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Xenaroswellanini, *Xenaroswelliana deltaquadrant*, New Tribe, New Genus, and New Species from the Cerrado of Estado de Goiás, Brazil (Insecta: Coleoptera: Carabidae)

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A new tribe, genus, and species are recognized and described for the beetle family Carabidae. *Xenaroswellanini* new tribe, *Xenaroswelliana deltaquadrant* new genus, new species is known from a unique specimen found in 1974 at Lagoa des Pedras, west of the Rio Caña Brava, 160 km NE Brasília, 15.067°S, 47.078°W, 492 m, Estado de Goiás, Brazil. While the species can be categorized within the Psydriiformes – Psydriinae or Harplinae, its further classification is tenuous. Some attributes are similar to those of members of Psuedomorphini, a mymecophilus/isopteroophilus lineage. The new species lives in the cerrado vegetation zone of eastern Goiás State and was found by sweeping vegetation at the edge of a large eutrophic marsh.

Uma nova Tribo, Gênero e espécie são reconhecidos e descritos para os besouros da família Carabidae. *Xenaroswellanini* nova tribo, *Xenaroswelliana deltaquadrant* novo gênero, nova espécie são conhecidos para um único exemplar encontrado em 1974 na Lagoa das Pedras, oeste do Rio Cana Brava, 160 km NE Brasília, 15.067°S, 47.078°W, 492 m, Estado de Goiás, Brasil. Enquanto a espécie pode ser aceita para os Psydriiformes – Psydriinae ou Harplinae, sua classificação é pouco significativa. Alguns atributos são similares aos dos membros de Psuedomorphini, a linhagem mimecófila. Esta nova espécie vive na vegetação do cerrado, a leste do estado de Goiás e foi encontrada com a varredura da vegetação nas margens de um extenso charco eutrófico.

Una nueva Tribu, género y especie son reconocidas y descritas para los escarabajos de la familia Carabidae. *Xenaroswellanini* nueva Tribu, *Xenaroswelliana deltaquadrant* nuevo género, nueva especie, es conocida a partir de un único espécimen colectado en 1974 en Lagoa des Pedras, oeste de Río Caña Brava, 160 km NE Brasília, 15.067°S, 47.078°W, 492 m, Estado de Goiás, Brasil. Si bien, la especie puede ser categorizada dentro de los Psydriiformes – Psydriinae o Harplinae, su clasificación posterior resulta poco clara. Parte de los atributos son similares a los de los miembros de Psuedomorphini, del linaje mymecophilus/isopteroophilus. La nueva especie vive en la vegetación de Cerrado del este del estado de Goiás y fue encontrado barriendo con red la vegetación en los márgenes de un gran pantano eutrófico.

Discovery of a strange new life form is an exciting human experience. If that human is also a biologist, then there is a challenge to recognize its place in the existing Linnean classification, know more about it, learn how to identify it, and then tell someone. To do the latter, at least accurately through time, a valid scientific name is required. When recognition and classification are not

achievable after much literature and collection research and collegial interchange, one must then provide a suitable taxonomic context for the strange new life form, and provide the information necessary for others to recognize additional specimens of it, should they be discovered (*cf.* Ball and Shpeley 2002) and with the hope they will be found despite global landscape conversion and outright habitat destruction.

The subject of the present contribution on my studies of carabid beetles of the Western Hemisphere has resided in the Coleoptera collection of the U.S. National Museum of Natural History since 1974, undetected until earlier this year among the mixed lots of un-curated carabid beetles. The specimen was double-mounted sideways on a minuten pin, it is pale, and it is fairly small, hence it drew no attention from users of the collection, including me, until I began a general reorganization of the NMNH Carabidae as part of my Treatise series (Erwin 2007). At first glance, one is hard put even to recognize the specimen as a carabid beetle; it is so alien in its attributes (Fig. 1). There is nothing like it in the known Carabidae, yet upon observations of details, it has all the necessary structural features to place it amongst the more derived tribes, in Psydriiformes — Psydriinae or Harpalinae, perhaps even close to the myrmecophilus members of Pseudomorphini.

The purpose of this paper is to make the taxon known, so that museum curators and field entomologists might be on the lookout for more individuals, both adults and immature stages, and what must be an extremely peculiar way of life in contrast to more “normal” carabid beetles. The species is putatively either myrmecophilus or isopterophilus because it shares certain features with known lineages of such disposition.

Darlington (1933) with his *Gehringia olympica*, Kavanaugh and Nègre (1983) with their *Notiokasis chaudoiri*, and Ball and Shpeley (2002) with their *Ginema thomasi* were the last, since the early 20th century, to report a truly novel tribe of carabid beetles based on the description of a new species, rather than a reclassification of previously known oddities (*cf.* Basilewsky 1953, Bascanini; Erwin 1985, Amarotypini). Carabid beetles represent a well-known global lineage, thus not many new higher-level discoveries can be expected. However, when one does make such a discovery, it is incredibly exciting and challenging for us to search for more in under-explored and little known landscapes and microhabitats.

MATERIALS AND METHODS

Length and width measurements follow the conventions suggested by Ball (1972) and Kavanaugh (1979). Apparent body length (ABL) is measured from apex of labrum to apex of longer elytron. Standardized body length (SBL) is the sum of the lengths of the head (measured from the apex of the clypeus to a point on midline at level of the posterior edge of the compound eyes), pronotum (measured from apical to basal margin along midline), and elytron (measured from apex of scutellum to apex of the longer elytron). Total width (TW) is measured across both elytra at their widest point (usually this is a measure of the left elytron doubled). The habitus images of the adult were made with a Leica M420 microscope and an EntoVision™ system. Precise measures were taken using the Archimed software embedded in the EntoVision™ system.

ACCOUNT OF TAXON

Western Hemisphere Genus and Species of Xenaroswellanini, New Tribe*Xenaroswelliana deltaquadrant* Erwin, gen. et sp. nov., BRAZIL

PARTIAL KEY TO THE TRIBES OF CARABIDAE OF THE WESTERN HEMISPHERE

Modified from Erwin, Kavanaugh, and Moore (2002, revised 2004)

Key to Tribes*

- 1 Intercoxal process of prosternum very broad, covering mesosternum. Scutellum concealed by median lobe of posterior margin of pronotum. Body almost circular in outline **Omophronini**, Bonelli 1810
- 1' Intercoxal process of prosternum not enlarged. Scutellum visible, at least in part. Shape of body various, but not circular 2
- 2 (1') Mentum and submentum fused. Scape of antenna only partially evident in dorsal aspect when antenna not in repose. Head with short, deep antennal sulcus ventrally between eyes and mouthparts. **Pseudomorphini**, Newman 1842
- 2' Mentum and submentum not fused. Scape of antenna visible from above. Head without short deep antennal sulcus, or with shallow channel for reception of scape 2a
- 2a (2') Head semi-hypognathus, clypeus vertical, frons somewhat bulbous, mouthparts not visible in dorsal aspect; neck markedly constricted. Gena markedly swollen behind eye. Pronotum distinctly bow-shaped **Xenaroswellanini**, new tribe
- 2a' Combination of attributes not as in 2a 3

* For continuation of key, see step 3 at Erwin, Kavanaugh, and Moore (2003)

Xenaroswellanini Erwin, new tribeTYPE GENUS: *Xenaroswelliana*, gen. nov., here designated.**TRIBAL NAME.**— Based on the name of the type genus, with its derivation explained below.**PROPOSED ENGLISH VERNACULAR NAME.**— Dissonant carabid beetles.

DIAGNOSIS.— Head semi-hypognathus, frons bulbous, mouthparts not visible in dorsal aspect, clypeus vertically oriented, edge at basal third of mandible with three stout anteriorly-curved setae; eye small, convex, orbit somewhat quadrate, posterior margin straight, others slightly rounded; gena markedly inflated behind eye; preocular lobes both above and below antennal insertion, the upper one small, the lower one markedly enlarged forming with the eye above a shallow sulcus for reception of the robust and long antennal scape. Antennomeres 1–3 elongate, 1–2 sparsely setiferous, without pubescence, antennomere 3 more setiferous apically, 4–11 short, subequal in length, with dense pubescence and an apical ring of longer setae. Mouthparts small and directed sub-ventrally at about 45°. Neck markedly constricted with large posterior collar. Pronotum bow-shaped with very wide lateral explanations, apically with recessed connection to neck, basally lobed. Elytra apically truncate, apical margin slightly sinuate. Abdomen with 6 visible sterna; last visible tergum with apical margin double-scalloped.

***Xenaroswelliana* Erwin, gen. nov.**TYPE SPECIES: *Xenaroswelliana deltaquadrant* Erwin, sp. nov., here designated.**DERIVATION OF GENUS NAME.**— The word “*Xenaroswelliana*” derives from the Greek, *Xenos*,

plus a town in New Mexico, Roswell. Roswell, NM, became famous in the 1940s when a putative flying saucer landed there bringing with it guest aliens. *Xenos*, meaning guest or stranger, referees both to the strangeness of this lineage of carabid beetles and the likely possibility that it, and/or its larvae are inhabitants (guests) of ant or termite nests.

PROPOSED ENGLISH VERNACULAR NAME.— Dissonant carabid beetles.

DIAGNOSIS.— With the attributes of the tribe as described above and male with modified white adhesive setae on basal two anterior tarsomeres in two parallel rows. Mentum and submentum not fused; apical maxillary palpomere axinoform, apical labial palpomere slender, slightly longer than penultimate. Eye setiferous, setae long. Entire dorsal surface setiferous, setae long and stout, more densely amassed on bulbous frons, inflated gena, anterior and posterior pronotal margins, humeral margin, ventral posterior angle of pronotum, and apical margin of all sterna. Intervals and interneurs effaced, although trace of latter under high magnification and oblique lighting; elytral setae in eight parallel rows (including sutural) along midline of interneurs. Elytral margin broadly explanate.

GEOGRAPHIC DISTRIBUTION.— The geographical range of this genus is presently unknown given that a single specimen from Brazil is all that has been found, but undoubtedly, they occur elsewhere, if their habitat has not been completely converted to agriculture or desertified.

***Xenaroswelliana deltaquadrant* Erwin, sp. nov.**

Figures 1–5.

HOLOTYPE.— BRAZIL, **Goiás**, Lagoa de Pedras, west of Rio Caña Brava, 160 km NE Brasília, 15.067°S, 47.078°W, 492 m, 30 October 1974 (L. Knutson) (NMNH:ADP109095, male).

DERIVATION OF SPECIFIC EPITHET.— The word “*deltaquadrant*” is a Star Trek “run-together” word denoting an area of the popular television program’s Universe where the Starship Voyager gets lost; the word is feminine. While there in the Delta Quadrant, the Starship crew faces Species 8472, an alien life form likely from a “fluidic” parallel Universe to our own. The carabid species described herein presents similar mental challenges in understanding what must surely be a mysterious way of life in the cerrado of Goiás, Brazil. Another such mystery (*Cicindis horni* Bruch), took 100 years to solve (Erwin and Aschero 2004). Now, along comes another!

PROPOSED ENGLISH VERNACULAR NAME.— Delta-Q dissonant carabid beetle.

DIAGNOSIS.— With the attributes of the tribe and genus as described above and, overall color testaceous (Figs. 1–3), head slightly darker than pronotum and elytra; pronotum (Fig. 1) wider than long, rectangulate; apex and base deeply arcuate. Elytron with prominent humerus, broadly explanate and setiferous lateral margins, and truncate apex. Metathoracic wings fully developed.

DESCRIPTION.— (Figs. 1–4). *Size*: Small, ABL = 4.64 mm; SBL = 4.128 mm; TW = 1.78 mm. Pronotum ratio (W/L) – 1.66; elytron ratio (W/L) – 0.33; pronotum width/elytral length ratio – 0.53. With the attributes of the tribe and genus as described above and: *Color*: Head, pronotum, elytra and appendages testaceous. *Luster*: Dorsal surface markedly shiny. *Microsculpture*: Dorsal surface microsculpture effaced. *Head*: (Fig. 3) Mandible with shallow scrobe, margin tri-setiferous; labrum small, rectangulate, quadrisetose; clypeus small, rectangulate, hexisetose; frons bulbous, with numerous setigerous pores, setae markedly long and stout, directed anteriad. Occiput markedly convex, with same setal attributes as on frons. *Prothorax*: Pronotum (Fig. 1) markedly bow-shaped, disc convex and non-setose; lateral margins broadly explanate; anterior and posterior angles markedly prominent; lateral margins, base, and apex with numerous long stout erect setae; anterior margin fitted to vertical collar of constricted neck; posterior margin lobed; disk with longitudinal shallowly impressed line.



FIGURE 1. *Xenaroswelliana deltaquadrant* Erwin, male, dorsal aspect.



FIGURE 2. *Xenaroswelliana deltaquadrant* Erwin, male, ventral aspect.

Pterothorax:

Elytral interneurs micropunctate (difficult to observe); interval setigerous pores moderately closely spaced, moderately coarsely impressed. Metepisternum longer than wide, surface sparsely setiferous.

Metasternum

sparsely setiferous. Metathoracic wing fully developed, no doubt functional. Trochanter narrowed apically, acute. *Abdomen:* Sternum III-IV fused. All visible sterna sparsely setiferous on disk, each with numerous long stout setae along apical margin. *Male genitalia:* (Fig.



FIGURE 3. *Xenaroswelliana deltaquadrant* Erwin, male, head, lateral aspect.

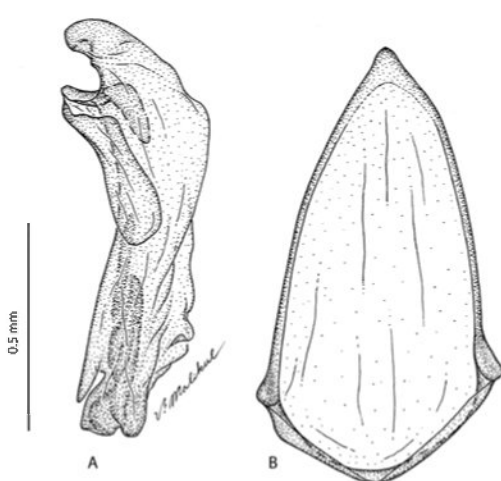


FIGURE 4. *Xenaroswelliana deltaquadrant* Erwin, male, A. aedeagus, left lateral aspect; B. Ring sclerite, dorsal aspect.

4) Phallus straight in dorsal *situ* aspect, apex pointed, left lateral margin very slightly arcuate at apical third; basal maw open, moderately deep. Parameres (Fig. 4): left more than twice length of right paramere and somewhat broader and truncate, distal margin of right markedly narrowed.

Endophallus with folding pattern and microtricheal fields, only. Ring sclerite an inverted “wish-bone” with proximal end slightly produced, narrowly rounded.

DISPERSAL POTENTIAL.—

These beetles are macropterous and probably capable of flight. Accordingly, the species may be expected to be broadly distributed across a wide geographical range where its microhabitat persists in the face of massive landscape conversion to agriculture and neglect.

WAY OF LIFE.— Adults putatively might be found in ant or termite nests or in the surrounding vicinity; larvae putatively could be nestinquilines. Members of *X. deltaquadrant* Erwin occur at midland altitudes in the cerrado vegetation zone at the margin of a large eutrophic marsh (5,100 meters diameter; Fig. 6). Adults are active in October and at least the male described here was active or resting on low sweep-able vegetation during the day (L. Kuntson, pers. comm.). Vegetation surrounding the marsh where the unique specimen was collected consists of

Cassia sp., *Aeschynomene* ? *brasiliiana* (Poir.) DC. (Leguminosae); *Setaria geniculata* (Lam.), *Paspalum* sp. *Sagittaria* sp. (Poaceae); *Heliotropium* sp. (Boraginaceae); *Ludwigia sedioides* (H. & B) Ham. (Onagraceae); *Echinodorus andrieuxii* (Hook. & Arn.) (Alismataceae); *Borreria* sp. (Rubiaceae).

OTHER SPECIMENS EXAMINED.— None; the holotype is unique.

GEOGRAPHIC DISTRIBUTION.— (Fig. 5). This species is known only from the type locality.



FIGURE 5. Geographic distribution map for *Xenaroswelliana deltaquadrant* Erwin with aerial view of marsh at the type locality along Brazil's Highway 20 in Goiás State, Brazil. Courtesy of Google Earth.



FIGURE 6. The vegetation and water body at the type locality in Goiás State, Brazil.

DISCUSSION

The uniqueness of the single known specimen of this new taxon warrants its description for the purposes of promoting the discovery of more individuals for a more in-depth study of its relationships amongst the Carabidae and its natural history. In finding more individuals, attention must be given to recording its way of life in all aspects — possible host species if any, microhabitat, micro-vegetation zone, behavior, etc.

At present, from some of the attributes of the single individual described herein, I suggest there is a possible relationship with the enigmatic Pseudomorphini; however, that tribe's relationships are still unclear (Baehr 1992, 1997; Ober 2002; D. Maddison, pers. comm.) except that they are Harpalinae. Alternatively, are the apparent shared attribute tendencies with the pseudomorphines due to convergence because of similar selection pressures in life with ants or termites?

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