



***Polyrhachis (Myrma) cyaniventris* F. Smith, 1858 (Hymenoptera: Formicidae) and a related new ant species from the Philippines**

D.M. SORGER & H. ZETTEL

Mag. Daniela Magdalena Sorger & Dr. Herbert Zettel, International Research Institute for Entomology, Natural History Museum, Burgring 7, A-1010 Vienna, Austria. E-mail: dm.sorger@gmx.at, herbert.zettel@nhm-wien.ac.at

Abstract

The *Polyrhachis (Myrma) cyaniventris* species group is established and described. It contains *Polyrhachis (Myrma) cyaniventris* F. Smith, 1858 and a species new to science, *P. (Myrma) pirata* **sp. n.** At present knowledge the clade is restricted to the northern and eastern islands of the Philippine archipelago. *Polyrhachis cyaniventris* is recorded from central and southern Luzon, Catanduanes, Mindoro, Samar, and Leyte; *P. (Myrma) pirata* **sp. n.** from central and southern Luzon, Mindoro and Samar.

Key words: Hymenoptera, Formicidae, *Polyrhachis*, *Myrma*, *Polyrhachis cyaniventris* species group, new species, Philippines, Luzon, Catanduanes, Mindoro, Samar, Leyte

Introduction

Polyrhachis F. Smith, 1857 is one of the most dominant ant genera in the Oriental, Malesian and Australian Regions with well over 600 valid species. In the Philippines, a survey by the second author yielded 76 morphospecies (H. Zettel, unpublished), while 62 identified species (= 15.8 % of 393 Philippine ant species) are presently listed by Alpert *et al.* (2009). Since the species of these two studies only partly overlap and certainly more species will be discovered, the Philippine *Polyrhachis* fauna is estimated to consist of about 100 species. Moreover, the Philippine fauna contains some very spectacular and peculiar species regarding colour and shape, e.g., *P. (Myrmhopla) cryptoceroides* Emery, 1887, *P. (Myrmhopla) osiris* Bolton, 1975, *P. (Myrma) parabiatica* Chapman, 1963, and *P. (Myrmhopla) tragos* Stitz, 1925. In the subgenus *Myrma* Billberg, 1820, which comprises 138 valid names, *P. cyaniventris* F. Smith, 1858 and related species stand out due to their metallic bluish shimmer, although the gaster is also bluish coloured in some species of the *Polyrhachis (Myrmhopla) hector* species group (see Dorow 1995).

A careful examination of ant specimens similar to *P. cyaniventris* from various parts of the Philippines yielded a species new to science.

Material and methods

All specimens are dry mounted on card squares or triangles. Examination of specimens was carried out with an Olympus SZH10 Research stereomicroscope and measurements were taken at magnifications of 20× and 40×. Digital photographs were taken with a Leica DFC490 camera attached to a Leica MZ16 binocular microscope by help of Image Manager IM50 and processed with Auto-Montage Pro and Adobe Photoshop 7.0 programmes. Locality data are arranged zoogeographically, the sequence follows the regions and subregions listed by Ong *et al.* (2002).

Acronyms of repositories:

| | |
|--------|---|
| BMNH | The Natural History Museum, London (= British Museum of Natural History) |
| CSW | Coll. D.M. Sorger, Vienna, Austria |
| CZW | Coll. H. & S.V. Zettel, Vienna, Austria |
| MCZL | Musée cantonal de zoologie, Lausanne, Switzerland (Kutter Collection) |
| NHMW | Natural History Museum, Vienna, Austria |
| QMBA | Queensland Museum, Brisbane, Australia |
| UPLB | University of the Philippines, Los Baños, Philippines |
| USC-EC | University of San Carlos – Entomological Collection, Cebu City, Philippines |

Measurements and indices:

| | |
|------|--|
| HW | Head width. Maximum width of head, in full-face view, in front of eyes (excluding eyes in gynes). |
| HL | Head length, in full-face view, excluding mandibles, measured from most-anterior point on clypeal margin to most-posterior point on medial convexity on vertex. |
| CI | Cephalic index. $HW/HL \times 100$. |
| MTL | Metatibia length. Maximum length of metatibia (extensor side) excluding basal constriction. |
| PPI | Propodeum index. $PPW/PPL \times 100$. |
| PPL | Propodeum length (Fig 3). Length of propodeum measured from posterior corner parallel with midline until anterior margin. For that purpose the specimen is tilted forward until anterior and posterior margin of dorsal face of propodeum are in the same plane. |
| PPW | Propodeum width (Fig. 3). Width of propodeum at level of posterior corners. |
| PSPD | Pronotal spine distance. Maximum distance between apices of pronotal spines. |
| PTW | Petiole width. Maximum distance between apices of long spines of petiole. |
| SL | Scape length. Length of antennal scape excluding basal constriction. |
| SI | Scape index. $SL/HW \times 100$. |
| TL | Total length. Length of entire ant measured in dorsal view with head stretched out, from anterior margin of clypeus to apex of abdomen. |

Measurements and indices are presented as minimum, average and maximum values of ten specimens of each morph.

Chaetotaxy

Although chaetotaxy of various body parts serves as an important distinguishing characteristic, counting of setae is problematic as broken setae usually cannot be recognized by their pits, which are totally obscured by dense microsculpture. In some cases, where strong variation has been observed, it is suspected that low numbers are a result of partially rubbed off setae. Setae were counted for the same specimens as used for measurements; in *P. cyaniventris*, counts are presented as minimum, average and maximum values.

For counting setae on the frons, numbers were taken only from the area medial to the frontal lobes, between the posterior margin of the clypeus and the level of the posterior end of the frontal lobes. For the vertex, setae behind the level of the posterior ends of the frontal carinae were counted; for genae and the head venter, the boundary between these two areas is defined by the microsculpture – densely punctate on genae, smooth and shining on venter. For counting setae on the clypeus, the marginal setae are excluded. Setae numbers on femora and tibiae are strongly variable (presumably due to broken-off setae) and therefore presented as the total of all six legs.

Distribution of species listed and mapped includes only examined specimens. Locality data of *P. cyaniventris* listed in previous studies (Ashmead 1904, Forel 1910, Viehmeyer 1916, Stitz 1925, Bibby 1947)

– although within the area of confirmed distribution – could not be verified.

Taxonomy

The *Polyrhachis (Myrma) cyaniventris* species group

(Figs 1–12)

Diagnosis of worker: Large (TL 7.9–11.5 mm), stout, finely sculptured, matte ants with peculiar metallic, in most species bluish, shimmer. Setae short, black, and in low numbers on body, scape, and legs, or totally absent. Eyes not surpassing outlines of head in full face view (Figs 1, 7). Ventrolateral margin of head rectangular or obtuse (Figs 1, 7). Antennae and legs rather short (compared with species of the *P. relucens* group), scape strongly widened towards apex, there about twice as wide as at base, SI 132–155. Dorsolateral margin of mesosoma sharp and protruded, strongly indented between nota (Figs 2–4, 8–10). Pronotal spines prominent (Figs 1, 2, 4, 7, 8, 10). Propodeum without spines, with distinct transverse carina (Figs 3, 9) separating slightly convex dorsal from concave caudal face which is higher than petiole (Figs 2, 8). Petiole wide, with two pairs of spines dorsolaterally; ventral pair short, dorsal pair very long, curved and embracing base of gaster (Figs 2, 4, 8, 10). Anterior face of gaster concave (Figs 2, 8).

Diagnosis of gyne (gyne of *P. pirata* sp.n. unknown): Similar to worker, except the following: TL 9.4–10.9 mm. Eyes slightly surpassing head sides (Fig 5). Dorsolateral margin of mesosoma incomplete, but present on anterior three-fourths of pronotum and on propodeum (Fig 6). Spines of petiole shorter than in worker and hardly curved.

Males: No males were available for this study, but males of *P. cyaniventris* were reported to be held in the Museum of Comparative Zoology, Cambridge, U.S.A. (G. Alpert, in litt.)

Description of worker: Body with metallic shimmer, petiole and gaster dark bluish. Mandibles black. Palpi brown. Antennae in most species black, except tip of apical segment reddish brown. Legs, except femora, usually black.

Body, legs and antennae with isodiametric reticulum or very fine and dense puncturation, locally overlaid with longitudinal rugae; with fine, short, appressed golden or silverish white pubescence.

Head stout, longer than wide, broadest at level of antennal fossae, sides and venter forming right to obtuse angle; dorsum and sides with appressed pubescence; sides of head convex. Venter of head almost smooth, with very sparse pubescence. Eyes very small, in frontal view located in upper third of head and laterally not breaking its outline in full face view (Figs 1, 7). Ocelli usually absent or very indistinct. Occipital margin with medial lobe (Figs 1, 7). Frontal carinae high (Figs 1, 7). Clypeus in profile slightly sinuate, proximally convex, distally concave (Figs 2, 8); with obtuse elevation along midline; anterior margin with row of long golden setae (1, 7). Mandibles with longitudinal striation, fine at base, coarser towards masticatory margin; numerous pits with long, golden setae distally.

Mesosoma dorsolaterally with strongly developed, sharp margin deeply indented between segments (Figs 2, 4, 8, 10). Dorsal face in side view convex (Figs 2, 8), with fine, short, appressed pubescence. Pronotal spines long, directed anterolaterad (Figs 1, 2, 4, 7, 8, 10). Propodeum with transverse ridge separating dorsal and posterior face and laterally forming short, blunt teeth (Figs 2–4, 8–10).

Petiole stout, biconvex in lateral view (Figs 2, 8), armed with two pairs of spines dorsolaterally; the slightly more ventral pair short, but acute, the dorsal pair very long, curved and embracing base of gaster (Figs 2, 4, 8, 10). Gaster with anterior face slightly concave, tergites with varying number of short, black setae (Figs 2, 8).

Species included: *Polyrhachis cyaniventris*, *P. pirata* sp. n.

Distribution: Only known from the Philippines (Figs 11, 12).

Discussion: Taxonomic knowledge on the species-rich subgenus *Myrma* is summarized by Dorow (1995). Since Forel (1915) numerous authors have given priority to the name *Polyrhachis* over *Myrma*, and finally

they were followed by Opinion 1919 of the International Commission of Zoological Nomenclature (ICZN 1999). *Polyrhachis cyaniventris* was placed in the *P. militaris-relucens* group by Emery (1925); it contains African and Australasian species and is defined by long pronotal spines, flat or concave dorsum of mesosoma, and petiole with four spines or, rarely, dorsally convex and without spines. *Polyrhachis cyaniventris* does not properly fit into any Ethiopian species group established by Bolton (1973). Kohout (1989) defined the *P. relucens* group as a part of Emery's (1925) *P. militaris-relucens* group which is widely distributed and species-rich in Australasia and has several representatives in the Philippines. Kohout (2008) presents a key to the subgenera and species groups of *Polyrhachis* occurring on Sulawesi, recognizing five species groups in *Myrma* from this island. Although *P. cyaniventris* fits the character set of Kohout's (1989, 2008) *P. relucens* group, there are several differences from typical species of this clade (in the sense of Kohout 1989), e.g., *P. relucens* (Latreille 1802) and *P. illaudata* (Walker 1859), which in our opinion justifies the separation of *P. cyaniventris* and related species and the establishment of a separate group. The main distinguishing characteristics of the *P. cyaniventris* group, if compared with Kohout's (1989) *P. relucens* group, are the metallic shimmer of the integument, a strong reduction in pilosity, small and less protruding eyes (most peculiar in workers), short legs, a high propodeum, and long dorsal spines of the petiole, that are curved posterolaterad and embrace the gaster's base in the worker caste.

Key to species (workers)

- 1 Propodeum relatively broader, PPI 152–189. Small species (TL 7.9–9.0–10.1 mm; HW 1.70–2.30 mm) with numerous setae on entire body: vertex with 2–13–20, mesosoma dorsally with 3–36–60, tergite 1 of gaster with 4–25–40 short black setae. Pronotal spines in cross-section flat. Sculpture of integument coarse; microsculpture of head, mesosoma and gaster overlaid with longitudinal striation. Ridge separating dorsal and posterior face of propodeum sinuate, medially not depressed. Head and mesosoma with dark bluish shimmer..... *P. cyaniventris*
- Propodeum relatively narrower, PPI 114–137. Large species (TL 10.1–10.8–11.5 mm; HW 2.19–2.50 mm) with only few short black setae on entire body: vertex, dorsum of mesosoma and tergite 1 of gaster without setae (rarely with 2 setae on vertex). Pronotal spines in cross-section triangular and massive. Sculpture of integument fine; microsculpture of propodeum overlaid with fine longitudinal striation. Ridge separating dorsal and posterior face of propodeum sinuate, medially slightly depressed. Head and mesosoma with greenish to coppery shimmer.....
..... *P. pirata* sp. n.

Polyrhachis (Myrma) cyaniventris F. Smith, 1858

(Figs 1–6, 11)

Polyrhachis cyaniventris Smith, F. 1858: 70, pl. IV, fig. 47 (description of worker, Philippines).

Polyrhachis cyaneus Mayr, 1862: 684–685, tab. XIX, fig. 6 (description of worker; distribution: Luzon: Manila). Syn. by Roger 1863.

Polyrhachis cyaniventris: Roger 1863: 9 (synonymy). Forel 1910: 128 (description of gyne; distribution: Luzon: Rizal, Mindoro: Mt. Halcon). Bibby 1947: 78 (distribution: Calicaon Island south of Samar).

Polyrhachis [sic] *cyaniventris*: Ashmead 1904: 10 (distribution: Luzon: Manila).

Polyrhachis (Myrma) cyaniventris: Viehmeyer 1916: 288 (distribution: Luzon: Mt. Banahaw). Emery 1925: 201 (catalogue, species group). Stitz 1925: 135 (distribution: Luzon: Limay). Baltazar 1966: 276 (catalogue, references). Dorow 1995: 33 (listed).

Type material examined: Holotype of *P. cyanea* (worker) labelled "Manilla" [Luzon: Manila], "Wthm.", "Polyrhach.\ cyaneus M.\ det. G. Mayr.", "Polyrhachis cyanus Mayr." (NHMW). In addition, we have seen photographs of the holotype of *P. cyaniventris* (in BMNH) and can confirm species identity.

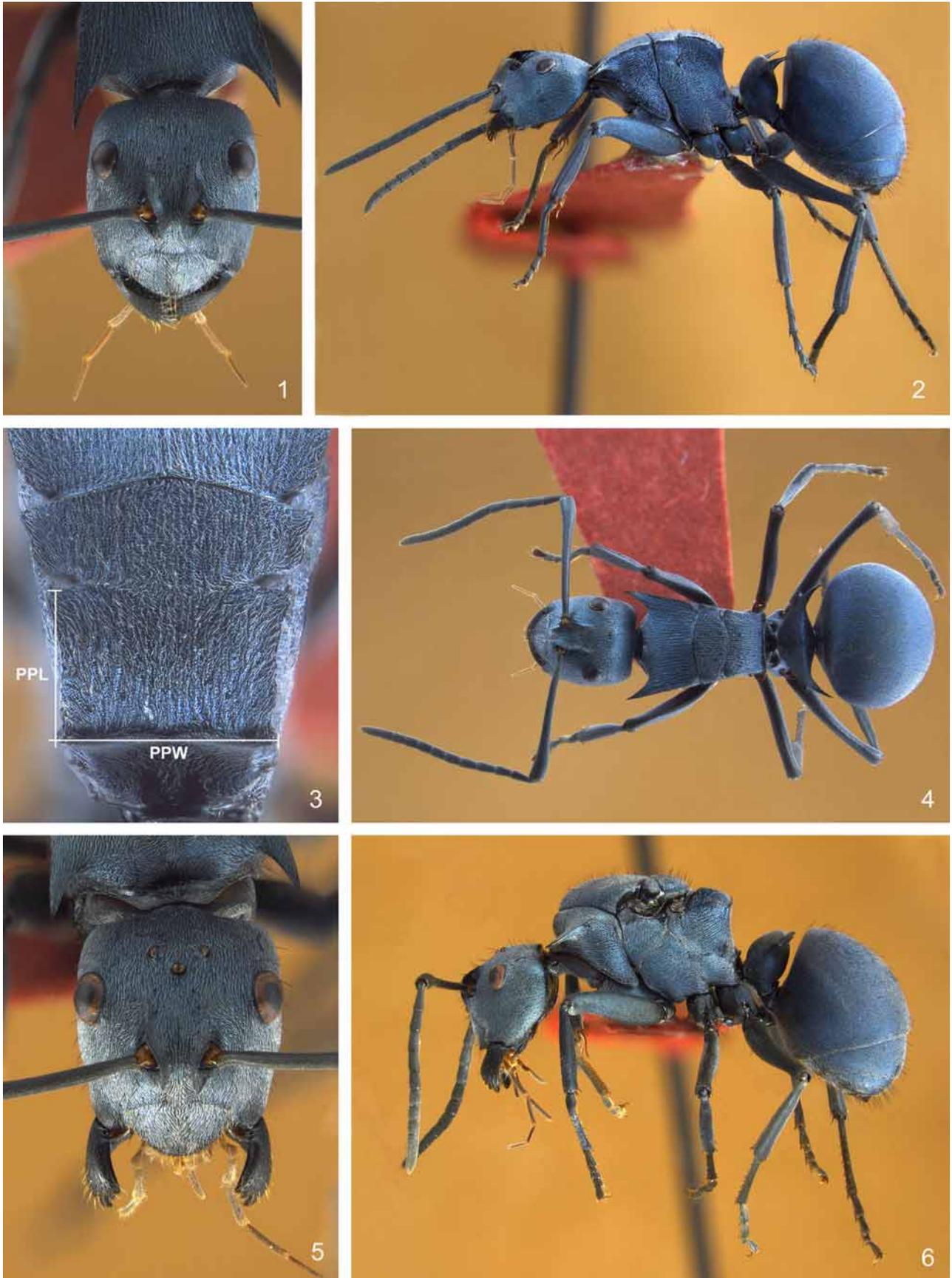
Additional material examined: Luzon Isl.: Zambales Prov. [erroneously labelled "Bataan"]: Olongapo, Subic Bay, 30.XI.1993, leg. H. Zettel (# 37a), 1 worker (CZW). **Laguna Prov.:** Los Baños, Mt. Makiling, 13.-18.XI.1992, leg. H. Zettel (#1), 1 worker (CZW), 500-1144 m, 14.XI.1993, leg. H. Zettel (#21a), 1 worker (CZW), 300-500 m, 8.-9.II.1996, leg. H. Zettel (#74), 1 worker (CZW); Laguna, Los Baños, Mt. Makiling,

Mud Springs, 1.XI.1996, leg. H. Zettel (#88a), 1 dealate gyne (NHMW), 13.-14.I.1999, leg. H. Zettel (#174), 1 worker (CZW); Los Baños, Mt. Makiling, Rain Forest Park, 14.II.1999, leg. S. Schödl (5): 1 worker (NHMW). **Quezon Prov.:** Atimonan, Quezon National Park, Old Zigzag Road, 24.-30.III.1998, leg. H. Zettel (# 165), 16 workers (CZW, CSW, NHMW, UPLB, USC-EC), 14.III.1999, leg. F. Seyfert (#27), 1 worker (NHMW), 16.III.1999, leg. H. Zettel (#202), 1 worker (CZW), 6.IV.2000, leg. H. Zettel (#253), 2 workers (CZW), 30.-31.I.2001, leg. H. Zettel (#262), 1 worker (CZW), 27.-28.I.2002, leg. H. Zettel (#300), 1 worker (CZW). **Camarines Norte Prov.:** SW Daet, San Vicente, Fabrica, Mananap, 6.II.2001, leg. H. Zettel, E. S. & L. S. Vichozo (#264), 1 worker, 1 dealate gyne (CZW), 17.III.2003, leg. H. Zettel, C. V. Pangantihon & L. S. Vichozo (#348), 1 worker, 1 dealate gyne (CZW), 3.III.2004, leg. C. V. Pangantihon (#P52), 8 workers, 3 dealate gyns (CZW, NHMW); Labo, Tulay na Lupa, Mt. Labo – Mt. Bayabas area, 17.-18.III.2004, leg. H. Zettel & C. V. Pangantihon (#382), 2 workers, 4 dealate gyns (CZW, CSW, NHMW); S Daet, Bicol NP, Basud, Nalisan, 7.II.2001, leg. H. Zettel (#274), 1 worker (CZW), 26.II.2004, leg. H. Zettel & C. V. Pangantihon (# 376), 1 worker, 2 dealate gyns (CZW, NHMW), 13.-14.III.2003, leg. H. Zettel, L. S. Vichozo & C. V. Pangantihon, 1 worker (CZW), 1.III.2005, leg. H. Zettel (#419), 2 workers, 13.III.2006, leg. H. Zettel, R. Gille & L. S. Vichozo (#446), 1 worker (CZW). **Camarines Sur Prov.:** Alanao, Bahi River, 100 m, 14.XI.1999, leg. H. Zettel (#205), 1 worker (CZW), 10.III.2000, leg. H. Zettel (#245), 3 workers (CZW), 7.III.2000, leg. H. Zettel (#243), 1 worker (CZW), 1.IV.2000, leg. H. Zettel (#251), 3 workers (CZW, UPLB), 10.II.2002, leg. H. Zettel (#307), 1 worker (CZW), 11.II.2003, leg. H. Zettel (#337)", 1 worker (CZW), 25.-27.II.2008, leg. H. Zettel (#510), 1 worker (CZW); Lupi, Sooc, Bicol NP, 30.III.2003, leg. C. V. Pangantihon, 1 worker (CZW), 29.X.2005, leg. C. V. Pangantihon (#P192), 1 worker (CZW), leg. C. V. Pangantihon (#P318), 1 worker (CZW); Lupi, Sooc, Looban, 25.II.2004, leg. H. Zettel & C. V. Pangantihon (#375), 4 workers (CZW, NHMW); Lupi, Sooc, Telecom – Sipocot, Tikman, 22.II.2004, leg. C. V. Pangantihon (#P42+43), 1 worker (CZW); Sipocot, Villazar, 27.III.2003, leg. C. V. Pangantihon, 1 worker (CZW); Lupi, Sooc, Lucbanan, 25.II.2003, leg. C. V. Pangantihon & L. S. Vichozo, 1 worker (CZW); 20 km E Naga, 5 km E Carolina, Malabsay Falls, 20.XI.1999, leg. H. Zettel (208), 1 worker (CZW); 18 km E Naga, Panicason, 500-550m, 6.III.2003, Narra plantation with Abaca understory, leg. D. General & al. (ABT-1, CZI), 1 dealate gyne (NHMW). **Catanduanes Isl.:** **Catanduanes Prov.:** W Virac, Magnesia, near sea shore, 8.III.1999, leg. H. Zettel (#197), 14 workers (NHMW, CZW), 8.III.1999, leg. F. Seyfert (#22), 1 worker (NHMW), 13.IV.2000, leg. H. Zettel (#255), 3 workers (CZW). **Mindoro Isl.:** **Mindoro Oriental Prov.:** SW Calapan, Baco, Hidden Paradise, 20.-21.XI.1992, leg. H. Zettel (#16), 2 workers (CZW); 28 km S Calapan, Balete, 100 - 700 m, 27.-29.XI.1992, leg. H. Zettel (#18), 7 workers (CZW, UPLB, QMBA). **Samar Isl.:** **Northern Samar Prov.:** San Joaquin, Lologayan Falls, 4.-6.III.2003, leg. H. Zettel (#345), 1 dealate gyne (CZW), 1.-5.III.2004, leg. H. Zettel (#377), 4 workers, 1 dealate gyne (CZW). **Leyte Isl.:** **Leyte Prov.:** N Tacloban, Babatngon, Busay Falls, 28.I.2000, leg. H. Zettel (#220), 1 worker (CZW), leg. S. Schödl (#1), 1 worker (NHMW); N Baybay, Mt. Pangasugan, 50-250 m, along Lago-Lago River, 1.II.2000, leg. S. Schödl (#5), 4 workers (NHMW). **Philippines, no further locality data:** 13.II.1914, leg. Moser, 2 workers, 1 gyne (MCZL); 4.III.1914, leg. Moser, 1 worker (MCZL); "In Baum" [in tree], 4.III.[19]14, 1 worker (MCZL); 13.II.1914, leg. Moser, 4 workers (MCZL).

Description of worker: Measurements: Holotype of *P. cyanea* (worker): TL 9.5 mm, HW 2.08 mm, HL 2.48 mm, CI 84, SL 2.99 mm, SI 144, PSPD 2.63 mm, PPL 1.04 mm, PPW 1.48 mm, PPI 142, PTW 2.55 mm, MTL 2.95 mm. Additional workers (n = 10): TL 7.9–8.9–10.1 mm, HW 1.70–2.01–2.30 mm, HL 2.06–2.36–2.70 mm, CI 79–85–97, SL 2.58–2.88–3.23 mm, SI 132–144–155, PSPD 2.05–2.58–3.13 mm, PPL 0.80–0.98–1.15 mm, PPW 1.05–1.33–1.55 mm, PPI 127–137–151, PTW 2.03–2.37–2.88 mm, MTL 2.55–2.90–3.25 mm.

Head, mesosoma, petiole, and gaster with dark bluish shimmer. Antennae and legs black, except femora bluish; in some specimens tibiae partially reddish brown.

Head sides and dorsum with distinct longitudinal striation overlaying microsculpture, venter with 9–12–15 setae. Vertex with 2–13–20 setae. Frons with 6–9–11 setae, median furrow indistinct. Genae with 0–6–12 setae. Clypeus on disk with 4–13–20 setae.



FIGURES 1–6. *Polyrhachis cyaniventris* (1–4 worker, HW 2.00 mm, TL 8.9 mm; 5–6 gyne, HW 2.20 mm, TL 10.8 mm). (1, 5) Head, frontal view. (2, 6) Lateral view. (3) Dorsal face of propodeum, perpendicular view. (4) Dorsal view. © NHMW Image Database & www.antbase.net, published with permission.

Dorsal face of mesosoma with 3–36–60 setae, in addition to microsculpture with longitudinal rugae. Pronotal spines gracile and, in cross-section, rather flat (if compared with *P. pirata* sp. n.), their bases not or indistinctly raised over anterior pronotal disk (Figs 2, 3). Propodeum with dorsal and posterior face separated by almost straight ridge (Figs 3, 4). Sides of mesosoma, in addition to microsculpture, overlaid by longitudinal rugae, on propodeum dorsal of stigma slightly coarser (Fig 2). Femora with 4–13–20 setae, tibiae with 0–1–5 setae.

Gaster with isodiametric reticulum overlaid with fine striation (Fig 2); tergite 1 with 4–25–40 setae, tergite 2 with 12–15–20 setae, following tergites and all sternites with numerous setae increasing in length towards apex of abdomen.

Description of gyne: Measurements (n = 10): TL 9.4–10.5–10.9 mm, HW 2.00–2.13–2.25 mm, HL 2.38–2.61–2.73 mm, CI 79–82–89, SL 2.76–2.98–3.16 mm, SI 131–140–145, PSPD 2.36–2.62–2.88 mm, PPL 0.75–0.89–1.00 mm, PPW 1.38–1.53–1.65 mm, PPI 152–172–189, PTW 1.98–2.29–2.45 mm, MTL 2.95–3.09–3.23 mm.

Microsculpture on pronotum overlaid with fine striation, on propodeum overlaid with distinctly coarser striation than on pronotum. Gaster punctate, with very fine overlaying striation (Fig 6).

Chaetotaxy: on disk of clypeus 6–13–16, on frons 7–12–14, on vertex 15–20–28, on venter of head 10–13–19, on genae 2–8–14 setae. On dorsum of mesosoma 47–62–72 setae. On femora 12–21–36, on tibiae 1–8–17 setae. On tergite 1 30–41–55, on tergite 2 19–25–40 setae.

Notes: Although *P. cyaniventris* is clearly more pilose than *P. pirata* sp. n., pilosity appears strongly variable. It is suspected that this is caused by partially rubbed off setae. Therefore, pilosity is expressed as minimum–average–maximum values to provide a more comprehensive picture.

Distribution: Central and Southern Luzon, Catanduanes, Mindoro, Samar, Leyte (Fig 11).

Biology: Habitats range from degraded primary dipterocarp forests to secondary forests and even extensively used coconut groves with rich undergrowth in lowlands and low montane regions. The second author frequently collected workers and gynes during daytime foraging on leaves and twigs of small trees and bushes, rarely on the ground, but did not encounter nest sites. Gary Alpert (in litt.) found nests occupying cavities in branches, both on the ground and in low vegetation; one nest had approximately 100 individuals and a single queen.

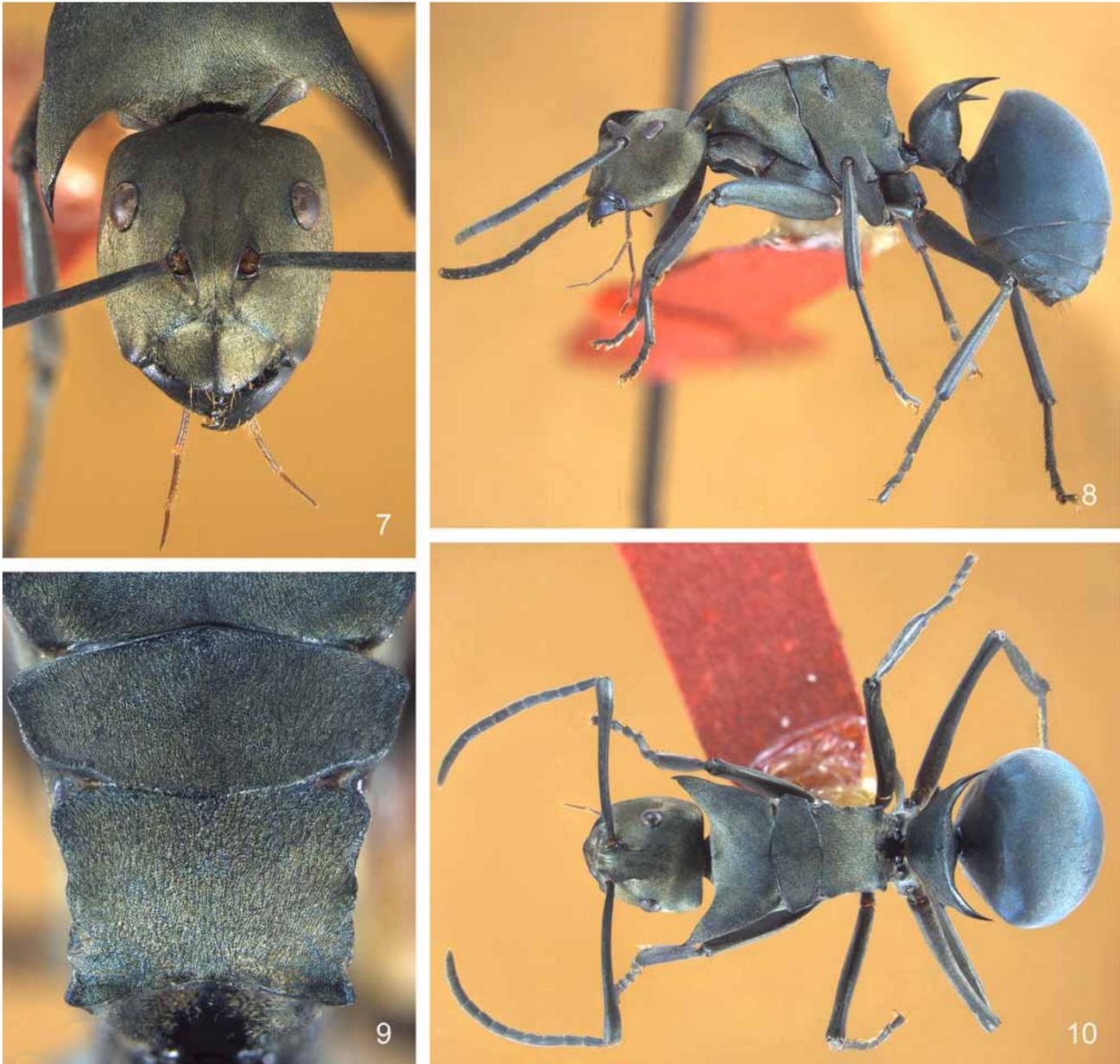
Polyrhachis (Myrma) pirata sp. n.

(Figs 7–10, 12)

Etymology: Latin for "pirate," used as a noun in apposition. The name *pirata* is an homage to the mythic world of ancient pirates. The stoutness, distinct colours and massive spines of this species – in comparison to related species – served as an inspiration for this name.

Type locality: Philippines, Luzon Island, Quezon Province, Quezon National Park near Atimonan, dipterocarp forest near Old Zigzag Road.

Type material: **Holotype** (worker) labelled "Philippinen: Luzon, Quezon\ Atimonan, Quezon NP\ Old Zigzag Rd., 24.-30.3.\ 1998, leg. Zettel (#165)" (UPLB). **Paratypes:** **Luzon Isl.:** Zambales Prov. [erroneously labelled "Bataan"]: Olongapo, Subic Bay, "Jungle Educational Survival Training" area, 4.XII.1993, leg. H. Zettel (#37h), 1 worker (NHMW). Quezon Prov.: Atimonan, Quezon National Park, Old Zigzag Road, 24.-30.III.1998, leg. H. Zettel (#165), 31 workers (CZW, CSW, NHMW, QMBA, UPLB, USC-EC), 16.III.1999, leg. H. Zettel (#202), 2 workers (NHMW). Camarines Norte Prov.: Labo, Tulay na Lupa, Mt. Labo - Mt. Bayabas area, 17.-18.III.2004, leg. H. Zettel & C. V. Pangantihon (#382), 1 worker (CZW). **Mindoro Isl.:** Occidental Mindoro: [San Jose,] Mangarin, 12.[19?]17, unknown collector, 1 worker (MCZL). **Samar Isl.:** Northern Samar Prov.: San Joaquin, Lologayan Falls, 4.-6.III.2003, leg. H. Zettel (#345), 1 worker (CZW), 1.-5.III.2004, leg. H. Zettel (#377), 9 workers (CZW, NHMW, UPLB).



FIGURES 7–10. *Polyrhachis pirata* sp. n. (paratype worker, HW 2.45 mm, TL 10.9 mm). (7) Head, frontal view. (8) Lateral view. (9) Dorsal face of propodeum, perpendicular view. (10) Dorsal view. © NHMW Image Database & www.antbase.net, published with permission.

Additional material (not examined): G. Alpert (in litt.) reported four workers from Luzon Island held in the Museum of Comparative Zoology, Cambridge, U.S.A.: Zarnbales Prov., no further data, leg. Baker (gift of W.M. Wheeler), 1 worker; Laguna Prov.: Pakil, Saray [labelled "Paeta, Sarai"], leg. McGregor, 1 worker; Mt. Makiling, low altitude, leg. F.X. Williams (gift of W.M. Wheeler), 2 workers.

Description of worker: Measurements: Holotype worker: TL 10.8 mm, HW 2.33 mm, HL 2.83 mm, CI 82, SL 3.33 mm, SI 143, PSPD 3.28 mm, PPL 1.34 mm, PPW 1.71 mm, PPI 128, PTW 3.00 mm, MTL 3.66 mm. Paratype workers (n = 10): TL 10.1–10.8–11.5 mm, HW 2.19–2.37–2.50 mm, HL 2.60–2.83–2.98 mm, CI 81–84–86, SL 3.15–3.34–3.50 mm, SI 130–141–146, PSPD 2.90–3.19–3.50 mm, PPL 1.23–1.38–1.49 mm, PPW 1.49–1.75–1.94 mm, PPI 114–127–137, PTW 2.49–2.93–3.23 mm, MTL 3.18–3.47–3.64 mm.

Head and mesosoma with bluish green, in some specimens slightly coppery shimmer; petiole and gaster often appearing darker and more bluish than mesosoma. Antennae and legs (except femora) black.

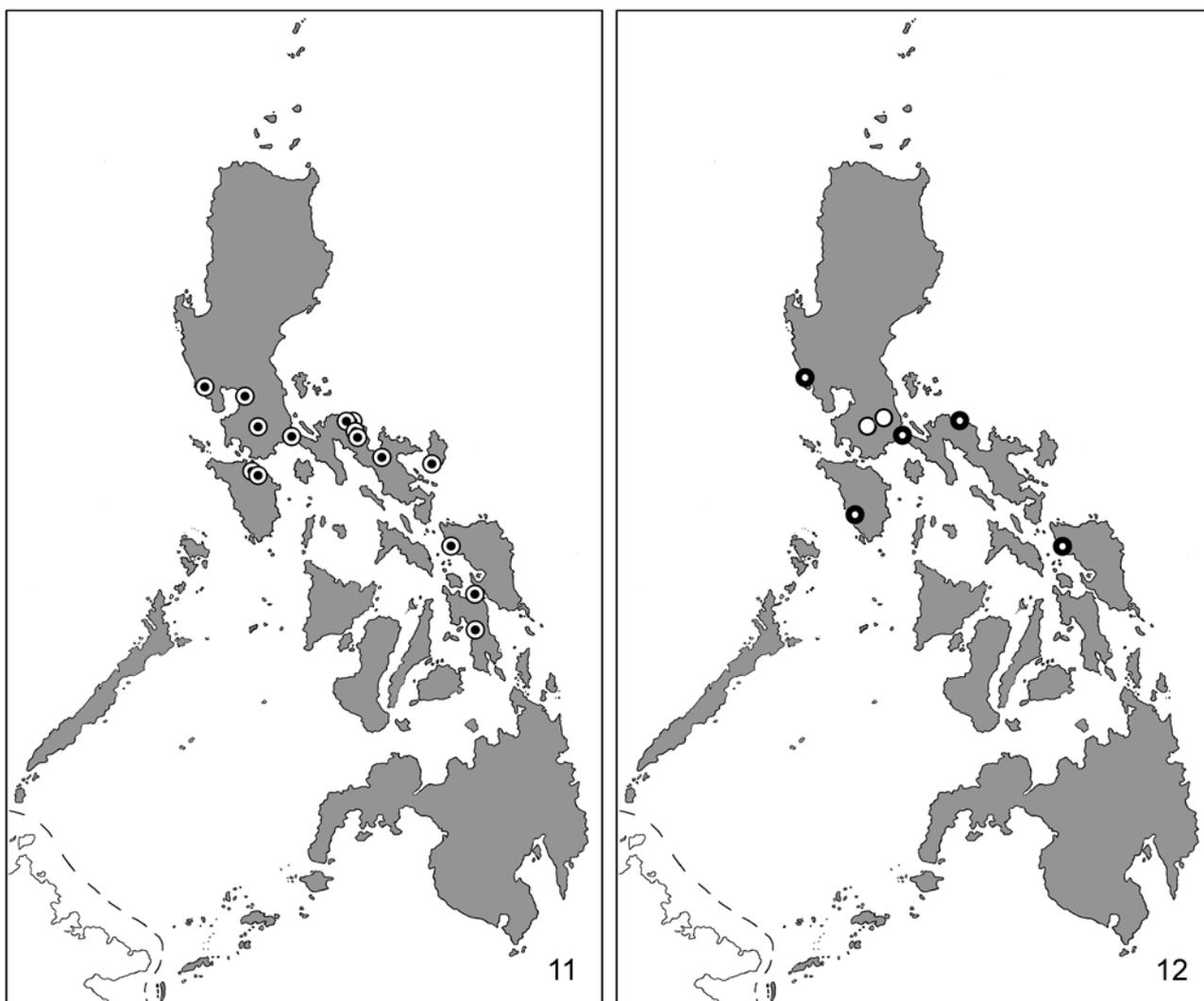
Head dorsum with some fine rugae between eyes, sides without rugae. Venter without setae. Vertex usually without setae (except in one specimen with two setae). Frons with fine median furrow and 4–7 setae. Genae without setae. Clypeus on disk with 5–7 setae.

Mesosoma dorsally without setae; in addition to microsculpture on disk of pronotum and – more distinct – on propodeum with very fine longitudinal rugae. Pronotal spines long and massive, in cross-section approximately triangular, their bases conspicuously elevated over anterior pronotal disk (Figs 8, 10). Ridge separating dorsal and posterior face of propodeum sinuate, medially slightly depressed (Figs 9, 10). Sides of propodeum dorsal of stigma with strong longitudinal rugae overlaying microsculpture (Fig 8). Femora and tibiae without setae.

Sculpture of gaster with isodiametric reticulum; tergite 1 without setae, tergite 2 usually without setae (except in five specimens with few setae at hind margin), following tergites and all sternites with numerous setae increasing in length towards apex of abdomen (Fig. 8).

Notes: Some intraspecific variation has been observed in *P. pirata* **sp. n.** : Compared with specimens from Luzon, the ants from Northern Samar are smaller, appear more gracile, and have a distinctly more bluish shimmer on gaster.

Distribution: Central and Southern Luzon, Mindoro and Samar (Fig 12).



FIGURES 11–12. Distribution of (11) *Polyrhachis cyaniventris* and (12) *Polyrhachis pirata* **sp. n.** (empty circles refer to specimens not examined).

Biology: Habitats are very similar to those of *P. cyaniventris* and syntopic occurrence was observed in the Quezon National Park and in an abandoned coconut grove in Northern Samar. However, based on its infrequent occurrence relative to *P. cyaniventris* and the habitats where it has been found, *P. pirata* **sp. n.** probably prefers more natural habitats with higher tree coverage and is possibly restricted to lower altitudes. Although the majority of specimens (Zettel collection #165) were collected on the ground, other individual workers were found foraging on leaves and twigs of small trees and bushes. Nesting habits of *P. pirata* **sp. n.** are unknown.

Acknowledgments

We acknowledge thanks to Suzanne Ryder at the Natural History Museum in London for providing digital photographs of the holotype of *P. cyaniventris*. Special thanks to Mag. Dominique Zimmermann (Natural History Museum Vienna) for access to collection and library and for sharing her office space, research equipment and mind. Thanks to Dr. Anne Freitag at the Musée cantonal de zoologie in Lausanne for providing access to the Kutter collection. Acknowledgements are given to Rudy Kohout (Queensland Museum), Gary D. Alpert (Museum of Comparative Zoology, Harvard University), an anonymous reviewer, and the editor, John T. Longino, for their valuable comments to improve earlier versions of the manuscript, and to Simon Robson (James Cook University) for language review.

References

- Alpert, G.D., General, D.M. & Samarita, V. (2009) Ants of the Philippines. Available from: http://pick4.pick.uga.edu/mp/20q?act=x_checklist&list=Ants_Philippines (accessed 4 February 2009).
- Ashmead, W.H. (1904) A list of Hymenoptera of the Philippine Islands, with descriptions of new species. *Journal of the New York Entomological Society*, 12, 1–22.
- Baltazar, C.R. (1966) A catalogue of Philippine Hymenoptera (with a bibliography, 1758-1963). *Pacific Insects Monographs*, 8, 1–488.
- Bibby, F.F. (1947) Notes on the insect fauna of the Samar group, Philippines. *Philippine Journal of Science*, (D)77, 61–81.
- Bolton, B. (1973) The ant genus *Polyrhachis* F. Smith in the Ethiopian region (Hymenoptera: Formicidae). *Bulletin of the British Museum (Natural History)*, 28, 283–369.
- Dorow, W.H.O. (1995) Revision of the ant genus *Polyrhachis* Smith, 1857 (Hymenoptera: Formicidae: Formicinae) on subgenus level with keys, checklist of species and bibliography. *Courier Forschungsinstitut Senckenberg*, 185, 1–113.
- Emery, C. (1925) Hymenoptera, Fam. Formicidae, subfam. Formicinae. *Genera Insectorum*, 183, 1–302.
- Forel, A. (1910) Fourmis des Philippines. *Philippine Journal of Science*, 5(D), 121–130.
- Forel, A. (1915) Results of Dr. E. Mjöberg's Swedish scientific expeditions to Australia., 1910–1913. 2. Ameisen. *Arkiv for Zoologi*, 9, 1–119.
- ICZN (1999) Opinion 1919. *Polyrhachis* Smith, 1857 (Insecta, Hymenoptera): given precedence over *Myrma* Billberg, 1820. *Bulletin of Zoological Nomenclature*, 56, 92–93.
- Kohout, R.J. (1989) The Australian ants of the *Polyrhachis relucens* species-group (Hymenoptera: Formicidae: Formicinae). *Memoirs of the Queensland Museum*, 27, 509–516.
- Kohout, R.J. (2008) A review of the *Polyrhachis* ants of Sulawesi with keys and descriptions of new species (Hymenoptera: Formicidae: Formicinae). *Memoirs of the Queensland Museum*, 52, 255–317.
- Mayr, G. (1862) Myrmecologische Studien. *Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien*, 12, 649–776.
- Ong, P.S., Afuangm L.E. & Rosell-Ambal, R.C. (2002) *Philippine Biodiversity Conservation Priorities: A Second Iteration of the National Biodiversity Strategy and Action Plan*. Department of Environment and Natural Resources - Protected Areas and Wildlife Bureau, Conservation International Philippines, Biodiversity Conservation Program - University of the Philippines Center for Integrative and Development Studies, and Foundation for the Philippine Environment, Quezon City, Philippines, 113 pp.

- Roger, J. (1863) Verzeichniß der Formiciden-Gattungen und Arten. *Berliner Entomologische Zeitschrift*, 7 (suppl.), 1–65.
- Smith, F. (1858) *Catalogue of hymenopterous insects in the collection of the British Museum. Part VI. Formicidae.* British Museum, London, 216 pp.
- Stitz, H. (1925) Ameisen von den Philippinen, den malayischen und ozeanischen Inseln. *Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin 1923*, 110–136.
- Viehmeyer, H. (1916) Ameisen von den Philippinen und anderer Herkunft (Hym.). *Entomologische Mitteilungen*, 5, 283–291.