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Three new species of South American checkered beetles  
(Coleoptera: Cleridae: Clerinae)

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## Three new species of South American checkered beetles (Coleoptera: Cleridae: Clerinae)

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**Abstract.** Three **new species** of *Enoclerus* Gahan (Coleoptera: Cleridae) are described and illustrated. They are: *Enoclerus minas* Opitz from Colombia and Brazil, *E. salta* Opitz from Argentina, and *E. thomasi* Opitz from Bolivia.

**Key words.** Taxonomy, *Enoclerus*, Argentina, Bolivia, Brazil, Colombia.

**ZooBank registration.** urn:lsid:zoobank.org:pub:1E3911A0-7462-4D17-B35C-8EF5994EF238

### Introduction

Corporaal (1950: 14) lists 185 species of *Enoclerus* Gahan (Coleoptera: Cleridae: Clerinae). I know of over 60 undescribed species. It is a daunting task to organize such a high number of species into some sort of taxonomic revision, which cannot be provided at this time. However, some of these new species can be described that will be added to a larger work at a later date. Such descriptive efforts may involve species comparisons at the faunal level. Opitz (2005:112) defined major faunal regions for South America which are referenced here. Each of the three new species described here possess character combinations that are unique to the fauna in the region they occur.

This contribution is dedicated to the memory of Michael C. Thomas. Mike always found the time to help colleagues with his immense knowledge of computer programs. He was a superb taxonomist, especially in his dealings with the micro-coleoptera. His artistic skills are well known and documented in his publications.

### Materials and Methods

Although morphological criteria are used to determine species status, I adhere to the biological species concepts as discussed by Standfuss (1896), Dobzhansky (1937), and Mayr (1963). The operational criteria for the delimitation of species involve morphological structure and any other available criteria that suggest reproductive isolation among members of metapopulation lineages (de Queiroz 2007). Experience with morphological structure is generally a reasonable criterion with which to hypothesize reproductive isolation. In this study, consideration for species status involves: integumental color, color and arrangement of setal patterns on the pronotum and the elytra, length of the antenna, prominence of the elytral tubercle, length of the legs, and characteristics of the aedeagus. Methods involving dissection, measurements involving eye width/frons width, pronotal width, and elytral length, and morphological terminology follow those described in Opitz (2010: 35). Brown (1956) and Borror (1960) were used to coin scientific names. Abbreviations used in this manuscript are defined as follows: EW/FW = eye width/frons width (measured at 500 $\times$  from the front of the head); PW/PL = pronotal width (across the widest portion of the pronotal disc), pronotal length (from midline anterior margin to midline posterior margin); EL/EW = elytral length (from humeral angle to apex)/elytral width (greatest dorsal width of one elytron). A question mark “?” in the presented label data indicates missing information.

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). Image stacks, involving the aedeagus, were taken with a Leica<sup>®</sup> DM2500 compound scope with a 10 $\times$  objective lens and a Leica<sup>®</sup> DFC425 camera (Meyer Instruments, Houston, Texas, United States of America), and combined using Zerene Stacker<sup>®</sup>.

Repository of specimens studied:

- ACMT** American Coleoptera Museum, 8734 Paisano Pass, San Antonio, Texas 78255, United States of America (James E. Wappes; wappes@earthlink.net).
- FWSC** Fredrick W. Skillman Collection, Longhorn Ranch, 751 N. Cochise Stronghold Road, Pearce, Arizona 85606, United States of America (azbycid@yahoo.com).
- FSCA** Florida State Collection of Arthropods, Division of Plant Industry/Entomology, 1911 SW 34<sup>th</sup> Street, Florida Department of Agriculture, Gainesville, Florida 32608. United States of America (Paul E. Skelley; Paul.Skelley@fdacs.gov).
- MNHN** Museum d'Histoire Naturelle, Entomologie, 45 bis, Rue de Buffon, Paris (Ve), France (Antoine Mantilleri; amantill@mnhn.fr).
- RGCM** Roland Gerstmeier Collection, Technische Universität München, Lehrstuhl für Zoologie AG Entomologie, Hans-Carl-von-Carlowitz-Platz 2 85354, Freising, Germany (gerstmei@wzw.tum.de).
- UCDC** University of California - Davis, Department of Entomology, R. M. Bohart Museum of Entomology, 1 Shields Avenue, Davis, California 95616-85849, United States of America (Steve L. Heydon; slheydon@ucdavis.edu).
- 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; leblanc@uidaho.edu)
- WOPC** Weston Opitz Collection, Research Associate, Florida State Collection of Arthropods, Division of Plant Industry/Entomology, Florida Department of Agriculture and Consumer services, 1911 SW 34<sup>th</sup> Street, Gainesville, Florida 32608-7100, United States of America (Weston.Opitz@fdacs.gov).

### ***Enoclerus minas* Opitz, new species**

Figures 1, 4.

**Type material. Holotype.** ♂. Type locality: Brazil, Minas Geraes (MNHN). **Paratypes: 28. Colombia: Departamento de Caldas;** Manizales, collection date not noted, A. M. Patino (WOPC, 2; MNHN, 1). **Brazil: Estado do Goiás;** Rio Verde, ?-?- 1908, G. A. Baer (WOPC, 5; MNHN, 4); Jatahy, unknown- 1902, H. Donckier (WOPC, 1; MNHN, 1); ?- IX-1897 (WOPC, 2); Goiás (MNHN, 6); Trinidad, collection date not noted, Ch. Pujol (MNHN, 3); **Estado do Amazonas;** Santo Paulo de'Oliveça, collection date not noted, Hahnel (MNHN, 1); **Estado do Bahia;** Diamantina, collection date not noted, R. P. Torgue (MNHN,1); **Rio Grande do Sul;** Porto Alegre, collection date not noted, collector not noted (MNHN, 1).

**Diagnosis.** Aedeagus comprised of two subparallel phallic plates, plates narrow near apex; antennae and legs testaceous; cranium black; elytra mostly black, each elytron with three yellow maculae, anterior two maculae nearly contiguous; elytral apex slightly setose.

**Description.** *Size:* Length 6.0 mm; width 1.0 mm. *Form:* As in Figure 4. *Head:* Capitulum slightly acuminate; (EW/FW 20/53). *Thorax:* Elytral disc slightly roughened (PL/PW 80/80); (EL/EW 220/50). *Abdomen:* Aedeagus (Fig. 1).

**Variation.** Length 6.0–8.0 mm; width 1.0–1.1 mm.

**Etymology.** The trivial name, *minas*, constitutes a noun in apposition and refers to the type locality.

**Remarks.** *Enoclerus minas* is from the Cordillera Oriental Complex and the Brazilian Highlands (Opitz 2005). The red legs and elytral color pattern, along with a subparallel aedeagus that is narrowed apically distinguish this species from all others in this region.

### ***Enoclerus salta* Opitz, new species**

Figures 2, 5.

**Type material. Holotype.** ♂. Type locality: Argentina, Salta, La Liña, 23-2-1992 (RGCM). **Paratypes: 9. Argentina: Provincia de Salta;** 3 km S Cnel Moldes, 23-I-1989, C. L. Bellamy (WFBM, 1); 4 km S Coronel Moldes, I-23-1989, 1,150, collector not noted (UCDC, 1); **Provincia Santiago del Estero;** Ojo de Agua, 4-III-1992, collector not noted (RGCM, 1); **Provincia de Salta;** Alemania, 23-II-1992, collector not noted (RGCM, 1); 5 km N



Figures 1–6. *Enoclerus* spp. 1–3) Aedeagi. 1) *Enoclerus minas*. 2) *E. salta*. 3) *E. thomasi*. 3–6) Habitus. 4) *E. minas*. 5) *E. salta*. 6) *E. thomasi*.

Cnel Moldes, 23-I-1989, C. L. Bellamy (WOPC, 1); Sumalao, ?-I-1992, collector not noted (WOPC, 1); **Provincia de Córdoba**; ?-II-1939, M. J. Viana (WOPC, 2); **Provincia de Tucumán**; Tapia, 3-IV-1903, 600 m, G. A. Baer (MNHN, 1).

**Diagnosis.** Aedeagus comprised of two parallel sided phallic plates, plates obtusely rounded at apex; mouthparts, antennae, and legs testaceous; cranium black; pronotum mostly testaceous, arch infuscated and partially setose; elytra tricolored, basal 1/3 setaceous, apical 2/3 mostly black, each elytral with two small punctiform maculae at base, and two crescentic maculae on apical third; elytral apex highly setose.

**Description.** *Size:* Length 8.0 mm; width 1.3 mm. *Form:* As in Figure 5. *Head:* Capitulum slightly acuminate; (EW/FW 23/60). *Thorax:* Elytral disc slightly roughened (PL/PW 120/120); (EL/EW 270/80). *Abdomen:* Aedeagus (Fig. 2).

**Variation.** Length 6.0–8.0 mm; width 1.0–1.3 mm. The forebody may be entirely testaceous.

**Etymology.** The trivial name, *salta*, constitutes a noun in apposition and refers to the type locality.

**Remarks.** *Enoclerus salta* is from the Argentinian Highlands (Opitz 2005). The crescentic elytral maculae and parallel sided aedeagus distinguish this species from all others from the region.

### ***Enoclerus thomasi* Opitz, new species**

Figures 3, 6.

**Type material. Holotype.** ♂. Type locality: Bolivia, Santa Cruz, 4-5 km N Achira, road to Amboro, 12-13-X-2000, coll. Wappes & Dozier (FSCA). **Paratypes:** 41. **Bolivia: Departamento de Santa Cruz;** 4-5 km Achira, road to Amboro, 12-13-X-2000, Wappes & Dozier (ACMT, 2); *idem*, 22-X-2000, M. C. Thomas (FSCA, 1); *idem*, 21-22-X-2000, Wappes & Morris (ACMT, 1); *idem*, Campo 5-5, 9-11-X-2004, 800 ft, Wappes & Morris (ACMT, 6); *idem*, 27-28-X-2011, Wappes & Skillman (ACMT, 6); *idem*, 28-X-2011, Skillman & Wappes (FWSC, 8); *idem*, road to Floripondo, 15-IX-2012, 6,350 ft, light, Wappes, Skelley, Bonaso, Hamel (ACMT, 1); *idem*, 15-IX-2012, Skelley & Hamel (FSCA, 1); *idem*, 19-X-2011, 1,900 m, Wappes, Lingafelter, & N. Woodley (ACMT, 6); **Departamento de La Paz;** Chaco, Yungas, 3,000 m, G. Garlepp (NMHN, 2; WOPC, 1); *idem*. Chaco, collection date not noted, collector not noted (MNHN, 2); Coroico, 6-XII-1955, 1,800 m, L. E. Peña (WFBM, 1); Callanga, collection date not noted, G. Garlepp (MNHN, 1); Chicani, collection date not noted, collector not noted (MNHN, 1). “Bolivia” collection date not noted, collector not noted (MNHN, 1).

**Diagnosis.** Aedeagus distally flared, then narrowing towards apex, phallic inner margin spinous; mouthparts and antennae testaceous; body mostly black; elytra bicolored, with basal maculae and three broad fasciae and the elytral surface is subglabrous.

**Description.** *Size:* Length 6.5 mm; width 1.2 mm. *Form:* As in Figure 6. *Head:* Capitulum slightly truncated (EW/FW 20/47). *Thorax:* Elytral disc finely punctate (PL/PW 90/80); (EL/EW 260/60). *Abdomen:* Aedeagus (Fig. 6).

**Variation.** Length 5.0–7.0 mm; width 1.0–1.2 mm. The width of the testaceous regions of the elytra vary as do the size of the basal maculae.

**Etymology.** The trivial name, *thomasi*, honors Michael C. Thomas for his many contributions to Systematic Entomology.

**Remarks.** *Enoclerus thomasi* is from the Altiplano Complex (Opitz 2005). The elytral color pattern with a subglabrous surface along with unique distally flared aedeagus distinguished this species from all other in the region.

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