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On a collection of Pteromalidae (Hymenoptera: Chalcidoidea) from North-East India with description of a new *Halticoptera* Spinola species

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ABSTRACT

A new species of *Halticoptera* Spinola (Hymenoptera: Pteromalidae) *H. indica* Sureshan & Gupta **sp. nov.** is described from Upper Shillong, Meghalaya, India. Affinities of the new species with related species are discussed. In addition, nine species are illustrated of which eight species are new distribution records from Meghalaya. A modified key to the Indian species of *Halticoptera* is also provided. The types are deposited with the National Bureau of Agricultural Insect Resources, Bangalore, India.

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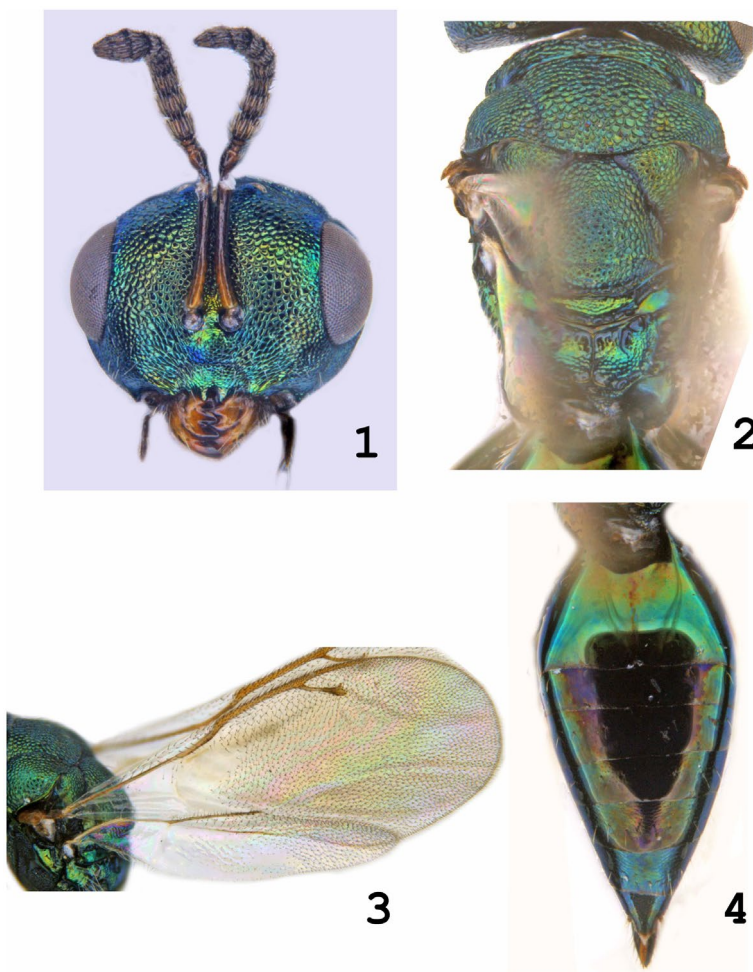
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KEYWORDS

Hymenoptera; Pteromalidae;
Halticoptera; new species;
new record; Meghalaya

Introduction

The genus *Halticoptera* Spinola (1811) (Hymenoptera: Pteromalidae: Miscogasterinae) was raised based on the type species *Diplolepis flavicornis* Spinola. As correctly pointed out by Graham (1969), this genus remains problematic and difficult to study. *Halticoptera* has widespread distribution including the Oriental region (China, India, Pakistan and Sri Lanka). Currently, eight species are known from the Oriental region: *H. agaliensis* Sureshan, *H. circulus* (Walker), *H. crius* (Walker), *H. imphalensis* Chishti & Shafee, *H. lorata* Huang, *H. patellana* (Dalman), *H. propinqua* (Waterston) and *H. shimlica* Narendran & Girish Kumar. Barely four species are known from the Indian subcontinent – *H. agaliensis* Sureshan (2003) from Kerala, India; *H. imphalensis* Chishti and Shafee (1986) from Manipur, India; *H. propinqua* (Waterston 1915) from Sri Lanka and Pakistan; and *H. shimlica* Narendran and Girish Kumar (2010) from Himachal Pradesh, India. The genus was reported from *Tropicomyia* sp. (Diptera: Agromyzidae) on coffee from Karnataka, India (Balakrishnan et al. 1986). In this



Figures 1–4. *Halticoptera indica* **sp. nov.** holotype, 1, head in frontal view; 2, mesosoma; 3, wings; 4, metasoma.

study a new species *Halticoptera indica* Sureshan & Gupta **sp. nov.** is described from Meghalaya, India. This species shows affinity with *H. laevigata* Thomson in key to the European species and differs in having all quadrate antennal segments and petiole $1.11 \times$ longer than wide. Ten species of Pteromalidae are illustrated of which eight species are new distribution records from Meghalaya. A modified key to the Indian species of *Halticoptera* is also provided.

Materials and methods

The survey area comprises Meghalaya State: NEH ICAR Complex, Umiam (25.49 N, 91.52 E, 1010 m); Shillong Peak (25.32 N, 91.50 E, 1811 m); Upper Shillong (25.32 N, 91.48 E, 1686 m); Jaintia hills: Jowai (J.J. Hills) (25.27 N, 92.11 E, 1297 m); Sohra: East Khasi Hills (E.K.H.D), Cherrapunji (25.32 N, 91.48 E,

1231 m); Mawphlang; East Khasi Hills (E.K.H.D) (25.21 N, 91.44 E, 1788 m) and West Khasi Hills (25.32 N, 91.40 E, 1753 m).¹ The specimens of this study were collected using Malaise trap and sweep net. Leica M 205A stereozoom microscope with Leica DC 420 inbuilt camera was used for imaging. Morphological terminology used in the species description follows Bouček (1988) except for the terms ‘mesosoma’ and ‘metasoma’. The holotype and paratype along with other specimens are deposited in the National Bureau of Agricultural Insect Resources (NBAIR), Bangalore.

1. *Halticoptera indica* Sureshan & Gupta sp. nov. (Figures 1–6)

Description (measurements in mm)

Female

Head, mesosoma and metasoma metallic green; eyes brown; ocelli pale yellow. Antennae brown (except apical 1/3rd scape yellow brown). Coxae concolourous with body, femora metallic green brown with apices yellow, remainder testaceous (except apical tarsal segment and claw brown). Tegulae brown. Wings hyaline; veins, marginal setae and discal pubescence brown.

Head (Figure 1): reticulate, reticulation coarse on frons, finer on lower face and gena, white pubescence sparsely scattered on lower face, otherwise indistinct; in front view head width (0.98) $1.38 \times$ height (0.71); clypeus emarginate with deep median incision; malar grooves distinct; gena carinate posteriorly; eye length $1.40 \times$ width (frontal view); malar space length (0.18) $0.44 \times$ eye length (profile view); eye length (0.40) $2.50 \times$ width (0.16) (profile view); malar space (0.18) $0.64 \times$ transverse diameter of eye (0.28); scrobe not reaching median ocellus. Head width $3 \times$ length (dorsal view); POL $0.96 \times$ OOL. Antennae inserted below middle of face, little above lower ocular line; scape exceeding median ocellus, length $1.02 \times$ eye length, $1.50 \times$ width; pedicel plus flagellum $0.78 \times$ as long as head width; pedicel $2 \times$ as long as wide, $1.40 \times$ as long as F1; two transverse anelli; funicular segments subequal and quadrate; clava as long as two preceding segments combined, length $1.80 \times$ width, clava 3 segmented, clearly separated.

Mesosoma (Figure 2): $1.15 \times$ as long as wide; pronotum $7.20 \times$ as wide as long, collar rounded anteriorly, moderately reticulate with small brown pubescence, lateral panel finely reticulate. Mesoscutum $1.21 \times$ as long as wide, reticulate punctate with small brown pubescence, notauli complete. Scutellum $1.05 \times$ longer than wide, distinctly reticulate without longitudinal striations, reticulations finer as compared to mesoscutum, frenum strongly indicated. Dorsellum narrow and shiny. Propodeum width (0.71), median length (0.20) $3.50 \times$ as wide as median length; moderately reticulate; strong median carina present; plicae curved, present in apical half; spiracles large, bean shaped, separated from hind margin of metanotum by own diameter; callus with dense long white hairs. Posterior one-third of mesopleuron reticulate, anteriorly smooth and shiny, metapleuron irregularly reticulated with shiny areas. Fore coxae and mid coxae shiny and finely shagreen;



Figures 5–6. *Halticoptera indica* **sp. nov.** 5, holotype, profile view; 6, paratype, profile view.

hind coxae reticulate and transversely ridged; hind tibiae with two unequal spurs, longer spur $0.30 \times$ hind basitarsus. Relative lengths of hind coxa (0.29), femora (0.62), tibia (0.59) and tarsus (0.59). Fore wing (Figure 3) $2.40 \times$ as long as wide (2.2: 0.9), pubescence absent in basal 1/3rd except 6 setae (in holotype and paratype) below submarginal vein and at apex of basal cell, speculum open; costal cell with setae. Lengths: MV 0.47, PMV 0.38 and STV 0.21.

Metasoma (Figure 4): lanceolate, $2.24 \times$ as long as wide (median length – 1.7, width – 0.76), petiolate, petiole $1.11 \times$ longer than wide (median length – 0.19, width – 0.17), $0.7 \times$ as long as wide, reticulate. Gaster $0.96 \times$ as long as head plus mesosoma combined (in profile view); T1 longest (median length – 0.39, lateral length – 0.6), T2 (0.13), T3 (0.26), T4 (0.24), T5 (0.23), T6 (0.13), T7 (0.13);

hind margin of T1 convex, extending on lateral sides, ovipositor sheaths exerted (0.09 mm).

Body length 2.60 mm (Figure 5, holotype, profile view); 3.41 mm (Figure 5, paratype, profile view), 3.07 mm (holotype, dorsal view).

Holotype

f, India: Meghalaya: Upper Shillong, 25.32 N, 91.48E, 1686 m, 10.vi.2013, in net seeping, Coll. V. Naveen (Reg.No. NBAII/Ptero/Halt/10613-A); *paratype*, 1f, with data same as holotype, (Reg.No. NBAII/Ptero/Halt/10613-B).

Male

Not known.

Etymology

The name of this new species is derived from the country – India, from where it was collected.

Comments

Comments: *Halticoptera indica* **sp. nov.** shows affinity with *H. laevigata* Thomson in the key to European species (Graham 1969) in having metasoma 2–2.5 times as long as broad, and about as long as head and mesosoma combined but differs in having all quadrate antennal segments and petiole $1.11 \times$ longer than wide (vs. *H. laevigata* – antenna with proximal segments of funicle quadrate to slightly longer than wide, distal segments hardly transverse; gastral petiole as long as wide).

Halticoptera indica **sp. nov.** differs from other Indian species in the following characters: (1) Median area of propodeum moderately reticulate; gaster with posterior margin of T1 not deeply incised in the middle; petiole $1.11 \times$ longer than wide; fore wing with MV $2.24 \times$ STV; POL $0.96 \times$ OOL; femora metallic green brown with apices yellow (vs. median area of propodeum finely but distinctly reticulate; gaster with posterior margin of T1 deeply incised in the middle; petiole a little wider than long; fore wing with MV $3.5 \times$ STV; POL subequal to OOL; fore and mid femora dark brown, hind femora metallic in *H. agaliensis*). (2) POL $0.96 \times$ OOL (vs. POL $1.4\text{--}1.54 \times$ OOL in *H. shimlica*).

For *H. indica* **sp. nov.** males could not be collected hence not compared with *H. imphalensis* (as description is based on males only).

Key to the Indian species of *Halticoptera* based on female (modified after Sureshan 2003; Narendran and Girish Kumar 2010)

- (1) Male. F1–F5 slightly longer than wide, F6 as long as wide; F1 about as long as F2; pedicel longer than F1; clava less than $3 \times$ as long as wide, shorter than preceding 3 funicle segments together; last tarsal segments pale; maxillary palpi with apical segments much expanded; mesosoma sparsely and uniformly punctate; notauli indistinct; fore wing with costal cell slightly longer than MV; PMV twice the length of STV; legs

yellowish brown except dark coxae; male genitalia with digits dentate apically *H. imphalensis* Chishti and Shafee (1986)

- Female. Characters not as in above combination, partly or completely different 2
- (2) Median area of propodeum distinctly reticulate; other characters variable 3
- Median area of propodeum smooth and shiny 4
- (3) Median area of propodeum finely but distinctly reticulate; gaster with posterior margin of T1 deeply incised in the middle; petiole a little wider than long; fore wing with MV $3.5 \times$ STV; POL subequal to OOL; fore and mid femora dark brown, hind femora metallic; body length 2.3–2.5 mm
H. agaliensis Sureshan 2003
- Median area of propodeum moderately reticulate; gaster with posterior margin of T1 not deeply incised in the middle; petiole $1.11 \times$ longer than wide; fore wing with MV $2.24 \times$ STV; POL $0.96 \times$ OOL; femora metallic green brown with apices yellow; body length 2.6–3.4 mm *H. indica* **sp. nov.**
- (4) Gaster with posterior margin of T1 very slightly incised in the middle or almost straight; petiole a little longer than wide; fore wing with MV $2.2 \times$ STV; POL $1.4\text{--}1.54 \times$ OOL; frenal area finely reticulate; all femora, mid and hind tibiae dark brown except at base and apex pale brownish yellow; malar space $0.35 \times$ length of eye in profile; body length 1.96–2.0 mm *H. shimlica* Narendran and Girish Kumar 2010

2. *Dinarmus maculatus* (Masi) (Figure 7)

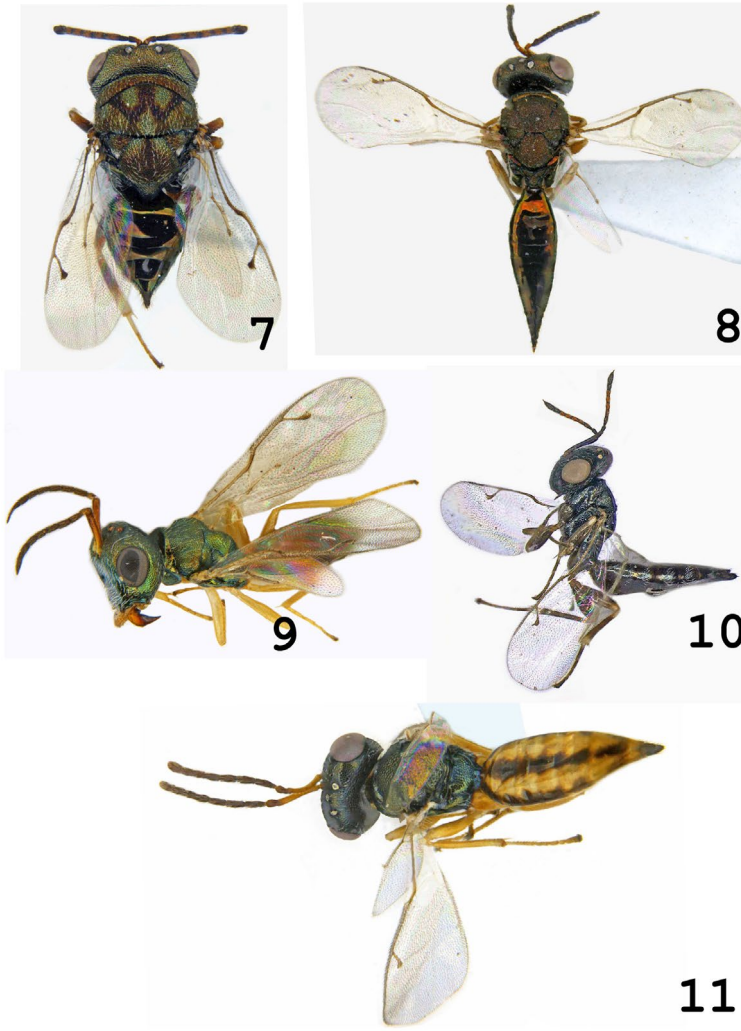
Brief diagnosis

Body length 2.56 mm (dorsal view). Metallic green with bronze patches on frons, vertex, mesoscutum and scutellum; metasoma shiny and metallic. Antennae yellow brown with dark brown rings on funicular segments, anelli and clava completely brown, reaching median ocellus. Anterior margin of clypeus straight. POL $1.32 \times$ OOL. Coxae concolourous with body, femora brown, middle portion of tibiae brown. PMV $1.16 \times$ MV. Propodeum with nucha reticulate. Metasoma cordiform, smooth with metallic shine.

Distribution

India – Meghalaya (new record), Kerala and Tamil Nadu.

Specimen examined



Figures 7–11. 7, *Dinarmus maculatus*, female dorsal view; 8, *Halticopterella burwelli*, female dorsal view; 9, *Mokrzeckia menzeli*, male profile view; 10, *Norbanus acuminatus*, female profile view; 11, *Propicroscytus mirificus*, female profile view.

1f, India: Meghalaya: Jaintia Hills, 25.27 N, 92.11 E, 1297 m, 11.vi.2013, in net seeping, Coll. A. Ramesh Kumar (Reg.No. NBAII/Ptero/Dinar/11613); 1f, India: Meghalaya: ICAR Complex, 13.vi.2013, in net seeping, Coll. V. Naveen (Reg.No. NBAII/Ptero/Dinar/13613-C).

3. *Halticopterella burwelli* Sureshan (Figure 8)

Brief diagnosis

Body length 4.09 mm (dorsal view). Head and mesosoma shiny black, metasoma brown with metallic blue reflection, antennae with scape and pedicel testaceous,

flagellum dark brown. Coxae concolorous with body; remaining yellow. Tegulae testaceous; fore wing hyaline; veins pale brown. POL as long as OOL. Antennal formula 11353; scape reaching median ocellus; clava $0.86 \times$ preceding two funicular segments combined. Propodeum entirely coarsely reticulate; nucha long. Metasoma lanceolate, shiny and non-collapsing, hind margin of T1 produced, T₁–T₃ slightly incised in the middle.

Distribution

India – Meghalaya (new record), Karnataka and Kerala.

Specimen examined

1f, India: Meghalaya: J. J. Hills, 25.27 N, 92.11 E, 1297 m, 11.vi.2013, Malaise trap, Coll. A. Ramesh Kumar (Reg.No. NBAII/Ptero/Halti/11613-D).

4. *Mokrzeckia menzeli* Subba Rao (Figure 9)

Brief diagnosis

Body length 2.2 mm (profile view). Head and mesosoma bright metallic green; metasoma dark brown with metallic shine laterally, apically and basally on the dorsal surface, ventrally pale yellow. Antennae with scape testaceous, pedicel testaceous with brown tinge dorsally, remainder dark brown. Wings hyaline, veins brown. Head moderately reticulate; clypeus with anterior margin deeply incised; antennae inserted in the middle of face, above lower level of eyes; POL $0.75 \times$ OOL; pronotal collar carinate. Fore wing without irregular cilia below SMV. Metasoma depressed, collapsing, ovate-lanceolate; ovipositor exerted out.

Distribution

India – Meghalaya (new record), Uttarakhand, Uttar Pradesh, Kerala, and Karnataka.

Specimen examined

1m, India: Meghalaya: Jowai, 25.27 N, 92.11 E, 1297 m, 11.vi.2013, in net sweeping, Coll. A. Ramesh Kumar (Reg.No. NBAII/Ptero/Mokrz/menz/11613-E).

5. *Norbanus acuminatus* Dutt & Ferriere (Figure 10)

Brief diagnosis

Body length 2.27 mm (profile view). Head and mesosoma greenish black, metasoma dark brown. Antenna with basal tip of scape pale yellow, F2–F5 light brown, remaining dark brown. Second anellus twice as long as first. Toruli almost at the lower level of eyes, slightly below middle of face. Head moderately reticulate with longitudinal shallow striations towards the mouth, setation white, moderately spread all over. Anterior margin of clypeus weakly emarginated. POL $1.05 \times$ OOL. Wings hyaline, veins brown. Fore wing with MV $2.35 \times$ STV. Mesosoma coarsely reticulate. Propodeum flat, finely reticulate. F1 $0.95 \times$ F2; clava $1.32 \times$ as long as two preceding segments. Metasoma elongate, pointed towards apex, T6 small.

Distribution

India – Meghalaya (new record), West Bengal and Kerala.

Specimen examined

1f, India: Meghalaya: Upper Shillong, 25.32 N, 91.48 E, 1686 m, 10.vi.2013, Malaise trap, Coll. A. Ramesh Kumar (Reg.No. NBAII/Ptero/Norb/acum/10613-F).

6. *Propicroscytus mirificus* (Girault) (Figure 11)

Brief diagnosis

Body length 2.30 mm (dorsal view). Head and mesosoma black with metallic green tinge; metasoma yellow with three brown longitudinal streaks (one in the middle and two on the sides); antennal scape, pedicel and anelli testaceous, remainder dark brown; legs yellow. Antennae inserted on middle of face, above lower level of eyes. Clypeus slightly emarginated anteriorly, with striations towards the mouth; both mandibles with 4 teeth. POL $1.09 \times$ OOL. Pronotum collar weakly marginated. Mesosoma convex and reticulate; notauli impressions faint; propodeum without median carina and plica, evenly reticulate. Fore wing densely hairy outside speculum; basal vein setose, basal cell bare; speculum open posteriorly. Metasoma sessile and lanceolate.

Distribution

India – Meghalaya (new record), Uttar Pradesh, Karnataka and Kerala.

Specimen examined

1f, India: Meghalaya: Upper Shillong, 25.32 N, 91.48 E, 1686 m, 10.vi.2013, in net sweeping, Coll. V. Naveen (Reg.No. NBAII/Ptero/Prop/miri/10613-G).

7. *Psilocera neoclavicornis* Narendran & GirishKumar (Figure 12)

Brief diagnosis

Body length 3.5 mm in profile view, black; antennae with scape, pedicel, anelli, three-fourth of F1 from base pale brown, rest black, clava $1.14 \times$ longer than three preceding segments combined; antennae with scape reaching below level of median ocellus, pedicel as long as F1, malar suture distinct. Funicular segments F1–F3 longer than wide, F4 almost quadrate, F5–F6 transverse. Scutellum with pronounced conical hump with distinct fingernail tip. Fore wing with basal cell not densely hairy, open below. Ovipositor exerted.

Distribution

India – Meghalaya (new record) and West Bengal.

Specimen examined

1f, India: Meghalaya: Umaiham, 25.49 N, 91.52 E, 1010 m, 13.vi.2013, in net sweeping, Coll. A. Ramesh Kumar (Reg.No. NBAII/Ptero/Psil/neoc/13613-J).

8. *Pteromalus puparum* (Linnaeus) (Figure 13)

Brief diagnosis



12



13



14



15

Figures 12–15. 12, *Psilocera neoclavicornis*, female profile view; 13, *Pteromalus puparum*, female profile view; 14, *Spalangia cameroni*, female profile view; 15, *Stictomischus gangtokicus*, female profile view.

Body length 2.6 mm (profile view). Body dark metallic blue. Antennae with scape testaceous, remainder brown. Coxae concolorous with mesosoma, femora dark brown except tips and remainder of legs testaceous with tips of tarsi brown. Tegulae dark brown, wings hyaline, veins pale brown. Head moderately reticulate, setae short and sparse. Antennae with scape reaching level of vertex; F1 longer than pedicel; funicular segments longer than wide; clava almost equal to two preceding segments combined. POL as long as OOL. Mesosoma reticulate punctuate; pronotal collar distinctly narrower than head. Propodeum moderately reticulate medially, lateral area finely reticulate, median carina faintly indicated; plicae complete, nucha long. Forewing with basal part almost bare, costal cell hairy on the upper part, basal hairline indicated. Metasoma ovate, shorter than head plus mesosoma combined.

Distribution

Cosmopolitan. India – Meghalaya, Assam, Uttarakhand, Uttar Pradesh, Bihar and Kerala.

Specimen examined

3f, India: Meghalaya: West Khasi Hills, 25.32 N, 91.40 E, 1753 m, 7.vi.2013, in net sweeping, Coll. V. Naveen (Reg.No. NBAII/Ptero/Ptero/pup/7613-K); 1f, East Khasi Hills: Sohra: Cherrapunji, 25.32 N, 91.48 E, 1231 m, 10.vi.2013, in net sweeping, Coll. V. Naveen (Reg.No. NBAII/Ptero/Ptero/pup/10613-L); 2f, Shillong peak, 25.32 N, 91.50 E, 1811 m, 8.vi.2013, Malaise trap, Coll. A. Ramesh Kumar (Reg.No. NBAII/Ptero/Ptero/pup/8613-M).

9. *Spalangia cameroni* Perkins (Figure 14)

Brief diagnosis

Body length 2.21 mm (profile view). Body black, legs dark black except basal 3–4 tarsal segments yellow brown. Head smooth and shiny except for coarse punctures; malar sulcus absent. Pronotal collar convex, anteriorly smoothly rounded to neck with distinct crenulate cross-line posteriorly. Mesoscutum median lobe with anterior region smooth, convex and shiny; internotaular region irregularly punctate-rugose except smooth laterally. Scutellum smooth and shiny except few punctures; frenum with complete crenulate punctures. Fore wing hyaline; bare behind submarginal vein. Propodeum reticulate rugose laterally and posteriorly; median carina with crenulate punctures in two lines. Petiole with longitudinal carinae. Metasoma smooth and shiny.

Distribution

Cosmopolitan. India – Meghalaya (new record), Delhi, Karnataka and Pondicherry.

Specimen examined

1f, India: Meghalaya: Umiam: ICAR complex, 25.49 N, 91.52 E, 1010 m, 13.vi.2013, Coll. A. Ramesh Kumar, in net sweeping (Reg.No. NBAII/Spal/cam/13613-O).

10. *Stictomischus gangtokicus* Narendran (Figure 15)

Brief diagnosis

Body length 1.75 mm (profile view). Body with metallic greenish blue tinge; scape with metallic green blue shine, remainder dark brown; all coxae concolorous with mesosoma; femora with metallic green tinge medially, bases and apices paler; all tibiae and tarsi pale yellow except brown apex; tegula dark brown; wings hyaline with veins pale brown; stigma enlarged and dark brown. Head reticulate. Antenna inserted slightly below middle of face; pedicel shorter than F1; F1 longer than F2. Pronotum anterior edge rounded; notauli complete; axillae projected anteriorly; scutellum strongly reticulate; frenal groove distinct. Propodeum medially convex, reticulate and shiny, lateral part finely reticulate; median carina complete; plicae

distinct throughout. Metasoma shiny, petiole dull reticulate, almost as long as hind coxa; T1 almost near middle of metasoma.

Distribution

India – Meghalaya (new record), Jammu & Kashmir and Sikkim.

Specimen examined

1f, India: Meghalaya: Upper Shillong, 25.32 N, 91.48 E, 1686 m, 10.vi.2013, in net sweeping, Coll. V. Naveen (Reg.No. NBAII/Stict/gang/10613-P).

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Disclosure statement

As we submit our new MS entitled ‘On a collection of Pteromalidae (Hymenoptera: Chalcidoidea) from north-east India with description of a new *Halticoptera* Spinola species’ with authors – Ankita Gupta, P. M. Sureshan, Anandhan Rameshkumar, Naveen Venkataramana and Umeshkumar Sanjeev for possible publication in the journal ‘Oriental Insects’ we wish to mention the above said research article is based on taxonomic research with ‘NO COMMERCIAL GAIN’ implications. Hence, there is no financial interest or benefit arising from the direct applications of our research.

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References

- Balakrishnan MM, Vinodkumar PK, Govindarajan TS. 1986. Role of the natural enemies in the suppression of the leaf miner *Tropicomyia* sp. (Diptera: Agromyzidae) on coffee. *Journal of Coffee Research (India)* 16(3–4):89–93.
- Bouček Z. 1988. Australasian Chalcidoidea (Hymenoptera). A biosystematic revision of genera of fourteen families, with a reclassification of species. Wallingford: CAB International. 832 pp.
- Chishti MSAK, Shafee SA. 1986. A new species of *Halticoptera* Spinola (Hymenoptera Pteromalidae) from Imphal India. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 59:471–472.
- Graham MWRdeV. 1969. The Pteromalidae of North-Western Europe (Hymenoptera, Chalcidoidea). *Bulletin of the British Museum (Natural History) Entomology* 16 Suppl:1–908.
- Narendran TC, Girish Kumar P. 2010. A new species of *Halticoptera* Spinola (Hymenoptera: Chalcidoidea: Pteromalidae) from Himachal Pradesh, India with a revised key to Indian subcontinent species. *Journal of Environment & Sociobiology* 7(1):2–4.

- Spinola M. 1811. Essai d'une nouvelle classification générale des Diplolépaires. Annales du Muséum National d'Histoire Naturelle. Paris. 17:148.
- Sureshan PM. 2003. On the Indian species of *Halticoptera* Spinola (Hymenoptera: Chalcidoidea: Pteromalidae). Records of Zoological Survey of India 100(Part 1–2):231–237.
- Waterston J. 1915. New species of Chalcidoidea from Ceylon. Bulletin of Entomological Research 5:325–342.