphysis small and short, much shorter than shaft of aedeagus. Shaft of aedeagus about as long as plates, evenly narrowed to sharp curve near outer third; apical third almost parallel-margined to a pair of small, slender apical processes. Styles over twice as long as greatest width, narrowest near middle, broadly rounded on outer margin to a short, outwardly projecting apical process.

Last ventral segment of female slightly less than twice as wide as length at middle, lateral margins slightly convex; posterior margin lobed on each side and small lobes on each side of a small median notch.


Additional material studied: Babaquivari Mts., Arizona.

Host plants: Ball (1932) writes "-types together with the nymphs were taken on the mint-like plant (Anisacanthus thurberi) near Tuscon, Arizona."

Comparative notes: This is a relatively large species, almost covered with vermiculations. The long, curved aedeagus with tiny paraphyses is distinct and unlike any other species.
22. *Scaphytopius (Cloanthanus) contractus* n. sp.

Resembles *loricatus*, but lighter in color, shorter crown and small paraphyses. Length: female, 4.1 mm., male, 3.8 mm.

**Color:** Crown white with an irregular, broad band across middle and a few thin lines on each side of wedge, yellow to brown. Pronotum a dark greenish-fulvus with light vittae distinct and sometimes irregularly bordered with dark dots. Scutellum same color as pronotum, or slightly lighter, with light markings distinct. Face yellow, narrow white line along margin between ocelli; slightly tawny behind eye, except for short, faint vitta; apex of clypellus black.

**Structural characteristics:** Crown about one and two-third times as long as width between eyes, lateral margins convex on each side of a bluntly pointed apex. Pronotum only slightly shorter than crown, two and one-half times as wide as length at middle and five times as wide as length behind eyes. Clypeus about twice as long as width between ocelli and, except for slightly sinuate at antennae, evenly narrowed to clypellus. Face convex in lateral view. Forewings with vein-like markings in brachial cell and about ten recurved veins to costa.

**Genitalia:** Valve almost as long as greatest width, posterior margin oval; anterior margin concave on each side of a blunt, narrow, median lobe. Plates
relatively slender, broadest on basal third. Small, short paraphyses, barely extending to apex of valve. Aedeagus almost parallel-margined throughout, consisting of a basal, stem-like part, a short, simple, slightly curved shaft and an apical part about as long as basal part but curved at a right angle on middle. Styles somewhat over twice as long as basal width, "dog-legged" and almost parallel-margined on middle, slightly lobed on outer margin at apical fourth before finger-like apical process.

Last ventral segment of female slightly less than twice as wide as length at middle, lateral margins slightly concave, posterior margin produced at middle with a very shallow median notch.

Types: Holotype male, allotype female, and 1 female paratype, Brownsville, Texas, June 29, 1938, R. H. Beamer, in the Francis Huntington Snow Entomological Museum, University of Kansas, Lawrence, Kansas. One other male paratype, Brownsville, Texas, June 29, 1938, L. W. Hepner.

Host plants: The host plant is not known.

Comparative notes: This species, evidently restricted to southern Texas, is quite distinctive with its yellow face and short aedeagus with short, small genital paraphyses.
23. **Scaphytopius (Cloanthanus) brunneus n. sp.**

Resembles *loricatus* but lighter, darker on lateral margins of face and with small genital paraphyses. Length: female, 4 mm., male, 3.7 mm.

**Color:** Crown brown with light markings as follows: narrow line along anterior margin; wedge and a pair of oblique lines on each side; three pairs of markings on a band before eyes, the median pair longest; two pairs of spots on posterior margin, one next each eye and one on each side of median suture, the median pair often split anteriorly. Pronotum about same color as crown with typical vittae evident. Scutellum brown with typical light markings. Clypeus, lorumae and clypellus yellow to fulvus with white sharksmouth; irregular area along margin between eyes and irregular light markings in area of sharksmouth, brown; apex of clypellus dark. Gena with numerous dark irrorations, vitta behind eye irregular but distinct. Forewing semihyaline fulvus with milky aeroles and brown irrorations; veins brown, becoming fuscus on apex and costa.

**Structural characteristics:** Crown about one and one-third times as long as width between eyes, longer in female, anterior margin almost straight on each side of a blunt apex; wedge about one-fourth length of crown. Pronotum about three-fourths as long as crown, shorter in female, about two and one-half times as wide as length at
middle and about four times as wide as length behind eyes. Clypeus over twice as long as width at ocelli, practically no constriction at antennae. Clypellus relatively slender and somewhat enlarged near apex. Face in lateral view almost straight in male, definitely concave between anterior margin of eyes in female. Forewing with several vein-like markings in brachial cell and eight or nine recurved veins to costa.

**Genitalia:** Valve somewhat shorter than greatest width; posterior margin convex on each side of a bluntly pointed apex; anterior margin with relatively long median lobe. Plates short and very broad near base. Aedeagus in lateral view, broad, roughly "U" shaped, dorsal part shortest, shaft broad and short, enlarged at apex. Paraphysis very small and short, hardly reaching to apex of shaft of aedeagus. Styles about three times as long as basal width, relatively large lobe on outer margin just before slender, finger-like apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margin convex, posterior margin with small lobe at each side and broad median lobe.

**Types:** Holotype male, allotype female, and a pair of paratypes, Paradise Key, Florida, April 9, 1921, D. M. DeLong, in the DeLong collection, Ohio State University, Columbus, Ohio. Additional paratypes as follows: 8 female, Key Largo, Florida, July 19, 1939, R. H. Beamer.
Host plants: No host plant is known.

Comparative notes: The only species with which this might be confused in southern Florida is *albifrons*, from which it might be separated by its marginal infuscation on face and small paraphyses.

24. *Scaphytopius* (Cloanthamus) *fuscifrons* (Van Duzee)


Resembling *frontalis*, but with shorter crown, face and crown entirely dark and with plates of male very short. Length: female, 4.5 mm., male, 4 mm.

Color: Crown fuscus and white mottled in male, lighter in female, usually darkest on each side of median suture. Pronotum same color as crown with irregular vitrea usually evident. Scutellum dark, orange spot near each basal corner, typical light markings distinct. Face in male fuscus with small white spots throughout, darkest on outer margin of genae, female usually lighter; sharks-mouth small in both; white vitta behind eye and two shorter vitta before eye, distinct. Forewing of male fuscus with semihyaline milky spots throughout, larger in costal area; female lighter, usually milky semihyaline
with brown veins, darkest in apical cells. Occasionally females are found which are the same color as the males but usually they are much lighter.

**Structural characteristics:** Crown about one and one-third times as long as shortest distance between eyes, wedge about one-third length of crown, anterior margin slightly convex on each side of a blunt apex. Pronotum over twice as wide as length at middle, about four-fifths as long as crown and four times as wide as length behind eyes. Clypeus less than twice as long as width between ocelli, only slightly narrowed, if at all, at antennae. Clypellus enlarged at both ends. Face convex in lateral view, more so in the male. Forewing with venation typical, about six vein-like marks in brachial cell, usually about ten recurved veins to costa.

**Genitalia:** Valve over three-fourths as long as greatest width, broadly oval on posterior margin; anterior margin broadly produced on median third. Plates truncate, extending only slightly beyond styles. Paraphysis broad, extending well beyond plates, apex spear-like. Aedeagus about as long as width at base, evenly narrowed to a flange-like, broadly-pointed apex. Styles over twice as long as basal width, slightly constricted on basal third, outer margin rounded to finger-like process on apical third. Last ventral segment of female almost three times as wide as length at middle, lateral margins convex,
posterior margin lobed on outer thirds, median third concave with relatively long, parallel-sided notch at middle.

Types: Lectotype male, lectoallotype female, (Arizona) in Iowa State College collection, Ames, Iowa, here designated, were on hand for study.


Host plants: Ball (1932) writes "apparently strictly confined to the buckbrush. The writer has taken it commonly in Utah and Arizona on Geraothus fedleri." One specimen was taken in 1938 by R. H. Beamer on Amorpha frutiosa in Huachucua Mts., Arizona, but this may have been merely resting there.

Comparative notes: Fusciifrons, with its two subspecies, are distinctly different from other species in the shape of the external genitalia. References of this species from east of the Rockies probably refer to migrifrons or magdalensis.
25. Scaphy. (Gloanthanus) fuscifrons s. sp. compactus (Ball)


 Resembles fuscifrons but with definite light band on crown before eyes. Length: female, 4.7 mm., male, 4.5 mm.

 Color: Crown black with yellow irrorations except for irregular light band before eyes, wedge, and a spot on posterior margin next each eye; often a pair of oblique light marks on base about half way between median suture and eyes. Pronotum milky semihyaline with heavy black irrorations, heaviest near posterior margin, lightest on anterior and lateral margins, often yellow area behind each eye; vittae obscure or faintly indicated near lateral margins. Scutellum with basal half brown with ivory or yellow spots in each corner and irregular spots throughout; apical half usually ivory to yellow with few dark markings, if any. The scutellum varies considerably, but is usually distinctly lighter than in fuscifrons. Forewing semihyaline white, with heavy black markings, especially on disc of outer anteapical cell and adjoining area of costa and in apical cells. Males are usually darker than females. The amount of black may vary from almost none in specimens from Colorado and Wyoming to almost entire in specimens from the mountains of California.
Face chocolate brown to black, lightest on lorae, with small, light dots throughout; short light vitta behind eye, one below ocellus and another at base of antennae; sharksmouth short but distinct; basal margin of clypeus narrowly lined with light.

**Structural characteristics:** Crown only slightly longer at middle than width between eyes; wedge about one-third as long as crown. Pronotum about three-fourths as long as crown, almost three times as wide as length at middle and four and one-half times length behind eyes. Clypeus about twice as long as width between ocelli, slightly sinuate near base of antennae. Clypellus widest near apex. Face convex in lateral view. Forewing venation often obscured by dark markings.

**Genitalia:** Valve about four-fifths as long as greatest width, broadly rounded on posterior margin; anterior margin slightly concave on each side of a slender median process. Plates short, evenly rounded on outer margins. Paraphysis more or less parallel-margined to a speak-like apex. Aedeagus about as long as basal width, apex flange-like and bluntly pointed. Styles reaching almost to apex of plates, about two and one-half times as long as greatest width, sinuate near basal third, broadly lobed on outer margin to a finger-like process on apical third, somewhat more slender than in fuscifrons.
Last ventral segment of female almost three
times as wide as greatest length, lateral margins convex,
posterior margin with deep, "V" shaped, median suture and
a small concavity on each side.

Types: Lectotype female, Dunsmuir, California,
Aug. 13, 1912, E. D. Ball hereby designated, in the
National Museum, Washington, D. C. Allotype male, Dunsmuir,
California, June 29, 1935, R. H. Beamer, here designated,
in the Francis Huntington Snow Entomological Collection,
University of Kansas, Lawrence, Kansas. Paratypes
males as follows: (Montana) 3, Haugan, Aug. 9, 1931, R. H.
Beamer; 2, Haugan, Aug. 9, 1931, John Nottingham.
(California) 2, Towie, Aug. 20, 1938, R. I. Sailer; 5,
Towie, Aug. 20, 1938, R. H. Beamer; 1, Echo, Aug. 10, 1940,
R. H. Beamer; 1, Yosemite National Park, Aug. 1, 1940,
R. H. Beamer. (Wyoming) 1, Grand Teton National Park,
Aug. 18, 1931, John Nottingham.

Host plants: Ball says (1932) "--taken by the
writer on a tall species of buckthorn (*Ceanothus sp*) in
northern California and has since been taken in small
numbers in the higher mountains of Arizona." However,
Ball may have confused this subspecies with the follow-
ing subspecies, which it resembles.

Comparative notes: This subspecies evidently
replaces *fuscifrons* at high altitudes.
26. Scaphy. (Cloeanthamus) fuscifrons sub sp. minutus n. sub sp.

Resembles compactus, but smaller, with basal area of crown light and with distinct light band across forewing. Length: female, 4 mm.; male, 4 mm.

Color: Crown brown except for ivory to yellow markings as follows: wedge, narrow area next pronotum, more or less distinct band before eyes, and narrow line along anterior margin. Pronotum brown irrorate with fulvus, more or less broad milky area along posterior margin; vittae very indistinct or absent, except near lateral margins. Scutellum ivory to yellow, large brown spot near each basal corner and sometimes indistinct irrorations between these. Face reddish-brown, approaching black on lateral margins of genae and near sharksmouth; small, light irrorations throughout, larger light spot along margin of genae next lower part of lora, on disc of loralsclerites and on disc of clypeus near apex; a light vitta behind eye, a shorter one near ocellus and another near base of antenna; sharksmouth small but distinct; basal margin light. Forewing milky semihyaline with black markings on basal half and in antepical and apical cells, leaving a distinct light band across second cross-vein and across apices of antepical cells, giving a distinct two-banded appearance, more distinct in males, which are usually slightly darker; veins dark throughout.
Structural characteristics: Crown about one and one-third times as long as width between eyes, margins slightly convex; wedge about one-fourth length of crown. Pronotum about three-fourths as long as crown, about three times as wide as length at middle and four and one-half times as wide as length behind eyes. Clypeus almost twice as long as distance between ocelli, only slightly sinuate, if any, at antennae. Clypellus widest near apex. Face convex in lateral view, although slightly concave between anterior margin of eyes. Forewing with claval veins joining or almost joining; eight or ten more or less distinct cross-vein like markings in brachial cell and about twelve recurved veins to costa.

Genitalia: Valve about four-fifths as long as greatest width, oval on median half of posterior margin, broadly truncate on median half of anterior margin. Plates short, bluntly pointed. Paraphysis only slightly broadened toward sharp apex. Aedeagus short, smallest at base, broadest just before blunt apex. Styles about two and one-half times as long as basal width, sinuate on basal fourth, slightly lobed on outer third to a parallel margined apical process.

Last ventral segment of female about three times as wide as greatest length; irregularly lobed on each side of a relatively long, parallel-margined median notch.
Types: Holotype male, allotype female, and 6
female and 7 male paratypes, Miami, Arizona, Aug. 6, 1941,
R. H. Beamer, in the Francis Huntington Snow Entomological
Collection, University of Kansas, Lawrence, Kansas.

Additional paratypes as follows: (Arizona) 1 male,
Yarnell Mts., Oct. 8, 1929, 1 female, July 21, 1929, E. D.
Ball; 4 female, 2 male, Pinal Mts., July 7, 1936, E. D.
Ball; 1 female, Santa Catalina Mts., July 30, 1930, E. D.
Ball; 1 male, Santa Rita Mts., June 16, 1933, P. W. Oman;
1 pair, Douglas, June 10, 1936, E. D. Ball; (Texas) 1
female, Concan, July 6, 1936, R. H. Beamer; 1 male, Chisos

Host plants: Ball's reference (1932) to compactus
in Arizona probably referred to this species, as some of his
specimens were labelled "Geonothus."

Comparative notes: The specimens from Texas are
somewhat smaller than those from Arizona, but appear to be
the same thing. It is easily separated from compactus by
its smaller size and more light color on crown and face.

27. Scaphytopius (Cleanthanus) dodonanus (Ball)

Nasutoidea dodonanus, Ball, E. D., Can. Ent., LXIII, p. 225,
Oct., 1931.

Resembling fulvus but with longer crown, western
in distribution, and with genital paraphyses united basally.
Length: female 4.2 mm., male 4 mm.

Color: Crown fulvous to brown with ivory markings as follows: wedge, three pairs of spots across crown in front of eyes, a pair of spots near median suture at base and a pair of small spots on posterior margin next eyes. Pronotum yellow-fulvous, vittae usually at least faintly evident. Scutellum yellow to orange with typical markings ivory. Face creamy-yellow throughout. Forewing fulvous semihyaline with a few scattered aeroles; veins concolorous except in apical cells and costa, where they are brown.

Structural characteristics: Crown about one and one-half times as long as width between eyes, bluntly pointed, wedge only about one-fifth length of crown. Pronotum about three-fourths as long as crown, about two and one-half times as wide as length at middle and about five times length behind eyes. Clypeus about twice as long as width at ocelli, more or less evenly narrowed to apex. Clypellus widest near apex. Face convex in lateral view except near apex, where it is slightly concave. Forewing with several vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve about as long as greatest width, rounded on posterior margin; concave on each side of median lobe on anterior margin. Plates slender, over twice as long as greatest width, broadest on basal fourth.
Physis loosely joined on basal third, broadest on apical third, constructed on apical fifth and enlarged again before sharp apex. Aedeagus inserted where paraphyses separate, roughly an inverted "T" shape, with ventral process short and stout, dorsal process longer and more slender and shaft slightly narrowing to a pair of erect processes at apex. Styles about three times as long as basal width, almost parallel-marginined on basal three-fourths, except for slight constriction near middle, slightly lobed on outer margin before outwardly-projecting, finger-like apical process.

Last ventral segment of female about twice as wide as length at middle, posterior margin straight and slightly narrower than at widest point.


Additional material for study: (Arizona) Sabino Canyon, Santa Catalina Mts., Santa Cruz River, Baboquavara Mts., La Osa River.

Host plants: Ball (1932) writes "Yellow nymps and brownish yellow adults were taken exclusively on the shrub Dodonaea viscosa var. angustifolia in Arizona."

Comparative notes: Some specimens are gray with darker veins and markings, especially in specimens collected
in October and November. The male genitalia are unlike any other species examined.

28. *Scaphytopius* (Cloananthus) *celticus* (Ball)


Somewhat resembling *anisacanu*s but smaller, lighter in color, with area of crown next pronotum with few or no markings and with distinctly different genitalia. Length: female 4.5 mm., male 4 mm.

Color: Crown white except for indistinct fuscus band between anterior part of eyes, area around wedge, a few lines on disc and usually a few small spots on posterior margin next eye. Pronotum milky semihyaline with scattered brown to fuscus dots, darkest along anterior and near posterior margin. Scutellum white to yellow, except for indistinct darker markings near apex and sometimes near each basal corner. Face ivory with brown vermiculations throughout; sharksmouth and vitta behind eye, distinct. Forewing milky semihyaline with numerous scattered fuscus vermiculations, usually dark area on costa and adjoining anterapical cell opposite apex of clavus. In some dark specimens, the vermiculations are fused to form large dark blotches throughout wing.
Structural characteristics: Crown about one and one-half times as long as width between eyes, margins slightly convex on each side of a blunt apex; wedge about one-fourth length of crown. Pronotum about three-fourths as long as crown at middle, about two and one-half times as wide as length at middle and about four and one-half times length behind eyes. Clypeus about twice as long as width between ocelli in female, slightly shorter in male, slightly sinuate near antennae. Clypellus largest near base. Face in lateral view almost straight in male, slightly concave between anterior margin of eyes in female. Forewing with venation typical with numerous markings in brachial cell and about ten recurved veins to costa.

Genitalia: Valve roughly triangular, posterior margin somewhat convex on each side of a bluntly pointed apex; anterior margin with a broad median lobe. Plates short, broad near base. Paraphyses joined on basal three-fourths, apical fourth slightly bulbed before a sharp apex. Aedeagus in lateral view with broad dorsal portion, shaft "J" shaped, almost parallel-margined, and with a pair of slender apical processes about as long as shaft; in ventral view, the apical processes extend laterally. Styles about two and one-half times as long as basal width, lobed on outer margin just before curved, outwardly projecting, finger-like apical processes.
Last ventral segment of female slightly more than half as long as greatest width, lateral margins slightly convex; posterior margin with small lobe near outer margin and a broad median lobe notched at middle.


Additional material on hand: (Arizona) Lewis Spgs., Santa Rita Mts., Sabino Canyon.

Host plants: Ball (1932) writes "strictly confined, both nymphs and adults, to the evergreen desert hackberry (Celtis pallida)."

Comparative notes: The distinctively marked crown and distinct male genitalia easily separate this species from any other.

29. Scaphytopius (Cloanthanus) californiensis n. sp.

Resembles irroratus but lighter, larger, with larger spots on crown, and with short genital paraphyses. Length: female 4.2 mm., male 3.8 mm.

Color: Crown with fuscus areas around wedge and between anterior part of eyes, remainder fulvus except for following light markings: wedge, thin line along anterior margin, three pairs of spots before eyes, the median pair greatly elongated and joining a pair of spots on posterior
margin next median suture. Pronotum semihyaline milky to fulvus with irrorations throughout, vitellae usually indicated. Scutellum orange with typical light markings usually lined with fuscus. Face fulvus with brown irrorations throughout, usually slightly darker along lateral margins and lightest on lorae; sharksmouth and vitta behind eye usually fairly distinct. Forewing semihyaline milky to pale fulvus with veins and numerous dots, forming aerolae throughout; dark area on costa and adjoining antepical cell.

Structural characteristics: Crown of male about one and one-half times as long as width between eyes, slightly longer in female; margins slightly convex in male, almost straight in female. Pronotum about three-fourths as long as crown, almost two and one-half times as wide as length at middle. Clypeus slightly more than twice as long as width at ocelli, slightly sinuate near antennae. Clypellus relatively slender, widest near apex. Face in lateral view convex, slightly concave between anterior margin of eyes in female. Forewing with venation typical, about ten recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin convex on each side of a bluntly pointed apex; anterior margin with a relatively long median lobe. Paraphyses joined on basal two-thirds, apices free and sharply pointed. Shaft of aedeagus short, curved, only slightly narrower at apex than at base. Styles only about
twice as long as basal width, distinct lobe on outer margin just before outward-projecting, finger-like, apical process.

Last ventral segment of female slightly over half as long as greatest width, lateral margins slightly converging; posterior margin straight with exception of small, broad, median lobe.

**Types:** Holotype male, allotype female, and 21 female and 10 male paratypes, Ventura, California, July 20, 1933, R. H. Beamer, in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas. Additional paratypes as follows: (California) 8 female, 2 male, Claremont, July 29, 1935, R. H. Beamer; 1 male, Claremont, July 29, 1935, Jack Beamer; 1 female, Topango Canyon, Aug. 5, 1938, L. W. Hepner; 3 female, 7 male, Topango Canyon, Aug. 5, 1938, R. H. Beamer; 4 female, 2 male, San Diego, Aug. 7, 1935, 2 female, July 24, 1941, R. H. Beamer; 1 female, July 17, 1915, 1 female, Aug. 29, 1915, L. A. Titus; 1 male, Escondido, July 15, 1941, R. H. Beamer; 2 male, Anza, July 29, 1938, R. H. Beamer; 1 male, Arroyo Seco River, Aug. 8, 1938, R. H. Beamer; 1 pr., San Gabriel Canyon, July 2, 1935, R. H. Beamer; 1 pr., Lompoc, Aug. 9, 1938, R. H. Beamer; 1 female, Lompoc, Aug. 9, 1938, R. I. Sailer; 1 female, 2 male, La Jolla, July 13, 1941, R. H. Beamer; 1 female, Santa Ana Canyon, July 30, 1932, R. H. Beamer; 1 female, Palm City, Aug. 7, 1935, R. H. Beamer; 2 female, Ontario, April 21, 1908; 1 female,

Host plants: Specimens were collected in California in 1938 on Arctastaphyleae glauca and A. zacaensis, but these plants may have been only a resting place for them.

Comparative notes: This species is restricted to southern California, somewhat resembles nogalinus, but has a longer, sharper, darker crown and quite different genitalic.

30. Scaphytoptius (Cloanthanus) diabolus (Van Duzee)


Resembles frontalis, but lighter colored, with longer crown, more distinct band before eyes and western
in distribution. Length: female, 4.5 mm., male, 4 mm.

**Color:** Crown black with ivory or white markings as follows; thin line along anterior margin; wedge and oblique mark on each side; irregular, almost complete band before eyes; and irregular markings in an area along basal margin, largest in female. Pronotum gray with irregular black irroration, much lighter on lateral and anterior margins. Scutellum black with typical light markings. Clypeus light brown on apical two-thirds, darker on base in area of small sharksmouth. Lora and olyellus light brown except for black tip of olyellus. Genae mottled brown to fuscus with white vitta behind eye and shorter one near ocellus, distinct. Forewing semihyaline white with irregular black markings throughout, heaviest on costa and in anteapical cell opposite apex of clavus.

**Structural characteristics:** Crown about one and one-third times as long as width between eyes, anterior margin slightly convex on each side of a bluntly pointed apex; wedge very short. Pronotum slightly over two and one-half times as wide as length at middle and four times length behind eye. Clypeus about twice as long as width at ocelli, only slightly sinuate, if at all, at antennae; depression on each side at end of sharksmouth. Clypellus rather slender and slightly enlarged near apex. Face in lateral view straight in male, slightly concave between anterior margin of eyes in female. Forewing with outer
claval vein approaching or touching second claval vein at cross-vein, often extra cross-veins in clavus; brachial cell with many vein-like markings and costal area with ten or eleven recurved veins.

**Genitalia:** Valve about one and one-third times as wide as length at middle, posterior margin somewhat convex on each side of a pointed apex; anterior margin with short, broad median lobe. Paraphyses broad, extending well beyond plates, almost parallel-marginated to sharp apex. Aedeagus in ventral view short, apex "arrow-head like."

Styles long, about three times as long as basal width, constricted on basal fourth, outer margin rounded just beyond middle to a long, bluntly pointed, apical process.

Last ventral segment of female slightly less than twice as wide as length at middle, evenly rounded on latero-posterior margins to a distinct median notch on posterior margin.

**Types:** Holotype male, #1788, allotype female, #1789, Mt. Diablo, California, July 14, 1916, E. P. Van Duzee, in the Museum of the California Academy of Science, San Francisco, California.

**Material studied:** (Colorado) Macedonia; Poudre River Canyon. (Arizona) Grand Canyon; Jerome; Prescott; Granite Dell. (California) Mt. Shasta; Yosemite Valley; Weed; La Jolla; Lone Pine; Mariposa; Colfax; Doyle; Beaumont; Chilcoot; Ontario. (Nevada) "Nev." March, 1936 (Washington)
Satus Pass; Toppinish. (Utah) Provo; Logan Canyon; Heber City. (Oregon) Grants Pass; Spray; Medford; Ashland. (Idaho) Ruhl.

Host plants: Ball (1932) writes of nasutus, evidently referring to diabolus, "—taken in abundance, nymphs and adults, on the cliff rose (Cowania stansburiana) in Utah and Arizona."

Comparative notes: The male of nasutus was probably this species, but since it was described in a paper on Jamaica insects, the female from that island should be considered holotype for that species, leaving diabolus, described from California, to include the specimens originally placed in nasutus. The color of forewing varies from white with scattered black vermiculations, to almost entirely black.

31. Scaphytopius (Cleanthamus) pallidiscutus n. sp.

Resembles diabolus but larger, with a longer crown, scutellum lighter colored, and with longer aedeagus. Length: female, 4.5 mm., male, 4.5 mm.

Color: Crown black with white marks as follows: a thin line along anterior margin; wedge and a line on each side parallel to margin; an almost complete, broad irregular band before eyes; and two pairs of spots along posterior margin, one pair next eyes and another next median suture—basal fifth with black replaced by fulvus or brown except
for a few lines. Pronotum gray with scattered dark spots; irregular light vittae usually faintly indicated. Scutellum light fulvus to brown with typical light markings; sometimes almost entirely ivory. Face evenly reddish-brown, mottled throughout, much more unicolorous than diabolus, except for fuscus tip of clypellus, irregular black markings below small sharksmouth, light vitta behind eye and shorter one near ocellus.

**Structural characteristics:** Crown about one and two-thirds times as long as width between eyes, almost straight margined on each side of a bluntly pointed apex; wedge about one-fifth length of crown. Pronotum about two-thirds as long as crown, about two and one-half times as wide as length at middle, and four and one-half times length behind eye. Clypeus over twice as long as width at ocelli, slightly sinuate at antennae; a depression, almost parallel to basal margin, on each side before eye. Clypellus broadest just before apex. Face in lateral view concave between anterior margin of eyes. Forewing with two or three cross-veins connecting claval veins; usually ten or more marks or cross-veins in brachial cell and about ten recurved veins to costa.

**Genitalia:** Valve about four-fifths as long as greatest width, posterior margin convex on each side of a bluntly pointed apex; anterior margin evenly rounded. Paraphysis almost twice as long as styles, largest near
base, almost parallel-margined to sharp apex, except for constriction near outer third. Shaft of aedeagus slender, about one-half as long as styles, evenly narrowed to a pair of short, dorsal, apical processes. Styles almost four and one-half times as long as greatest width, slightly constricted on basal third, distinct lobe on outer margin before long, slender process on apical half.

Last ventral segment of female somewhat less than twice as wide as length at middle, slightly concave on lateral margins, then rounded to a small median notch at middle on posterior margin; more truncate than diabolus.


Host plants: Specimens have been collected in southern California from Geanothus greggii purplexans and G. cuneatus and Arctostaphylos pungens and A. glauca, so it is possible that Geanothus or Arctostaphylos is the host of this species.

Comparative notes: This species is similar to diabolus, but can be easily separated by the lighter scutellum, lighter and more evenly colored face and the longer aedeagus of the male. The female last ventral segment of this species is more truncate than that of diabolus. This species is evidently restricted to southern California.

32. Scaphytopius (Cloanthanus) fulvus (Osborn)

Platymetopius fulvus, Osborn, Herbert, Rep't. of New York St. Entomologist (20th Report), p. 519, 1905.

Resembles magdalenensis, but fulvus throughout and with paraphyses bifid. Length: female 5 mm., male 4.5 mm.

Color: Crown fulvus with lighter markings as
follows: wedge; one or two pairs of dots between wedge and eye, a long mark on each side of median suture from near wedge to posterior margin and another pair on posterior margin next eyes. Pronotum fulvus with light vittae sometimes faintly indicated. Scutellum fulvus with typical light markings. Face fulvus, usually lightest on clypeus, with relatively long sharksmouth faintly indicated. Forewing fulvus, veins only slightly darkened except near apex and on costa.

**Structural characteristics:** Crown about one and one-half times as long as width between eyes, anterior margin only slightly convex on each side of a pointed apex; wedge about one-fourth length of crown. Pronotum somewhat shorter than crown, a little less than two and one-half times as wide as length at middle and about four times as wide as length behind eyes. Clypeus about twice as long as width at ocelli, almost evenly narrowed to apex. Clypellus relatively narrow and enlarged near apex. Face in lateral view almost straight in male, slightly concave between anterior margin of eyes in female. Forewing with venation typical, seven or eight recurved veins to costa.

**Genitalia:** Valve almost as long as greatest width; posterior margin only slightly convex on each side of a sharp apex, anterior margin with broad, short median lobe. Paraphysis narrow, about twice as long as styles, with slender lateral processes on outer third. Aedeagus
roughly "U" shaped, dorsal part lighter and less heavily sclerotized, shaft almost parallel-marginined to a very small dorsal process at apex. Styles about four times as long as greatest width, almost parallel-marginined on basal three-fourths, only slightly lobed on outer margin to finger-like apical process.

Last ventral segment of female about one and one-half times as wide as length at middle, latero-posterior margins rounded to a small median lobe.

**Types:** Lectotype female, lectoallotype male, Cold Spr. Harbor, New York, August 18, 1904, H. Osborn, here designated, in the Osborn Collection, Ohio State University, Columbus, Ohio. The original description gives Oyster Bay as the type locality, but Cold Spr. is within Oyster Bay and in this case, these two localities are identical. One co-type was on hand for study.

**Additional material on hand:** (Conn.) New Haven; (N. C.) Walnut, Franklin; (Md.) Ashton; (Va.) Cape Henry; (Wis.) Grand Rapids.

**Host plants:** Osborn (1904) writes "--beaten from pine and huckleberry--as all are adults it is impossible to determine the food plant with certainty though it seems likely that it is the huckleberry and that individuals taken from pines were resting accidentally on the trees." Ball (1932) writes "--found yellow nymphs swarming on Bayberry (**Myrica carolinensis**) at Woods Hole, Massachusetts,
July 7, 1925, a few days later an immature adult that was determined as fulvus was taken from this spot."

Comparative notes: This species, with its sub species collaris, has genitalia which differ considerably from any other species—the long, slender bifid paraphyses and the long slender shaft of the aedeagus easily separate it from any other species. It has a relatively wide distribution, but from the small number of specimens, it seems to be relatively uncommon.

33. Scaphytopius (Cloanthanus) fulvus s. sp. collaris
(Sanders and DeLong)


Resembles fulvus, but with most of pronotum and basal half of scutellum dark brown and remainder of dorsum ivory to light fulvus. Length: female 5.3 mm., male 4.8 mm.

Color: Crown ivory to light fulvus; wedge and arcuate markings on disc often indicated. Pronotum brown, except for yellow to fulvus area on each lateral margin, slender median vitta, and dots throughout. Scutellum with basal half dark brown and apical half yellow to fulvus. Face completely yellow to fulvus and without irroration. Forewings translucent pale fulvus, veins brown on apex and costal area.
Structural characteristics: Crown about one and one-third times as long as width between eyes, anterior margin straight to slightly convex on each side of bluntly pointed apex. Pronotum about as long as crown, two and one-half times as wide as length at middle and four times length behind eyes. Clypeus about twice as long as width at ocelli, slightly sinuate at antennae. Clypellus long and somewhat enlarged near apex. Face in lateral view almost straight in male, slightly concave between anterior margin of eyes in female. Forewing with venation typical and about eleven recurved veins to costa.

Genitalia: Male and female genitalia about the same as for fulvus.

Types: Holotype male, allotype female, Penfield, Clearfield Co., Pennsylvania, Aug. 24, 1918, Sanders, here designated, in the DeLong Collection, Ohio State University, Columbus, Ohio. The holotype was on hand for study.

Host plants: The original description gives Vaccinium sp. as the plant from which the type material was taken.

Comparative notes: This is apparently a rather rare species, as only the type specimen named above has been seen by the author. Except for the color, it agrees with fulvus in almost every respect.

Resembles loricatus, but with lateral margins of face dark and with paraphyses. Length: female 4.1 mm., male 3.8 mm.

Color: Crown fuscus to black with light markings as follows: narrow line along anterior margin; wedge; a large irregular spot on margin before each eye and a smaller pair between these; two pairs of dots on posterior margin, one pair next eyes and another near median suture. The light spots are usually smaller on the male. Pronotum and scutellum about same color as crown with typical light markings. Clypeus yellow with brown markings near base, forming large "sharksmouth" and other irregular markings along basal margin. Clypellus and lora yellow. Genae yellow mesally, infuscated behind eyes and along lateral margins, except for distinct white vitta behind eye; less distinct, short vitta near ocellus. Forewing semihyaline black, pale fulvus along veins, and milky aeroles throughout.

Structural characteristics: Crown about one and one-half times as long as width between ocelli, anterior margin slightly convex on each side of a blunt apex; wedge about one-fourth length of crown. Pronotum about three-
fourths as long as crown, about two and one-half times as wide as length at middle and four times as wide as length behind eye. Clypeus about twice as long as width at ocelli, margins almost straight. Clypellus relatively slender, slightly broadened near base. Face in lateral view almost straight. Forewing with typical venation, several vein-like markings in brachial cell and nine or ten recurved veins to costa.

Genitalia: Valve roughly triangular, almost as long as greatest width, posterior margin convex on each side of a pointed apex; anterior margin with a wide, short, median lobe. Paraphysis long, slender, almost parallel-margined to a sharp apex. Shaft of aedeagus "L" shaped, curved on basal two-fifths, almost parallel-margined to blunt apex. Styles about four times as long as basal width, large lobe on outer margin just before relatively long, slender, finger-like apical process.

Last ventral segment of female about three-fifths as long as greatest width, latero-posterior margin roughly circular with a small median notch.

Types: Lectotype male, lectoallotype female, Buffalo, New York, June, 1887, E. P. Van Duzee, here designated, in the Iowa State College Collection at Ames, Iowa. They were on hand for study.

Additional material on hand: This species is one of the most common species and occurs throughout the
United States east of the Rocky Mountains and possibly into Mexico, as specimens are on hand from Brownsville, Texas. Hundreds of specimens are on hand from all parts of this area.

**Host plants:** Many host plants are recorded for this species. Specimens are on hand collected from hemp at Kansas City, Missouri. In Bexar Co., Texas, *Heterotheca subaxillaris* proved a host. Ball (1932) writes "was taken in numbers on pure stands of wild blackberry, (*Rubus* spp.) in New Jersey, the District of Columbia and again at Gainesville, Florida." Osborn (1915) writes "ordinarily occurs in grass-land and is very frequently taken in adult form from oak trees." Fletcher (1930) gives native grass-land as the host plant in Texas. Gibson and Cogan (1915) give clover, alfalfa, grasses and woody shrubs as the hosts in Missouri. Van Duzee (1894) gives oak bushes as the host at Buffalo, New York.

**Comparative notes:** This species is the only blackish species with a short crown and yellow clypeus. Specimens from southern Texas and Florida are smaller than those collected farther north, but are identical in other respects.

Resembles magdalenis but with indistinct markings on crown, lighter face and with more slender paraphyses.

Length: female 5 mm., male 4.5 mm.

Color: Crown fulvus mottled with light, with white markings as follows: thin line along anterior margin; wedge; and two spots along posterior margin, one next each eye and one on each side of median suture.

Pronotum fulvus, irregularly marked with brown, pale vittae usually faintly evident. Scutellum fulvus to light brown with typical light markings. Face bright fulvus, slightly clouded along lateral margins, shanksmouth and vitta behind eye faintly indicated. Forewing semihyaline light fulvus, with numerous brown irroration, becoming fuscus on apex and outer anteapical cell; veins brown, darker on costa.

Structural characteristics: Crown almost one and one-half times as long as width between eyes, anterior margin only slightly convex on each side of a bluntly pointed apex; wedge over one-third length of crown.

Pronotum about three-fourths length of crown; two and one-fourth times as wide as length at middle and three and one-half times as wide as length behind eyes. Clypeus about twice as long as width at ocelli, somewhat constricted at antennae, slight concavity along shanksmouth. Clypellus relatively stout and enlarged near apex. Face in lateral view almost straight. Forewing with vein-like marks in brachial cell and about nine recurved veins to costa.
Genitalia: Valve about one and one-third times as wide as length at middle, posterior margin bell shaped to small, teat-like, rounded process at apex. Paraphysis with large basal, bulb-like process, almost parallel-margined to a sharp apex. Aedeagus "L" shaped, narrowest near slightly enlarged apex. Styles about four times as long as basal width, slightly sinuate near basal third, lobe on outer margin before stout, finger-like process on apical two-fifths.

Last ventral segment of female slightly less than twice as wide as length at middle, lateral margins slightly convex; posterior margin almost straight with small median notch.

Types: Lectotype male, Aug. 30, 1913, lectoallos-type female, Aug. 5, 1913, Orono, Maine, Herbert Osborn, here designated, in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas. The types were on hand for study.


Host plants: A long series was collected on Chamaedaphne at Itasca Park, Minnesota, by R. H. Beamer, and a pair was taken from the same host at Bryants Bog, Michigan, by H. B. Hungerford. Bear berry was given as
the host of a long series collected at Mafeking, Manitoba, by R. H. Beamer. Both of these plants are in the heath family, so it is possible that the species is restricted to the family or certain plants in the family.

Comparative notes: Although described as a variety of *magdalenis*, the genitalia show this species to be more closely related to *frontalis* than to any other. Several male specimens collected at Toronto, Canada, in September are much darker and may represent the fall brood on this species.

36. Scaphytopius (Cloanhanus) *deltensis* n. sp.

Resembling *fuscifrons*, but with pointed plates in male and last ventral segment of female produced at middle. Length: female 4.8 mm., male 4.4 mm.

Color: Crown irregularly mottled fuscus and ivory, lightest along anterior margin. Pronotum about same color as crown, vittae evident only on lateral margins. Scutellum dark brown, with typical white markings and usually a large orange area near each basal corner. Face fuscus and light mottled; vitta behind eye, shorter once near ocelli and antennae and long sharksmouth, light. Forewings semi-hyaline white, fuscus vermiculations throughout, darkest on apical cells, darkest in males; veins fuscus, becoming black on costa.
Structural characteristics: Crown only slightly longer at middle than next eyes; about as long as width between eyes, anterior margin convex on each side of a very bluntly pointed apex; wedge about one-third length of crown. Pronotum somewhat longer than crown, about two and one-fourth times as wide as length at middle and three and one-half times length behind eyes. Clypeus somewhat less than twice as long as width at ocelli, only slightly constricted at antennae. Clypellus relatively stout, slightly enlarged near apex. Face in lateral view strongly convex. Forewing with several vein-like marks in brachial cell, about twelve recurved veins to costa and sometimes extra cross-veins in calvus.

Genitalia: Valve somewhat shorter than greatest width, posterior margin almost straight on each side of a rounded apex; anterior margin with broad, short median lobe. Paraphysis bulbed at base, slender and completely spiraled on middle, and enlarged before sharp apex. Aedeagus curved near base, gradually narrowing to blunt apex, with small teeth on dorsal margin. Styles about three times as long as width at base, somewhat sinuate near middle, distinct lobe on outer margin just before finger-like, apical process.

Last ventral segment of female about as long as greatest width, lateral margins straight and converging; posterior margin convex except for small median notch.
Types: Holotype male, allotype female, 7 female and 1 male paratypes, Delta, California, June 28, 1935, P. W. Oman, in the National Museum, Washington, D. C.
Additional paratypes as follows: 1 female, Mt. Shasta, June 29, 1935, P. W. Oman; 8 female, Delta, June 28, 1935, R. H. Beamer.

Host plants: None known.

Comparative notes: This species is much like fuscifrons, but the genitalia easily separate it from that species.

37. Scaphytopius (Cloanthanus) dorsalis (Ball)


Resembling frontalis but with crown light and without markings, and without white aeroles in forewing.
Length: female 4.8 mm., male 4.5 mm.

Color: Crown ivory to yellow without markings.
Pronotum dark brown, fading to yellowish along anterior and lateral margins; vittae very faintly indicated in male, mottled ivory with large, dark brown spot near each basal corner in female. Face fulvus, slightly darker behind eyes. Forewing opaque dark chocolate-brown with yellow apex in
male, light brown; light brown, apex of clavus and apex
of corium semihyaline, darkest on outer antepapical cell
in female.

Structural characteristics: Crown about one
and one-third times as long as width between eyes, anterior
margin slightly convex on each side of a pointed apex.
Pronotum almost as long as crown, about two and one-half
times as wide as length at middle and about four times
length behind eyes. Clypeus about twice as long as width
at ocelli, slight concavity inside each eye, only slightly
constricted, if at all, at antennae. Clypellus relatively
long, evenly and slightly enlarged from near base to near
apex. Face in lateral view almost straight. Forewing with
venation typical, several vein-like markings in brachial
cell and six or seven recurved veins to costa.

Genitalia: Valve almost as long as basal width,
posterior margin concave on each side of a bluntly pointed
apex; anterior margin with a median lobe. Paraphysis
with basal bulb, slender to outer third, with distinct
lateral process before enlarged, sharply pointed, apex.
Aedeagus curved near middle, broadest on basal half.
Styles slightly over three times as long as basal width,
sinuate near middle, small lobe on outer margin before
relatively long finger-like, apical process.

Last ventral segment of female about five-eights
as long as greatest width, latero-posterior margin broadly
angled near middle on each side of a small median notch at apex.

**Types:** This species was described from two female types from Onaga, Kansas. Lectotype female, Onaga, Kansas, June 27, hereby designated, in the National Museum, Washington, D. C. Allotype male, Saratoga, Union Co., July 17, 1877, Uhler, hereby designated, in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas. The holotype of **bicolor** was on hand for study, as well as the designated allotype of **dorsalis**.

Additional material on hand: 1 female with no collection data.

Host plants: None known.

Comparative notes: This species is probably more closely related to **scriptus** than to any other species, but appears to be distinct. It evidently is quite rare, as the two female types, the pair studied, and the male type of **bicolor** are the only ones recorded.

**38. Scaphytopius (Cloanthanus) nigrifrons** (DeLong)


Resembling **frontalis** but darker, with dark clypeus
and with genital paraphyses enlarged near apex. Length: female 4.6 mm., male 4 mm.

Color: Crown black in male, fuscus in female, with light markings as follows: thin line along anterior margin; wedge and long, irregular, oblique mark on each side, (in female these oblique marks may be broken into two more or less circular areas); two pairs of dots on posterior margin, one next each eye and one on each side of median suture, in the female, there is usually two dots on each side of median suture. Pronotum black with fulvus irroration, male darker; vittae evident. Scutellum fuscus to black with light markings at least indicated, female lighter. Face fuscus to black with light dots, and light markings as follows: vitta along posterior margin between eyes, long sharksmouth, faint vitta behind eye and shorter ones in front of eye near ocelli and antennae; face darkest on margins of genae and apex of clypellus. Forewings opaque black and fulvus, darkest in male, a few white aeroles on apical third.

Structural characteristics: Crown about one and one-third times as long as width between eyes, anterior margin convex on each side of a bluntly pointed apex; wedge about one-third length of crown. Pronotum about as long as crown, two and one-half times as wide as length at middle and about four times as wide as length behind eyes. Clypeus about twice as long as width at ocelli,
definitely constricted at antennae. Clypellus stout, enlarged near apex. Face in lateral view convex. Fore-wing with irregular marks in brachial cell, seven or eight recurved veins to costa and often extra veins in clavus.

**Genitalia:** Valve about three-fourths as long as width; posterior margin bell-shaped with a teat-like apical process; anterior margin with broad median lobe. Paraphysis enlarged on apical two-fifths with a sharp, lateral lobe near beginning of enlargement. Aedeagus in lateral view curved, narrowest near apex, and with small spines along dorsal margin. Styles about four times as long as basal width, sinuate near middle, lobe on outer margin before finger-like process on apical fourth.

Last ventral segment of female about one and one-half times as wide as length at middle, latero-posterior margin rounded.

**Types:** Holotype male, North Branford, Conn., July 12, 1921, B. H. Walden, in the DeLong Collection, Ohio State University, Columbus, Ohio.

Additional material on hand: (Ohio) Rocking Co., (Connecticut) New Haven, (Maryland) Plummer's Island.

**Comparative notes:** This black species, without light aeroles in wing, is quite distinctive, darker than *frontalis*, and with a black face; somewhat like *scriptus*, but darker.
39. *Scaphytopius* (Clonanthanus) *amplinotus* n. sp.

Resembles *verecundus*, but larger, with large white spots throughout, and with lateral projection near apex of genital paraphyses. Length: female 4.6 mm., male 4 mm.

**Color:** Crown orange-fulvus with white markings as follows: thin line on anterior margin; wedge and oblique line on each side; three pairs of spots across crown before eyes, the median pair about size of wedge; on posterior margin a large spot at middle and a smaller spot next each eye. Pronotum same color as crown with irregular white vittae distinct and sometimes quite broad. Scutellum same color as crown, with typical light markings and irregular markings, especially on disc, white. Genae and clypeus fulvus to yellow; area next lorae, vitta behind eye and shorter ones near antennae and ocelli, white. Forewing semihyaline orange-fulvus with large white areas throughout; veins dark on apical half and on costa.

**Structural characteristics:** Crown about twice as long as width between eyes, anterior margin almost straight to a pointed apex. Pronotum about three-fourths as long as crown, about two and one-half times as wide as length at middle and three and one-half times length behind eye. Clypeus over twice as long as width at ocelli, slender, only slightly constricted, if at all, at antennae.
Clypellus slender and slightly enlarged near apex. Forewing usually with claval veins nearest each other at cross-vein, several vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin convex on each side of a pointed apex; anterior margin broadly rounded. Paraphysis slender on basal four-fifths, enlarged, with a short lateral process, just before sharply pointed apex. Shaft of aedeagus in ventral view almost parallel-margined, in lateral view, long, slender, slightly curved and without processes. Styles slightly over three times as long as basal width, sinuate just beyond basal third, slightly enlarged on outer margin just before finger-like, apical process.

Last ventral segment of female with latero-posterior margin broadly rounded and with a short, broad median lobe.

Types: Holotype male, allotype female, and 2 female and 25 male paratypes, Hudson, Florida, July 13, 1939, R. H. Beamer, in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas. Additional paratypes as follows: (Florida) 2 female, 1 male, Hudson, July 13, 1939, P. B. Lawson; 13 female, 19 male, Hudson, July 13, 1939, P. W. Oman; 1 female, 2 male, Lacoochee, Aug. 18, 1930, R. H. Beamer;

Host plants: Not known.

Comparative notes: This species is the only one in this country with large white, unmargined spots covering the entire dorsum.

40. Scaphytopius (Cloanthanus) osborni (Van Duzee)


Resembles fuscifrons but without blunt plates of male and with a different pattern on crown. Length: female 4.5 mm., male 4.3 mm.

Color: Crown brown with light markings as follows: short wedge; two large dots on each side between wedge and eye, sometimes united, a pair of short dashes behind wedge and two pairs of dots along posterior margin, one next each eye and one on each side of median suture. Pronotum gray and fulvus with brown to fuscus irrorations; vittae evident. Scutellum fulvus with typical light markings. Face ivory with brown to fuscus coarse irrorations,
large irregular white blotches in lorae and clypellus
and on adjoining area of genae; vitta behind eye and
shorter ones near ocelli and antenna, distinct. Fore-
wings semi-hyaline fulvus with dark irrorations and large
milky aeroles throughout.

**Structural characteristics:** Crown only slightly
longer than width between eyes, only slightly longer at
center than next eyes; apex rounded; wedge about one-
fourth length of crown. Pronotum slightly longer than
crown, about two and one-half times as wide as length
at middle and four and one-half times length behind eyes.
Clypeus about twice as long as width at ocelli, relatively
broad, constricted at antennae. Clypellus considerably
enlarged near apex. Face in lateral view definitely con-
 vex. Forewing with venation typical, several vein-like
markings in brachial cell and about ten recurved veins to
costa.

**Genitalia:** Valve almost as long as greatest
width, posterior roughly bell-shaped with a small, rounded
tip; anterior margin with short, broad median lobe. Para-
physis slender on basal half, gradually broadened to a
sharp point on outer third before a sharply pointed apex.
Aedeagus small, parallel-marginated and semi-circular.
Styles more than three times as long as basal width, slightly
sinuate near middle, small lobe on outer margin before
finger-like process on apical fourth.
Last ventral segment of female about twice as wide as length at middle, latero-posterior margin with small lobe on each side of median lobe with a small median notch.

Types: Holotype male, allotype female, Los Amates, Guatemala, Jan. 17, 1905, and Feb. 28, 1905, J. S. Hine, here designated, in the Osborn Collection, Ohio State University, Columbus, Ohio.

Material on hand: (Texas) 1 male, Marfa, Aug. 7, 1936, E. D. Ball. (Mexico) Tamazunchale and Jacala.

Host plants: Not known.

Comparative notes: The one male from Marfa, Texas, is the only record of this species collected in the United States. Since it was collected during the same month that Dr. Ball collected in Mexico, it is possible that the specimen was mislabeled, in which case it does not occur in this country.

41. Scaphytopius (Cloanthanus) andromus (Ball)


Resembling magdalensis, but smaller, and with process on paraphysis near apex. Length: female 4 mm., male 3.6 mm.

Color: Crown fulvus with white marks as follows;
line along anterior margin; wedge and indistinct oblique line on each side; a pair of relatively large spots on disc before eyes and a pair of longer marks between these; on posterior margin, a spot at center and next each eye. Pronotum about same color as crown, dark irrorations, especially in male, light vittae usually evident, although often indistinct. Scutellum fulvus with typical light markings, usually some fuscous markings in male. Face fulvus, mottled with light, white markings as follows: long sharkamouth, vitta behind eye and shorter ones near ocellis and antenna. Apex of clypellus only slightly darkened, if at all. Face in lateral view slightly concave between anterior margin of eyes. Forewing semihyaline fulvus with small milky aeroles throughout.

**Structural characteristics:** Crown a little more than one and one-half times as long as width between eyes, anterior margin slightly convex on each side of a bluntly pointed apex; wedge over one-fourth length of crown. Pronotum about three-fourths as long as crown, about two and one-half times as wide as length at middle and four times length behind eyes. Clypeus about twice as long as width at ocelli, very slightly sinuate near antennae. Clypellus relatively slender, enlarged near apex. Forewing often with extra cross-veins in clavus, several vein-like marks in brachial cell and about nine recurved veins to costa.
Genitalia: Valve a little wider than length at middle, posterior margin convex on each side of a very bluntly pointed apex; anterior margin with broad, rounded lobe on median half. Paraphysis longer than plates, coiled near base, small lateral process on outer third before enlargement near sharply pointed apex. Aedeagus in lateral view almost straight, small teeth on dorsal margin on apical half. Styles about three times as long as basal width, slightly sinuate near middle, lobe on outer margin before finger-like apical process.

Last ventral segment of female slightly less than twice as wide as length at middle, latero-posterior margin unevenly rounded.


Additional material for study: (Florida) Ft. Mead, Branford, La Belle, Childs, Elfers, Sanford, Gainsville.

Host plants: Ball (1932) writes "Nymphs and adults were taken commonly in Florida on the fetter bushes (Pieris spp.)."

Comparative notes: The male of this species somewhat resembles scriptus, but the female is very light and quite distinctively colored.
42. *Scaphytopius* (Croanthanus) *verecundus* (Van Duzee)


Resembling *magdalensis*, but smaller, with a longer crown and without lateral process on paraphysis.

Length: female 4.2 mm., male 4 mm.

Color: Crown mottled brown with sometimes a reddish tinge and white markings as follows: incomplete narrow line along anterior margin, wedge and oblique line on each side; two large irregular marks sometimes fused between each eye and wedge, and a slender line about size of wedge on each side of median suture; on posterior margin, a large spot at middle and a smaller one next each eye. Pronotum usually somewhat lighter than crown, fuscous markings thickest near posterior margin, light vittae usually evident, especially on sides. Scutellum orange with typical light markings. Clypeus mottled brown and fulvus with irregular light line along posterior margin; relatively long sharksmouth. Lorae and clypellus mottled brown, with apex of clypellus black. Genae mottled, darkest along lateral margins; irregular area next lorae, vitta behind eye and shorter ones near ocellus and antenna, white. Forewing semihyaline fulvus with irregular milky aeroles throughout; veins darkest at apex and on costa; outer anteapical cell usually darkest.
**Structural characteristics:** Crown over twice as long as width between eyes, anterior margin almost straight on each side of relatively sharp pointed crown, especially in female; wedge slightly less than one-fourth length of crown. Pronotum less than two-thirds as long as crown, about two and one-half times as wide as length at middle and about three and one-half times as wide as length behind eyes. Clypeus almost two and one-half times as long as width at ocelli; only slightly sinuate near antennae, slight depression at end of sharksmouth. Clypellus broadest near apex. Face in lateral view concave between anterior margin of eyes. Forewings with claval veins approaching each other at cross-vein, several vein-like marks in brachial cell; about ten recurved veins to costa.

**Genitalia:** Valve almost as long as greatest width, posterior margin oval; anterior margin with lobe on median half. Paraphysis about two and one-half times as long as styles, slender, enlarged on outer fourth before a sharp apex. Aedeagus in lateral view almost straight and parallel-marginined, small teeth on dorsal margin. Styles about three times as long as greatest width, sinuate just before middle, lobed on outer margin before a finger-like process on apical third.

Last ventral segment of female slightly less than twice as wide as length at middle, latero-posterior margins rounded to a broad, short median lobe.
Types: Lectotype female, Fort Myers, Florida, May 3-5, 1908, Van Duzee, in the National Museum, Washington, D. C., here designated. This was the only co-type that was located.


Host plants: Ball (1932) writes "taken abundantly at Sanford, Florida, on mixed stands of low shrubs of the families Ericaceae and Vaccinioaceae growing in flat woods."

Comparative notes: The sharp crown and reddish color readily separate this species from any other.

43. Scaphytolius (Cleothanatus) insolitus n. sp.

Resembles verecundus somewhat, but smaller, with shorter crown and genital paraphyses lobed. Length: female 3.4 mm., male 3 mm.

Color: Crown mottled reddish, with light markings as follows: thin wedge, three pairs of long marks in band before eye, the median pair often united with a pair of spots near median suture on posterior margin. Pronotum, scutellum and face more or less mottled reddish-fulvus,
sharksmouth indicated. Forewing transluscent dark fulvus, becoming fuscus on costal and apical margins.

Structural characteristics: Crown about one and one-half times as long as width between eyes, anterior margin almost straight on each side of a pointed apex. Pronotum about four-fifths as long as crown, two and one-third times as wide as length at middle and four and one-half times length behind eyes. Clypeus twice as long as width at ocelli, somewhat sinuate at antennae. Clypellus broad and only slightly enlarged at apex. Face somewhat convex in lateral view. Forewing with venation typical, vein-like marks in trachial cell and about ten recurved veins to costa.

Genitalia: Valve somewhat wider than length at middle, posterior margin bell-shaped, anterior margin with large lobe on median half. Aedeagus in lateral view straight, converging toward blunt apex, toothed along dorsal margin. Paraphysis slender on basal two-thirds, somewhat enlarged toward apex with a small pointed lateral lobe. Styles about two and one-half times as long as basal width, somewhat sinuate on basal fourth, slightly lobed on outer margin before finger-like process on apical third.

Last ventral segment of female about three-fifths as long as greatest width, latero-posterior margin rounded.
Types: Holotype male, allotype female, Sanford, Florida, June 17, 1927, E. D. Ball, in the National Museum, Washington, D. C.

Host plants: None known.

Comparative notes: This small species, reddish and distinctively marked, is undoubtedly rare, as only the one pair is known.

44. Scaphytoptius (Cloanthanus) magdalensis (Provancher)

*Platymetopius magdalensis*, Provancher, Petite Faune Entomologique du Canada (VIII, Hemiptera) III, p. 275, 1889.


*Cloanthanus stratus*, DeLong, Ohio Jour. Sciences, VL; p. 27, 1945.


Resembles *acutus*, but with shorter crown with different color pattern, a uniformly colored face and with a sharp process on genital paraphysis near middle. Length: female 4.8 mm., male 4.5 mm.

Color: Crown mottled fulvus-brown with light markings as follows: wedge, irregular markings from eye
along anterior margin; two or three pairs of spots, sometimes fused, forming a very irregular band across crown before eyes; two pairs of spots on posterior margin, one pair next median suture and the other next eyes. Pronotum fulvus-brown, more or less irrorate with dark, light vittae usually very faintly indicated. Scutellum fulvus with typical white markings. Clypeus brown and light mottled, darkest in area of long sharkamouth. Lorae and clypellus as in clypeus, but with a large light spot on each oral sclerite and apex of clypellus infuscated. Genae same color as clypeus, darkest on disc, white vitta behind eye and shorter ones near ocellus and antenna distinct. Forewing semihyaline yellow with numerous milky aeroles; veins brown, becoming fusca at apex and on costa, darker in males.

Structural characteristics: Crown about one and one-half times as long as width between eyes, anterior margin slightly convex on each side of a bluntly pointed apex; wedge about one-fourth length of crown. Pronotum almost as long as crown in male, shorter in female, about two and one-half times as wide as length at middle and a little less than four times length behind eyes. Clypeus twice as long as width at ocelli, slightly sinuate at antennae. Clypellus slightly enlarged at apex. Forewing with venation typical, numerous vein-like markings in brachial cell and nine or ten recurved veins to costa.

Genitalia: Valve about three-fourths as long as
greatest width, roughly triangular, posterior margin somewhat convex on each side of a bluntly pointed apex; anterior margin with a broad, short lobe. Paraphysis long, slender on basal half, small, sharp process near middle, enlarged beyond to a sharp apex. Aedeagus in lateral view rounded near base, almost parallel-margined on basal half, slightly narrowed to a blunt apex; small teeth-like processes on dorsal margin near apex. Styles about twice as long as basal width, greatly sinuate near middle, large lobe on outer margin before finger-like, apical process.

Last ventral segment of female slightly over twice as long as greatest width, latero-posterior margin roughly circular.

Types: The type of magdalenensis should be in the Provincial Museum, Quebec, Canada. The type of obscurus (Osb), Lectotype male, lectoallotype female, Greensburg, Pennsylvania, Oct. 22, 1901, in the Osborn collection, Ohio State University, Columbus, Ohio, here designated. The types of carolinus (Lathrop) was destroyed in the Clemson College fire some years ago. The remaining paratype in the Osborn collection here designated neotype. Types of stratus DeLong and vaccinium DeLong in Illinois Natural History Survey Collection, Urbana, Illinois. The following types were on hand for study: obscurus oo-type, paratypes of stratus and vaccinium.
Additional material studied: Many specimens are on hand from many points from Florida to Maine, west of the Rocky mountains, as well as in eastern Canada.

Host plants: Ball (1932) writes "Dr. Osborn credits this to blueberries. Dr. Irene Debrosky tells me that she has carried this species through from egg to adult on the cranberry. The writer has taken this dark-faced species while sweeping shrubs in low damp places in northern Wisconsin and again at Woods Hole, Massachusetts, both situations where cranberries are abundant." Horsfall (1916) writes of the species in Missouri "From black jack brush in July." Lowry (1933) regarding the species in New Hampshire writes "rare on Vaccinium pennsylvanicum."

Comparative notes: As might be expected from its wide range, this species varies considerably. Specimens from Florida are much smaller, but the small process near middle of paraphysis readily separates this species from any other, with the exception of nigtrifrons, which is darker.

45. Scaphytopius (Cloanthus) scriptus (Ball)


Color: Crown brown to fuscus in male, fulvus in female, with light markings as follows: narrow line along anterior margin; wedge and short oblique line on each side; two irregular marks on each side, often coalesced, half-way between eye and wedge, and a smaller, longer mark, often indistinct, extending on each side of median suture from near wedge to base of crown; two pairs of spots on posterior margin, one pair near median suture and another next eyes. Pronotum same color as crown, light vittae irregular, but present. Scutellum same color as crown with typical light markings. Face about same color as crown with light markings as follows: relatively long sharksmouth, vitta behind eye and shorter ones at ocelli and antennae. Forewing semi-hyaline fulvus with cells in corium of male almost entirely fuscus except next veins, fuscus area in female restricted to outer antecapical cell and adjoining area of costa; light aereoles throughout, but especially near apex.

Structural characteristics: Crown about one and one-third times as long as width at ocelli, anterior margin slightly convex on each side of bluntly pointed apex; wedge about one-fourth length of crown. Pronotum slightly shorter than crown, about two and one-half times as wide as length at middle and four and one-half times length behind eyes. Clypeus over twice as long as width at ocelli, evenly narrowed beyond antennae in male, slightly sinuate in female; slight concavity at end of sharksmouth. Clypellus
relatively stout, broadened near apex. Face in lateral view somewhat concave between anterior margin of eyes. Forewing with typical venation, several vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin slightly convex on each side of a bluntly pointed apex; anterior margin with a broad, rounded lobe on median half. Paraphysis extending beyond plates, almost parallel-margined to small lateral process on outer fourth before sharp apex. Aedeagus in lateral view almost as long as style, tooth-like marks on dorsal surface, apex flattened. Styles about three times as long as basal width, inner margin abruptly enlarged near middle, outer margin with distinct lobe on middle before finger-like, apical process.

Last ventral segment of female one and two-thirds times as wide as length at middle, latero-posterior margin evenly rounded to small median lobe at middle.

Types: Lectotype male, Onaga, Kansas, May 27, 1902, in the National Museum, Washington, D.C., here designated. It is presumed that the collector was Crevecœur. Allotype female and one female parallotype, Douglas Co., Kansas, Aug., 1923, W. Robinson, here designated, in the Francis Huntington Snow Entomological collection, University of Kansas, Lawrence, Kansas. Additional parallotyopes as follows: (Kansas) 1, Leavenworth

Host plants: None known.

Comparative notes: This species ranges over most of the eastern half of the United States, excepting extreme south, and is distinguished by its short crown with small markings and heavily marked forewings.

46. Scaphy. (Cloanthanus) scriptus s. sp. meridianus n. sp.

Resembles scriptus, but lighter color, longer crown and more southern in distribution. Length: female 4.7 mm., male 3.8 mm.

Color: Crown mottled brownish, with light markings as follows: wedge; circular area on apical half, broken by three lines behind wedge; irregular area along
posterior margin. Pronotum pale fulvus, irregularly marked with brown, vittae only lightly indicated. Scutellum fulvus with typical markings indicated. Face fulvus, mottled with brown, light sharks' mouth and vitta behind eye, evident. Forewing semihyaline fulvus, veins and irroration fuscos in male, fulvus in female.

Structural characteristics: Crown slightly less than twice as long as width between eyes, anterior margin straight to slightly convex on each side of a pointed apex. Pronotum about three-fourths as long as crown, about two and one-third times as wide as length at middle and three and one-half times length behind eyes. Clypeus slightly over twice as long as width at ocelli, slightly, if any, sinuate at antennae. Clypellus broad, enlarged and rounded at apex. Face in lateral view straight in male, slightly concave between anterior margin of eyes in female. Venation typical, vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin bell-shaped; anterior margin with broad, short lobe on median third. Shaft of aedeagus in lateral view slightly curved, almost parallel-margined to blunt apex, rugulose area on dorsal margin near apex. Paraphysis slender on basal two-thirds, coiled near middle, slender lateral process before enlarged, sharply pointed, apical portion. Styles about three times as long as basal width,
slightly sinuate near middle, distinct lobe on outer margin before bluntly pointed, finger-like apical process.

Last ventral segment of female slightly more than half as long as greatest width, latero-posterior margin rounded.


Additional specimens, somewhat larger, are on hand from Mississippi and Arkansas.
Host plants: None known.

Comparative notes: This species might be confused with *verecundus* in Florida but lacks the red color, has a shorter crown and is easily separated by the male genitalia.

47. *Scaphytopius (Cleothanaeus) angustatus* (Osborn)


Resembles *acutus*, but pale greenish-fulvus in color, different color pattern on crown and face not greatly darkened on lateral margin. Length: female 5 mm., male 4 mm.

Color: Crown pale greenish-fulvus with indistinct darker markings, especially next eyes and near wedge. Pronotum gray to fulvus with brown irrorations, often lightest on anterior and lateral margins. Scutellum same color or slightly darker than pronotum, typical light markings usually at least indicated. Face about same color as crown, shanksmouth indicated and a few dark irrorations near basal margin. Forewing semihyaline fulvus, often with a faint greenish tinge, light aeroles in antesapical and apical cells and along costa; veins concolorous except at apex and along costa.

Structural characteristics: Crown about one and one-half times as long as width between eyes, almost straight
margined on each side of a blunt apex; wedge about one-third length of crown. Pronotum slightly over twice as wide as length at middle and about four times length behind eyes. Clypeus almost straight margined. Clypellus relatively slender, widest near apex. Face in lateral view almost straight. Forewings with venation usually obscured, five or six recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin with sides only slightly convex to a sharp apex; anterior margin only slightly concave to a short, broad median process. Paraphysis slender, about twice as long as styles, somewhat coiled on basal half, narrowest on outer third, only slightly enlarged before sharp apex. Aedeagus simple, curved near middle, slightly produced on dorsal margin. Styles almost three times as long as basal width, constricted on basal third, outer margin lobed on outer third to finger-like apical process.

Last ventral segment of female about one and one-half times as wide as length at middle, latero-posterior margin rounded to a small lobe on each side of a median notch.

Types: Lectotype female, lectoallotype male, Cold Spr. Harbor, New York, Aug. 18, 1904, H. Osborn, here designated, in the Osborn collection, Ohio State University, Columbus, Ohio. The original description gives Oyster Bay as the collection place, but Professor Osborn has said that
these two localities are the same, as Cold Spring Harbor is within Oyster Bay. One specimen on hand from the type series.

Additional material examined: (Minnesota) Itasca Park, Bena. (Wisconsin) Florence, Brule. (Maine) Fryeburg.

Host plants: Ball (1932) writes "--has taken this species from Jack pine in several places in northern Wisconsin and has examined specimens from New Hampshire (Lowry) taken from pitch pine." Lowry (1933) writes regarding the species in New Hampshire "common on pitch and red pine."

Comparative notes: This greenish species has the crown pattern faint and variable. The color is quite distinctive and so far as known, is the only species found on pine.

48. Scaphytopius (Cloanthanus) calliandrus (Ball)


Resembling loricatus, but with lighter scutellum, much shorter crown and with genital paraphyses. Length: female 4 mm., male 3.8 mm.

Color: Crown mottled fuscous with light markings as follows: wedge; two pairs of marks along anterior margin,
a small pair just in front of eyes and a larger oblique pair about half-way from eye to wedge; a small dot on each side of posterior end of wedge; on posterior margin, a dot next each eye and one or two pairs of dots between these. Pronotum same color as crown with light vittae indicated, especially on lateral margins. Scutellum ivory to orange, with a few black marks, especially along base and at apex. Face ivory to pale fulvus with irregular brown irroration, often reduced; sharksmouth small; white vitta behind eye and shorter ones near ocelli and antennae. Forewing semi-hyaline white with heavy irroration and areas throughout; veins dark.

**Structural characteristics:** Crown about one and two-fifth times as long as width between eyes, anterior margin slightly convex on each side of a blunt apex; wedge short. Pronotum about as long as crown, slightly less than two and one half times as wide as length at middle, and about four and one-half times length behind eyes. Clypeus relatively slender, about two and one-half times as long as width at ocelli, slightly sinuate near antennae. Clypellus relatively slender and enlarged near apex. Face in lateral view distinctly convex. Forewing with venation typical, several vein-like markings in brachial cell and about ten recurved veins to costa.

**Genitalia:** Valve about as long as greatest width, posterior margin straight on each side of a truncate apex;
anterior margin concave on each side of a slender, rounded lobe at middle. Paraphysis extending well beyond apex of plates, almost parallel-margined to a sharp apex. Aedeagus in lateral view "V" shaped, shaft more slender but about same length as basal part. Styles about three times as long as width at base, "dog-legged" near base, almost parallel-margined to small lobe on outer margin before small finger-like apical process.

Last ventral segment of female about twice as wide as length at middle, posterior margin with a lobe on outer margins and a smaller lobe at middle with a slight median notch.


Host plants: Ball (1932) writes "—has been found only on the low clumps of the fairy duster (Calliandra eriophylla) in Arizona."

Comparative notes: This small, dark species is easily recognized by the yellowish to orange scutellum in sharp contrast to the much darker forewings.

49. Scaphy. (Cloanthanus) analis var. castranus (Ball)

Convolinus analis var. castranus, Ball, E. D. Can. Ent., LXIII, p. 228, 1931.

Somewhat resembling nigricollis, but gray with dark dots, crown more pointed and with genital paraphyses.

Length: female 4.1 mm., male 3.8 mm.

Color: Crown ivory with pale brown dots and irrorations; wedge and irregular area on each side without irrorations. Some specimens have only a few dots.

Pronotum white with sparsely-spaced dark dots throughout. Scutellum ivory with an orange spot near each basal corner and a few dark dots, especially near apex. Face ivory with scattered dark dots, thickest behind eyes. Forewing semi-hyaline white with scattered dots, especially along veins; apex and costa darkest.

Structural characteristics: Crown about one and one-third times as long as width between eyes, anterior margin slightly convex on each side of a bluntly pointed.
apex; wedge about one-third length of crown, sometimes indistinct. Promotum almost as long as crown, almost two and one-half times as wide as length at middle, four and one-half times length behind eyes. Clypeus about twice as long as width at ocelli, slightly constricted at antennae. Face in lateral view distinctly convex. Forewing with venation typical, several vein-like marks in brachial cell and about twelve recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin distinctly convex on each side of a blunt apex; anterior margin slightly concave on each side of a rounded median lobe. Paraphysis slender, almost parallel-marginated to sharp apex. Aedeagus in lateral view, "U" shaped, shaft about as long, but more slender than base. Styles about three times as long as basal width, only slightly narrowed at middle, small lobe on outer margin before finger-like apical process.


Material studied: (Arizona) Tuscon, Tempe, Hope.

Host plants: Ball (1932) writes that this species is confined strictly to the desert iron wood (Olneya tesota).

Comparative notes: This species was originally placed in the genus Convelinus, but the genitalia is much different from nigricollis, showing more resemblance to
calliandra. This might be a synonym of analis, as that species has not been examined.

50. Scaphytopius (Cloanthanus) radiatus n. sp.

Resembles loricatus but light, with a dark face, different markings on crown and with genital paraphysis. Length: female 4 mm., male 4 mm.

Color: Crown brown and white mottled, with the white markings giving the appearance of lines radiating toward the apex. Pronotum gray with fuscus markings; vittae evident, especially on sides. Scutellum dark orange to brown with typical light markings. Clypeus fulvus with brown irrorations excepting small sharksmouth. Clypellus and loreae same as clypeus. Genae same as clypeus, darkest behind eye, light vitta behind eye and shorter ones near ocellus and antenna, evident. Forewing semihyaline fulvus with white aeroles or areas; many brown vermiculations throughout, especially in male, darkest at apex and on costa.

Structural characteristics: Crown slightly less than one and one-half times as long as width between eyes; anterior margin slightly convex on each side of a bluntly pointed apex; wedge about one-fifth length of crown. Pronotum somewhat shorter than crown, two and one-fourth times as wide as length at middle and about four times length behind eyes. Clypellus slightly more than twice
as long as width at ocelli, only slightly sinuate, if at all, at antennae. Face in lateral view convex in male, concave between anterior margin of eyes in female. Forewing with typical venation; several vein-like marks in brachial cell and about nine recurved veins to costa.

**Genitalia:** Valve about as long as greatest width, posterior margin broadly convex on each side of a small teat-like process at apex; anterior margin with small lobe on median half. Paraphysis long, slender and almost parallel-margined to sharp apex. Aedeagus in lateral view roughly "I" shaped, shaft longer but narrower than basal portion. Styles about four times as long as basal width, slender, with narrow, long lobe on outer margin before outwardly directed apical process.

Last ventral segment of female almost twice as wide as length at middle, lateral margins slightly convergent, posterior margin with small lobe at each side and a broader lobe on each side of a small median notch.

**Types:** Holotype male, allotype female, and 2 male and 6 female paratypes, Three Rivers, Texas, June 27, 1938, R. H. Beamer, in the Francis Huntington Snow Entomological Museum, University of Kansas, Lawrence, Kansas. Additional paratypes as follows: 1 male, Sinton, Texas, Dec. 28, 1945, R. H. Beamer.

**Host plants:** Not known.
Comparative notes: The brown crown, with light lines radiating toward apex, easily separates this species from any other in southern Texas. The male collected in December was darker, with shorter lineations on crown, but the genitalia were almost identical to the type series. From the description of flavens DeLong, this species differs in the markings on the crown with a radiating appearance and with many more marks on the forewing.

51. Scaphytopius (Cloanthanus) modicus n. sp.

Resembles magdalensis, but smaller, lighter in color, a different pattern on crown and greatly produced last ventral segment of female. Length: female 3.6 mm., male 3.2 mm.

Color: Crown fulvus except for light markings as follows: short wedge; most of area before eyes; two pairs of spots along posterior margin, one next each eye and one on each side of median suture. Pronotum fulvus with anterior margin lightest; many brown irroration in male, almost none in female; vittae evident. Scutellum fulvus to orange with typical light markings. Clypeus ivory to fulvus with dark dots, excepting small sharks-mouth. Clypellus and loraes same as clypeus with less markings. Genae darker than clypeus with vitta behind eye and shorter ones near ocelli and antennae, distinct. Forewing fulvus with few dark markings.
Structural characteristics: Crown almost one and one-half times as long as width between eyes, slightly convex on each side of a bluntly pointed apex; wedge very short. Pronotum almost as long as crown, about two and one-half times as wide as length at middle and four and one-half times length behind eyes. Clypeus slightly over twice as long as width at ocelli, very slightly sinuate at antennae. Clypellus slightly enlarged near apex. Face in lateral view distinctly convex in male, almost straight in female. Forewing with venation typical, several vein-like marks in brachial cell and about nine recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin convex on each side of a small median lobe; anterior margin with long bluntly pointed lobe. Plates very slender, concave on inner margin. Paraphysis relatively stout, slightly longer than plates, broadest on outer fifth before sharply pointed apex. Aedeagus in lateral view short, curved and parallel margined. Styles about twice as long as basal width, constricted near middle, lobed on outer margin before sharply pointed, outwardly projecting apical process.

Last ventral segment of female about two-thirds as long as greatest width, latero-posterior margin with very long, notched, median lobe.

Types: Holotype male, allotype female, Cameron
Co., Texas, Aug. 3, 1928, R. H. Beamer, in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas.

**Host plants:** Not known.

**Comparative notes:** This is one of the smallest species in southern Texas and the genitalia is quite distinctive—the slender plates, short styles and stout paraphyses of the male and the greatly produced last ventral segment of the female are unlike any other species in the area.

52. *Scaphytopius (Cloanhanus) pallidicapitatus* n. sp.

Resembling *castranus* but darker, more distinct pattern on crown and with shorter aedeagus. Length: female 4 mm., male 4 mm.

**Color:** Crown fulvus marked with brown; wedge, irregular band before eyes and posterior margin without markings. Pronotum gray with sparsely spaced dark dots, vittae visible on lateral margins. Scutellum yellow to fulvus, darkest near basal corners. Face yellow to fulvus with sparsely spaced dots throughout, especially on lateral margins of genae; shanksmouth small; apex of olypellus only slightly darkened. Forewings semihyaline white, darkened posteriorly; veins brown, darkest on posterior and costal margins.
Structural characteristics: Crown slightly longer than width between eyes, anterior margin slightly convex on each side of a blunt apex; wedge relatively small. Pronotum about as long as crown, almost two and one-half times as wide as length at middle and about five times length behind eyes. Clypeus slightly over twice as long as width at ocelli, slightly sinuate near antennae. Clypellus definitely constricted near base and enlarged near apex. Face in lateral view convex. Forewings with vein-like markings in trachial cell, about eleven recurved veins to costa and sometimes extra veins in clavus.

Genitalia: Valve about as long as greatest width, posterior margin distinctly convex on each side of a truncate lobe on median third. Plates slender. Paraphysis slender, extending slightly beyond apex of plates, apex pointed. Aedeagus in lateral view very short, slightly curved and parallel-margined. Styles about four times as long as basal width, almost parallel-margined to rounded outer margin before sharply pointed apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margins slightly convergent, posterior margin rounded to a very small median notch.

Types: Holotype male, allotype female, and 3 male and 2 female paratypes, Mission, Texas, July 5, 1938, R. H. Beamer, in the Francis Huntington Snow Entomological
Collection, University of Kansas, Lawrence, Kansas.

Host plants: Not known.

Comparative notes: The very light crown, with speckled face, is distinctive. A specimen from Calcasieu Parrish, Louisiana, is probably this species, but the abdomen is missing. This species is near brevis but the genitalia is somewhat different.

53. Soaphytopius (Cloanthanus) nigriviridis (Ball)


Resembles trilineatus in the female, but much smaller and lighter; the male has a much shorter crown, somewhat resembling castranus, but more slender and without dots on dorsum. Length: female 4.5 mm., male 3.8 mm.

Color: Crown greenish and with three or four black vittae on each side of median suture, restricted to apical two-thirds. Pronotum yellowish-green, usually darkest on disc, without markings except for sometimes an indication of vittae. Scutellum slightly lighter than pronotum and either without markings or, at most, with
two or three short brown lines along anterior margin. Face
greenish-yellow, without markings except for a few brown
vermiculations along base in area of sharksmouth and some-
times behind eyes; sharksmouth short in the male, long in
the female. Forewing semihyaline ivory on clavus, brachial,
apical and antapical cells, colorless on remainder of wing;
sometimes clouded with brown or with five brown spots on
inner half of clavus and apical half of corium; veins
colorless except for two or three recurved veins to costa.

Structural characteristics: Crown about one and
one-half times as long as width between eyes in male, two
and one-half times basal width in female; anterior margin
convex on each side of broadly pointed apex in male, some-
what concave on each side in female; wedge short in male,
half length of crown in female. Pronotum three-fourths as
long as crown in male, one-half length of crown in female;
two and one-fourth times as wide as length at middle and
four times length behind eyes. Clypeus about twice as
long as width at ocelli in male, two and two-thirds times
width in female; only slightly sinuate at antennae, if at
all. Clypellus slender, only slightly enlarged at apex.
Face in lateral view convex in the male, almost straight
in female. Forewing with about five recurved veins on
costa (with only two or three colored) and sometimes extra
cross-veins in clavus.
Genitalia: Valve wider than greatest length, posterior margin slightly concave near base, remainder evenly rounded; anterior margin concave on each side of a relatively long median lobe. Paraphysis extending well beyond plates, enlarged, bulb-like near sharp apex. Aedeagus in lateral view broad and "U" shaped. Styles short, less than three times as long as basal width, sinuate near middle, lobed on dorsal margin just before short, slender, outward-projecting apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margin slightly convex and converging; posterior margin with slight concavity at middle and small lobe on each side and another small lobe on each outer margin, giving a four-lobed appearance.


Host plants: Ball (1932) writes "--taken by the writer in abundance, both nymphs and adults, on Hymenoclea monogyra in southern Utah and Arizona."
Specimens were examined from Las Vegas, Nevada labeled "Hymanoclesea salsola."

Comparative notes: The greenish color readily separates this species from any other in the genus found in the Southwest. The difference in the length of the crown is not always so great; as some short crowned females will be found, although never so short as in the males.

54. Scaphy. (Cleanthanus) nigriviridis sub sp. dixianus (Ball)

Resembles nigriviridis but brownish in color and with the aedeagus longer and less curved. Length: female 4.5 mm., male 4 mm.

Color: Crown ivory to yellow with brown lineations on apical two-thirds; same color pattern as in nigriviridis. Pronotum ivory with vittae indicated by brown dots. Face as in nigriviridis, with the green replaced by yellow. Forewings more opaque ivory than nigriviridis, with most of wing, excepting brachial cell, containing brown clouded areas, especially in female; usually about three dark recurved veins in costa, others ivory to yellow.

Structural characteristics: About the same as in nigriviridis, except usually with somewhat shorter crown.
Genitalia: About the same as in *nigriviridis* but with aedeagus in lateral view stout, almost parallel-margined, only slightly curved; and with paraphyses narrower near apex.


**Host plants:** Ball (1932) writes "--has been taken sparingly from *Hymenoclea salsola* in the same regions."

**Comparative notes:** Specimens collected in the winter have a somewhat shorter crown than those collected in the summer. This form seems to be restricted to
Arizona and adjacent areas of California and Utah, a somewhat narrower range than for nigriviridis.

55. Scaphytopius (Gloanthanus) heldoranus (Ball)

Resembling desertanus but with a large, black spot near apex of crown and black lines to posterior margin and with genital paraphyses. Length: female 3.8 mm., male 3.4 mm.

Color: Crown white to ivory with large, irregular black blotch near apex and three black lines from this to base; usually a less distinct line inside each eye. Pronotum gray with dark dots, vittae usually faintly indicated. Scutellum white to ivory with a few dark markings along base and on disc. Face light with black dots, lightest on disc of clypeus, darkest behind eye and between anterior margin of eye; line behind eye and long sharksmouth at least indicated. Forewings opaque white, scattered brown dots throughout; veins consisting of brown dots anteriorly, becoming black lines on costa and at apex.

Structural characteristics: Crown about one and one-half times as long as width between eyes, almost straight on each side of a bluntly pointed apex; wedge short and an irregular circle. Pronotum about three-
fourths as long as crown, slightly more than twice as broad as length at middle and about four and one-half times as wide as length behind eyes. Clypeus about two and one-half times as long as width at ocelli, slightly concave along sharksmouth, somewhat constricted at antennae. Clypellus stout, only slightly enlarged, if any, near apex. Face in lateral view distinctly convex. Forewing with typical venation, several vein-like markings in brachial cell and about ten recurved veins to costa.

Genitalia: Valve about one and one-half times as wide as length at middle, posterior margin broadly rounded, anterior margin convex. Paraphysis long, straight and slender to a sharp apex. Aedeagus small, "J" shaped, slightly broadest near apex. Styles almost three times as long as basal width, sinuate near middle, slightly lobed on outer margin, before apical finger-like process.

Last ventral segment of female about twice as wide as median length, lateral margins convergent, posterior margin convex, with a small, bluntly-pointed median process.


Host plants: Ball (1932) writes "breeding abundantly on the wild rubber plant (Parthenium incanum) in southeastern Arizona."

Comparative notes: This small desert species is easily recognized by the opaque white forewing and the large black spot at apex of crown.

56. Scaphy. (Cloanthanus) vittifrons n. sp.

A distinctively marked species, with the fuscus-margined, light vitta from sharksmouth to apex of frons.

Length: female 4.5 mm., male 3.7 mm.

Color: Crown mottled fulvus to brown with broad, fuscus margined light vittae as follows; along anterior margin from eye to eye, wedge, a long vitta on disc on each side of median suture and an irregular area along the median margin of each eye. Pronotum mottled yellow to fulvus with typical vittae distinct and dark-margined. Scutellum yellowish, darkest next each basal corner. Clypeus yellowish, mottled with brown, and with fuscus-bordered light marks as follows; line along basal margin joining ocelli, sharksmouth, vitta from near sharksmouth to apex. Clypellus and lorae same color as clypeus, but
with fewer dark markings. Genae about same color as clypeus, with fuscus-bordered light vittae as follows: behind eye, from apex of eye to lateral margin and next lorae. Forewings opaque white with irregular dark fulvus or light brown clouded areas covering about half of entire wing; veins darkening posteriorly and on costa.

**Structural characteristics:** Crown about twice as long as width between eyes, longest in female, anterior margin almost straight on each side of a pointed apex; wedge about two-fifths length of crown. Pronotum about three-fourths as long as crown, proportionately shorter in female, twice as wide as length at middle and three and two-thirds times length behind eye. Clypeus over twice as long as width at ocelli, lateral margins sinuate at antennae. Clypellus only slightly enlarged near apex. Face in lateral view slightly convex between anterior margin of eyes. Forewing with a few vein-like marks in brachial cell and about ten recurved veins to costa.

**Genitalia:** Valve about three-fourths as long as greatest width, posterior margin convex on each side of a bluntly pointed apex; anterior margin with short, broad lobe. Paraphysis long, slender and sharply pointed. Aedeagus in lateral view short, curved and almost parallel margined. Styles almost four times as long as basal width, sinuate on basal third, small lobe on outer margin before long, slender processes on apical third.
Last ventral segment of female almost twice as wide as length at middle, lateral margin slightly convex; posterior margin almost straight except for small median lobe.

**Types:** Holotype male, Concan, Texas, July 6, 1936, R. H. Beamer, in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas. Allotype female, Chisos Mts., Texas, Sept. 19, 1938, D. J. and J. N. Knoll, in the Knoll Collection, Ohio State University, Columbus, Ohio. One paratype female, El Paso Co., Texas, Aug. 30, 1940, D. J. and J. N. Knoll.

**Host plants:** Not known.

**Comparative notes:** So far as known, this is the only species north of Mexico with the vitta on the middle of the frons, although there are several larger, similarly marked species in Mexico.

57. *Scaphytopius* (Cloanthanus) *slossonae* (Van Duzee)

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Resembling *acutus* but smaller, more slender and with a sharper crown. Length: female 4.5 mm., male 4 mm.

**Color:** Crown fulvus with light markings as follows: thin line along anterior margin, wedge, long broad arcuate line on disc on each side of median suture and two pairs of dots on posterior margin. Light areas
are thinly and irregularly lined with brown. Pronotum fulvus, much darker than crown, lightest along anterior margin, scattered brown dots, especially in male; vittae irregular but distinct. Pronotum yellow to fulvus with typical markings. Clypeus, clypellus and lorae yellow except on basal fourth; brown along basal margin between eyes except for long sharksmouth. Ganae lightest next clypeus, dark along lateral margins, vitta behind eye and near ocellus distinct. Forewing semihyaline fulvus with large milky aeroles throughout, heavy fuscus vermiculations in male, lighter in female, darkest on outer anteapical and adjoining costa; veins fuscus in male, lighter in female.

Structural characteristics: Crown about two and one-fourth times as long as width between eyes, anterior margin straight on each side of a sharply pointed apex; wedge about half length of crown. Pronotum about three-fifths as long as crown, two and one-fourth times as wide as length at middle and three and one-half times length behind eyes. Clypeus almost two and one-half times as long as width at ocelli with slight or no constriction at antennae; shallow concavity along sharksmouth. Clypellus relatively slender and enlarged at apex. Face in lateral view concave between anterior margin of eyes. Forewing with vein-like markings in brachial cell, eight or nine recurved veins to costa and sometimes extra cross-veins in clavus.
Genitalia: Valve slightly wider than length at middle, posterior margin convex on each side of a bluntly pointed apex; anterior margin with short median lobe. Paraphysis long, slender, pointed and parallel-margined. Aedeagus slender, almost parallel-margined, slightly curved near base. Styles almost four times as long as basal width, slightly sinuate on basal third, lobed on outer margin before, short, slender, outwardly curved apical process.

Last ventral segment of female about three-fifths as long as greatest width, latero-posterior margin almost evenly rounded.

Types: I was unable to locate the types, but one of the Van Duzee series from Crescent City, Florida, was on hand for study.


Host plants: Ball (1932) writes "--was taken--in abundance everywhere in Florida. In several places larvae and adults were found on pure stands of a narrow-leaved sunflower (Helianthus angustifolius)."
Comparative notes: This species is occasionally confused with *cinereus* in Florida, but in *slossonae* the area between sharksmouth and basal margin of clypeus is darker than remainder of clypeus, while in *cinereus* it is about the same color as remainder of clypeus.

58. *Scaphytopius* (Cloanthanus) *rubellus* (Sanders and DeLong)


Resembling *acutus* but with more slender, pointed crown, reddish in color and with coiled genital paraphyses. Length: female 5 mm., male 4.5 mm.

Color: Crown mottled reddish-fulvus with yellowish markings as follows: thin line along anterior margin, wedge, arcuate vittae on disc often obsolete except at middle, typical spots along posterior margin. Pronotum about same color as crown, vittae usually indicated. Scutellum same as crown, light markings faintly indicated. Face reddish-fulvus, lightest on disc of clypeus, sharksmouth long, vitta behind eye and one near ocellus faint, but visible. Forewing semihyline reddish-fulvus with light aeroles, especially at apex; veins concolorous, becoming fusous at apex and on costa.

Structural characteristics: Crown as long as width between eyes in male, longer in female, anterior margin straight to slightly concave on each side of a sharply
pointed apex; concavity along wedge and median suture; wedge very narrow and about half length of crown. Pronotum slightly more than half as long as crown, about two and one-fourth times as wide as length at middle and three and one-half times length behind eye. Clypeus about two and one-fourth times as long as width at ocelli in male, longer in female, shallow concavity along sharksmouth and very little constriction at antennae. Clypellus slightly enlarged near apex. Face in lateral view strongly concave between anterior margin of eyes. Forewing with vein-like marks in brachial cell, about nine recurved veins to costa and often extra veins in clavus.

Genitalia: Valve almost as long as greatest width, posterior margin definitely convex on each side of bluntly pointed apex; anterior margin concave on each side of a truncate lobe on median third. Paraphysis slender, a complete coil on outer half; apex sharp. Aedeagus in lateral view with slender, slightly curved shaft. Styles almost four times as long as basal width, sinuate near middle, lobe on dorsal margin before finger-like apical process on outer fourth.

Last ventral segment of female almost twice as wide as length at middle, lateral margins convex and slightly convergent; posterior margin notched on each side of a distinct, rounded lobe on median fourth.
Types: Lectotype male, lectoallotype female, Battle Point, Virginia, June 22, 1918, Sanders, here designated, in the DeLong collection, Ohio State University, Columbus, Ohio.


Washington.

Comparative notes: This reddish species with the very sharp, slender crown is quite distinctive. Most like acutus in color, it has a much more pointed crown.

59. Scaphytopius (Cloanthanus) cinereus (Osborn and Ball)


Resembles acutus, but smaller, yellowish in color and markings of forewing consisting primarily of dots.

Length: female 4.5 mm., male 4 mm.
Color: Crown yellowish with dark fulvus irrorations throughout, light markings indicated as follows: wedge, broken oblique lines from anterior margin to base next median suture and two pairs of dots on posterior margin, one next each eye and another on each side of median suture. Pronotum more darkly marked than crown, excepting distinct light vittae. Scutellum yellow with typical markings. Clypeus, clypellus and lorae yellow, excepting long sharksmouth, lighter, and dark irrorations across clypeus between eyes. Genae irrorate with dark, lightest along margin of clypeus, vitta behind eye and shorter ones near ocellus and antenna, distinct. Forewing semihyaline white with a faint fulvus tinge, numerous dark dots throughout, veins darkening posteriorly.

Structural characteristics: Crown about one and one-half times as long as width between eyes, anterior margin almost straight on each side of a pointed apex; wedge almost half length of crown. Pronotum about two-thirds as long as crown two and one-half times as wide as length at middle and four times length behind eye. Clypeus slightly more than twice as long as width at ocelli, slightly constricted near antennae and shallow concavity along sharks mouth. Clypellus distinctly larger near apex. Forewing with vein-like marks in brachial cell, eight or nine recurved veins to costa and usually extra cross-veins in clavus.
Genitalia: Valve about as long as greatest width, posterior margin slightly convex and converging to a rounded apex; anterior margin concave on each side of a rounded lobe on median third. Paraphysis slender, coiled around aedeagus on outer half; apex very sharp. Aedeagus with wedge-shaped base, shaft in lateral view, broad, curved and bluntly pointed. Styles about three times basal width, sinuate near middle, dorsal margin lobed just before short, bluntly pointed, finger-like apical process.

Last ventral segment of female one and two-third times as wide as length at middle, lateral margins convex; posterior margin with small lobe on each side of median notch.

Types: Lectotype male, lectoallotype female, June 4, 1896, in the Iowa State College collection, Ames, Iowa, here designated. These were on hand for study.

The types of parvus were destroyed in the Clemson College fire, but a paratype male was in the Osborn Collection, and DeLong has designated an allotype from his collection.

The types of oviedus are in the National Museum, Washington, D. C.

Material on hand: Many specimens from throughout the East from Texas to Minnesota eastward. This is probably the commonest grass species in this area.

Host plants: Ball (1932) writes "Attention was called in the original description to the fact that this
species is only found in open grasslands and it was, therefore, inferred that it was a grass feeding species. With the present knowledge of food habits of the group it appears more likely that the food plant will prove to be some one of the shrubs or shrub-like plants that are found in such situations. *P. parvus* Lathrop is apparently a synonym of this species as he states that the male has a right-angled vertex and the female is 4 mm. long with orange on scutellum, characters that apply to *cinereus* but not to what he describes as *cinereus* in his South Carolina list.

"*P. oviedus* Ball. This species either has several host plants on which it is apparently equally at home or else several species, for which distinctive characters have not been discovered, are involved. The type material was taken along with the nymphs on a low mat forming heather—but either this or a closely allied species is abundant both nymphs and adults on a wire-stemmed *Euphorbiaceae* (*Chamaesyce sp.* ) that forms large red mats in dry places and again on a finely branching aster-like plant abundant along the margins of wet places in Florida. *P. cinereus* of Lathrop's South Carolina list is no doubt this species as it is described as too small and too long-headed in the male for the true *cinereus* Osb. & Ball."

Osborn writes "It appears to develop especially on three different kinds of grasses, Andropogon scoparius, Michx., Bouteloua hirsuta Lag. and curtipendula (Michx) Torr., the latter two species probably being its most common hosts."

Comparative notes: Ball separates oviedus from cinereus by size and the presence of orange on the scutellum of cinereus but there were much gradations in size and the color of scutellum did not necessarily hold true. As one examines a series, it is found that the ones in Florida are the smallest and those further north are largest, just as the case in some other species, especially frontalis.

60. Scaphytopius (Cloanthanus) guterranus (Ball)


Resembling acutus, but smaller and with numerous irrorations on crown. Length: female 4.5 mm., male 4 mm.

Color: Crown mottled fuscus and light, excepting light markings as follows: wedge; broken oblique line from anterior margin half-way between eye and wedge to posterior
margin on each side of median suture; on posterior margin
two pairs of spots, one next each eye and one on each
side of median suture. Pronotum same color as crown,
vittae irregular, but usually present. Scutellum fulvus
to orange with typical markings present. Clypeus ivory
to light fulvus, dark irrorations between anterior margin
of eyes excepting white sharksmouth. Clypellus and lorae
about same color as clypeus, usually some irregular dark
clouded areas; apex of clypellus darkened. Genae darker
than clypeus, somewhat mottled, vitta behind eye and
shorter ones near ocellus and antenna, distinct. Forewing
semihyaline light fulvus with lighter aeroles, although
often the fulvus areas are reduced and most of wing is
light; dark irrorations throughout; veins brown, becoming
fuscus at apex and on costa.

Structural characteristics: Crown one and one-
half times as long as width between eyes in male, longer
in female; anterior margin almost straight on each side of
a pointed apex; wedge about one-third length of crown.
Pronotum about two-thirds as long as crown in male, half
as long as crown in female, slightly over twice as wide
as length at middle and three times length behind eye.
Clypeus about two and one-half times as long as width at
ocelli, shallow concavity along sharksmouth, slightly
sinuate at antennae. Clypellus enlarged near apex. Face
in lateral view slightly concave between eyes. Forewing
with several vein-like marks in brachial cell and eight or nine recurved veins to costa.

**Genitalia:** Valve about one and one-fourth times as broad as length at middle, posterior margin slightly converging to a small median lobe at apex; anterior margin rounded throughout and without a median lobe. Paraphysis somewhat less than twice length of styles, extending well beyond plates, almost parallel-margined to sharply apex. Aedeagus in lateral view small, "U"-shaped, broadest at base, slender, narrowest just before apex. Styles slender, almost five times as long as basal width, slightly sinuate on basal third, outer margin slightly lobed on outer three-fifths just before long, slender apical process on outer two-fifths.


**Additional material on hand:** (Arizona) Coconino Co., Flagstaff, Sunset Pk., Yarnell, Yavapai Co., Navajo Co., St. Johns, Grand Canyon, Williams, Ashfork, Granite Dell, Kaibab, Safford. (New Mexico) Tijique, Mountain Park, Santa Fe, Las Vegas, Silver City, Jemez Springs. (Utah) Smithfield.

**Host plants:** Ball (1932) writes "Nymphs and adults of this species were found in abundance on
Outierrezia californica in northern Arizona."

Comparative notes: The relatively long crown, almost entirely covered with vermiculations resembles no other species with the possible exception of the much larger trilineatus.

61. Scaphytopius (Cloanthanus) acutus (Say)


Resembles *latus* but with different pattern on a shorter crown and with genital paraphysis almost parallel-margined. Length: female 5.2 mm., male 4.8 mm.

Color: Crown mottled fulvus with light markings as follows: thin, broken line along anterior margin; wedge; arcuate or straight line on disc from near apex to base on each side of median suture; two pairs of dots along posterior margin, one next each eye and another next median suture, the latter are often united.
Pronotum darker than crown, lightest along anterior margin, few irrorations, vittae evident. Scutellum yellow to orange with typical light markings. Clypeus, clypellus and loriae bright yellow excepting brown irrorations on both sides of yellow sharksmouth and black line along apex of clypellus. Genae fuscus except for broad area next clypeus, vitta behind eye and shorter one near ocellus. Forewing semihyaline fulvous with fuscus dots and vermiculations, excepting milky aeroles throughout; veins brown, becoming fuscus to black at apex and on costa.

Structural characteristics: Crown slightly over one and one-half times as long as width between eye, slightly convex on each side of a bluntly pointed apex; wedge about one-third length of crown. Pronotum slightly shorter than crown, about two and one-fourth times as wide as length at middle, and three and one-half times as wide as length behind eyes. Clypeus about twice as long as width at ocelli, very slightly constricted at antennae. Clypellus enlarged near apex. Forewings with vein-like marks in brachial cell and eight or nine recurved veins to costa.

Genitalia: Valve about one and one-fourth times as wide as length at middle, posterior margin convex near bluntly-pointed apex; anterior margin rounded. Paraphysis with basal bulb-like enlargement, slightly enlarged on
outer half before sharp apex. Aedeagus "J" shaped, narrowest on outer third before bluntly-pointed apex. Valves long, about four times as long as basal width, slightly sinuate near basal third, slightly lobed on outer margin with a sharply pointed process on apical fifth; a small process on outer margin just below apical process. Aedeagus with broad concavity on outer margin on basal half.

Last ventral segment of female one and three-fifths times as wide as length at middle, lateral margins slightly convergent, posterior margin slightly convex with a slight median notch.

Types: Evidently the Say types of this species have been lost or destroyed. Belong (1945) erected a neotype, which is in his collection.

Material studied: Numerous specimens from southern Canada and most of the United States except for the extreme southern part.

Host plants: Uhler, etc. (1895) writes "Rhus trilobata at Ft. Collins, Clematis and oak at Manitou and sugar beet at Grand Junction, Colorado." DeLong (1923) writes "may be found on Calamagrostis canadensis in a wet meadow habitat." Lowry (1933) reports "grasses and sedges" as the host. Osborn (1915) writes "--from bushes, brass and sweet fern--willows, potato and various plants." This species is apparently found on a large number of hosts.
Comparative notes: This species is the most variable one in the genus, both in external characters and internal genitalia. Color may vary from almost black to a light fulvus, the crown may vary considerably in length, and the loriae may vary from almost black to fulvus. The styles vary from very long to rather short. The only constant character is the broadly concave margin of the pygofer on basal half, often the only character that will separate this species from similar ones. Several attempts were made to separate this species into sub-species, but there are gradations from one extreme to the other. Until more is known regarding the host relationships, it is best to consider them as the one species, especially with the good character furnished by the outer margin of the pygofer.

62. Scaphytopius (Cloanthanus) oregonensis (Baker)


Resembling acutus but larger, lighter in color, margins of face not infuscated and with shorter crown. Length: female 6 mm., male 5.5 mm.

Color: Crown fulvus with brown irrorations, light markings as follows: thin line along anterior margin, wedge, indistinct, irregular arcuate line on each side of median suture on disc. Pronotum about same color as crown
but with few or no irroration, vittae usually evident only on lateral margins. Scutellum slightly darker than crown with typical light markings. Clypeus, clypellus and lorae ivory to yellow, excepting distinct long sharksmouth and dark dots between this and posterior margin. Genae fulvus, darkest on lateral margins, vitta behind eye and shorter one near ocellus distinct. Forewings semihyaline fulvus with milky aeroles throughout, especially on costa; veins concolorous near base, becoming brown to fuscus at apex and on costa.

Structural characteristics: Crown of male about one and one-third times width between eyes, longer in female, anterior margin straight to slightly convex on each side of a pointed apex; wedge almost half as long as crown. Pronotum about two-thirds as long as crown, two and one-fourth times as wide as length behind eyes. Clypeus slightly over twice as long as width at ocelli, only slightly constricted at ocelli, shallow concavity along sharksmouth. Clypellus slender, only slightly enlarged near apex. Face in lateral view straight in male, slightly concave between antennae in female. Forewings with several vein-like markings in brachial cell, about nine or ten recurved veins to costa and often extra cross-veins in clavus.

Genitalia: Valve slightly wider than length at middle, roughly triangular, posterior margin almost straight
on each side of a bluntly pointed apex; anterior margin with short, broad median lobe. Paraphysis stout, broadest near outer fourth before sharp apex. Aedeagus in lateral view narrowest at base, broadest near middle; apex bluntly pointed. Styles short, about two and one-half times as long as basal width, sinuate just before middle, lobed on outer margin before sharply pointed, apical process on outer fifth.

Last ventral segment of female almost as long basal width, lateral margins somewhat converging, posterior margin rounded.

**Types**: Dr. P. W. Oman writes regarding the type of this species "Oreg. 2509 Collection Carl F. Baker. Associated notes indicate that this specimen was collected at Portland, Ore., 9-18-97, A. P. Morse." This male specimen here designated lectotype, in National Museum, Washington, D. C. Allotype female, Canyonville, Ore., July 12, 1935, R. H. Beamer, in Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas. Parallotype females as follows: (California) 3, Santa Cruz Mt., Aug. 13, 1938, R. I. Sailer; 1, Santa Cruz Mts., Aug. 13, 1938, R. H. Beamer; 10, Santa Rosa, Aug. 16, 1938, R. H. Beamer; 1, Santa Rosa, Aug. 16, 1938, D. W. Craik; 4, Santa Rosa, Aug. 16, 1938, L. W. Hepner; 5, Jamesburg, Aug. 11, 1938, R. H. Beamer; 4, Jamesburg, Aug. 11, 1938, L. W. Hepner; 5, Lockwood, July 24, 1935,

Host plants: Specimens were examined with the following host data on them: Arctostaphylos manzanita, Occidental, California; A. patula, Towie, California; Holodiscos discolor, Medicago sativa, Geocanthus sanguineus and Pteridium aquilinum, Moscow Mts., Idaho; buck brush, Logan Canyon, Utah. Ball (1932) writes "--was swept by the writer both larvae and adults in abundance from mixed clumps of wild roses and snowberries (Symphoricarpos) at Wenatchee and Le Grand, Oregon."
Comparative notes: There is a light acutus in the same range with oregonensis but the latter species has a shorter crown, is larger and lacks the concavity on the outer margin of the male pygofer. The males are sometimes quite dark and are almost invariably darker than the females.

63. Scaphytopius (Gloanthanus) latus (Baker)


Resembles acutus but with less distinct markings on a longer crown, lighter on margins of genae, and with genital paraphyses enlarged near apex. Length: female 5.5 mm., male 5 mm.

Color: Crown fulvus, darkest on disc with light wedge and sometimes faintly evident, long arcuate marks on disc. Pronotum about same color as disc of crown, lightest along anterior margin. Scutellum fulvus, darkest next each basal corner, typical markings distinct. Face yellow to fulvus, darkest on lateral margin and along base of clypeus; long sharksmouth faint but distinct. Forewing fulvus on clavus, darker on corium, dark vermiculations on corium, light aeroles near apex, darkest on outer anteapical; veins fulvus, becoming brown to fuscus at apex and on costa.
Structural characteristics: Crown about twice as long as width between eyes, somewhat concave on disc, straight on each side of a rounded, but acutely pointed apex; wedge about one-third length of crown. Pronotum slightly more than twice as wide as length at middle, three and one-half times length behind eyes. Clypeus about two and one-fourth times width at ocelli, only very slightly constricted at antennae, if at all; shallow concavity along shanksmouth. Clypellus relatively broad and slightly enlarged near apex. Face in lateral view slightly concave between anterior margin of eyes. Forewing with numerous vein-like marks in brachial cell, about twelve recurved veins on costa and usually extra cross-veins in clavus.

Genitalia: Valve about one and one-third times as wide as length at middle, posterior margin oval; anterior margin with relatively large, truncate median lobe. Paraphysis stout, bulb-like, basal area elongate, greatly enlarged on outer fifth; spine-like process at apex. Aedeagus in ventral view narrowest on outer half. Styles stout, two and one-half times as long as basal width, sinuate near basal third, lobed on outer margin before stout, bluntly-pointed process on apical third.

Last ventral segment of female about one and one-third times as wide as length at middle, lateral margins converging, posterior margin with broad lobe on each side of small median notch.
Types: Holotype female, "Colo. 882, Collection Carl F. Baker, Collected Fr. Collins, Colo., 8-11." in the National Museum, Washington, D. C. Allotype male, here designated, "Colo." (only data) in Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas. Parallotype males as follows:


Host plants: Material examined from Itasca Park, Minnesota were collected on Pinus banksiana.

Comparative notes: This species is apparently rare in Colorado and Utah, but this species is rather common in the Northeast and has been known as cuprescens Osborn.
64. Scaphytopius (Cloanthanus) argutus DeLong

Cloanthanus argutus, DeLong, D. M., Ohio Jour. of Sci.,

Scaphytopius hastus, DeLong, D. M., Ohio Jour.

Scaphytopius lanceus, DeLong, D. M., Ohio Jour.

Resembling acutus but lighter along margins of

genae, darker outer wings, and paraphyses enlarged near

apex. Length: female 5 mm., male 4.5 mm.

Color: Crown fulvus, sometimes darkest on disc

with light markings as follows; thin line along anterior

margin, wedge, long arcuate vitta on each side of median

suture and usually two pairs of large dots along posterior

margin. Pronotum usually darker than crown, typical

vittae usually faintly indicated. Scutellum about same

color as crown, with typical markings. Clypeus, clypellus

and lorate yellow to fulvus, darkest along posterior margin

excepting long sharksmouth. Genae darker than clypeus,
lightest next clypeus, and vitta behind eye and near

ocellus distinct. Forewing opaque fulvus to reddish-fulvus

with white aeroles at apex of clavus and apex of corium,
dark vermiculations; veins fuscus.

Structural characteristics: Crown about twice

as long as width between eyes in female, shorter in male,

anterior margin very slightly convex on each side of a
pointed apex; wedge almost half length of crown. Pronotum about two-thirds as long as crown, slightly over twice as wide as length at middle and three and one-half times as long as width at ocelli, somewhat sinuate at antennae and shallow concavity along sharksmouth. Clypellus enlarged near apex. Forewings with several vein-like marks in brachial cell, about ten recurved veins to costa and often extra cross-veins in clavus.

Genitalia: Valve about one and one-fourth times as wide as length at middle, posterior margin rounded to a bluntly pointed apex; anterior margin concave on each side of a broad, rounded lobe on median third. Paraphysis extending well beyond plates and, except for basal bulb, almost parallel-margined to outer fourth, where it is enlarged, long, platelike, before sharp apex. Aedeagus in ventral view, much narrower near apex, in lateral view with short, broad "arrow head" like basal process and slightly curved shaft, narrowed to a blunt apex. Styles about three times as long as basal width, sinuate near middle, long lobe on dorsal margin just before finger-like apical process.

Types: Types of argutus and lanceus in the DeLong collection, Ohio State University, Columbus, Ohio. Types of hastus in Illinois Natural History Survey Collection, Urbana, Illinois. Holotype of argutus, and paratypes of lanceus and hastus on hand for study.
Additional material on hand: (Florida) Hilliard.
(Georgia) Prattsburg, Griffin. (Alabama) Burnsville, Tuskegee. (Mississippi) Fulton, Ireland, Shuqualak.
(Louisiana) Caddo Co. (South Carolina) Tigerville, Lexington. (Tennessee) Clarksville, Magnolia, Coal Creek, Elk Valley, Chattanooga. (North Carolina) Walnut.
(Kentucky) Cadiz. (Arkansas) Polk Co. (Indiana) Gary.

Host plants: Not known.

Comparative notes: This species varies a great in size, color and with some variation in the male genitalia. The distinctive characters are the brownish, almost opaque wings, the fulvus face and the aedeagus much smaller at apex than at middle, when viewed from the ventral side. Sometimes the crown is lighter than the forewings.

65. Scaphytopius (Cloanthanus) fuscicephalus n. sp.

Resembles argutus but with crown darkest on disc and aedeagus straight and parallel-margined in ventral view. Length: female 4.8 mm., male 4.1 mm.

Color: Crown mottled fulvus and brown, darkest on disc; wedge light. Pronotum fulvus flecked with dark, vittae evident. Scutellum dark fulvus, darkest near basal corner, typical markings present. Face yellowish, slightly darker behind eye and along basal margin between ocelli, with dark-margined light markings as follows: sharksmouth,
vitta behind eye and shorter one near ocellus. Forewings translucent brown, veins and many vermiculations, darker; white aeroles throughout.

**Structural characteristics:** Crown about twice as long as width between eyes, anterior margin almost straight on each side of a sharply pointed apex; wedge about two-fifths length of crown. Pronotum about three-fifths as long as crown, two and one-fourth times as wide as length at middle and three and one-half times length behind eye. Clypeus slightly more than twice as long as width at ocelli, only slightly, if any, sinuate at antennae. Clypellus only slightly enlarged near apex. Face in lateral view concave between anterior margin of eyes. Forewings often with extra veins in clavus, vein-like markings in brachial cell and about ten recurved veins to costa.

**Genitalia:** Valve about three-fourths as long as greatest width, posterior margin bell-shaped; anterior margin with broad, short median lobe. Paraphysis long and slender and only slightly enlarged near apex. Aedeagus parallel-margined in ventral vein; slightly curved near base in lateral view. Styles about two and one-half times as long as basal width, quite sinuate near middle, lobed on outer margin before finger-like process on apical third. Last ventral segment of female almost twice as wide as median length, latero-posterior margin rounded.

Host plants: Not known.

Comparative notes: Specimens were on hand from Texas and New Mexico which were evidently of this same species. It is separated from argutus by the different aedeagus and the much darker crown.

66. Scaphytopius (Cloanthanus) viridicephalus n. sp.

Resembling slossonae but with shorter, greenish crown, and darker male. Length: female 4.2 mm., male 3.6 mm.

Color: Crown greenish-fulvus, especially in female, with wedge, long arcuate markings on disc and four pairs of large dots on posterior margin at least indicated. The male often is only faintly tinged with green, but may be distinguished from other species by the
crown being much lighter than the forewing. Pronotum
darker than crown, sparsely punctuate with dark in male,
vittae distinct. Scutellum about same color as pronotum
with typical light markings present. Face greenish-fulvus
in female, light green in male, slightly darkest along
lateral margin of genae, long sharksmouth, vitta behind eye
and another near ocellus faintly indicated. Forewing of
female semihyaline fulvus with dark vermiculations through-
out, very dark on apex, veins concolorous at base,
darkening and becoming fuscous at apex and on costa.
Forewing of female bright fulvus throughout, a few milky
aeroles throughout, no vermiculations; veins concolorous.
Occasionally a female with one or two of the recurved
veins darkened will be found.

Structural characteristics: Crown about twice
as long as width between eyes, anterior margin straight
on each side of a pointed apex; wedge over one-third length
of crown. Pronotum about three-fifths as long as crown,
two and one-half times as wide as length at middle and
four and one-half times length behind eye. Clypeus about
two and one-fourth times width at ocelli, only slightly
constricted at antennae. Clypellus definitely enlarged
near apex. Face in lateral view almost straight. Forewing
with about seven recurved veins on costa, claval veins
approaching each other at cross vein and sometimes extra
cross veins in clavus.
Genitalia: Valve about one and one-fourth times as wide as length at middle, posterior margin convex on each side of a bluntly pointed apex; anterior margin slightly concave on each side of a median lobe. Paraphysis with basal, bulb-like enlargement, almost parallel-margined to enlargement near sharp apex. Aedeagus, in lateral view, slightly curved, smallest near blunt apex. Styles stout, about three times as long as basal width, sinuate just before middle, lobed on dorsal margin before finger-like process on outer third.

Last ventral segment of female about twice as wide as length at middle, latero-posterior margin rounded to a small median lobe.

Types: Holotype male, allotype female and 4 male and 8 female paratypes, Shuqualak, Mississippi, July 16, 1930, P. W. Oman in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas. Additional paratypes as follows: (Mississippi) 2 male Shuqualak, July 16, 1930, R. H. Beamer; 1 female, Shuqualak, July 16, 1930, L. D. Tuthill; 1 female, Meridian, July 17, 1930, L. D. Tuthill; 1 female, Hamilton, July 15, 1930, R. H. Beamer; 1 female, Fulton, July 14, 1930, R. H. Beamer; 1 male, Columbus, July 16, 1930, R. H. Beamer. (Alabama) 1 female, Marion Junction, July 16, 1930, R. H. Beamer. (Texas) 2 male, Brownsville, Dec. 27, 1945, 2 female, June 29, 1938, R. H. Beamer; 8 female, 1 male, Brownsville,

Host plants: Not known.

Comparative notes: In some of the series, some specimens have a distinctively green head, while others will hardly be green at all, but a dark fulvus, in the male, lighter in the female.

67. Scaphytopius (Cloanthanus) utahensis n. sp.

Resembles graneticus but larger, somewhat lighter in color, with broader aedeagus and paraphyses. Length:
female 5 mm., male 4.8 mm.

Color: Crown fulvus flecked with brown, darkest next median suture, except for light markings as follows: line along anterior margin, wedge, long arcuate line on disc on each side of median suture. Pronotum fulvus flecked with dark, vittae irregular but present. Scutellum fulvus with a few irregular brown markings on basal half and a large brown spot inside each basal corner. Face light fulvus to yellow, with fuscus-bordered light markings as follows: sharksmouth, vitta behind eye and a shorter one in front of eye near ocellus. Forewing semi-hyaline fulvus with veins and many vermiculations, brown.
Structural characteristics: Crown about twice as long as width between eyes, anterior margin almost straight on each side of apex. Pronotum about two-thirds as long as crown, two and one-fourth times as wide as length at middle and three and one-half times length behind eye. Clypeus about two and one-third times as long as width at ocelli, lateral margins slightly sinuate at antennae. Clypellus slender, only slightly enlarged near apex. Face straight in lateral view. Forewing with vein-like marks in brachial cell and about twelve recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin oval, anterior margin with broad, short, truncate lobe. Paraphysis slender on basal three-fifths, gradually enlarged almost to sharp apex. Aedeagus almost parallel-margined in ventral view, long, curved near base, almost parallel-margined to blunt apex, in lateral view. Styles almost four times as long as basal width, sinuate near middle, lobed on outer margin before short, slender finger-like apical process.

Last ventral segment of female about one and one-half times as wide as median length, latero-posterior margin rounded, slightly notched at middle.

Types: Holotype male, allotype female, and 4 female and 1 male paratypes, Alton, Utah, Aug. 11, 1936, R. H. Beamer, in the Francis Huntington Snow Entomological
Collection, University of Kansas, Lawrence, Kansas.

**Host plants:** The type series was collected on *Rhus sp.*

**Comparative notes:** This species is tannish color and rather more slender than related species.

68. *Scaphytopius (Cleanthanus) graneticus* (Ball)


Resembling *acutus* but smaller, with lateral margins of genae lighter and pygofer without basal concavity on outer margin. Length: female 4.8 mm., male 4.3 mm.

**Color:** Crown mottled fulvus and brown, often darkest on disc; light markings as follows: thin, sometimes broken line along anterior margin, wedge, long arcuate vitta on disc on each side of median suture and usually four large dots on posterior margin. Pronotum about same color as crown, darkest on disc, typical light vittae at least indicated. Scutellum yellow to orange with typical light markings. Clypeus, clypellus and lora e yellow, excepting brown markings around long sharksmouth and along posterior margin between eyes. Genae yellow next clypeus, darkening and becoming fulvus on lateral margins; vitta behind eye and near ocellus,
distinct. Forewign semihyaline fulvus with many brown 
vermiculations, especially in male; veins darkening 
posteriorly, becoming black on costa.

Structural characteristics: Crown about twice 
as long as width between eyes in female, shorter in male, 
anterior margin straight on each side of sharp apex; wedge 
over one-third length of crown. Pronotum about two-thirds 
as long as crown; two and one-third times as wide as length 
at middle and about three and one-half times length behind 
eyes. Clypeus about two and one-half times width at ocelli, 
constricted at antennae, concave along sharksmouth. 
Glypellus relatively slender and somewhat enlarged near 
apex. Face in lateral view straight to slightly concave 
between anterior margin of eyes. Forewings with several 
vein-like markings in brachial cell, about ten recurred 
veins to costa and often extra cross-veins in clavus.

Genitalia: Valve about one and one-third times 
as wide as length at middle, posterior margin convex on 
each side of a rounded apex; anterior margin rounded. 
Paraphysis slender, with relatively small basal, bulb-like 
enlargement; enlarged on apical fourth before sharp apex. 
Aedeagus in lateral view, slender, slightly larger and 
curved on basal half. Styles about three times as long 
as basal width, sinuate near middle, lobe on outer margin 
before slender, finger-like process on apical fifth.

Last ventral segment of female about one and two-
thirds as wide as length at middle, latero-posterior margin evenly oval.

**Types:** Holotype female, Granite Dell, Arizona, July 17, 1929, allotype male, Williams, Arizona, Aug. 15, 1929, E. D. Ball, in the National Museum, Washington, D. C.

One pair of paratypes, same data as holotype, on hand for study.

**Additional material on hand:** (Arizona) Prescott, Yavapai Co., Granite Dell, Oak Creek Canyon, Kaibab Forest. (California) Leona Hts., Alameda Co., Lemon Cove, Redding, Delta, Big Bear Lake, Dunsmuir, Mint Canyon, Santa Rosa, Atascadero, Alpine, Stinton Beach.

**Host plants:** Ball (1932) writes "Females of this species were taken in some numbers from wild grape near Prescott, Arizona, July 17. It was apparently the last end of a brood as there were no nymphs or males present at that time. A single male was taken from wild grape in the mountains above Williams, Arizona, Aug. 15."

**Comparative notes:** This species is somewhat like argutus from the east, but the genitalia are somewhat different. It varies considerably, the specimens from California being much darker than those from Arizona.

69. *Scaphytopius (Oleanthanus) canus* n. sp.

Resembles *trilineatus* but larger, lighter in color, with a light face and genital paraphyses much larger near
apex. Length: female 6 mm., male 5.6 mm.

Color: Crown light fulvus with brown irrorations, light markings as follows: line along anterior margin, wedge, irregular arcuate line on disc on each side of median suture and an indication of another line parallel to this just inside eyes. Pronotum usually slightly darker than crown, darkest on disc and sparsely sprinkled with brown dots; vittae usually evident only on lateral margins. Clypeus, clypellus and lorae light fulvus, except for sharksmouth and irregular brown markings along base of clypeus; apex of clypellus brown. Forewings light fulvus with brown dots throughout; veins fulvus, becoming fuscus to costa.

Structural characteristics: Crown about twice as long as width between eyes in male, slightly longer in female, anterior margin almost straight on each side of a slender, but bluntly pointed apex; wedge almost half length of crown. Eyes usually have red lines in them. Pronotum slightly over half length of crown, about two and one-fourth times as wide as length at middle and three and one-half times length behind eyes. Clypeus almost two and one-half times width at ocelli, slightly sinuate at antennae; shallow concavity along sharksmouth. Clypellus stout, slightly enlarged near apex. Face in lateral view slightly concave between anterior margin of eyes. Forewings with many vein-like marks in brachial cell, about
twelve recurved veins to costa and often extra veins in clavus.

Genitalia: Valve about three-fourths as long as greatest width, posterior margin almost straight on each side of a bluntly pointed apex; anterior margin convex. Paraphysis enlarged near sharp apex. Aedeagus "j" shaped, almost parallel-margined throughout. Styles over twice as long as basal width, sinuate near middle, distinct lobe on outer margin before rather small apical process.

Last ventral segment of female about three-fourths as long as greatest width, convex and converging on lateral margins; posterior margin straight.

Types: Holotype male, allotype female, 10 female and 11 male paratypes, Pine Valley, California, July 27, 1938, R. H. Beamer, in the Francis Huntington Snow Collection, University of Kansas, Lawrence, Kansas. Additional paratypes as follows: (California) 1 female, Quatay, July 19, 1941, R. H. Beamer; 1 female, Santa Cruz Mts., Aug. 13, 1938, R. H. Beamer.

Host plants: The type series was collected on Garrya veatchii and is probably the host plant.

Comparative notes: This species resembles trilineatus, but has a shorter crown and the face is light. The general color is much lighter than trilineatus. It is evidently restricted to southern California.
70. Scaphytopius (Cloanthanus) trilineatus (Ball)


Resembles acutus, but with longer crown, dark face and distinct genitalia. Length: female 5.2 mm., male 5 mm.

Color: Crown mottled brown or fuscus and ivory, with light areas as follows: relatively broad line along anterior margin; wedge; irregular arcuate line from near apex to base on each side of median suture; two pairs of large dots on posterior margin, one next each eye and another on each side of median suture, often continuous with the long arcuate vittae on disc. Pronotum about same color as crown with vitta fairly distinct. Scutellum fulvus to brown with typical markings. Face brown to reddish-brown with small light dots throughout, lightest on long shanksmouth and coarse vermiculations along base between eyes; darkest on lateral margin of genae; vitta behind eye and shorter ones near ocellus and antennae distinct. Forewings opaque fulvus on disc, apex and part of clavus, remainder semihyaline white in patches, scattered vermiculations throughout; veins dark.

Structural characteristics: Crown almost two and one-half times as long as width between eyes, anterior
margin almost straight on each side of sharp apex; disc somewhat concave; wedge over half length of crown. Pronotum slightly less than half as long as crown, two and one-third times as wide as length at middle and four times length behind eyes. Clypeus over two and one-half times as long as width at ocelli, definitely constricted at antennae; concavity along sharksmouth. Clypellus somewhat enlarged near apex. Face in lateral view somewhat concave between anterior margin of eyes. Forewings with several vein-like marks in brachial cell, about eleven recurved veins to costa and usually extra cross-veins in clavus.

Genitalia: Valve about seven-tenths as long as greatest width, posterior margin rounded; anterior margin with broad, short median lobe. Paraphysis long, slender and hardly enlarged at all before sharp apex. Aedeagus roughly "L" shaped, short, almost parallel-margined throughout. Styles slender, over twice as long as basal width, small lobe on outer margin before process on apical fifth.

Last ventral segment of female about three-fourths as long as greatest width, lateral margins straight and converging; posterior margin straight and converging on each side of a shallow, slender median notch.

Types: Holotype male, San Margareta, California, Aug. 6, 1912, E. D. Ball, in the National Museum, Washington, D. C. Allotype female, and 12 female parallotypes, Anza,
California, July 29, 1938, R. H. Beamer, in the Francis Huntington Snow Entomological Collection, University of Kansas, Lawrence, Kansas, here designated. Additional parallotype females as follows: 1, Anza, July 29, 1938, R. I. Sailer; 2, Santa Rosa, Aug. 16, R. H. Beamer; 4, Santa Cruz Mts., Aug. 13, 1938, R. H. Beamer; 3, Santa Cruz Mts., Aug. 13, 1938, R. I. Sailer; 2, Lompoc, Aug. 7, 1938, R. I. Sailer; 1, Alpine, July 19, 1941, R. H. Beamer; 1, Arroyo Seco River, Aug. 8, 1938, R. H. Beamer; 1, Jacumba, July 17, 1940, R. H. Beamer; 1, Towie, Aug. 20, 1938, R. H. Beamer; 20, Boulevard, July 26, 1938, R. H. Beamer.

**Host plants:** Ball (1932) writes "This California species was taken by the writer in number from Rhus trilobata in several places in the mountains around Prescott, Arizona." Ball was evidently referring to the subspecies spicatus, found in Arizona. Numerous specimens were collected in California in 1938 on Arctostaphylos sp.

**Comparative notes:** The dark face separates this species from canus and the truncate plates and short aedeagus separates it from the subspecies spicatus, found in Arizona and New Mexico. This species varies a great deal in color, although usually it is darker than the other two species mentioned above.
71. Scaphy. (Cloanthanus) trilineatus sub sp. spicatus n. sub sp.

Resembling trilineatus but lighter with fulvous areas of forewing restricted to apical cells and with plates sharply pointed. Length: female 5₁₀ mm., male 5 mm.

Color: Crown mottled ivory and fuscous with light markings as follows: thin line along anterior margin; long wedge; irregular arcuate vitta on each side of median suture from near apex to base and usually two pairs of large dots on posterior margin, one next each eye and another on each side of median suture. Pronotum about same color as crown, lightest on anterior and lateral margins, vittae distinct. Scutellum ivory, dark irrorations and typical light markings. Face ivory with fine brown to fuscous irrorations excepting long sharkmouth and coarser irrorations along posterior margin, darkest on lateral margins of genae. Forewing semihyaline white except for small fulvous area in apical cells, fuscous vermiculations and veins throughout.

Structural characteristics: Crown over twice as long as width between eyes in male, twice width between eyes in female, shallow concavity on disc, anterior margin straight to slightly concave on each side of pointed apex; wedge about half length of crown. Pronotum about half as long as crown, about two and one-fourth times as wide as length at middle and four times length behind eyes. Clypeus over two and one-half times as long as width at ocelli, concavity along sharkmouth, sinuate at antennae.
Olypellus enlarged near apex. Face in lateral view concave between anterior margin of eyes. Forewing with several vein-like marks in brachial cell, about twelve recurved veins to costa and sometimes extra cross-veins in clavus.

Genitalia: Valve about one and one-half times as wide as length at middle, posterior margin rounded; anterior margin with a broad, short, median lobe. Paraphysis with slight basal enlargement, slightly broadened just before sharp apex. Aedeagus in lateral view roughly "L" shaped, short, almost parallel-margined throughout. Styles about two and one-half times as long as width at base, slightly sinuate just before middle, outer lobe on dorsal margin just before finger-like process on apical fifth.

Last ventral segment of female about one and one-half times as wide as length at middle, lateral margins converging; posterior margins with lobe on each side of relatively prominent median notch.

Types: Holotype male, allotype female, and 27 female and 5 male paratypes, Miami, Arizona, Aug. 6, 1941, R. H. Beamer, in the Francis Huntington Snow Entomological Museum, University of Kansas, Lawrence, Kansas. Additional paratypes as follows: (Arizona) 1 female, Miami, July 22, 1932, R. H. Beamer; 7 female, 8 male, Yarnell, July 29, 1933, 4 female, 1 male, July 27, 1933,
Host plants: The specimen from Silver City was collected on Mountain Mahogany. Ball (1932) was evidently referring to this form when he gave Rhus trilobata as the host plant.

Comparative notes: The males of this species can be separated from trilineatus by the sharp plates and the female by the absence of the notch on the last ventral segment.

72. Scaphytopius (Cloanthanus) abbreviatus (DeLong)


Color: Crown brown mottled with yellow, light markings as follows: thin line along anterior margin; wedge; indistinct arcuate line on disc on each side of median suture; typical large dots along posterior margin. Pronotum darker than crown, heavily irrorate, vittae visible. Scutellum about same color as crown, with typical markings. Face fulvus irrorate with brown, darkest on lateral margin of genae; sharksmouth, vitta behind eye and shorter ones near ocelli and at antennae, light. Forewings semihyaline fulvus with white aeroles and brown irrorations throughout; veins fuscus.
Structural characteristics: Crown about one and one-half times as long as width between eyes, slightly concave on each side of a bluntly pointed apex; wedge about one-third length of crown. Pronotum about three-fourths length of crown, two and one-third times as wide as length at middle and three and one-half times length behind eye. Clypeus about two and one-third times as long as width at ocelli, only slightly constricted, if at all, at antennae, shallow concavity along sharksmouth. Clypellus enlarged at apex. Face in lateral view definitely concave between anterior margin of eyes. Forewing with numerous vein-like marks in brachial cell, about nine recurved veins to costa and often extra cross-veins in clavus.

Genitalia: Valve about two-thirds as long as greatest width, posterior margin convex on each side of a teat-like apex. Paraphysis long, slender and sharply pointed. Aedeagus in lateral view "L" shaped, almost parallel-margined throughout. Styles almost five times as long as basal width, constricted on basal third, small lobe on outer margin before slender process on outer two-fifths.

Last ventral segment of female about two-thirds as long as greatest width, latero-posterior margin rounded.

male, Tullahoma, Tennessee, Aug. 3, 1915, D. M. DeLong, here designated, in the DeLong collection, Ohio State University, Columbus, Ohio. Additional male paratypes as follows: (Florida) 1, Sanford, July 26, 1934, R. H. Beamer; 3, Sanford, Aug. 8, 1939, R. H. Beamer; 1, Sanford, Aug. 8, 1939, A. T. Dardy; 3, Pensacola, July 12, 1934, R. H. Beamer; 1, Yankeetown, July 17, 1934, R. H. Beamer; 3, Lacoochee, Aug. 18, 1930, R. H. Beamer; 1, Branford, July 16, 1934, R. H. Beamer; 2, Branford, July 31, 1930, P. W. Oman. (Alabama) 1, Burnsville, July 20, 1930, P. W. Oman; 1, Marion Jct., July 14, 1930, L. D. Tuthill; 1, Prattsville, July 21, 1930, R. H. Beamer. (Tennessee) 3, Clarksville, Oct. 8, 1914. (Mississippi) 1, Shuqualak, July 16, 1930, R. H. Beamer; 1, Fulton, July 14, 1930, L. D. Tuthill; 1, Fulton, July 14, 1930, R. H. Beamer. (Georgia) 1, Griffin, Aug. 12, 1939, R. H. Beamer.

Host plants: Ball (1932) writes "The writer found it fairly common on Gecanthis americanus at Sanford, Florida."

Comparative notes: This is one of the commonest species found in the Southeast. The entire face is marked, but the clypeus is lighter than the margins of the genae, separating it from triangularia, and it is much darker than cinereus. It may be found as far north as New Jersey. The genitalia are variable but the long, slender paraphyses, "L" shaped aedeagus, and long process on style readily
separates it from any other. The frons of the Florida specimens are much lighter than those from further north.

73. Scaphytopius (Cloanthanus) triangularis DeLong


Resembles acutus but with dark face and paraphyses enlarged near apex. Length: female 4.8 mm., male 4.2 mm.

Color: Crown mottled brown and light, often darkest on disc, with light markings as follows: thin line along anterior margin; wedge; irregular vittae on disc, either straight or arcuate; irregular area before eyes; typical light spots along posterior margin. Pronotum slightly lighter than crown, heavily irrorate with dark, vittae usually visible. Scutellum lighter than pronotum with typical markings. Face fulvus irrorate with dark, excepting wedge, vitta behind eye and shorter ones near ocelli and antennae. Forewing semihyaline fulvus with light aeroles and fuscus vermiculations throughout; veins brown, becoming fuscus on apex and costal margin.

Structural characteristics: Crown about twice as long as width between eyes, anterior margin straight on each side of a pointed apex; wedge about half length of crown. Pronotum three-fifths as long as crown, two and one-third times as wide as length at middle and three and one-half times length behind eyes. Clypeus over twice as
long as width at ocelli, shallow concavity along sharks-mouth, only slightly sinuate at antennae. Clypellus only slightly enlarged near apex. Face in lateral view concave between anterior margin of eyes. Forewing with vein-like marks in brachial cell, about ten recurved veins to costa and sometimes extra cross-veins in clavus.

**Genitalia:** Valve about one and two-fifths as wide as length at middle, posterior margin rounded; anterior margin with short, broad median lobe. Paraphysis with slight enlargement at base, and somewhat enlarged just before sharp apex. Aedeagus in lateral view slightly curved, largest just before middle, bluntly pointed. Styles almost three times as long as basal width, sinuate near basal third, lobe on dorsal margin before slightly curved, finger-like process on apical third.

Last ventral segment of female with lateral margins short, posterior margin almost straight on each side of a blunt apex.

**Types:** Types in Illinois Natural History Survey Collection, Urbana, Illinois. One male paratype on hand for study.

Host plants: The original description gave *Crataegus* sp. as the host. Specimens from Etowah Co., Alabama, were labeled as from *Prunus angustifolia* and the author has collected the species in Kansas from rose.

Comparative notes: The dark brown face separates this species from most, since it has a shorter, broader crown than rubellus.
Bibliography


226.


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