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THREE NEW *POLYRHACHIS SEXSPINOSA*-GROUP SPECIES FROM THE PHILIPPINES (HYMENOPTERA : FORMICIDAE)

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ABSTRACT

Eight species of the *Polyrhachis sexspinosa* species-group are recorded from the Philippines. Three (*P. exotica*, *P. ignota* and *P. scabra*) are described as new and two (*P. aureovestita* Donisthorpe and *P. calypso* Forel), previously described from elsewhere, are recorded from the Philippine Islands for the first time. A key to all species of the group known to occur in the Philippines is provided.

INTRODUCTION

The *Polyrhachis sexspinosa* species-group was revised recently by Bolton (1975). He recognised twelve species, two of which, *P. magnifica* Menozzi and *P. osiris* Bolton, are apparently endemic to the Philippines, and gave full reference citations, which are not repeated here. My studies on the systematics of Indo-Australian *Polyrhachis* have resulted in the recognition of three new species from Mindanao. They are described here as *P. exotica* n.sp., *P. scabra* n.sp. and *P. ignota* n.sp. The first two were originally received from a private collection, without data, but certainly originating from somewhere in the Philippines probably Mindanao. Their presence there was later confirmed by specimens received from the Bernice P. Bishop Museum, Hawaii, through the kindness of Dr Gordon Nishida. The occurrences of *P. aureovestita* Donisthorpe, *P. calypso* Forel and *P. sexspinosa* (Latr.) were also verified from this material, and the third new species (*P. ignota*) was discovered. This brings to eight the number of *P. sexspinosa*-group species found in the Philippines.

The illustrations were drawn using a Zeiss (Oberkochen) SR Stereomicroscope and camera lucida. Those of the new species and of *P. osiris* depict holotypes.

The conventions of measurements and indices used in this paper are identical to those of Bolton (1973, 1975).

The following abbreviations are used for institutions and depositories: ANIC = Australian National Insect Collection, CSIRO, Canberra; BMNH = British Museum (Natural History), London; BPBM = Bernice P. Bishop Museum, Honolulu; USNM = National Museum of Natural History, Smithsonian Institution, Washington, D.C.; QM = Queensland Museum, Brisbane; RJK = R.J. Kohout, Brisbane (private collection).

KEY TO *P. SEXSPINOSA*-GROUP SPECIES RECORDED FROM PHILIPPINES (BASED ON WORKER CASTE)

1. First gastral tergite covered with fine, rather dense pubescence, which is arranged in a characteristic midline pattern (Fig. 12) 2
First gastral tergite smooth and shining; pubescence almost completely absent from dorsal surface of the gaster (Fig. 9).....
..... *P. exotica*, sp. nov.
2. Petiolar spines relatively long, elevated, recurved and hook-like (Figs 18, 19)
..... *P. calypso* Forel
Petiolar spines relatively short, scarcely elevated, not developed into recurved hooks .
..... 3
3. Head strongly contracted behind eyes, the occipital margin narrow, neck-like; antennal scapes relatively long (SI > 190)..... 4
Head not strongly contracted behind eyes, the occipital margin broad; antennal scapes relatively short (SI < 190), (Fig. 16).....
..... *P. aureovestita* Donist.
4. Antennal scapes with numerous short erect hairs (Figs 5, 17) 5
Antennal scapes without erect hairs, or with only a few inconspicuous solitary short hair present (Figs 6, 13, 14)..... 6
5. Occipital margin with lateral angular prominences, which are visible in full face view (Fig. 17) *P. sexspinosa* (Latr.)
Occipital margin without lateral angular prominences, short and collar-like (Fig. 5) ...
..... *P. osiris* Bolton
6. Extensor surfaces of middle and hind tibiae with moderately long erect hairs 7

- Extensor surfaces of middle and hind tibiae without erect hairs..... *P. magnifica* Menozzi
7. Pronotal dorsum strongly convex in profile (Fig. 7)..... *P. ignota*, sp. nov.
- Pronotal dorsum only moderately convex in profile (Fig. 8)..... *P. scabra*, sp. nov.

***Polyrhachis aureovestita* Donisthorpe, 1937**
(Fig. 16)

MATERIAL EXAMINED

MINDANAO: Zamboanga del Sur, Lemesahan, 600 m, 7.ix.1958, light trap, H.E. Milliron, BPBM coll. (1 worker); Agusan, S. Francisco, 10 km SE, 13.xi.1959, L. Quate & C. Yoshimoto, BPBM coll. (1 alate female).

DIMENSIONS

Worker cited first: TL 14.76, 16.07; HL 3.53, 3.63; HW 2.32, 2.42; CI 66, 67; SL 4.38, 4.33; SI 189, 179; PW 2.02, 2.37; MTL 5.34, 5.34.

REMARKS

Both specimens closely match the holotype of *P. aureovestita*. They represent the first records of this species from the Philippines.

***Polyrhachis calypso* Forel, 1911**
(Figs 18, 19)

MATERIAL EXAMINED

SULU: Tawitawi, Tarakan, Farm. distr., 11.ii.1957, Yoshio Kondo, BPBM coll. (1 worker).

DIMENSIONS

TL 10.28; HL 2.40; HW 1.50; CI 62; SL 3.03; SI 202; PW 1.25; MTL 3.58.

REMARKS

Not previously recorded from the Philippines. In spite of some minor differences, including the slightly narrower head and the reduced pilosity, the single worker closely matches the syntypes and other available material of *P. calypso* from Borneo, Sumatra and Java.

***Polyrhachis exotica*, sp. nov.**
(Figs 9, 11, 15)

MATERIAL EXAMINED

MINDANAO: Misamis Oriental, Mt. Kibungol, 10.-11. April 1960, H.M. Torrevillas, BPBM coll. (Holotype, 2 paratype workers); Mt. Kibungol, 20 km SE of Gingoog, 700-800 m, 9.-18.iv.1960, H.M. Torrevillas, BPBM coll. (3 paratype workers); Mt. Empagatao, 9.-18. April 1961, H.M. Torrevillas, BPBM coll. (1 paratype worker, 2 paratype dealate females); Hindangon, 20 km S of Gingoog, 600-700 m, 20.-24.iv.1960, H. Torrevillas, BPBM coll. (2 paratype workers); Minalwang, 1050 m,

24.iii.-4.iv.1961, W. Torrevillas, BPBM coll. (1 paratype worker); MINDANAO, no further data, ex C. Danes coll. (3 paratype workers, 1 paratype dealate female).

TYPE DEPOSITION: Holotype and most paratypes (6 workers and 2 females) in BPBM; 3 paratypes (2 workers, 1 female) in RJK; 1 paratype worker each in ANIC, BMNH, USNM and QM (with kind consent of Bernice P. Bishop Museum).

DESCRIPTION

WORKER

Dimensions (holotype cited first): TL 14.46, 13.31-14.66; HL 3.43, 3.17-3.43; HW 2.22; 2.07-2.22; CI 65, 64-66; SL 4.48, 4.28-4.59; SI 202, 201-207, PW 2.06, 1.96-2.17; MTL 6.05, 5.74-6.10 (13 measured).

Mandibles with 4 distinct teeth. Clypeus with a median longitudinal carina; convex in profile. Sides of head in front of eyes feebly convex, nearly straight; narrowed behind eyes with occipital margin narrow and without lateral angular prominences. Antennal carinae well elevated, sinuate; the furrow between them 2 x as wide in front than behind. Antennal scapes long, extending beyond the occipital margin by at least half their length. Eyes convex, but not as prominent as in some species of the group. Median ocellus present, though rather obscure in some specimens. Pronotum in profile very strongly convex, dome-like. Pronotal spines long, projecting laterally and strongly curved forward. Mesonotal dorsum in profile straight; propodeal dorsum shallowly concave, declivity abrupt. Mesopleural process produced to form an acute ventral angle. Propodeal spines very strong, long, elevated from their bases, divergent and recurved. Petiole with dorsum sloping anteriorly, spines scarcely elevated and curved to the base of gaster, which is short and broadly ovate; first tergite covering almost half of the gastral dorsum.

Mandibles relatively smooth and shining at the masticatory border; punctate-opaque laterally, with numerous piliferous pits at their bases. Sculpturation a fine reticulate punctation on clypeus, front and sides of head; increasing posteriorly to coarsely punctate on vertex and at the occipital border. Mesosoma and petiole fairly coarsely and closely punctate; sides of mesonotum and propodeum foveolate-punctate. Dorsum of gaster shining, with only very fine microscopic punctations.

All surfaces of the body and appendages, except the tips of spines and dorsum of the first gastral segment, with numerous yellow or off-white long erect undulate hairs. These are longest and most dense on the mesosomal dorsum and

only slightly shorter on the head, petiole, gaster and legs. Appressed, somewhat radiating, bright golden pubescence abundant all over the body, except the mandibles, legs, apices of pronotal, propodeal and petiolar spines, and most of gaster (where it is much diluted, and virtually absent from dorsal aspect of the first tergite).

Head and body black or very dark reddish brown; mandibles at the masticatory border, apical portions of antennal segments, subpetiolar process and legs reddish brown, the femora always a shade lighter. Gaster black with deep red reflections.

FEMALE

Dimensions: TL 16.08–16.63; HL 3.73–3.88; HW 2.47–2.57; CI 65–67; SL 4.74–4.99; SI 190–196; PW 2.37–2.47; MTL 6.20–6.35 (3 measured).

Females differ from workers in the usual characters identifying full sexuality — three ocelli, complete mesosomal structure and wings. The sculpturation, pilosity and colour patterning is identical, but development of the spines is different. The pronotal spines are short and stout, projecting laterally and bent only weakly forward. The propodeal spines are directed posteriorly, projecting horizontally, with their tips curved slightly inwards. The petiolar spines are closely similar to those of the workers, but slightly shorter.

MALE AND IMMATURE STAGES

Unknown.

REMARKS

This species is a very distinct member of the *P. sexspinosa*-group. It possesses all the combined characters of the group except that the gaster is smooth and shining, in contrast to those of other species, where it is characteristically pubescent. This character together with the exceptionally produced pronotal dorsum render *exotica* immediately identifiable, and readily separable from any other member of the *sexspinosa*-group.

Polyrhachis ignota sp. nov.

(Figs 7, 10, 13)

MATERIAL EXAMINED

MINDANAO: Zamboanga del Sur, Lemesahan, 600 m, 7.–8.ix.1958, H.E. Milliron, BPBM coll. (Holotype, 2 paratype workers).

TYPE DEPOSITION: Holotype and 1 paratype in BPBM; 1 paratype in RJK.

DESCRIPTION

WORKER

Dimensions (holotype cited first): TL 14.36, 13.26–14.97; HL 3.48, 3.17–3.43; HW 2.07, 1.86–2.07; CI 59, 59–60; SL 4.54, 4.43–4.48; SI 219, 216–238; PW 1.81, 1.66–1.81; MTL 6.20, 5.90–6.20 (3 measured).

Mandibles with 5 teeth. Clypeus carinate, sinuate in profile (convex above and concave below). Sides of head in front of eyes only feebly convex, almost straight; strongly narrowed behind eyes. Occipital margin narrow, collar-like, without lateral angular prominences. Antennal carinae elevated, sinuate. Antennal scapes extending beyond occipital border by nearly half their length. Eyes convex. Pronotum strongly convex, distinctly swollen (though not to such a degree as in *P. exotica*); pronotal spines stout, projecting laterally, only slightly curved forward. Mesonotal dorsum in profile feebly convex, propodeum shallowly concave, declivity abrupt. Metanotal groove replaced by a minutely raised ridge. Mesopleural process represented as a non-acute simple lobe. Propodeal spines elevated at their bases, divergent and recurved. Petiole relatively low in front; its dorsum shallowly concave in profile, sloping anteriorly, and with a weak median longitudinal ridge similar to that in *P. osiris*. Apices of petiolar spines scarcely elevated, the spines short. Gaster, when contracted, short, broadly ovate.

Mandibles smooth and shining at the masticatory border, densely punctate at their bases, intervening surfaces with graded sculpturation. Clypeus and front of head finely reticulate-punctate; sculpturation increasing posteriorly in intensity and density, so that the dorsal face and lateral branches of occiput are somewhat coarsely rugose. Mesosomal dorsum with weak rugosity, decreasing posteriorly in intensity and density. Gaster very finely reticulate-punctate.

White or yellowish erect hairs present in variable density all over the body and appendages, but absent from the antennal scapes. Relatively long, suberect, somewhat radiating rich golden pubescence variously developed; most dense on head and mesosomal dorsum, rather diluted on lateral portions of mesosoma (the specimens might be somewhat worn). Gastral pubescence ranging from yellow on anterodorsal aspect of first tergite to silvery white elsewhere, arranged in a characteristic midline pattern.

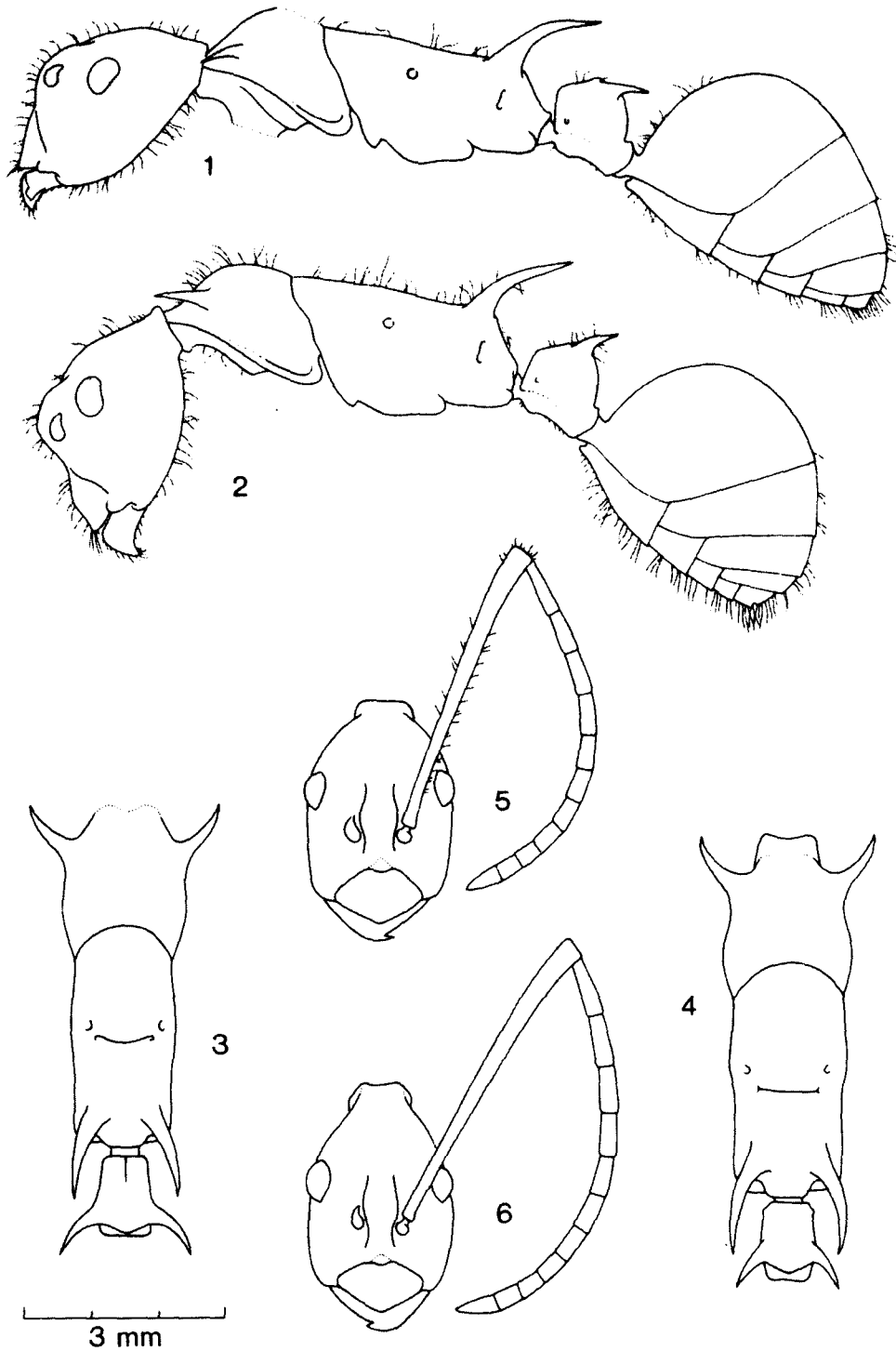
Body and appendages black.

SEXUALS AND IMMATURE STAGES

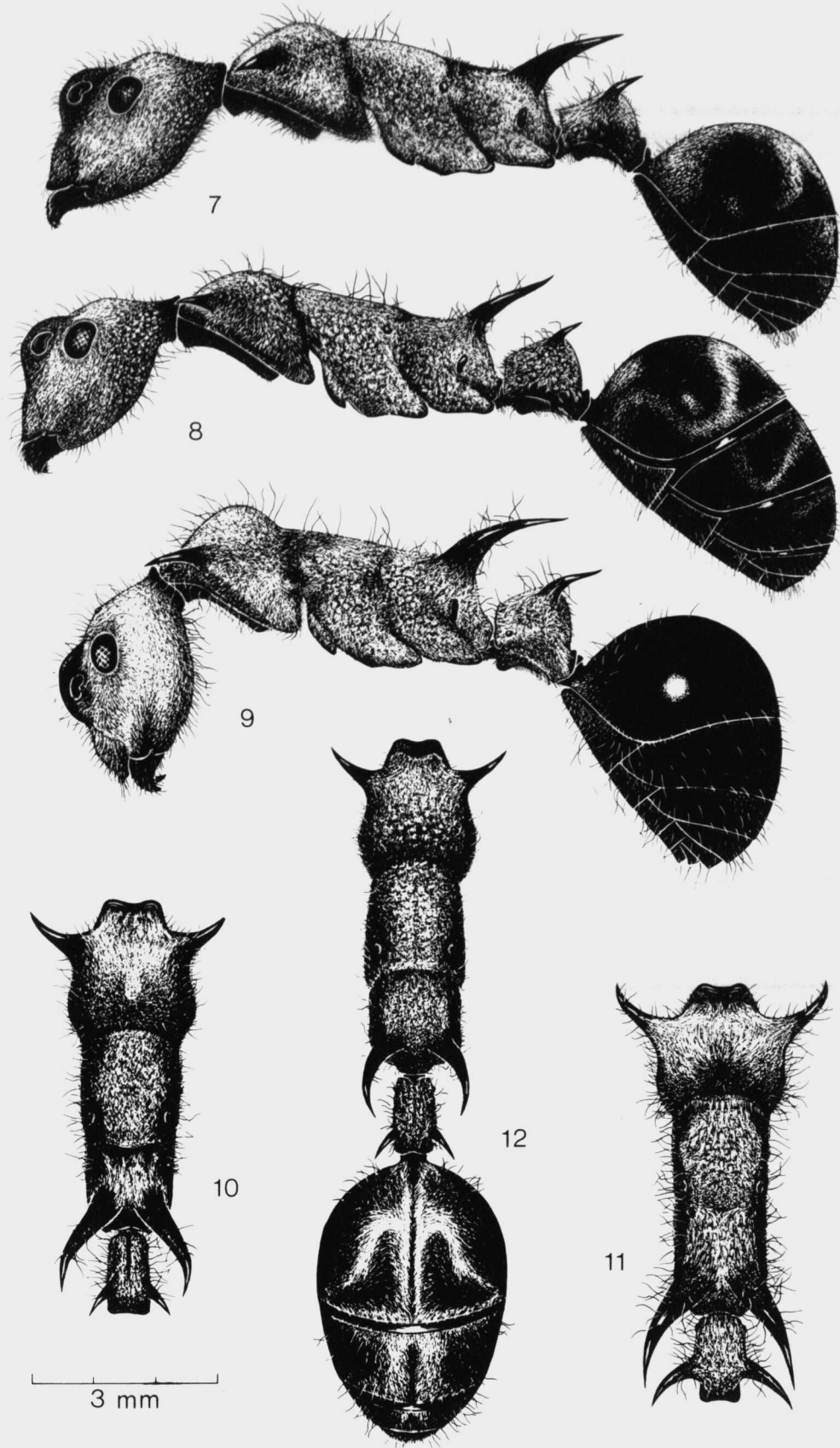
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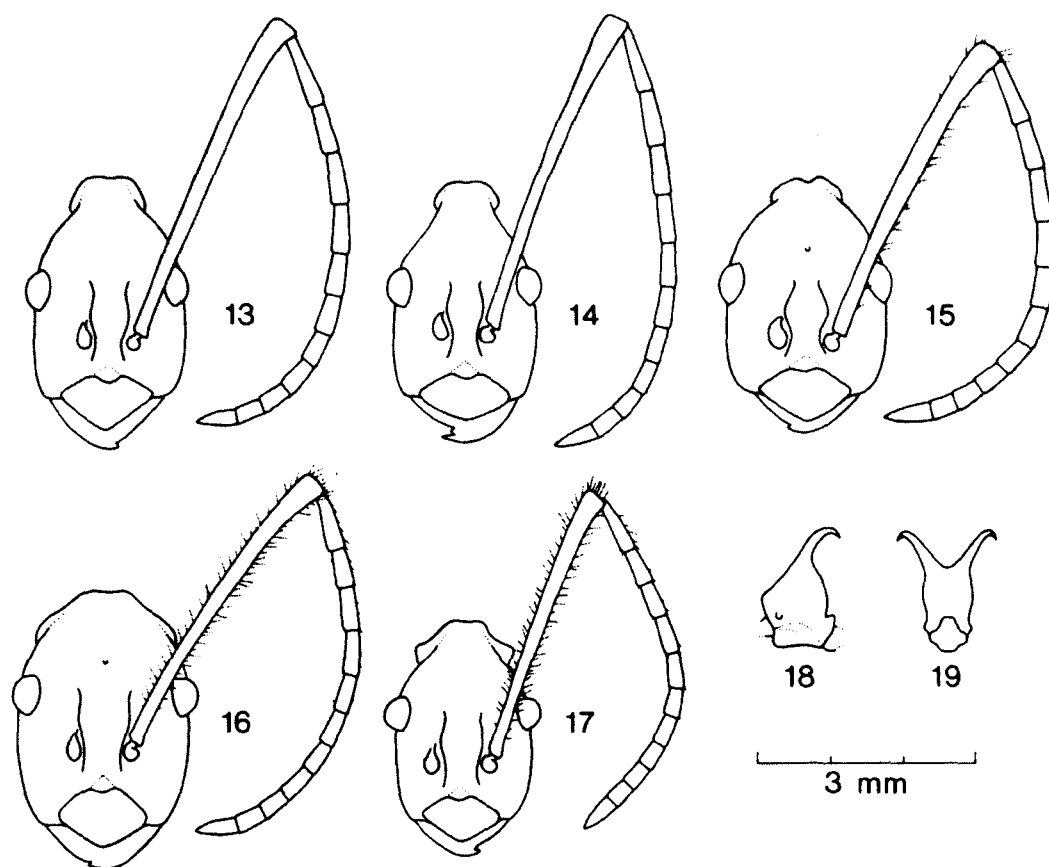
REMARKS

This is the third *P. sexspinosa*-group species from Philippines which lacks hairs on the antennal



FIGS 1-2: Lateral view (antennae and legs omitted); 1 — *P. osiris*; 2 — *magnifica*.
 FIGS 3-4: Dorsal view of mesosoma and petiole (pilosity omitted); 3 — *P. osiris*; 4 — *magnifica*.
 FIGS 5-6: Head in full face view (right antennae and cephalic pilosity omitted); 5 — *P. osiris*; 6 — *magnifica*.
 FIGS 7-9: Lateral view (antennae and legs omitted); 7 — *P. ignota*; 8 — *scabra*; 9 — *exotica*.
 FIGS 10-11: Dorsal view of mesosoma and petiole; 10 — *P. ignota* (tip of the right spine on holotype broken off);
 11 — *exotica*.
 FIG. 12: Dorsal view of mesosoma, petiole and gaster of *P. scabra*.





FIGS 13-17: Head in full face view (right antenna and cephalic pilosity omitted); 13 — *P. ignota*; 14 — *scabra*; 15 — *exotica*; 16 — *aureovestita*; 17 — *sexspinosa*.
 FIGS 18-19: Petiole of *P. calypso*; 18 — lateral; 19 — anterior.

scapes (the others are *P. magnifica* and *P. scabra*). *P. ignota* differs from *magnifica* in having erect hairs present on the extensor surfaces of the middle and hind tibiae and in the structure of the pronotal spines. In *P. ignota* these are quite short, and only weakly curved, while in *P. magnifica* they are long and strongly curved forward. *P. ignota* differs from *P. scabra* in having a strongly produced pronotal dorsum, which is only moderately convex in *scabra*.

***Polyrhachis magnifica* Menozzi, 1925**
 (Figs 2, 4, 6)

MATERIAL EXAMINED

NEGROS: Talay, Valencia, 8.i.1961, H.M. Torrevillas;
 LUZON: Camarines Sur, Mt. Iriga, 500-600 m, 4.-
 17.May 1962, H.M. Torrevillas; Camarines Sur, Mt.
 Isarog, 750-850 m, 20 km E of Naga, 4.-11.April 1963,

H.M. Torrevillas (all BPBM coll.); LUZON, no further
 data, ex C. Danes coll.

REMARKS

This species was adequately described by Menozzi, and redescribed by Bolton (1975). The pubescence of specimens from Mt. Isarog tends to be more silvery than in the other populations where it is consistently brightly golden.

***Polyrhachis osiris* Bolton, 1975**
 (Figs 1, 3, 5)

REMARKS

I have been able to examine the holotype through the kindness of Barry Bolton. Apart from *P. exotica*, this is the only endemic Philippine species of the group with erect hairs on the antennal scapes.

***Polyrhachis scabra*, sp. nov.**
(Figs 8, 12, 14)

MATERIAL EXAMINED

MINDANAO: Agusan, 10 km SE S. Francisco, 12.Nov.1959, Quate & Yoshimoto, BPBM coll. (Holotype, 2 paratype workers); Misamis Oriental, Mt. Empagatao, 9.-18.April 1961, H.M. Torrevillas, BPBM coll. (3 paratype workers); Agusan, Esperanza, 4.-11.xi.1959, C.M. Yoshimoto, BPBM coll. (1 paratype worker); Zamboanga del Sur, 11 km NW of Milbuk, 390 m, 5.viii.1958, H.E. Milliron, BPBM coll. (1 paratype worker); Surigao, L. Mainit, 23.xi.-1.xii.1959, C.H. Yoshimoto, BPBM coll. (1 paratype worker); Misamis Or., Balason, 1.iv.1960, H. Torrevillas, BPBM coll. (1 pseudogyne); MINDANAO, no further data, ex C. Danes coll. (2 paratype workers, 1 paratype dealate female).

TYPE DEPOSITION: Holotype and 5 paratypes (4 workers and 1 pseudogyne) in BPBM; 3 paratypes (2 workers, 1 dealate female) in RJK, 1 paratype worker each in ANIC, BMNH, USNM and QM (with kind consent of Bernice P. Bishop Museum).

DESCRIPTION

WORKER

Dimensions (holotype cited first, pseudogyne last): TL 14.81, 13.56-15.06, 16.48; HL 3.43, 3.22-3.58, 3.93; HW 2.02, 1.86-2.12, 2.37; CI 59, 58-61, 60; SL 4.74, 4.38-4.89, 5.14; SI 235, 227-237, 217; PW 1.66, 1.56-1.81, 2.02, MTL 6.25, 5.85-6.35, 6.80 (12 measured).

Mandibles with five teeth. Clypeus carinate, sinuate in profile (convex above, concave below). Sides of head in front of eyes almost straight, strongly contracted behind eyes, with narrow occipital margin, lacking lateral angular prominences. Antennal carinae rising sharply, sinuate. Antennal scapes long, extending beyond the occipital margin by about half their length. Eyes convex. Pronotum in profile moderately convex; pronotal spines long, slender, projecting laterally and curved forward. Mesonotal dorsum straight in profile, propodeal dorsum shallowly concave, declivity abrupt. Metanotal groove replaced by a minute ridge. Mesopleural process represented as a dentiform lobe with acute ventral angle. Propodeal spines long, elevated at their bases, diverging and recurved. Petiole with dorsum sloping anteriorly; spines scarcely elevated, short.

Mandibles punctate-opaque with numerous piliferous pits. Sculpturation consists of very fine punctation on clypeus, front and sides of head, increasing posteriorly to densely, but shallowly punctate. Dorsum of mesosoma densely, but shallowly punctate, sculptural intensity increasing laterally to coarsely punctate. Gaster very finely reticulate-punctate.

All body surfaces except antennal scapes with rather diluted, moderately long, undulate, silvery white hairs. These are longest on mesosomal dorsum and shortest on lateral portions of mesosoma, and on the gastral dorsum. Silvery white, somewhat radiating, appressed pubescence abundant over entire body, including gastral dorsum, where it forms the midline pattern characteristic of most members of the group.

Body black with the appendages dark reddish brown.

The single *pseudogyne* (in the terminology of Wheeler, 1910) represents a worker-like form with transversely enlarged mesonotum, which is convex in profile. The sculpturation and pilosity are essentially as in the worker.

FEMALE

Dimensions: TL 15.51; HL 3.63; HW 2.17; CI 60; SL 4.69; SI 216; PW 2.02; MTL 5.80 (1 measured).

The female differs from the worker in the usual sexual characters, including the reduction in length of pronotal and propodeal spines. The sculpturation and pilosity similar to that in worker.

MALE AND IMMATURE STAGES

Unknown.

REMARKS

This species stands close to *P. magnifica* and bears a superficial resemblance to the silvery pubescent population of that species from Mt. Isarog, Luzon Island. The main distinguishing features additional to that given in the key, are the longer antennal scapes of *scabra*, along with its more dense sculpturation and a more gracile build.

***Polyrhachis sexspinosa* (Latreille), 1802**
(Fig. 17)

MATERIAL EXAMINED

MINDANAO: Zamboanga del Sur, Lemesahan, 600 m, 7.ix.1958, light trap, H.E. Milliron, BPBM coll. (3 workers in poor condition).

DIMENSIONS

TL 12.41-13.00; HL 2.97-3.17; HW 1.86-1.94; CI 61-63; SL 3.78-3.93; SI 203-206; PW 1.56-1.76; MTL 4.74-4.99 (3 measured).

REMARKS

Recorded previously from the Philippines by various authors (Smith 1858, 1859, 1863; Mayr 1867; Viehmeyer 1916; Stitz 1923; Emery 1925; Donisthorpe 1943; Baltazar 1966). The three specimens before me differ from those of typical

New Guinean populations of *P. sexspinosa* (as defined by Bolton, 1975) in having the sculpturation of the head and body more reduced and almost completely masked by a rich yellowish pubescence. In spite of these differences, and in view of the general similarity between these specimens, and the absence of additional material, I feel obliged to consider them as representatives of *P. sexspinosa* (Latreille).

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