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Vombisidris freyae, a new nocturnal arboreal ant species from the Philippines (Hymenoptera: Formicidae)

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Abstract

A new species, *Vombisidris freyae* sp. n., collected by nocturnal sampling of low vegetation, is described from the Philippines. The rarity of *Vombisidris* is briefly discussed.

Keywords: *arboreal, Formicidae, new species, nocturnal, Vombisidris.*

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Introduction

The genus *Vombisidris* Bolton, 1991 was erected to accommodate myrmicine ants possessing a couple of unique morphological characters: a) a subocular groove laterally on the head, except for *V. bilongrudi* (Taylor, 1989) which does not possess this groove; and b) mandibular dentition consisting of a large apical tooth, followed by two smaller teeth, a large diastema, and finally two more small teeth (Bolton, 1991). There are currently 17 species known in this genus, ranging throughout the Oriental and Indo-Australian bioregions (Bolton, 2020). The genus is poorly represented in collections and is considered rare (Bolton, 1991).

There are at least two species known from the Philippines although only one species has been formally described. Zettel and Sorger (2010) described *V. philippina* Zettel and Sorger, 2010, the first species known from the Philippines. In the same paper, they also described a dealate queen, that likely represents a different species, which they declined to name.

Vombisidris ants are considered to be arboreal or sub-arboreal but very little is known of their biology (Bolton, 1991; Xu and Yu, 2012).

This paper describes and proposes a name to one of the unidentified species in the study of General *et al*. (2020) and provides a better understanding of the nocturnal arboreal ant diversity of the Philippines.

Materials and Methods

Measurements (in millimetres), arranged sequentially from anterior to posterior, and acronyms follow Zettel and Sorger (2010) to facilitate comparison with the species treated therein.

HL Head length, maximum length of head capsule, excluding mandibles, from anterior-most point of clypeal margin to posterior-most point of head capsule, measured in full face view.

HW Maximum head width, including eyes when they exceed the lateral margin of the head, measured in full face view.

SL Scape length, maximum length of scape, excluding basal neck and condyle, measured at the appropriate angle such that the scape is positioned perpendicularly to the viewer.

EL Maximum eye length, measured along the longest axis of eye.

WL Weber's Length, mesosomal length measured from anterior edge of the pronotum (excluding the collar) to posterior edge of propodeal lobe.

PW Maximum width of pronotum, measured in dorsal view.

FL Hind femur length, maximum length of hind femur.

Indices

CI Cephalic index: HW/HL x 100
SI Scape index: SL/HW x 100
EI Eye index: EL/HW x 100
FI Hind Femur Index: FL/HW x 100

Collection Abbreviations (mostly from Brandão, 2000)

MCZC Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA.
PNM Philippine National Museum of Natural History, Manila, Philippines.
UPLB University of the Philippine Los Baños, Museum of Natural History Entomological Collection, Los Baños, Laguna, Philippines.

Specimens were examined and measured using a Leica S8 stereomicroscope with ocular micrometer. Images of the ant were created using a Leica MC120HD digital camera attached to the Leica S8 stereomicroscope. These images were stacked using Combine ZM. The stacked images were edited with Adobe Photoshop CS5.

Taxonomy

Key to the Philippine species of *Vombisidris*

1. Head and body dark brown; antennal scrobe indistinct; subocular groove sinuate; propodeal spiracle low, situated at the level of the propodeal spine……***V. philippina* Zettel and Sorger**
- Head and body golden yellow; antennal scrobe distinct but shallow; subocular groove straight; propodeal spiracle high on the side, situated higher than base of propodeal spine…….. ***V. freyae* sp. n.**

Species Account

***Vombisidris freyae* General sp. n.**

(Figures 1-3)

urn:lsid:zoobank.org:act:4AEE87E8-CABD-491D-8A1E-CB0BD0979ECB

Holotype Measurements (mm), (two paratype specimens in parenthesis): HL 0.63 (0.69, 0.64); HW 0.56 (0.63, 0.60); SL 0.41 (0.46, 0.45); EL 0.16 (0.16, 0.15); WL 0.83 (0.94, 0.88); PW 0.43 (0.46, 0.45); FL 0.50 (0.55, 0.51); CI 90 (91, 94); SI 73 (74, 75); EI 29 (26, 25); FI 89 (88, 85).

Diagnosis: With typical *Vombisidris* dentition; subocular groove complete, almost straight; sparse, blunt erect setae on dorsum of head and body; body, except gaster, rugoreticulate; gaster largely smooth, but with short basigastral costulae; metanotal groove absent; body concolorous brownish yellow, with pale yellow legs.

Description of Worker

(Character states in boldface contrast with the worker of *V. philippina*, the other formally named Philippines species)

Head longer than broad, **lateral margins behind eyes subparallel**; dorsum rugoreticulate, **with microreticulate interstices**. Torulus obscured by short, narrow frontal lobes. Antennal scrobes **shallow, with smaller reticulation than head dorsum, dorsally bordered by frontal carinae that are scarcely more pronounced than rugoreticulum**. Subocular groove complete, **almost straight**. Clypeus reticulate, convex in lateral view; in full-face view, true anterior clypeal margin medially convex **but not obscured by convexity of clypeus**. Compound eye with 8-9 ommatidia in longest row. Mandibles smooth, with faint longitudinal striation. Dorsum of mesosoma, petiole and postpetiole with coarse rugoreticulum. In lateral view, **dorsum of mesosoma weakly convex**; metanotal groove obsolete; propodeum follows the slight curvature of the mesosomal outline; propodeal declivity sharply sloped downward; propodeal spines situated at the top of the propodeal declivity, distinctly curved in dorsal view; propodeal spiracle **high on the side**, well separated from the metapleural gland bulla; petiolar peduncle **without teeth protecting petiolar spiracle**; petiolar spiracle at about midlength of peduncle; dorsal face of peduncle **forming a very obtuse angle with the anterior face of petiolar node**; subpetiolar and subpostpetiolar processes present. In dorsal view, postpetiole subtrapezoidal, widest anteriorly. Gaster ovate, dorsally smooth except for short basigastral costulae, with blunt erect setae slightly shorter than those on mesosoma. Sting simple and functional.

Pilosity: Dorsum of head and body with long erect blunt setae. Setae on dorsum of mesosoma, petiole, and postpetiole longer than those on head dorsum.

Figures 1-4. *Vombisidris freya* **sp. n.**:**1.** Head in full-face view; **2.** Lateral habitus; **3.** Dorsal habitus; **4.** Labels.

Colour: Head, body, gaster, mandibles, and antennae **golden yellow**; legs **light yellow**.

Type material examined

Holotype worker: PHILIPPINES: Camarines Sur Province, Mt. Isarog Natural Park, Municipality of Pili, Del Rosario Village, 600 masl, 23-ii-2019, leg. D. E. M. General, et al. (deposited at UPLB: UPLBMNH HYM-01757).

Paratype workers: (n=2) same data as holotype; one each deposited at PNM (UPLBMNH HYM-01758 and PNM 14018) and MCZC (UPLBMNH HYM-01759).

Bionomics

This species was collected only during nocturnal beating of low vegetation in a transect study (General *et al.*, 2020), suggesting that *V. freyae* **sp. n.** is a nocturnal, arboreal forager.

Etymology

This species is lovingly dedicated to the author's granddaughter, Freya Marie General Booth.

Comparative Notes

The morphological differences between the workers of *V. philippina* and *V. freyae* **sp. n.** are presented in the key above and in the species description. In addition, *V. freyae* **sp. n.** has a larger mesosoma (mean WL 0.88 mm, mean PW 0.45 mm) than *V. philippina* (range WL 0.80-0.85 mm, range PW 0.40-0.44 mm) (Zettel and Sorger, 2010). Despite the presence of a shallow antennal scrobe, this ant belongs to the genus *Vombisidris* (B. Bolton, personal communication). *Vombisidris freya* **sp. n.** is the second species formally described from the Philippines. It is unclear whether *Vombisidris* sp. A sensu Zettel and Sorger (2010) is conspecific with this new species.

In Bolton's (1991) key, *V. freya* **sp. n.** arrives at couplet 11 that separates *V. harpeza* Bolton, 1991 from *V. occidua* Bolton, 1991. *Vombisidris freya* **sp. n.** differs from *V. occidua* in possessing stiff, erect blunt setae on the dorsum of the head and mesosoma as well as being golden yellow. *Vombisidris freya* **sp. n.** is more similar to *V. harpeza* [image of holotype from AntWeb (2020)] but possesses an almost straight sub-ocular groove, and in which the metanotal groove is obsolete.

Vombisidris freya **sp. n.** fails to key out at couplet #9 of Xu and Yu (2012) because both *V. nahet* Bolton, 1991 and *V. regina* Bolton, 1991 have sinuate sub-ocular grooves while *V. freya* **sp. n.** has an almost straight sub-ocular groove.

Discussion

Vombisidris freya **sp. n.** was discovered by modifying a collecting technique to target nocturnal arboreal ants and other arthropods (General *et al.*, 2020). This species was referred to as "*Vombisidris* sp1" in General *et al.* (2020).

It is possible that other *Vombisidris* species are nocturnal arboreal foragers, explaining the rarity of the genus in collections. Other rare genera may also be simply nocturnal, escaping the attention of field researchers. The primitive *Nothomyrmecia macrops* Clark, 1934 was rediscovered when foraging ants were observed on eucalyptus trees at night (Taylor, 1978). Further observations and field work by Taylor (1978) showed that *N. macrops* was strictly nocturnal. Observing a nest fragment in a laboratory setting, Wong and Yong (2017) found that *Tyrannomyrmex rex* Fernández, 2003 ants forage at night, while clustering in the artificial nest during the day.

The nocturnal behavior of certain ant species may explain the rarity of these species in collections. The ants may be active when field researchers are already back in camp. The rarity of *Vombisidris* ants may just be an artifact of sampling bias (B. Bolton, personal communication).

Sampling arboreal ants at night may detect the presence of *Vombisidris* and other rare genera in other localities.

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