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## Systematic revision of *Gonaphodiellus* taxa, with description of two new genera and fourteen new species (Coleoptera: Scarabaeidae: Aphodiinae)

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Dellacasa, Marco; Dellacasa, Giovanni; and Gordon, Robert D., "Systematic revision of *Gonaphodiellus* taxa, with description of two new genera and fourteen new species (Coleoptera: Scarabaeidae: Aphodiinae)" (2012). *Insecta Mundi*. 734.

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# INSECTA MUNDI

A Journal of World Insect Systematics

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0230

Systematic revision of *Gonaphodiellus* taxa, with description  
of two new genera and fourteen new species  
(Coleoptera: Scarabaeidae: Aphodiinae)

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Date of Issue: April 6, 2012



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Insecta Mundi 0230: 1-41

**Published in 2012 by**

Center for Systematic Entomology, Inc.  
P. O. Box 141874  
Gainesville, FL 32614-1874 USA  
<http://www.centerforsystematicentomology.org/>

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Systematic revision of *Gonaphodiellus* taxa, with description of two new genera and fourteen new species (Coleoptera: Scarabaeidae: Aphodiinae)

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**Abstract.** The American species belonging to the genus *Gonaphodiellus* Schmidt (Coleoptera: Scarabaeidae: Aphodiinae) are redescribed and figured. Two **new genera** are described: *Gonaphodioides* and *Gonaphodiopsis*. Fourteen **new species** are described: *Gonaphodiellus arcanus*, *G. cerropuntanus*, *G. manantlanicus*, *G. martinpierai*, *G. omiltemicus*, *G. sacatepequezis*, *Gonaphodioides newtoni*, *G. ratcliffei*, *G. skelleyi*, *Gonaphodiopsis deloyai*, *G. hypogea*, *G. montesdeocai*, *G. pachecoi*, *G. teopiscaensis*. The **lectotype** of *Aphodius columbicus* (Harold, 1880) is designated. The following **new combinations** are proposed: *Gonaphodiellus nigrinus* (Schmidt, 1916), *Gonaphodioides acutecernans* (Balthasar, 1960), *Gonaphodioides chapini* (Hinton, 1934), *Gonaphodioides columbicus* (Harold, 1880), *Gonaphodioides sincerus* (Petrovitz, 1973). *Aphodius* (*Gonaphodiellus*) *xalapensis* Galante, Stebnicka and Verdú, 2003 is placed as a junior synonym of *Gonaphodiellus bimaculosus* (Schmidt, 1909), **new synonymy**. *Aphodius ataenioides* Hinton, 1938 and *Aphodius* (*Blackburneus*) *castanescens* Petrovitz, 1973 are placed as junior synonyms of *Gonaphodioides chapini* (Hinton, 1934), **new synonymies**.

**Key words.** New species, new genera, new combinations, new synonymies, lectotype designation, systematics, American Aphodiinae

## Introduction

In preparation for a systematic complete revision of Mexican Aphodiinae (Coleoptera: Scarabaeidae), we deem it necessary to study all “gonaphodielliform” Meso- and South American. This group roughly keys to “*Gonaphodiellus*” in Skelley (2008) and includes the genus *Gonaphodiellus* Schmidt, 1913 and two new genera *Gonaphodioides* and *Gonaphodiopsis* with a total number of twenty-three species of which fourteen are new.

The main characteristics common to the involved genera are:

- scutellum small, triangular;
- fore tibiae punctate on dorsal surface;
- hind tibiae apically fimbriate with irregularly unequal spinules;
- pronotum not bordered at base and with hind angles obliquely truncate;
- elytral humerus dentate in many;
- first joint of labial palps normally shaped in both sexes.

## Materials and methods

Types of most critical taxa were examined. Geographical distributions based on reliable literature records are also reported. Terminology used in this work to describe morpho-anatomical features follows that of Dellacasa et al. (2001).

Widespread, common species have collection data abbreviated to province or states within the countries, numbers examined and their depositories. Materials studied are in the following collections:

**BCSC** – Bordat P. Collection, Saint-Cirq, France

**CNCI** – Canadian National Collection, Ottawa, Canada

**CMNO** – Canadian Museum of Nature, Ottawa, Canada [H. F. Howden Collection]

**CSCA** – California State Collection of Arthropods, California Department of Food & Agriculture, Sacramento, California, U.S.A.

**DCGI** – Dellacasa Collection, Genoa, Italy

**EMEB** – Essig Museum of Entomology, Berkeley, California, U.S.A.

**FSCA** – Florida State Collection of Arthropods, Gainesville, Florida, U.S.A.

**ISEA** – Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Kraków, Poland

**LSAM** – Louisiana State Arthropod Museum, Baton Rouge, Louisiana, U.S.A.

**MCGA** – Morris collection, Lakeland, Florida, U.S.A.

**MDOX** – Montes de Oca E. Collection, Xalapa, Veracruz, Mexico

**MHNG** – Muséum d'Histoire Naturelle, Geneva, Switzerland

**MNHN** – Muséum national d'Histoire naturelle, Paris, France

**MSNT** – Museo di Storia Naturale e del Territorio, Università di Pisa, Calci (Pisa), Italy

**MZUF** – Museo di Storia Naturale dell'Università, Sezione di Zoologia "La Specola", Firenze, Italy

**NHRS** – Naturhistoriska Riksmuseet, Stockholm, Sweden

**NMPC** – National Museum, Department of Entomology, Prague, Czech Republic

**NYSM** – New York State Museum, Albany, New York, U.S.A.

**RHTC** – R. H. Turnbow Collection, Enterprise, Alabama, U.S.A.

**USNM** – United States National Museum, Washington, D. C., U.S.A.

## Key to "Gonaphodielliform" genera

1. First joint of labial palps as long as second (Fig. 50-51); clypeus subtruncate anteriorly or very feebly sinuate at middle, round at sides; elytra oval, more or less broadened posteriorly, finely striate; body feebly or, at most, moderately convex; mostly medium size species (length 5.0-6.0 mm). Taxa more or less dark brownish, with or without paler elytral spots. Neotropical region ..... ***Gonaphodiellus* Schmidt**
- First joint of labial palps longer than second (Fig. 69, 117); body more convex; mostly rather small species (length 4.0-5.0 mm) ..... **2**
- 2(1). Clypeus deeply sinuate at middle, angulate at sides; elytra subparallel-sided or oval elongate, finely striate; body more or less distinctly convex. Taxa chestnut brown or reddish testaceous, rarely blackish. Neotropical region ..... ***Gonaphodioides* new genus**
- Clypeus feebly sinuate at middle, round at sides; elytra amygdaliform, deeply striate; body strongly convex. Taxa piceous or reddish brown, usually with pronotum and elytral disc darker. Mexico ..... ***Gonaphodiopsis* new genus**

## Genus *Gonaphodiellus* Schmidt, 1913

*Aphodius* (*Gonaphodiellus*) Schmidt, 1913: 133.

*Gonaphodiellus*; Paulian 1942: 73.

*Aphodius* (*Gonaphodiellus*); Balthasar 1960: 58 (as synonym of *Gonaphodius*).

*Aphodius* (*Gonaphodiellus*); Dellacasa 1988: 239.

*Gonaphodiellus*; Dellacasa et al. 2001: 154; Skelley et al. 2007: 4.

**Type species.** *Aphodius pacatus* Harold, 1880 (subsequent designation by Paulian 1942: 73).

**Diagnosis.** Rather small to medium size species (length 3.5-6.0 mm), feebly or moderately convex, short or elongate oval, feebly shiny, glabrous or almost glabrous. More or less dark brownish, with or without elytral paler spots. Head with epistome punctured; clypeus subtruncate anteriorly or faintly sinuate at middle, round at sides, quite finely bordered, edge bristled; genae obtusely round, very shortly ciliate, protruding from the eyes or not; eyes rather large; frontal suture finely impressed, not tuberculate; first segment of labial palp as long as the second. Pronotum transverse, punctured; hind angles truncate and more or less distinctly inwardly sinuate; basal margin not bordered. Scutellum small, narrow, regularly triangular. Elytra more or less strongly denticulate at shoulder, rarely lacking denticle; striae fine and punctured, first one more superficial than the others and sometimes faint toward apex; interstriae slightly convex, finely punctured, rarely shortly sparsely pubescent on preapical declivity. Fore tibiae distally tridentate and proximally serrulate on outer margin; upper side rather densely and more or less coarsely punctured. Middle and hind tibiae with feeble transverse carinae on outer face, apically fimbriate with spinules elongate and irregularly unequal. Hind tibiae upper spur shorter than first tarsal segment. Pygidium with straight pubescence. Sexual dimorphism shown in males mainly by shape of fore tibiae and respective spur; by sparser punctation of head and pronotum; and pronotum with hind angles more strongly inwardly sinuate. Aedeagus with parameres short, at least as long as half of tegmen, or somewhat more elongate, always with clump of more or less dense hairs toward apex. Epipharynx with anterior margin distinctly sinuate at middle; epitorma drop-shaped; corypha with two strong apical spiculae; pedia densely pubescent, intermixed few stout and large chaetae; chaetopariae slender and elongate.

**Distribution.** Mesoamerican and Neotropical region.

**Remarks.** The correct identification of unassociated females of several *Gonaphodiellus* species is more or less impossible due to their weakly differentiated external morphological characters.

### Key to species of *Gonaphodiellus*

1. Genae rounded, not or faintly protruding from the eyes ..... 2
- Genae obtuse, protruding from the eyes ..... 5
- 2(1). Body oval and relatively less convex; elytra broadened posteriorly ..... 3
- Body elongate and relatively more convex; elytra almost subparallel-sided ..... 4
- 3(2). Species relatively smaller: length 3.5-4.0 mm; elytra not denticulate at shoulder, interstriae flat. Dark brownish; clypeal margin, side and base of pronotum and apex of elytra yellowish brown. Ecuador, Peru ..... ***G. nigrinus* (Schmidt)**
- Species relatively larger: length 5.5-6.0 mm; elytra minutely denticulate at shoulder, interstriae feebly convex. Pale brownish, clypeal margin, pronotum sides, base and preapical declivity of elytra yellowish. Costa Rica, Panama ..... ***G. cerropuntanus* new species**
- 4(2). Elytral interstriae feebly convex, glabrous, preapically alutaceous thus almost dull; truncation of hind angles of pronotum inwardly sinuate. Dark brownish; clypeal margin and fore angles of pronotum reddish; elytra yellowish spotted basally on second and third interstriae and at shoulder, posteriorly with more or less elongate and widened blackish margined yellowish spots on second, fourth, sixth and seventh interstriae. Length 4.5-5.0 mm. Colombia, Costa Rica, El Salvador, Honduras, Mexico (Chiapas), Panama ..... ***G. sexguttatus* (Schmidt)**

- Elytral interstriae flat, usually shortly sparsely pubescent and rather shiny on apical declivity; truncation of hind angles of pronotum not inwardly sinuate. Yellowish-brown; head anteriorly and pronotum disc brownish; elytra with juxtasutural interstria, base of fifth interstria and preapical declivity brownish, latter including an oblique oval yellowish spot; sometimes elytra entirely dirty yellowish or entirely dark-brownish. Length 4.0-5.0 mm. Guatemala, Mexico ..... ***G. opisthius* (Bates)**
- 5(1). Aedeagus with parameres as long as half of tegmen or less ..... **6**  
 — Aedeagus with parameres almost as long as tegmen ..... **7**
- 6(5). Pronotum on sides dually, somewhat irregularly punctured; clypeal lateral margins arcuate. Brown-yellowish, epistome, pronotal and elytral disc usually darker. Length 5.5-6.0 mm. Colombia, Costa Rica, Panama ..... ***G. pacatus* (Harold)**  
 — Pronotum on sides evenly punctured; clypeal lateral margins straight. Brownish-yellow; head, pronotum disc and elytra brownish, latter usually with a yellowish round spot on preapical declivity, sometimes elytra entirely brownish. Length 5.0-6.0 mm. El Salvador, Mexico (Hidalgo, Jalisco, Oaxaca, Puebla, Queretaro, Veracruz) ..... ***G. bimaculosus* (Schmidt)**
- 7(5). Elytral preapical declivity strongly microreticulate thus dull. Dark reddish-brown, clypeal margin, pronotal anterior angles and preapical declivity of elytra paler. Length 5.0-5.5 mm. Mexico (Jalisco) ..... ***G. manantlanicus* new species**  
 — Elytral preapical declivity shiny or, at most, superficially microreticulate ..... **8**
- 8(7). Elytral striae distinctly punctured (fig. 3, 19) ..... **9**  
 — Elytral striae almost impunctate or, at most, very finely and superficially punctured (Fig. 29, 39, 59) ..... **10**
- 9(8). Elytral interstriae finely sparsely but distinctly punctured. Shape oval elongate, relatively large (length 5.5-6.0 mm). Dark brown; clypeal margin and sides of pronotum paler; elytra with more or less elongate basal yellowish spots on second, third and seventh interstriae; first interstria yellowish on disc; second interstria posteriorly with a round blackish margined yellowish spot at two thirds of length; often shoulder and apical declivity more or less widely yellowish. Guatemala, Mexico (Chiapas) ..... ***G. hoffmanni* (Islas)**  
 — Elytral interstriae nearly imperceptibly sparsely punctured. Body shortly oval, relatively small (length 3.5-4.0 mm). Piceous; clypeal margin, anterior angles of pronotum brownish-yellow; elytra with yellowish round spots on preapical declivity and with yellow apex. Guatemala, Mexico (Chiapas) ..... ***G. arcanus* new species**
- 10(8). Elytral interstriae finely microreticulate, subopaque. Piceous; clypeal margin, pronotal sides and elytral preapical declivity more or less widely paler. Length 5.0-5.5 mm. Guatemala ....  
 ..... ***G. sacatepequezis* new species**  
 — Elytral interstriae smooth, shiny ..... **11**
- 11(10). Elytral interstriae finely but distinctly punctured. Head and pronotum brown, elytra more or less dark brownish, usually with shoulder, base of second interstria, apical margin, and a round preapical spot yellowish. Length 5.0-5.5 mm. Mexico (Guerrero) .....  
 ..... ***G. omiltemicus* new species**  
 — Elytral interstriae nearly imperceptibly punctured. Dark brown; clypeal margin, anterior angles of pronotum, base and preapical declivity of elytra paler. Length 5.5-6.0 mm. Mexico (Veracruz) ..... ***G. martinierai* new species**

***Gonaphodiellus arcanus* new species**

(Fig. 1-5)

**Type locality.** Chiquihuite env., 15°05'41.0"N–092°06'04.0"W, m 2060, Chiapas, Mexico.



**Type repository.** Dellacasa Collection, Genoa, Italy.

**Description.** Length 3.5-4.0 mm; oval, convex, shiny, glabrous. Piceous; clypeal margin, anterior angles of pronotum and elytral apex brownish-yellow; elytra with yellowish round spots on preapical declivity; legs pale brown; antennal club dirty testaceous. Head with epistome feebly gibbous on disc, evenly, not closely punctured throughout, punctation on disc only less superficial and sparser; clypeus subtruncate anteriorly, widely round at sides, rather thickly bordered, edge slightly reflexed, glabrous; genae obtuse, almost imperceptibly ciliate, protruding from the eyes; frontal suture almost obsolete; front finely, sparsely, somewhat irregularly punctured. Pronotum transverse, moderately convex, dually somewhat irregularly punctured; large punctures, twice larger than small ones, denser and closer on sides, lacking medially; small punctures rather regularly, not closely scattered throughout; lateral margins feebly arcuate, slightly inwardly sinuate before hind angles, finely bordered, edge glabrous; hind angles obliquely truncate, truncation inwardly feebly sinuate; base very slightly bisinuate. Scutellum almost flat, superficially alutaceous, with few sparse irregular punctures toward base. Elytra rather shortly oval, convex, strongly denticulate at shoulder, finely striate; striae rather deeply, not closely punctured, subcrenulate; interstriae moderately convex, superficially alutaceous, nearly imperceptibly and sparsely punctured. Hind tibiae upper spur shorter than first tarsal segment; first tarsal segment as long as following four segments combined. Male: shape relatively less broad and more convex; pronotal punctation more superficial and sparse mainly medially; metasternal plate with median longitudinal groove distinct; aedeagus Fig. 4-5. Female: shape relatively broader and less convex; pronotal punctation coarser and denser medially; metasternal plate with median longitudinal groove very superficial.

**Type material.** **GUATEMALA:** Quezalten, 14.2 Km SW Zunil, m 1340, 21.VI.1993, leg. F. Génier, human feces (1 female paratype, CNCI); **MEXICO: Chiapas:** Chiquihuite env., 15°05'41.0"N–092°06'04.0"W; m 2060, 23.VI.2007; leg. Dellacasa M. & Fresi C. (holotype male, allotype and 3 female paratypes; DCGI).

**Distribution.** Guatemala, Mexico (Chiapas).

**Etymology.** Named after the Latin word *arcanus* [= hidden].

**Bionomics.** All the specimens of the type series were collected in June.

### ***Gonaphodiellus bimaculosus* (Schmidt, 1909)**

(Fig. 6-12)

*Aphodius bimaculosus* Schmidt, 1909: 19.

*Aphodius* (*Gonaphodiellus*) *bimaculosus*; Schmidt 1913: 134; Dellacasa 1988: 98.

*Aphodius* (*Gonaphodiellus*) *xalapensis* Galante et al. 2003: 304 (**new synonymy**).

*Gonaphodiellus bimaculosus*; Skelley et al. 2007: 4.

**Type locality.** Mexico.

**Type repository.** Naturhistoriska Riksmuseet, Stockholm, Sweden (type examined).

**Redescription.** Length 5.0-6.0 mm, oblong, moderately convex, shiny, glabrous. Brown-yellowish; head, pronotum disc and elytra brownish, elytra usually with a yellowish round spot on preapical declivity (Fig. 10), sometimes elytra entirely brownish (Fig. 9); legs dark brown; antennal club brownish. Head with epistome feebly convex on disc, subregularly and rather densely punctured; clypeus anteriorly subtruncate, obtusely round at sides, lateral margins finely bordered, edge very shortly sparsely bristled; genae obtusely round, very shortly ciliate, protruding from the eyes; frontal suture finely impressed; front rather sparsely regularly punctured. Pronotum transverse, moderately

convex, subregularly punctured; punctation somewhat denser on sides; lateral margins almost parallel-sided, finely bordered, edge very shortly sparsely bristled; hind angles widely truncate, inwardly sinuate; base bisinuate. Scutellum triangularly elongate, with few sparse and irregular punctures on basal half. Elytra slightly broadened posteriorly, with a small denticle at shoulder; striae fine, superficially punctured, faintly crenulate; interstriae entirely shiny, slightly convex, finely sparsely punctured. Hind tibiae upper spur as long as half of first tarsal segment; first tarsal segment as long as following four segments combined. Male: pronotum not narrowed anteriorly, relatively somewhat more sparsely punctured on disc; fore tibiae slender and more elongate, their spur stouter, downward bent and outward curved; metasternal plate longitudinally feebly excavate at middle; aedeagus Fig. 11-12. Female: pronotum slightly narrowed anteriorly, relatively somewhat more densely punctured on disc; fore tibiae stouter and shorter, their spur slender and almost straight; metasternal plate flat.

**Material examined.** **EL SALVADOR:** Monte Cristo, 23 Km N Matapan, m 2300, 08-10.V.1971, leg. Howden H. F. (12 exx., CMNO). **MEXICO:** **Hidalgo:** 2.9 Km S Molango, 20.VII.1988, leg. Turnbow R. (2 exx., RHTC); 1 mi. S Santa Monica, 6100', 12.VII.1973, leg. Newton A. (4 exx. CMNO, DCGI); 7 Km SW Tenango de Doria, VII.1971, leg. Newton A. (2 exx., CMNO); 6.4 mi. S Tenango de Doria, m 3000, 24-28.VII.1969, leg. Peck S. & J., cloud forest, oak (5 exx., CMNO); Tlanchinol env., m 1500, 10-24.VIII.2001, leg. Kabourek V. (2 exx., DCGI); 6.4 mi. S Tianguistengo, 6800', 12.VII.1973, leg. A. Newton (1 ex., DCGI); Zacualtipan, 27.V.1979, leg. Zunino M. (2 exx., DCGI); **Jalisco:** 10 mi W Atenquique, 6700' 18.IX.1971, leg. Newton A. (5 exx. CMNO, DCGI); **Oaxaca:** 13 mi. N Nochistlan, 7000', 27.VI.1968, leg. Hardy A. R., Espinosa L. & Abreyaya J. P., Hardy Central American Expedition, (1 ex., USNM); Km 40 Camino Teotitlan, Hualta de Jiménez, m 2400, 09.XI.1968, leg. Reyes P. & Cabrera M., bosque nebuloso (2 exx., DCGI, FSCA); Km 133 carr. Tuxtepec to Oaxaca-Atepec, Llano de las Flores, 17°26'37.2"N – 96°30'13.2"W, m 2600, 14.IX.2003, leg. Martínez I. & Suarez T. (1 ex., DCGI); 30 mi. Valle Nacional, 17.VIII.1973, leg. Newton A. (2 exx., CNCI); **Puebla:** 5 mi. W Huauchimango, 5900', 07.VII.1970, leg. Newton A. (3 exx., CNCI); 6 mi W Teziutlan, 4-6.VIII.1960, leg. Howden H. F. (1 ex., DCGI); **Queretaro:** 25 mi. E Landa de Matamoros, 5000', 14-17.VII.1969, leg. Peck S. & J., liquidambar forest (2 exx., CNCI, 1 ex., DCGI); **Veracruz:** Mpio. Coscomatepec, Cuiyachapa, 06.II.1999, leg. Alvarado M. (5 exx., DCGI); Cuiyachapa, carr. á Potrero Nuevo, 15.IX.1994, leg. Arellano L. & Zunino M. (3 exx., DCGI); Mpio. Coscomatepec, carr. Cuiyachapa, Pueblo Nuevo, 08.XI.1999, leg. Dellacasa M. (1 ex., DCGI); El Duraznal, m 1600, 15.VII.1994, leg. Arellano L. & Sanchez R. (1 ex., DCGI); Mpio. Xico, Oxtlapa, m 2100, 16.XI.1999, leg. Dellacasa M. (1 ex., DCGI); carr. Xico-Tonalaco, 19°26'21"N–97°06'10"W, m 2300, 09.XII.1999-09.II.2000, leg. Montes de Oca E. & Santiago Q. (4 exx., DCGI); *idem*, 06.VII.-11.VIII.2000, leg. Montes de Oca E. & Santiago Q. (13 exx., DCGI).

**Distribution.** El Salvador, Mexico (Hidalgo, Jalisco, Oaxaca, Puebla, Queretaro, Veracruz).

**Bionomics.** Probably all year round, coprophagous species found in several kinds of dung.

### ***Gonaphodiellus cerropuntanus* new species**

(Fig. 13-17)

**Type locality.** 2-3 km E Cerro Punta, m 2000-2200, Chiriquí Prov., Panama.

**Type repository.** Canadian Museum of Nature, Ottawa, Canada (Howden collection).

**Description.** Length 5.5-6.0 mm, oblong, moderately convex, shiny, glabrous. Brownish; clypeal margin, pronotum sides, base and preapical declivity of elytra yellowish; legs brownish; antennal club dark testaceous. Head with epistome weakly convex on disc, rather finely, regularly, not densely punctured; clypeus almost semicircular, anteriorly faintly truncate, finely bordered, edge with extremely short and sparse bristles; genae round, very shortly ciliate, not protruding from the eyes; frontal suture finely impressed; front finely, regularly punctured. Pronotum transverse, moderately convex, dually, somewhat irregularly punctured; punctation coarser and denser on sides; large punctures,

twice larger than small ones, missing on disc; small punctures almost regularly sparse throughout, more superficial on disc; lateral margins feebly arcuate, distinctly bordered, edge glabrous; hind angles truncate; truncature not sinuate inwardly; base bisinuate. Scutellum elongately triangular, sparsely irregularly punctured on basal half. Elytra oval-elongate, minutely denticulate at shoulder; striae fine, superficially punctured, subcrenulate; interstriae feebly convex, very finely sparsely punctured. Hind tibiae upper spur somewhat longer than half of first tarsal segment; first tarsal segment as long as following four segments combined. Male: fore tibiae relatively more slender and elongate, their spur somewhat shorter; metasternal plate longitudinally moderately excavate; aedeagus Fig. 16-17. Female: fore tibiae relatively shorter, their spur somewhat slender; metasternal plate almost flat.

**Type material.** **COSTA RICA:** Mirador de Quetzales, 09°38'N-83°50'W, m 2705, 11-15.II.2004, leg. Holzer E. (1 ex., paratype, DCGI). **PANAMA:** Chiriqui Prov., Bosquete, Bajo Mono, m 1700, 05-07.VI.2000, leg. Curoe D. & Eya B. (1 paratype, DCGI); Chiriqui Prov., 2-3 Km E Cerro Punta, m 2000-2200, 23.V.1977, leg. Howden H. & A., dung traps (male holotype, and allotype, CMNO; 4 paratypes, DCGI); Chiriqui Prov., 2 Km W Cerro Punta, m 1300, 8°51'N-82°36'W, 30.V.1977, leg. Howden H. & A., megatrap (59 paratypes, CMNO); *idem*, m 2000-2300, 01.VI.1977, leg. Howden H. & A., 3 dung traps (2 paratypes, CMNO); Chiriqui Prov., 2 Km W Cerro Punta, Baldwin Forest, 03.VI.1977, leg. Howden H., 10 cup traps (12 paratypes, CMNO); Chiriqui Prov., 2 Km W Cerro Punta, Baldwin Forest, m 1760, 03.VI.1977, leg. Peck S. & J., Berl 381 (1 paratype, CMNO); Chiriqui Prov., Las Lagunas, 4 Km W Hato del Volcan, m 1360, 01.VI.1977, leg. Howden H. & A. (1 paratype, CMNO); Irazu [Volcán], 6-7000', leg. Rogers H. (1 paratype, DCGI).

**Distribution.** Costa Rica, Panama.

**Etymology.** Named after the type locality.

**Bionomics.** Almost unknown; the specimens of the type series were collected in late winter and in spring.

### *Gonaphodiellus hoffmanni* (Islas, 1945)

(Fig. 18-22)

*Aphodius* (*Gonaphodiellus*) *hoffmanni* Islas, 1945: 451; Dellacasa 1988: 140.  
*Gonaphodiellus hoffmanni*; Skelley et al. 2007: 4.

**Type locality.** Aldea Coronado, Chiapas, Mexico.

**Type repository.** Instituto de Biología, Mexico City, Mexico (type not examined).

**Redescription.** Length 5.5-6.0 mm, oblong, moderately convex, shiny, glabrous. Dark brownish; clypeal margin and sides of pronotum paler; elytra with more or less elongate basal yellowish spots on second, third and seventh interstriae; first interstria yellowish on disc; second interstria posteriorly with a round blackish margined yellowish spot at two thirds of length; often shoulder and apical declivity more or less widely yellowish; legs brown-reddish; antennal club brownish. Head with epistome feebly convex on disc, with moderately dense, almost coarse, regular punctation; clypeus subtruncate anteriorly, round at sides, distinctly bordered, edge almost glabrous; genae obtusely round, very shortly ciliate, protruding from the eyes; frontal suture finely impressed; front rather finely subregularly punctured. Pronotum transverse, moderately convex, punctation somewhat irregular, denser and coarser on sides, more regular superficial and sparser on disc; lateral margins subparallel toward base, distinctly bordered, edge glabrous; hind angles widely truncate; truncature faintly sinuate inwardly; base distinctly bisinuate. Scutellum elongate, irregularly punctured on basal half. Elytra slightly broadened posteriorly, weakly denticulate at shoulder; striae fine, superficially punctured,



subcrenulate; interstriae feebly convex, very finely microreticulate, moderately shiny, nearly imperceptibly sparsely punctured. Hind tibiae upper spur as long as two thirds of first tarsal segment; first tarsal segment as long as following four segments combined. Male: pronotum not narrowed anteriorly; fore tibiae relatively longer and slender, their spur somewhat stouter; metasternal plate longitudinally excavate at middle; aedeagus Fig. 21-22. Female: pronotum somewhat narrowed anteriorly; fore tibiae relatively shorter and stouter, their spur slender; metasternal plate nearly flat.

**Material examined. GUATEMALA:** Dept. El Progreso, Sierra de la Minas, nr. Cerro Pinalon, "Las Cabañas", nr. 15.08467-89.94299, m 2579, 12-15.V.2010, leg. Skelley P. E., Steck & Sutton, cloud forest, FIT (5 exx., FSCA); *idem*, 12-15.V.2010, leg. Skelley P. E., cloud forest, animal dung (3 exx., FSCA); *idem*, 12-15.V.2010, leg. Skelley P. E., cloud forest, dung baited pitfall (7 exx., FSCA); Dept. El Progreso, Sierra de la Minas, nr. Pinalon, nr. Finca de La Tormenta, m 2199, nr. 15.07222-89.94891, 15-17.V.2010, leg. Skelley P. E., moist oak forest, animal dung (3 exx., FSCA); *idem*, 15-17.V.2010, leg. Skelley P. E., moist oak forest, 8w light trap (26 exx., FSCA; 6 exx., DCGI); San Marcos, San Rafael Soché, m 2500, 01.VI.2000, leg. Cano E., bosque Alnus encino y cipreses sembrados, luz UV+Hg 18.30-23.30 hrs (1 ex., FSCA); **MEXICO: Chiapas:** Chiquihuite dint., 15°05'41.0"N-092°06'04.3"W, m 2060, 23.VI.2007, leg. Dellacasa M. & Fresi C. (51 exx., DCGI); El Porvenir, m 2850, 23.IV.1995 leg. Curoe D. (1 ex., CNCI); La Selva Negra, 30.VI.1991, leg. Burne J. B. & Thomas D. (1 ex., CNCI); *idem*, 03.VIII.1991, leg. Thomas D. & Mendoza (3 exx., CNCI); Laguna Montebello, 4700', 30.VII.1974, leg. C. W. O'Brien, L. B. O'Brien & G. B. Marshall (1 ex., EMEB); Mpio. Motozintla, Boquerón, 10.V.2003, leg. López-Rojas J. (2 exx., DCGI); Mpio. Angel Albino Corzo, Reserva El Triúnfo, trail to El Triúnfo Peak, 15°39'82"N – 92°48'62"W, m 2180, 16-20.XI.2001, leg. Kovarik P., transect #6 flight intercept. trap (9 exx., FSCA); 7.4 Km SSW Motozintla, Mendoza, m 2000, 21.IX.1992, Anderson R. S. leg., cloud forest litter (cut over) (2 exx., CMNO); 8 mi. N Pueblo Nuevo, 6000', 26-27.VIII.1973, leg. Newton A. (1 ex., CNCI); 4 mi. NW Teopisca, 24.VIII.1971, leg. Newton A. (2 exx., CNCI); Mpio. Union Juarez, Telquian, VI.2003, leg. Coutino T. A. (1 ex., DCGI); Volcan Tacana, lower slopes, ca. 4 Km N Union Juarez, m 2000, 20.IX.1992, leg. Anderson R. S., cloud forest litter (2 exx., CMNO).

**Distribution.** Guatemala, Mexico (Chiapas).

**Bionomics.** Probably all year round, coprophagous species, often collected in horse dung.

### ***Gonaphodiellus manantlanicus* new species**

(Fig. 23-27)

**Type locality.** Las Joyas, m 1870, Sierra de Manantlán, Jalisco, Mexico.

**Type repository.** Essig Museum of Entomology, Berkeley, California, U.S.A.

**Description.** Length 5.0-5.5 mm; oblong, convex, moderately shiny but elytra on preapical declivity dull, glabrous. Dark reddish-brown, clypeal margin, pronotal anterior angles and preapical declivity of elytra paler; legs brown-reddish; antennal club dark brownish. Head with epistome weakly convex on disc, coarsely, rather densely, subregularly punctured; clypeus faintly sinuate at middle, round at sides, rather thickly bordered, edge faintly upturned, very shortly sparsely bristled; genae obtusely round, very shortly ciliate, feebly protruding from the eyes; frontal suture very finely impressed; front relatively more sparsely and less coarsely punctured than epistome. Pronotum moderately transverse, convex, almost subparallel-sided; somewhat irregularly punctured; punctation coarser and denser on sides, sparser and more superficial on disc; lateral margins very finely bordered and faintly inwardly sinuate before hind angles; hind angles widely truncate; truncature slightly sinuate inwardly; base bisinuate. Scutellum elongate, sparsely irregularly punctured on basal half. Elytra slightly broadened posteriorly, distinctly denticulate at shoulder; striae very fine, superficially punctured, subcrenulate; interstriae nearly flat, finely microreticulate basally and on disc thus few shiny, more strongly microreticulate on preapical declivity thus dull, distinctly sparsely punctured.

Hind tibiae upper spur as long as two thirds of first tarsal segment; first tarsal segment somewhat shorter than following four segments combined. Male: pronotum not narrowed anteriorly; fore tibiae spur relatively stouter and abruptly downward bent; metasternal plate longitudinally excavate at middle; aedeagus Fig. 26-27. Female: pronotum somewhat narrowed anteriorly; fore tibiae spur relatively slender and almost straight; metasternal plate nearly flat.

**Type material. MEXICO: Jalisco:** Sierra de Manantlán, Las Joyas, m 1870, 18.VII.1985, leg. Doyen J., black and white light (male holotype, allotype and 24 paratypes, EMEB; 4 paratypes, DCGI); *idem*, 1850 m, 15-20.VII.1970, bosque mesofilo “*Carpinus*”, coprotrampa, leg. Torres D. (15 paratypes, DCGI, 2 paratypes, FSCA).

**Distribution.** Known from type locality only.

**Etymology.** Named after the type locality.

**Bionomics.** Almost unknown. The specimens of the type series were collected in July at light or with pitfall traps baited with dung.

***Gonaphodiellus martinpierai* new species**

(Fig. 28-32)

*Aphodius* (*Gonaphodiellus*) *bimaculosus*; Galante et al. 2003: 303 *nec* Schmidt 1909.

**Type locality.** Acajete, m 2000, Veracruz [Mexico].

**Type repository:** Dellacasa Collection, Genoa, Italy.

**Description.** Length 5.5-6.0 mm; oblong, convex, shiny, glabrous. Dark brown; clypeal margin, anterior angles of pronotum, base and preapical declivity of elytra paler; legs brown-reddish; antennal club testaceous. Head with epistome slightly gibbous on disc, finely regularly not densely punctured throughout; clypeus faintly sinuate at middle, obtusely round at sides, lateral margins slightly arcuate, very finely bordered, edge with extremely short and sparse bristles; genae obtuse, very shortly ciliate, feebly protruding from the eyes; frontal suture finely impressed; front finely regularly punctured. Pronotum moderately transverse, convex, finely regularly not densely punctured throughout; sides feebly arcuate, finely bordered, edge glabrous; hind angles widely truncate; truncature faintly sinuate inwardly; base bisinuate. Scutellum elongate, sparsely punctured on basal half. Elytra slightly widened posteriorly, minutely denticulate at shoulder; striae extremely fine and very superficially punctured, not crenulate; interstriae shiny, almost flat, near imperceptibly sparsely punctured. Hind tibiae upper spur longer than the half of first tarsal segment; first tarsal segment longer than following four segments combined. Male: pronotum not narrowed anteriorly; fore tibiae spur relatively stouter and outwardly curved; metasternal plate moderately excavate longitudinally; aedeagus Fig. 31-32. Female: pronotum somewhat narrowed anteriorly; fore tibiae spur relatively slender and almost straight; metasternal plate flat.

**Type material. MEXICO: Veracruz:** Acajete, m 2000, 09-11.III.1991, leg. Martín-Piera F., bosque mesofilo, excr. vacuno ( male holotype and allotype, DCGI).

**Distribution.** Known from the type locality only.

**Etymology.** Named in honor of our friend and colleague, the late Dr. Firmin Martín-Piera, Spanish specialist in Scarabaeoidea.

**Bionomics.** The specimens of the type series were collected in March, in cow dung in “bosque mesofilo”.

***Gonaphodiellus nigrinus* (Schmidt, 1916) new status and new combination**  
(Fig. 33-37)

*Aphodius* (*Gonaphodiellus*) *pacatus* var. *nigrinus* Schmidt, 1916: 115.

*Aphodius* (*Gonaphodiellus*) *pacatus* ab. *nigrinus*; Dellacasa 1988: 97.

**Type locality.** S[an]. Anton[io]., Curaray [Peru].

**Type repository.** Naturhistoriska Riksmuseet. Stockholm (type examined).

**Redescription.** Length 3.5-4.0 mm; oval, convex, shiny, glabrous. Dark brown; clypeal margin, base and sides of pronotum, and elytral apex yellowish brown; legs brownish-yellow; antennal club brownish. Head with epistome feebly gibbous on disc, superficially alutaceous, finely evenly, not closely punctured; clypeus anteriorly subtruncate and thickly bordered, widely round and finely bordered at sides, edge glabrous; genae obtusely round, almost glabrous; faintly protruding from the eyes; eyes large; frontal suture extremely fine, obsolete laterally; front evenly sparsely punctured. Pronotum broadly transverse, moderately convex, dually punctured; large coarse punctures, four to five times larger than small ones, irregularly scattered; denser and coarser on sides, much sparser and superficial toward disc and therein lacking; small punctures not closely, evenly sparse throughout, more superficial and sparse medially; lateral margins feebly arcuate, rather finely bordered, edge glabrous; hind angles widely obliquely truncate, truncation feebly sinuate inwardly; base bisinuate. Scutellum rather narrowly elongate, somewhat concave; finely punctured on basal half. Elytra oval, broadened posteriorly, not denticulate at shoulder, finely striate; striae superficially punctured, feebly crenulate; interstriae finely alutaceous, almost flat, nearly imperceptibly sparsely punctured. Hind tibiae upper spur almost as long as first tarsal segment; first tarsal segment longer than following three segments combined. Male: head and pronotum relatively more transverse, less convex and less densely coarsely punctured; aedeagus Fig. 36-37. Female: head and pronotum relatively narrower anteriorly, more convex and more densely coarsely punctured.

**Material examined.** **ECUADOR:** Napo Prov., Yasuni Research Station, 0°38'S-76°36'W, m 250, 17-31.X.1998, leg. Dozier B. K. (1 ex., FSCA); Napo Prov., Yasuni National Park, m 300, 09-17.VIII.2000, at light, leg. Sforzi A. & Bartolozzi L., at light (2 exx., DCGI, MZUF). **PERU:** S[an]. Anton[io]., Curaray, ...Ohs., 20.I.06 (1 female, syntype, RMS); S[an]. Anton[io]., Curaray (1 female syntype, NHRS); Iquitos, Peru, 28.I.1983, leg. Dellacasa E. & G., airport lights (1 ex., DCGI).

**Distribution.** Ecuador, Peru.

**Bionomics.** Unknown. One of the few specimens examined was collected at light.

***Gonaphodiellus omiltemicus* new species**  
(Fig. 38-42)

**Type locality.** Omiltemi, 17°33'23.4"N-099°44'00.8"W, m 2131, Guerrero, Mexico.

**Type repository.** Dellacasa Collection, Genoa, Italy.

**Description.** Length 5.0-5.5 mm, oblong, moderately convex, subshiny, glabrous. Head and pronotum brownish; elytra more or less paler, usually with shoulder, base of second interstria, apical margin and a round preapical spot yellowish; legs and antennal club dark brown. Head with epistome slightly convex, superficially alutaceous, rather finely, evenly, not closely punctured, punctation somewhat sparser and finer on disc; clypeus subtruncate anteriorly, round at sides, finely bordered, edge glabrous and faintly reflexed anterolaterally; genae obtusely round, near imperceptibly bristled, protruding from the eyes; frontal suture extremely fine, almost obsolete medially; front evenly, finely, rather

sparsely punctured. Pronotum transverse, moderately convex, rather shiny, simply punctured; punctation somewhat denser and coarser on sides, sparser and finer on disc; lateral margins feebly arcuate, finely bordered, edge glabrous; hind angles obliquely truncate, the truncation slightly sinuate inwardly; base feebly bisinuate. Scutellum elongate, finely sparsely punctured on basal half. Elytra oval elongate, moderately convex, weakly denticulate at shoulder, finely superficially striate; striae fine, not closely punctured, subcrenulate; interstriae almost flat, sparsely, finely, but distinctly punctured. Hind tibiae upper spur shorter than first tarsal segment; first tarsal segment somewhat longer than following three segments combined. Male: head and pronotum relatively less convex and more sparsely and superficially punctured; fore tibiae spur downwardly bent, shorter and stouter; metasternal plate feebly excavate, sparsely punctured; aedeagus Fig. 41-42. Female: head and pronotum relatively more convex and more densely and coarsely punctured; fore tibiae spur slender and rather straight; metasternal plate almost flat, impunctate.

**Type material.** MEXICO: Guerrero: Omiltemi, 17°33'23.4"N–099°41'00.8"W, m 2131, 06.VII.2007, leg. Dellacasa M., Fresi C. & Martínez I. (male holotype, allotype and 12 paratypes, DCGI; 2 paratypes, FSCA).

**Distribution.** Known from the type locality only.

**Etymology.** Named after the type locality.

**Bionomics.** The specimens of the type series were collected in July in horse dung.

***Gonaphodiellus opisthius* (Bates, 1887)**

(Fig. 43-50)

*Aphodius duplex* Bates, 1887: 87 (*nec Aphodius duplex* LeConte, 1878).

*Aphodius opisthius* Bates, 1887: 92 (*nomen novum*); 1889: 392; Blackwelder 1944: 213.

*Aphodius* (*Trichaphodius*) *opisthinus*; Schmidt 1913: 136 (incorrect spelling); 1922: 132.

*Aphodius* (*Gonaphodiellus*) *opisthius*; Dellacasa 1988: 173.

*Gonaphodiellus opisthius*; Dellacasa et al. 2002: 189; Skelley et al. 2007: 4.

**Type locality.** Cerro de Plumas [=Cerro de Palmas], [Veracruz], Mexico.

**Type repository.** Natural History Museum. London, UK (type examined).

**Redescription.** Length 4.0-5.0 mm, oval-elongate, moderately convex, subshiny, nearly glabrous. Yellowish-brown; head anteriorly and pronotum disc brownish; elytra with juxtasutural interstria, base of fifth interstria and preapical declivity brownish, apical declivity including an oblique oval yellowish spot (Fig. 44); sometimes elytra almost entirely dirty yellowish (Fig. 46) or almost entirely dark-brownish (Fig 45). Head with epistome somewhat convex medially, superficially microreticulate, regularly and distinctly punctured; punctation denser and coarser laterally; clypeus slightly sinuate at middle, round at sides, bordered, edge shortly bristled; genae round, slightly auriculate, shortly ciliate, feebly protruding from the eyes; frontal suture finely impressed; front regularly and rather coarsely punctured. Pronotum transverse, moderately convex, distinctly, regularly and rather densely punctured; sides slightly sinuate inwardly before hind angles, finely bordered, edge glabrous; hind angles obliquely truncate, the truncature not inwardly sinuate; base bisinuate. Scutellum elongate with curved sides, coarsely but rather sparsely punctured. Elytra almost subparallel-sided, convex, minutely denticulate at shoulder, finely striate; striae feebly crenulate; interstriae almost flat, superficially microreticulate, finely and irregularly punctured, sparsely shortly pubescent on preapical declivity. Hind tibiae upper spur shorter than first tarsal segment; latter slightly longer than following three segments combined. Male: fore tibiae spur abruptly downward curved; pronotum relatively more transverse and less convex; metasternal plate distinctly excavate; aedeagus Fig. 48-49. Female:

fore tibiae spur almost straight; pronotum relatively narrower frontward and more convex; metasternal plate almost flat.

**Material examined.** **GUATEMALA:** San Marcos, 25.0 Km NW San Marcos, 15°04'N–91°51'W, m 3052, 25.V.1973, leg Erwin & Havel, Central American Expedition 1973 (1 ex., USNM). **MEXICO:** **Chiapas:** 6 exx. (DCGI) 1 ex. (MSNT); **Chihuahua:** 4 exx. (DCGI); **Distrito Federal:** 10 ex. (FSCA), 1 ex. (NYSM); **Durango:** 4 exx. (CSCA), 61 exx. (DCGI), 8 exx. (MSNT); **Guerrero:** 164 exx. (DCGI), 5 exx. (MSNT); **Hidalgo:** 56 exx. (DCGI), 369 exx. (MSNT), 4 exx. (RHTC); **Jalisco:** 4 exx. (CSCA), 103 exx. (DCGI), 2 exx. (EMEB), 137 exx. (MSNT), 4 exx. (NYSM), 2 exx. (RHTC); **México:** 94 exx. (DCGI), 77 exx. (MSNT), 6 exx. (NYSM), 1 ex. (USNM); **Michoacán:** 215 exx. (DCGI), 10 exx. (EMEB), 768 exx. (MSNT), 1 ex. (NYSM); **Morelos:** 57 exx. (DCGI), 2 exx. (NYSM); **Nayarit:** 1 ex. (DCGI); **Oaxaca:** 392 exx. (DCGI), 737 exx. (MSNT); **Puebla:** 50 exx. (DCGI), 195 exx. (MSNT); **Queretaro:** 111 exx. (DCGI), 307 exx. (MSNT); **Sinaloa:** 57 exx. (CSCA), 1 ex. (DCGI); **Tlaxcala:** 16 exx. (DCGI); **Veracruz:** 392 exx. (DCGI), 46 exx. (EMEB), 325 exx. (MSNT).

**Distribution.** Guatemala, Mexico (widely distributed almost all over).

**Bionomics.** All year round, coprophagous species collected in nearly all kinds of dung.

### *Gonaphodiellus pacatus* (Harold, 1880)

(Fig. 51-56)

*Aphodius pacatus* Harold, 1880: 37; Blackwelder 1944: 213.

*Aphodius* (*Gonaphodiellus*) *pacatus*; Schmidt 1913: 133; Dellacasa 1988: 174.

*Gonaphodiellus pacatus*; Paulian 1942: 73; Dellacasa et al. 2001: 155; Skelley et al. 2007: 4.

**Type locality.** Fusagasugà (Colombia).

**Type repository.** Muséum national d'Histoire naturelle, Paris, France (type examined).

**Redescription.** Length 5.5-6.0 mm, oval-elongate, feebly convex; moderately shiny, glabrous. Brown-yellowish, epistome, pronotal and elytral disc usually darker; legs brown-yellowish; antennal club pale testaceous. Head with epistome slightly convex on disc, finely, rather sparsely and subregularly punctured; clypeus faintly sinuate at middle, round at sides, very finely bordered, edge glabrous, lateral margins feebly arcuate; genae obtusely round, very shortly ciliate, protruding from the eyes; frontal suture finely impressed, not tuberculate, front finely, rather sparsely, subregularly punctured. Pronotum transverse, moderately convex, subparallel-sided, dually, somewhat irregularly punctured; punctation coarser and denser on sides; large punctures, twice to three times larger than small ones, almost lacking on disc, small punctures regularly scattered throughout, more superficial on disc; lateral margins rather thickly bordered, edge glabrous; hind angles widely truncate, truncature distinctly inwardly sinuate, base bisinuate. Scutellum elongate, finely sparsely punctured on basal half. Elytra slightly broadened posteriorly, moderately convex, weakly denticulate at shoulder; striae fine, superficially punctured, subcrenulate; interstriae feebly convex, sparsely superficially punctured. Male: pronotum not narrowed anteriorly; fore tibiae relatively slender and more elongate, their spur stouter and downward bent; metasternal plate longitudinally excavate; aedeagus Fig. 55-56. Female: pronotum narrowed anteriorly, relatively more densely and coarsely punctured on disc; fore tibiae shorter and stouter, their spur slender and almost straight; metasternal plate nearly flat.

**Material examined.** **COLOMBIA:** Fusagasugà (1 ex., female, type, MNHN); Rovira, Tolima, VIII.1980, leg. L. Peña (1 ex., DCGI); **COSTA RICA:** Monte Verde, Puntarenas, V.1979, leg. Forsyth A. (1 ex., WBC); 4 mi. E Volcán, 09.XII.1952 (1 ex., USNM); **PANAMA:** Chiriqui Prov., Cerro Pelota, 4 Km N Sta. Clara, m 1500, VIII.1982, leg. Gill B., flight interception trap (1 ex., CNCI); Chiriqui Prov., Cerro Punta, m 1500, 23.V.1977, leg. Howden H., cup traps (12 exx., CNCI); *idem*, 5100',



08.I.1964, leg. Bottimer L. J., horse dung (3 exx., CNCI); Chiriqui Prov., 2 Km W Cerro Punta, 8°51'N–82°36'W, 22.V.1987, leg. Howden H., cup traps (4 exx., CMNO); *idem*, m 1720, 01-07.VI.1977, leg. Howden H. & A. (5 exx., CMNO); Chiriqui [Prov.], Hartmann's Finca, 19.V.1996, leg. Turnbow R., feces baited pitfall (1 ex., RHTC); *idem*, 19-20.V.1995, leg. Turnbow R., feces baited pitfall (8 exx., DCGI, RHTC); *idem*, 04-07.VII.1997, leg. Morris & Wappes, feces baited pitfall traps (23 exx., DCGI, MCGA); *idem*, 18-20.V.1996, leg. Wappes, Huether & Morris (6 exx., FSCA); Chiriqui [Prov.], Sta. Clara, Hartmann's Finca, 23-25.V.1980, leg. Riley E. & LeDoux (1 ex., DCGI).

**Distribution.** Colombia, Costa Rica, Panama.

**Bionomics.** Poorly known; probably coprophagous species collected mostly in spring and often at light.

***Gonaphodiellus sacatepequezis* new species**

(Fig. 57-61)

**Type locality.** Sacatepéquez, Cerro Alux, m 2260, Guat[emala].

**Type repository.** Canadian Museum of Nature, (Howden collection). Ottawa, Canada.

**Description.** Length 5.0-5.5 mm; oblong, moderately convex, shiny, glabrous. Piceous; clypeal margin, pronotal sides and elytral preapical declivity more or less widely paler; legs dark brown; antennal club piceous; sometimes elytra with a semilunar yellowish preapical bind. Head with epistome faintly gibbous on disc, sparsely finely regularly punctured throughout; clypeus subtruncate anteriorly, round at sides, distinctly bordered, edge slightly upturned and almost glabrous; genae obtusely round, very shortly bristled, weakly protruding from the eyes; frontal suture very finely impressed; front sparsely finely and somewhat irregularly punctured. Pronotum transverse, moderately convex, dually irregularly punctured; punctation coarser and denser on sides, sparser and superficial on disc; large punctures, twice larger than small ones, lacking on disc; lateral margins feebly arcuate, rather finely bordered, edge glabrous; hind angles widely truncate; truncature faintly sinuate inwardly; base feebly bisinuate. Scutellum elongate, sparsely irregularly punctured on basal half. Elytra feebly broadened posteriorly, minutely denticulate at shoulder; striae fine, almost impunctate, not crenulate; interstriae almost flat, finely microreticulate, rather dull, imperceptibly punctured. Male: pronotum not narrowed anteriorly; fore tibiae relatively slender and more elongate, their spur stouter and downward bent; metasternal plate longitudinally excavate; aedeagus Fig. 60-61. Female: pronotum somewhat narrowed anteriorly; fore tibiae relatively stouter and shorter, their spur slender and almost straight; metasternal plate flat.

**Type material.** GUATEMALA: Baja Verapaz, 7 Km NE Purulhá, m 1500, 20.VI.1993, leg. Howden H. & A., at light (1 paratype, CNCI); Baja Verapaz, 16.5 Km N Salama, m 1650, 29.VI.1993, leg. Génier F., human feces (35 paratypes, CMNO); Quetzaltenango, 12 Km SE Zunil, Fuentes Georginas, m 2460, 27.V.1991, leg. Anderson R. S., cloud forest litter (4 paratypes, CMNO, DCGI); Sacatepéquez, Cerro Alux, m 2260, 12.VI.1991, leg. Howden H. & A. (male holotype, and allotype, CNCI; 4 paratypes, DCGI, CNCI); *idem*, 20.VI.1993, leg. Howden H. & A. (40 paratypes, CNCI); San Marcos, 11.5 Km NW San Marcos, 15°10'N–91°48'W, m 3000, 24-25.V.1973, leg. Erwin & Havel, Central American Expedition 1973 (1 paratype, USNM).

**Distribution.** Guatemala.

**Etymology.** Named after the type locality.

**Bionomics.** Unknown; the specimens of the type series were collected in May and June.

***Gonaphodiellus sexguttatus* (Schmidt, 1916)**

(Fig. 62-66)

*Aphodius* (*Gonaphodiellus*) *sexguttatus* Schmidt, 1916: 114; Dellacasa 1988: 240.*Aphodius sexguttatus*; Blackwelder 1944: 213.*Gonaphodiellus sexguttatus*; Skelley et al. 2007: 4.**Type locality.** Pichinde, Colombia.**Type repository.** Naturhistoriska Riksmuseet, Stockholm, Sweden (type examined).

**Redescription.** Length 4.5-5.0 mm; elongate, moderately convex, subshiny, glabrous. Dark brownish; clypeal margin and fore angles of pronotum reddish; elytra yellowish spotted basally on second and third interstria and at shoulder, posteriorly with more or less elongate and widened blackish margined yellowish spots on second, fourth, sixth and seventh interstria; legs brownish-red; antennal club dark brown. Head with epistome slightly gibbous on disc, superficially alutaceous, rather finely, evenly, not closely punctured; punctation medially finer and more superficial; clypeus subtruncate anteriorly, round at sides, rather finely bordered, edge glabrous; genae round, almost imperceptibly bristled, not protruding from the eyes; frontal suture finely impressed, not tuberculate; front evenly, not closely punctured. Pronotum transverse, moderately convex, superficially alutaceous, somewhat irregularly, not very densely punctured; punctation denser and coarser on sides, sparser and more superficial on disc; lateral margins feebly arcuate, rather finely bordered, edge glabrous; hind angles obliquely truncate, truncation distinctly sinuate inwardly; base bisinuate. Scutellum flat, finely alutaceous, finely sparsely punctured. Elytra convex, almost subparallel-sided, finely striate; striae superficially punctured, faintly crenulate; interstriae feebly convex, very finely sparsely punctured, glabrous, preapically finely alutaceous thus rather dull. Hind tibiae upper spur shorter than first tarsal segment; first tarsal segment almost as long as following four segments combined. Male: pronotum not narrowed anteriorly and relatively somewhat less densely and less coarsely punctured; metasternal plate medially moderately excavate; aedeagus Fig. 65-66. Female: pronotum somewhat narrowed anteriorly and relatively more densely and more coarsely punctured; metasternal plate almost flat.

**Remarks.** The species is redescribed on Costa Rican specimens, the characters of which match almost perfectly those of the sole female type from Colombia.

**Material examined.** **COLOMBIA:** Pichinde (female holotype, NHRS). **COSTA RICA:** Alajuela Prov., Penas Blancas River Valley, m 500-1000, 06.V.1985, leg. Lyon B. (1 ex., CNCI); Atlantic Slope, 6 Km N Santa Elena Punt., 31.V.1979, leg. Howden H. & A. (1 ex., CNCI); Cartago Prov., Pan Am Hwy, Km 45, 6 Km NW El Empalme, 08-26.VI.1997, leg. Peck S. & J., FIT (3 exx., CNCI); *idem*, m 1975, 08-26.VI.1997, FIT, leg. Peck S. & J. (1 ex., DCGI); La Cañada T. Bi, m 2300, 15.IX.1940, leg. Bierig A. (1 ex., USNM); Cartago Prov., Navarro, 16-31.VII.1962 (4 exx., USNM); Monteverde, m 1520, 11-18.VI.1983, leg. Howden H. & A. Howden, FIT (4 exx., CNCI); *idem*, 23-30.VII.1983, leg. Lindeman D. H., FIT (1 ex., DCGI); Puntarenas, Monteverde, 26.V-03.VI.1984, leg. Riley E., Rider D. & Ledoux D. (1 ex., DCGI); *idem*, m 1400, 04.VI.1979, leg. Howden H. & A. (1 ex., CNCI); *idem*, m 1500, 23-27.XI.1991, leg. Howden H. & A., dung traps (1 ex., DCGI); Punt[arenas]., Monteverde Reserve, m 1500, 22.VIII.1967, leg. Howden H. & A. (8 exx., CNCI); San José, 05.VIII.1910, leg. Schmidt H. (1 ex., NMPC); S[an]. J[osé]., 9 Rd Km S of Division, 19.V.1991, leg. Curoe D. (2 exx., USNM); 8 rd km N Vara Blanca, Volcan Poas, 1500 m, Alajuela Prov., 11.V. 1985, leg J. Doyen, Black light (2 exx., EMEB). **EL SALVADOR:** Monte Cristo, 23 Km N Metapán, m 2300, 08-10.V.1971, leg. Howden H. F. (2 exx. CNCI, DCGI); Monte Cristo, 07-09.V.1958, leg. Cartwright O. L. (1 ex., USNM); Hda. Montecristo, Miramundo, Metapán, m 2300, 08.V.1971, leg. Steinhäuser S. & L., cloud forest (1 ex., FSCA). **HONDURAS:** F. Morazán, 30 Km E Tegucigalpa, Cerro Hyuca, m 1800, 10.VI.1994, leg. Howden H. & A. (122 exx., CNCI, DCGI); Paraíso, Cerro Monserrat, 7 Km SW Yuscarán, m 1800, 24.IV.1994, leg. Howden H. & A. (10 exx., CNCI, DCGI); Depto. Paraíso, Monserrat Mt., 01.IV.1994,

leg. Ganaway R. (1 ex., DCGI); El Paraíso, Cerro Monserrat, 6.9 mi. W Yuscaran, m 1760, 07.VI.1994, leg. Anderson R. S., cloud forest litter, Berlese (2 exx., CNCI); Ocotepeque, R. B. Gulsayote, 22.V.1995, leg. Turnbow P., mv+bl (10 exx., FSCA; 2 exx., DCGI); Dept. Olancho, La Muralla Pk. N., 24-27.V.1995; leg. Huether J. (1 ex., FSCA) Olancho, Parque Nacional La Muralla, 15°05'49"N-86°44'17"W, m 1450, 04-07.VII.2002, leg. Smith A. T. B. & Ocampo F. C. (34 exx., FSCA; 2 exx., DCGI). **MEXICO: Chiapas:** Mpio. Angel Albino Corzo, Reserva El Triúnfo, rd. to Finca Prussia, nr. campamento, 15°39'44.7"N-092°48'40.7"W, 25.IX-25.X.2002, leg. Galvez R. S., FTT (1 ex., FSCA). **PANAMA:** Chiriqui, Hartmann's Finca, Sta. Clara, 15-18.VI.1985, leg. Riley & Rider (1 ex., DCGI).

**Distribution.** Colombia, Costa Rica, El Salvador, Honduras, Mexico (Chiapas), Panama.

**Bionomics.** Poorly known; the majority of specimens examined were collected in spring.

### Genus *Gonaphodioides* new genus

**Type species.** *Aphodius columbicus* Harold, 1880, here designated.

**Diagnosis.** Small or medium size species (length 3.5-6.0 mm), moderately convex, shiny, glabrous. Chestnut or dark brown, rarely black. Head with epistome evenly, coarsely, more or less densely punctured; clypeus angulately sinuate at middle, obtusely angulate at sides, with finely glabrous border; genae obtuse, not or near imperceptibly ciliate, protruding from the eyes; frontal suture finely impressed, not tuberculate; first segment of labial palps longer than second (Fig. 69, 79). Pronotum transverse, weakly convex, evenly more or less coarsely and densely punctured; lateral margins glabrous; hind angles widely truncate. Scutellum small, triangularly elongate, basally punctured. Elytra elongate, subparallel-sided or faintly widened posteriorly, denticulate or not at shoulder; striae rather deep, fine, superficially punctured, subcrenulate; interstriae moderately convex, sparsely punctulate. Fore tibiae distally tridentate and proximally serrulate on outer margin; upper side densely and more or less coarsely punctured. Hind tibiae with rather feeble transverse carinae on outer face, apically fimbriate with spinules elongate and irregularly unequal. Pygidium distinctly microreticulate, evenly, rather sparsely, not coarsely punctured; each puncture with a short recumbent hair; apical margin with few very elongate setae. Sexually dimorphic characters feebly stressed: males have head and pronotum relatively more transverse and less densely punctured, fore tibiae slender and more elongate with spur stouter and shorter. Aedeagus with parameres rather elongate, apically curved and more or less diffusely pubescent. Epipharynx with anterior margin deeply sinuate at middle, round at sides; epitorma subconical; corypha with two prominent apical strong spiculae; pedia densely pubescent, with subserially arranged lateral stout chaetae; chaetopariae dense and moderately elongate.

**Distribution.** Meso- and South American regions.

**Etymology.** The name results from the combination of the genus name *Gonaphodius* and the suffix *-oides* [= having the form of]. The gender is masculine.

### Key to species of *Gonaphodioides*

1. Elytra denticulate at shoulder ..... 2
- Elytra not denticulate at shoulder but therein with distinctly raised epipleural carina ..... 6
- 2(1). Elytra subparallel-sided, very elongate. Chestnut-brown. Length 5.5-6.0 mm. Bolivia, Colombia ..... *G. acutecernans* (Balthasar)
- Elytra oval, less elongate ..... 3



- 3(2). Elytral interstriae distinctly convex. Chestnut-brown. Length 4.0-5.0 mm. Colombia, Venezuela ..... ***G. columbicus* (Harold)**  
 — Elytral interstriae flat or almost flat ..... **4**
- 4(3). Pronotum dually punctured; few large punctures irregularly scattered on sides; very fine small punctures evenly, not closely sparse throughout. Black. Length 5.0-6.0 mm. Mexico (Chiapas) ..... ***G. skellei* new species**  
 — Pronotum simply, evenly regularly or almost regularly punctured ..... **5**
- 5(4). Elytral interstriae rather coarsely, not very closely punctured. Dark chestnut brown. Length 3.5-4.0 mm Mexico (Oaxaca) ..... ***G. ratcliffei* new species**  
 — Elytral interstriae very finely, sparsely punctured. Dark brown. Length 4.0-4.5 mm. Mexico (Hidalgo, Puebla, San Luis Potosí) ..... ***G. newtoni* new species**
- 6(1). Elytral interstriae flat, superficially microreticulate thus almost dull; sides of pronotum relatively more coarsely and more irregularly punctured. Reddish-testaceous. Length 3.5-4.0 mm. Bolivia, Brazil, Paraguay ..... ***G. sincerus* (Petrovitz)**  
 — Elytral interstriae convex, smooth thus shiny; sides of pronotum relatively less coarsely and more regularly punctured. Chestnut brown. Length 4.0-4.5 mm. Brazil, Costa Rica, Ecuador, Mexico (Oaxaca), Panama, Peru, Venezuela ..... ***G. chapini* (Hinton)**

***Gonaphodioides acutecernans* (Balthasar, 1960) new combination**

(Fig. 67-72)

*Aphodius* (*Gonaphodiellus*) *acutecernans* Balthasar, 1960: 57; Dellacasa 1988: 240.

*Gonaphodiellus* (s. l.) *acutecernans*; Skelley et al. 2007: 4.

**Type locality.** Yungas de Arepuchio, Sihuenas, m 2200-2500, Bolivia.

**Type repository.** National Museum, Prague, Czech Republic (type not examined).

**Redescription.** Length 5.5-6.0 mm, elongate, moderately convex, shiny, glabrous. Chestnut-brown; clypeal margin and sides of pronotum shadowy reddish; legs brown-reddish; antennal club testaceous. Head with epistome feebly gibbous on disc, rather finely and regularly punctured, punctation distally near imperceptible due to strong microreticulation; clypeus faintly sinuate at middle, angulate, subangulate or, rarely, obtusely round at sides, very finely bordered, edge glabrous; genae obtuse, very shortly ciliate, protruding from the eyes; frontal suture finely impressed and widely curved backward at middle; front relatively more coarsely and densely punctured. Pronotum transverse, rather coarsely and subregularly punctured; punctation laterally and basally somewhat denser; lateral margins distinctly bordered, edge glabrous; hind angles widely truncate, truncature inwardly sinuate; base bisinuate. Scutellum ogival, elongate, shiny, near imperceptibly punctured basally. Elytra elongate, subparallel-sided, with humeral denticle rather strong; striae deep, somewhat wide, distinctly punctured, feebly crenulate; interstriae nearly flat, almost imperceptibly punctured. Hind tibiae upper spur a quarter shorter than first tarsal segment; first tarsal segment somewhat longer than following four segments combined. Male: fore tibiae relatively slender and more elongate, their spur short, stout and abruptly downward bent; aedeagus Fig. 71-72. Female: fore tibiae relatively more short and stout, their spur slender, elongate and outward curved.

**Material examined. BOLIVIA:** Cochabamba Prov. (2 exx., DCGI); Yungas de Arepuchoi, Sihuenas, m 2200-2500, 25.IX.1953, leg. Forster W. (1 ex., NMPC). **COLOMBIA:** Oberhalb Bogotá, 10000', leg. O Thieme, 1877 (4 exx., MNHN).

**Distribution.** Bolivia, Colombia.

**Bionomics.** Almost unknown. One of the specimen examined was collected in autumn.

***Gonaphodioides chapini* (Hinton, 1934) new combination**

(Fig. 73-77)

*Aphodius chapini* Hinton, 1934: 189; Blackwelder 1944: 212.*Aphodius ataenioides* Hinton, 1938: 123; Blackwelder 1944: 212 (**new synonymy**).*Aphodius (Blackburneus) ataenioides*; Dellacasa 1988: 229.*Aphodius (Blackburneus) chapini*; Dellacasa 1988: 351.*Aphodius (Blackburneus) castanescens* Petrovitz, 1973: 145; Dellacasa 1988: 233 (**new synonymy**).*Gonaphodiellus* (s. l.) *chapini*; Skelley et al. 2007: 4.**Type locality.** Porto Bello [Puerto Bello, Panama].**Type repository.** United States National Museum, Washington, DC, U.S.A. (type examined).

**Redescription.** Length 4.0-4.5 mm; oblong, moderately convex, shiny, glabrous. Chestnut brown; clypeal margin, pronotal sides and elytral apex somewhat paler; legs chestnut brown; antennal club yellowish. Head with epistome feebly convex on disc, superficially microreticulate, almost evenly subregularly coarsely punctured; punctation distally confusedly superficial, somewhat sparser on disc; clypeus angulately sinuate at middle, obtusely round at sides, very finely bordered, edge slightly upturned, glabrous; genae obtusely round, not ciliate; faintly protruding from the eyes; frontal suture finely impressed, front evenly, coarsely, regularly, not closely punctured throughout. Pronotum transverse, moderately convex, evenly, almost coarsely, almost regularly, not closely punctured; punctation somewhat sparser on disc; lateral margins feebly arcuate, finely bordered, edge glabrous; hind angles obtusely truncate; truncation slightly inwardly sinuate; base bisinuate, more or less strongly crenulate by a contiguous belt of coarse punctures. Scutellum elongate, almost smooth, distinctly striolate along lateral margins. Elytra oval elongate, moderately convex, not denticulate at shoulder; on disc, striae fine, superficially punctured, faintly crenulate; on preapical declivity, striae superficial, wider and not crenulate; on disc, interstriae convex, smooth, very shiny and with extremely fine sparse punctures; preapically, interstriae almost flat, superficially microreticulate, weakly shiny and more distinctly punctured. Hind tibiae upper spur shorter than first tarsal segment; first tarsal segment as long as following three segments combined. Male: aedeagus Fig. 76-77. Female: fore tibiae spur relatively more slender, elongate and somewhat outward curved.

**Material examined. BRAZIL:** Acre, Nueva York (1 ex., male, type of *Aphodius (Blackburneus) castanescens* Petrovitz, 1973, MHNG). **COSTA RICA:** Alajuela, Penas Blancas, IX-X.1986, leg. E. Cruz, M.T. (1 ex., DCGI); Cartago, Turrialba, 28.II.1980, leg. Howden H. & A. (37 exx., CNCI); *idem*, 06.VI.1951, leg. Cartwright O. L. (1 ex., USNM); *idem*, m 650, 26.II.1980, leg. Howden H. & A. (5 exx., CNCI, DCGI); *idem*, 26.II.1980, leg. Howden H. & A., dung mega trap, Florencia sur woods (1 ex. CNCI); *idem*, m 600, 19-21.V.1979, leg. Howden H. & A., CATI (33 exx., CNCI); Heredia Pr., La Selva, nr. P.to Viejo, m 50, 19.II.1980, leg. Howden H. & A. (12 exx., CNCI); Limon P., Valle de la Estrella Pandora, 14.II.1984, leg. Howden H. & A. (1 ex., CNCI); Punt., Monteverde, m 140, 24.V.1979, leg. Howden H. & A. (8 exx., CNCI); Puntarenas Prov., Rincon de Osa, 10-15.VIII.1966, leg. Peck B. (1 ex., CNCI); San José P., 2 Km S Colon, m 1100, 01-16.II.1984, leg. Howden H. & A. (1 ex., CNCI). **ECUADOR:** Pich[incha]. Prov., Rio Palenque, 24.II.1976, leg. Nealis V. (6 exx. CNCI, DCGI); Pich[incha]. Prov., 16 Km E Santo Domingo, Tinalandia, m 680, 04.V-25.VII.1985, leg. Peck S. & J., malaise-FIT, rain forest (1 ex., CNCI); **MEXICO: Oaxaca:** Ixtlán de Juárez, 17°20'07"N-96°29'02"W, 19.IV.1993 (1 ex., DCGI). **PANAMA:** Canal Zone, 12-13.IX.1975, leg. Young P., human feces trap (1 ex., DCGI); Canal Zone, Ciricito, 03.V.1930 (1 ex., USNM); Cerro Campana, m 3000, 02.VIII.1970, leg. Howden H. & A. (5 exx., CNCI); Chiriqui Prov., Cerro Pelota, m 1500, 01-14.VII.1982, leg. Gill B. (2 exx., DCGI, CNCI); *idem*, 4 Km N Sta. Clara, VIII.1952, leg. Gill B. (2 exx., CNCI); Chiriqui Prov., 2 Km N Sta. Clara, Hartmann's Finca, 8°51'N-82°46'W, m 1300, 24-25.V.1977, leg. Howden H. & A. (2 exx., DCGI, CNCI); Chiriqui Prov., 2 Km N Sta. Clara, m 1300, W. Hartman's Finca, 30-31.V.1977, leg. Howden H. & A. (8 exx., CNCI); *idem*, 8°51'N-82°36'W, m 1300, 30-31.V.1977, leg. Howden H. & A. (1 ex., CNCI); Chiriqui Prov., Hartmann's Finca, 04-07.VII.1977, leg. Morris & Wappes, feces baited pitfall trap (2 exx., MCGA); Colon Prov., Santa Rita Ridge, m 270, 10-

11.VI.1977, leg. Howden H. & A. (9 exx., CNCI); Panama Prov., Cerro Azul, 13-18.II.1996, leg. Turnbow & Wappes, swine feces baited trap (2 exx., RHTC); *idem*, 12-13.V.1996, leg. Wappes, Huether & Morris (1 ex., ISEA); *idem*, 21-27.V.1996, leg. Wappes, Huether & Morris (1 ex., MCGA); Panama Prov., Cerro Jefe, 30.VI.1997, leg. Turnbow R. (2 exx., DCGI, RHTC); Panama [Prov.], Chepo-Carti Rd, m 400, VI.1982, leg. Gill B., flight interception trap (2 exx., CNCI); Panama Prov., K 8-13 El Llano-Carti Rd, 10-13.V.1996, leg. Wappes, Huether & Morris (1 ex., MCGA); *idem*, 21-24.V.1996, leg. Wappes, Huether & Morris (2 exx., MCGA); Panama Prov., Pipeline Rd K 1-12, 15-22.II.1999, leg. Wappes J. E., feces baited pitfall trap (1 ex., CNCI); [Panama Prov.], Porto Bello [= Puerto Bello], 11.II.1911, leg. Schwarz E. A., ex horse manure (1 ex., male, type of *Aphodius chapini* Hinton, 1934, USNM); Pan[ama]. [Prov.], Potrellos [=Potrerillos?], II.1934 (1 ex., male, type of *Aphodius ataenioides* Hinton, 1938, USNM). **PERU:** Pucalpa, 11.VII.1992, leg. Peña L. E. (2 exx., DCGI). **VENEZUELA:** Carab[o]bo., Borbureta, P. Cabella, m 200, 13.X.1985, leg. Bordon C. (1 ex., DCGI); Miranda, Los Altos, m 1300, 24.XII.1983, leg. Bordon C. (1 ex., DCGI); Miranda, El Amarillo, S. Antonio de los Altos, sector Los Moralitas, 10°21'N–66°56'W, m 50, 20.II.2002, leg. Zunino M. (2 exx., DCGI); Parque Nacional de Rancho Grande, m 1300, 19.VII.1964, leg. Bordon C. (1 ex., DCGI).

**Distribution.** Brazil, Costa Rica, Ecuador, Mexico (Oaxaca), Panama, Peru, Venezuela.

**Bionomics.** Poorly known; the majority of specimens examined were collected in late winter and early spring.

**Remarks.** The new synonymies are established with the thorough study of the types of involved taxa.

### ***Gonaphodioides columbicus* (Harold, 1880) new combination**

(Fig. 78-83)

*Aphodius columbicus* Harold, 1880: 36; Blackwelder 1944: 212.

*Aphodius* (*Gonaphodiellus*) *columbicus*; Schmidt 1913: 134; 1922: 121; Dellacasa 1988: 314.

*Gonaphodiellus* (*s. l.*) *columbicus*; Skelley et al. 2007: 4.

**Type locality.** Bogotá [Colombia].

**Type repository.** Muséum national d'Histoire naturelle, Paris, France (lectotype herein designated).

**Redescription.** Length 4.0-5.0 mm, elongate, moderately convex, shiny, glabrous. Chestnut-brown; clypeal margin, sides of pronotum, apex of elytra shadowy reddish; legs pale reddish; antennal club testaceous. Head with epistome feebly gibbous, finely regularly and rather sparsely punctured throughout; clypeus slightly sinuate at middle, obtusely angulate at sides, faintly bordered; edge distinct and somewhat upturned anteriorly only, glabrous; genae subangulose, not ciliate, protruding from the eyes; frontal suture finely impressed; front finely and sparsely punctured. Pronotum transverse, moderately convex, finely, regularly and rather sparsely punctured; punctation somewhat denser anteriorly; sides feebly curved, very finely bordered, edge glabrous; hind angles widely truncate, truncature slightly inwardly sinuate; base distinctly bisinuate. Scutellum ogival elongate, somewhat depressed and distinctly microreticulate basally. Elytra convex, elongate with humeral denticle very small; striae fine, superficially punctured, not crenulate; interstriae distinctly convex on disc and nearly imperceptibly punctured laterally, nearly flattened subapically. Hind tibiae upper spur as long as half of first tarsal segment; first tarsal segment longer than following three segments combined. Male: pronotum relatively more transverse and less convex, parallel-sided with anterior discal punctation finer; elytra more elongate, nearly parallel-sided; fore tibiae more slender and more elongate, their spur downward bent; aedeagus Fig. 82-83. Female: pronotum relatively less transverse and more convex, somewhat narrowed anteriorly, uniformly punctured throughout; elytra shorter and somewhat broadened backward; fore tibiae more stout and shorter, their spur straight.

**Type material.** **Lectotype**, male, herein **designated** (MNHN), bearing the following labels:

- 1) white, handwritten: Bogotá;
- 2) white, printed: ex Musaeo/E. Steinheil;
- 3) red, printed: *Aphodius/ columbicus/* Harold, 1880;
- 4) red, printed: Lectotypus/ M. & G. Dellacasa des. 2001.

**Paralectotypes:** 3 males and 4 females from Bogotá (**paralectotypes**, MNHN); 3 females from La Luzera [Colombia], ex Musaeo/ E. Steinheil (**paralectotypes**, MNHN); 1 male and 1 female from Viani, ex Musaeo/ Harold (**paralectotypes**, , MNHN); 1 female from Noescen. [Colombia?] (**paralectotype**, MNHN); 1 female from Colombia, ex Musaeo/ E. Harold (**paralectotype**, MNHN).

**Material examined. COLOMBIA:** Agnas Largas près Bogotá, 1877, leg. Thieme O. (1 ex., MNHN); Bogotá (1 ex., DCGI); Bogotá, 1877, leg. Thieme O. (3 exx., MNHN); Oberhalb Bogotá, 1000', 1877, leg. Thieme O. (3 exx., MNHN); Papayan, 1899, leg. Abbé Gaujon (1 ex., MNHN); Santander, R. Natural Cachalú, m 2150-2250, III.1999, leg. Gonzales F. (2 exx., DCGI). **VENEZUELA:** Merida, Mucuy Fish Hatchery, 7 Km E Tabay, 6600', 10-13.II.1978, leg. Heppner J. B., black light (3 exx., DCGI); Merida, La Mucuy Estacion, 10-15.VIII.1976, leg. Bordon C. (4 exx., DCGI); Merida, La Mucuy, m 2300, 10.IX.1965, leg. Bordon C. (1 ex., DCGI); Trujillo, Paramo del Guaramacal, m 3000, 24.V.1980, leg. Bordon C. (5 exx., DCGI).

**Distribution.** Colombia, Venezuela.

**Bionomics.** Poorly known; the specimens examined were collected in spring, summer and early autumn.

### *Gonaphodioides newtoni* new species

(Fig. 84-88)

**Type locality.** 43 Km SW Huejutla, m 1500, Tlanchinol, Hidalgo, Mexico.

**Type repository.** Canadian National Collection, Ottawa, Canada.

**Description.** Length 4.0-4.5 mm; moderately elongate, rather convex, shiny, glabrous. Dark brown; clypeal margin, anterior angles of pronotum and elytral apex paler; legs dark reddish-brown; antennal club dirty testaceous. Head with epistome gibbous medially, evenly, not closely, distinctly punctured; clypeus feebly sinuate at middle, subangulose at sides, rather thickly bordered, edge glabrous, anteriorly moderately reflexed; genae obtuse, not ciliate, protruding from the eyes; frontal suture obsolete; front somewhat more sparsely punctured than epistome. Pronotum transverse, convex, simply, almost evenly, rather closely punctured; punctation somewhat denser on sides; lateral margins straight, faintly sinuate inwardly before hind angles, rather thickly bordered, edge glabrous; hind angles obliquely truncate, truncation slightly sinuate inwardly; base feebly bisinuate. Scutellum somewhat elongate, superficially alutaceous and sparsely punctured on basal half. Elytra elongate, subparallel-sided, minutely denticulate at shoulder; striae fine, superficially, not closely punctured, not crenulate; interstriae almost flat, irregularly, sparsely finely punctured. Hind tibiae upper spur shorter than first tarsal segment; first tarsal segment as long as following four segments combined. Male: head and pronotum relatively more transverse, less convex and less densely punctured; metasternal plate with median longitudinal groove deeper; aedeagus Fig. 87-88. Female: head and pronotum relatively less transverse, more convex and more densely punctured; metasternal plate with median longitudinal groove superficial.

**Type material. MEXICO: Hidalgo:** 43 Km SW Huejutla, Tlanchinol, m 1500, 14.VI-04.VIII.1983, leg. Peck S. & J., cloud forest FIT (male holotype, allotype and 7 paratypes, CNCI, 2 paratypes, DCGI); 3 mi. N Tlanchinol, 5200', 11.VII.1973, leg. Newton A. (4 paratypes, DCGI, CNCI); 10 mi. NE Rancho Viejo, 5100', 29.VII.1971, leg. Newton A. (4 paratypes, CNCI); **Puebla:** 4 mi. E Tezuitlán,

5000', 14.VII.1971, leg. Newton A. (4 paratypes, DCGI, CNCI); **San Luis Potosí:** 13 mi. W Xilitla, 4800', 28.VI.1971, leg. Newton A. (9 paratypes, DCGI, CNCI); 20 Km W Xilitla, m 1600, 12.VI-06.VIII.1983, leg. Peck S. & J., cloud forest (1 paratype, CNCI).

**Distribution.** Mexico (Hidalgo, Puebla, San Luis Potosí).

**Etymology.** Named in honor of Alfred Newton, curator of entomology, Field Museum, Chicago, Illinois.

**Bionomics.** All specimens of the type series were collected in late spring; some of them in cloud forest by flight interception trap.

***Gonaphodioides ratcliffei* new species**

(Fig. 89-93)

**Type locality.** 20 mi S. Juchatango, Rt 131, 6000', Oaxaca, Mexico.

**Type repository.** Canadian Museum of Nature (Howden Collection), Ottawa, Canada.

**Description.** Length 3.5-4.0 mm; elongate, moderately convex, rather shiny glabrous. Dark chestnut brown; clypeal margin, anterior angles of pronotum and elytral apex paler; legs reddish brown; antennal club brownish-red. Head with epistome feebly convex medially, evenly, rather coarsely, densely punctured throughout; clypeus slightly sinuate at middle, subangulose at sides, rather thickly bordered, edge faintly upturned, glabrous; genae obtuse, almost imperceptibly ciliate, protruding from the eyes; frontal suture finely impressed; front identically punctured as epistome. Pronotum transverse, moderately convex, densely, simply, evenly punctured; punctation somewhat denser on sides; lateral margins subparallel, faintly inwardly sinuate before hind angles; rather thickly bordered, edge glabrous; hind angles obliquely truncate, truncation feebly inwardly sinuate; base slightly bisinuate. Scutellum somewhat elongate, coarsely, not closely punctured on basal two thirds. Elytra moderately elongate, almost parallel-sided, minutely denticulate at shoulder, finely striate; striae rather superficially punctured, not crenulate; interstriae almost flat, distinctly, rather coarsely, not closely punctured. Hind tibiae upper spur shorter than first tarsal segment; first tarsal segment longer than following three segments combined. Male: fore tibiae relatively slender and more elongate; head and pronotum more transverse and less convex; metasternal plate with median longitudinal groove deeper; aedeagus Fig. 92-93. Female: fore tibiae relatively shorter and stouter; head and pronotum less transverse and more convex; metasternal plate with median longitudinal groove superficial.

**Type material.** **MEXICO: Oaxaca:** 20 mi. S Juchatango, Rt 131, 6000', 27-30.V.1971, leg. Newton A. (male holotype, allotype and 5 paratypes, CMNO; 2 paratypes, DCGI).

**Distribution.** Known from the type locality only.

**Etymology.** Named in honor of professor Brett Ratcliffe, curator of insects at the University of Nebraska State Museum, Lincoln, Nebraska.

**Bionomics.** All specimens of the type series were collected in May.

***Gonaphodioides sincerus* (Petrovitz, 1973) new combination**

(Fig. 94-98)

*Aphodius* (*Gonaphodiellus*) *sincerus* Petrovitz, 1973: 142; Dellacasa 1988: 240.  
*Gonaphodiellus* (s. l.) *sincerus*; Skelley et al. 2007: 4.



**Type locality.** Cuyabá, Mato Grosso, Brasilien [Brazil].

**Type repository.** Muséum d'Histoire Naturelle, Geneva, Switzerland (type examined).

**Redescription.** Length 3.5-4.0 mm; oblong, convex, moderately shiny, glabrous. Reddish-testaceous; basal margin of pronotum and elytral suture brown-reddish; legs yellowish; antennal club pale yellow. Head with epistome shiny, slightly gibbous on disc, finely rather sparsely somewhat irregularly punctured; clypeus angulately sinuate at middle, subangulate at sides, very finely bordered, edge slightly upturned, glabrous; genae obtusely round, very shortly ciliate, not protruding from the eyes; frontal suture distinctly impressed; front coarsely, rather densely, regularly punctured. Pronotum transverse, moderately convex, shiny, rather irregularly punctured; punctation sparser and more superficial on disc, denser and more coarse on sides; intermingled with the large punctures there are many extremely minute and nearly imperceptible punctures; lateral margin feebly arcuate, finely bordered, edge glabrous; hind angles widely truncate; truncature inwardly sinuate; base distinctly bisinuate. Scutellum elongate superficially microreticulate, almost impunctate. Elytra oval-elongate, moderately convex; epipleural carina distinct at shoulder; striae fine and rather superficial on disc, wide and deeper toward apex, superficially punctured, almost not crenulate; interstriae feebly convex, on disc superficially microreticulate on each side near striae, more strongly microreticulate and almost dull on preapical declivity, sparsely and very finely punctured. Hind tibiae upper spur one third shorter than first tarsal segment; first tarsal segment somewhat shorter than following four segments combined. Male: head and pronotum relatively more wide, and less coarsely punctured; aedeagus Fig. 97-98. Female: head and pronotum relatively narrower, more convex and more coarsely punctured.

**Material examined.** **BOLIVIA:** Santa Cruz, Buena Vista vic., Flora & Fauna Hotel, 22-26.X.2000, leg. Morris & Wappes (6 exx., DCGI, MCGA); Santa Cruz, 3.7 Km SSE Buena Vista, Hotel Flora & Fauna, m 430, 23-26.X.2000, leg. Thomas M. C., tropical transition forest (3 exx., FSCA); *idem*, 14-28.X.2000, leg. Dozier B. K. (1 ex., FSCA); Santa Cruz, 5 Km ESE Warnes, Hotel Rio Selva, 20.X.2000, leg. Thomas M. C., black light (3 exx., FSCA). **BRAZIL:** Ariquemes, nr. Fazenda Rancho Grande, Rondonia, 03-15.XII.1996, leg. Eger J. E., black light trap (4 exx., DCGI); Bahia, Encruzilhada, m 980, XI.1972, leg. Alvarenga M. (1 ex., DCGI); Mato Grosso, Cuyaba (1 ex., male, type of *Aphodius* (*Gonaphodiellus*) *sincerus* Petrovitz, 1973, MHNG); Minas Gerais, Viçosa, XI.1996, leg. Vaz de Mello F. (2 exx., DCGI, ISEA); Sao Paulo, Sidrolandia, Route Campo Grande-Sao Paulo, Pk 68, leg. Degallier N., piège d'interception (1 ex., BCSC). **PARAGUAY:** Dept. Guaira, Calle Florida, VIII.1993 (1 ex., DCGI).

**Distribution.** Bolivia, Brazil, Paraguay.

**Bionomics.** Almost unknown. The specimens examined were collected in summer and autumn.

### *Gonaphodioides skelleyi* new species

(Fig. 99-103)

**Type locality.** San Juan Chamula env., 16°46'56.4"—092°41'36.3"W, m 2282, Chiapas, Mexico.

**Type repository.** Dellacasa Collection, Genoa, Italy.

**Description.** Length 5.0-6.0 mm, oblong, rather convex, moderately shiny, glabrous. Black; tarsi and antennal club dark piceous. Head with epistome feebly convex on disc, finely, evenly, not closely punctured throughout; clypeus faintly sinuate at middle, obtusely round at sides, finely bordered, edge glabrous, moderately reflexed; genae obtusely round, not ciliate, feebly protruding from the eyes; frontal suture obsolete; front almost evenly finely, rather sparsely punctured. Pronotum transverse, convex, dually punctured; large punctures, five to six times larger than small ones, sparsely irregularly

scattered on sides only; small, very fine punctures evenly not closely sparse throughout, medially extremely fine; lateral margins feebly arcuate, rather thickly bordered, edge glabrous; hind angles obliquely truncate, truncation feebly inwardly sinuate; base distinctly bisinuate. Scutellum slightly convex, finely irregularly punctured on basal half. Elytra oval-elongate, feebly broadened posteriorly, minutely denticulate at shoulder; striae fine, superficially, not closely punctured, faintly crenulate, somewhat deeper on preapical declivity; interstriae flat, near imperceptibly alutaceous and with extremely fine sparse punctures. Hind tibiae upper spur shorter than first tarsal segment; first tarsal segment somewhat longer than following three segments combined. Male: head and pronotum relatively more transverse, less convex and more sparsely punctured; aedeagus Fig. 102-103. Female: head and pronotum relatively less transverse, more convex and somewhat more closely punctured.

**Type material. MEXICO: Chiapas:** San Juan Chamula env., 16°56'56.4"N–092°41'36.3"W, m 2282, 21.VI.2007, leg. Dellacasa M., Fresi C. & Martínez I., horse dung (male holotype, allotype and 1 paratype, DCGI); 6 mi. E San Cristobal L. C., 07.V.1969, leg. Howden H. F. (1 paratype, CNCI); 8 mi. NE San Cristobal L. C., 01.V.1969, leg. Howden H. F. (1 paratype, CNCI); 7 mi. SE San Cristobal, 09.V.1969, leg. Howden H. F. (1 paratype, CNCI); 3 mi. NW San Cristobal L. C., 31.V.1969, leg. Howden H. F. (1 paratype, CNCI); 5 Km W San Cristobal de las Casas, 8000', 13-16.VIII.1969, leg. Peck S. & J., pine-oak forest (2 paratypes, CNCI, DCGI); 10 mi. SE Teopisca, 11.V.1969, leg. Martin J. & N. (1 paratype, CNCI).

**Distribution.** Known from the type locality only.

**Etymology.** Named in honor of Paul E. Skelley, collections manager of Florida State Collection of Arthropods, Gainesville, Florida.

**Bionomics.** Almost unknown. Some of the specimens of the type series were collected in horse dung.

### Genus *Gonaphodiopsis* new genus

**Type species.** *Gonaphodiopsis montesdeocai* new species, here designated.

**Diagnosis.** Small size species (length 4.0-5.5 mm), shortly oblong, strongly convex, shiny, glabrous. Piceous or reddish brown, usually with pronotum and elytral disc darker. Head with epistome rather coarsely, evenly punctured; clypeus feebly sinuate at middle, round at sides, margin glabrous; genae obtusely round, not ciliate, not or feebly protruding from the eyes; frontal suture not tuberculate; first segment of labial palps longer than second (Fig. 117). Pronotum moderately transverse, convex, dually punctured, rarely with a basal belt of contiguous large punctures crenulating a sort of edge; hind angles broadly obliquely truncate; base not bordered. Scutellum small, triangularly elongate. Elytra amygdaliform, distinctly denticulate at shoulder, deeply striate; striae crenulate or subcrenulate; interstriae convex, sometimes preapically subcariniform. Fore tibiae distally tridentate and proximally serrulate on outer margin; upper side densely and more or less coarsely punctured. Hind tibiae with feeble transverse carinae on outer face; apically fimbriate with spinules moderately elongate and irregularly unequal. Pygidium strongly alutaceous, evenly roughly punctured; each puncture with a short recumbent hair; apical margin with few, very elongate, straight setae. Sexually dimorphic characters shown in males by pronotum relatively more transverse, less convex, less coarsely and less densely punctured; fore tibiae apical spur stouter and shorter. Aedeagus with parameres apically shortly bristled, medially with a characteristic oblique fold. Epipharynx with anterior margin deeply sinuate at middle, widely round at sides; epitorma subconical; corypha with two prominent apical strong spiculae; pedia densely pubescent, with irregularly arranged lateral stout chaetae; chaetopariae dense and rather short.

**Distribution.** Guatemala, Mexico.

**Etymology.** The name results from the combination of the genus name *Gonaphodius* and the suffix *-opsis* [= looking like]. The gender is feminine.

**Bionomics.** Besides the species collected in horse or sheep dung in open pastures or in forests, several taxa were found feeding in bat dung in caves (labels data).

### Key to species of *Gonaphodiopsis*

1. Pronotal dual punctation dense and almost uniformly scattered throughout (Fig. 105, 115) .. **2**  
 — Pronotal dual punctation sparse and rather irregularly scattered (Fig. 111, 122, 126) ..... **3**
- 2(1). Elytra elongate, feebly widened posteriorly (Fig. 106); interstriae feebly convex on disc, somewhat more convex on preapical declivity. Reddish brown, pronotum and elytra shadowy darker on disc. Length 4.0-4.5 mm. Mexico (Oaxaca, Puebla, San Luis Potosí, Tamaulipas, Veracruz) ..... ***G. deloyai* new species**  
 — Elytra short, distinctly broadened posteriorly (Fig. 115); interstriae convex on disc, subcariniform on preapical declivity. Chestnut brown or piceous. Length 3.5-4.5 mm. Mexico (Veracruz) ... ***G. montesdeocai* new species**
- 3(1). Basal margin of pronotum with a belt of coarse contiguous punctures crenulating a sort of thick edge (Fig. 111); lateral margins of pronotum slightly inwardly sinuate before hind angles; truncation of hind angle inwardly sinuate; elytral interstriae slightly convex on disc, subcariniform on preapical declivity. Chestnut brown more or less dark. Length 5.0-5.5 mm. Mexico (San Luis Potosí, Tamaulipas, Veracruz) ..... ***G. hypogea* new species**  
 — Basal margin of pronotum without such a belt of punctures ..... **4**
- 4(3). Large pronotal punctures moderately coarse, very sparse on sides and widely lacking medially; small punctures almost imperceptible on disc (Fig. 122); elytral striae fine, superficially punctured, faintly crenulate; interstriae almost flat on disc, very feebly convex on preapical declivity, almost impunctate. Piceous or blackish. Length 5.0-5.5 mm. Mexico (Chiapas) .... ***G. pachecoi* new species**  
 — Large pronotal punctures strongly coarse and rather dense on sides; small punctures distinct also on disc, even if therein more superficial (Fig. 126); elytral striae rather deep, coarsely punctured, crenulate; interstriae convex on disc, subcariniform on preapical declivity, sparsely finely punctured. Reddish brown, pronotum disc and elytra somewhat shadowy darker. Length 4.5-5.0 mm. Guatemala, Mexico (Chiapas) ..... ***G. teopiscaensis* new species**

### *Gonaphodiopsis deloyai* new species

(Fig. 104-108)

**Type locality.** Cueva de Tasalolpan, 20°01'N–097°31'W, m 1495, Cuetzalan del Progreso, Puebla, Mexico.

**Type repository.** Dellacasa Collection, Genoa, Italy.

**Description.** Length 4.0-4.5 mm; oblong elongate, convex, shiny, glabrous. Reddish brown; pronotum and elytra shadowy darker on disc; legs dark brown; antennal club testaceous. Head with epistome feebly convex, densely, evenly, moderately coarsely punctured; clypeus feebly sinuate at middle, round at sides, rather finely bordered, edge glabrous; genae broadly round, not ciliate, faintly protruding from the eyes; frontal suture feebly raised, not tuberculate; front evenly, moderately coarsely punctured. Pronotum transverse, moderately convex, dually punctured; punctation dense and almost uniformly scattered throughout; large punctures, five to six times larger than small ones, somewhat denser on sides, sparser medially; small, very fine punctures evenly scattered throughout; lateral margins



nearly straight, very finely bordered, edge glabrous; hind angles truncate, truncation not inwardly sinuate; base almost regularly arcuate. Scutellum elongate, somewhat depressed laterally, finely punctured on basal half. Elytra convex, elongate, feebly broadened posteriorly, moderately denticulate at shoulder, deeply striate; striae rather fine, distinctly punctured, subcrenulate; interstriae slightly convex on disc, somewhat more convex on preapical declivity, very finely sparsely punctured. Hind tibiae upper spur somewhat shorter than first tarsal segment; first tarsal segment distinctly longer than following three segments combined. Male: pronotum relatively more transverse and less convex; fore tibiae spur stouter and shorter; aedeagus Fig. 107-108. Female: pronotum relatively less transverse and more convex; fore tibiae spur slender and longer.

**Type material. MEXICO: Oaxaca:** rd Mexico 135-San Gabriel Mixtepec env., 16°13'13.8"N-097°08'55.7"W, m 2600, 17.VI.2002, leg. Dellacasa M. & Martínez I. (1 paratype, DCGI); 26 Km E Valle Nacional Km 71, 25.VI-02.VIII.1983, leg. Peck S. & J., mountain tropical forest, FIT (2 paratypes, DCGI, CNCI); **Puebla:** 2.7 Km S Apulco, nr. Zacapoxtla, m 1401, 22.VII.1987, leg. Anderson R. S., cloud forest (1 paratype, CNCI); Cueva de Tasalolpan, Cuetzalan del Progreso, 20°01'N-97°31'W, m 1495, 18.VIII.1987, leg. Deloya A. C., salchicha de nidificación de *Haplogeotrupes reddelli* (Howden) (male holotype, DCGI; allotype, FSCA; 2 paratypes, DCGI); Nuevo Necaxa, m 1200, 25-28.VII.1969, leg. Peck S. & J., carrion baited trap, Sycamore forest (1 paratype, CNCI); **San Luis Potosí:** 20 Km W Xilitla, m 1600, 12.VI-06.VIII.1983, leg. Peck S. & J., FIT, cloud forest (2 paratypes, CNCI); **Tamaulipas:** nr. Gomez Farias, Rancho del Cielo, m 1000, 06.VI.-07.VIII.1983, leg. Peck S. & J., FIT, cloud forest (3 paratypes, DCGI, CNCI); Wet Cave, 06.II.1964, leg. Reddell, McKenzie & Manire (1 paratype, USNM); **Veracruz:** El Duraznal, m 1600, 15.VII.1994, leg. Arellano L. & Sanchez R., bosque encino, trampa copro vaca (1 paratype, DCGI).

**Distribution.** Mexico (Oaxaca, Puebla, San Luis Potosí, Tamaulipas, Veracruz).

**Etymology.** Named in honor of the Mexican scarabaeidologist Aristeo Cuauhtémoc Deloya, researcher at Instituto de Ecología in Xalapa (Veracruz).

**Bionomics.** Some of the specimens of the type series were collected in "salchicha de nidificación" of *Haplogeotrupes reddelli* (Howden).

***Gonaphodiopsis hypogea* new species**  
(Fig. 109-113)

**Type locality.** Salamander Cave, Gomes Farias, Rancho del Cielo, 3700', Tamaulipas, Mexico.

**Type repository.** Canadian Museum of Nature (Howden Collection), Ottawa, Canada.

**Description.** Length 5.0-5.5 mm; shortly oblong, strongly convex, shiny, glabrous. Dark chestnut brown to blackish; clypeal margin paler; legs more or less dark brown; antennal club testaceous. Head with epistome feebly gibbous medially, slightly depressed anteriorly, rather finely, not closely, evenly punctured; clypeus feebly sinuate at middle, round at sides, very finely bordered, edge glabrous; genae obtusely round, not ciliate, protruding from the eyes. Pronotum strongly convex, moderately transverse, dually punctured and with a transverse belt of large, deep and contiguous punctures crenulating a sort of thick edge close to basal margin; large, coarse punctured, six to seven times larger than small ones, irregularly, rather closely scattered on sides, lacking on disc; small, very fine punctures evenly sparse throughout; lateral margins almost parallel, inwardly sinuate before hind angles, rather thickly bordered, edge glabrous; hind angles broadly truncate; truncation distinctly inwardly sinuate; base feebly bisinuate. Scutellum elongate, flat, sparsely finely punctured. Elytra widened posteriorly, strongly convex, strongly denticulate at shoulder, deeply striate; striae rather fine, coarsely, not closely punctured, crenulate; interstriae convex on disc, subcariniform on preapical declivity, very finely, sparsely punctured. Hind tibiae upper spur shorter than first tarsal segment;

first tarsal segment distinctly longer than following three segments combined. Male: pronotum relatively less coarsely and less densely punctured; aedeagus Fig. 112-113. Female: pronotum relatively more coarsely and more densely punctured.

**Type material.** **MEXICO: San Luis Potosí:** Cuevas de los Caballos, entrance area, 30 Km E San Luis Potosí, Mpio. Zaragoza, m 3000, 18.V.1972, leg. McEachern M. (1 paratype, CMNO); **Tamaulipas:** Cueva de Rancho del Cielo, 06-07.II.1964, leg. Reddell J., McKenzie D. & Maniré L. D. (1 paratype, CMNO); Rancho del Cielo, Gomez Farias, Salamander Cave, 3700', 01-04.VII.1969, leg. Peck S. & J. (male holotype, allotype, CNCI; 6 paratypes, CMNO, DCGI); **Veracruz:** Cueva de Nacimiento Grande, fisch bld., 22.VIII.1965, leg. Reddell J. (2 paratypes, CMNO, DCGI).

**Distribution.** Mexico (San Luis Potosí, Tamaulipas, Veracruz).

**Etymology.** Named after the Latin word *hypogeus* [= hypogeal].

**Bionomics.** Almost unknown. The specimens of the type series were collected in late winter, spring and summer in caves.

***Gonaphodiopsis montesdeocai* new species**

(Fig. 114-119)

**Type locality.** Xuatusco env., Parada der los Pinos, Veracruz, Mexico.

**Type repository.** Dellacasa Collection, Genoa, Italy.

**Description.** Length 3.5-4.5 mm; shortly oblong, strongly convex, shiny, glabrous. Chestnut brown; pronotum usually darker, elytra shadowy paler basally and apically; legs chestnut brown; antennal club piceous. Head with epistome feebly convex, slightly depressed antero-medially, coarsely, densely, somewhat irregularly punctured throughout; clypeus moderately sinuate at middle, round at sides, finely bordered, edge faintly reflexed, very shortly, sparsely bristled; genae obtusely round, nearly imperceptibly bristled, almost not protruding from the eyes; frontal suture finely impressed, not tuberculate; front coarsely, densely, evenly punctured. Pronotum moderately transverse, convex, dually punctured; large coarse punctures, four to five times larger than small ones, much denser on sides, sparser and fewer on disc; small, very fine punctures evenly sparse throughout; lateral margins nearly straight, rather finely bordered, edge glabrous; hind angles distinctly truncate, truncation very feebly sinuate inwardly; base feebly bisinuate. Scutellum narrowly elongate, somewhat depressed laterally, sparsely finely punctured on basal half. Elytra broadened posteriorly, convex, denticulate at shoulder, deeply striate; striae coarsely, not closely punctured, crenulate; interstriae moderately convex on disc, subcariniform on preapical declivity, near imperceptibly punctured. Hind tibiae upper spur shorter than first tarsal segment; first tarsal segment longer than following three segments combined. Male: pronotum relatively a little more transverse, less convex and more sparsely punctured; fore tibiae spur somewhat stouter and shorter; aedeagus Fig. 118-119. Female: pronotum relatively less transverse, more convex and more densely punctured; fore tibiae spur somewhat slender and almost straight.

**Type material.** **MEXICO: Veracruz:** Xico, Camino a Ixtlapa, 19°25'10"N–97°02'09"W, m 1330, VI.2000, leg. Montes-de-Oca E. & Santiago Q., pastizal para ganado, trampa excr. vaca (5 paratypes, DCGI, MDOX); *idem*, 19°25'22"N–97°02'08"W, m 1390, XII.1999-I.2000, leg. Montes-de-Oca E. & Santiago Q., pastizal para ganado, trampa excr. vaca (3 paratypes, MDOX); Xico, 19°25'10"N–97°02'09"W, leg. Montes-de-Oca E. & Santiago Q., (2 paratypes, MDOX); Xico, Rancho Pextlán, 19°25'28"N–97°01'43"W, m 1465, 08.VI.2005, leg. Martínez I., Cruz M. & Suarez T. (1 paratype, DCGI); Xuatusco env., Parada der los Pinos, 08.XI.1999, leg. Dellacasa M. (male holotype, and allotype, DCGI).

**Distribution.** Mexico (Veracruz).

**Etymology.** Named in honor of Enrique Montes de Oca, Mexican biologist.

**Bionomics.** Almost unknown. The specimens of the type series were collected in June, November and December, most of them with pitfall traps baited with cow dung.

***Gonaphodiopsis pachecoi* new species**

(Fig. 120-124)

**Type locality.** Rancho Nuevo, San Cristobal de las Casas, 16°40'14.9"N–092°35'03.7"W, m 2100, Chiapas, Mexico.

**Type repository.** Dellacasa Collection, Genoa, Italy.

**Description.** Length 5.0-5.5 mm; shortly oblong, strongly convex, shiny, glabrous. Blackish, clypeal margin and elytral suture shadowy reddish; legs dark brown; antennal club piceous. Head with epistome feebly convex medially, somewhat depressed anteriorly, rather finely, evenly not closely punctured, punctation denser and coarser distally, sparser and finer medially; clypeus feebly sinuate at middle, round at sides, rather thickly bordered, edge slightly reflexed, glabrous; genae obtusely round, not ciliate, feebly protruding from the eyes; frontal suture almost obsolete, not tuberculate; front rather finely evenly punctured. Pronotum moderately transverse, convex, dually punctured; larger, moderately coarse punctures, five to six times larger than small ones, irregularly and rather sparsely scattered on sides, broadly lacking on disc; small, extremely fine punctures evenly scattered throughout, nearly imperceptible on disc; lateral margin almost straight, finely bordered, edge glabrous; hind angles broadly truncate, truncation not inwardly sinuate; base feebly bisinuate. Scutellum elongate, somewhat depressed laterally, very finely, sparsely punctured toward base. Elytra amygdaliform, strongly convex, moderately denticulate at shoulder, rather finely striate; striae superficially, not closely punctured, feebly crenulate; interstriae flat on disc, moderately convex on preapical declivity, almost imperceptibly punctured. Hind tibiae upper spur shorter than first tarsal segment; first tarsal segment longer than following three segments combined. Male: head and pronotum relatively more transverse, less convex and less densely punctured; fore tibiae spur shorter and stouter; aedeagus Fig. 123-124. Female: head and pronotum relatively less transverse, more convex and more densely punctured; fore tibiae spur longer and slender.

**Type material. MEXICO: Chiapas:** San Cristobal de las Casas, Rancho Nuevo, 16°40'14.9"N–92°35'03.7"W, m 2100, 29.VI.2003, leg. Pacheco C. (male holotype, and allotype, DCGI).

**Distribution.** Known from the type locality only.

**Etymology.** Named in honor of Cutberto Pacheco, Mexican scarabaeidologist.

**Bionomics.** Almost unknown. The specimens of the type series were collected in June.

***Gonaphodiopsis teopiscaensis* new species**

(Fig. 125-129)

**Type locality.** 4 mi NW Teopisca, 6500', Chiapas, Mexico.

**Type repository.** Canadian Museum of Nature (Howden Collection), Ottawa, Canada.

**Description.** Length 4.5-5.0 mm; shortly oblong, strongly convex, shiny, glabrous. Reddish brown, pronotum and elytral disc shadowy darker; legs reddish brown; antennal club testaceous. Head with epistome feebly gibbous medially, rather coarsely, somewhat irregularly punctured; clypeus faintly sinuate at middle, round at sides, rather thickly bordered, edge slightly reflexed, nearly imperceptibly bristled; genae broadly round, not ciliate, not protruding from the eyes; frontal suture almost obsolete; front not closely, evenly punctured. Pronotum moderately transverse, convex, dually punctured; large punctures, seven to eight times larger than small ones, coarser and denser on sides; small fine punctures evenly scattered throughout, somewhat superficial on disc; lateral margins feebly arcuate, finely bordered, edge glabrous; hind angles broadly truncate, truncation slightly sinuate inwardly; base faintly bisinuate. Scutellum elongate, flat, sparsely punctured on basal half. Elytra strongly convex, broadened posteriorly, moderately denticulate at shoulder, rather deeply striate; striae fine, coarsely, not closely punctured, crenulate; interstriae convex on disc, subcariniform on preapical declivity, sparsely finely punctured. Hind tibiae upper spur shorter than first tarsal segment; first tarsal segment longer than following three segments combined. Male: pronotum relatively more transverse, less convex and less densely punctured; fore tibiae spur shorter and stouter; aedeagus Fig. 128-129. Female: pronotum relatively less transverse, more convex and more densely punctured; fore tibiae spur longer and slender.

**Type material.** **GUATEMALA:** Quezaltan, 14 Km SW Zunil, m 1340, 20.VI.1993, leg. Génier F., human feces (18 paratypes, CMNO, DCGI). **MEXICO: Chiapas:** 4 mi. NW Teopisca, 6500', 24.VIII.1971, leg. Newton A. (male holotype, and 1 paratype, CMNO; allotype, DCGI; 13 paratypes, CMNO, DCGI); 10 mi. N Bochil, 04.V.1969, leg. Howden H. (1 paratype, CMNO); 6.6 mi. W El Bosque, 4800', 25-29.VIII.1973, leg. Newton A., cloud forest (2 paratypes, CMNO, DCGI); Yerbabuena Reserva, 1750 m, oak pine forest litter, 19.IX.1991, leg. Anderson R. (2 paratypes, CMNO, DCGI).

**Distribution.** Guatemala, Mexico (Chiapas).

**Etymology.** Named after the type locality.

**Bionomics.** Almost unknown; the specimens of the type series were collected in May, June and August.

## Catalogue

### *Gonaphodiellus* Schmidt, 1913

*Gonaphodiellus arcanus* **new species**, Guatemala, Mexico (Chiapas).

*Gonaphodiellus bimaculosus* (Schmidt, 1909: 19) [*Aphodius*], El Salvador, Mexico (Hidalgo, Jalisco, Oaxaca, Puebla, Queretaro, Veracruz).

= *Aphodius* (*Gonaphodiellus*) *xalapensis* Galante, Stebnicka and Verdú, 2003: 304, **new synonymy**.

*Gonaphodiellus cerropuntanus* **new species**, Costa Rica, Panama.

*Gonaphodiellus hoffmanni* (Islas, 1955: 451) [*Aphodius*], Guatemala, Mexico (Chiapas).

*Gonaphodiellus manantlanicus* **new species**, Mexico (Jalisco).

*Gonaphodiellus martinpierai* **new species**, Mexico (Veracruz).

*Gonaphodiellus nigrinus* (Schmidt, 1916: 115) [*Aphodius*], **new status** and **new combination**, Ecuador, Peru.

*Gonaphodiellus omiltemicus* **new species**, Mexico (Guerrero).

*Gonaphodiellus opisthius* (Bates, 1887: 12) [*Aphodius*], Guatemala, Mexico.

*Gonaphodiellus pacatus* (Harold, 1880: 37) [*Aphodius*], Colombia, Costa Rica, Panama.

*Gonaphodiellus sacatepequezis* **new species**, Guatemala.

*Gonaphodiellus sexguttatus* (Schmidt, 1916: 114) [*Aphodius*], Colombia, Costa Rica, El Salvador, Honduras, Mexico (Chiapas), Panama.

***Gonaphodioides* new genus**

*Gonaphodioides acutecernans* (Balthasar, 1960: 57) [*Aphodius*], **new combination**, Bolivia, Colombia.

*Gonaphodioides chapini* (Hinton, 1934: 189) [*Aphodius*], **new combination**, Brazil, Costa Rica, Ecuador, Mexico (Oaxaca), Panama, Peru, Venezuela.

= *Aphodius ataenioides* Hinton, 1938: 123, **new synonymy** (from type).

= *Aphodius* (*Blackburneus*) *castanescens* Petrovitz, 1973: 145, **new synonymy** (from type).

*Gonaphodioides columbicus* (Harold, 1880: 36) [*Aphodius*], **new combination**, Colombia, Venezuela.

*Gonaphodioides newtoni* **new species**, Mexico (Hidalgo, Puebla, San Luis Potosí).

*Gonaphodioides ratcliffi* **new species**, Mexico (Oaxaca).

*Gonaphodioides sincerus* (Petrovitz, 1973: 142) [*Aphodius*], **new combination**, Bolivia, Brazil, Paraguay.

*Gonaphodioides skellei* **new species**, Mexico (Chiapas).

***Gonaphodiopsis* new genus**

*Gonaphodiopsis deloyai* **new species**, Mexico (Oaxaca, Puebla, San Luis Potosí, Tamaulipas, Veracruz).

*Gonaphodiopsis hypogea* **new species**, Mexico (San Luis Potosí, Tamaulipas, Veracruz).

*Gonaphodiopsis montesdeocai* **new species**, Mexico (Veracruz).

*Gonaphodiopsis pachecoi* **new species**, Mexico (Chiapas).

*Gonaphodiopsis teopiscaensis* **new species**, Guatemala, Mexico (Chiapas).

**Acknowledgments**

Thanks are due to C. B. Barr (Berkeley), L. Bartolozzi (Florence), C. Bellamy (Sacramento), A. Bellman (Bremen), P. Bouchard (Ottawa), G. Cuccodoro (Geneva), J. Ferrer (Stockholm), J. Hájek (Praha), L. H. Herman (New York), M. A. Hielkema (Gouda), H. Howden (Ottawa), J. Jelínek (Praha), O. Montreuil (Paris), Z. Stebnicka (Krakow), R. Turnbow (Enterprise) for loan of material and support; and to P. Bordat (Saint-Cirq), T. Branco (Porto), and P. E. Skelley (Gainesville) for loan of material and for critical reviews of the manuscript.

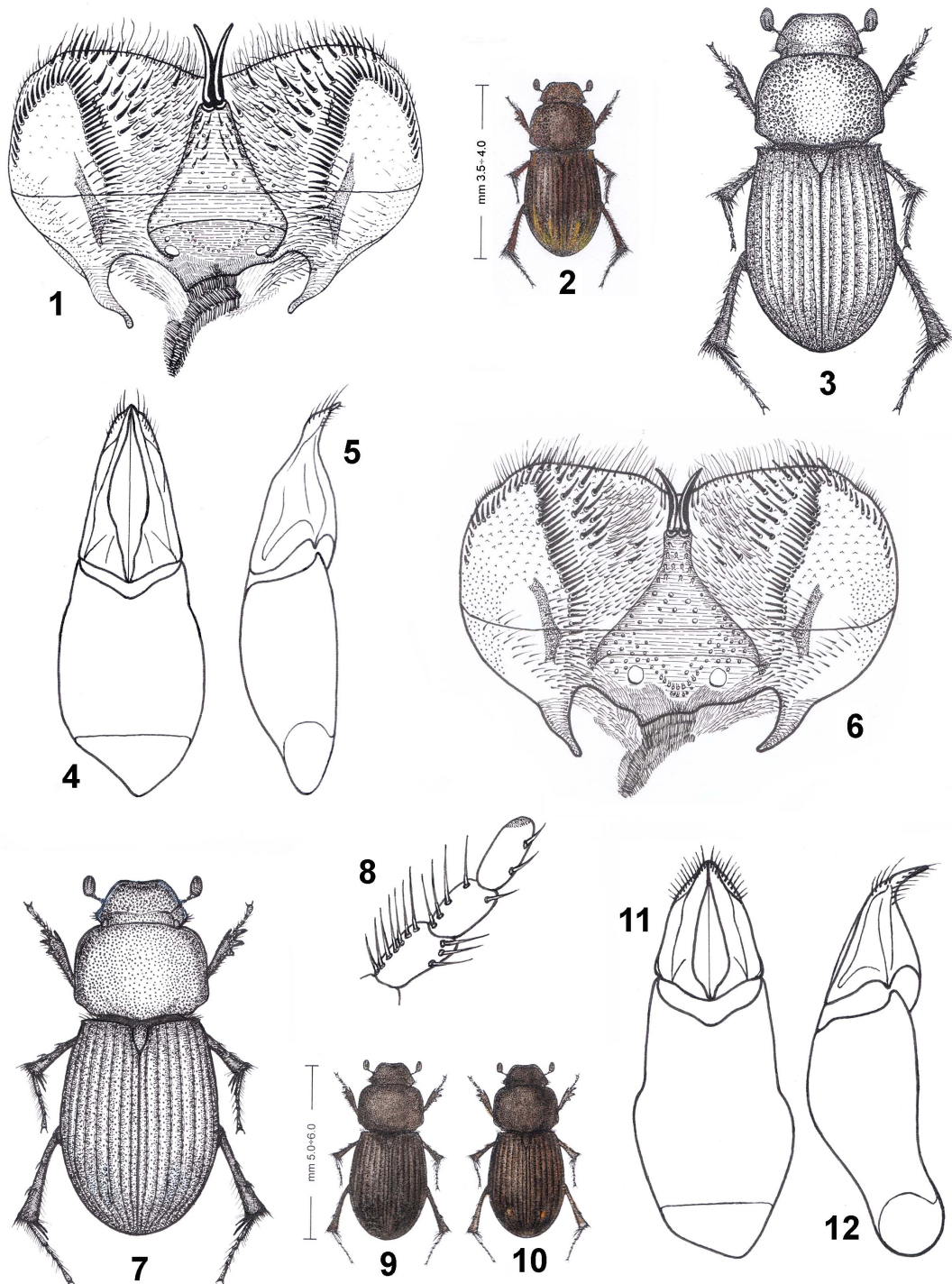
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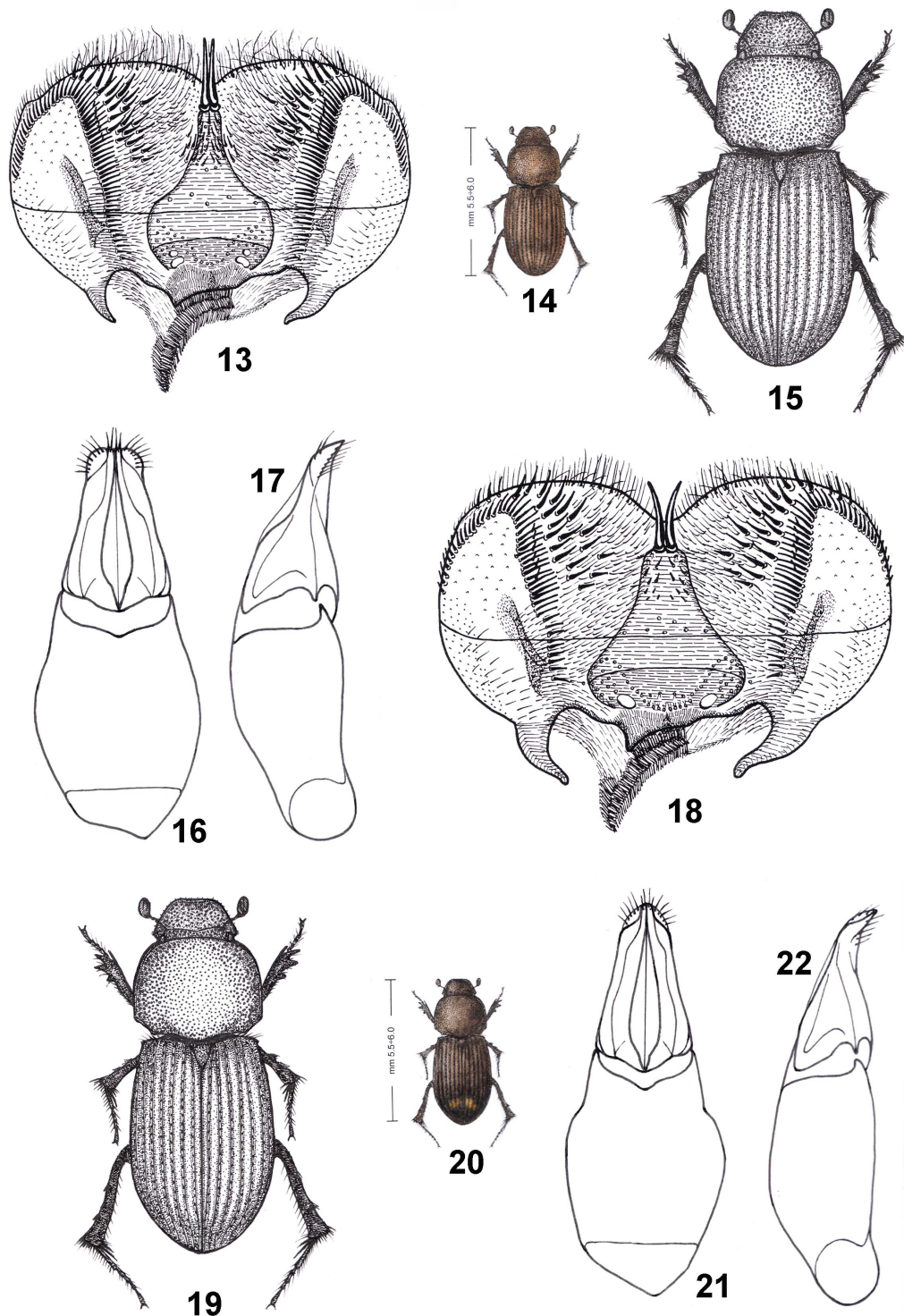


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**Received February 14, 2012; Accepted March 21, 2012.**

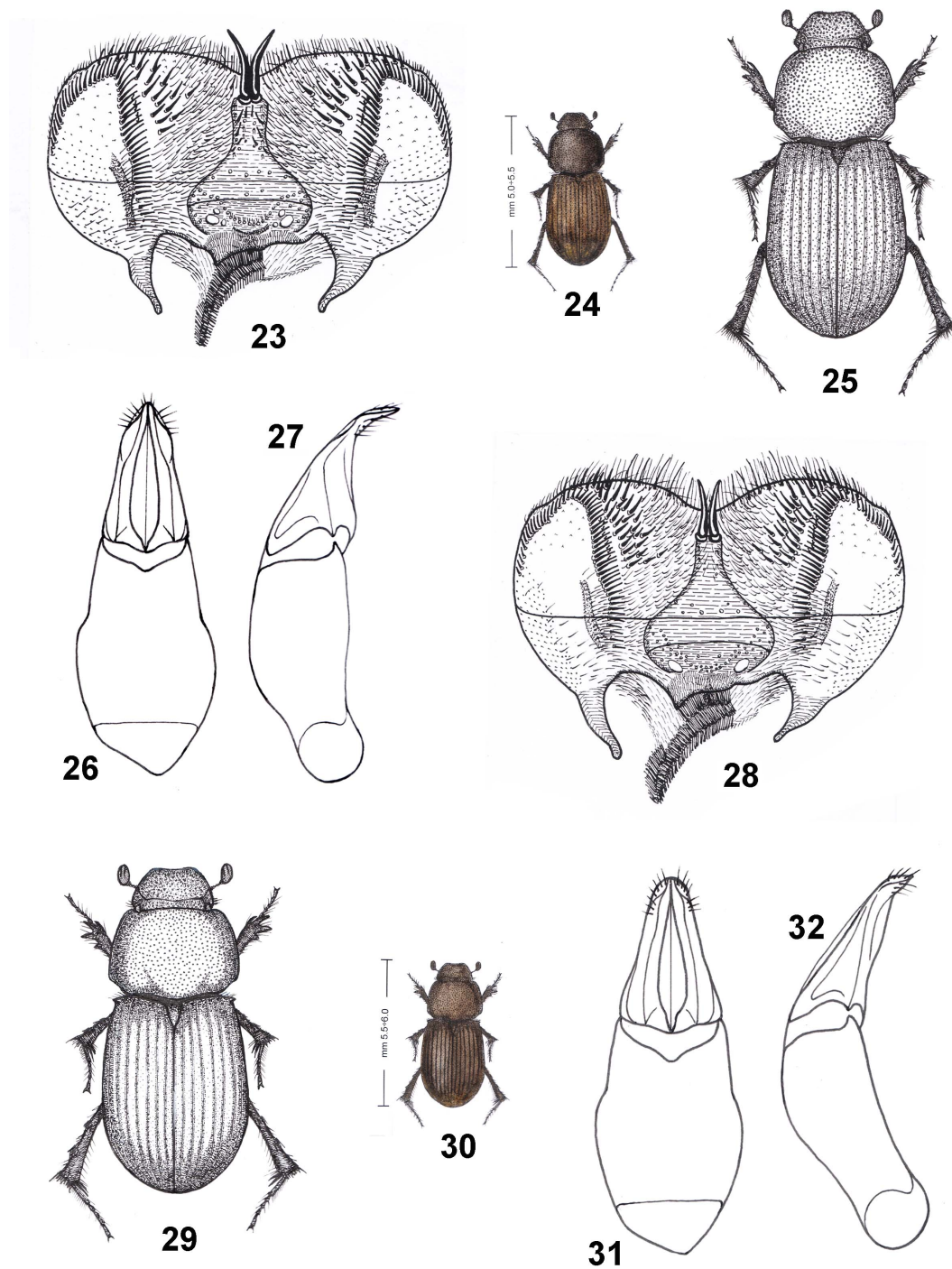


**Figure 1-12.** *Gonaphodiellus arcanus*, new species (Chiquihuite env., Chiapas, Mexico). 1) Epipharynx. 2-3) Habitus (length ideogram and morphological details). 4-5) Aedeagus (dorsal and lateral view). *Gonaphodiellus bimaculosus* (Schmidt, 1909) (6 mi. W Teziutlan, Puebla, Mexico). 6) Epipharynx. 7-10) Habitus (morphological details, right labial palp in dorsal view and length ideogram with color variations). 11-12) Aedeagus (dorsal and lateral view).

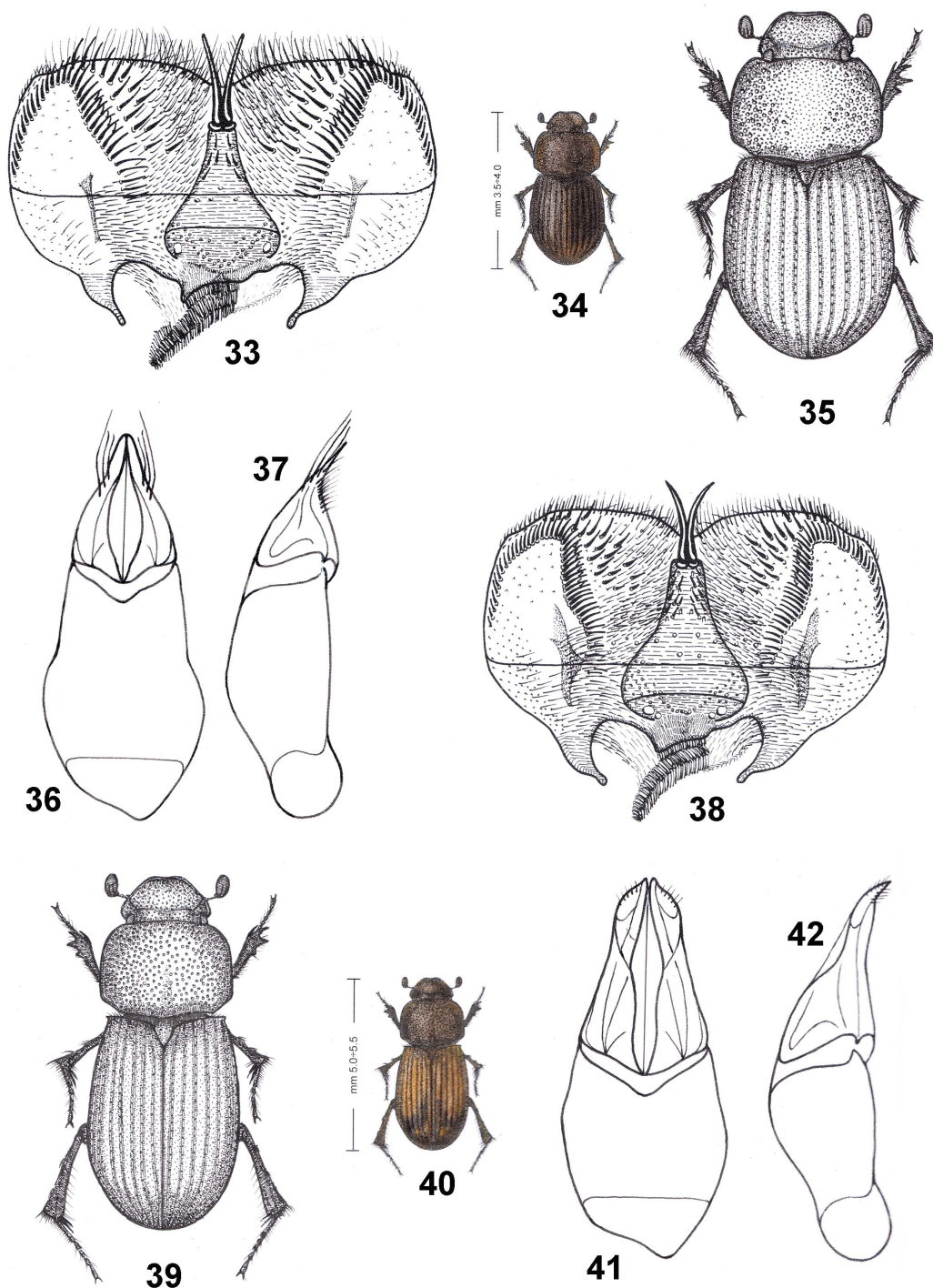


**Figure 13-22.** *Gonaphodiellus cerropuntanus*, new species (2-3 Km E Cerro Punta, Chiriqui Prov., Panama). **13)** Epipharynx. **14-15)** Habitus (length ideogram and morphological details). **16-17)** Aedeagus (dorsal and lateral view). *Gonaphodiellus hoffmanni* (Islas, 1955) (Reserva El Triunfo, Mpio. Angel Albino Corzo, Chiapas, Mexico) **18)** Epipharynx. **19-20)** Habitus (morphological details and length ideogram). **21-22)** Aedeagus (dorsal and lateral view).



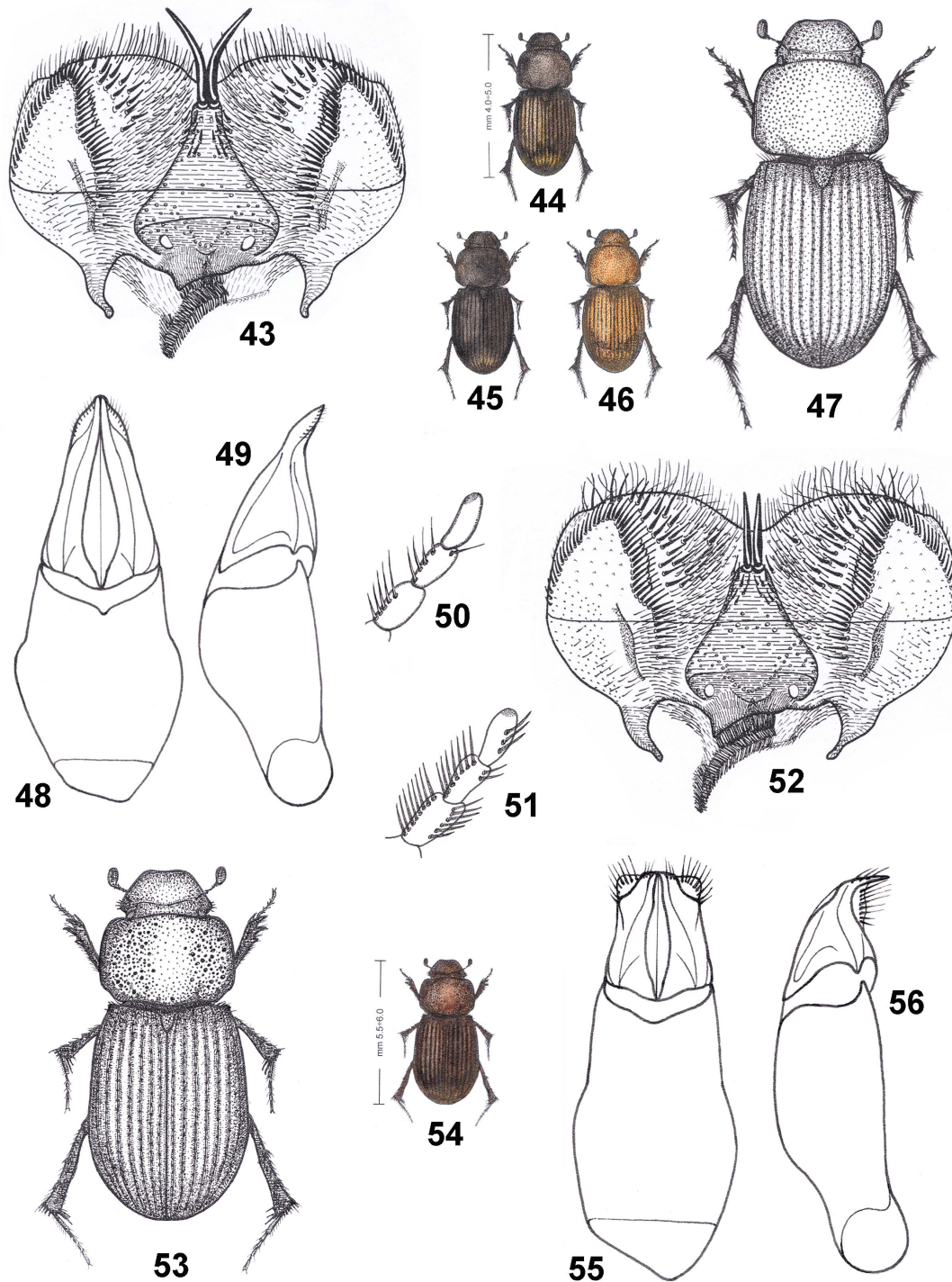


**Figure 23-32.** *Gonaphodiellus manantlanicus*, new species (Las Joyas, Sierra de Manantlán, Jalisco, Mexico). **23)** Epipharynx. **24-25)** Habitus (length ideogram and morphological details). **26-27)** Aedeagus (dorsal and lateral view). *Gonaphodiellus martinpierai*, new species (Acajete, Veracruz, Mexico). **28)** Epipharynx. **29-30)** Habitus (morphological details and length ideogram). **31-32)** Aedeagus (dorsal and lateral view).

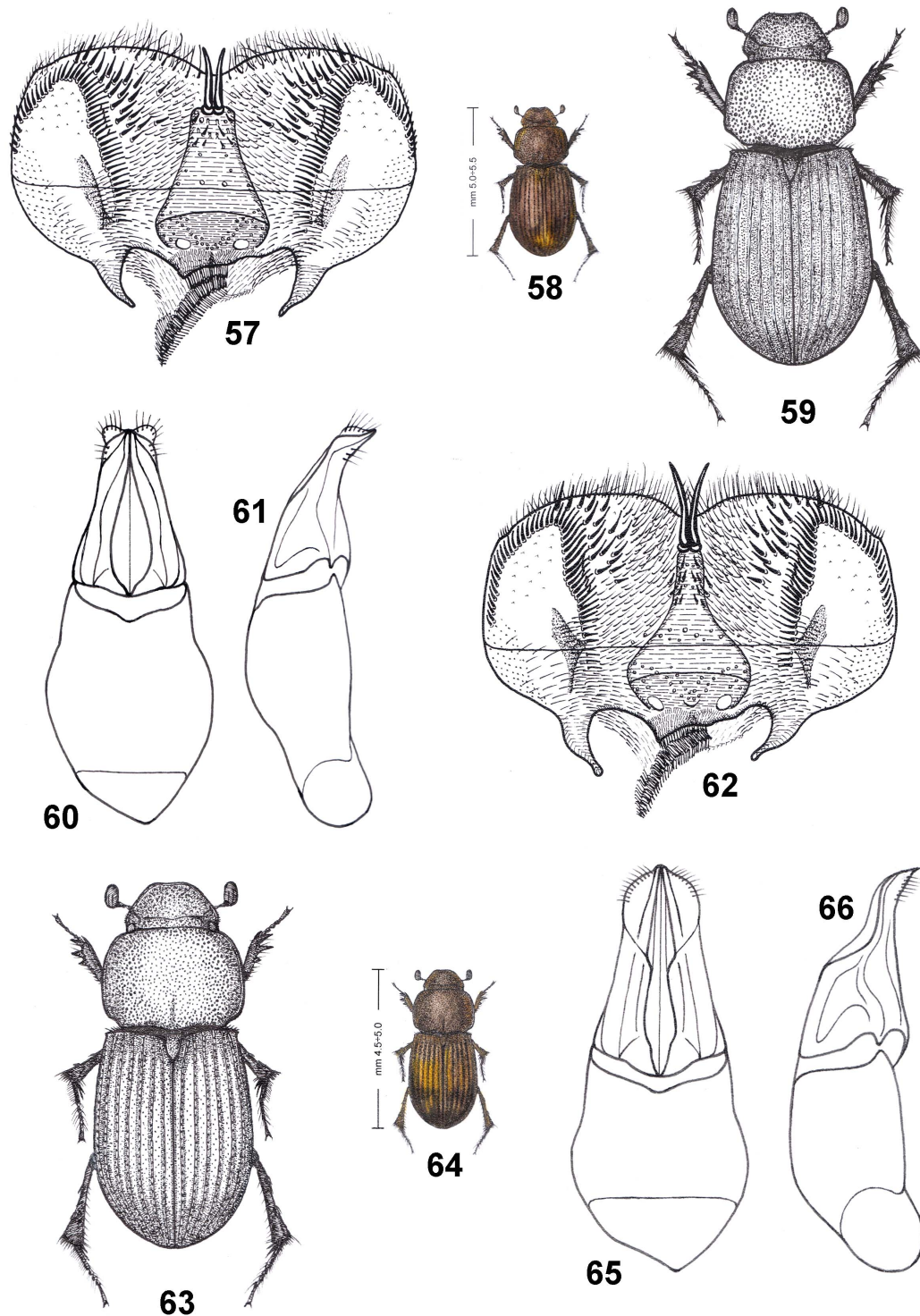


**Figure 33-42.** *Gonaphodiellus nigrinus* (Schmidt, 1916) (Yasuni National Park, Napo Prov., Ecuador). **33)** Epipharynx. **34-35)** Habitus (length ideogram and morphological details). **36-37)** Aedeagus (dorsal and lateral view). *Gonaphodiellus omiltemicus*, new species (Omiltemi, Guerrero, Mexico). **38)** Epipharynx. **39-40)** Habitus (morphological details and length ideogram). **41-42)** Aedeagus (dorsal and lateral view).



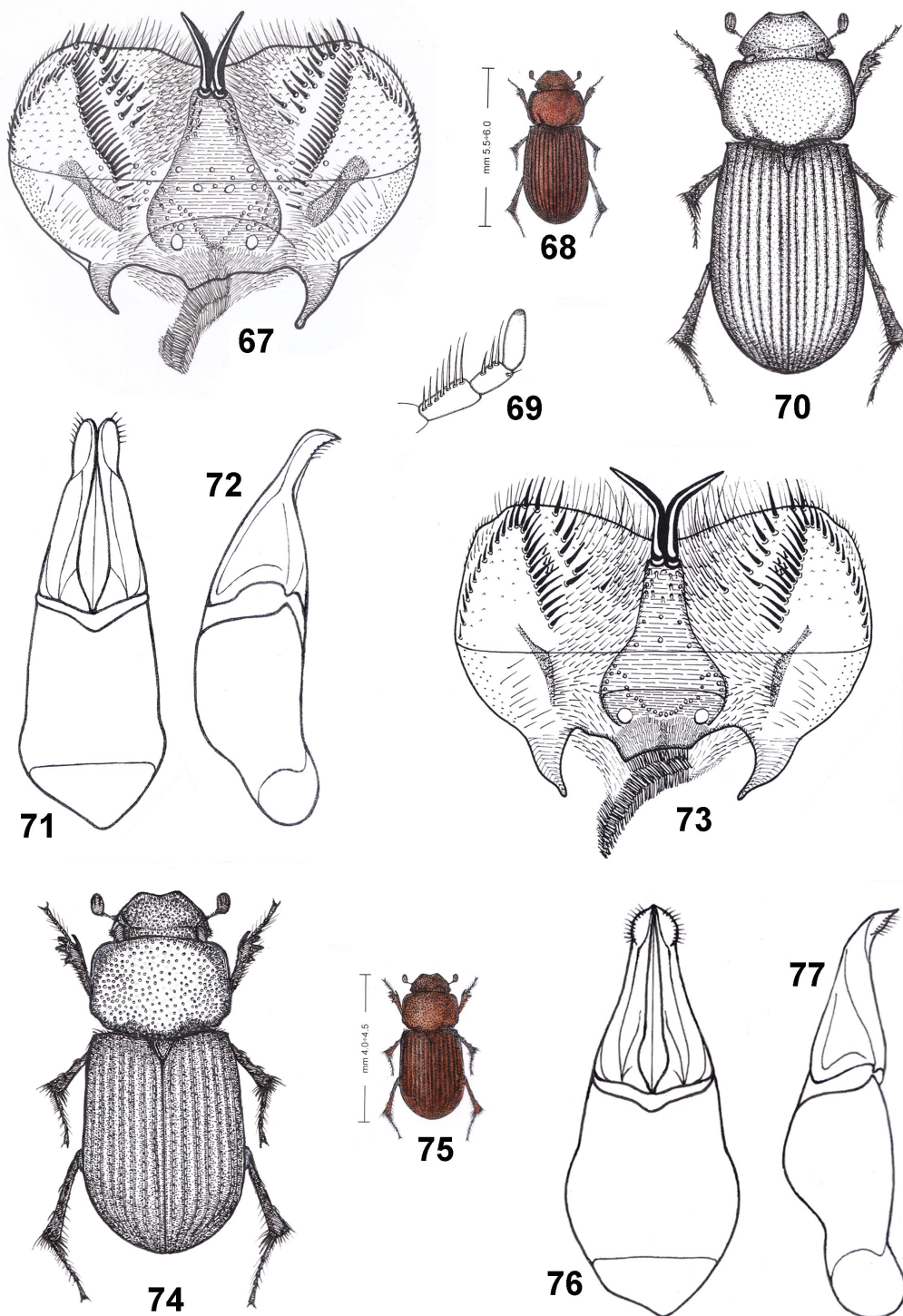


**Figure 43-56.** *Gonaphodiellus opisthius* (Bates, 1887) (Zacualtipan, Hidalgo, Mexico). **43)** Epipharynx. **44-47)** Habitus (length ideogram, color variations and morphological details). **48-49)** Aedeagus (dorsal and lateral view). **50)** Right labial palp (dorsal view). *Gonaphodiellus pacatus* (Harold, 1880) (Tolima, Rovira, Colombia). **51)** Labial palp. **52)** Epipharynx. **53-54)** Habitus (morphological details and length ideogram). **55-56)** Aedeagus (dorsal and lateral view).



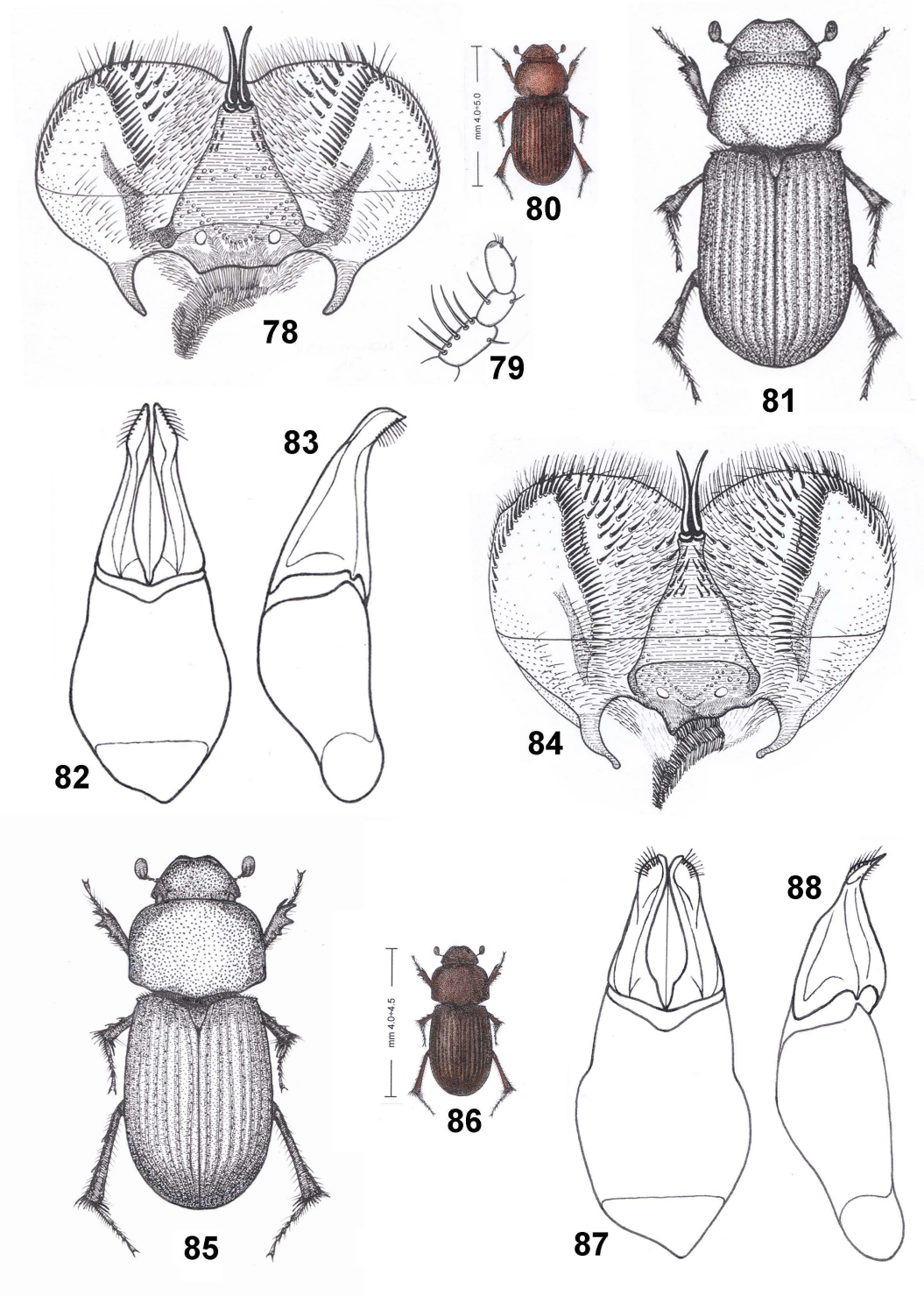
**Figure 57-66.** *Gonaphodiellus sacatepequezis*, new species (Cerro Alux, Sacatepéquez, Guatemala). **57)** Epipharynx. **58-59)** Habitus (length ideogram and morphological details). **60-61)** Aedeagus (dorsal and lateral view). *Gonaphodiellus sexguttatus* (Schmidt, 1916) (Monteverde, Puntarenas, Costa Rica). **62)** Epipharynx. **63-64)** Habitus (morphological details and length ideogram). **65-66)** Aedeagus (dorsal and lateral view).



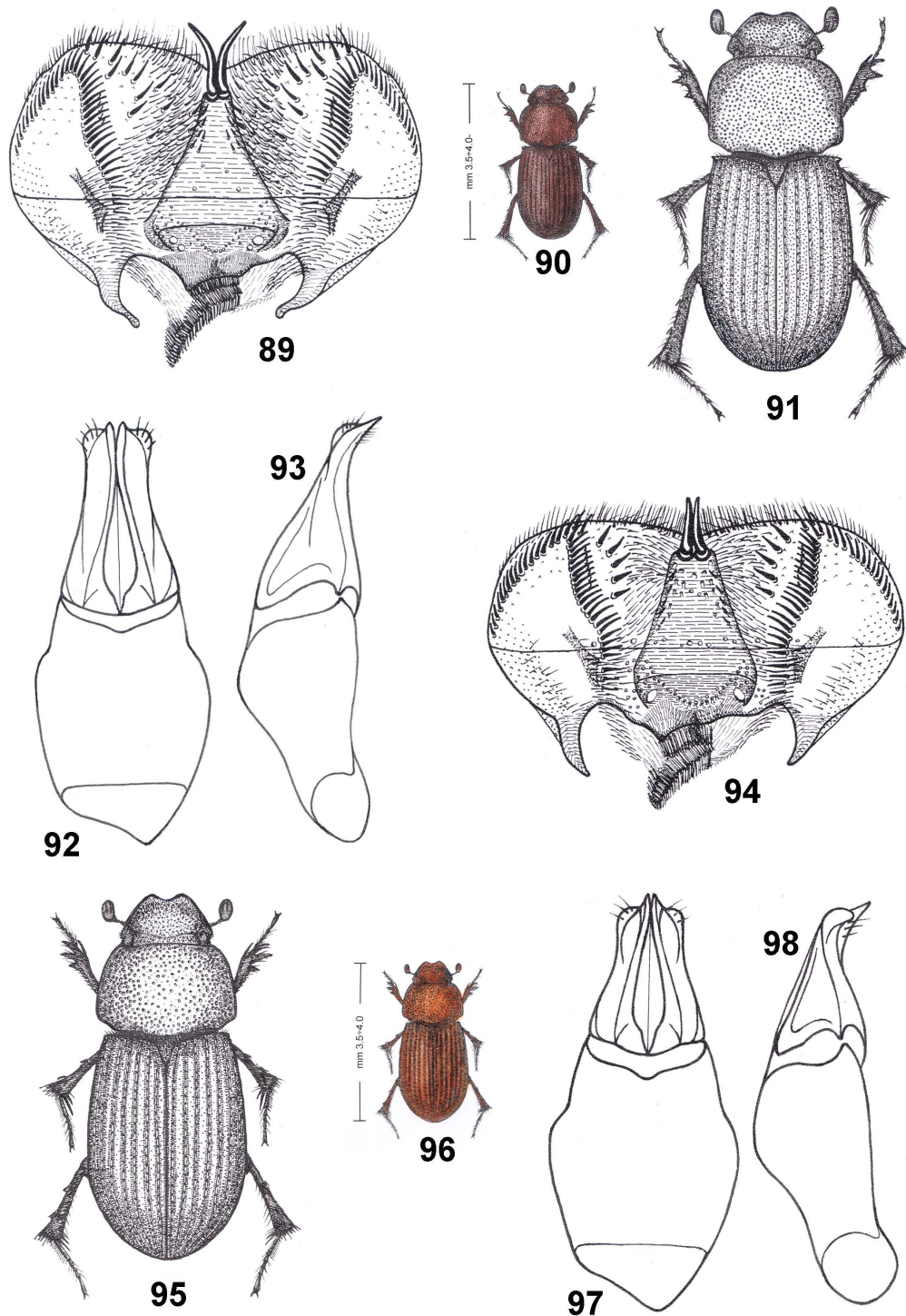


**Figure 67-77.** *Gonaphodioides acutecernans* (Balthasar, 1960) (Cochabamba Prov., Bolivia). **67)** Epipharynx. **68, 70)** Habitus (length ideogram and morphological details). **69)** Right labial palp (dorsal view). **71-72)** Aedeagus (dorsal and lateral view). *Gonaphodioides chapini* (Hinton, 1934) (2 Km N Sta. Clara, W Hartmann's Finca, Chiriqui Prov., Panama). **73)** Epipharynx. **74-75)** Habitus (morphological details and length ideogram). **76-77)** Aedeagus (dorsal and lateral view).



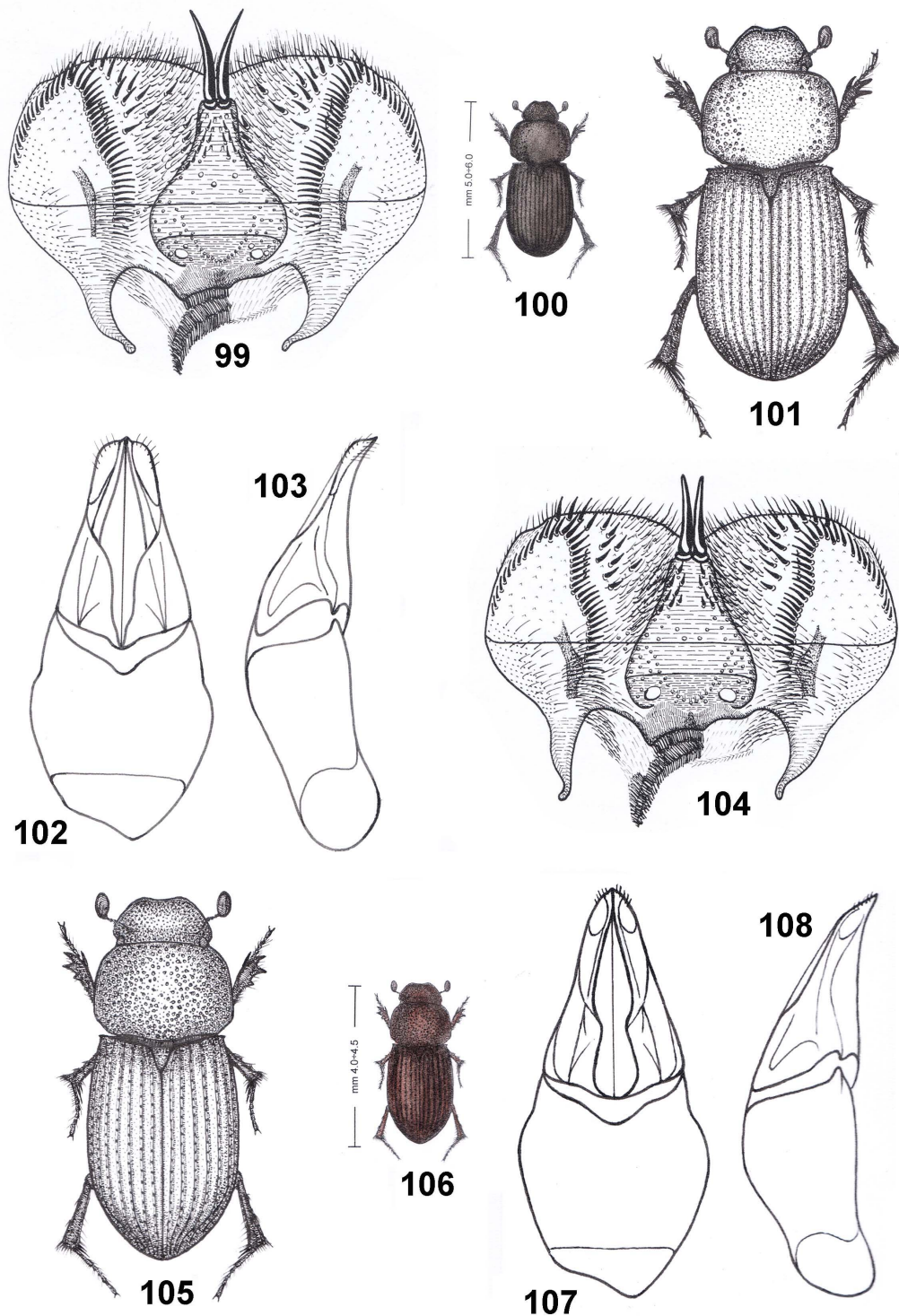


**Figure 78-88.** *Gonaphodioides columbicus* (Harold, 1880) (Oberhalb Bogotá, Colombia). **78)** Epipharynx. **79)** Right labial palp (dorsal view). **80-81)** Habitus (morphological details and length ideogram). **82-83)** Aedeagus (dorsal and lateral view). *Gonaphodioides newtoni*, new species (3 mi. N Tlanchinol, Hidalgo, Mexico). **84)** Epipharynx. **85-86)** Habitus (morphological details and length ideogram). **87-88)** Aedeagus (dorsal and lateral view).

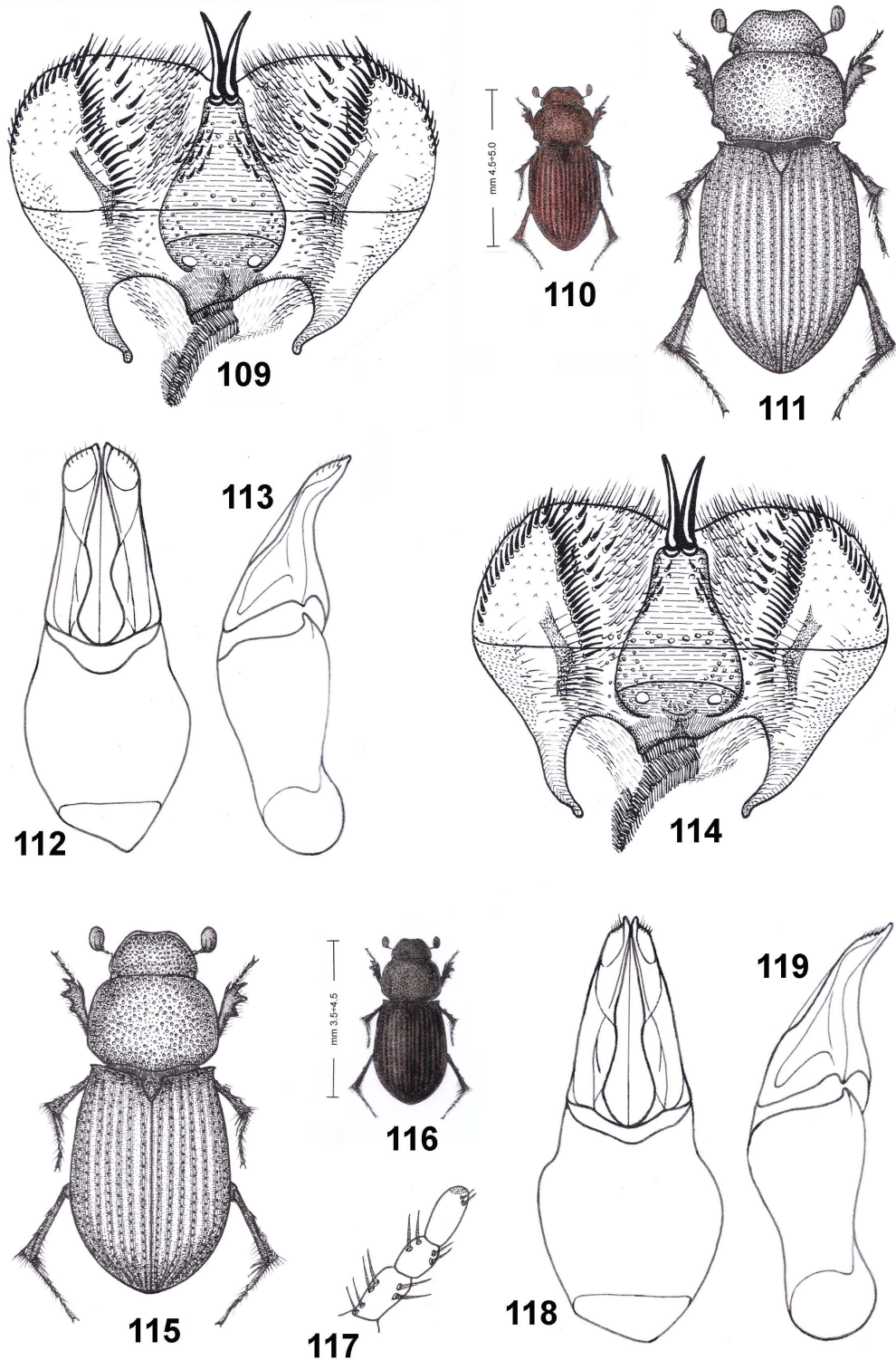


**Figure 89-98.** *Gonaphodioides ratcliffi*, new species (20 mi. S Juchatango, Oaxaca, Mexico). **89)** Epipharynx. **90-91)** Habitus (length ideogram and morphological details). **92-93)** Aedeagus (dorsal and lateral view). *Gonaphodioides sincerus* (Petrovitz, 1973) (Viçosa, Minas Gerais, Brazil). **94)** Epipharynx. **95-96)** Habitus (morphological details and length ideogram). **97-98)** Aedeagus (dorsal and lateral view).



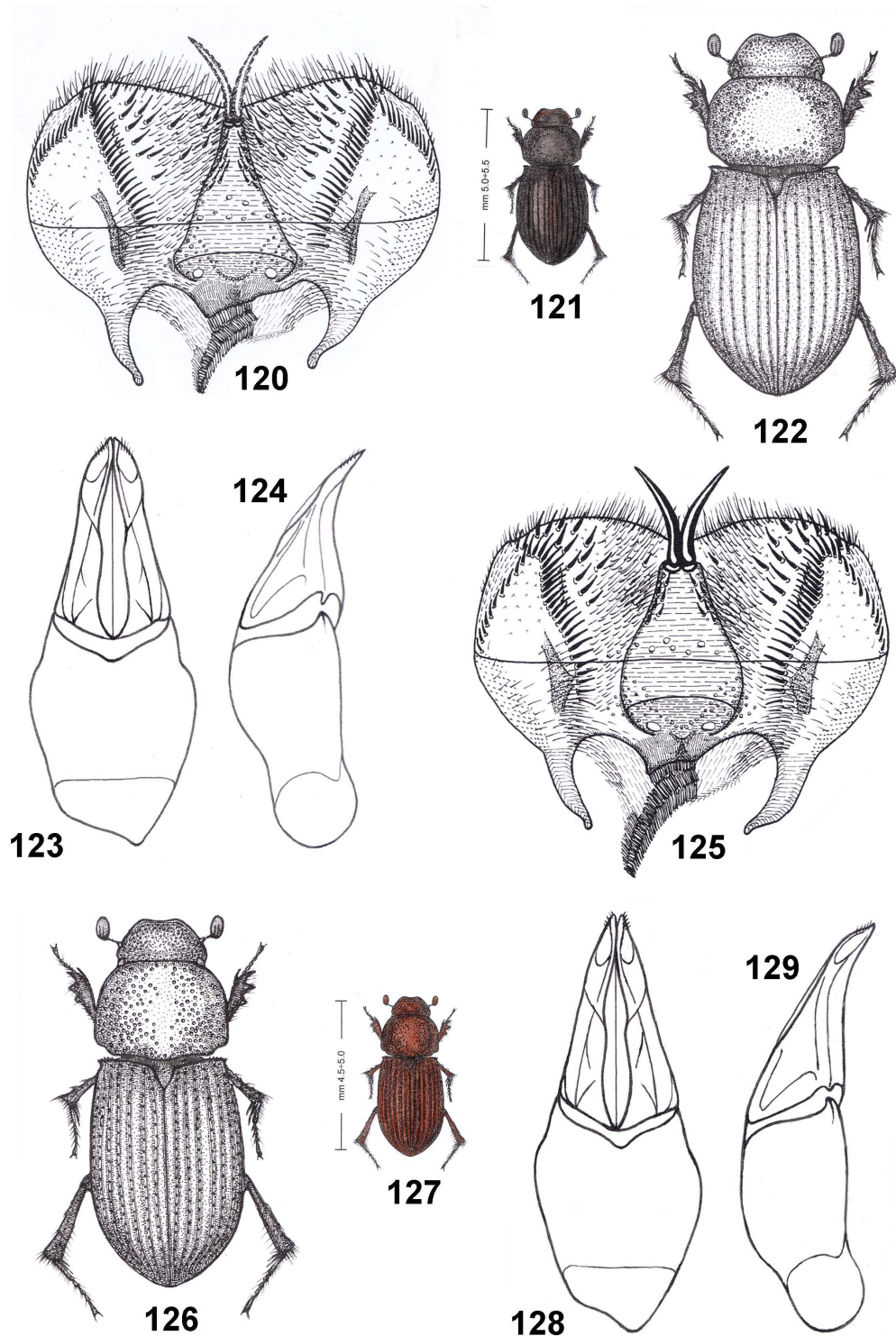


**Figure 99-108.** *Gonaphodioides skelleyi*, new species (San Juan Chamula env., Chiapas, Mexico). **99)** Epipharynx. **100-101)** Habitus (morphological details and length ideogram). **102-103)** Aedeagus (dorsal and lateral view). *Gonaphodiopsis deloyai*, new species (Cueva de Tasalolpan, Cuetzalan del Progreso, Puebla, Mexico). **104)** Epipharynx. **105-106)** Habitus (morphological details and length ideogram). **107-108)** Aedeagus (dorsal and lateral view).



**Figure 109-119.** *Gonaphodiopsis hypogea*, new species (Salamander Cave, Rancho del Cielo, Gomes Farias, Tamaulipas, Mexico). 109) Epipharynx. 110-111) Habitus (length ideogram and morphological details). 112-113) Aedeagus (dorsal and lateral view). *Gonaphodiopsis montesdeocai*, new species (Xuatusco env., Parada de los Pinos, Veracruz, Mexico). 114) Epipharynx. 115-116) Habitus (morphological details and length ideogram). 117) Right labial palp (dorsal view). 118-119) Aedeagus (dorsal and lateral view).





**Figure 120-129.** *Gonaphodiopsis pachecoi*, new species (Rancho Nuevo, San Cristobal de las Casas, Chiapas, Mexico). **120)** Epipharynx. **121-122)** Habitus (morphological details and length ideogram). **123-124)** Aedeagus (dorsal and lateral view). *Gonaphodiopsis teopiscaensis*, new species (4 mi. NW Teopisca, Chiapas, Mexico). **125)** Epipharynx. **126-127)** Habitus (morphological details and length ideogram). **128-129)** Aedeagus (dorsal and lateral view).



