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On the ants (Hymenoptera: Formicidae) of the Philippine Islands: IV. The genus *Vombisidris* BOLTON 1991

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A b s t r a c t: The myrmicine ant genus *Vombisidris* BOLTON 1991 is recorded from the Philippines for the first time. One new species, *Vombisidris philippina* nov.sp., is described; it is rare, but widespread in the archipelago and has been found on the islands of Luzon, Negros and Cebu. *Vombisidris* sp. A is described from a single dealate gyne from Luzon island; it remains unnamed.

K e y w o r d s: ants, Formicidae, Formicoxenini, *Vombisidris*, new species, Philippines.

Introduction

Vombisidris BOLTON 1991 comprises sixteen myrmicine ant taxa distributed from southern India to northeastern Australia (BOLTON 1991, 2003, ZACHARIAS & RAJAN 2004, HUANG & ZHOU 2006, and this study). Three of them were originally placed in *Leptothorax* MAYR 1855 (WHEELER 1934, TAYLOR 1989; combination in *Vombisidris* by BOLTON 1991) and one in *Atopula* EMERY 1912 (FOREL 1915; combination in *Vombisidris* by BOLTON 2003). Since BOLTON's (1991) original description of *Vombisidris*, which contains a detailed diagnosis, a key, and an intrageneric classification to species groups, only two new species from India and China were added (ZACHARIAS & RAJAN 2004, HUANG & ZHOU 2006), and one, *Atopula jacobsoni* FOREL 1915, was transferred to *Vombisidris* by BOLTON (2003). *Vombisidris* was originally placed in the myrmicine tribe Leptothoracini EMERY 1914 which was later recognised as a junior synonym of Formicoxenini FOREL 1893 (BOLTON 1994, 2003).

Formicoxenini have their highest diversity in the temperate and subtropical zones of the northern hemisphere, while they are rarely reported from tropical regions. Hitherto only seven species have been recorded from the Philippines: *Cardiocondyla kagutsuchi* TERAYAMA 1999 – widespread in the East Palearctic, Oriental and West Pacific Regions; *C. mauritanica* (FOREL 1890) – a cosmopolitan tramp species; *C. sima* (WHEELER 1935) – possibly endemic; *C. tjibodana* KARAVAJEV 1936 – widespread in the Oriental and West Pacific Regions; *C. wroughtonii* (FOREL 1890) – widespread from the Oriental Region to Australia; *Dilobocondyla chapmani* WHEELER 1924 – possibly endemic; and *Romblonella opaca* (F. SMITH 1861) – known from the Philippines and Sulawesi (BALTAZAR 1966, SEIFERT 2003, ALPERT et al. 2009).

With the exception of some widespread, ground-nesting *Cardiocondyla* species, the

above Formicoxenini are extremely rarely collected. The same is true for species of *Vombisidris* reported in the present study. Six single workers of *V. philippina* nov.sp. have been sampled in six sampling events at five localities, but the species' biology remains completely unknown. There are no previous records of *Vombisidris* from the Philippine archipelago, neither in the literature nor in the world wide web (ALPERT et al. 2009). According to BOLTON (1991) *Vombisidris* is "mostly or entirely subarboreal to arboreal" and "tree-fogging ... is to a large extent responsible for our knowledge on *Vombisidris*." ZACHARIAS & RAJAN (2004) reported *V. humboldticola* ZACHARIAS & RAJAN 2004 nesting in the domatia of *Humboldtia* trees in southern India; after collecting a total of 16 workers and two queens at three localities they speculated that the rare findings of *Vombisidris* are caused by arboreal nesting and foraging.

Compared with other myrmicine ants, species of *Vombisidris* can be recognized by two unique characteristics (BOLTON 1991): 1) The head bears a sinuate subocular groove which runs from the mandibular insertion below the eye to the laterooccipital margin (Figs 2, 6; but posteriorly reduced in *V. acherdos* BOLTON 1991 and entirely absent in *V. bilongrudi* (TAYLOR 1989) both from New Guinea). 2) The masticatory margin of the mandible (Fig. 4) has a unique dentition consisting of five teeth: a large apical tooth followed by two smaller teeth, then a long diastema (at least as long as the distance from apical to third tooth) and two small basal teeth.

Material and methods

Specimens were dry mounted on card squares or triangles. Examination of specimens was carried out with a Leica Wild M10 binocular microscope; measurements were taken at magnifications of 80× and 128×. Digital photographs were taken with a Leica DFC490 camera attached to a Leica MZ16 binocular microscope with the help of Image Manager IM50 and processed with the software Auto-Montage Pro and Adobe Photoshop 7.0.

Terminology and way of description largely follow BOLTON (1991), most measurements and indices follow BOLTON (1983) (as done by BOLTON 1991). All measurements are in millimetres; minimum and maximum values are presented for paratypes.

Measurements and indices (* from BOLTON 1983)

- TL* Total Length. Total outstretched length of ant from mandibular apex to gastral apex.
- HL* Head Length. Length of head proper, excluding mandibles, measured in full face view from mid-point of anterior clypeal convexity to mid-point of occipital margin.
- HW* Head Width. Maximum width of head, in full-face view measured immediately behind eyes.
- CI* Cephalic Index. $HW/HL \times 100$
- EL Eye length. Length of maximum eye diameter in lateral aspect of head.
- EI Eye Index. $EL/HW \times 100$
- SL* Scape Length. Maximum straight line length of antennal scape excluding basal constriction or neck close to condylar bulb.

- SI* Scape index. $SL/HW \times 100$
 PW* Pronotal Width. Maximum width of pronotum in dorsal view.
 AL* Alitrunk Length. Diagonal length of mesosoma in profile, from the point at which the pronotum meets the cervical shield to posterior base of metapleuron.
 FL Hind femur Length. Maximum length of hind femur.
 FI Hind femur Index. $FL/HW \times 100$

***Vombisidris philippina* nov.sp. (Figs 1-4)**

E t y m o l o g y : The species epithet is a noun in apposition and refers to the country of distribution.

T y p e m a t e r i a l : Holotype worker labelled "Philippinen: Cebu, W C. City\ Minglanilla, Camp 7, creek\ and waterfall 16.11.2003\ l.Zettel & Pangantihon (358)", in the Entomological Collection of the University of San Carlos, Cebu City, Philippines. 5 individual paratype workers with the following labels: Philippines: "Cebu, C. City\ Cantipla-Uno, forest res.,\ 800m, 1.3.2008, leg.\ Zettel & Pangantihon (512)" (in first author's collection); "Philippinen: LZ [Luzon], Laguna\ Los Baños, Mt.Makiling\ UPLB - Mud Spring, 18.11.\ 1999, leg. H. Zettel (207)" (in first author's collection); Philippines: Luzon, Quezon\ Atimonan, Quezon NP, Old\ Zigzag Road, 27.-28.1.2002\ leg. H. Zettel (300)" (in first author's collection); Philippines: Negros Or., Cuenos de Negros, Valencia\ Apolong, Casaroro Falls, 28.\ 1.2007, leg. H. Zettel (456)" (in first author's collection); "Philippinen: Negros Or.\ Cuernos de Negros, Valen-\ cia, Apolong, Casaroro Falls\ 26.3.2006, leg. H. Zettel & C. Pangantihon (451)" (in the Natural History Museum Vienna).

T y p e l o c a l i t y : Philippines, Cebu Island, municipality of Minglanilla, barrio Camp 7, degraded forest near small creek (ca. N 10° 19', E 123° 45', estimate from Google Earth).

D i a g n o s i s (worker): Species of *Vombisidris* as defined by 20 genus characteristics (in BOLTON 1991). Size small, TL 2.8-2.9. Body chiefly blackish brown; appendages usually light brown, but tibiae whitish and tarsi yellow. Eyes large, EI 30-33. Subocular groove complete, from mandibular insertion backwards to laterooccipital margin (Fig. 2). Antennae and legs relatively short, SI 77-79, FI 89-93. Mesosoma with long setae (longer than those on head; Fig. 2). Mesonotum slender, laterally not prominent (Fig. 3). Metanotal groove absent (Fig. 2). Propodeal spines long, curved inwards in dorsal aspect (Fig. 3). Petiole (Fig. 2) with long peduncle; anterior and dorsal face of node separated by transverse ridge (with angle in lateral aspect); spiracle approximately at midlength of peduncle.

D e s c r i p t i o n (worker):

Measurements. Holotype: TL 2.9; HL 0.68; HW 0.56; CI 82; EL 0.18; EI 32; SL 0.43; SI 77; PW 0.43; AL 0.83; FL 0.52; FI 93. Paratypes (n = 5): TL 2.8-2.9; HL 0.66-0.69; HW 0.55-0.58; CI 82-85; EL 0.17-0.20; EI 30-33; SL 0.42-0.44; SI 77-79; PW 0.40-0.44; AL 0.80-0.85; FL 0.49-0.51; FI 89-93.

Colour of head, mesosoma, petiole, postpetiole, and gaster almost uniformly blackish brown, only apex of gaster yellowish brown. Mandibles bright yellow. Antennae yellow to brown, funicle usually lighter than scape. Tibiae whitish yellow (except infuscated base) and tarsi yellow; other parts of legs in most specimens dark brown.

Structures: Head (Fig. 1) slender, sides behind eyes feebly convergent; dorsum with

distinct rugoreticulum, interspaces mostly smooth. Torulus covered by short, narrow frontal lobes. Antennal scrobes indistinct, only tracable by fine sculpture just behind torulus. Subocular groove (Fig. 2) complete, meeting occipital margin. Clypeus strongly convex in lateral aspect (Fig. 2), in full face view its anterior margin covered by this convexity (Fig. 1). Eyes (Figs 1, 2) strongly protruding, comparatively large, containing 9-10 ommatidia in longest row. Mandibles smooth, with distinct hair pits. Dorsum of mesosoma, petiolar node, and postpetiole with distinct coarse rugoreticulum (Fig. 3) and relatively long standing setae (distinctly longer than those on head; Fig. 2); dorsum of petiolar peduncle with very finely reticulate sculpture. In lateral aspect (Fig. 2) dorsum of mesosoma evenly curved; metanotal groove absent; propodeal dorsum gently down-curved; propodeal spines set at high position, long, approximately reaching node of petiole in outstretched specimen, distinctly curved in dorsal aspect (Fig. 3). Petiole (Figs 2, 3) with long peduncle bearing pair of short teeth in front of spiracle; anterior and dorsal face of node forming a blunt angle in lateral aspect, ventrally with small tooth anteriorly and shallow concavity below node; spiracle approximately at (slightly in front of) midlength of peduncle. Postpetiole in dorsal aspect (Fig. 3) subtrapezoidal, widest anteriorly. Gaster slightly depressed; dorsum smooth, except short striae at base of tergite 1 (Fig. 3), and with standing setae hardly shorter than those of mesosoma (Fig. 2).

Intraspecific variability: Although type material was collected in five localities on three islands, it is approximately uniform in size, measurements, and structural characteristics. Some variation has been observed in colour of legs: in most specimens, coxae, trochanters, and femora are light to dark brown, tibiae white to yellowish, and tarsi yellow; but in the specimen from Quezon Province, also basal parts of legs are yellow. In this specimen, antennae are lighter than in other specimens, too.

Comparative notes: *Vombisidris philippina* nov.sp. is placed in BOLTON's (1991) *V. australis* group which, however, was erected as a "convenient-group to hold species not fitting any of the above [= all other] groups." This group contains *V. australis* (WHEELER 1934) from Queensland (Australia), *V. harpeza* BOLTON 1991 from Sarawak (Malaysia), *V. occidua* BOLTON 1991 from Karnataka (India), and – here assigned to this group – *V. jacobsoni*. It is defined by three – possibly plesiomorphic – characteristics, i.e., the complete subocular groove, relatively short antennae and legs (SI < 80, FI < 100) and a vestigial or absent metanotal groove. In BOLTON's (1991) key, *V. philippina* nov.sp. reaches couplet 11 which contains *V. harpeza* and *V. occidua*. *Vombisidris harpeza* differs from *V. philippina* nov.sp. by yellow colour, short and stout hairs on dorsum of mesosoma, laterally projecting sides of mesonotum, and short petiolar peduncle. *Vombisidris occidua* differs from *V. philippina* nov.sp. by having a light brown gaster, very small eyes (EI 23 vs. 30-33), and dorsum and anterior face of petiolar node forming a smooth curve. In addition, *V. philippina* nov.sp. differs from both *V. harpeza* and *V. occidua* by small size (TL 2.8-2.9 vs. 3.5-4.0; HW 0.55-0.58 vs. 0.75-0.79) and long propodeal spines. *Vombisidris jacobsoni* differs from *V. philippina* nov.sp. by large size (TL 3.3 - 3.6), yellow body, small eyes (EI 25), propodeal spiracles situated on distinct tubercles, broad petiole, and fine striation at anterior fourth of tergite 1 of gaster (in addition to very short, distinct striae at extreme base).

Vombisidris humboldticola ZACHARIAS & RAJAN 2004 from Kerala and Karnataka, India, of course not included in BOLTON's (1991) key, is morphologically distant from *V. philippina* nov.sp. Although *V. humboldticola* was compared with *V. occidua* in the

original description (ZACHARIAS & RAJAN 2004) some characteristics, specifically the combination of absent metanotal groove and long scapes, legs and propodeal spines, place *V. humboldticola* in BOLTON's (1991) *V. philax* group. *Vombisidris umbradomina* HUANG & ZHOU 2006 from Hunan, China, cannot be comfortably placed in any of BOLTON's (1991) species groups. It differs from *V. philippina* nov.sp., e.g., by yellow head and mesosoma, faint frontal carinae, long scapes (SI 115), and the shape of the long, nodeless petiole (according to HUANG & ZHOU 2006). *Vombisidris philippina* nov.sp. is among the smallest species of the genus, only *V. australis* (TL 2.3-2.6; TAYLOR 1989) and *V. humboldticola* (TL 2.4; ZACHARIAS & RAJAN 2004) are smaller.

Distribution: Philippines: Luzon (Laguna Province, Quezon Province), Cebu, Negros (Negros Oriental Province).

***Vombisidris* sp. A (Figs 5-7)**

Material examined: 1 dealate gyne labelled "Philippines: Luzon\ Camarines Sur, N Sipocot\ Sooc, 7.-13.11.1999\ leg. H. Zettel (204)" (in first author's collection).

Diagnosis: Species of *Vombisidris* as defined by 19 of 20 genus characteristics (in BOLTON 1991), but with faint, rather long frontal carinae (Fig. 5). Body almost completely yellow, but funicle of antenna light brown and sclerites around wing insertion black. Subocular groove complete (Fig. 5). Antennae and legs of intermediate length, SI 84, FI 100. Petiole (Fig. 6) very long, slender, and depressed, nodeless. Postpetiole small and slender (Fig. 7).

Descriptive notes: TL 3.4; HL 0.75; HW 0.60; CI 79; EL 0.21; EI 35; SL 0.50; SI 84; PW 0.48; AL 1.05; FL 0.60; FI 100. Dorsum of head, petiole, and postpetiole with rugoreticulum consisting of elongate meshes, of mesonotum with almost regular longitudinal ridges (Figs 5, 7). Propodeum with short teeth (Figs 6, 7). Petiole ca. 2.5 times longer than high, spiracle situated at anterior fifth of length. Base of gaster tergite 1 with short striae.

Comparative notes: Although gynes are only described of four species (*V. australis*, *V. bilongrudi*, *V. humboldticola*, and *V. renateae* (TAYLOR 1989)), this single gyne from southern Luzon almost certainly represents an undescribed species. Colour and many structural details distinguish *Vombisidris* sp. A and *V. philippina* nov.sp. However, the authors refrain from naming it without further knowledge of the worker caste. Due to intermediate lengths of scape (SI 84) and hind femur (FI 100) and the impossibility to evaluate presence or absence of a mesonotal groove in a winged specimen, *Vombisidris* sp. A cannot be comfortably placed in any of BOLTON's (1991) species groups. The presence of faint frontal carinae (Fig. 5) and the shape of the long, nodeless petiole (Fig. 6) distinguish *Vombisidris* sp. A from all species treated by BOLTON (1991). However, similar characteristics are present in two recently described species, *V. humboldticola* and *V. umbradomina*. The gyne of *V. humboldticola* differs strongly from *Vombisidris* sp. A in SI 120 (according to ZACHARIAS & RAJAN 2004); the worker of *V. umbradomina* (gyne unknown) differs from *Vombisidris* sp. A by dark brown gaster and SI 115 (according to HUANG & ZHOU 2006).

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Zusammenfassung

Die Myrmicinengattung *Vombisidris* BOLTON 1991 wird erstmals von den Philippinen nachgewiesen. Eine neue Art, *Vombisidris philippina* nov.sp., wird beschrieben; sie ist selten aber weit verbreitet und wurde auf den Inseln Luzon, Negros und Cebu gefunden. *Vombisidris* sp. A liegt nur in einer dealaten Gyne von der Insel Luzon vor und bleibt unbenannt.

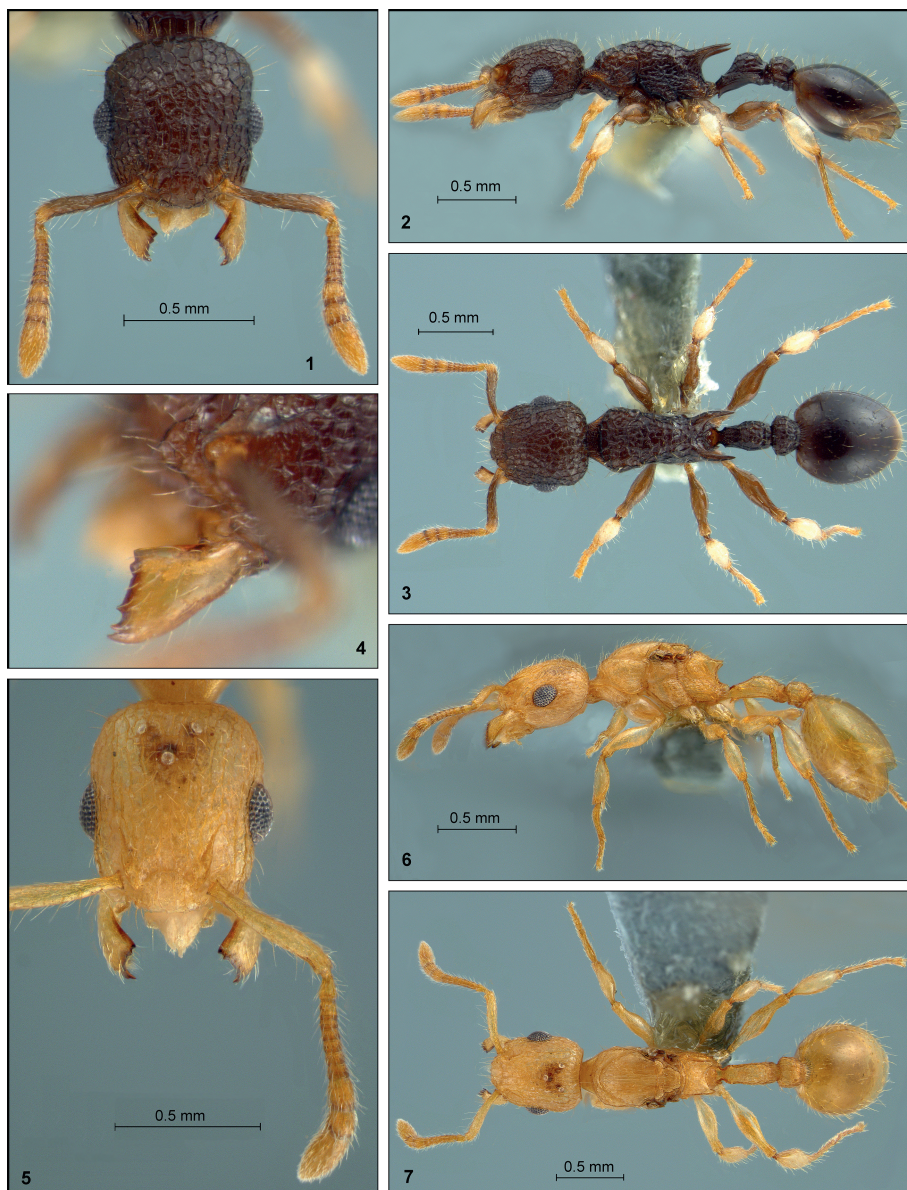
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Figs. 1-7: (1-4) *Vombisidris philippina* nov.sp., paratype worker (HW 0.56, AL 0.85) from Negros (locality # 451) in the Natural History Museum Vienna. (1) Head, full face view. (2) Habitus, lateral view. (3) Habitus, dorsal view. (4) Masticatory margin of mandible. (5-7) *Vombisidris* sp., dealate gyne (HW 0.60, AL 1.05) from Luzon in the first author's collection. (5) Head, full face view. (6) Habitus, lateral view. (7) Habitus, dorsal view. © NHMW Image Database & www.antbase.net, published with permission.

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