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# Classification, Natural History, and Evolution of the Subfamily Peloniinae OPITZ (Coleoptera: *Cleroidea*: Cleridae). Part IX. Taxonomic revision of the New World genus *Muisca* SPINOLA

Weston OPITZ

A b s t r a c t : The genus *Muisca* is comprised of 34 known species. There are 15 new species described herein; they are: *M. adamanta*, *M. agma*, *M. anachyma*, *M. biordinis*, *M. dozieri*, *M. heppneri*, *M. hexa*, *M. malakela*, *M. magdalena*, *M. menda*, *M. mestolinea*, *M. omma*, *M. signa*, *M. sigilla*, and *M. zona*. The previously described species are: *M. angulicollis* (CHEVROLAT), *M. apicalis* (SPINOLA), *M. bitaeniata* SPINOLA, *M. dilatata* (CHEVROLAT), *M. fera* (WOLCOTT), *M. hirtula* (KLUG), *M. insigna* (CHEVROLAT), *M. irrorata* (GORHAM), *M. lateripuntata* (SCHENKLING), *M. maculosa* (GORHAM), *M. nigrosignata* (SPINOLA), *M. octonotata* (GORHAM), *M. peruviana* (PIC), *M. scutellata* (SPINOLA), *M. testacea* (KLUG), *M. tetraspilota* (CHEVROLAT), *M. togata* (CHEVROLAT), *M. variabilis* (SPINOLA), and *M. xanthura* (CHEVROLAT). Lectotypes have been designated for all previously described species except *M. bitaeniata* SPINOLA, *M. fera* (WOLCOTT), and *M. hirtula* (KLUG). *Pelonium quadrifoveolatum* SCHENKLING is synonymized with *M. insigna* (CHEVROLAT) and *Pelonium ampliatum* CHEVROLAT with *M. bitaeniata* SPINOLA. *Cregya cylindricollis* PERACCHI is synonymized with *Muisca togata* (CHEVROLAT). Morphological evidence suggests that *Muisca* beetles are involved in a predatory life style. Distributional evidence invites the speculation that ancestral *Muisca* inhabited the forested environs of South America. A computer generated phylogeny points to eleven lines of evolution in *Muisca*, which correspond to the 11 species groups in the genus. This treatise includes Spanish and German translations of the abstract, brief discussion of natural history, key to *Muisca* species, treatise of intrageneric phylogeny, 78 line drawings, 12 electron micrographs, 5 distributional maps, 27 photographs of aedeagi, and 33 habitus photographs.

K e y w o r d s : Coleoptera, Peloniinae, *Muisca*, checkered beetles, natural history, taxonomy, evolution.

## Introduction

This contribution continues the objective of making known the species and generic taxa of the checkered beetle subfamily Enopliinae. Concomitantly, it provides new information for inclusion into the forthcoming work, "A catalogue of the checkered beetles of the Western Hemisphere". A significant challenge in the preparation of this revision was making available a clear presentation of the intricate, but small-sized, interspecific differences among the phallic apex of aedeagi. Then, Elihja Talamas (FSCA) came forth and provided guidance and equipment for clear microscopic photographs of aedeagal structure: A clear picture is worth a thousand words.

## Material and Methods

Methods involving measurements and morphological terminology follow those described in OPITZ (2010). BROWN (1956) was used to coin scientific names. Abbreviations used in this treatise are defined as follows: EW/FW= eye width (frontal view)/frons width (frontal view); PW/PL= pronotal width (from left tubercle extremity to right tubercle extremity) /pronotal length (midline from pronotal anterior margin to posterior margin); EL/EW= elytral length (from humeral angle to apex)/elytral width (greatest dorsal width of one elytron). Measurements were made at 500X. Microscopic observations were made with a M5 Wild stereoscopic microscope with camera lucida attachment (Leica, Wetzlar, Germany). Habitus photographs were taken with a Leica Z 16 APO microscope equipped with JVC KY-F75U-CCD camera and controlled by Syncroscopy Auto Montage software (Cambridge, United Kingdom). The SEM micrographs were produced with a Scanning Electron Microscope-S-3500N (Hitachi Science Systems, Ltd., Tokyo, Japan). Image stacks, involving the aedeagus, were taken with a Leica® DM2500 compound scope with a 10X objective lens and a Leica® DFC425 camera (Meyer Instruments, Houston, Texas, United states of America), and combined using Zerene Stacker®. To facilitate the identity of type specimens, I transcribed their locality information in the exact manner as found on labels.

Development of variations of morphology is an intricate part of evolution, and one that we most often have to rely on to estimate conspecificity or nonconspecificity among samples of populations. In insects, structure of the aedeagus seems to attain an intraspecific fixity of form when compared to other structures. In most groups of checkered beetles differences in the male genitalia are good indicators of reproductive isolation (OPITZ 2011: 69). Exceptions have been found in some clerines and peloniines; as one finds in some groups of *Enoclerus* GAHAN (Clerinae) (RIFKIND, personal communication) and in the genus *Chariessa* FORSTER (Peloniinae) (OPITZ 2017b: 36, 37). In the majority of cases, the aedeagus of *Muisca* species are very diagnostic at species level but, as one would expect, there are cases where differences of external features, in combination with distributional parameters, seem to be better indictors of reproductive isolation. An example of such a case was recently found in the tarsostenine genus *Tarsostenodes* Blackburn (OPITZ 2016: 588) involving *T. simulator* BLACKBURN and *T. guttulus* WHITE), and in *Muisca* SPINOLA where the aedeagus appears identical in *Muisca dilatata* (CHEVROLAT) and *Muisca insigna* (CHEVROLAT). These two species of *Muisca* are clearly not conspecific if we take into account their differences in elytral structure.

Although I used morphological criteria to distinguish species, I adhere to the biological species concepts as discussed by STANDFUSS (1896), DOBZHANSKY (1937), and MAYR (1963). The principles of HENNIG (1966) were followed to investigate supraspecific relationships. Some phylogenetic terminology varies from that of HENNIG in that I am in agreement with TUOMIKOSKI (1967) who advocates the use of "apotypic" and "plesiotypic" instead of "apomorphic" and "plesiomorphic" because phylogenetic work may not be restricted to morphological criteria.

In 1974, I examined the type of *Pelonium scutellatum* SPINOLA and the next year (EKIS 1975: 55), I assigned this Spinola species to *Muisca* SPINOLA. Unfortunately, I do not recollect the appearance of the type, which is not available for study. Moreover, Spinola's description (SPINOLA 1844b: 156) does not match any of the examined *Muisca* specimens. Under these circumstances it is not feasible to further consider *Muisca scutellata* (SPINOLA) in this work.


**Fig. 1**: Habitus of *Muisca octonotata*.

## Evolutionary States of Characters

Nineteen character states were organized into a matrix (Table 1), which was then analyzed with NONA (GOLOBOFF 2003) in combination with WINCLADA version 100.80 (NIXON 2002); to find to most parsimonious phylogenetic tree. These programs produced one tree via heuristic analysis [Maximum trees (hold) = 100, number of replications 1 (mult) = 100, and multiple TBR = TBR (mult max) were used]. Character states given the value of "0" are assessed plesiotypic whereas those judged a value of "1" are assessed apotypic. The genera of the *Labasiella* complex (OPITZ 2018) and my general knowledge of other Peloniinae genera were used as outgroups to assist in predictions of the evolutionary states of characteristics. I relied on the methods of character-state analysis employed by EKIS (now OPITZ) (1977), WATROUS & WHEELER (1981), and NIXON & CARPENTER (1993).

Character 0.....Pronotal sides: (1) not cribrate; (2) cribrate

Character 1.....Pronotal tubercle: (0) not acute; (1) acute

Character 2.....Pronotal shape: (0) not oblong; (1) oblong

Character 3.....Pronotal projections: (0) not long; (1) long

Character 4.....Body form: (0) not ovate; (1) ovate

Character 5.....Fifth funicular antennomere: (0) not expanded; (1) expanded

Character 6.....Elytral basal margin: (0) not narrow; (1) narrow

Character 7.....Secondary pronotal tubercle (0) absent; (1) present

Character 8.....Pronotal disc: (0) without tumescences; (1) with tumescences

Character 9.....Primary pronotal tubercle; (0) not small; (1) small

Character 10.....Capitulum: (0) not expanded; (1) expanded

Character 11.....Asetiferous punctures: (0) not broadly pigmented; (1) broadly pigmented

Character 12.....Hind body: (0) subrectangulate; (1) subovoid

Character 13.....Elytral setae: (0) not stout; (1) stout

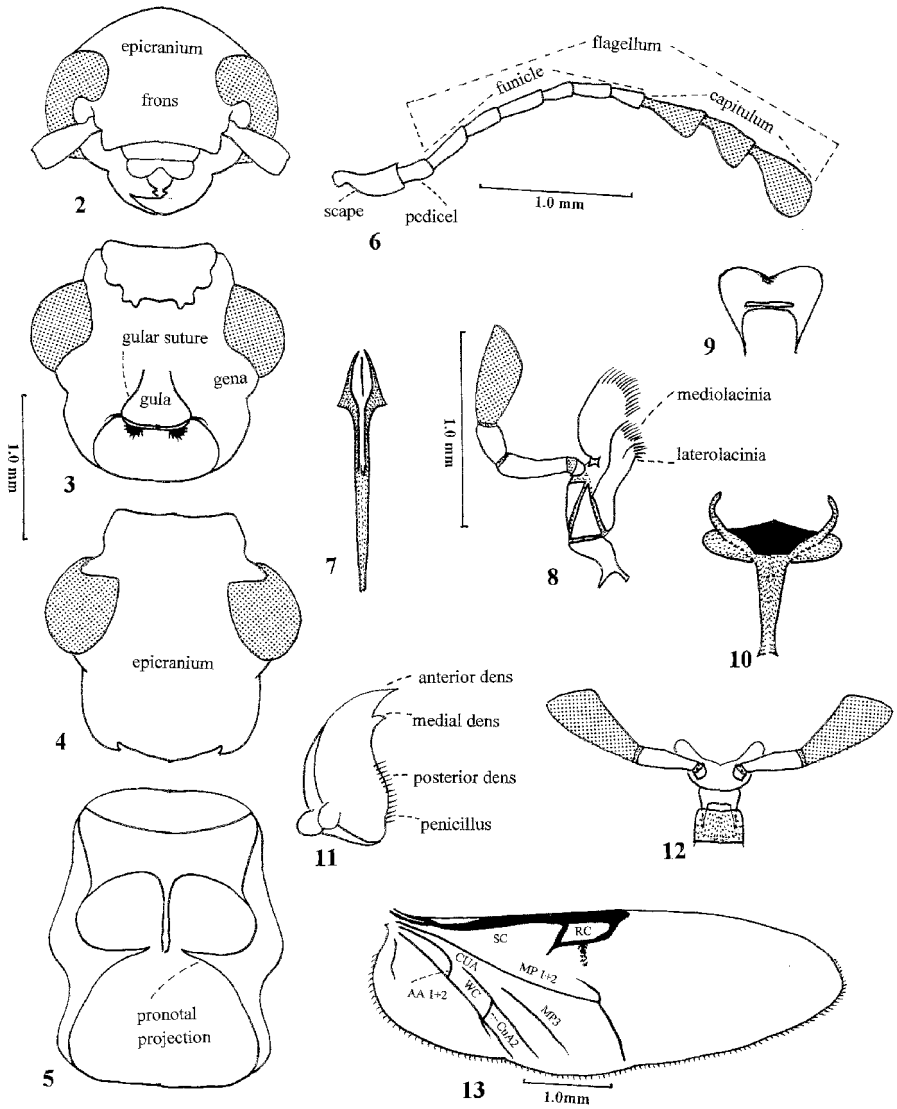
Character 14 .....Eye size: (0) not small; (1) small

Character 15.....Number of asetiferous punctures: (0) not reduced; (1) reduced

Character 16.....Pronotal disc: (0) not cribrate; (1) cribrate

Character 17.....Male pygidium posterior margin: (0) not concave; (1) concave

Character 18.....Antennal funiculum: (0) not elongate; (1) elongate




**Figs 2-13**: Various structures of *Muisca testacea*. (**2**) Head, frontal view. (**3**) Head, ventral view. (**4**) Head, dorsal view. (**5**) Prothorax, ventral view. (**6**) Antenna, male. (**7**) Spicular fork. (**8**) Maxilla. (**9**) Labrum. (**10**) Metendosternite. (**11**) Mandible. (**12**) Labium. (**13**) Metathoracic wing.

**Table 1**: Character matrix of 19 adult morphological characters of genera of the *Labasiella* complex and species groups of *Muisca*.

| Taxa | Character | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Labasiella* complex | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *dilatata* | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *apicalis* | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *hirtula* | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *xanthura* | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *irrorata* | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| *angulicollis* | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| *fera* | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| *maculosa* | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| *mestolinea* | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| *octonotata* | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| *testacea* | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Repositories of specimens

I used the codens for specimen repositories as noted in ARNETT et al. (1993), with some modification to accommodate institutional changes. This will maintain a consistency with those codons used in my previous publications.

ACMT American Coleoptera Museum, 8734 Paisano Pass, San Antonio, Texas 78255, United States of America (James E. Wappes)

AMNH American Museum of Natural History, Department of Entomology, Central Park West at 79th Street, New York, New York 10024-5192, United States of America (Lee Herman).

ANSP The Academy of Natural Sciences of Drexel University, Department of Entomology, 1900 Benjamin Franklin Parkway, Philadelphia, Pennsylvania 19103, United States of America (Jason Weintraub).

ASUC Arizona State University, School of Life Sciences, Biodiversity Knowledge Integration Center, PO Box 874108, Tempe, Arizona, 85287-4108, United States of America (Nico M. Franz)

BMNH British Museum of Natural History, Department of Entomology, SW 5BD, London, England (Beulah Garner).

CASC California Academy of Sciences, Department of Entomology, Golden Gate Park, San Francisco, California 94118, United States of America (Jere Schweikert).

CMNC Canadian Museum of Nature, Insect Collection, Post Office Box 3443, Station D, Ottawa, Ontario, Canada K1P 6P4 (Robert S. Anderson; Francois Genier).

CMNH Carnegie Museum of Natural History, Invertebrate Zoology, 4400 Forbes Avenue, Pittsburgh, Pennsylvania 15213, United States of America (Robert L. Davidson; Robert Androw).

CNCI Canadian National Collection of Insects, Agriculture-Food Canada, K.W. Neatby Building, 960 Carling Avenue, Ottawa, K1A OC6, Canada (Serge Laplante).

CSCA California State Collection of Arthropods, Plant Pest Diagnostics Branch, California Department of Food and Agriculture, 3294 Meadowview Road, Sacramento, California 95832-1448, United States of America (Jacqueline Kishmirian-Airoso).

DZUP Universidade Federal do Paraná, Departamento de Zoologia, Colecão de Entomologia, Caixa Postal 19020, 81531-990, Curitiba, Paraná, Brazil (Germano H. Rosado-Neto).

EMEC Essig Museum of Entomology, University of California, College of Agriculture, Division of Entomology and Parasitology, California Insect Survey, Berkeley, California 94720, United States of America (Pete Oboyski).

FMNH Field Museum of Natural History, Department of Entomology, Roosevelt Road at Lake Shore Drive, Chicago, Illinois 60605, United States of America (Crystal Maier).

FSCA Florida State Collection of Arthropods, Division of Plant Industry/Entomology, Doyle Connor Building, 1911 SW 34th Street, Florida Department of Agriculture, Gainesville, Florida, 32608-7100, United States of America (Paul E. Skelley).

FWSC Fredrick W. Skillman Collection, Longhorn Ranch, 751 N Cochise Stronghold Road, Pearce, Arizona 85606, United States of America.

IBSP Coleção Entomológica Adolph Hempel, Instituro Biológico, Avenida Conselheiro Rodrigues Alves 1252, Vila Mariana, 04014-900, São Paulo, São Paulo, Brazil (Sergio Ide).

JMLC John M. Leavengood, Jr., USDA-APHIS-PPQ, 9325 Bay Plaza Boulevard, Suite 206, Tampa, Florida 33619, United States of America.

JNRC Jaques Rifkind Collection, 5105 Morella Avenue, Valley Village, California 91607-3219, United States of America.

MCZC Museum of Comparative Zoology, Harvard University, Entomology, 26 Oxford Street, Cambridge, Massachusetts 02138-2902, United States of America (Rachel L. Hawkins).

MNHN Museum d'Histoire Naturelle, Entomologie, 45 bis, Rue de Buffon, Paris (Ve), France (Antoine Mantilleri).

MNKM Museo Historia Natural, Noel Kempff Mercado, Santa Cruz de la Sierra, Bolivia (Julieta Ledzema)

MRSN Museo Regionale di Scienze Naturali, Via Giolitti 36, 10123, Torino, Italy (Luca Piccian).

QCAZ Pontifica Universidad Catolica del Ecuador, Departamento de Biologia, Avenida 12 de Octubre, entre Patria Y Beitilla, Apartado 17-01-2184, Quito, Ecuador (Cliff Keil).

RFMC Roy F. Morris II Collection, 2635 Ewell Road, Lakeland, Florida 33811, United States of America.

SDEI Deutsches Entomologisches Institute, Leibniz-Zentrum für Agrarlandschaffs- und Landnutzungsforschung e. V. Ebersvalde Str. 84, D-15374 Müncheberg, Germany (Lutz Behne).

USNM United States National Museum of Natural History, Smithsonian Institution, Department of Entomology, National Museum of Natural History MRC 165, PO Box 37012, Washington, D.C. 20013-7012 (Floyd W. Shockley).

WFBM William F. Barr Museum, University of Idaho, Department of Plant, Soil, and Entomological Sciences, 606 Rayburn Street, Moscow, Idaho 83844-2339, United States of America (Luc Leblanc).

WOPC Weston Opitz Collection, Research Associate: Florida State Collection of Arthropods, Division of Plant Industry/Entomology, Florida Department of Agriculture, Doyle Connor Building, 1911 SW 34th Street, Gainesville, Florida, 32608, United States of America.

ZMHB Museum für Naturkunde, Institute für Systematische Zoologie, Invalidenstrasse 43, D – 10115, Berlin, Germany (Bernd Jaeger).

## Natural History

No direct information for a discussion of the life habits of *Muisca* species is available, but morphological evidence from legs, mouthparts, and alimentary canal suggests that these beetles are carnivorous. They have been collected in habitats laden with hardwoods and intermixtures of vines, lianas, and tree foliage; the kind of vegetation inhabited by other checkered beetles known to prey on lignicolous insects (OPITZ 2004:13; 2005: 16). *Muisca* specimens were captured in a Malaise trap set in a disturbed tropical transition forest. They have also been collected in a blacklight trap set in a montane tropical cloud forest, and by beating forest-edge foliage. Altitudinally, most specimens were captured near 1200 meters.

## Taxonomy

### Description of *Muisca* SPINOLA

***Muisca* SPINOLA, 1844b: 147.**

EKIS (now OPITZ) 1975: 54. OPITZ 2010: 100; 2017a: 69. See CORPORAAL (1950: 198) for historical citations.

Type species: *Muisca bitaeniata* SPINOLA, 1844b:148. By monotypy.

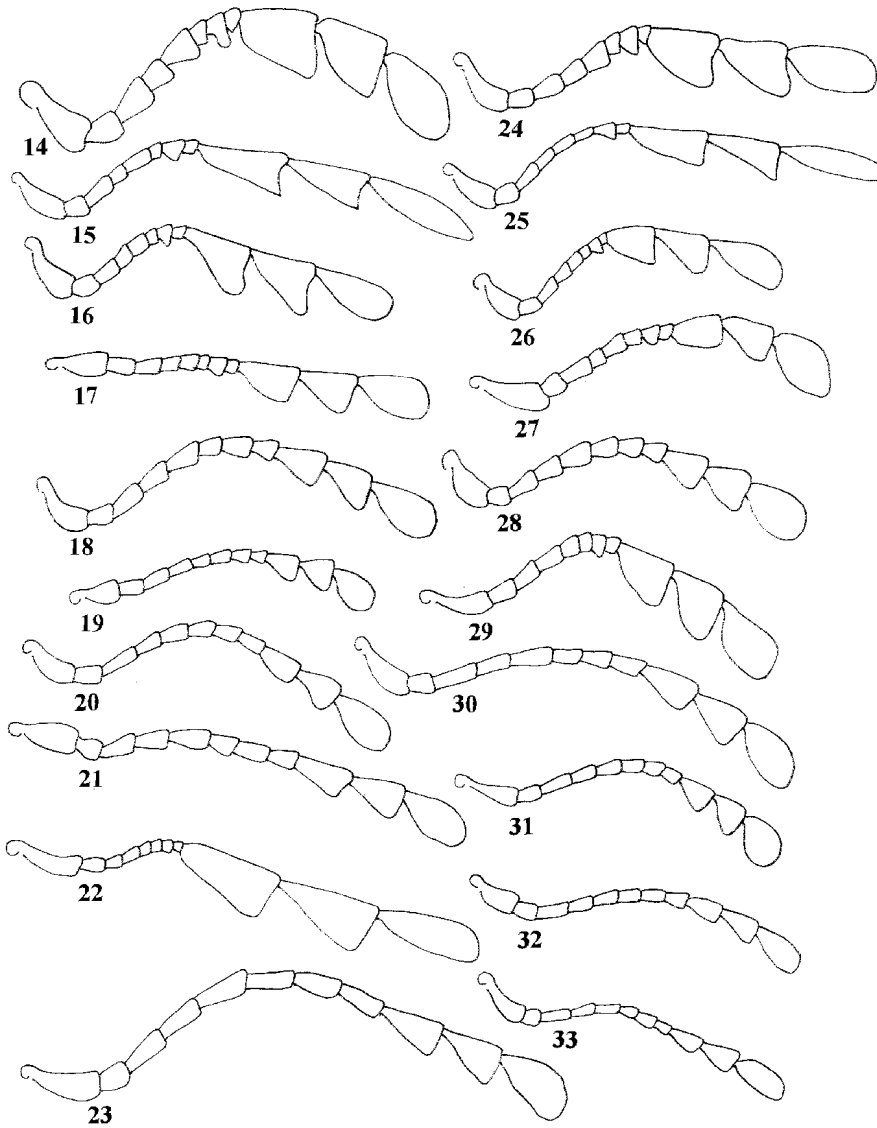
Junior synonym: *Paragregya* PERACCHI, 1964: 115.

D i a g n o s i s : *Muisca* has an oblong pronotum, which this genus shares with the Neotropical genera *Ambitus*, *Apolopha*, *Crusbatus*, *Merickelus*, *Neotenerus*, *Ramosus*, and *Tanycorpus*, but *Muisca* specimens differ by having a comparatively short capitulum when compared with the capitulum of the members of the other aforementioned genera. Also, peloniine specimens belong to this genus if they show an oblong pronotum (discounting the width measure provided by the lateral tubercles) in combination with exceedingly long pronotal projections (Figs 5, 89).

A p o t y p i c c h a r a c t e r i s t i c s : Pronotal projections long.

R e d e s c r i p t i o n : Size: Length 4.0-11.0 mm; width 1.5-5.0 mm. Form (Fig. 1): Oblong, hind body may be suboval, body not particularly deep, about 2 times longer than broad. Vestiture: Dorsum profusely vested with pale setae; antenna moderately setose;

elytra with 1º and 2º setae. Head (Figs 2-4, 80): Cranium subquadrate, frons usually wider than width of eye, indented with coarse setiferous punctations; gula (Figs 3, 82)




**Figs 14-33**: Antennae. (**14**) *Muisca dilatata*, male. (**15**) *M. apicalis*, male. (**16**) *M. hirtula*, male. (**17**) *M. xanthura*, male. (**18**) *M. angulicollis*, male. (**19**) *M. signa*, male. (**20**) *M. fera*, male. (**21**) *M. octonotata*, male. (**22**) *M. maculosa*, male. (**23**) *M. anachyma*, male. (**24**) *M. insigna*, male. (**25**) *M. dozieri*, male. (**26**) *M. togata*, male. (**27**) *M. irrorata*, male. (**28**) *M. menda*, female. (**29**) *M. hexa*, female. (**30**) *M. heppneri*, male. (**31**) *M. magdalena*, female. (**32**) *M. mestolinea*, male. (**33**) *M. omma*, male.

large, triangular, sutures sinuous, gula with two well-developed setose gular processes (Fig. 83); labrum (Fig. 9) shallow, incised distally, tormal processes confluent, epipharyngeal plate small; mandible (Fig. 11), body stout and, anterior dens acuminate, medial dens well developed, posterior dens poorly developed, penicillus well developed; maxilla (Fig. 8), laterolacinia well developed, terminal palpomere subfiliform to subsecuriform; labium (Fig. 12), ligula deeply incised, ligular lobes narrowed, terminal palpomere subsecuriform; eyes large, coarsely facetted, ocular notch moderately sized; antenna (Figs 6, 84) comprised of 11 antennomeres, capitate, funicular antennomeres from filiform to subfiliform, capitulum usually longer than combined length of funicular antennomeres. Thorax: Pronotum (Figs 86, 88) usually oblong, rarely quadrate, anterior limit of dorsolateral carina extends to, but does not connect with, anterior pronotal margin, disc slightly convex, side margins with well-developed tubercle (Fig. 87), prointercoxal process narrow (Fig. 89), slightly expanded distally; pronotal projections long, acuminate, approximates prointercoxal process; elytron profusely sculptured with asetiferous punctations (Fig. 85) in basal half, epipleural fold wide, ends abruptly at about elytral distal 3/4$^{th}$, elytral anterior margin not carinate; metathoracic wing as in Fig. 13, wedge cell not closed; metendosternite (Fig. 10) with furcal lamina, furcal anterior plate wide; legs, profemora posterior margin without spines, tibial spur formula 1-2-2, tarsal pulvillar formula 3-3-3, unguis (Figs 90, 91) with basal denticle. Abdomen: Aedeagus, phallobase lobed, lobes minutely fimbriate, tegmen very reduced, submembranous, phallobasic struts not confluent with phallobasic apodeme, phallobasic rod very short, phallic plates narrow; spicular plates flared (Fig. 7), spicular apodemes fused near middle; ovipositor shorter than abdomen, laminae acuminate, laminal rod present. Alimentary Canal (Fig. 45): Proventriculus well developed; ventricular crypts poorly defined; 4 cryptonephridial Malpighian tubules. Mesodermal Male Internal Reproductive Organs (Fig. 46): Two pairs of accessory glands; ejaculatory duct greatly elongated.

D i s t r i b u t i o n : The geographical range of this Neotropical genus extends from Costa Rica to Brazil.

## Key to species of *Muisca* SPINOLA

My efforts in the production of this key strive to use convenient characteristics of external morphology. But, the distinction between closely related species is sometimes small and when possible the reader should in most cases rely in the shape of the phallus for definitive species identifications.

1 Pronotum with secondary tubercle (Fig. 47) (*M. insigna*-group) ..... 2

1' Pronotum without secondary tubercle ..... 3

2(1) Elytral asetiferous punctures terminate at elytral middle (Fig. 125) (Bolivia, Brazil, Paraguay) ..... *Muisca dilatata* (CHEVROLAT)

2' Distribution of elytral asetiferous punctures extend beyond elytral middle (Brazil) (Fig. 126) ..... *Muisca insigna* (CHEVROLAT)

3(1') Body form ovate (Fig. 127) ..... 4

3' Body form more rectangulate (Fig. 139) ..... 9

4(3) Antennal capitulum extraordinarily long (Fig. 15) (*M. apicalis*-group) ..... 5

4' Antennal capitulum not extraordinarily long ..... 6

5(4) White marking at elytral apex sharply defined (Fig. 127) (Bolivia, Brazil) ..... *Muisca apicalis* (SPINOLA)

5' White marking at elytral apex not sharply defined (Fig. 128) (Bolivia, Brazil) ..... *Muisca dozieri* OPITZ, nov.sp.

6(4') Elytral disc vested with extraordinarily stout setae; hind body subovoid (Fig. 129) (Brazil) (*M. irrorata*-group) (Brazil, Bolivia) ..... *Muisca irrorata* (GORHAM)

6' Elytral disc not vested with extraordinarily stout setae; hind body not subovoid (*M. hirtula* group) ..... 7

7(6') Elytral disc without spots, disc partially castaneous (*M. xanthura*-group) (Bolivia, Brazil, French Guiana) (Fig. 105) ..... *Muisca xanthura* OPITZ, nov.sp.

7'. Elytral disc with spots, disc not partially castaneous ..... 8

8(7') Elytral dark spot in form of "checkmark" (Brazil) (Fig. 130) .... *Muisca hirtula* (KLUG)

8' Elytral dark spot not in form of "checkmark" (Brazil) (Fig. 131) ..... *Muisca togata* (CHEVROLAT)

9(3') Eyes very small; frons twice width of eyes (*M. angulicollis*-group) ..... 10

9' Eyes not very small; frons not twice width of eyes ..... 11

10(9) Pronotal disc impunctate at midline (Colombia) (Fig. 136) ..... *Muisca menda* OPITZ, nov.sp.

10' Pronotal disc punctate at midline (Colombia) (Fig. 135) ..... *Muisca angulicollis* (CHEVROLAT)

11(9') Elytral disc with very few asetiferous punctures, broad region near sutural margin impunctate (*M. fera*-group) ..... 12

11' Elytral disc asetiferous punctures not reduced in numbers as described above ..... 13

12(11) Pronotum with dark brown lines at sides (Peru) (Fig. 134) ..... *Muisca signa* OPITZ, nov.sp.

12' Pronotum without dark brown lines at sides (Costa Rica) (Fig. 133) ..... *Muisca fera* (WOLCOTT)

13(11') Pronotal disc cribrate (*M. maculosa*-group) ..... 14

13' Pronotal disc not cribrate ..... 15

14(13) Pronotal disc with 2 black markings (Brazil) (Fig. 138) ..... *Muisca maculosa* (GORHAM)

14' Pronotal disc uniformly castaneous (Brazil, Peru) (Fig. 137) ..... *Muisca hexa* OPITZ, nov.sp.

15(13') Posterior margin of male pygidium broadly concave (*M. mestolinea*-group) ..... 16

15' Posterior margin of male pygidium not broadly concave ..... 18

16(15) Pronotum without dark brown markings; each elytral disc with 3 diagonally positioned faint markings (Colombia) (Fig. 139) ..... *Muisca anachyma* OPITZ, nov.sp.

16' Pronotum with dark brown markings ..... 17

17(16') Pronotum with 2 dark lines at sides (Ecuador) (Fig. 140) ..... *Muisca mestolinea* OPITZ, nov.sp.

17' Pronotum with 2 dark spots (Colombia, Ecuador) (Fig. 141) ..... *Muisca omma* OPITZ, nov.sp.

18(15') Antennal funicle longer than length of capitulum (*M. octonotata*-group) ..... 19

18' Antennal funicle not longer than length of capitulum ..... 23

19(18) Elytral disc with dark fascia ..... 20

19' Elytral disc with spots ..... 21

20(19) Midelytral fascia boldly expressed (Costa Rica, Panamá) (Fig. 142) ..... *Muisca heppneri* OPITZ, nov.sp.

20' Midelytral fascia faintly expressed (Colombia) (Fig. 143) ..... *Muisca lateripunctata* (SCHENKLING)

21(19') Each elytral disc with 6 spots (Colombia) (Fig. 144) ..... *Muisca magdalena* OPITZ, nov.sp.

21' Each elytral disc with 4 spots ..... 22

22(21') Elytral asetiferous punctures end at about discal ½ (Costa Rica, Panamá) (Fig. 145)..... ..... *Muisca octonotata* (GORHAM)

22' Distribution of elytral punctures extend well beyond discal ½ (Colombia) (Fig. 146)..... *Muisca tetraspilota* (CHEVROLAT)

23(18') Pronotum black (Bolivia, Peru) (Fig. 153)..... *Muisca peruviana* (PIC)

23' Pronotum not black .....24

24(23') Pronotum with dark markings.....25

24' Pronotum without dark markings.....27

25 Each elytral disc with 7 light brown spots (Peru) (Fig. 151)..... .....*Muisca malakela* OPITZ, nov.sp.

25' Elytral color not as above.....26

26(25') Antennal capitulum much longer than length of funicle (Bolivia) (Fig. 154) ..... ..... *Muisca sigilla* OPITZ, nov.sp.

26' Antennal capitulum not longer than length of funicle (Venezuela, Ecuador) (Fig. 149)..... *Muisca biordinis* OPITZ, nov.sp.

27(24') Antennal capitulum black .....28

27'. Antennal capitulum not black .....30

28(27) Seventh and 8th antennomeres not infuscated (Brazil) (Fig. 155)..... ..... *Muisca testacea* (KLUG)

28' Seventh and 8th antennomeres infuscated.....29

29(28') Elytral length/width ratio 1.89 (Brazil) (Fig. 147) .....*Muisca adamanta* OPITZ, nov.sp.

29' Elytral length/width ratio 1.61 (Brazil) (Fig. 156) .....*Muisca variabilis* (SPINOLA)

30(27') Short narrow black line projecting from elytral anterior margin.....31

30' Elytral color not as above.....32

31(30) Middle of elytral disc with irregular-shaped fascia (Colombia, Venezuela) (Fig. 152).....*Muisca nigrosignata* (SPINOLA)

31' Midelytral fascia fragmented (Colombia, Venezuela) (Fig. 148)..... .....*Muisca agma* OPITZ, nov.sp.

32(30') Elytral disc traversed by 3 black fasciae (Bolivia) (Fig. 157)*Muisca zona* OPITZ, nov.sp.

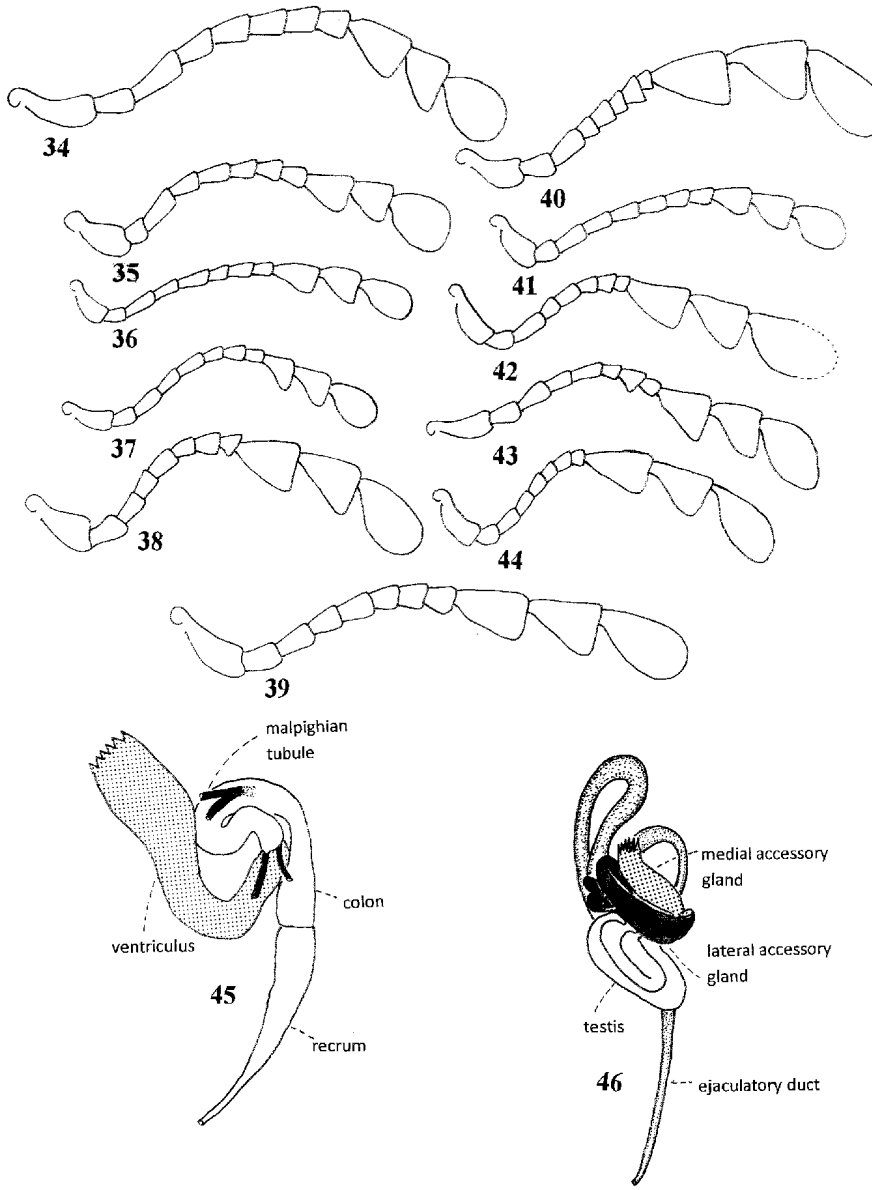
32' Elytra not traversed by fascia (Panamá, Colombia, Venezuela) (Fig. 150)..... .....*Muisca bitaeniata* (SPINOLA)

## Descriptions of *Muisca* species

On the basis of variations of adult external morphology the species of *Muisca* are classified into 11 species groups. Each group, with the exception of the *M. hirtula*, *M. mestolinea*, *M. testacea*, and *M. xanthura* groups, is characterized by at least one synapotypic character state.

### The *M. insigna* species group

The members of this species group have a secondary pronotal tubercle (Fig. 47). There are 2 species in this group whose geographic distribution involves Bolivia, Brazil, and Paraguay.




**Figs 34-46**: Antennae, alimentary canal, and male mesodermal internal reproductive organs. **34-44** Antennae. (**34**) *M. tetraspilota*, male. (**35**) *M. agma*, male. (**36**) *M. bitaeniata*, male. (**37**) *M. nigrosignata*, male. (**38**) *M. sigilla*, male. (**39**) *M. zona*, male. (**40**) *M. adamanta*, male. (**41**) *M. biordinis*, male. (**42**) *M. malakela*, female. (**43**) *M. peruviana*, male. (**44**) *M. variabilis*, male. (**45**) *M. condilum*, alimentary canal. (**46**) *M. variabilis*, male mesodermal internal reproductive organs.

### *Muisca dilatata* (CHEVROLAT, 1876) (Figs 14, 47, 93, 98, 125)

*Pelonium dilatata* CHEVROLAT, 1876: 39. Lectotype: ♀. Here designated. Brazilia (Brazil), Santa Rita, VIII, D. Sahlberg (MNHN). CORPORAAL 1950: 280. CHEVROLAT did not specify in his description the number of specimens before him while preparing his description. Therefore, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype for this nominal species.

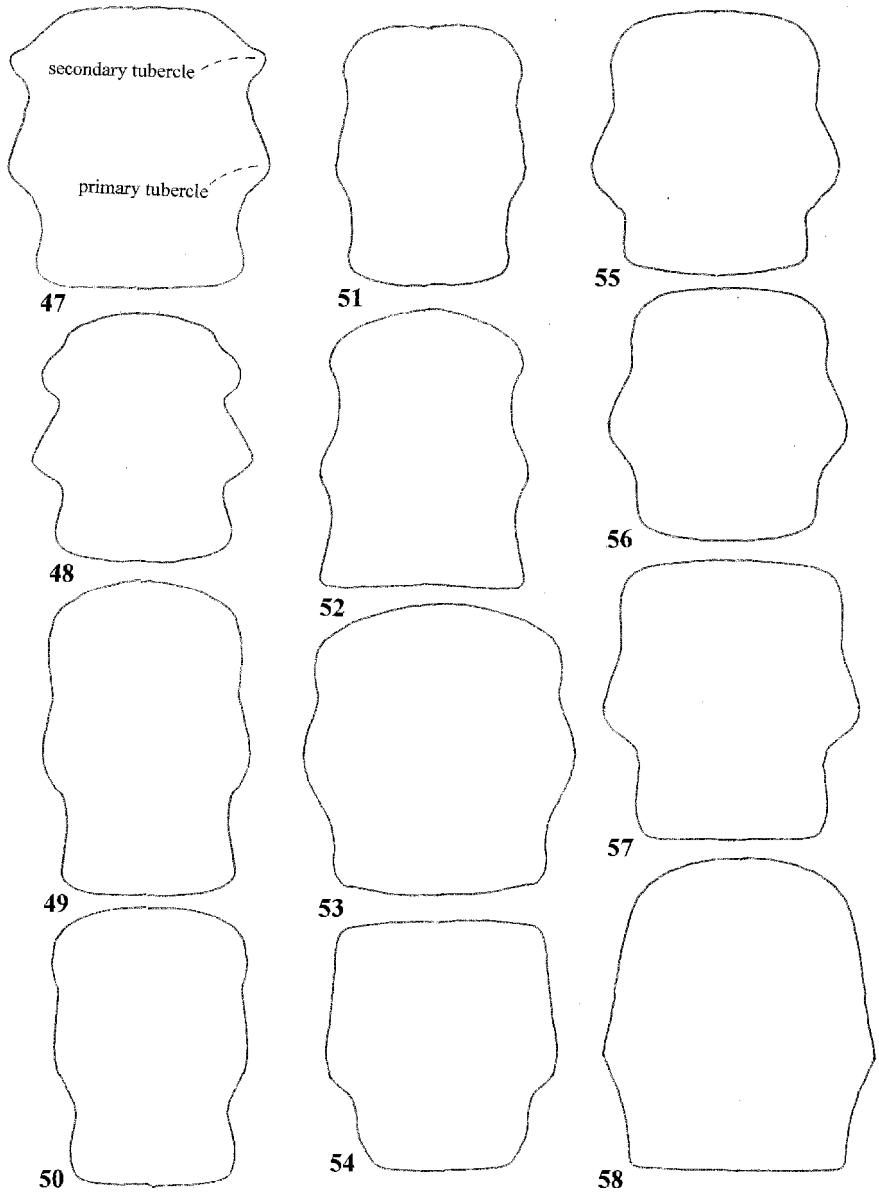
D i a g n o s i s : The members of this species resemble superficially those of *M. insigna*, but *M. dilatata* specimens differ in that their sutural margin near the meso-scutellum is brown and the elytral asetiferous punctures do not extend beyond elytral basal ½.

R e d e s c r i p t i o n : Size: Length 8.0 mm; width 3.0 mm. Form: As in Fig. 125. Color: Mouthparts, clypeus, and antennae brown, mandibular apices black; cranium mostly brown, frons infuscated; pronotal periphery black, submetalic, disc at center brown; elytral disc broadly brown behind humerus, disc with a white oblique line anteriorly contiguous with sutural margin and posteriorly flares to broad white region on elytral apical third, small brown fleck in posterior region of sutural margin. Head: Funicular antennomeres subtriangular, 5th funicular antennomere expanded laterally, capitular antennomeres 9 and 10 triangular (Fig. 14), with anterior margins slightly concave, antennomere 11 obovate; frons narrower than width of eye (EW/FW 35/26). Thorax: Pronotum (Fig. 47) oblong (PW/PL 100/110), side margin with well-developed primary and secondary tubercles, widely subglabrous at middle, disc with tumescenses; elytral asetiferous punctation subseriate, at sides extend to elytral apical 3/4th, punctures absent near sutural margin, except at anterior 1/5th (EL/EW 315/93). Abdomen: Male 6th visible sternite not concave distally; aedeagus, phallobasic lobes minute, phallobasic struts absent, phallus slender, apex minute and digitiform (Fig. 98), phallic plates very narrow and undulate near apex.

V a r i a t i o n : Size: Length 6.0-10.0 mm; width 2.5-4.5 mm. Except for body size, the available specimens are quite homogeneous.

N a t u r a l h i s t o r y : Specimens were collected in September through December, at altitudes that ranges from 370 to 800 m. Some specimens were collected with a black light set in a disturbed tropical transitional forest.

D i s t r i b u t i o n (Fig. 93): In addition to the lectotype, I examined 130 specimens: Bolivia: **Departamento de Santa Cruz,** Santa Cruz, 3.7 km SSE Buena Vista, Hotel Flora & Fauna, 14-19-X-2000, 430 m, tropical transition forest, M. C. Thomas; idem, 14-28-X- 2000, 430 m, B. K. Dozier; idem, 29-X-1999, 410 m, disturbed tropical transition forest, G. Porter & L. Stange; idem, 17-20-X-2000, R. Morris; idem, 14-16-X-2000, Wappes & Morris; idem, 2-14-X-2003, Robin Clarke; idem, 22-26-X-2002, Morris & Wappes; Los Volcanes, 4-9-X-2007, R. Morris; Potrerillos del Guenda, 40 km NW Santa Cruz, 17°40'S 63°27'W, 3-X-2007, at light, R. Morris; idem, 7-9-IX-2012, P. E. Skelley, J. E. Wappes, & T. Bonaso; idem, 17°40'S 63°27'W, 16-22-X-2006, 370 m, Wappes, Nearns, & Eya; idem, 13-17-X-2014, Wappes & Morris; idem, 1-8-XI-2002, J. E. Wappes; idem, Refugio Los Volcanes, 18°06'S 063°36'W, light, 3400-4200, 16-20-IX-2012, Wappes, Skelley, Bonaso, Hamel. Brazil: **Estado do Rio de Janeiro**, Rive Gauche du Parahyba, ?-IX-1884, P. Germain; Laguna de Sacuaresma, ?-IX-1884; Corcovado, Guanabara, ?-XI-1961, Seabra & Alvarenga; **Estado do Minas Gerais**, Pedra Azul, ?-XI-1972, 800 m, M. Alvarenga; idem, ?XI-1974, M. Alvarenga; **Estado do Paraiba**, Santa Rita; **Estado do Bahia**, Cochimbo, ?-?-1890. Pujol; Encruzilhada, ?-XI-1972, 960 m, M. Alvarenga; Itapetinga, ?-XI-1969, M. Alvarenga; **Estado do Pernambuco**, Serra de Communaty, 12-III- 1893, Gounelle; **Estado do Espírito Santo**, Trinidade, Ch. Pujol; ?-X-1972, M. Alvarenga; Parque Sooretana, 27-XI-1967, F. Oliveira; Linhares, ?-IX-1973, M. Alvarenga; Linhares; Colatinia, ?-X-1969, F. M. Oliveira; **Estado do São Paulo**, Val. Du Rio Pardo, ?-XII-1898, E. Gounelle; Barueri, XI-1966, K. Lenke;




**Figs 47-58**: Pronota. (**47**) *M. dilatata*. (**48**) *M. insigna*. (**49**) *M. apicalis*. (**50**) *M. dozieri*. (**51**) *M.* hirtula. (**52**) *M. togata*. (**53**) *M. xanthura* (**54**) *M. irrorata*. (**55**) *M. angulicollis*. (**56**) *M. menda*. (**57**) *M. signa*. (**58**) *M. hexa*.

**Estado do Goiás**, Goyaz (Goiás), Rio Verde; Jatai Goiás; **Estado do Santa Catarina**, Nova Teutonia, 27°11'S 52°23'W, 9-X-1944, F. Plaumann; idem, 10-X-1941, F. Plaumann; idem, 16-X-1941, F. Plaumann; idem, 25-X-1941, F. Plaumann; idem, 26-X-1941, F. Plaumann; idem, 27-X-1941, F. Plaumann; idem, 30-X-1941, F. Plaumann; idem, 31-X-1941, F. Plaumann; idem, 10-27-X-1942, F. Plaumann; idem, 3-XI-1941, F. Plaumann; idem, 27-IX-1941, F. Plaumann; idem, 10-XI-1941, F. Plaumann; idem, 12-XII-1941, F. Plaumann; idem, 5-XII-1941, F. Plaumann; idem, 17-XI-1941, F. Plaumann; idem, 6-I-1935, F. Plaumann; idem, ?-XII-1941, F. Plaumann; idem, ?-X-1965, F. Plaumann; idem, 30-IX-1960, F. Plaumann; ?-XI-1971, F. Plaumann; idem, ?-XI-1969, F. Plaumann; idem, ?-XI-1966, F. Plaumann. Paraguay: **Departamento de Cordillera**, Instituto Agricola Nacional, Cacupe, 29-X-1981, at black light, R. D. Cave; idem, 15-XII-1980, R. D. Cave; **Departamento de Caazapá**, Colonia Neufeld, 26°28'S 55°55'W, 24-X-02-XI-2008, U. Drechsel; 3 km N B. Acerval, 13-X-1968, L. & C. W. O'Brien Specimens are deposited in ACMT, AMNH, DZUP, FSCA, IBSP, RFMC, JNRC, MNHN, and WOPC.

### *Muisca insigna* (CHEVROLAT, 1874) (Figs 24, 48, 93, 99, 126)

*Pelonium insigne* CHEVROLAT, 1874: 326. Lectotype: Gender not known. Here designated. Brazilia (Brazil) (MNHN). CORPORAAL 1950: 281. Chevrolat did not specify in his description the number of specimens before him while preparing his description. Therefore, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype for this nominal species.

*Pelonium quadrifoveolatum* SCHENKLING, 1906: 313. **nov.syn.** Lectotype. ♀. Here designated. Brazil, Jatahi (Jatai Goias) (SDEI). CORPORAAL 1950: 283. Paralectotype: 1 specimen from Brazil, Jatai Goias (SDEI). In his description Schenkling indicates that there was more than one specimen available to him, but he did not tag one of these to be the name barer of this nominal species. Therefore, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype.

D i a g n o s i s : The members of this species resemble superficially those of *M. dilatata*, but *M. insigna* specimens differ in that their sutural margin near the mesoscutellum is pale and the elytral asetiferous punctures extend beyond elytral basal 1/2.

R e d e s c r i p t i o n : Size: Length 9.0 mm; width 4.0 mm. Form: As in Fig. 126. Color: Maxillae, labium, and antennae castaneous, mandibles labrum and clypeus brown; cranium mostly castaneous, with black mark on upper frons and behind eyes; pronotal disc with black circle bordered by white setae; elytral disc broadly dark brown behind humerus, brown area with a bluish luster, disc with a white oblique line anteriorly contiguous with sutural margin and posteriorly flares to broad white region on elytral apical third, light and dark brown marking near posterior region of sutural margin. Head: Funicular antennomeres subtriangular, 5$^{th}$ funicular antennomere expanded, capitular antennomeres 9 and 10 triangular (Fig. 24), anterior margins slightly concave, antennomere 11 obovate; frons narrower than width of eye (EW/FW 40/35). Thorax: Pronotum (Fig. 48) oblong (PW/PL 95/130), side margin with well-developed primary and secondary tubercles, disc coarsely punctate at sides, widely subglabrous at middle, disc with tumescenses; elytral asetiferous punctation subseriate, at sides extend to elytral apical 3/4$^{th,}$ punctures absent near sutural margin (EL/EW 370/112). Abdomen: Male 6$^{th}$ visible sternite not concave distally; aedeagus, phallobasic lobes minute, phallus slender, apex minute and digitiform (Fig. 99), phallic plates very narrow and undulate near apex.

V a r i a t i o n : Size: Length 5.5-9.0 mm; width 2.5-4.0 mm. Other than body size, the available specimens are quite homogeneous.

N a t u r a l h i s t o r y : A specimen was collected in November.

D i s t r i b u t i o n (Fig. 93): In addition to the lectotype, I examined 6 specimens: Brazil: **Estado do São Paulo**, Barueri, XI-1966, K. Lenke; **Estado do Goiás**, Goyaz (Goiás), Rio Verde; Jatai Goiás. Specimens are deposited in CMNH, MNHN, SDEI, and WOPC.

### *The M. apicalis* species group

There are 2 species in this group that are characterized by having the antennal capitulum expanded. Geographically, the species are from Bolivia and Brazil.

### *Muisca apicalis* (SPINOLA, 1844b) (Figs 15, 49, 93, 100, 127)

*Pelonium apicale* SPINOLA, 1844b: 155. Lectotype: ♂. Designation by EKIS (now OPITZ) 1975: 55. Le Bresil (Brazil) (MRSN). CORPORAAL 1950: 279.

D i a g n o s i s : The members of this species resemble superficially those of *M. dozieri*, but *M. apicalis* specimens differ in that the white marking at the elytral apex is sharply defined, which is not the case in *M. dozieri* specimens.

D e s c r i p t i o n : Size: Length 6.5 mm; width 2.2 mm. Form: As in Fig. 127. Color: Mostly castaneous, femora and abdomen more testaceous; elytral disc castaneous, except yellow angular marking near apex. Head: Funicular antennomeres subfiliform, progressively more triangular, 5$^{th}$ funicular antennomere expanded, capitulum expanded, about twice as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 with distal margins concave; anterior angles acute (Fig. 15), antennomere 11 narrow elongate; frons narrower than width of eye (EW/FW 30/20). Thorax: Pronotum (Fig. 49) elongate (PW/PL 67/110), side margin with very shallow tubercle, disc narrowly subglabrous at middle; elytral asetiferous punctation striate, to distal 4/5$^{th}$, (EL/EW 240/70). Abdomen: Distal margin of male 6$^{th}$ visible sternite slightly concave; aedeagus, phallic apex as in Fig. 100.

V a r i a t i o n : Size: Length 4.0-7.5 mm; width 2.0-3.0 mm. The castaneous marking near the apex of the elytra varies in its ending.

N a t u r a l h i s t o r y : Specimens were collected during October and November, some in a tropical transition forest, at altitudes that ranges from 405 to 430 m.

D i s t r i b u t i o n (Fig. 93): In addition to the lectotype, I examined 44 specimens: Bolivia: **Departamento de Santa Cruz**, Buena Vista, Hotel Flora & Fauna, 14-17-XI-2003, Morris, Nearns, Wappes; idem, 22-31-X-2002, Wappes & Morris; idem, 21-25-X-2003, Morris, Nearns, Wappes; idem, 27-31-X-2002, Morris & Wappes; idem, 17°29.949'S 63°33.52'W, 5-15-XI-2001, 405 m, tropical transition forest, M. C. Thomas & B. K. Dozier; idem, 17°29.925'S 63°39.128'W, 10-22-X-2004, J. E. Eger; idem, 17°29.949'S 63°33.152'W, 5-15-XI-2001, M. C. Thomas; 3.7 km SSE, Buena Vista, Hotel Flora & Fauna, 14-28-X-2000, 430 m, B. K. Dozier; 20 km S Buena Vista, 18-25-X-1992, E. Giesbert; Potrerillos del Guenda, 17°40'S 63°27'W, 40 k NW Santa Cruz, 10-15-X-2007, J. Wappes & A. Cline; idem, Snake Farm, 21-24-X-2011, 350-400, Wappes & Skillman; idem, 14-16-X-2011, Wappes & Skillman; idem, 16-22-X-2006, Wappes, Nearns & Eya; **Departamento de Cochabamba**, Carrasco El Sacta, Morris & Wappes. Brazil: **Estado do Rio de Janeiro**, Rio de Janeiro, ?-?-1883, P. Germain; Tijuca, ?-XII-1884, E. Gounelle; **Estado do Bahia**, S. Antonio da Barra, 11-XII-1988, Gounelle; Cachimbo, ?-?-1890, Ch. Pujol; **Estado do Minas Gerais**, ?-?-1990, J. DeGaulle; **Estado do São Paulo**, Caraca, ?-?-1884, P. Germain. Specimens are deposited in ACMT, CMNH, FMNH, FSCA, JNRC, MNHN, and WOPC.

### *Muisca dozieri* OPITZ nov.sp. (Figs 25, 50, 101, 93, 128)

Holotype: ♂. BOLIVIA: Santa Cruz, 3.7 km SSE Buena Vista, Hotel Flora & Fauna, 405 m, 5-15-XI-2001, 17°29.949'S 63°33.152'W, M. C. Thomas & B. K. Dozier, tropical transitional forest (MNKM).

Paratypes: 15 specimens. Bolivia: **Departamento de Santa Cruz**, Buena Vista, Hotel Flora & Fauna, 22-31-X-2002, Wappes & Morris (ACMT, 1; WOPC, 1); 4-6 km SSE Buena Vista, Hotel Flora & Fauna, 17°29'S 63°39'W, 26-27-X-2014, 300-400 feet, J. E. Wappes (ACMT, 1); idem, 17-20-X-2000, R. Morris (RFMC, 1); Potrerillo del Guenda, Snake Farm, 17°40'S 63°27'W, 21-24-X-2011, 370-400 m, Wappes & Skillman (ACMT, 1); idem, Reserva Natural Aka, 13-17-X-2014, Wappes & Morris (WOPC, 1); Andres Ibañes Prov., Potrerillo del Guenda, 17°40'S 63°20'W, 6-8-XII-2011, Wappes, Lingafelter, Morris, & Woodley (ACMT, 1). Brazil: **Estado do Mato Grosso**, Dimantino, Fazenda Rio Arinos, ?-X-1983, Eurides Furtado (JMLC, 1; WOPC, 1); Mato Grosso, ?-?-1886, P. Germain (MNHN, 1; WOPC, 1); **Estado do Rio de Janeiro**, ?-XI-? (CMNH, 1); **Estado do Bahia**, Chapada, ?-X-?, collector not noted (CMNH, 1); **Estado do Rio Grande do Sul**, Taquara, ?-X-?, collector not noted (CMNH, 1; WOPC, 1).

D i a g n o s i s : The members of this species resemble superficially those of *M. apicalis*, but *M. dozieri* specimens differ in that the white marking at the elytral apex is not sharply defined, which is the case in *M. apicalis* specimens.

D e s c r i p t i o n : Size: Length 6.5 mm; width 2.0 mm. Form: As in Fig. 128. Color: Mostly castaneous, antenna, legs, and abdomen testaceous; forebody dark castaneous; elytral disc light castaneous, except yellow angular marking near apex. Head: Funicular antennomeres subfiliform, progressively more triangular, 5$^{th}$ funicular antennomere expanded, capitulum about twice as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 very long-triangular, anterior angles subacute (Fig. 25), antennomere 11 narrow elongate; frons narrower than width of eye (EW/FW 32/22). Thorax: Pronotum (Fig. 50) elongate (PW/PL 75/95), side margin with very shallow tubercle, disc narrowly subglabrous at middle; elytra flared in posterior 1/2, elytral asetiferous punctation striate to distal 4/5$^{th}$ (EL/EW 225/75). Abdomen: Distal margin of male 6$^{th}$ visible sternite slightly concave; aedeagus, phallic apex as in Fig. 101.

V a r i a t i o n : Size: Length 4.5- 6.5.0 mm; width 1.8- 2.0 mm. Other than body size, the available specimens are quite homogeneous.

N a t u r a l h i s t o r y : Specimens were collected from October through December, some at altitudes that range from 91 to 122 m.

E t y m o l o g y : This species is dedicated to Byrd K. Dozier for his dedication to field coleopterology.

D i s t r i b u t i o n (Fig. 93): This species is known from Bolivia and Brazil.

## The *M. hirtula* species group

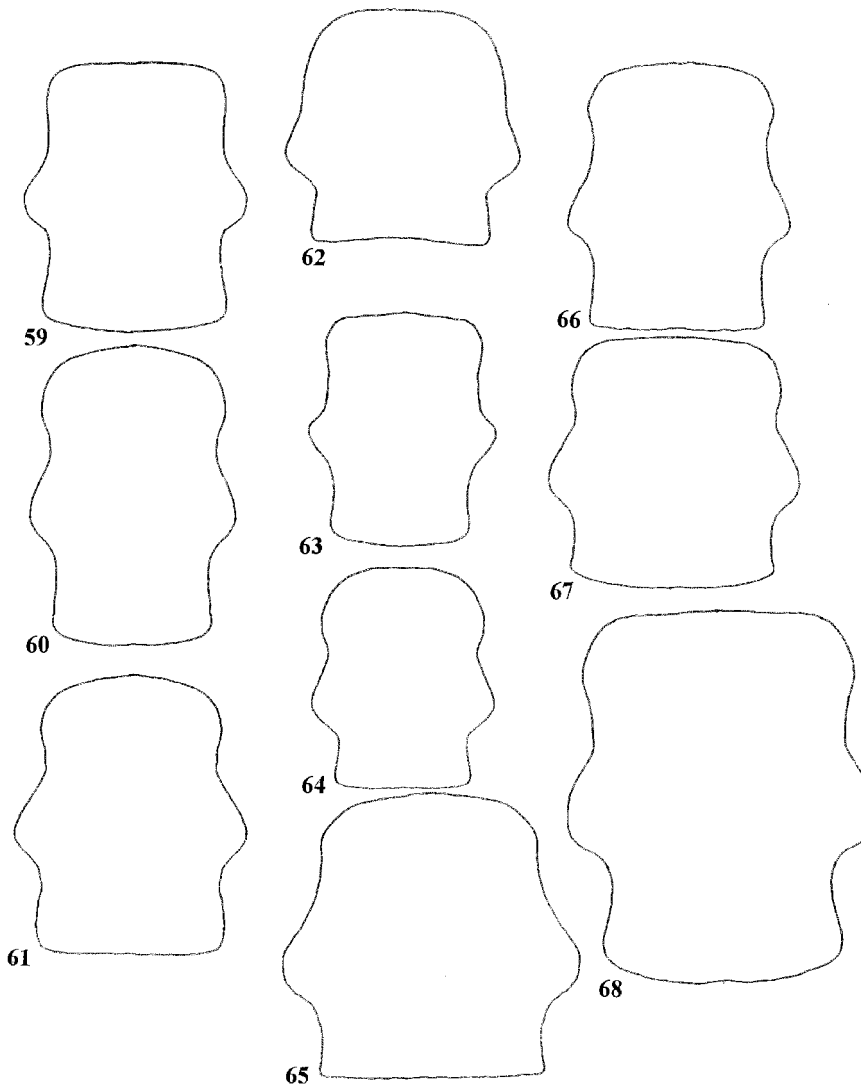
The *M. hirtula* group comprises 2 species whose specimens are characterized by having very small primary tubercles. The 2 species occur in Brazil.

### *Muisca hirtula* (KLUG, 1842) (Figs 16, 51, 94, 103, 130)

*Enopliun hirtulum* KLUG, 1842: 367. Holotype: Gender not known. Brazilien (Brazil) (ZMHB) CORPORAAL 1950: 281.

D i a g n o s i s : The members of this species resemble superficially those of *M. togata*, but *M. hirtula* specimens differ in that the elytral dark spot is in the form of a "checkmark", which is not the case in *M. togata* specimens.

R e d e s c r i p t i o n : Size: Length 4.5 mm; width 2.0 mm. Form: As in Fig. 130. Color: Mostly testaceous, cranium and thorax castaneous; posterior region of elytra with




**Figs 59-68**: Pronota. (**59**) M. fera. (**60**) *M. heppneri*. (**61**) *M. octonotata*. (**62**) *M. maculosa*. (**63**) *M. mestolinea*. (**64**) *M. omma*. (**65**) *M. anachyma*. (**66**) *M. lateripunctata*. (**67**) *M. magdalena*. (**68**) *M. tetraspilota*.

small brown "check mark" near sutural margin. Head: Funicular antennomeres subfiliform, 5th funicular antennomere expanded laterally, capitulum large, much longer than combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular, distal margin slightly concave (Fig. 16), antennomere 11 obovate; eyes coarsely facetted and bulging, frons narrower than width of eye (EW/FW 25/20). Thorax: Pronotum (Fig.

51) oblong (PW/PL 68/90), side margin with slightly developed tubercle, disc coarsely punctate; elytral asetiferous punctation subseriate, punctures extend to elytral apical 3/4th (EL/EW 220/60). Abdomen: Male 6th visible sternite slightly concave; aedeagus, phallic apex as in Fig. 103

V a r i a t i o n : Size: Length 3.2-7.0 mm; width 1.3-2.8 mm. The brown "check mark" on the elytral disc may only be faintly visible.

N a t u r a l h i s t o r y : Specimens have been collected during March, June, October-December, some at 860 m.

D i s t r i b u t i o n (Fig. 94): In addition to the holotype, I examined 56 specimens: Brazil: **Estado do Bahia**, Cachimbo, ?-?-1890, Ch. Pujol; S.Antonio da Barra, 11-XII-1988, Gounelle?-VI-1972, 860 m, M. Alvarenga; Encruzilhada, ?-XI-1974, M. Alvarenga; Itapetingam, ?-XI-1969, M. Alvarenga; **Estado do Minas Gerais**, Pedra Azul, ?-XI- 1974, M. Alvarenga; **Estado do Espirito Santo**, Calatinia, ?-X-1969, F. M. Oliveira; Linhares, ?-IX-1973, M. Alvarenga; **Estado do Mato Grosso**, Diamantino, Fazenda Rio Arinos, ?-X-1983, Eurides Furtado; **Estado do Rio de Janeiro**, Guanabara, ?-XII-1972, M. Alvarenga; idem, ?-III-1964, M. Alvarenga. Specimens are deposited in CMNH, FSCA, MNHN and WOPC.

### *Muisca togata* (CHEVROLAT, 1874) (Figs 26, 52, 94, 104, 131)

*Pelonium togata* CHEVROLAT, 1876: 39. Lectotype: Gender ♂. Here designated. Brazilia (Brazil), Santa Rita Mountain, ?-VIII-?, D. Sahlberg (MNHN). Paralectotype: 1 specimen. Brazil, **Estado do Maranhão**, Santa Rita Mountain, ?-VIII-?, D. Sahlberg. Chevrolat's description provides evidence that he examined more than one specimen, but he did not specify which one should be the name barer of this nominal species. Therefore, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype for this nominal species. Brazil, CORPORAAL 1950: 284.

*Cregya cylindricollis* PERACCHI, 1962: 180. **nov.syn**. PERACCHI 1964: 116 (*Paracregya*).

D i a g n o s i s : The members of this species resemble superficially those of *M. hirtula*, but *M. togata* specimens differ in that the elytral dark spot is not in the form of a "checkmark", which is the case in *M. hirtula* specimens.

R e d e s c r i p t i o n : Size: Length 5.0 mm; width 2.5 mm. Form: As in Fig. 131. Color: Antenna, mouthparts, legs, and abdomen yellow, except mandibles black; clypeus, cranium, and thorax castaneous; elytra bicolorous, castaneous coloration in basal half fades into yellow coloration in distal half. Head: Funicular antennomeres subfiliform, 5th funicular antennomere expanded laterally, capitulum large, much longer than combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 26), antennomere 11 obovate; frons narrower than width of eye (EW/FW 32/25). Thorax: Pronotum (Fig. 52) oblong (PW/PL 55/70), side margin with slightly developed primary tubercles, disc coarsely punctate; elytral asetiferous punctation subseriate, at sides extend to elytral apical 3/4th, punctures absent near sutural margin (EL/EW 190/60). Abdomen: Male 6th visible sternite concave along distal margin; aedeagus, phallic apex as in Fig. 104.

V a r i a t i o n : Size: Length 4.0-5.5 mm; width 1.8-2.2 mm. Other than body size, the available specimens are quite homogeneous.

N a t u r a l h i s t o r y : Specimens were collected during August and November, 2 at 960 m.

D i s t r i b u t i o n (Fig. 94): In addition to the lectotype and paralectotype, I examined 3 specimens: Brazil: **Estado do Bahia**, Encruzilhada, ?-XI-1972, M. Alvarenga. Specimens are deposited in MNHN and WOPC.

## The *M. xanthura* species group

This monotypic group is characterized by having a short body form and a well-developed primary pronotal tubercle. Its members are found in French Guiana, Bolivia, and Brazil.

### *Muisca xanthura* (CHEVROLAT, 1876) (Figs 17, 53, 94, 105, 132)

*Pelonium xanthurum* CHEVROLAT, 1876: 40. Lectotype: Gender ♀. Here designated. Brazilia (Brazil), Petropolis, ?-XII-?, D. Sahlberg (MNHN). Chevrolat's description provides evidence that he examined more than one specimen, but he did not specify which one should be the name baerer of this nominal species. Therefore, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype for this nominal species. CORPORAAL 1950: 284.

D i a g n o s i s : The well-developed pronotal tubercle distinguishes the members of this species group from superficially similar members of the *M. hirtula* species group.

R e d e s c r i p t i o n : Size: Length 5.5 mm; width 2.4 mm. Form: As in Fig. 132. Color: Antenna, mouthparts, legs, and abdomen yellow, except mandibles black; clypeus, cranium, and thorax castaneous; elytra bicolorous, castaneous coloration in basal 3/4$^{th}$ fades into yellow coloration in distal 1/4$^{th}$. Head: Funicular antennomeres subfiliform, 5$^{th}$ funicular antennomere expanded laterally, capitulum large, much longer than combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 17), antennomere 11 obovate; frons slightly narrower than width of eye (EW/FW 30/28). Thorax: Pronotum (Fig. 53) oblong (PW/PL 95/110), side margin with primary tubercles, disc coarsely punctate; elytral asetiferous punctation subseriate, at sides extend to elytral apical 3/4$^{th,}$ punctures absent near sutural margin (EL/EW 245/95). Abdomen: Male sixth visible sternite slightly concave along distal margin; aedeagus, phallic apex as in Fig. 105.

V a r i a t i o n : Size: Length 3.5-5.5 mm; width 1.7-2.4 mm. Other than body size, the available specimens were quite homogeneous.

N a t u r a l h i s t o r y : Specimens were collected during November and December, one at 405 m.

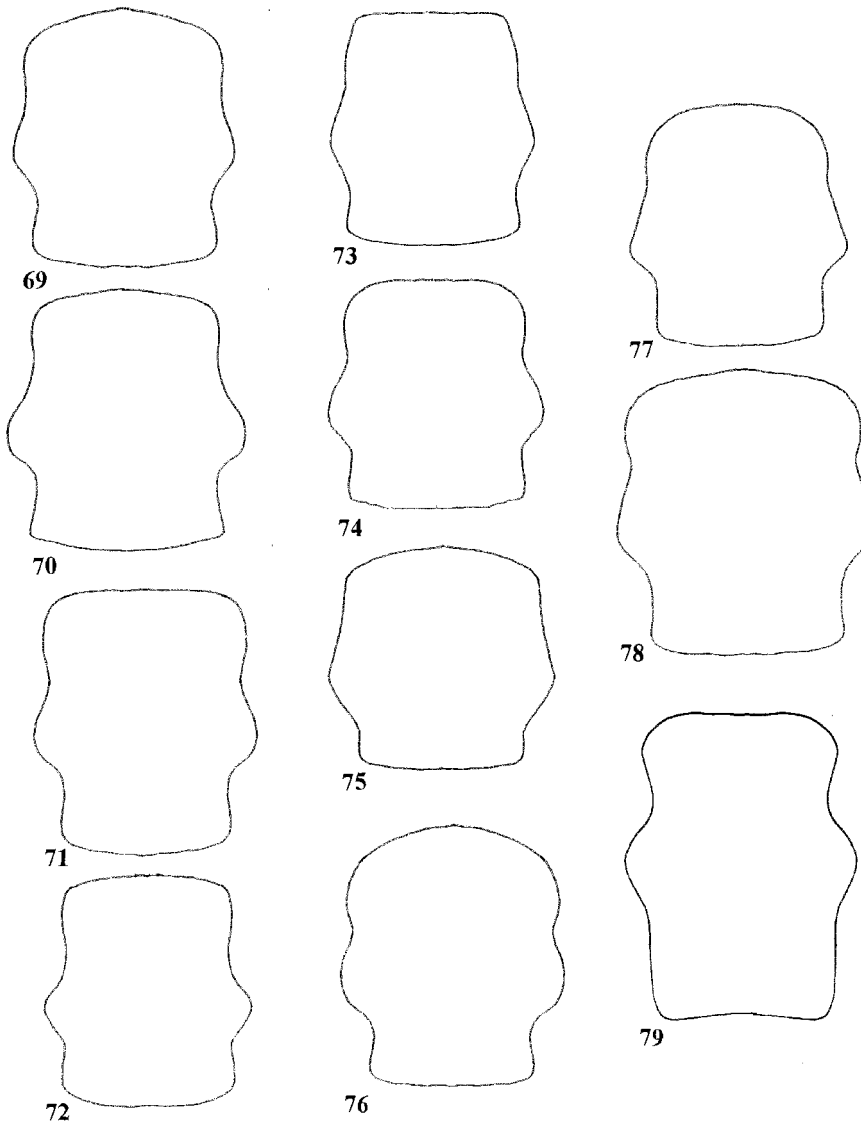
D i s t r i b u t i o n (Fig. 94): In addition to the lectotype, I examined 4 specimens: French Guiana: **Subdivision Saint-Georges**, 1 km du bourg vers Olapoque, 23-25-X-2006, Malaise trap, Ph. Cerdan. Bolivia: **Departamento de Santa Cruz**, 3.7 km SSE Buena Vista, Hotel Fauna & Flora, 17°29.949'S 63°33.152'W, 405 m, 15-XI-2001, tropical transition forest, M. C. Thomas & B. K. Dozier. Brazil: **Estado do Goiás**, Mineiro, ?-?- 1912, H. Donckier; **Estado do Rio do Janeiro**, Nova Briburgo. Specimens are deposited in FSCA, MNHN, and WOPC.

## The *M. irrorata* species group

The one species in this group is characterized by having extraordinarily long elytral setae, the elytral punctures are broadly pigmented, and the hind body is subovoid. This species occurs in Bolivia and Brazil.

### *Muisca irrorata* (GORHAM, 1877) (Figs 27, 54, 94, 102, 129)

*Pelonium irroratum*, GORHAM, 1877: 422. Lectotype: Gender not known. Here designated. Amazon, Bates (BMNH). Paralectotypes: 2 specimens. Amazon, Bates (one specimen severely damaged) (MNHN) Gorham's description provides evidence that he examined more than one specimen, but he did not specify which one should be the name barer of this nominal species. Therefore, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype for this nominal species. Brazil, CORPORAAL 1950: 281.




**Figs 69-79**: Pronota. (**69**) *M. adamanta*. (**70**) *M. agma*. (**71**) *M. biordinis*. (**72**) *M. bitaeniata*. (**73**) *M. malakela*. (**74**) *M. nigrosignata*. (**75**) *M. peruviana*. (**76**) *M. segilla*. (**77**) *M. variabilis*. (**78**) *M.* zona. (**79**) *M. testacea*.

D i a g n o s i s : The extraordinarily stout setae on the elytral disc and the subovoid hindbody will distinguish the members of this species from congeners.

R e d e s c r i p t i o n : Size: Length 5.8 mm; width 3.0 mm. Form: As in Fig. 129. Color: Mostly testaceous, capitulum and pterothorax black, and elytra infuscated near

mesoscutellum, elytral asetiferous punctations fuscous. Head: Funicular antennomeres subfiliform, capitulum longer than combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 27), antennomere 11 obovate; frons narrower than width of eye (EW/FW 32/25). Thorax: Pronotum (Fig. 54) quadrate (PW/PL 95/95), side margin with slightly developed tubercle, disc coarsely punctate; elytra subovoid, elytral asetiferous punctation randomly distributed, broadly pigmented, and extend to elytral apical 4/5$^{th}$ (EL/EW 220/95). Abdomen: Male 6$^{th}$ visible sternite slightly concave along distal margin; aedeagus, phallic apex as in Fig. 102.

Variation: Size: Length 4.0-5.5 mm; width 2.0-2.8 mm. In one specimen, the elytral disc is more infuscated.

Natural history: The specimen from Bolivia was collected in October, at 370 m.

Distribution (Fig. 94): In addition to the 3 types, I examined 6 specimens: Bolivia: **Departamento de Santa Cruz**, 3.7 km SSE, Buena Vista, Hotel Flora & Fauna, 17°29. 949'S 63°33.152'W, tropical transition forest, M. C. Thomas & B. K. Dozier; Poterillo del Guenda, 17°40'S 53°27' W, Provincia Andres Ibañes, 16-22-X-2006, 370 m, Wappes, Nearns & Eya. Brazil: **Estado do Amazonas**, Amazonas; **Estado do Pará,** Santarém. Specimens are deposited in ACMT, BMNH, MNHN, and WOPC.

## The *M. angulicollis* species group

The 2 species of this group are characterized by having small eyes. Their geographic distribution involves Colombia and Venezuela.

### *Muisca angulicollis* (CHEVROLAT, 1876) (Figs 18, 55, 94, 108, 135)

*Pelonium angulicolle* CHEVROLAT, 1876: 41. Lectotype. ♀. Here designated. Colombia, La Lucera, ?-X-?, 8800 feet, Steihelli (MNHN). Chevrolat does not indicate the number of specimens upon which he based his description. To fix this species name to a primary type specimen, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype. CORPORAAL 1950: 285.

Diagnosis: The members of this species resemble superficially those of *M. menda*, but *M. angulicollis* specimens differ in that the pronotal disc is punctate at the midline, which is not the case in *M. menda* specimens.

Redescription: Size: Length 8.0 mm; width 3.0 mm. Form: As in Fig. 135. Color: Castaneous, except each elytron with 3 faintly visible brown spots behind the middle of the disc. Head: Funicular antennomeres subfiliform, becoming progressively shorter and more triangular, capitulum about as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 oblong triangular (Fig. 18), antennomere 11 obovate; eyes small; frons wider than width of eye (EW/FW 25/50). Thorax: Pronotum (Fig. 55) slightly oblong (PW/PL 110/120), side margin with well-developed tubercle, disc coarsely punctate; elytral asetiferous punctation profusely distributed throughout elytral discs (EL/EW 240/100). Abdomen: Pygidium subquadrate; distal margin of 6$^{th}$ visible sternite slightly concave medially; aedeagus, phallic apex as in Fig. 108.

Variation: Size: Length 5.5-8.0 mm; width 2.2-3.0 mm. The faintly developed elytral spots vary in expression and may be absent.

Natural history: Specimens were captured during January through August at altitude ranging from 1700 to 2850 m.; most were taken in a Malaise trap.

D i s t r i b u t i o n (Fig. 94): In addition to the lectotype, I examined 15 specimens: Colombia: **Departamento de Boyaca**, SFF Iguaue Cabaña, 5°25'N 73°27'W, 21-VI-6-VII-2001, P. Reina; SFF Iguaque La Planada, 5°25'N 73°27'W, 7-I-2001-21-I-2001, 2850 m, Malaise, P. Reina; SSF Iguaque, La Planada, 13-V-2000, 2850 m, Malaise, P. Reina; idem, 26-VI-13-VII-2000, P. Reina; **Departamento de Magdalena**, PNN, SN de Santa Marta, El Ramo, 10°48'N 73°39W, 16-31-VIII-2000, 2500 m, J. Cantillo; idem, 22-XI-15-15-XII-2000, Malaise, J. Cantillo; idem, 15-VI-2-VII-2001, 1700 m, J. Cantillo; San Lorenzo, 41 km S Santa Marta, 2-V-1973, 7000 feet, Campbell & Howden; **Departamento de Cauca**, 15 miles E Silvia, 15-VII-1970, H. & A. Howden; **Departamento de Norte de Santander**, 30 km S Chinacota, 14-V-1974, 2600 m, H. & A. Howden. Specimens are deposited in CMNC, JNRC, and WOPC.

### *Muisca menda* OPITZ nov.sp. (Figs 28, 56, 94, 136)

Holotype: ♀. COLOMBIA, Cundinamarca, PNN Chingaza, Bosque Palacio 4°31' N 73°45'W, 3930 m Malaise 17.I-4.II.2001, E. Niño (FSCA).

D i a g n o s i s : The members of this species resemble superficially those of *M. angulicollis*, but *M. menda* specimens differ in that the pronotal disc is not punctate at the midline. The pronotal midline is clearly punctate in specimens of *M. angulicollis*.

D e s c r i p t i o n : Size: Length 6.0 mm; width 2.0 mm. Form: As in Fig. 136. Color: Castaneous, except elytral disc with brown blotches in posterior 1/2. Head: Funicular antennomeres subfiliform, capitular antennomeres 9 and 10 triangular (Fig. 28), antennomere 11 obovate; eyes small; frons wider than width of eye (EW/FW 15/43). Thorax: Pronotum (Fig. 56) quadrate (PW/PL 82/82), side margin with well-developed tubercle, disc widely subglabrous and undulate at middle; elytral asetiferous punctation substriate, punctures extend to elytral apical 4/5$^{th}$ (EL/EW 260/70). Abdomen: Pygidium scutiform.

N a t u r a l h i s t o r y : The holotype was collected between January 17 and February 4, in a Malaise trap set at 2930 m.

E t y m o l o g y : The specific epithet, *menda* (= blemish), is a Latin noun. I refer to the brown blemish-like patches on the elytral disc.

D i s t r i b u t i o n (Fig. 94): This species is known from Colombia.

### The *M. fera* species group

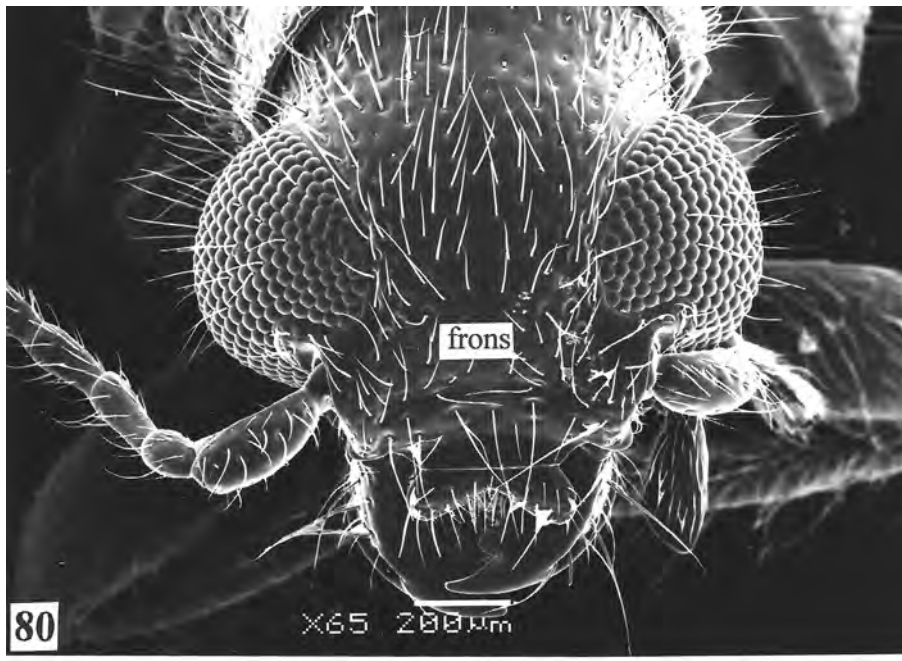
The quantity of elytral asetiferous punctures are significantly reduced in the two members of this group. The species occur in Costa Rica and Peru.

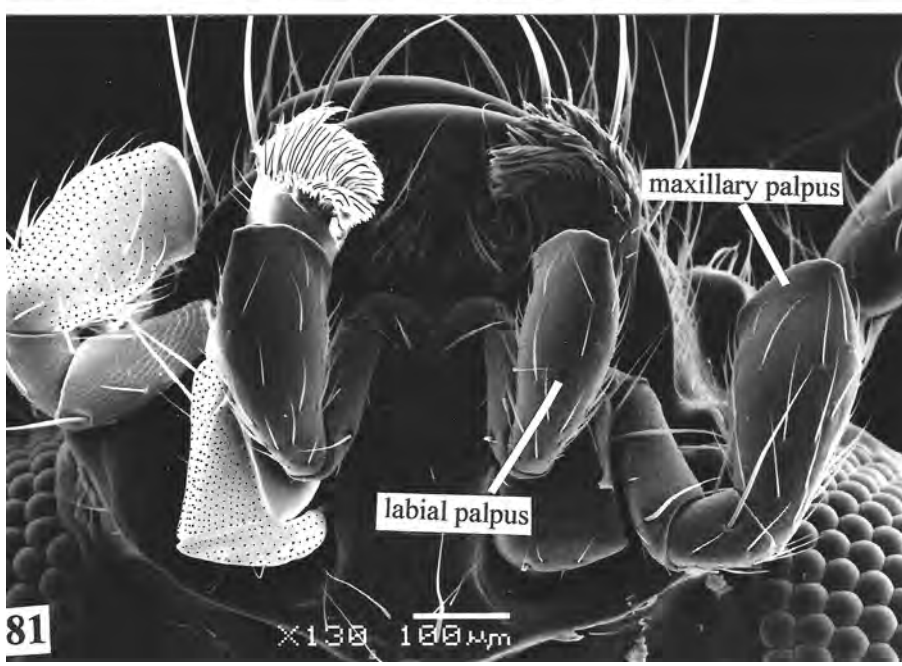
### *Muisca fera* (WOLCOTT, 1927) (Figs 20, 59, 95, 106, 133)

*Muisca fera* WOLCOTT, 1927: 97. Holotype. ♂. Turrialba, Costa Rica, Schild & Burgdorf USNM Type No. 40864 (USNM). CORPORAAL 1950: 280. Allotype: Costa Rica: **Provincia de Cartago**, Turrialba, Schild & Burgdorf (USNM).

D i a g n o s i s : *Muisca fera* specimens may be distinguished from those of its sister species, *M. signa* by markings of the elytral disc In *M. fera* specimens each elytron shows two black spots near the humeral angle and a curvate black fascia at the center of the disc. In *M. signa* specimens the elytral dark markings are more linear and angular. Also, *M. fera* specimens do not show two paralateral dark lines on the pronotal disc. Such lines are present in *M. signa* specimens.

R e d e s c r i p t i o n : Size: Length 6.5 mm; width 2.2 mm. Form: As in Fig. 133. Color: Light castaneous, except each elytron with 2 black spots in humeral region and




**Figs 80-81**: Various organs. (**80**) *M. octonotata*, head. (**81**) *M. octonotata*, mouthparts.

curvate black fascia at middle of disc. Head: Funicular antennomeres subfiliform, capitulum about as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 oblong triangular (Fig. 20), antennomere 11 obovate; frons as wide as width of eye (EW/FW 27/27). Thorax: Pronotum (Fig. 59) oblong (PW/PL 87/100), side margin with well-developed tubercle, disc subglabrous at middle; number of elytral asetiferous punctation reduced, punctures striate, prominent along sides of at basal 5$^{th}$ just beyond discal middle, single row of punctures at basal ½ of sutural margin (EL/EW 200/65). Abdomen: Pygidium subquadrate, distal margin strongly concave; 6$^{th}$ visible sternite doubly incised; aedeagus phallobase wide in basal half, tapered to lobe apices, phallic apex triangular (Fig. 106).

V a r i a t i o n : Size: Length 4.8-6.5 mm; width 1.3-2.2 mm. Other than body size, the available specimens are quite homogeneous.

N a t u r a l h i s t o r y : One specimen was collected in June at 760 m, another on a "light sheet" at 1500 m.

D i s t r i b u t i o n (Fig. 95): In addition to the 2 types, I examined one specimen: Costa Rica: **Provincia de Alajuela,** 10°42'65"N 65°02'43"W, Hotel Alberque Heliconias, 25-27-VI-2001, J. & A. Rifkind, P. Gum, I. Lopez. Specimens are deposited in JNRC and USNM.

### *Muisca signa* OPITZ nov.sp. (Figs 19, 57, 94, 107, 134)

Holotype: ♂. Pérou (Peru), Huambo, M. de Mathan, IV$^{e}$Trim.1889 (MNHN).
Paratypes: 5 specimens. Peru: **Provincia de Caylloma**, Huambo, ?-?-1889, M. de Mathan (MNHN, 2; WOPC, 2); **Provincia de Cusco,** Cusco District, Kosñipata Valley, Cock of the Rock Lodge, 71°32'44.6"W13°03'21.8"S, 20-XI-15-XII-2009, light sheet, 1500 m, Mendel, H. & Barklay, M. V. L. (BMNH, 1).

D i a g n o s i s : *Muisca signa* specimens show two paralateral dark lines on the pronotal disc. These lines are absent in *M. fera* specimens.

D e s c r i p t i o n : Size: Length 5.0 mm; width 2.0 mm. Form: As in Fig. 134. Color: Castaneous, except pronotal disc with two black lines and elytra bicolorous, elytral admixture of brown and yellow markings, disc mostly brown in basal 1/2, mostly yellow in distal 1/2. Head: Funicular antennomeres subfiliform, capitular antennomeres 9 and 10 triangular (Fig. 19), antennomere 11 obovate; frons wider than width of eye (EW/FW 23/30). Thorax: Pronotum (Fig. 57) slightly oblong (PW/PL 70/83), side margin with well-developed tubercle, disc coarsely punctate at sides, widely subglabrous at middle; number of elytral asetiferous punctation reduced, punctures striate and extend to elytral apical 3/4$^{th}$ at sides, punctures absent for most of region near sutural margin (EL/EW 210/65). Abdomen: Pygidium subquadrate; 6$^{th}$ visible sternite concave in distal margin; aedeagus, phallic apex as in Fig. 107.

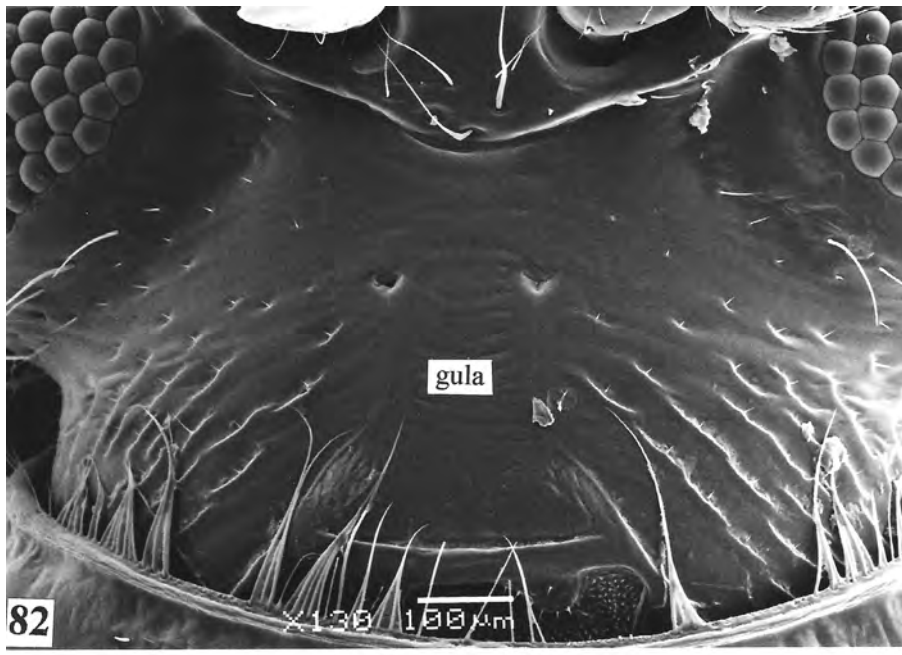
V a r i a t i o n : Size: Length 4.5-7.0 mm; width 1.7-2.3 mm. Other than body size, the available beetles are quite homogeneous.

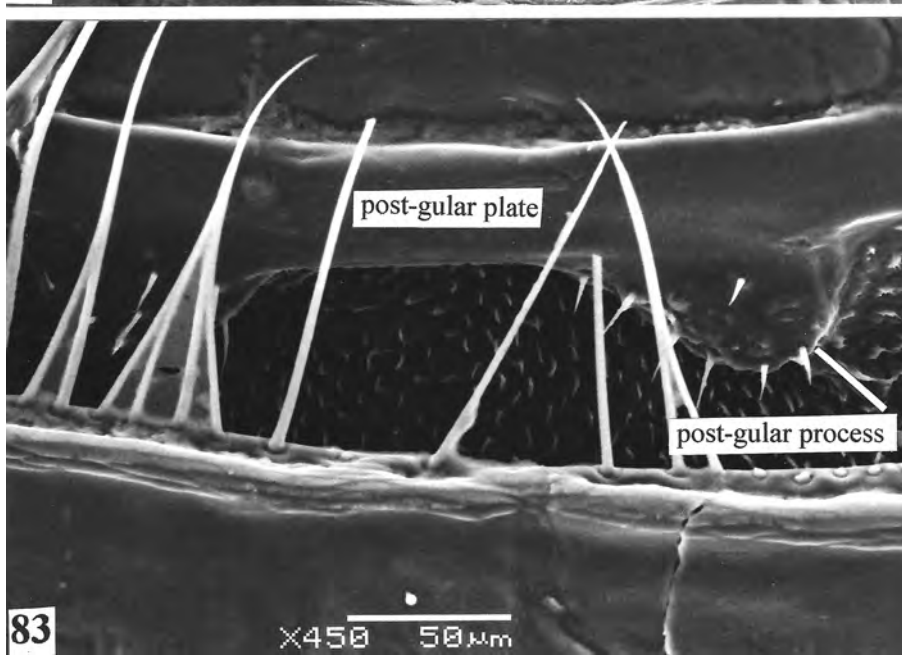
E t y m o l o g y : The specific epithet, *signa*, is a Latin noun that stems from *signum* (= mark). I refer to the interesting color marks on the elytral disc.

D i s t r i b u t i o n (Fig. 94): This species is known from Peru.

### The *M. maculosa* species group

The two species that comprise this group have the pronotal disc cribrate. They are known from Brazil.




**Figs 82-83**: Various organs. (**82**) *M. octonotata*, head, ventral view. (**83**) *M. octonotata*, forebody, ventral view.

### *Muisca hexa* OPITZ nov.sp. (Figs 29, 58, 94, 137)

Holotype: ♀. Brézil, Rio de Janeiro, 1883, P. Germain (MNHN).
Paratypes: 2 specimens. Brazil: **Estado do Rio de Janeiro**, Rio de Janeiro, ?-?-1883, P. Germain (MNHN, WOPC).

D i a g n o s i s : *Muisca hexa* specimens may be distinguished from those of its sister species, *M. maculosa*, by coloration of the pronotal disc. In *M. hexa* specimens the pronotal disc is uniformly castaneous. In *M. maculosa* specimens the pronotal disc shows two brown maculae.

D e s c r i p t i o n : Size: Length 6.5 mm; width 2.5 mm. Form: As in Fig. 137. Color: Castaneous, except thoracic sternum black, elytral disc with 4 mall black spots, and elytral apex black. Head: Funicular antennomeres subfiliform progressively more triangular, capitulum longer than combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 29), antennomere 11 obovate; eyes coarse and bulging, frons wider than width of eye (EW/FW 30/35). Thorax: Pronotum (Fig. 58) oblong (PW/PL 90/110), side margin with well-developed tubercle, punctation distributed throughout disc; elytral asetiferous punctation striate to distal 3/4$^{th}$ (EL/EW 255/75). Abdomen: Pygidium scutiform.

V a r i a t i o n : Size: Length 4.3-7.0 mm; width 2.0-2.5 mm. Other than body size, the available specimens are quite homogeneous.

E t y m o l o g y : The specific epithet, *hexa*, stems from the Greek *hex* (= six). I refer to the 6 black punctations near the elytral sutural margin.

D i s t r i b u t i o n (Fig. 94): This species is known only from Brazil.

### *Muisca maculosa* (GORHAM, 1877) (Figs 22, 62, 96, 109, 138)

*Muisca maculosa* (GORHAM), 1877: 424. Lectotype. ♂. Brazil, Rio Jan., Fry (BMNH) CORPORAAL 1950: 282. Paralectotypes: Two. Brazil: **Estado do Rio de Janeiro**, Rio de Janeiro, Fry (BMNH; MNHN) (forebody missing in paralectotypes).

D i a g n o s i s : *Muisca maculosa* specimens may be distinguished from those of its sister species, *M. hexa*, by coloration of the pronotal disc. In *M. maculosa* specimens the pronotal disc shows 2 brown maculae. In *M. hexa* specimens the pronotal disc is uniformly castaneous.

R e d e s c r i p t i o n : Size: Length 6.0 mm; width 2.0 mm. Form: As in Fig. 138. Color: Light castaneous, except frons and epicranium dark castaneous, pronotal disc with 2 large black maculae, and each elytron with 4 black spots. Head: Funicular antennomeres decreasing in length towards capitulum, capitulum much longer than combined length of funicular antennomeres, capitular antennomeres 9 and 10 oblong triangular (Fig. 22), antennomere 11 obovate; frons as wide as width of eye (EW/FW 29/29). Thorax: Pronotum (Fig. 62) quadrate (PW/PL 90/90), side margin with well-developed tubercle, disc cribrate; elytral asetiferous punctation striate, prominent at basal 3/4$^{th}$ (EL/EW 250/70). Abdomen: Pygidium subquadrate, distal margin strongly concave; 6$^{th}$ visible sternite concave in posterior margin; aedeagus phallobase very weakly sclerotized, phallic apex as in Fig. 109.

V a r i a t i o n : Size: Length 5.0-6.0 mm; width 1.8-2.0 mm. Other than body size, the available specimens are quite homogeneous.

N a t u r a l h i s t o r y : A non-type specimen was collected during December.

D i s t r i b u t i o n (Fig. 96): In addition to the 2 types, I examined 2 specimens: Brazil: **Estado do Rio de Janeiro**, Rio de Janeiro; Tijuca, ?-XII-1884, E. Gounelle. Specimens are deposited in BMNH, MNHN, and WOPC.

## The *M. mestolinea* species group

In this species group, the male pygidium is deeply concave at its posterior margin. Geographically, these species may be found in Colombia and Ecuador.

### *Muisca mestolinea* OPITZ nov.sp. (Figs 32, 63, 96, 110, 140)

Holotype: ♂. ECUADOR, COTOPAXI, LAS PAMPAS, 12 JUN 1997, G. ONORE (QCAZ).
Paratypes: 23 specimens. Ecuador: **Provincia de Cotopaxi**, Las Pampas, 26-IV-1997, 1500 m, G. Onore (QCAZ, 1); N of San Francisco de los Pampas, vicinity Rio Esmeraldas, 14-15-V-1993, 4400-5000 feet, Mercury vapor light, L. Herman (AMNH, 1); **Provincia de Pichincha**, Alluriquín, 26-I-1985, M. Jiménez (QCAZ, 1); Rio Mindo, 3-IV-2001, F. T. Hovore (JNRC, 1); Mindo, 26-I-2004, F. T. Hovore (WOPC, 1); Tinalandia, 2-XI-1983, L, Huggert (WOPC, 3); U del Toachi, Cuesta del Gallinazo, 6-III-1997, 950 m, G. Onore (WOPC, 1); **Provincia de Bolivar**, Balzapamba, ?-III-IV-1894, M. de Mathan (MNHN, 10; WOPC, 4).

D i a g n o s i s : *Muisca mestolinea* specimens may be distinguished from those of its sister species, *M. anachyma*, by coloration of the elytral disc. In *M. mestolinea* specimens the elytral disc shows 4 dark brown lines. In *M. anachyma* specimens the elytral disc is nearly uniformly castaneous with a faint indication of 3 punctiform infuscations. Also, the sutural margin is dark brown in specimens of *M. mestolinea*, which is not the case in those of *M. anachyma.*

D e s c r i p t i o n : Size: Length 5.5 mm; width 2.0 mm. Form: As in Fig. 140. Color: Mostly light castaneous; pronotum with 2 paralateral black lines; elytral sutural margins darkened and each disc with 4 black short lines. Head: Funicular antennomeres subfiliform, capitulum about as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 32), antennomere 11 obovate; frons wider than width of eye (EW/FW 20/30). Thorax: Pronotum (Fig. 63) oblong (PW/PL 73/85), side margin with well-developed tubercle, disc subglabrous at midline; elytral asetiferous punctation minute, striate to distal 2/3$^{rd}$ (EL/EW 230/60). Abdomen: Pygidium subquadrate; posterior margin of 6$^{th}$ visible sternite concave at middle; aedeagus, phallic apex as in Fig. 110.

V a r i a t i o n : Length 5.2-7.3 mm; width 2.0-2.7 mm. The infuscation of the sutural margin varies in expression.

N a t u r a l h i s t o r y : Specimens were collected from April to June, one with a Mercury vapor light set at an altitude between 1341-1524 m. One specimen was collected at 950 m.

E t y m o l o g y : The specific epithet, *mestolinea*, is a compound name that stems from the Greek *mesto* (= filled) and the Latin *linea* (= line). The name refers to the dark lines on the dorsum of this beetle.

D i s t r i b u t i o n (Fig. 96): This species is known from Ecuador.

### *Muisca omma* OPITZ nov.sp. (Figs 33, 64, 96, 111, 141)

Holotype: ♀. Leticia, Amazonas, 700', Colombia, July 10, 1970, H. A. Howden (CMNC).
Paratypes: 14 specimens. Colombia: **Departamento de Amazonas**, Leticia, 10-VII-1970, 700 feet, H. A. Howden (WOPC, 1). Ecuador: **Provincia de Orellana**, 1km S Okone Gare Camp,

Reserva Etnica Waorani, 20-I-1994, 220-250 m, T. L. Erwin (USNM, 1), idem, 20-VI-1994, 220-250 m, T. L. Erwin (USNM, 1), idem, 4-X-1994, 220-250 m, T. L. Erwin (USNM, 2; WOPC, 1), idem, 7-X-1995, 220-250 m, T. L. Erwin (USNM, 1; WOPC, 2), idem, 9-X-1995, 220-250 m, T. L. Erwin (USNM, 2; WOPC, 1); **Provincia de Sucumbío**, 9 km E Lumbaqui, 7-8-VIII-1998, W. Opitz (WOPC, 1). "Amazonas" Bates (MNHN, 1).

D i a g n o s i s : Within the *M. mestolinea* species group, only specimens of *M. omma* have the elytral disc mostly dark brown.

D e s c r i p t i o n : Size: Length 4.0 mm; width 1.5 mm. Form: As in Fig. 141. Color: Light castaneous, except pronotal disk with 2 brown punctiform spots and elytra bicolorous, elytral disc dark brown in basal 2/3rd, except each elytron with testaceous spot stemming from epipleural margin, distal 1/3rd of elytral disc testaceous. Head: Funicular antennomeres subfiliform, capitular antennomeres 9 and 10 triangular (Fig. 33), antennomere 11 obovate; frons wider than width of eye (EW/FW 18/27). Thorax: Pronotum (Fig. 64) slightly oblong (PW/PL 65/70), side margin with well-developed tubercle, disc widely subglabrous at middle; elytral asetiferous punctation striate, punctures extend to elytral apical 3/4th at sides and absent for most of region near sutural margin (EL/EW 185/50). Abdomen: Pygidium scutiform; aedeagus, phallic apex as in Fig. 111.

V a r i a t i o n : Size: Length 4.0-5.5 mm; width 1.5-1.8 mm. Other than body size the available beetles are quite homogeneous.

N a t u r a l h i s t o r y : The available specimens were collected in January, June, July, and October, at altitudes ranging from 214 to 250 m.

E t y m o l o g y : The specific epithet, *omma* (= eye), is a Greek noun. I refer to the spots on the pronotal disc.

D i s t r i b u t i o n (Fig. 96): This species is known from Colombia and Ecuador.

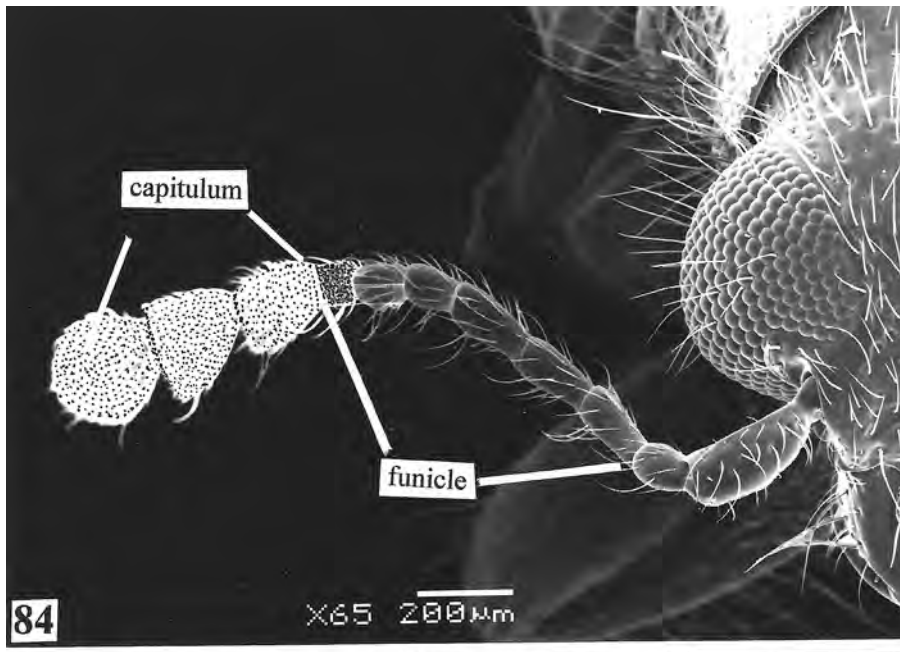
### *Muisca anachyma* OPITZ nov.sp. (Figs 33, 65, 96, 139)

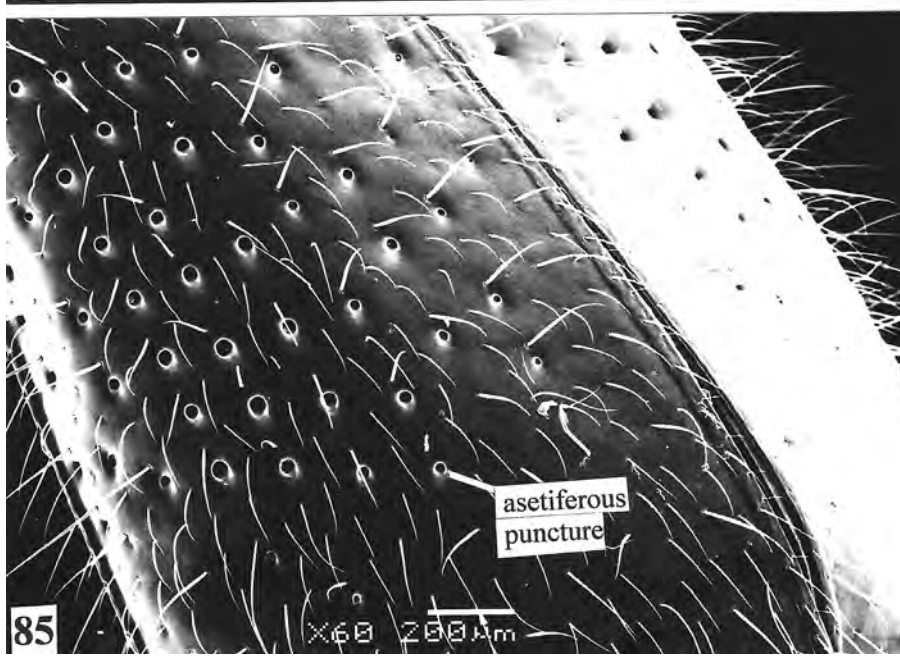
Holotype: ♂. COLOM. Magd., 7000', San Lorenzo, 41 km S Sta. Marta, V-2-1973, Campbell & Howden (CNCI).

D i a g n o s i s : *Muisca anachyma* specimens may be distinguished from those of its sister species, *M. mestolinea*, by coloration of the elytral disc. In *M. anachyma* specimens, the elytral disc is nearly uniformly light castaneous, each elytron with a faint indication of 3 punctiform infuscations. In *M. mestolinea* specimens, the elytral disc shows 4 dark brown lines. Also, the sutural margin is castaneous in specimens of *M. anachyma.* The margin is dark brown in specimens of *M. mestolinea*.

D e s c r i p t i o n : Size: Length 5.5 mm; width 2.3 mm. Form: As in Fig. 139. Color: Mostly light castaneous; each elytron with 3 obliquely positioned faint spots behind middle. Head: Funicular antennomeres filiform, capitulum shorter than combined length of funicular antennomeres, capitular antennomeres 9 and 10 long-triangular (Fig. 23), antennomere 11 obovate; frons wider than width of eye (EW/FW 25/40). Thorax: Pronotum (Fig. 65) quadrate (PW/PL 110/110), side margin with well-developed tubercle, punctation distributed throughout disc; elytral asetiferous punctation minute, interstitial spaces wide, substriate but diminished to elytral apex (EL/EW 340/95). Abdomen: Pygidium subquadrate, posterior margin concave.

N a t u r a l h i s t o r y : The holotype was collected during May, at 2134 m.




**Figs 84-85**: Various organs. (**84**) *M. octonotata*, antenna. (**85**) *M. octonotata*, elytra.

E t y m o l o g y : The specific epithet, *anachyma*, is a Greek adjective that means "expanse". The name refers to the comparatively large width of the elytral interstitial spaces.

D i s t r i b u t i o n (Fig. 96): This species is known from Colombia.

### The *M. octonotata* species group

There are 5 members of this species group that are characterized by having an expanded antennal funicle. The composite geographic distribution of these species involves Panamá and Colombia.

### *Muisca heppneri* OPITZ nov.sp. (Figs 30, 60, 95, 112, 142)

Holotype: ♀. PANAMÁ: Pmá. Prov., Cerro Campana, 820 m, 8°40'N, 79°56'W. A second label reads: 5 Sept. '77, H. P. Stockwell (FSCA). Paratypes: 19 specimens. Costa Rica: **Provincia de Guanacaste**, 9 km S Santa Ceciliam Parque Nacional Guanacaste, 24-VIII-1992, P Rios (WOPC, 1). Panamá: **Provincia de Veragua**, Santa Fe, Alto Piedra, 11-16-VI-2010, 850 m, J. B. Heppner (FSCA, 1); **Provincia de Panamá**, Cerro Campana, 8°40'N, 79°56'W, 850 m, 2-IX-1972, H. Stockwell (WOPC, 2); idem, 5-IX-1977, H. P Stockwell (WOPC, 1); idem, 18-VII-1970, H. P. Stockwell (WOPC, 1); idem, 13-V-1978, 2700', C. W. & L. B. O'Brien & Marshall (WOPC, 5); idem, 18-VI-1976, W. E. Clark (WOPC, 5); idem, 16-VII-1976, W. Clark (WOPC, 1); idem, 6-V-1973, 454 m, O'Brien & Marshall (WOPC,1); idem, 29-VI-1974, L. & C. O'Brien, Marshall, & H. Stockwell (WOPC, 1).

D i a g n o s i s : *Muisca heppneri* specimens may be distinguished from those of its sister species, *M. lateripunctata*, by coloration near the elytral humeral angle. In *M. heppneri* specimens there are 2 distinct black maculae near the humeral angle. In *M. lateripunctata* specimens the humeral region is marked by 1 irregularly-shaped brown macula.

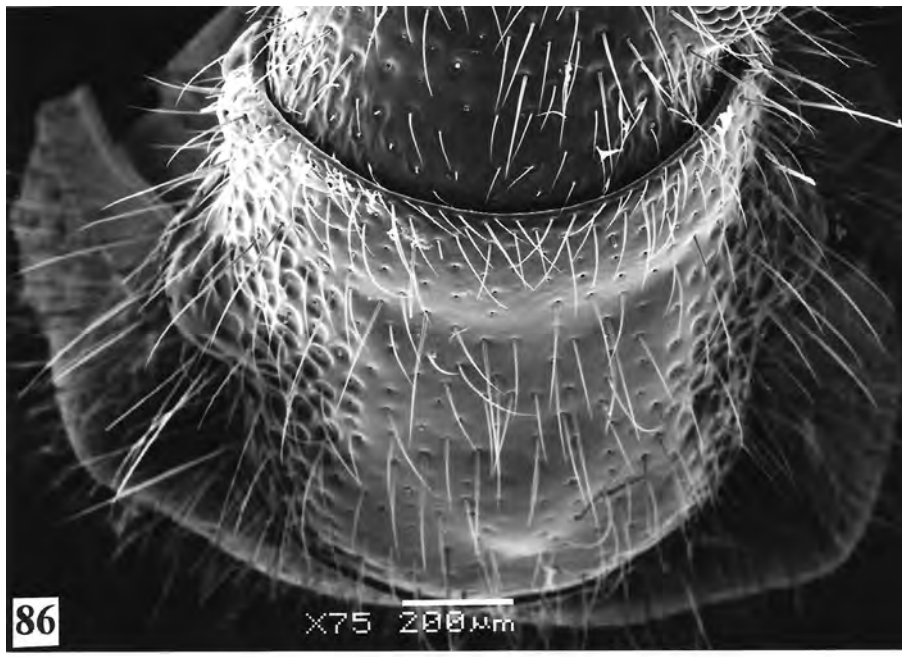
D e s c r i p t i o n : Size: Length 6.0 mm; width 2.5 mm. Form: As in Fig. 142. Color: Light castaneous, except each elytron with 2 black spots near the humeral angle and a black angular fascia at middle of disc. Head: Funicular antennomeres filiform, capitulum about as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 oblong triangular (Fig. 30), antennomere 11 obovate; frons wider than width of eye (EW/FW 30/35). Thorax: Pronotum (Fig. 60) oblong (PW/PL 95/115), side margin with well-developed tubercle, disc subglabrous at middle; elytral asetiferous punctation striate to distal 2/3$^{rd}$ (EL/EW 280/90). Abdomen: Pygidium subquadrate, posterior margin slightly concave; distal margin of 6$^{th}$ visible sternite broadly concave; aedeagus phallobase wide in basal half, tapered to lobe apices, phallic apex (Fig. 112) triangular.

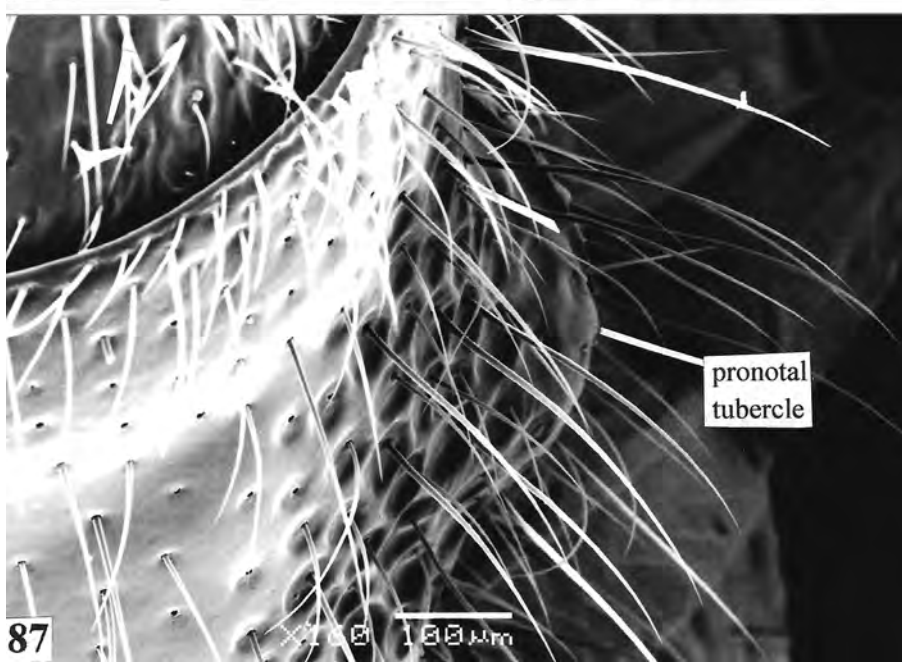
V a r i a t i o n : Size: Length 5.0-8.5 mm; width 1.5-3.0 mm. Other than body size the available beetles are quite similar in appearance.

N a t u r a l h i s t o r y : Specimens were collected during May through September at altitudes ranging from 800 to 850 m; most were taken with a beating sheet.

E t y m o l o g y : The specific epithet, *heppneri*, is a dedicative patronymic. It honors John B. Heppner for his many contributions to taxonomic entomology, among which is his dedication to field taxonomy.

D i s t r i b u t i o n (Fig. 95): This species is known only from Panamá.




**Figs 86-87**: Various organs. (**86**) *M. octonotata*, forebody. (**87**) *M. octonotata*, pronotum.

### *Muisca lateripunctata* (SCHENKLING, 1906) (Figs 66, 96, 113, 143)

*Pelonium lateripunctata* SCHENKLING, 1906: 314. Lectotype. ♂. Here designated. (Colombia, Boyaca), Muzo (SDEI). CORPORAAL 1950: 281. Paralectotype. 1 specimen. Colombia: Las Tibayer (SDEI). In his description Schenkling indicates that there was more than one specimen available to him, but he did not tag one of these to be the name baerer of this nominal species. Therefore, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype.

D i a g n o s i s : *Muisca lateripunctata* specimens may be distinguished from those of its sister species, *M. heppneri*, by coloration near the elytral humeral angle. In *M. lateripunctata* specimens the humeral region is marked by one irregularly shaped brown macula. There are 2 distinct black maculae near the humeral angle in *M. heppneri* specimens.

R e d e s c r i p t i o n : Size: Length 7.0 mm; width 2.5 mm. Form: As in Fig. 143. Color: Predominantly light castaneous, angular dark castaneous markings behind humeral angle and behind middle of elytral disc. Head: Funicular antennomeres filiform, capitulum about as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 oblong triangular, antennomere 11 obovate; frons wider than width of eye (EW/FW 30/35). Thorax: Pronotum (Fig. 66) oblong (PW/PL 70/100), side margin with well-developed tubercle, disc widely subglabrous at middle; elytral asetiferous punctation subseriate, puntures extend to elytral apical 3/4$^{th}$ (EL/EW 125/35). Abdomen: Pygidium subquadrate; 6$^{th}$ visible sternite broadly emarginate in posterior margin; aedeagus phallobase wide in basal half, narrow in distal half, phallobasic lobes slightly flared, phallic apex (Fig. 113) triangular, phallic plate with cross-plate.

D i s t r i b u t i o n (Fig. 96): This species is known only from Colombia. A specimen is deposited in SDEI.

### *Muisca magdalena* OPITZ nov.sp. (Figs 31, 67, 96, 144)

Holotype: ♀. COLOMBIA, Magdalena PNN, SN de Santa Marta, Bella Vista, 10°48'N 73°39'W, 1500 m, Malaise, 7.V-1-VI-2001, J. Cantillo (FSCA). Paratypes: 3 specimens. Colombia: **Departamento de Magdalena,** Magdalena PNN, SN de Santa Marta, Bella Vista, 10°48'N 73°39'W, 7.V-1-VI-2001, 1500 m, Malaise, J. Cantillo (WOPC, 1); idem, 22-X-7-XI-2001, 1500 m, Malaise, J. Cantillo (WOPC, 2).

D i a g n o s i s : Within the *M. octonotata* group, only in specimens of *M. magdalena* do we find the midelytral fascia fragmented into 4 punctiform components.

D e s c r i p t i o n : Size: Length 5.3 mm; width 2.0 mm. Form: As in Fig. 144. Color: Light castaneous, except each elytron with 6 black spots, 2 near the humeral angle and 4 near elytral middle. Head: Basal funicular antennomeres filiform, distal funicular antennomeres progressively shorter and more triangular, capitulum about as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 31), antennomere 11 globose; frons wider than width of eye (EW/FW 20/35). Thorax: Pronotum (Fig. 67) quadrate (PW/PL 83/83), side margin with well-developed tubercle, disc subglabrous at middle; elytral asetiferous punctation minute, striate to distal 2/3$^{rd}$ (EL/EW 250/60). Abdomen: Pygidium scutiform.

V a r i a t i o n : Length 5.0-6.0 mm; width 2.0-2.5 mm. Other than body size, the available beetles are quite homogeneous.

N a t u r a l h i s t o r y : Specimens were collected during May, June, October, and November, some in a Malaise trap, at altitudes ranging from 1500 to 1700 m.

E t y m o l o g y : The specific epithet, *magdalena*, constitutes a noun in apposition and refers to the type locality.

D i s t r i b u t i o n (Fig. 96): This species is known only from Colombia.

### *Muisca octonotata* (GORHAM, 1883) (Figs 1, 21, 61, 80-91, 95, 114, 145)

*Pelonium octonotatum* GORHAM, 1883: 191. Lectotype. ♂. Here designated. Panama, Volcan de Chiriqui, 2-3000 ft., Champion (BMNH). Paralectotype: 1 specimen. Panamá: **Provincia de Chiriquí**, Volcán de Chiriquí, 2-3000 ft., Champion (BMNH). CORPORAAL 1950: 2. In the original description there is indication that Gorham saw more than one specimen. However, he did not tag one to be the name barer of this nominal species. Therefore, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype.

D i a g n o s i s : Within the *M. octonotata* group, two punctiform black spots are found at the center of the elytral disc in specimens of *M. octonotata* and in those of *M. testaspilota*. However, in *M. octonotata* specimens the spots aligned in a straight line, across the elytron. The spots are more obliquely positioned in specimens of *M. testaspilota*.

R e d e s c r i p t i o n : Size: Length 7.5 mm; width 2.1 mm. Form: As in Fig. 145. Color: Light castaneous, except each elytron with 4 black spots, 2 near the humeral angle, 2 at middle of disc. Head: Basal funicular antennomeres filiform, distal funicular antennomeres progressively shorter towards capitulum, capitulum about as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 oblong triangular (Fig. 21), antennomere 11 obovate; frons wider than width of eye (EW/FW 25/33). Thorax: Pronotum (Fig. 61) oblong (PW/PL 87/105), side margin with well-developed tubercle, disc subglabrous at middle; elytral asetiferous punctation striate to distal 2/3$^{rd}$ (EL/EW 280/80). Abdomen: Pygidium subquadrate, distal margin sublinear; posterior margin of 6$^{th}$ visible sternite broadly concave; aedeagus phallobase wide in basal half, tapered to lobe apices, phallic apex (Fig. 114) triangular.

V a r i a t i o n : Size: Length 4.0-7.0 mm; width 2-3.0 mm. Other than body size, the available specimens are quite homogeneous.

N a t u r a l h i s t o r y : Specimens were collected throughout the year at altitudes ranging from 700 to 2100 meters; some with a black light, but most in a Malaise trap. Montane cloud forests seem to harbor many of these beetles.

D i s t r i b u t i o n (Fig. 95): I examined 231 specimens: Costa Rica: **Provincia de Guanacaste**, Cacao Biological Station, 10°55'38"N 85°27'7", 11-VII-2000, on vegetation, J. Ashe, R. Brooks, Z. Falin; Southeast slopes of Volcán Cacao, 21-29-V-1991, 1000-1400 m, collector not noted; idem, ?-V-1990; idem, ?-VII-1989-?-III-1990, collector not noted; idem, VI-1990, collector not noted; idem, ?-VII-1989, collector not noted; idem, 25-IX-11-X-1990, 1000-1400 m, C. Chaves; Southwestern slope of Volcán Cacao, ?-V-1991, Elfin Rainforest, collector not noted; idem, 21-29-V-1991, F. Araya; idem, ?-XI-XII-1990, A. Guadamuz; idem, ?-XI-XII-1989, R. Blanco & C. Chavez; idem, ?-VII-1989, collector not noted; 9 km S Sta. Cecillia, ?-VI-1991, P. Rios, 700 m; Parque Nacional Guanacaste, 6-26-VI-1994, 1600 m, K. Taylor; **Provincia de Puntarenas**, Las Cruces Biological Station, 8°47.14'N 87°52.58'W, 40-V-2004, 1330 m, J. S. Ashe, Z. Falin, I. Hinojosa; Monteverde, ?-XII-1990, E. Bello; idem, Campbell's bullpen, 20-V-1993, Steve Lingafelter; idem, ?-IX-1992, 1040 m, Z. Fuentes; 23-VIII-13-IX-1995, 1670 m, E, Navarro; idem, 9-VII-1989. MV light, D. G. Furth; Estación Biológica Monteverde, 10°19'40" N 84°49'08"W, 9-VI-2001, 1540 m, at light, R. Anderson; Estación Biológica Las Alturas, 2 km NE Alturas, 08°56'56" N 82°50'01"W, 10-VII-1999, 1520 m, upper montane cloud forest, R. Anderson; Monteverde Reserve, 23-VIII-1987, at light, H. & A. Howden; Monteverde, Hotel Belmar, 6-IX-1998, C. W.& L. O'Brien; Monteverde, 4-6-VI-1980, E. Giesbert; Reserva de

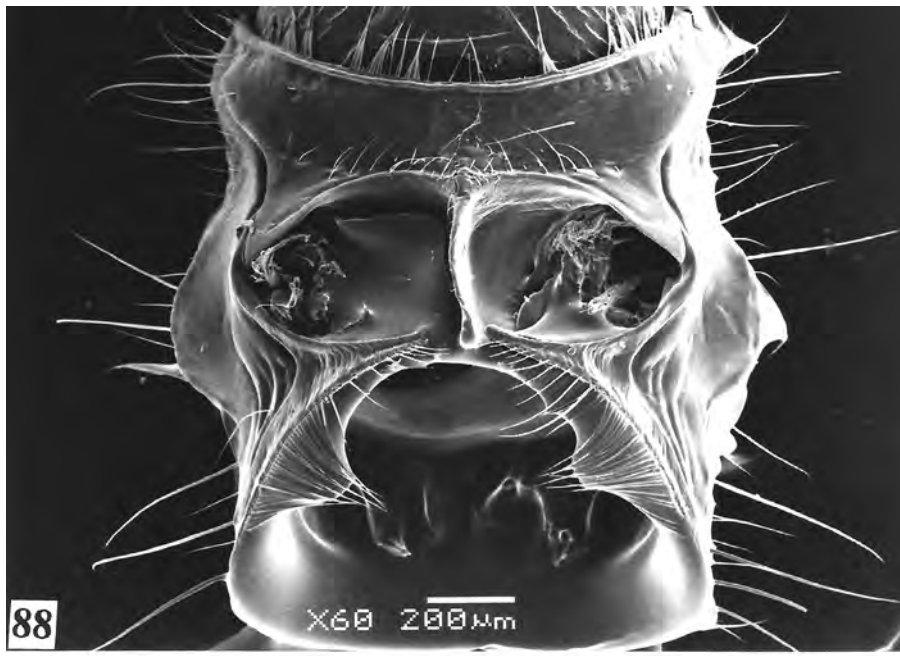
Monteverde, 27-29-V-1979, 5000 feet, J. M. & B. A. Campbell; idem, 4-6-VI-1980, E. Giesbert; idem, 27-II-1987, E. Giesbert; Estación Pittier, 13-IX-1995, 1670 m, E. Navarro; Las Tablas, 1.4 km SW Cerro Gemelos, 28-VII-7-VIII-1995, 1670 m, E. Navarro; Monteverde, 1-20-IX-1982, 1400 m, C. Nagano & M. Hayes; idem, 4-6-VI-1980, J. E. Wappes; idem, 24-VII-1990, 1500 m, black light, Meredith & Powell; idem, 20-V-1985, J. Doyen; idem, 19-V-1985, 1300 m, J. Chemsak; idem, 18-VIII-1987, 1500 H. & A. Howden; idem, 21-V-1979, H. & A. Howden; idem, 4-VI-1979, 1400 m, H. & A. Howden; idem, 24-V-1985, A. J. Gilbert; idem, 5-VII-1986, R. D. Cave; **Provincia de Cartago,** Rio Aquiares, near Santa Cruz, 9 km NW Turrialba, 15-V-1985, 1500 m, black light, J. Powel & O. Opler; Parque Nacional Tapanti, 9°45'.41"N 83°47'.5"W, 19-VII-2000, 1150 m, J. Sahe, R. Brooks, Z. Falin; **Provincia de San José**, 7 km N Varablanca at Cascada de la Paz, 24-VI-1992, B. Ratcliffe, M. Jameson; 2.4 km ENE San Gerando de Rivas, Cloudbridge Res. Cloudbridge North trail, 9°28.87'N 83°34.17'W, 11-VI-2004, 2000-2100 m, J. S. Ashe, Z. Falin. Panamá: **Provincia de Chiriquí**, 4 km S Jorge Arauz Biological Station, collection date not noted, Steve Lingafelter; Finca Hartmann, Trail coffee plantation, 8°.87685N 82°.73639W, 2-V-2013, 4853 feet, N. Franz. S. Flynn, Y. Aguirre; idem, 8°.86141N 82°.22829W, 28-V-2013, 6932 feet, N. Franz. S. Flynn, Y. Aguirre; idem, 8°.86141N 82°.74322W, 30-V-2013, 4853 feet, N. Franz. S. Flynn, Y. Aguirre; Fortuna Forest Reserve, Devil's Chin, 4.2 km S of STRI Ranger Station, 8°.69016N 82°.22829W, 25-V-2013, 4166 feet, N. Franz. S. Flynn, Y. Aguirre; Fortuna STRI Station, 8°.73464N 82°.24015W, 26-V-2013, 3775 feet, S. Flynn; Reserva La Fortuna, Estación Biológica, 08°43'18"N 82°14'17"W, 4-9-V-1999, 3900 feet, A. Gillogly & J. B. Woodley; idem, 27-28-VI-1996, 1150 m, Gillogly & Schaffer; 4 km E Boquete, Valle Palo Alto, 08°43'18"N 82°14'17"W, 29-VII-1999, J. Schaeffer; Volcán de Chiriquí, collection date not noted, 4000-6000 feet, Champion; Las Lagunas, 4 km W Hato del Volcán, 24-V-73, 1360 m, H. Stockwell; Fortuna, 08°44'N 82°15'W, 22-I-1977, H. Wolda; 4.7 km N Valle de las Minas, 3-8-VII-1997, J. Huether; Hartmans Finca, 4-7-VII-1997, Wappes & Morris; Totumas Lodge, 19-25-VI-2011, 1900 m, J. B. Heppner; Mount Totumas, NW Volcán, 24-30-V-2014, 1900, J. B. Hepner; Alto Lino, near Boquete, 18-V-1978, O'Briens & Marshall; Fortuna, 82°15'W, 08°44'N, 16-V-1978, O'Briens & Marshall; Las Lagunas, 22-VII-1976, W. E. Clark; 16 km N Hato del Volcán, 10-VIII-2000, beating roadside vegetation, intermix of lianas & verdure, W. Opitz; Las Lagunas, 27-IV-1973, G. Ekis; La Fortuna area, hydrological trail, 9-VI-1995, 1100 m, wet montane cloud forest, R. S. Anderson; Las Lagunas, 4 km W Hato del Volcán, 08°51'N 82°36'W, 9-23-V-1977, 1720 m, H. & A. Howden; **Provincia de Veraguas**, Alto Oledra, Santa Fe, 22-23-V-2014, J. B. Heppner; Specimens are deposited in ACMT, AMNH, ASUC, BMNH, CSCA, CNCI, CMNH, EMEC, FSCA, JMLC, JNRC, MNHN, USNM, WFBM, and WOPC.

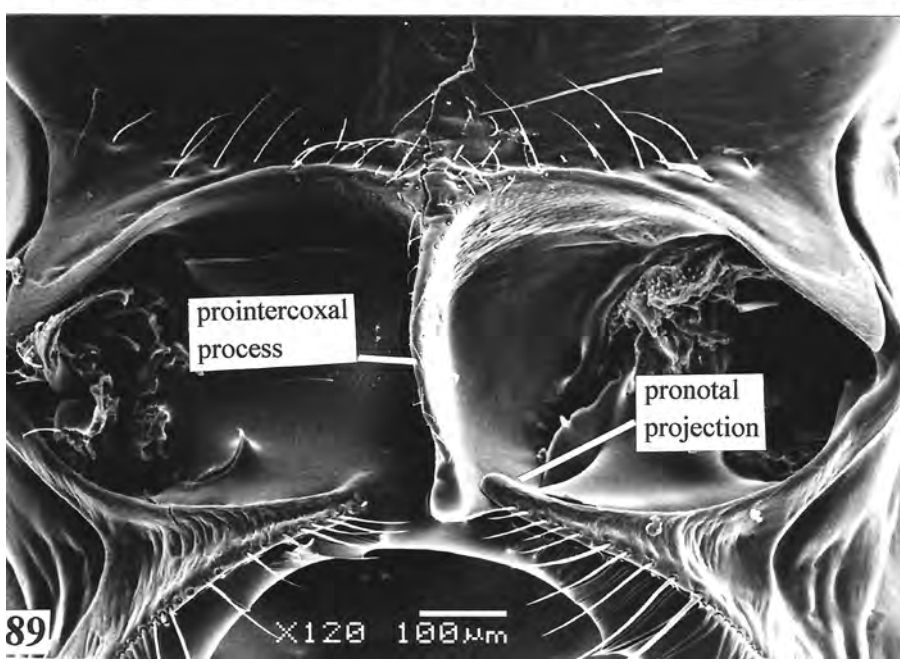
### *Muisca tetraspilota* (CHEVROLAT, 1876) (Figs 34, 68, 96, 115, 146 )

*Pelonium tetraspilotum* CHEVROLAT, 1876: 47. Lectotype. ♂. Here designated. Colombia, Ocaña, D. Landol (MNHN). CORPORAAL 1950: 290. Paralectotype. 1 specimen. Colombia: **Departamento de Norte de Santander**, Ocaña, D. Landol (MNHN). In his description Schenkling indicates that there was more than 1 specimen available to him, but he did not tag one of these to be the name barer of this nominal species. Therefore, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype.

D i a g n o s i s : Within the *M. octonotata* group, two punctiform black spots are found at the center of the elytral disc in specimens of *M. testaspilota* and in those of *M. octonotata*. However, in *M. testaspilota* specimens the spots are obliquely positioned across the elytral disc. In, *M. octonotata* specimens the spots are aligned in a straight line.

R e d e s c r i p t i o n : Size: Length 8.5 mm; width 3.2 mm. Form: As in Fig. 146. Color: Predominantly light castaneous, angular dark castaneous 4 markings on elytral disc one behind humeral angle, one projecting backwards from elytral anterior margin, and 2 black spots behind middle of elytral disc. Head: Basal funicular antennomeres filiform, distal funicular antennomeres increasingly wider towards capitulum, capitulum about as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 oblong triangular (Fig. 34), antennomere 11 obovate; frons wider than width of eye




**Figs 88-89**: Various organs. (**88**) *M. octonotata*, forebody, ventral view. (**89**) *M. octonotata*, prothorax, ventral view.

(EW/FW 35/50). Thorax: Pronotum (Fig. 68) slightly oblong (PW/PL 130/140), side margin with well-developed tubercle, disc widely subglabrous at middle; elytral asetiferous punctation subseriate, they extend to elytral apical 3/4th (EL/EW 370/120). Abdomen: Pygidium subquadrate; 6th visible sternite faintly emarginated in posterior margin; aedeagus, phallic apex (Fig. 115) triangular.

D i s t r i b u t i o n (Fig. 96): This species is known only from Colombia.

### The *M. testacea* species group

The species of this group do not share any unique characteristic, but are brought together for convenience. There are 11 species in this group, whose specimens have a variety of elytral markings. Geographically, this group exists in Colombia, Bolivia, Brazil, Ecuador, Peru, and Venezuela.

### *Muisca adamanta* OPITZ nov.sp. (Figs 40, 69, 97, 116, 147)

Holotype: ♂. BRAZIL, Minas Gerais, Pedra Azul, 800 m, XI-1974, Seabra & Oliveira (FSCA).
Paratypes: 2 specimens. Brazil: **Estado do Minas Gerais**, Pedra Azul, 800 m, XI-1974, Seabra & Oliveira (WOPC, 1); **Estado do Bahia**, S. Antonio da Barra, 11-XII-1888, Gounelle (MNHN, 1).

D i a g n o s i s : Within *Muisca* the antennal capitulum is black in specimens of *M. adamanta*, *M. testacea*, and in those of *M. variabilis.* But, in specimens of *M. adamanta*, the black coloration of the capitulum does not extend to funicular antennomeres, as it does in those of the other 2 aforementioned species.

R e d e s c r i p t i o n : Size: Length 5.5 mm; width 2.0 mm. Form: As in Fig. 147. Color: Testaceous, except capitulum and funicular antennomeres 5-6 dark brown. Head: Funicular antennomeres subfiliform, progressively shorter towards capitulum, capitulum longer than combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 40), antennomere 11 obovate; frons slightly wider than width of eye (EW/FW 25/30). Thorax: Pronotum (Fig. 69) quadrate (PW/PL 85/85), side margin with well-developed tubercle, disc uniformly punctate; elytral asetiferous punctation striate to distal 2/3rd of epipleural region, near sutural margin punctured end at about distal ½ (EL/EW 250/70). Abdomen: Pygidium scutiform; posterior margin of 6th visible sternite faintly concave; aedeagus, phallic apex as in Fig. 116.

V a r i a t i o n : Size: Length 4.7-6.0 mm; width 2.0-2.2 mm. Other than body size, the available specimens are quite homogeneous.

N a t u r a l h i s t o r y : Specimens were captured during November and December.

E t y m o l o g y : The trivial name, *adamanta*, is a Latin derivative from *adamas* (= like a diamond). I refer to the shape of the phallic apex.

D i s t r i b u t i o n (Fig. 97): Known from Brazil.

### *Muisca agma* OPITZ nov.sp. (Figs 35, 70, 96, 117, 148)

Holotype: ♂. Venezuela, Estado de Aragua, Estación Biológica Rancho Grande, 5-V-1973, at black light, G. Ekis (FSCA). Paratypes: 12 specimens. Venezuela: **Estado de Lara**, Sanare, ?-VII-1964, J. Maldonado (WOPC, 1); **Distrito Capital**, Caracas (MNHN, 1); idem, ?-V-VI-1877, O. Thieme (MNHN, 1); **Estado de Miranda**, San Antonio de los Altos, 1-VIII-1963, 1800 m, Carlos Bordon (WOPC, 1); **Estado de Aragua**, Estación Biológica Rancho Grande, 5-V-1973, at black light, G. Ekis (WOPC, 2); idem, 1500-1900 m, 8-V-1978, O'Brien & Marshall

(JNRC, 1); La Tiara, 9-VI-1995, H. & A. Howden (CMNC, 1); **Estado de Falcon**, 4 km W Curimagua, 16-VIII-1975, M. Murtagh (WOPC, 1); "Venezuela" (MNHN, 1). Colombia: **Depatamento de Cauca**, Valle del Cauca, Buga, 16-V-1973, G. Ekis (WOPC, 3).

D i a g n o s i s : Within the *M. testacea*-group, each elytron shows an irregular fascia in specimens of *M. agma* and in those of *M. nigrosignata*. However, in *M. agma* specimens, this fascia is fragmented, which is not the case in *M. nigrosignata* specimens.

D e s c r i p t i o n : Size: Length 4.3 mm; width 2.0 mm. Form: As in Fig. 148. Color: Light testaceous, except each elytron with 2 black spots near the humeral angle and a black fragmented angular fascia at middle of disc. Head: Funicular antennomeres subfiliform, progressively more triangular toward capitulum, capitulum about as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 35), antennomere 11 obovate; frons wider than width of eye (EW/FW 18/33). Thorax: Pronotum (Fig. 70) quadrate (PW/PL 75/75), side margin with well-developed tubercle, disc subglabrous at middle; elytral asetiferous punctation minute, striate to distal 2/3$^{rd}$ (EL/EW 220/55). Abdomen: Pygidium subquadrate; posterior margin of 6$^{th}$ visible sternite broadly concave; aedeagus long, phallic plates very narrow, phallic apex (Fig. 117) small, triangular.

V a r i a t i o n : Size: Length 4.3-6.0 mm; width 2.0-2.3 mm. Other than body size, the available specimens are quite homogeneous.

N a t u r a l h i s t o r y : Specimens were collected during April and May; those from Colombia at 1700 m; those from Venezuela with a black light set in a montane tropical cloud forest.

E t y m o l o g y : The specific epithet, *agma*, is a Greek noun with a meaning of "fragment". I refer to the fragmentation of the fascia on the elytral disc.

D i s t r i b u t i o n (Fig. 96): This species is known only from Colombia and Venezuela.

### *Muisca biordinis* OPITZ nov.sp. (Figs 41, 71, 118, 97, 149)

Holotype: ♀. VENEZUELA, Táchira, Pregonero, Camp. Siberia Hospital, 1280 m, 10-31.VII. 1989, S. & J. Peck, 2$^{nd}$ forest road, ex. mal. (CMNC). Paratypes: 4 specimens. Colombia: **Departamento de Cauca**, Cauca, Cauca Valley (WOPC, 1). Venezuela: **Estado de Táchira**, 50 km NE San Cristobal, picnic grounds, 20-V-1974, H. & A. Howden (WOPC, 1). Ecuador: **Provincia de Catopaxi**, San Francisco de las Pampas, 17-I-2002, F. T. Hovore (JNRC, 1); **Provincia de Napo**, Loreto Road, 7 km E Narupa, 16-IX-1998, F. Hovore (WOPC, 1).

D i a g n o s i s : *Muisca biordinis* specimens may be distinguished from those of its sister species, *M. bitaeniata*, by coloration of the pronotal disc. In *M. biordinis* specimens the pronotal disc shows two black lines. The pronotal disc is uniformly castaneous in *M. bitaeniata* specimens.

D e s c r i p t i o n : Size: Length 5.5 mm; width 2.5 mm. Form: As in Fig. 149. Color: Light castaneous, except frons and epicranium brown, pronotum with two brown, wide, paralateral lines, and each elytral disc with two brown oblong markings near humeral region, and with brown crescentiform fascia at middle. Head: Basal funicular antennomeres filiform, distal funicular antennomeres progressively shorter toward capitulum, capitular antennomeres 9 and 10 triangular (Fig. 41), antennomere 11 ovate; frons wider than width of eye (EW/FW 23/35). Thorax: Pronotum (Fig. 71) oblong (PW/PL 85/95), side margin with well-developed tubercle, disc coarsely punctate at sides, widely subglabrous at middle; elytral asetiferous punctation striate at middle of elytron end at elytral

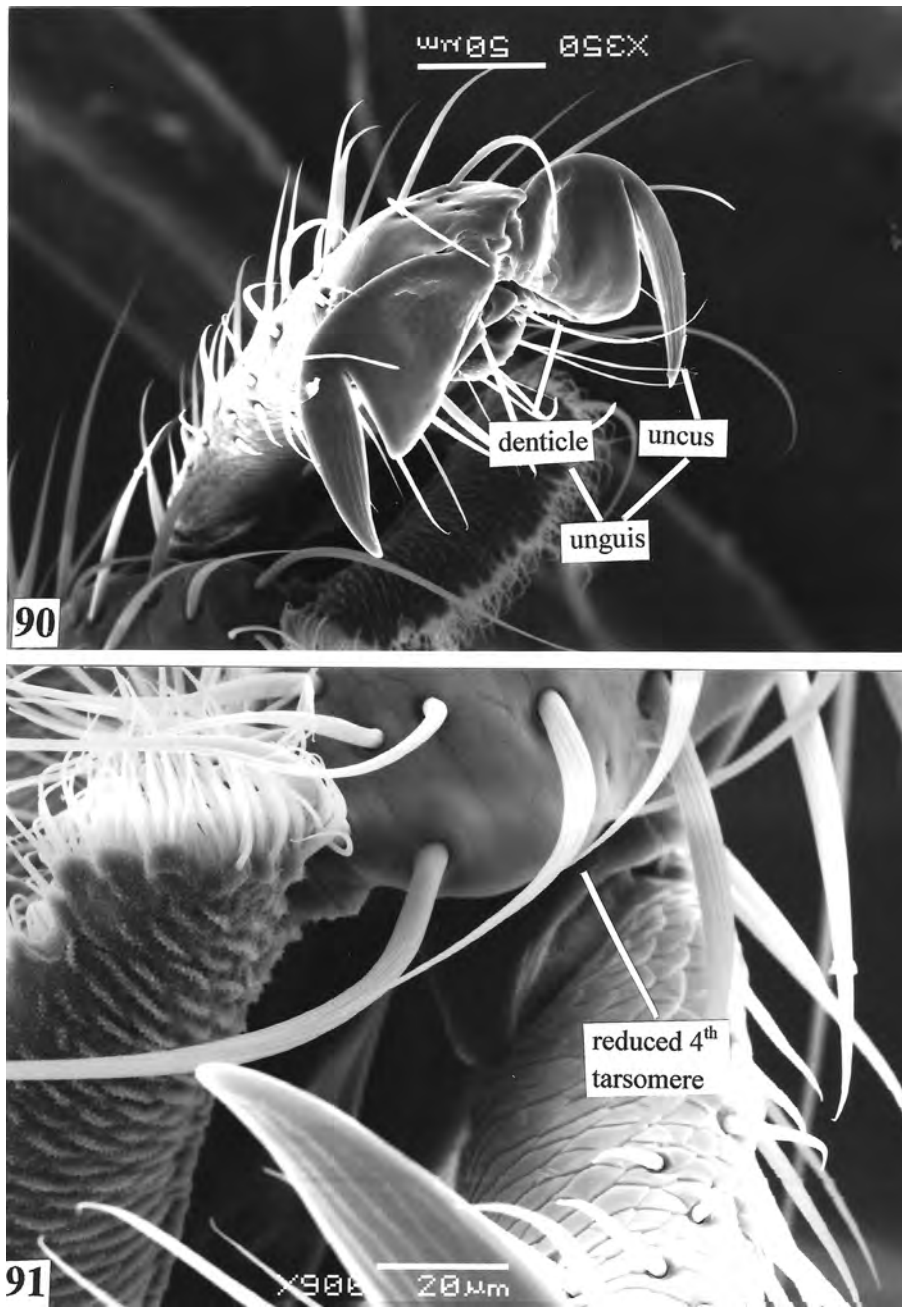



**Fig. 90-91**: Metatarsus. (**90**) *M. octonotata*, ungues. (**91**) *M. octonotata*, 4th tarsomere.

middle, otherwise punctures extend to elytral apical 2/3rd (EL/EW 250/75). Abdomen: Pygidium subquadrate; posterior margin of 6th visible sternite slightly concave at middle; aedeagus, phallic apex as in Fig. 118.

V a r i a t i o n : Size: Length 5.0-5.5 mm; width 2.0-2.5 mm. The elytral brown crescentiform fascia may be obliterated by the posterior expansion of the brown region from the elytral anterior margin and medial expansion of the brown region near the epipleural margin.

N a t u r a l h i s t o r y : Specimens was collected during January, May, September, and July; the holotype at 1280 m.

E t y m o l o g y : The trivial name, *biordinis*, is a Latin name derived from *ordo* (= line) and the prefix *bi-* (= two). I refer to the two wide brown lines on the pronotum.

D i s t r i b u t i o n (Fig. 97): This species is known from Colombia, Venezuela, and Ecuador.

### *Muisca bitaeniata* SPINOLA, 1844b (Figs 36, 72, 97, 119, 150)

*Muisca bitaeniata* SPINOLA, 1844b: 148. Holotype: ♀. Colombia (MRSN). CORPORAAL 1950: 298. EKIS (now OPITZ), 1975: 55.

*Pelonium ampliatum* CHEVROLAT, 1876: 41. **syn.nov**. Holotype: ♀. Colombia, Guayabal, ?-II-?, 6100 feet, Steinheil (MNHN). CORPORAAL 1950: 285.

D i a g n o s i s : *Muisca bitaeniata* specimens may be distinguished from those of its sister species, *M. biordinis*, by coloration of the pronotal disc. In *M. bitaeniata* specimens the pronotal disc is uniformly castaneous. In *M. biordinis* specimens the pronotal disc shows two black lines.

R e d e s c r i p t i o n : Size: Length 4.3 mm; width 2.0 mm. Form: As in Fig. 150. Color: Light castaneous, except elytral disc with crescentiform brown maculation that extends from humeral margin, touches sutural margin at middle and bends towards epipleural margin where it meets broad brown region along the epipleural margin. Head: Basal funicular antennomeres filiform, distal funicular antennomeres become shorter towards capitulum, capitular antennomeres 9 and 10 triangular (Fig. 36), antennomere 11 obovate; frons wider than width of eye (EW/FW 18/30). Thorax: Pronotum (Fig. 72) oblong (PW/PL 75/80), side margin with well-developed tubercle, disc coarsely punctate at sides, widely subglabrous at middle; elytral asetiferous punctation striate, punctures extend to elytral apical 3/4th (EL/EW 230/60). Abdomen: Pygidium scutiform; distal margin of 6th visible sternite slightly concave at middle; aedeagus, phallic apex as in Fig. 119.

V a r i a t i o n : Size: Length 4.5-6.0 mm; width 2.0-2.8 mm. The elytral brown crescentiform fascia varies in expression, and may be entirely obliterated.

N a t u r a l h i s t o r y : Specimens was collected during February, March, and July; at altitudes ranging from 1535 to 2220 m.

D i s t r i b u t i o n (Fig. 97): In addition to the holotype, I examined 9 specimens. Panamá: **Provincia de Chiriquí**, Cerro Pando, 24-V-1973, 1535 m, G. Ekis. Colombia: **Departamento de Risaralda**, Otún Quinbaya, El Monilillo, 4°43'N 75°34'W, 17-II-4-III-2003, 2220 m, Malaise, G. López; **Departamento del Valle de Cauca**, near Saladito, 13-VII-1970, 6700 feet, H. & A. Howden; Farallones de Cali, La Meseta, 3°34'N 76°40'W, 9-26-X- 2003, 2080 m, Malaise, S. Sarria. Venezuela: **Estado de Aragua**, Colonia Tovar, 18-VII-1988, 6780 feet, C. W. & L. B. O'Brien. Specimens are deposited in CMNC and WOPC.

### *Muisca malakela* OPITZ nov.sp. (Figs 42, 73, 97, 151)

Holotype: ♀. Pérou (Peru), Huambo, M de Mathan, IV$^{e}$ Trim 1889 (MNHN).

D i a g n o s i s : Within the *M. testacea* species group, only in the members of this species does each elytron show 7 brown maculations.

D e s c r i p t i o n : Size: Length 6.0 mm; width 2.3 mm. Form: As in Fig. 151. Color: Mostly light castaneous, frons and epicranium brownish, scape, pedicel, and funicular antennomeres yellow, capitulum brown; pronotal disc with 4 dark brown spots that coalesce via light brown flecks, each elytron with 7 brown flecks that show a bluish luster, humeral fleck elongate. Head: Funicular antennomeres subfiliform progressively more triangular, capitulum longer than combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 42), antennomere 11 obovate; frons wider than width of eye (EW/FW 25/34). Thorax: Pronotum (Fig. 73) quadrate (PW/PL 80/80), side margin with shallow tubercle, disc subglabrous at midline; elytral asetiferous punctation minute, striate to distal 2/3$^{rd}$, (EL/EW 260/70). Abdomen: Pygidium scutiform.

E t y m o l o g y : The specific epithet, *malakela*, is a Greek compound name that stems from *mala* (= much) and *kelis* (= stain). I refer to numerous flecks on the dorsum of this beetle.

D i s t r i b u t i o n (Fig. 97): This species is known only from Peru.

### *Muisca nigrosignata* (SPINOLA, 1844a) (Figs 37, 74, 97, 120, 152)

*Pelonium nigrosignatum* SPINOLA, 1844a: 371. Lectotype. ♂. Subsequent designation by EKIS (now OPITZ), 1975: 55. Colombia (MRSN). CORPORAAL 1950: 282.

D i a g n o s i s : Within the *M. testacea* group, each elytron shows an irregular fascia in specimens of *M. nigrosignata* and in those of *M. agma*. However, in *M. nigrosignata* specimens, this fascia is not fragmented, which is the case in *M. agma* specimens.

D e s c r i p t i o n : Size: Length 5.0 mm; width 2.0 mm. Form: As in Fig. 152. Color: Light castaneous, except each elytron with black maculae on humeral angle, and one slightly oblong steak extending backwards from elytral anterior margin, elytral disc with black angular fascia that does not meet the epipleural or sutural margins. Head: Funicular antennomeres subfiliform, progressively shorter and more triangular towards capitulum, capitulum about as long as combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 37), antennomere 11 globose; frons wider than width of eye (EW/FW 18/30). Thorax: Pronotum (Fig. 74) quadrate (PW/PL 75/75), side margin with well-developed tubercle, disc subglabrous at middle; elytral asetiferous punctation small, punctures striate at sides to distal 2/3$^{rd}$, few punctures near sutural margin (EL/EW 220/60). Abdomen: Pygidium subquadrate, posterior margin slightly concave; 6$^{th}$ visible sternite slightly concave in distal margin; aedeagus, phallic apex as in Fig. 120.

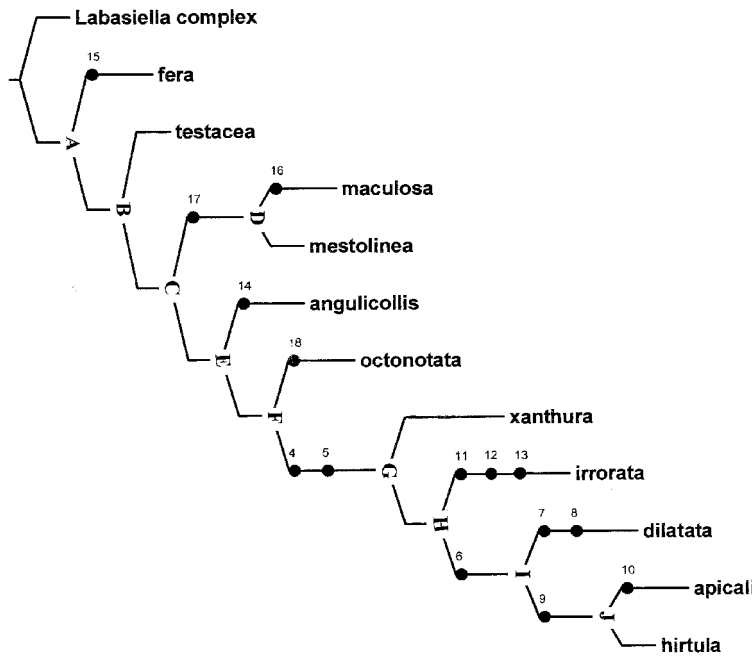
N a t u r a l h i s t o r y : Specimens were collected during May, at 1200 m.

D i s t r i b u t i o n (Fig. 97): This species is known from Colombia and Venezuela. In addition to the lectotype, I examined 1 specimen from: Venezuela: **Estado de Táchira**, Cordero, 20-V-1974, H. A. Howden. Specimens are deposited in MRSN and WOPC.

### *Muisca peruviana* (PIC, 1952) (Figs 43, 75, 97, 121, 153)

*Cregya peruviana* PIC, 1952: 4. Lectotype: ♀. Pérou (Peru), Terapoto, Mai a Aout, 1886, M. de Mathan (MNHN). It is not certain how many specimens were available to Pic for his description. Therefore, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype for this nominal species.

D i a g n o s i s : Within *Muisca*, only in specimens of this species is there a triangular black mark on the elytra near the mesoscutellum.




**92**

**Fig. 92**: Proposed phylogeny of *Muisca* species groups.

R e d e s c r i p t i o n : Size: Length 6.5 mm; width 2.7 mm. Form: As in Fig. 153. Color: Light castaneous, except cranium and pronotum blue-black; elytral disc bicolorous, mostly light castaneous, with a black triangular marking surrounding the mesoscutellum. Head: Funicular antennomeres subfiliform, 7th antennomere slightly expanded laterally, capitular antennomeres 9 and 10 triangular (Fig. 43), antennomere 11 obovate; frons narrower than width of eye (EW/FW 30/25). Thorax: Pronotum (Fig. 75) oblong (PW/PL 98/115), pronotal tubercle small, angular and positioned posterior to pronotal middle, disc coarsely punctate, elytral asetiferous punctation striate, punctures extend to elytral apical 3/4th (EL/EW 135/45). Abdomen: Pygidium scutiform; posterior margin of 6th visible sternite not concave at middle; aedeagus, phallic apex as in Fig. 121

V a r i a t i o n : Size: Length 4.5-7.0 mm; width 1.8-2.4 mm. Other than size, the available specimens are quite homogeneous

N a t u r a l  h i s t o r y : Specimens was collected during February, March, and July; at altitudes ranging from 1535 to 2220 m.

D i s t r i b u t i o n (Fig. 97): In addition to the lectotype, I examined 35 specimens: Bolivia: **Departamento de Santa Cruz**, Florida, 4 km N Bermejo, Refugio Los Volcanes, 63°36'W 18°06'S, 6-8-XII-2015, 1000-1200 m, Skillman, Wappes, & Kuckartz; 3.7 km SSE Buena Vista. Hotel Flora & Fauna, 17°29.949'S 63°33.152'W, 5-15-XI-2001, tropical transition forest, M. C. Thomas & B. K. Dozier; idem, 23-26-X-2000, tropical transition forest, M. C. Thomas; idem, 5-15-XI-2001, black light, tropical transition forest, M. C. Thomas; idem, 27-31-X-2002, Morris & Wappes; idem, 14-16-X-2000, R. Morris; idem, 5 km SSE Buena Vista. Hotel Flora & Fauna, 17°29.925'S 63°39.128'W, 10-22-X-2004, J. E. Eger; 4 km SSE Buena Vista, 22-25-XI-2013, Hotel Flora & Fauna, 17°29'S 63°49'W, Wappes & Skillman; idem, 4-6 SSE Buena Vista, Hotel Flora & Fauna, 3-8-X-2004, Wappes & Morris; idem, 22-31-X-2002, Wappes & Morris; Potrerillos del Guenda, Reserva Natural, 17°40'S 63° 27'W, 1-4-X-2007, 370 m, black light mercury vapor light, Wappes & Morris; idem, 16-22-X-2006, 370 m, Wappes, Nearns, Eya; Snake Farm, 17°40.15'S 63°27.26'W, 23-30-X-2013, 400 m, Wappes & Kuckartz; idem, 40 km NW Santa Cruz, 17°40.3'S 63°27.4'W, 3-X-2007, at light, R. Morris; idem, 17°40.26'S 63°27.44'W, 29-XI-2006, B. K. Dozier; idem, 17°40.26'S 63°27.44'W, 5-20-XI-2004, B. K. Dozier; 4 km N Bermejo, 17-24-X-2014, Wappes & Morris; idem, 31-X-3-XI-2013, Wappes & Kuckartz; idem, 18°066'S 63°36'W, 16-21-X-2007, J. Wappes & A. Cline; El Refugio, Los Volcanes, 18-24-X-20014, Morris & Wappes; idem, 4-9-X-2007, R. Morris; **Departamento La Paz**, Puente Mururata, Coroico, Yungas, ?-X-1984, Luis Peña. Specimens are deposited in ACMT, CSCA, FSCA, FWSC, JNRC, RFMC, and WOPC.

### *Muisca sigilla* OPITZ nov.sp. (Figs 38, 76, 97, 122, 154)

Holotype: ♀. BOLIVIA, S. Cruz Dept. 4 km N Bermejo, 11-17 December, 2012, Wappes & Skillman. A second label reads: Refugio los Volcanes, 1806, above Achira, Rd to Floripondo, 1900 m, 19 December, 2001 (MNKM). Paratypes: 49 specimens. Bolivia: **Departamento de Santa Cruz**, 4 km N Bermejo, Refugio los Volcanes, 18°06'S 63°36'W, 8-11-XII- 2011, 1350 m, Wappes, Lingafelter, Morris & Woodley (ACMT, 19; WOPC, 2); idem, 4-9-XII-2013, 1045-1350 m, Wappes & Skillman (ACMT, 11; WOPC, 4); idem, 18°06'S 63°36'W, 6-8-XII-2015, 1000-1200 m, Skillman, Wappes, & Kuckartz (FWSC, 1; WOPC, 1); idem, 18°06'S 63°36'W, 11-17-XII- 2012, 1045-1350 m, Wappes & Skillman (ACMT, 7); idem,18-22-I-2006, 1045 m, Wappes, Lingafelter (ACMT, 1; WOPC, 1); Chaco above Achira, Prov. Florida, Vicoquin area, 18°07'S 63°47'W, 22-25-I-2007, 1730 m, Wappes & Lingerfelter (ACMT, 1); 2-3 km N Bella Vista, road to Bella Vista, 4-5000 feet, 18°11'S 63°42'W, Wappes & Skillman (ACMT, 1).

D i a g n o s i s : Within the *M. testacea* group, only in members of this species does the pronotum show 2 very broad black lines. Also, the elytra are bicolorous with black markings that show a bluish luster.

D e s c r i p t i o n : Size: Length 9.0 mm; width 3.8.0 mm. Form: As in Fig. 154. Color: Mouthparts, except mandibles, antennae, cranial venter, prothoracic sternum, legs, pterothorax, and abdomen light castaneous, cranial dorsum black; pronotum with 2 broad black lines, otherwise castaneous; elytra mostly castaneous, with black markings as shown in Fig. 154. Head: Funicular antennomeres subfiliform, capitular antennomeres 9 and 10 triangular (Fig. 38), antennomere 11 ovate; frons wider than width of eye (EW/FW 40/50). Thorax: Pronotum (Fig. 76) quadrate (PW/PL 125/125), side margins with well-developed tubercles, disc coarsely punctate at sides, narrowly subglabrous at middle; elytral asetiferous punctation striate at middle of elytron, punctures end at elytral distal 4/5$^{th}$ (EL/EW 360/110). Abdomen: Pygidium scutiform; 6$^{th}$ visible sternite only slightly concave at posterior margin; aedeagus, phallic apex as in Fig. 122.

V a r i a t i o n : Size: Length 8.5-9.0 mm; width 2.5-3.8 mm. The black markings on the elytral disc are more pronounced in one specimen.

N a t u r a l  h i s t o r y : Specimens were collected during December and January, at altitudes that range from 1000 to 1350 m.

E t y m o l o g y : The trivial name, *sigilla* (= *signum*), is a Latin noun. I refer to the dark, shield-like, configuration of the castaneous portion of the elytral disc.

D i s t r i b u t i o n (Fig. 97): This species is known from Bolivia.

### *Muisca testacea* (KLUG, 1842) (Figs 2-13, 79, 97, 123, 155)

*Enoplium testacea* KLUG, 1842: 367. Lectotype. Gender not known. Here designated. Brazil (ZMHB). There is evidence (body size measurements) in Klug's description that the original description of this species is based on more than one specimen. However, Klug did not specify which of the specimens before him should be the name baerer of this species. Therefore, I invoke Recommendation 73F of the ICZN (1999) and designate a lectotype and paralectotype for this nominal species. CORPORAAL 1950: 284. EKIS (now OPITZ), 1975: 56 (New Status, New Synonymy was erroneously noted after Klug's species name).

D i a g n o s i s : Funicular antennomeres 4-6 are infuscated only in members of *M. testacea* and *M. variabilis*. At this time, only the males of these two species are separable using characteristics of the aedeagus (compare Figs 123, 124).

R e d e s c r i p t i o n : Size: Length 4.5 mm; width 1.7 mm. Form: As in Fig. 155. Color: Testaceous, except capitulum dark brown. Head: Funicular antennomeres subfiliform, progressively shorter towards capitulum, capitulum longer than combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 6), antennomere 11 obovate; frons wider than width of eye (EW/FW 21/30). Thorax: Pronotum (Figs 5, 79) oblong (PW/PL 70/80), side margin with well-developed tubercle, disc uniformly punctate; elytral asetiferous punctation striate to distal 2/3$^{rd}$ of epipleural region, near sutural margin punctured end at about distal 1/2 (EL/EW 220/70). Abdomen: Pygidium scutiform; posterior margin of 6$^{th}$ visible sternite concave; aedeagus, phallic apex as in Fig. 123.

V a r i a t i o n : Size: Length 4.5-8.0 mm; width 1.7-2.8 mm. Other than body size, the available specimens are quite homogeneous.

N a t u r a l  h i s t o r y : Specimens were captured during April and December.

D i s t r i b u t i o n (Fig. 97): In addition to the type, I examined 19 specimens: Brazil: **Estado do Minas Gerais**, Passa Quatro, ?-XII-1972, F. M. Oliveira; Matusinhos, 3-IV-1885, E. Gounelle; **Estado do Rio de Janeiro**, Nova Friburgo, ?-II-1884, P. Germain. Specimens are deposited in ANSP, MNHN, MCZN, WOPC, and ZMHB.

### *Muisca variabilis* (SPINOLA, 1844a) (Figs 44, 77, 97, 124, 156)

*Pelonium variabile* SPINOLA, 1844a: 367. Lectotype. ♂. Le Bresil (Brazil) (MRSN). CORPORAAL 1950: 284. EKIS (now OPITZ), 1975: 56.

D i a g n o s i s : Funicular antennomeres 4-6 are infuscated only in members of *M. variabilis* and *M. testacea*. At this time, only the males of these two species are separable using characteristics of the aedeagus (compare Figs 123, 124).

R e d e s c r i p t i o n : Size: Length 5.5 mm; width 2.0 mm. Form: As in Fig. 156. Color: Castaneous, except capitulum and funicular antennomeres 5-6 dark brown. Head: Funicular antennomeres subfiliform, progressively shorter towards capitulum, capitulum longer than combined length of funicular antennomeres, capitular antennomeres 9 and 10 triangular (Fig. 44), antennomere 11 obovate; frons wider than width of eye (EW/FW

20/30). Thorax: Pronotum (Fig. 77) quadrate (PW/PL 87/87), side margin with well-developed tubercle, disc uniformly punctate; elytral asetiferous punctation striate to distal 2/3rd of epipleural region, near sutural margin punctured end at about distal 1/2 (EL/EW 225/70). Abdomen: Pygidium scutiform; posterior margin of 6th visible sternite faintly incised; aedeagus, phallic apex as in Fig. 124.

V a r i a t i o n : Size: Length 4.7-6.0 mm; width 2.0-2.2 mm. Other than body size, the available specimens are quite homogeneous.

N a t u r a l h i s t o r y : Specimens were captured throughout the year, some at 300-500 m.

D i s t r i b u t i o n (Fig. 97): In addition to the type, I examined 66 specimens: Brazil: **Estado do Minas Gerais**, Serra do Caraca, Santa Barbara, ?-I-1970, F. M. Oliveira; Bocaiúva, ?-XI-1965, F. Plaumann; **Estado de Paraná**, Caveuna, ?-IX-1945, A. Maller; **Estado do Rio de Janeiro**, Rio de Janeiro, ?-XII-1856, H. Klark; Tijuca, ?-XII-1884, E. Gounelle; Nova Friburgo, 2-3-IV-1903, E. Gounelle; Petropolis, ?-II-1857, J. Gray; idem, ?-II-1857, H. Clark; **Estado do São Paulo**, Val. Rio Pardo, ?-XII-1898, E. Gounelle; Perelheiros, 6-XII-1975, V. N. Alin; idem, 8-XII-1975, V. N. Alin; São Paulo, 6-IX-1976; Constancia, ?-I-1957, J. Gray; **Estado do Mato Grosso**, Villa Vera, ?-X-1973, M. Alvarenga; **Estado do Santa Catarina**, Nova Teutonia, ?-I-1974, 300-500 m, F. Plaumann; idem, ?-XI-1974, 300-500 m, F. Plaumann; idem, ?-II-1978, F. Plaumann; idem, 27°11'S 52°23'W, ?-XI-1977, 300-500 m, F. Plaumann; Corupa, XII-1948, A. Maller. Specimens are deposited in MNHN, MRSN, WFBM, and WOPC.

### *Muisca zona* OPITZ nov.sp. (Figs 39, 78, 97, 157)

Holotype: ♀. BOLIVIA, Santa Cruz, above Achira, Rd to Floripondo, 1900 m, 19 December, 2001 (MNKM). Paratypes: 9 specimens. Bolivia: **Departamento de Santa Cruz**, above Achira, road to Floripondo, 18°09'S 63°47'W, 1900 m, 19-XII- 2001, Wappes, Bonaso, & Morris (WOPC, 1; ACTM, 4); idem, 10-XII-2011, Wappes, Bonaso, & R, Morris (ACTM, 2; WOPC, 1); La Hoyada, above Agua Clara, 19-XI-2003, Morris, Nearns, & Wappes (RFMC, 1).

D i a g n o s i s : Within the *M. testacea* species group, only the members of this species have each elytron disc show 3 transverse black fasciae.

D e s c r i p t i o n : Size: Length 9.5 mm; width 4.1 mm. Form: As in Fig. 157. Color: Castaneous, except elytral disc with 3 black fasciae, 1 basal, 1 medial, and 1 posteriorly located. Head: Funicular antennomeres subfiliform, capitular antennomeres 9 and 10 triangular (Fig. 39), antennomere 11 ovate; frons wider than width of eye (EW/FW 35/55). Thorax: Pronotum (Fig. 78) oblong (PW/PL 130/140), side margin with well-developed tubercles, disc narrowly subglabrous at middle; elytral asetiferous punctation striate at middle of elytron, end at elytral middle, otherwise punctures extend to elytral apical 2/3rd (EL/EW 390/130). Abdomen: Pygidium scutiform; posterior margin of 6th visible sternite faintly incised; aedeagus, phallic apex as in Fig. 158.

V a r i a t i o n : Size: Length 6.0-9.4 mm; width 2.5-4.1 mm. The third, the most posterior, transverse black fascia is missing in the specimen from "La Hoyada".

N a t u r a l h i s t o r y : Specimens was collected during November and December, one at 1900 m.

E t y m o l o g y : The trivial name, *zona* (= belt), is a Latin noun. I refer to the dark transverse bands on the elytral disc.

D i s t r i b u t i o n (Fig. 97): This species is known from Bolivia.

## Evolutionary Considerations

There are 33 known species in *Muisca*. Despite the existence of ample adult external morphology variations in the antenna, pronotum, elytron, and phallus, the observed variations do not permit an evolutionary analysis at the species level. Thus, the phylogenetic analysis proposed herein involves the level of the species group. Geographically, *Muisca* taxa are overwhelmingly South American. Of the 33 known species, 30 exist in South America and 3 in Nuclear/Insular Central America (OPITZ 2005: 106). The lack of species north of Costa Rica suggests that the Nicaraguan Depression (WHITEHEAD & BALL 1977: 403) is a considerable deterrent for a more northern extension of *Muisca*. Despite the paucity of synapotypies of the species level, 11 lines of evolution are apparent in *Muisca*, which correspond to the species groups established herein. The relationships among these species groups are depicted in a computer-generated phylogenetic tree (Fig. 92) (Winclada/Nona). The tree conveys the following indices: L= 18; Ci = 100; and Ri = 100.

## Phylogenetic Interpretations

The geographic distribution of extant species suggests a South American origin for ancestral *Muisca*. Based on an analysis of the plesiotypic characteristics within *Muisca*, I posit that the *Muisca ancestor* (A in Fig, 92) may be characterized as follows: Antenna comprised of 11, antennomeres, eyes coarsely facetted, pronotum oblong, pronotal tubercle well developed, pronotal projections extraordinarily long, elytral asetiferous punctures widely distributed on elytral disc, and elytra oblong/rectangulate. Ancestral species A generated the *M. fera* species group, in which there evolved a reduction of elytral asetiferous punctures. This ancestral stock also generated progenitor species B, from which evolved the *M. testacea* species group and progenitor species C. Ancestor C then generated a line of evolution that led to ancestral species D, in which the posterior margin of the male pygidium became broadly concave. Progenitor D generated the *M. maculosa* species group, whose members evolved a cribrate pronotal disc, and produced the ancestral stock of the *M. mestolinea* group. From ancestor C there also evolved ancestral species E. The latter produced basic stock of the *M. angulicollis* group and ancestral species F, from which eventually evolved the *M. octonotata* species. Ancestral stock F also generated progenitor G, from which evolved the *xanthura* stock, in which the asetiferous punctures became broadly pigmented. Progenitor G also evolved the basic stock H. Ancestral species H generated the *M. irrorata* species group, in which the hind body changed to a subovoid shape and the elytral setae became very stout. Ancestor H also produced, progenitor I that led to the ancestral stock of the *M. dilatata* species, in which there evolved a secondary pronotal tubercle and the pronotal disc developed a tumescent sculpturing. Finally, ancestral stock I generated progenitor J, which led to the *M. apicalis* species and the *M. hirtula* species.

## Acknowledgments

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## Zusammenfassung

Die Gattung Muisca beinhaltet 34 bekannte Arten. In dieser Arbeit werden 15 neue Arten beschrieben: *M. adamanta*, *M. agma*, *M. anachyma*, *M. biordinis*, *M. dozieri*, *M. heppneri*, *M. hexa*, *M. malakela*, *M. magdalena*, *M. menda*, *M. mestolinea*, *M. omma*, *M. signa*, *M. sigilla*, und *M. zona*. Die bisher beschriebenen Arten sind: *M. angulicollis* (CHEVROLAT), *M. apicalis* (SPINOLA), *M. bitaeniata* SPINOLA, *M. dilatata* (CHEVROLAT), *M. fera* (WOLCOTT), *M. hirtula* (KLUG), *M. insigna* (CHEVROLAT), *M. irrorata* (GORHAM), *M. lateripunctata* (SCHENKLING), *M. maculosa* (GORHAM), *M. nigrosignata* (SPINOLA), *M. octonotata* (GORHAM), *M. peruviana* (PIC), *M. scutellata* (SPINOLA), *M. testacea* (KLUG), *M. tetraspilota* (CHEVROLAT), *M. togata* (CHEVROLAT), *M. variabilis* (SPINOLA) und *M. xanthura* (CHEVROLAT).

Lectotypen wurden für alle bisher beschriebenen Arten designiert, mit Ausnahme von *M. fera* (WOLCOTT) und *M. hirtula* (KLUG). *Pelonium quadrifoveolatum* SCHENKLING wird mit *M. insigna* (CHEVROLAT) und *Pelonium ampliatum* CHEVROLAT mit *M. bitaeniata* SPINOLA synonymisiert. *Cregya cylindricollis* PERACCHI wird mit *Muisca togata* (CHEVROLAT) synonymisiert.

Morphologische Hinweise deuten darauf hin, dass Käfer der Gattung *Muisca* räuberisch leben. Verbreitungsnachweise erlauben die Spekulation, dass Vorfahren der Gattung *Muisca* bewaldete Regionen Südamerikas bewohnt haben. Eine computer-generierte Phylogenie resultiert in 11 evolutiven Linien, welche mit den 11 Artengruppen dieser Gattung übereinstimmen. Diese Arbeit beinhaltet weiterhin eine spanische und deutsche Übersetzung des abstracts, eine kurze Diskussion zur Naturgeschichte, einen Bestimmungsschlüssel der *Muisca*-Arten, eine Abhandlung zur Phylogenie innerhalb der Gattung, 78 Strichzeichnungen, 12 elektronenmikroskopische Fotos, 5 Verbreitungskarten, 27 Fotos der Aedeagi und 33 Habitusfotos.

## Resumen

El género *Muisca* incluye 34 especies descritas. En el presente trabajo se describen 15 especies nuevas adicionales: *M. adamanta*, *M. agma*, *M. anachyma*, *M. biordinis*, *M. dozieri*, *M. heppneri*, *M. hexa*, *M. malakela*, *M. magdalena*, *M. menda*, *M. mestolinea*, *M. omma*, *M. signa*, *M. sigilla*, y *M. zona*. Las especies ya conocidas eran: *M. angulicollis* (CHEVROLAT), *M. apicalis* (SPINOLA), *M. bitaeniata* SPINOLA, *M. dilatata* (CHEVROLAT), *M. fera* (WOLCOTT), *M. hirtula* (KLUG), *M. insigna* (CHEVROLAT), *M. irrorata* (GORHAM), *M. lateripuntata* (SCHENKLING), *M. maculosa* (GORHAM), *M. nigrosignata* (SPINOLA), *M. octonotata* (GORHAM), *M. peruviana* (PIC), *M. scutellata* (SPINOLA), *M. testacea* (KLUG), *M. tetraspilota* (CHEVROLAT), *M. togata* (CHEVROLAT), *M. variabilis* (SPINOLA) y *M. xanthura* (CHEVROLAT).

Se designan Lectotipos para todas las especies previamente descritas, con excepción de *M. bitaeniata* SPINOLA, *M. fera* (WOLCOTT), y *M. hirtula* (KLUG). *Pelonium quadrifoveolatum* Schenkling esta puesta en sinonimia de *M. insigna* (CHEVROLAT) y *Pelonium ampliatum* CHEVROLAT en sinonimia de *M. bitaeniata* SPINOLA. La evidencia morfológica sugiere que *Muisca* es un género de coleópteros depredadores. La evidencia basada en distribución geográfica nos permite especular que los ancestros de *Muisca* fueran habitantes de las zonas boscosas de Suramérica.

Una filogenia generada por computadora apunta a once líneas evolutivas dentro del género *Muisca*, correspondiente a los once grupos de especies incluidos en el género. *Cregya*

*cylindricollis* PERACCHI esta puesta en sinonimia con *Muisca togata* (CHEVROLAT). Este trabajo

incluye resúmenes en español y aleman, una discusión sobre la historia natural, una clave de las especies del genero *Muisca*, un ensayo sobre la filogenia intragenerica, 78 dibujos, 12 microfotografías realizadas con microscopio electrónico, 5 mapas de distribución, 27 fotografías de genitalia y 33 fotografías de especímenes.

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**Fig. 93**: Geographic distribution of *Muisca* species as listed.

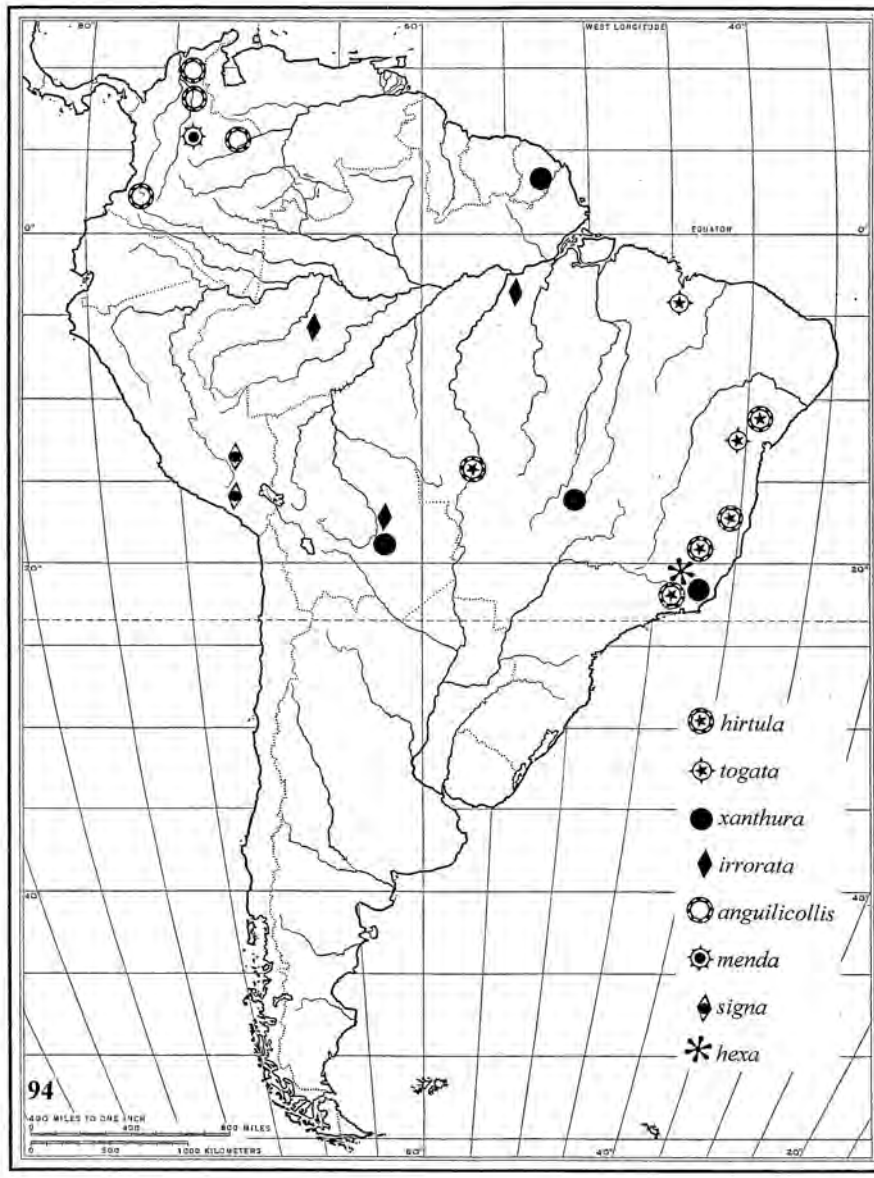
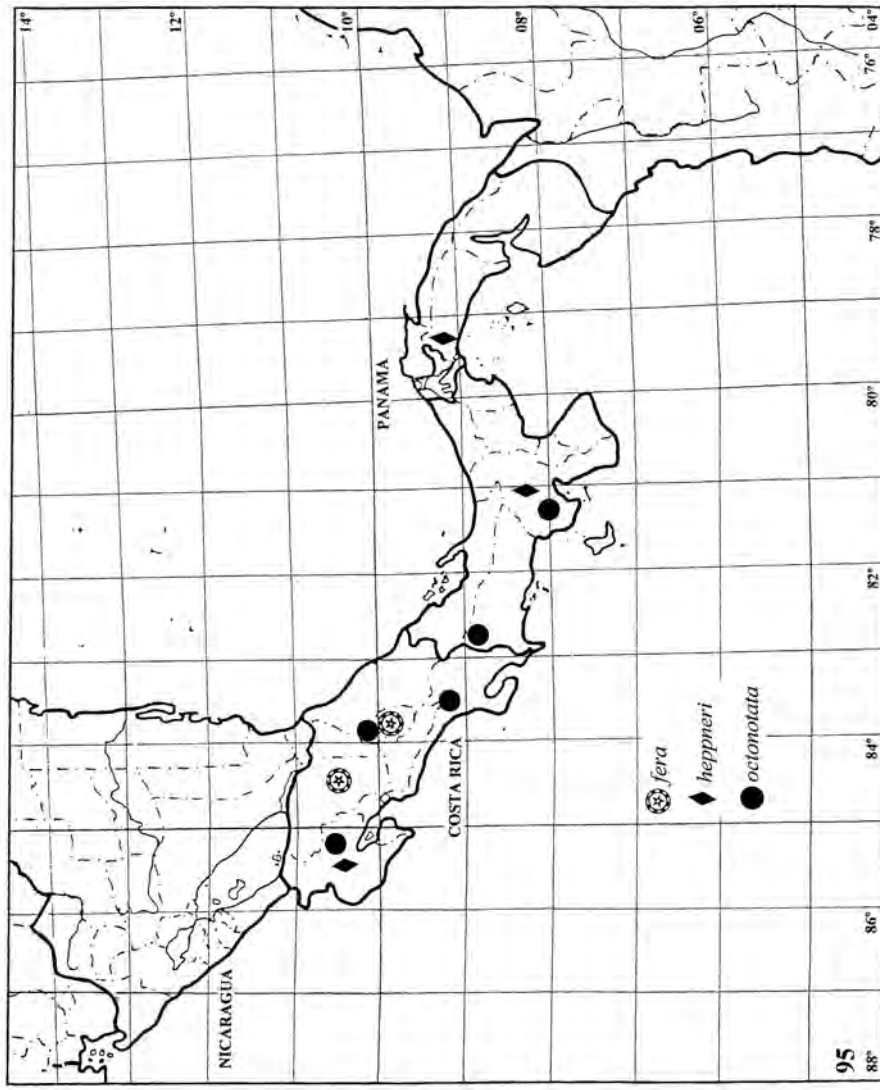



**Fig. 94**: Geographic distribution of *Muisca* species as listed.




**Figs 95**: Geographic distribution of *Muisca* species as listed.

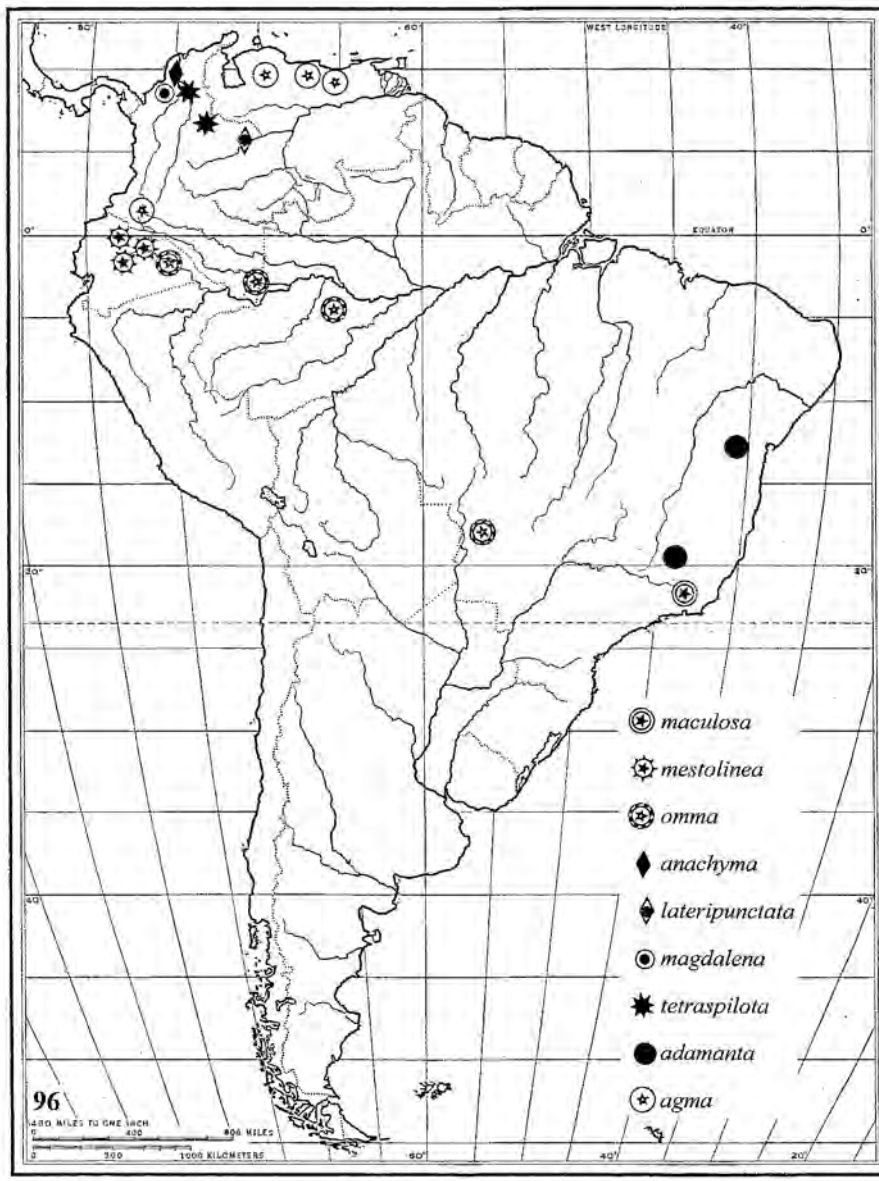



**Fig. 96**: Geographic distribution of *Muisca* species as listed.

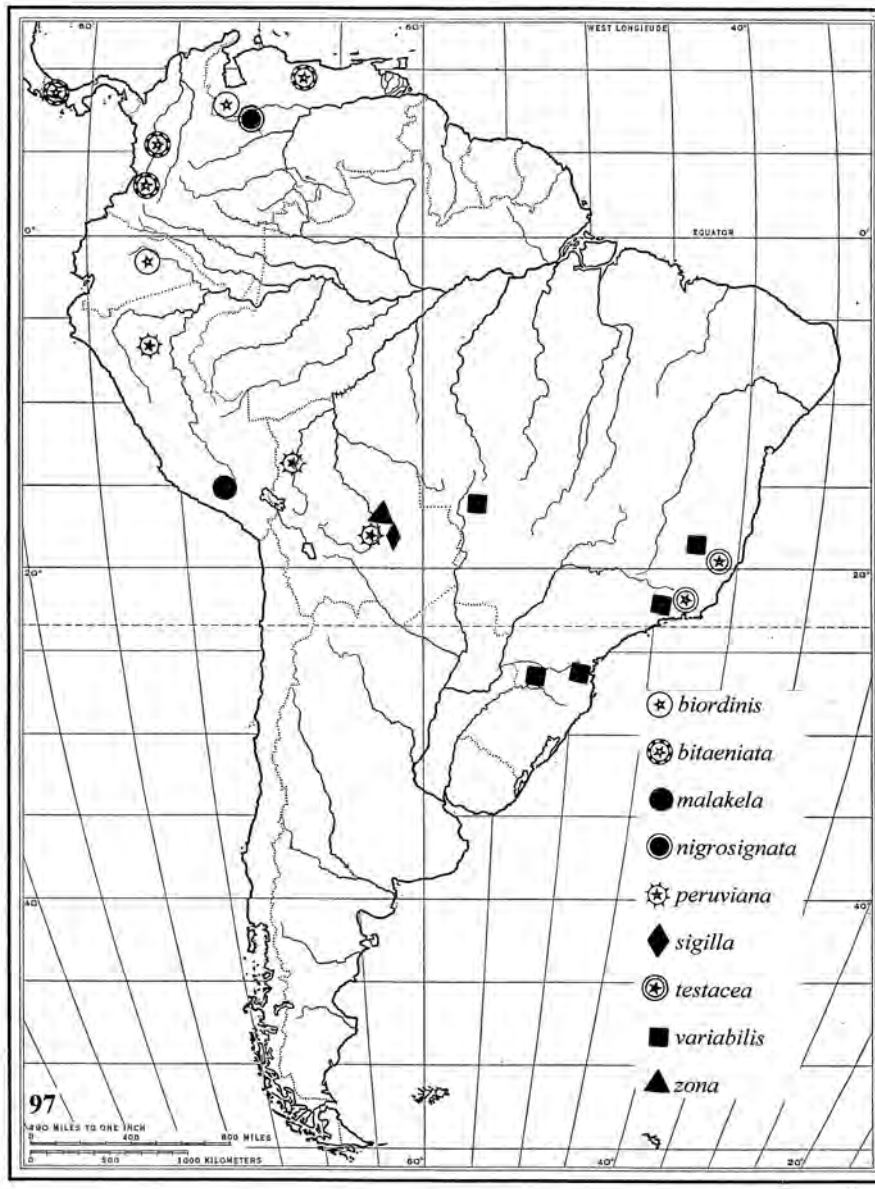
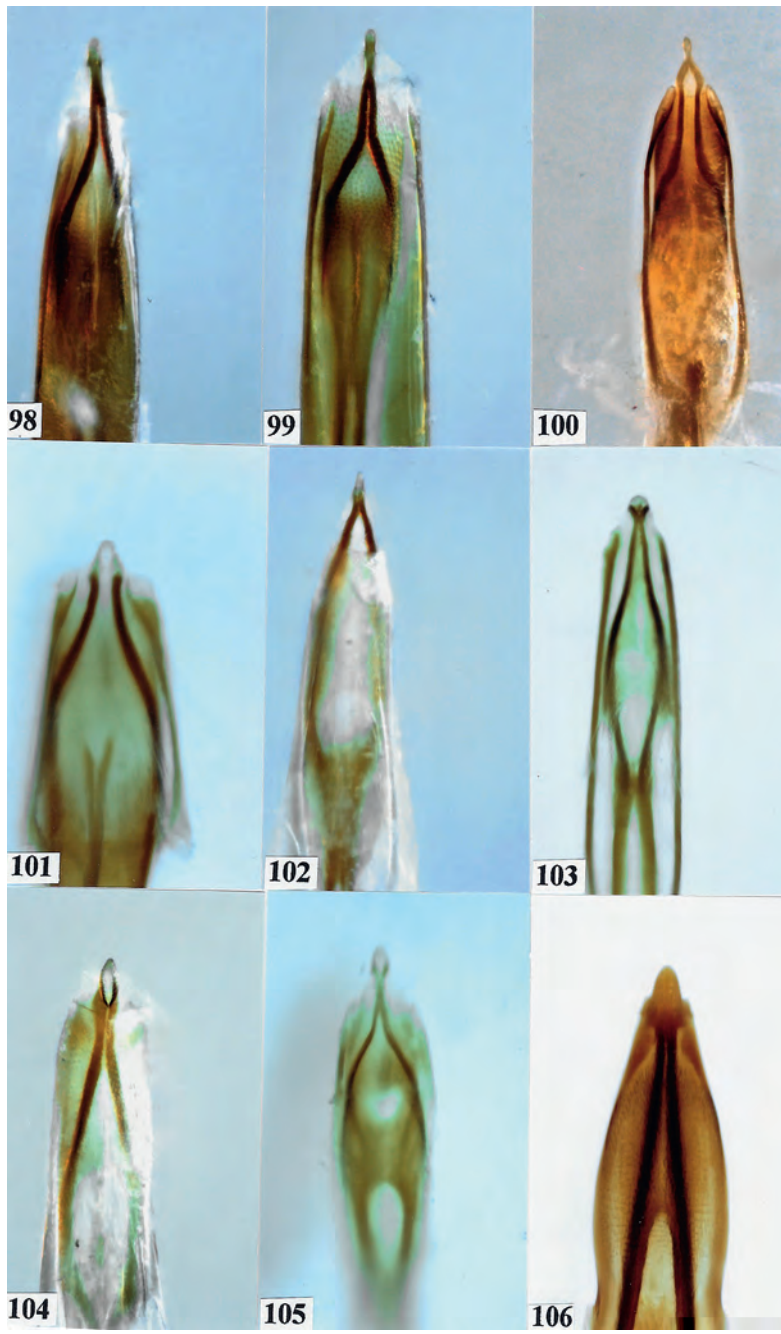
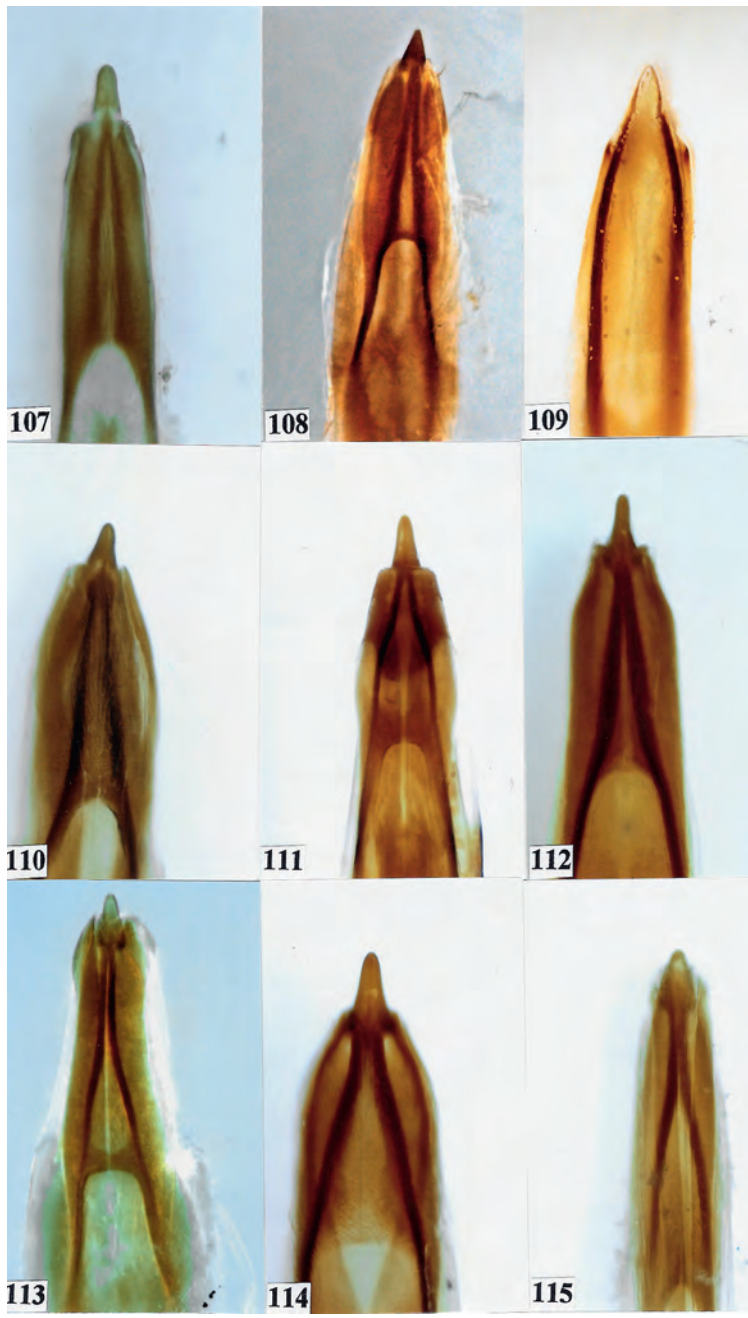



**Fig. 97**: Geographic distribution of *Muisca* species as listed.

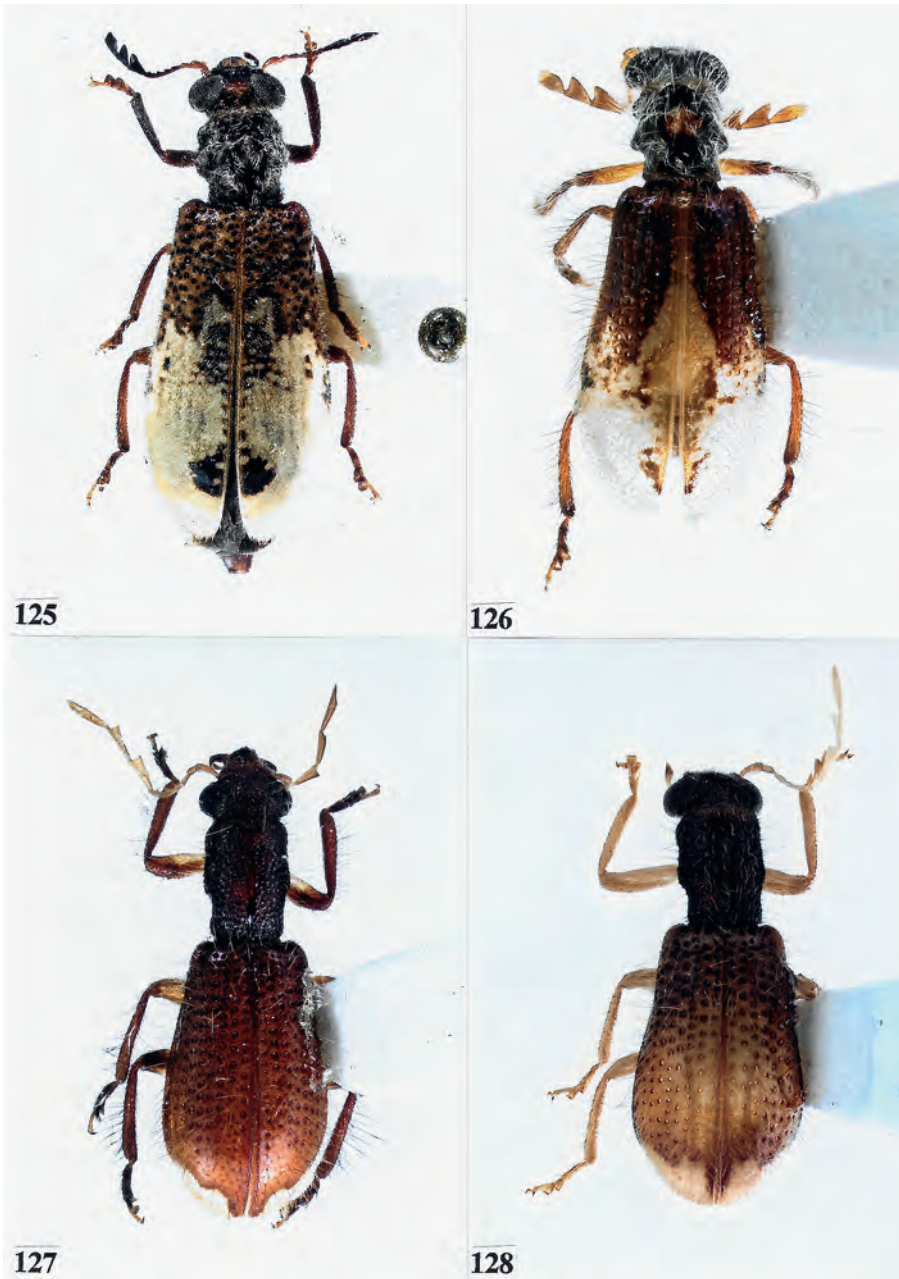



**Figs 98-106**: Phalli. (**98**) *Muisca dilatata*. (**99**) *M. insigna*. (**100**) *M. apicalis*. (**101**) *M. dozieri*. (**102**) *M. irrorata*. (**103**) *M. hirtula*. (**104**) *M. togata*. (**105**) *M. xanthura*. (**106**) *M. fera*.

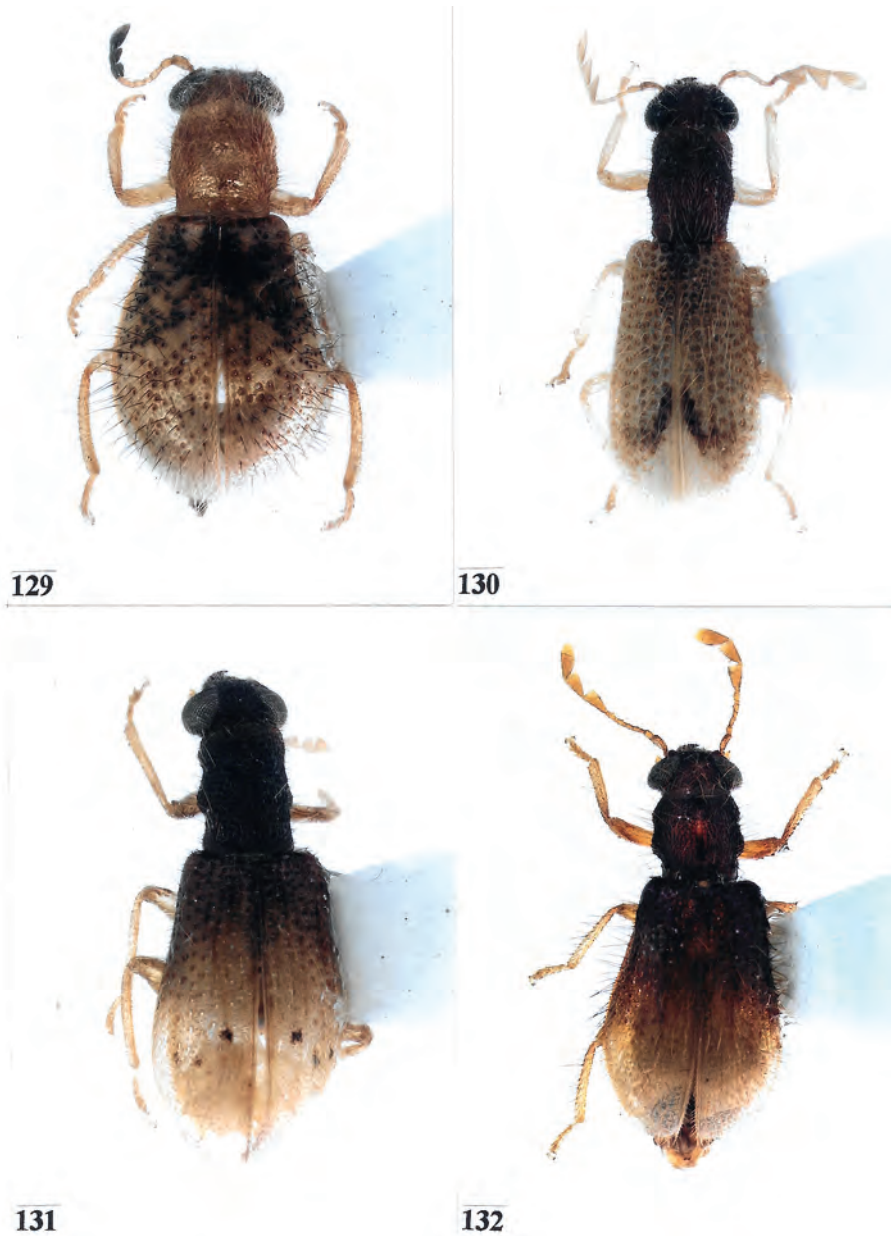



**Figs 107-115**: Phalli. (**107**) *Muisca signa*. (**108**) *M. angulicollis*. (**109**) *M. maculosa*. (**110**) *M. mestolinea*. (**111**) *M. omma*. (**112**) *M. heppneri*. (**113**) *M. lateripunctata*. (**114**) *M. octonotata*. (**115**) *M. tetraspilota*.

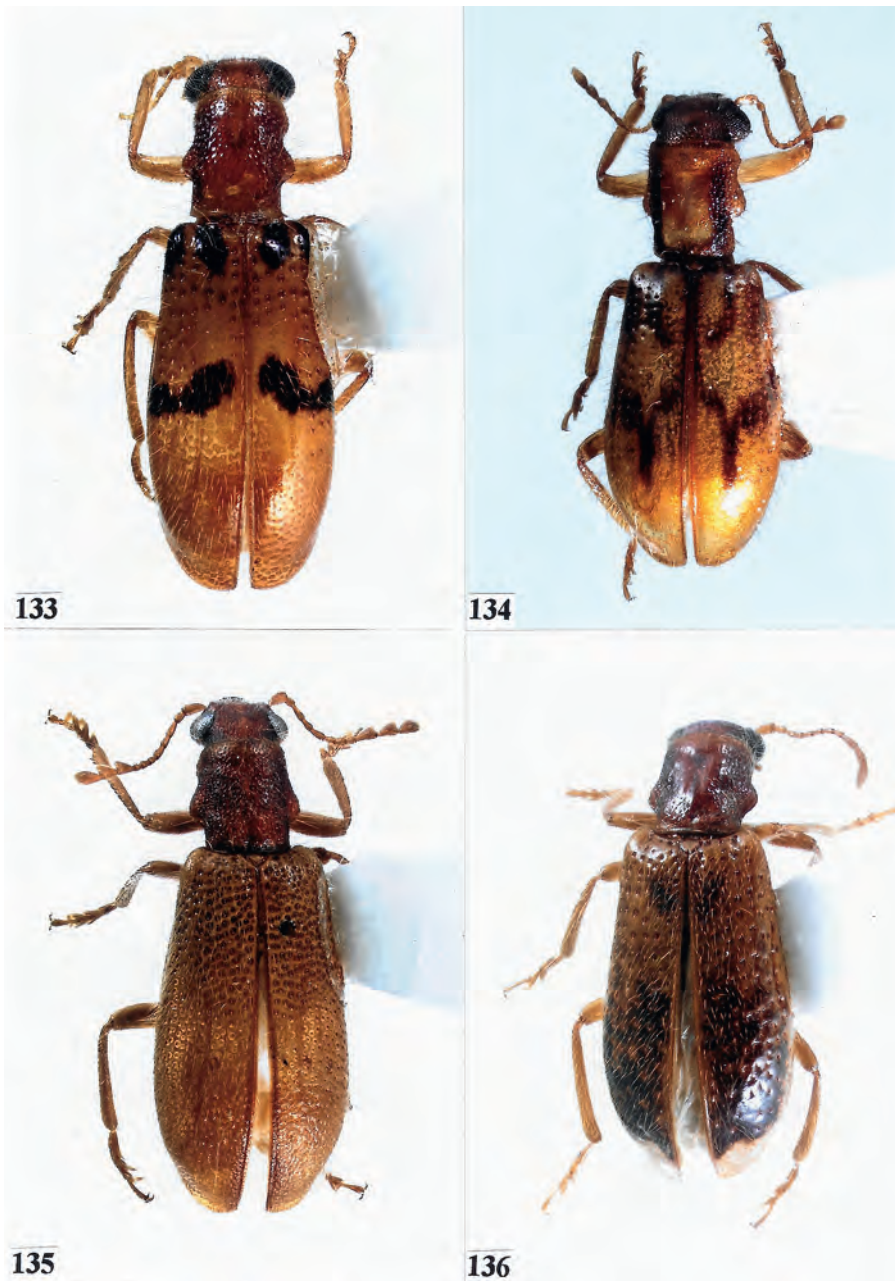

**Figs 116-124**: Phalli. (**116**) *Muisca adamanta*. (**117**) *M. agma*. (**118**) M. *biordinis*. (**119**) *M. bitaeniata*. (**120**) *M. nigrosignata*. (**121**) *M. peruviana*. (**122**) *M. sigilla*. (**123**) M. *testacea*. (**124**) *M. variabilis*.



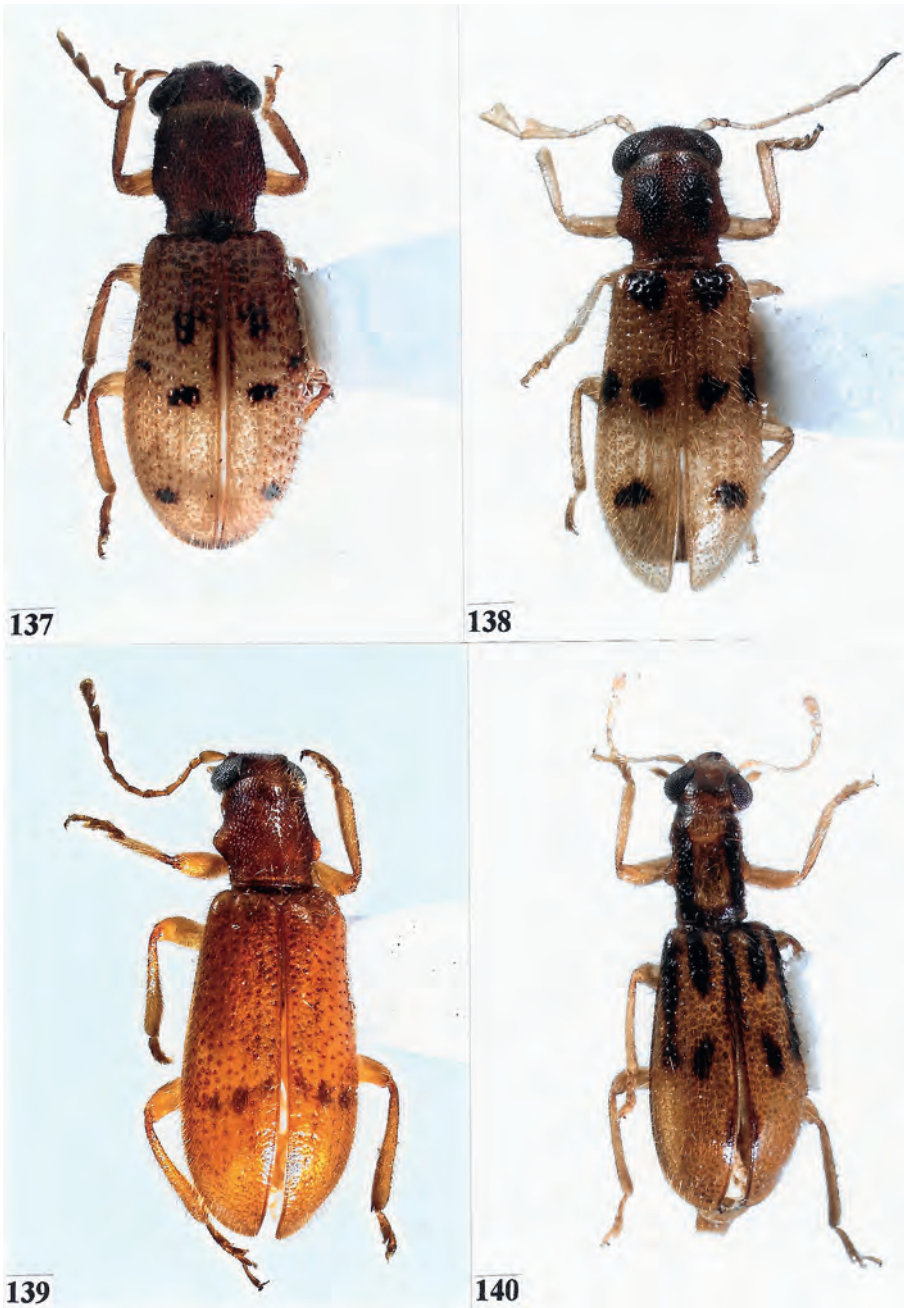

**Figs 125-128**: Habitus. (**125**) *Muisca dilatata*. (**126**) *M. insigna*. (**127**) *M. apicalis*. (**128**) *M. dozieri*.



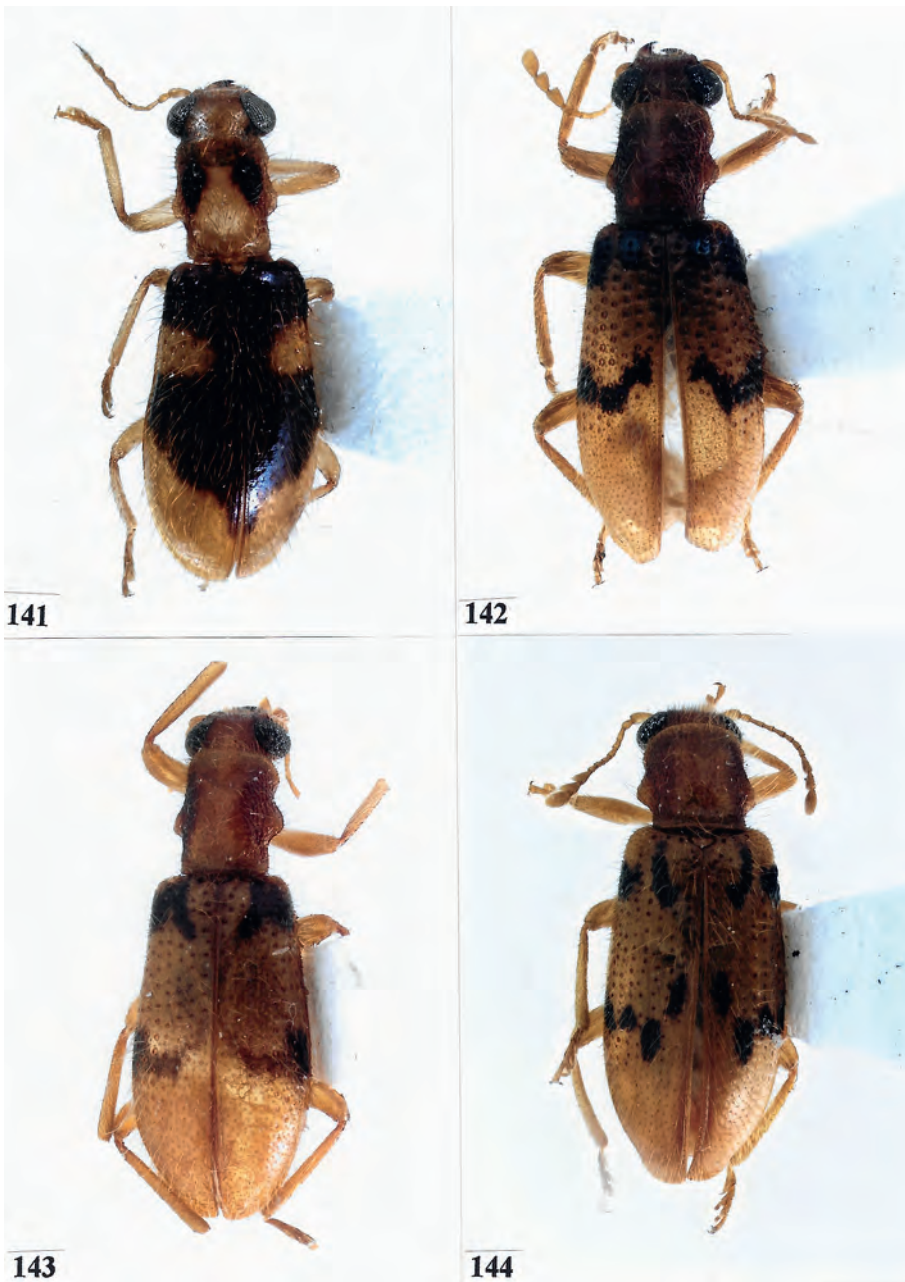

**Figs 129-132**: Habitus. (**129**) *Muisca irrorata*. (**130**) *M. hirtula*. (**131**) *M. toga*ta. (**132**) *M. xanthura*.



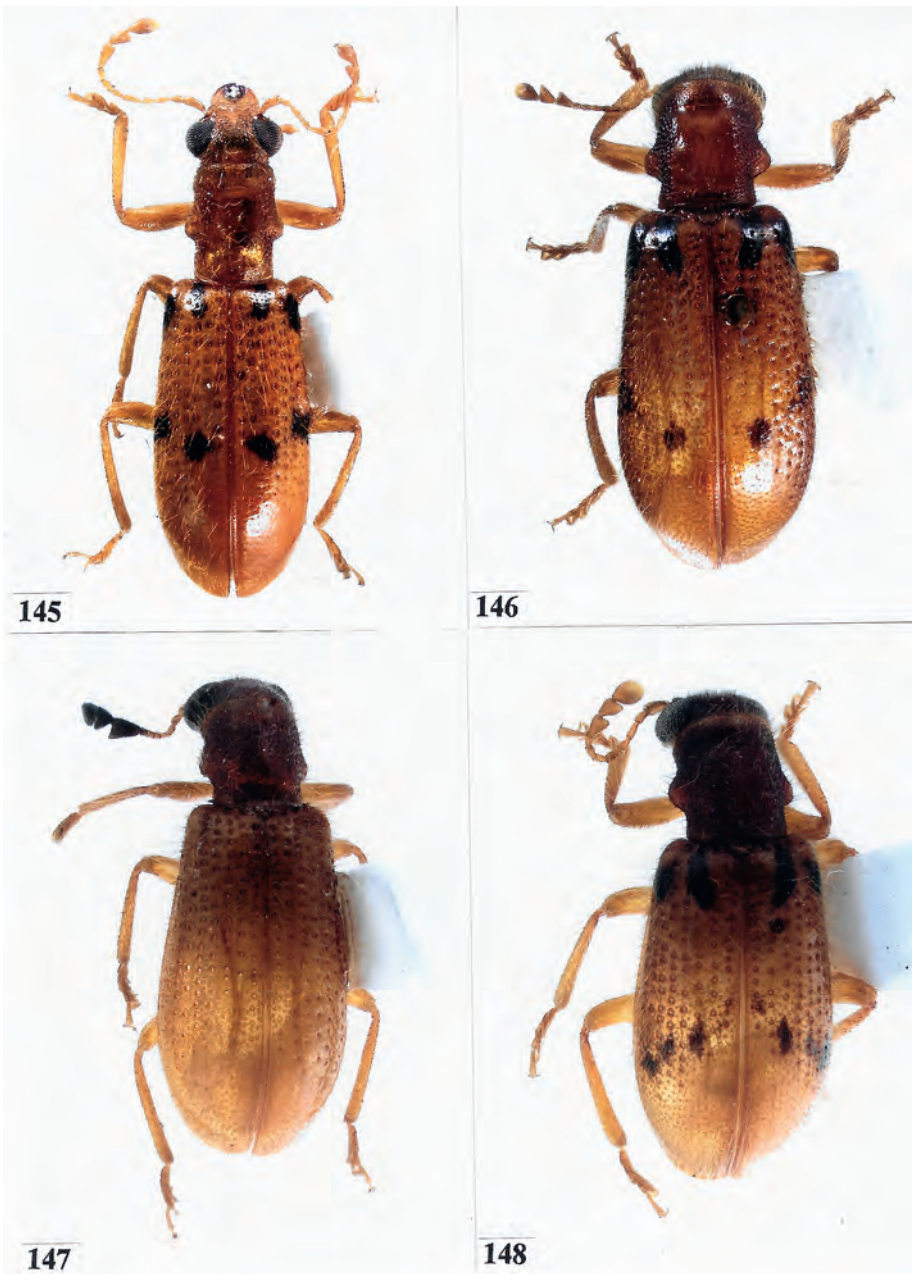

**Figs 133-136**: Habitus. (**133**) *Muisca fera.* (**134**) *M. signa.* (**135**) *M. angulicollis.* (**136**) *M. menda.*



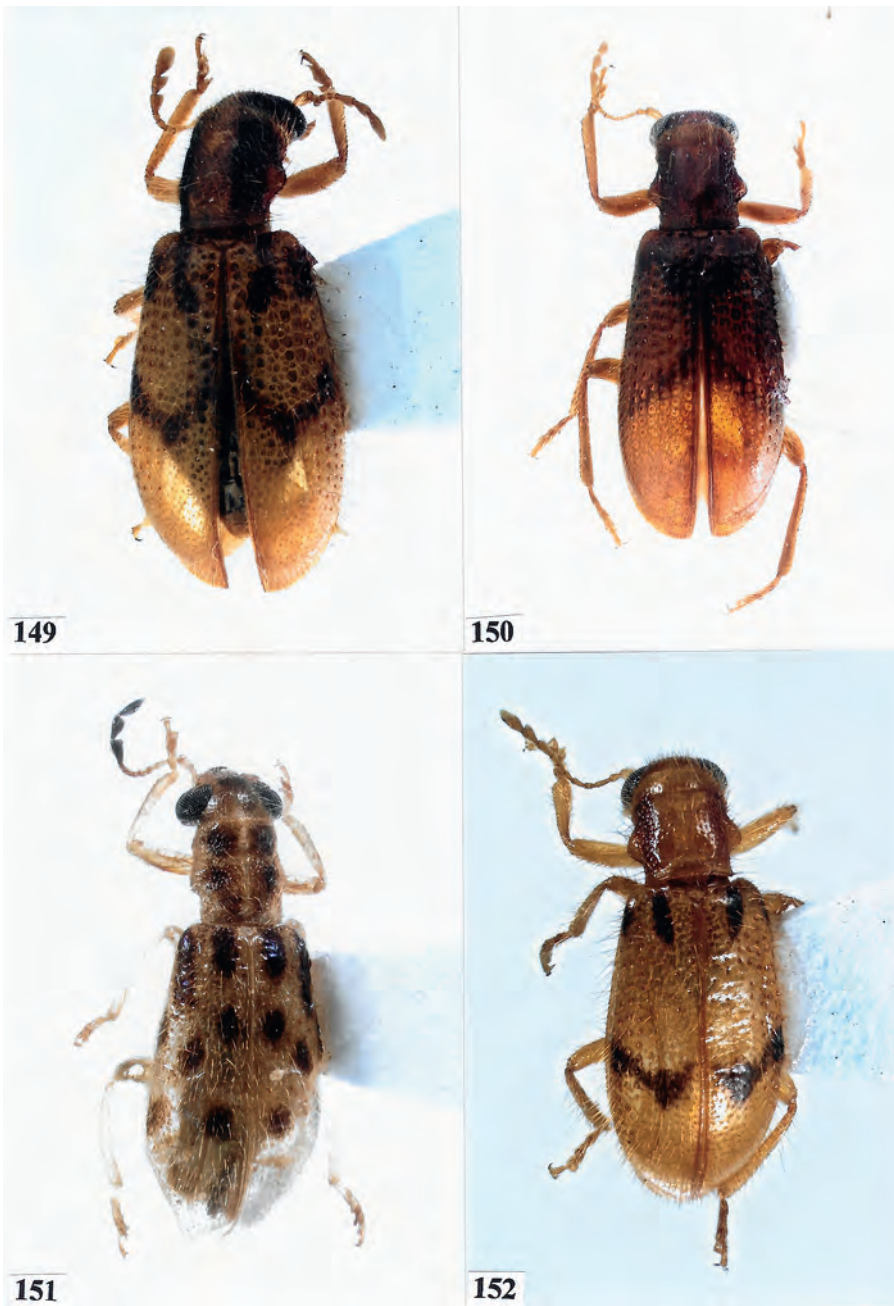

**Figs 137-140**: Habitus. (**137**) *Muisca hexa*. (**138**) *M. maculosa*. (**139**) *M. anachyma*. (**140**) *M. mestolinea*.



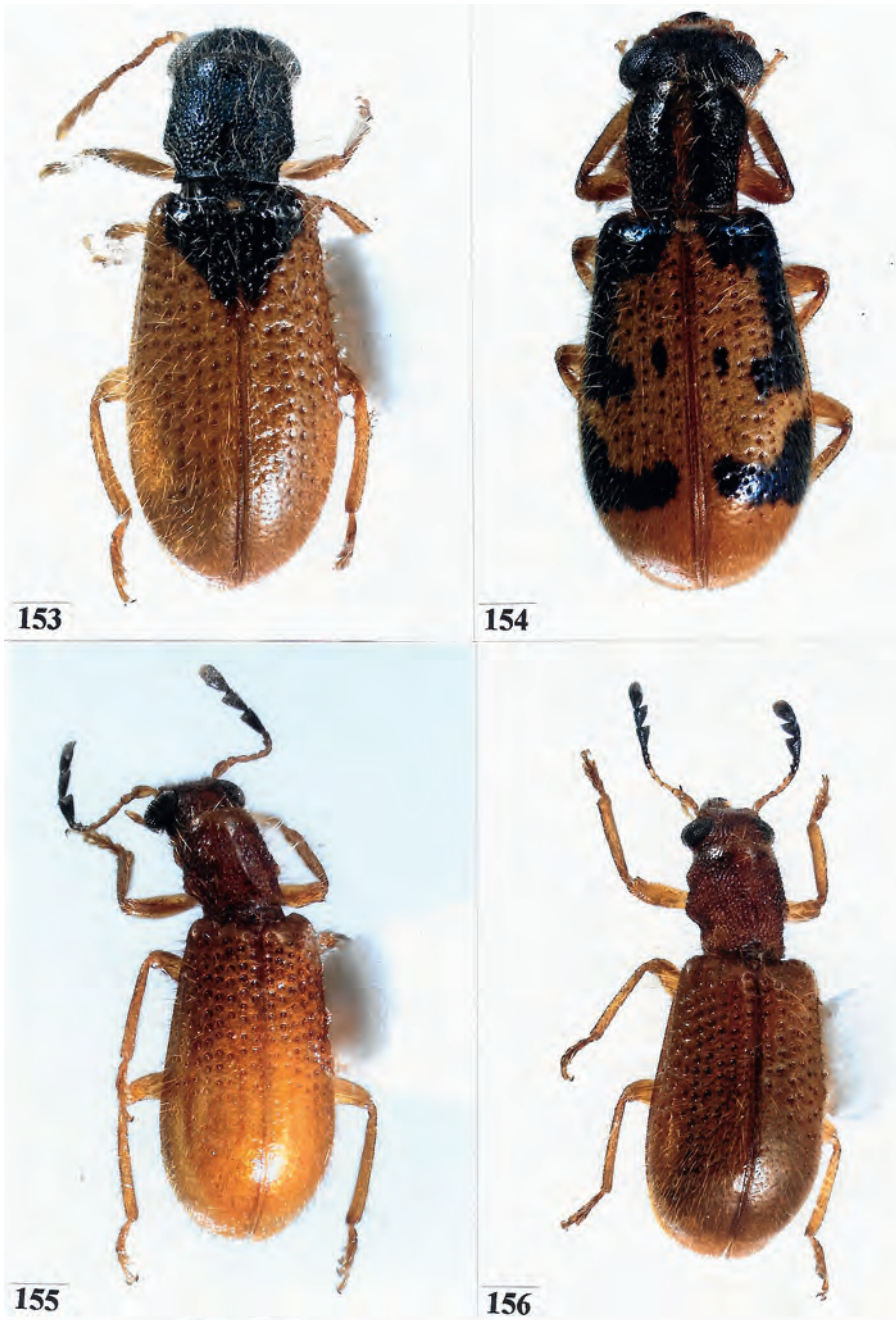

**Figs 141-144**: Habitus. (**141**) *Muisca omma*. (**142**) *M. heppneri*. (**143**) *M. lateripunctata*. (**144**) *M. magdalena*.




**Figs 145-148**: Habitus. (**145**) *Muisca octonotata*. (**146**) *M. tetraspilota*. (**147**) *M. adamanta*. (**148**) *M. agma*.




**Figs 149-152**: Habitus. (**149**) *Muisca biordinis*. (**150**) *M. bitaeniata*. (**151**) *M. malakela*. (**152**) M. *nigrosignata*.




**Figs 153-156**: Habitus. (**153**) *Muisca peruviana*. (**154**) *M. sigilla*. (**155**) *M. testacea*. (**156**) *M. variabilis*


**Fig. 157**: Habitus. (**157**) *Muisca zona.*