Zootaxa 1415: 17–24 (2007)
www.mapress.com/zootaxa/
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ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

A new genus and species of apterous Doryctinae (Hymenoptera: Braconidae) from Costa Rica

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Abstract

Oroceguera andersoni **n. gen.** and **n. sp.**, an apterous braconid in the subfamily Doryctinae is described from Costa Rica. Portions of the diagnostic keys from Marsh (1997; 2002) are combined and updated to include this new genus. Diagnostic features are presented to distinguish it from other Doryctinae; its unusual morphology is discussed and conjecture is made on life history.

Key words: Hymenoptera, Braconidae, New World, ocelli, wingless, *Oroceguera andersoni*

Introduction

Doryctinae are one of the most diverse and species-rich subfamilies of the Braconidae. The subfamily is diagnosed by a row of spines on the foretibia, a flange on the propleuron above the forecoxa, the presence of an epicnemial carina and occipital carina (Marsh 2002), a double node near the apex of the dorsal valve of the ovipositor (Quicke et al., 1992), and a cyclostome mouth. Most species are thought to be idiobiont ectoparasitoids of wood-boring beetles but host records are rare and show a great deal of diversity. Some are known to be phytophagus on seeds, parasitoids of Embiidinae (Shaw & Edgerly 1985) and others attack wood boring lepidopterans or sawflies. Members of *Psenobolus* are thought to be inquilines of fig wasps (Ramirez & Marsh 1996). Marsh (1997) provided a key to the New World genera and Marsh (2002) included a key to the genera of Costa Rica.

Material and methods

A single female specimen was collected in a Berlese funnel by R.S. Anderson in 1995 and it is deposited in the Hymenoptera Institute Collection, University of Kentucky, Lexington. Terminology for the description is taken from Marsh (2002), Belokobylskij (1993; 2004) and Sharkey & Wharton (1997). Brightfield images were taken using a Leica MZ-16 microscope attached to a JVC digital camera. Images were captured using Auto-Montage software by Syncroscopy© and edited in Adobe Photoshop©.

Material for comparison was obtained from the Canadian National Collection (Ottawa, Canada, *Ecphylus sp.*), the Hymenoptera Institute Collection (Lexington, Kentucky), and the The Natural History Museum (London, *Ecphylopsis sp.* Paratype).

Accepted by M. Buffington: 24 Jan. 2007; published: 5 Mar. 2007

***Oroceguera* Seltmann and Sharkey, gen. n.**

Type species*: Oroceguera andersoni* **sp. n.**

Etymology: The genus name is a combination of the Spanish words for “gold” (oro) and “blindness” (ceguera) and refers to the golden-yellow coloration, reduced eyes and lack of ocelli.

Diagnosis: Only the holotype female is known (Fig. 1a). They are easily distinguished from all other wingless genera of Doryctinae by the high insertion of the metasoma and the complete absence of wings which are not indicated, even as small scales or wingpads. (Fig. 1d).

Description: Small size, 1.27 mm; female wingless. *Head*: subcubical flattened and glabrous dorsally; face with median keel and few long setae; eye small, longer than wide; ocelli absent; occipital carina meeting hypostomal carina; postgenal bridge absent; first flagellomere subequal but slightly shorter than second. *Mesosoma:* highly modified and lacking tegula; pronotal collar equal in length to first flagellomere, pronotal carina distinct and raised; notauli present but short; scutellum conical and with distinct longitudinal carinae apically, coriaceous-rugose with tubercles on either side laterally; scuto-scutellar suture present; epicnemial carina distinct; postpectal carina present but less pronounced; sternaulus distinct; mesopleuron and metapleuron concave; deep sulcus dividing metanotum and propodeum; propodeum concave. *Legs:* foretibia and midtibia with numerous obvious and stout spines along anterior edge; hind coxa without basal tubercle or tooth. *Metasoma:* inserted high above hind coxal cavities and separated from them by a wide propodeal bridge; first metasomal tergite petiolate, acrosternite long, 0.5 times as long as first metasomal tergum (Belokobylskij et al., 2004), with distinct dorsope, without basolateral processes, spiracle found at about 0.5 length; longitudinal carinae present on tergum one, terga 2–8 without sculpture; distinct groove between second and third median tergites lacking; laterotergites not present on terga 2–4.

FIGURE 1. *Oroceguera andersoni* a. lateral habitus, b. lateral head, c. dorsal head, d. lateral metasoma; arrow indicates presence of the sclerite between the hind coxae and first metasomal segment.

Illustrations: Additional images describing *Oroceguera* are found on MorphBank biological image database (http://morphbank.net/Show/?id=101864).

Distribution: The sole specimen was sifted from leaf litter from a Costa Rican montane rain forest at 600m.

Biology: Unknown, but see discussion below.

Key to the New World genera of apterous and brachypterous Doryctinae

1. Propodeal bridge present between hind coxae and first metasomal segment, metasoma inserted high above hind coxae ..... *Oroceguera* Seltmann and Sharkey.
- Sclerite absent, metasoma inserted directly above hind coxae 2
2. Femora normal or only hind femur swollen 3
- All femora swollen 5
3. Propodeum convex in lateral view; ocelli well developed ..... *Aptenobracon* Marsh
- Propodeum not convex in side view; ocelli variable, but may be weak or absent 4
4. Scutellum conical..... *Ecphylopsis* Ashmead
- Scutellum flat..... *Ecphylus* Foerster
5. Brachypterous, only males have reduced wings; antenna with 9–12 antennomeres, scape and pedicel large and swollen (width of scape greater than diameter of eye); found in *Ficus sp.* fruit .. *Psenobolus* Reinhard
- Apterous, both sexes may be wingless, antenna with 12–19 antennomeres, without a distinctly swollen scape and pedicel ..... *Pambolidea* Ashmead

***Oroceguera andersoni* Seltmann and Sharkey, sp. n.**

Holotype: Female, COSTA RICA. Guanacaste Providence, Guanacaste Conservation Area, Pitilla Field Station, 600m., Berlese leaf litter, low montane rain forest, 2.v.1995, R.S. Anderson. Deposited in the Hymenoptera Institute Collection, University of Kentucky.

Etymology: The species name is in honor of the collector, Robert S. Anderson.

Holotype Description: *Body:* length 1.27mm; generally ant-like in appearance. *Color:* head orange to brown; antenna orange-brown basally becoming light yellow apically; mesosoma dark orange to brown, carinae pronounced and darker brown than rest of mesosoma; legs light yellow; metasoma orange to brown basally becoming yellow-white apically; ovipositor pale yellow. *Head:* entirely smooth with sparse hairs on the face; eye small, malar space subequal to eye height; ocelli absent; antenna broken after the 10th flagellomere (7th on the other). *Mesosoma:* wingless; tegula absent; scutellum raised; propodeum subequal in length to mesonotum + metanotum, coriaceous-rugose. *Legs:* foretibia with single row of seven stout spines along anterior edge; dorsal surface of hind coxa rugose. *Metasoma:* first tergum with distinct irregular median and lateral longitudinal carinae and a basal transverse ridge that defines a concave area anteriorly, concave area fits into a bulge on propodeum; remainder of terga smooth, with few sparse setae; ovipositor about 0.4 times length of body.

Male: Unknown.

Discussion

Tribal placement of *Oroceguera* is inconclusive although it is most similar to members of the Evaniodini. According to Belokobylskij (1993; 2004) the presence of a wide propodeal bridge would place it in the Evan-

iodini although *Oroceguera* has a shorter acrosternite. Like members of *Evaniodes* Szépligeti, the new genus has a petiolate metasoma that is inserted high on the propodeum and far from the hind coxae. However, members of *Evaniodes* do not have a distinct dorsope, and possess a basal tubercle on the hind coxae. Lack of ocelli is found rarely but when present it is always associated with species with reduced wings. Other New World genera without ocelli are: *Psenobolus* (Ramirez & Marsh 1996), *Ecphylopsis* and *Ecphylus* (Marsh 2002). This reduction and the extremely tiny size of *Oroceguera* are reminiscent of *Psenobolus, Ecphylopsis* and *Ecphylus*; however, of these genera only *Psenobolus* has a petiolate metasoma. Brachypterous *Psenobolus* are highly modified, with swollen femora, but the mesosoma is inserted directly above the hind coxae as is the norm in Doryctinae.

Australospathius Belokobylskij described from Australia is also ant-like in appearance, has small eyes, lacks ocelli and has a wide propodeal bridge (Belokobylskij et al., 2004). However, this taxon does not possess a dorsope, has wings present as small scales, and a very long acrosternite relative to *Oroceguera.*

Conjecture on life history: The lack of ocelli, reduced eyes and body sculpture seems to be associated with hymenopterans living in enclosed or subterranean habitats. For example, members of *Psenobolus* are possible inquilines living in *Ficus sp.* and, as mentioned above, the males lack ocelli. *Idarnes* (Chalcidoidea, Agaonidae) are inquilines found in these same figs (Ramirez & Marsh 1996) and, like many agaonids, lack ocelli. Other examples include myrmecophiles in subterranean ant colonies and many species of ants. The literature on brachypterous and apterous associates of enclosed nests reveals that many lack ocelli including: *Bruesiella* (Bethylidae) from a *Formica microgyna rasilis* var. *nahua* nest in Mexico (Mann 1914) and *Pseudisobrachium* (Bethylidae) which lives in Haitian ant nests and is thought to be parasitic on *Aphoenogaster relicta* larvae (Mann 1915). Ocelli are present but highly reduced and pale in *Papatuka* (Evaniidae) found in association with the nest of *Dasyproctus westermanni*, a ground nesting African sphecid wasp (Deans 2002). There are myrmecophiles of nest inhabiting ants that have ocelli. Four genera of Diapriidae, *Bruesopria, Solenopsia, Auxopaedeutes* and *Lepidopria,* are all guests of *Solenopsis spp.* and have similar morphology (Wing 1951). Though these Diapriidae have well developed ocelli, their winglessness is the result of their wings being broken off mechanically; either being removed themselves or by their host ants (Masner 1976; Wing 1951). It appears that they use flight as a dispersal mechanism and spend some time outside of the subterranean habitat. The wasp *Iridomimus spp*. (Pompilidae) also has ocelli and is thought to mimic and live in close association with a species of Australian meat ant *Iridomyrmex rubriceps*. Evans (1970) did not observe *Iridomimus spp.* entering ant nests, but instead reported that they wander among workers on the ant's extensive system of open trails. It appears, as a general rule, that hymenopterans that remain in enclosed habitats have a tendency to loose their ocelli whereas those that spend any time in the open retain ocelli. These literature records and the observation that *Oroceguera andersoni* was captured by sifting soil litter lead us to believe that this species likely occurs in an enclosed, perhaps subterranean habitat.

Acknowledgements

Our gratitude is extended to John T. Longino and the Alas Project NSF DEB-9401069 & NSF DEB-0072702 and to Robert Anderson for collecting the specimen. Also thanks to Kevin Pitz and the anonymous reviewers for their helpful suggestions. This research was supported by NSF EF-0337220 to the junior author and this is paper number 06-08-037 of the Kentucky Agriculture Experiment Station.

References

Belokobylskij, S.A. (1993) On the classifcation and phylogeny of Braconidae wasps of subfamilies Doryctinae and Exothecinae (Hymenoptera, Braconidae). Part II. Phylogeny. *Entomological Review*, 73 (8), 1–27.

Belokobylskij, S.A., Zaldivar-Riverón, A. & Quicke, D.L.J. (2004) Phylogeny of the genera of the parasitic wasps subfamily Doryctinae (Hymenoptera: Braconidae) based on morphological evidence. *Zoological Journal of the Linnean Society*, 142, 369–404.

Belokobylskij, S.A., Iqbal, M.& Austin, A.D. (2004) Systematics, distribution and diversity of the australasian doryctine wasps (Hymentoptera, Braconidae, Doryctinae). *Records of the South Australian Museum Monograph Series*, 8, 1–150.

Deans, A.R. (2002) *Papatuka alamunyiga* Deans, a new genus and species of apterous ensign wasp (Hymenoptera: Evaniidae) from Kenya. *Zootaxa*, 95, 1–8.

Evans, Howard E. (1970) A new genus of ant-mimicking spider wasps from Australia (Hymenoptera, Pompilidae). *Psyche*, 77(3), 303–307.

Mann, W.M. (1914) Some myrmecophilous insects from Mexico. *Psyche*, 21(6), 171–184.

Mann, W.M. (1915) Some myrmecophilous insects from Hayti [sic]. *Psyche*, 22(5), 161–166.

Marsh, P. (2002) The Doryctinae of Costa Rica (Excluding the Genus *Heterospilus*). *Memoirs of the American Entomological Institute*, The American Entomological Institute, Gainesville, Florida, U.S.A., 319pp.

Marsh, P. (1997) Doryctinae. *In*: Wharton, R.A., Marsh, P.M., & Sharkey, M.J. (Ed) *Manual of the New World Genera of the Family Braconidae (Hymenoptera)*, Special Publication of the International Society of Hymenopterists Number 1, Washington D.C., U.S.A., pp. 207–233.

Masner, L. (1976) Notes on the ecitophilous diapriid genus *Mimopria* Holmgren (Hymentoptera: Proctotrupoidea, Diapriidae). *The Canadian Entomologist*, 108, 123–126.

MorphBank (http://www.morphbank.net, 27 December 2006). Florida State University, School of Computational Science, Tallahassee, FL 32306-4026, USA

Quicke, D.L., Ficken, L.C. & Fitton, M.G. (1993) new diagnostic ovipositor characters for doryctine wasps (Hymenoptera, Braconidae). *Journal of Natural History*, 26, 1035–1046.

Ramirez, B.W. & Marsh, P.M. (1996) A review of the genus *Psenobolus* (Hymenoptera: Braconidae) from Costa Rica, an inquiline fig wasp with brachypterous males, with descriptions of two new species. *Journal of Hymenoptera Research*, 5, 64–72.

Sharkey, M.J. & Wharton, R.A. (1997) Morphology and Terminology. *In*: Wharton, R.A., Marsh, P.M., & Sharkey, M.J. (Ed) *Manual of the New World Genera of the Family Braconidae (Hymenoptera)*, Special Publication of the International Society of Hymenopterists Number 1, Washington D.C., U.S.A., pp. 19–37.

Shaw, S.R. & Edgerly, J.S. (1985) A new braconid genus (Hymenoptera) parasitizing webspinners (Embiidina) in Trinidad. *Psyche*, 92(4), 505–511.

Wing, W.M. (1951) A new genus and species of myrmecophilous Diapriidae with taxonomic and biological notes on related forms. *Transactions of the Royal Entomological Society of London*, 102(3), 195–210.