

ORIENTAL SPECIES OF *XORIDES* (*GONOPHONUS*) (HYMENOPTERA, ICHNEUMONIDAE)*

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A revision of the Oriental species of *Xorides* (*Gonophonus*) is given. *X. (Gonophonus) exquisitus* (TOSQUINET) is redescribed. A new species, *X. (G.) karnaticus* and a new subspecies, *X. (G.) exquisitus ceylonicus* are described.

Xorides (*Gonophonus*), a relatively small subgenus of the Palaearctic and Oriental distribution, is known from the Oriental Region by two species, viz. *Xorides (Gonophonus) exquisitus* (TOSQUINET, 1903) from Mont Gede (Java) and *X. (G.) carinifrons* (BALTAZAR, 1961) from the Philippines. A new species *karnaticus* is described here and *exquisitus* (TOSQUINET) is redescribed from three females of the type-series loaned by the Brussels Museum. Three subspecies of *exquisitus* are recognized here.

Subgenus *Gonophonus* FOERSTER

Gonophonus FOERSTER, 1868, *Verh. Naturh. Ver. Rheinlande*, 25: 169. Type: *Gonophonus mokrzeckii* (KOKUJEV) = *propinquus* TSCHERK; included by KOKUJEV, 1902.

Caenostoma CAMERON, 1905, *J. Straits Br. Asiatic Soc.*, 44: 125. Type: (*Caenostoma filicornis* CAMERON) = *exquisitus* TOSQUINET; monobasic; CAMERON, 1905, *Entomologist*, 38: 171. Type: (*Caenostoma filicornis* CAMERON) = *exquisitus* TOSQUINET, monobasic.

Paraglypta KIEFFER, 1921, *Bull. Agr. Inst. Sci. Saigon*, 3: 137. Type: (*Paraglypta tubigera* KIEFFER) = *exquisitus* TOSQUINET; original designation.

TAXONOMY: TOWNES & TOWNES, 1960: 501; TOWNES *et al.*, 1961: 106; TOWNES *et al.*, 1965: 542; TOWNES, 1969: 212.

Face striato-punctate or rugose; malar space 0.4–0.6x as long as the basal width of mandible, sparsely to densely punctate; flagellum 21–23 segmented, in female curved subapically, the bend involving 2–3 segments, with three peg-like bristles on their outer side; occipital carina complete above; pronotal groove smooth and shiny, sometimes with weak oblique carinae; mesoscutum moderately punctate, its median and lateral lobes often with parallel transverse carinae; notauli wide and shallow, usually smooth; scutellum weakly convex to moderately raised, usually smooth and shiny with weak punctures; metascutellum moderately raised, with strong lateral carinae; prepectal carina extending up to about 0.7x the height of mesopleurum, sometimes ending at lower 0.3; meta-pleurum reticulate, its lower 0.3 smooth and shiny; posterior transverse carina of mesosternum complete and strong; propodeum with strong carinae, its spiracle elliptic; nervulus basad of basal vein; intercubitus basad of second recurrent vein by as much as its length; nervellus intercepted below the middle; trochantellus of fore leg usually with an acute apical tooth on the inner side;

* The Oriental species of the subgenera *Moerophora* and *Xorides* have been treated in *Oriental Ins.*, 6 (4): 409–417 (1972) and 8 (4): 395–411 (1974) respectively.

fore and hind tibiae sometimes with a row of 4-9 spines; fore and middle femora compressed basally and tibia of female with a constriction at basal 0.3 and semicircular crease on the ventral side of the constriction; hind trochantellus in front view about 2.5x as long as its trochanter; first tergite 2.0-3.3x as long as its apical width and 1.8-2.5x the length of second, strongly narrowed at the base; second and third tergites with oblique basolateral and apical grooves; ovipositor long, strong and sub-cylindrical, apically decurved; ovipositor sheath 1.2-1.4x as long as fore wing and 2.6-3.3x the length of hind tibia.

The chief distinguishing features of *Gonophonus* are: (i) hind trochantellus in front view about 2.5x as long as the trochanter; (ii) posterior transverse carina of mesosternum complete and strong; (iii) sub-apical bend of female flagellum involving 2-3 segments; (iv) nervulus basad of basal vein; (v) intercubitus basad of second recurrent vein by not more than its own length and (vi) trochantellus of fore leg usually with an apical tooth on the inner side.

KEY TO THE ORIENTAL SPECIES OF
XORIDES (GONOPHONUS)

1. Areola very long, separated from the basal area by a weak transverse carina; fore tibia without spines; frons smooth, sparsely punctate without a carina on the lateral margins; median lobe of mesoscutum with short, parallel, transverse carinae; scutellum yellow, flat or weakly convex, smooth and shiny; face transversely striato-punctate laterally and densely punctate or longitudinally striated in the middle, yellow with a black longitudinal band in the middle; clypeus yellow, black behind the transverse crease. Java, Kalimantan, Sri Lanka, Sumatra and Vietnam. *1. exquisitus* (TOSQUINET).

Areola pentagonal, connected to the triangular basal area by a single long carina; fore tibia with a row of short spines on the inner side; frons with a longitudinal carina on its lateral margins; median lobe of mesoscutum without transverse carinae; scutellum black, strongly convex, wrinkled basally

and laterally, face black, rugose, with long hairs; clypeus blackish-brown. 2

2. Occipital carina absent ventrally, complete dorsally; temple closely punctate; first and second tergites without yellow apical margins; hind coxa and femur black; basal half of hind basitarsus black; frons rugose; longitudinal carinae petiolar area of propodeum confined to the apical half. Philippines. 2. *carinifrons* BALTAZAR.

Occipital carina complete ventrally, dorsally weak, represented by a crease; temple obliquely striated; all tergites with yellow apical margins; hind coxa yellowish-brown, femur orange; hind basitarsus entirely yellow; frons smooth with coarse punctures on the lateral margins; longitudinal carinae of petiolar area strong, extending full length. India. 3. *karnaticus*, sp. nov.

1. *Xorides (Gonophonus) exquisitus* (TOSQUINET) (Figs. 2, 3, 5 & 6).

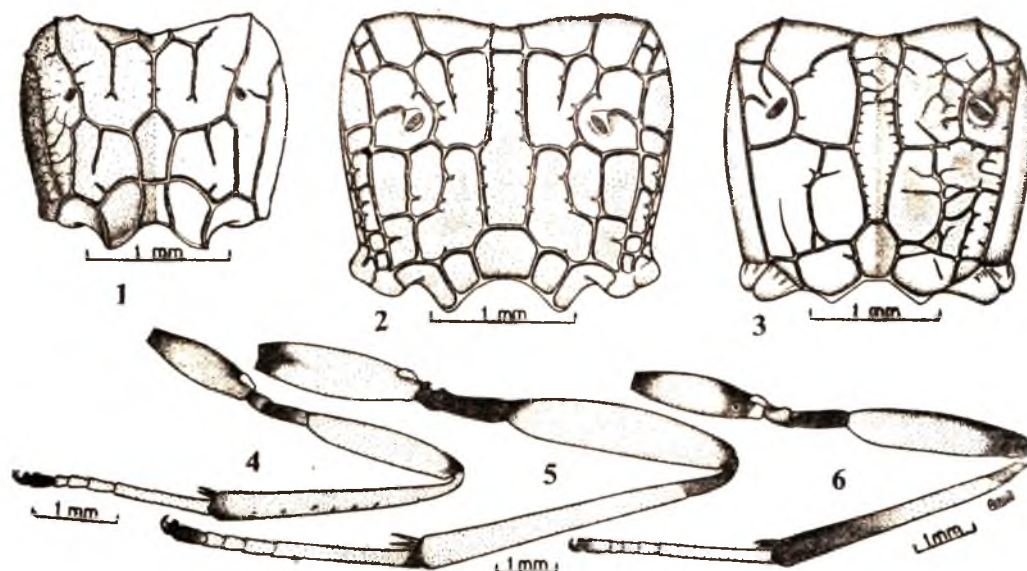
Moansa exquisitus TOSQUINET, 1903, *Mem. Soc. Ent. Belgique*, **10** : 57. Female des. Types : males, Java : Mont Tengger, 1219m (Brussels). The types are labelled "Java, Mont Gede, Aug. 1892, Fruhstorfer."

Caenostoma filicornis CAMERON, 1905, *J. Straites Br. Asiatic Soc.* **44** : 126. Male des. Lectotype male, Sarawak : Kuching (London) CAMERON, 1905, *Entomologist*, **38** : 172. Male des.

Paraglypta tubigera KIEFFER, 1921, *Bull. Agr. Inst. Sci. Saigon*, **3** : 137. Male. des. Type: Female, Vietnam: Tonkin: (Lost). Host : *Xylotrechus quadripes*; DUPORT, 1921, *Bull. Chambre d'Agr. Tonkin et Nord-Annam* **130**, sup. **11** : 7. Female. des. Vietnam : Cho-Ganh. Host : *Xylotrechus quadripes* ; *Chlorophorus annularis*.

Xorides filicornis : TOWNES, 1944, *Mem. Amer. Ent. Soc.*, **11** : 103. syn.

Xorides (Gonophonus) exquisitus : TOWNES & TOWNES, 1960, *Bull. U. S. Natl. Mus.*, **216** (2) : 494. syn; TOWNES, TOWNES & GUPTA 1961, *Mem. Amer. Ent. Inst.*, **1** : 107. syn.



Figs. 1-3. Dorsal view of the propodeum of: 1. *Xorides (Gonophonus) karnaticus*, sp. nov.; 2. *X. (G.) exquisitus exquisitus* (TOSQUINET); 3. *X. (G.) exquisitus ceylonicus*, subsp. nov. Figs. 4-6. Colour pattern of hind leg of: 4. *Xorides (Gonophonus) karnaticus*, sp. nov.; 5. *X. (G.) exquisitus ceylonicus*, subsp. nov.; 6. *X. (G.) exquisitus exquisitus* (TOSQUINET).

Xorides (Caenostoma) exquisitus: BALTAZAR, 1961, *Monogr. Natl. Inst. Sci. Tech. Manila*, 7: 107 syn.

This species was described from Java by TOSQUINET in 1903. Three topotype females of this species, collected and determined by J. TOSQUINET and loaned to us by Brussels Museum, were studied. In addition, one male from Sumatra, one from Kalimantan (c. w. t. of *Caenostoma filicornis* CAMERON by R. SHELFORD), three females from Sri Lanka and one female each from Malaya and Vietnam were also studied.

The distribution data of the type as recorded by TOSQUINET is, "Mont Tengger (Java Oriental), 400 pieds, 1890, H. Fruhstorfer." Three females loaned by the Brussels Museum are labelled, "Java: Mt. Gede, August 1892, Fruhstorfer", and one of them bears the label "Type". They have original determination label in TOSQUINET'S

hand as "*Moansa exquisitus* Tosq." These are evidently the types as has also been mentioned by TOWNES *et al.* (1961: 107) and we believe that the type locality should be corrected to Mt. Gede as given on the label of the specimen.

Face densely punctate in the middle and finely transversely striated laterally, 0.4-0.6x as long as wide, yellow with a black longitudinal band in the middle; malar space 0.5-0.6x the basal width of mandible; frons finely sparsely punctate with a weak, median longitudinal carina but without a carina on the lateral margins; temple smooth and shiny, weakly obliquely striated on the lower side; last flagellar segment of female 4-6x its basal width; occipital carina complete; median and lateral lobes of mesoscutum with short, parallel transverse carinae; mesoscutum also with 3-5 median longitudinal carinae behind the middle scutellum yellow, flat or very weakly convex, smooth,

sometimes with a weak median longitudinal ridge; propodeum with strong carinae, areola very long, weakly separated from the basal area; propodeal apophyses absent; fore tibia without spines; first tergite with distinct, oblique, subapical groove; second and third tergites with basolateral and subapical grooves; densely to coarsely punctate, tending to be rugose; all tergites with their apical margins yellow.

BALTAZAR (1971) recognized two subspecies of this species, viz. *Xorides (Caenostoma) exquisitus exquisitus* (TOSQUINET) and *X. (C.) exquisitus xanthopleurus* BALTAZAR. A new subspecies, *X. (G.) exquisitus ceylonicus* is described here from Sri Lanka and Vietnam.

Key to the Subspecies of *Xorides (Gonophonus) exquisitus*

1. Mesopleurum blackish-brown, with a small yellow spot behind speculum; propodeum black except a small yellow spot above the base of hind coxa; pronotum with a single large yellow spot on the upper margin; median lobe of mesoscutum entirely black; first tergite without a median yellow spot; hind tibia brownish on its apical 0.3. Java, Kalimantan, Sumatra and Malaya.....
.....1. *exquisitus exquisitus* (TOSQUINET).

Mesopleurum with yellow bands or three large yellow spots; apical 0.3 of propodeum yellow; pronotum with one yellow spot each on its upper and lower margins; carinated area on median lobe of mesoscutum with a yellow spot; first tergite with a median yellow spot; hind tibia brown on its apical 0.6 or entirely yellowish-brown with a darker tinge on the extreme apex and base.....2

2. Metascutellum black; mesopleurum with two longitudinal yellow bands, upper band sometimes divided into two; second ter-

gite with one or three median yellow spots and third tergite with a median yellow spot; hind tibia with its distal 0.6 brown; hind femur yellowish-brown, its base brownish. Philippines.....
.....2. *exquisitus xanthopleurus* BALTAZAR.

Metascutellum yellow; mesopleurum with two anterior and one postero-ventral yellow spots; second and third tergites without median yellow spots, only their apical margins yellow; hind tibia orange-yellow, sometimes extreme apex and base with a brownish tinge; hind femur entirely orange-yellow, sometimes brown at apex. Sri Lanka and Vietnam.....
.....3. *exquisitus ceylonicus* subsp. nov.

1. *Xorides (Gonophonus)exquisitus exquisitus* (TOSQUINET) (Figs. 2 & 6) *Moansa exquisitus* TOSQUINET, 1903, *Mem. Soc. Ent. Belgique*, 10 : 57. Female. des. Types : 3 females, Java: Mt. Gede, 1219m (Brussels). *Xorides(Caenostoma)exquisitus exquisitus*: BALTAZAR, 1961, *Monogr. Natl. Inst. Sci. Tech. Manila*, 7 : 107. syn.

This subspecies can easily be distinguished from the other two by the set of characters mentioned in the key. The re-description given here is based on the specimens from Java, Malaya, Kalimantan and Sumatra.

Female : Face about 0.5x as long as wide, densely punctate in the middle and transversely striated laterally; clypeus smooth and shiny; malar space 0.6-0.7x the basal width of mandible, finely punctate, with very weak striations near the base of mandible; temple smooth and shiny, weakly obliquely striated near the mandibular base; flagellum 21-23 segmented, first flagellar segment nearly 4.0x its apical depth, second segment about 0.9x as long as the first, last segment about 5.0x its basal width, sharply narrowed apically; frons, vertex and occiput

smooth and shiny; interocellar distance 0.75–0.86x the ocello-ocular distance; occipital carina entire; pronotum polished, with fine sparse punctures, its groove shallow and shiny; mesoscutum raised, evenly punctate, punctures fine and separated by their own diameter, median and lateral lobes with parallel transverse carinae in the middle; posterior half of mesoscutum with three parallel longitudinal carinae in the middle; notaulus wide shallow, smooth and shiny; scutellum flat, squarish, smooth and shiny; mesopleurum evenly closely punctate with long white pubescence; mesosternum with fine close punctures; metapleurum reticulate, with long white pubescence; propodeum stout, shiny with strong carinae, areola about 4.0x as long as wide near costulae, separated from the basal area by a very weak carina, apical transverse carina complete and strong, spiracle elliptic; nervulus basal of the basal vein by about 0.33x its length; hind femur 4.4–4.6x as long as its depth at middle; hind tibia 11.0–12.0x its apical depth; hind basitarsus 3.9–4.5x the length of longer hind tibial spur; first tergite 2.1–2.4x its apical width and nearly twice as long as second, strongly rugoso-punctate, less so towards the base, with deep subapical oblique grooves, cutting its apical margin into three distinct lobes; second tergite about 0.9x as long as its apical width, with deep basolateral and apical oblique grooves which enclose a raised area that is slightly depressed in the middle, densely punctate basally, moderately punctate on the convexities and towards the apex, grooves and depression striated; third tergite nearly half as long as its apical width, grooves and depression as on the second tergite but weakly represented, moderately punctate, punctures rather sparse on the raised areas; tergites 4–8 smooth and shiny; ovipositor subcylindrical, apically decurved, its sheath 2.12–1.3 x the length of fore wing and 1.6–2.7 x the length of hind tibia.

Blackish-brown to black. Face except a median longitudinal band, apical half of clypeus, lateral margins of frons, palpi, temple except its posterior margin, scutellum, mesepimeron and apices of all tergites, yellow; antenna blackish-brown with segments 10–21 yellow, apex of the last segment black; pronotum black with a large yellow spot on the upper margin; mesoscutum and metascutellum entirely black; propleurum yellow; mesopleurum black with a small yellow spot near the speculum; propodeum black except a small yellow spot above the base of coxa; fore and middle legs yellow except their last tarsal segments and base of the tibia brownish; hind coxa brown, yellowish towards the base, trochanter brown, femur yellowish basally and brown apically, tibia brown, yellow in the middle and tarsus yellow, its last segment brown apically; all claws black; apical lobes of first tergite yellow; second and third tergites each with a yellow spot in the middle and their apical margins yellow.

Male: Similar to female in all respects except for the following characters: flagellum 38-segmented; first flagellar segment 1.2–2.0x its spical depth; second flagellar segment 2.0–3.0x as long as the first; last flagellar segment 3.0x its basal width; interocellar distance nearly equal to the ocello-ocular distance; fore and middle tibiae without a constriction and semicircular crease at basal 0.3; first tergite 3.0x its spical width and 2.2–2.5x as long as the second which in turn is about 1.2x its apical width.

Black. Flagellum black with segments 8–12 yellow; mesopleurum with or without a yellow spot behind speculum; median yellow spots on second and third tergites tending to merge with the yellow apical margins.

Length: Female, 12.0–19.0 mm; fore wing 9.7–13.5 mm; ovipositor sheath 12.5–18.0

mm; male, 11.8–12.6 mm; fore wing 8.5–9.4 mm.

Specimens examined: 4 females, 2 males. Java: Mont Gede, 3 females (one female "Type," other two determined by J. TOSQUINET) viii. 1892, Frühstorfer Coll. (Brussels) Malaya: Kwala Kangsar (Perak), 1 female 1902, Grubauer (Vienna). Kalimantan: Kuching, 1 male, 24. v. 1903, R. SHELFORD (Oxford). Sumatra: Tandjong Morawa (Serdang), 1 male, Dr. B. HAGEN (Leiden).

Distribution: Indonesia: Java, Kalimantan and Sumatra. Malaya.

2. *Xorides (Gonophonus) exquisitus xanthopleurus* BALTAZAR

Xorides (Caenostoma) exquisitus xanthopleurus BALTAZAR, 1961, *Monogr. Natl. Inst. Sci. Tech. Manila*, 7: 107. Male, female, des., fig. Type: males, Philippines: Mindanao: Lanao: Kolambugan (U. S. N. M.).

This subspecies is hitherto known only from the type locality in the Philippines. It can be readily distinguished by the set of characters mentioned in the key.

3. *Xorides (Gonophonus) exquisitus ceylonicus*, subsp. nov. Figs. 3 & 5

This species closely resembles *X. (G.) exquisitus xanthopleurus* BALTAZAR but can be easily distinguished from it by the following characters: Mesopleurum with two anterior and one postero-ventral yellow spots; metascutellum yellow; second and third tergites without yellow spots in the middle; hind tibia orange-yellow, rarely its extreme base and apex with brownish tinge and hind femur orange-yellow, sometimes its apex brownish.

Female: Face about 0.4 x as long as wide, transversely striato-punctate, with

dense punctures and longitudinal striations in the middle; malar space 0.6 x (0.55–0.6)* the basal width of mandible, distinctly punctate, punctures rather sparse below the groove; flagellum 21-segmented, first flagellar segment 4.0 x (3.5–4.5) its apical depth and nearly as long as the second, last segment 4.5 x (3.6–4.8) its basal width; frons moderately punctate, punctures very fine; vertex polished with scattered punctures; interocellar distance 1.1 x (1.1–1.3) the ocello-ocular distance; punctures on pronotum fine, separated by 1.5–2.0 x their diameter; scutellum smooth and shiny, finely punctate, usually with a median longitudinal ridge or carina; mesopleurum evenly closely punctate on the lower margin, rest polished with fine scattered punctures; prepectus moderately closely punctate; mesosternum moderately punctate, punctures sparse posteriorly; metapleurum reticulate, with long scattered pubescence; propodeal carina comparatively weaker, tending to merge with the reticulations; areola very long, not separated from the basal area distinctly; pleural and lateral areae irregularly reticulate, with shiny portions in their middle: hind femur 4.5 x (3.6–4.5) as long as its depth at middle and tibia 11.0 x (10.5–12.5) its apical depth; hind basitarsus 5.0 x (4.7–5.0) the length of longer hind tibial spur; first tergite 2.0 x (1.9–2.3) its apical width and 1.8 x (1.8–2.0) as long as the second, finely reticulate or rugoso-punctate in the middle, with large punctures towards the base; second tergite 0.9 x (0.85–1.0) its apical width, rugoso-punctate, moderately punctate on the apical yellow band, rather polished on the apical margin; third tergite densely punctate, striated in the depressions. its apical margin; polished; ovipositor sheath 1.3 x (1.3–1.4) the length of fore wing and 3.0 x (2.8–3.0) the length of hind tibia.

Black. Face except a longitudinal band in the middle, apical half of clypeus,

* figures in parantheses refer to the measurements of paratypes.

labrum, palpi, inner orbits, a long band on temple, segments 10-21 of flagellum, scutellum metascutellum, mesepimeron, apical 0.3 of propodeum and apical margins of all tergites, yellow; median lobe of mesoscutum with a yellow spot in the middle; upper and lower margins of pronotum with long yellow bands; propleurum with a yellow spot in the middle; mesopleurum with two anterior and one postero-ventral yellow spots, anterior spots dorsal and ventral in position; fore and middle legs yellowish-brown, their trochanters and last tarsal segments brown; hind leg orange-yellow, coxa basally, trochanter and last tarsal segment blackish-brown, femur and tibia sometimes with brownish tinge apically; ovipositor rust-brown, its sheath black.

Male: Unknown.

Length: Female, 10.7-17.0 mm; fore wing 8.5-13.0 mm; ovipositor sheath 11.0-17.5 mm.

Holotype Female, Sri Lanka, 1861, Felder (Vienna). **Paratypes**: 3 females. Sri Lanka: Kandy, 1 female, ii. 1910, E. COMBER (B. M. N. H.). PILLAI (Jaffna N. P.), 30m, 1 female, 30. xi. 1934, GAURI DUTT (F. R. I.). Vietnam: Tonkin: Hoabinh 1 female, viii. 1918, R. V. de SALVAZA (B. M. N. H.).

Distribution: Sri Lanka and Vietnam.

2. *Xorides* (*Gonophonus*) *carinifrons*

BALTAZAR

Xorides (*Gonophonus*) *carinifrons* BALTAZAR, 1961, *Monogr. Natl. Inst. Sci. Tech. Manila*, 7: 109. Female. des., fig. Type: female, Negros Oriental: Mt. Canlaon, 1097m (TOWNES).

Specimens of this species were not available for study. However, it can be easily distinguished from the other species by the characters mentioned in the key.

3. *Xorides* (*Gonophonus*) *karnaticus*, sp. nov. (Figs. 1 & 4)

This species closely resembles *carinifrons* BALTAZAR by the shape of areola and nature of propodeal carination, spines on the fore tibia, lateral carinae on frons, shape and colour of scutellum and sculpture of face. However, it deserves a separate status by having a ventrally complete occipital carina, obliquely striated temple, yellow apical bands on all tergites, colour of hind leg, sculpture of frons, and strong longitudinal carinae in the petiolar area of propodeum.

Female: Face 0.7x as long as wide, evenly strongly rugoso-punctate; clypeus closely punctate, mat; malar space 0.4x as long as the basal width of mandible, moderately closely punctate; temple obliquely striated, with few wide punctures; frons shiny, laterally with shallow dense punctures, its median longitudinal carina weak, not extending behind up to the median ocellus; frontal orbit with a distinct longitudinal carina; vertex shiny with wide sparse punctures; interocellar distance nearly twice as long as the ocello-ocular distance; occipital carina strong ventrally, dorsally weak, represented by a crease above in the middle; antenna 21-segmented, wide apically, its first and second segments equal in length, last segment about 2.8x as long as its basal width; thorax long, about 3.5x as long as wide above between tegulae; pronotum shiny with large coarse punctures; mesoscutum with fine dense punctures, rugose in the middle, notauli shallow; scutellum moderately convex, with strong lateral carinae, rugose, shiny above; mesopleurum smooth and shiny with moderately spaced punctures and long hairs on the margins; prepectal carina ending near the anterior margin; propodeum smooth and shiny with reticulations in

pleural areae, areola pentagonal connected to the small triangular basal area by a single long carina, petiolar area with a pair of longitudinal carinae extending from its base to apex; fore tibia with a row of spines on the inner side; hind tibia 9.9x as long as its apical depth, with a row of small spines on the outer side; first three tergites densely coarsely punctate, rest smooth and shiny; first tergite 2.3x as long as its apical width and nearly twice the length of second, strongly narrowed towards the base; second tergite 0.9x as long as wide apically; ovipositor long, apically decurved, its sheath 1.4x as long as fore wing and 3.4x the length of hind tibia.

Black. Yellow portions are: flagellar segments 13-21, palpi, hind tarsus except its fifth segment and apical margins of all tergites; fore and middle legs orange, their fifth tarsal segments black; hind coxa yellowish-brown, trochanter brown, femur and tibia orange; ovipositor sheath blackish-brown.

Male : Unknown.

Length: Female, 8.0 mm; fore wing 6.2 mm; ovipositor sheath 8.7 mm.

Holotype: Female, India: Karnataka: Anmod, 762m, 27.xi. 1965, JOSEPH K. JONATHAN Coll. No. J103 (GUPTA).

Distribution: India: Karnataka.

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