

The genus *Omphale* Haliday (Hymenoptera, Chalcidoidea, Eulophidae) from India with description of four new species

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ABSTRACT. The Indian species of *Omphale* Haliday are discussed. Seven species are included, of which four species *O. akhtari* Jamali & Zeya **sp. nov.**, *O. ecola* Jamali & Zeya **sp. nov.**, *O. kamili* Jamali & Zeya **sp. nov.** and *O. litera* Jamali & Zeya **sp. nov.** are described and illustrated. One species *O. appannai* (Kurian) is transferred to *Omphale* Haliday from *Chrysonotomyia* Ashmead. Diagnostic characters are presented for *O. stonia* Narendran & *O. calicuti* Narendran. An identification key to Indian species is also provided.

Key words: Hymenoptera, Entedoninae, key, Oriental region, Taxonomy

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INTRODUCTION

Omphale Haliday, 1833 (Eulophidae: Entedoninae) is a cosmopolitan genus and currently includes 267 known species worldwide (Noyes, 2022). Most of the *Omphale* species are described from Europe (Graham, 1963; Hansson & Shevtsova, 2012), North America (Hansson, 1996, 1997) and Central America (Hansson, 2004). However, the knowledge of the group in Oriental region is poor. Up to now, only thirteen species have been recorded. Narendran (2006) studied Oriental species of *Omphale*. He described six new species, of which two were from India and four from Malaysia. The aim of this paper is to further the knowledge of Indian eulophids fauna. Here we include seven species of *Omphale*, of which four species are newly described. An identification key to Indian species of *Omphale* is also provided.

MATERIAL AND METHODS

The present study is based on total of nine specimens collected mainly by sweep net from the Indian States Himachal Pradesh, Uttar Pradesh and Uttarakhand. All collected specimens were transferred in 80% alcohol and some of them were mounted on rectangular cards. The body colour was represented from card mounted specimens before clearing and mounting them on slide in Canada balsam. Body

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length for the new species is given in millimetres and all other measurements are relatively taken from the divisions of a linear scale of an ocular-micrometer. These measurements were taken at 100× magnification of the microscope (one ocular micrometer division = 0.01 mm). The photographs of card mounted specimens were taken with a Nikon DS-Fi2 digital camera attached to a Nikon SMZ25 stereomicroscope and photomicrographs of slide-mounted parts were taken with a Nikon DS-Fi1c digital camera attached to a Nikon Eclipse Ci microscope. The following abbreviations are used in the text: C1, C2 = Clavomeres 1, 2.; Fu1, Fu2, .. etc. = Funiculars 1, 2, etc.; Gt1, Gt2, ... etc. = Gastral tergites; OOL = Minimum distance between a posterior ocellus and corresponding eye margin; POL = Minimum distance between the posterior ocelli. The following acronyms are used for the depositories: **DZUC** = Department of Zoology, University of Calicut, Kerala, India; **ZDAMU** = Insect collections, Department of Zoology, Aligarh Muslim University, Aligarh, India.

RESULTS

Taxonomic Hierarchy

Class Insecta Linnaeus, 1758

Order Hymenoptera Linnaeus, 1758

Superfamily Chalcidoidea Latreille, 1817

Family Eulophidae Westwood, 1829

Genus *Omphale* Haliday, 1833

Omphale Haliday, 1833:339. Type species – *Omphale salicis* Haliday, by monotypy.

Smaragdites Westwood, 1833:419. Type species – *Smaragdites admirabilis* Westwood, by monotypy. Synonymy by Graham, 1963:240.

Secodes Förster, 1856:78, 81. Type species – *Secodes fagi* Förster, by monotypy. Synonymy by Graham, 1963:240.

Holcopelte Förster, 1856:78. Type species – *Elachistus obscurus* Förster, 1841:40, by monotypy and original designation. Synonymy by Hansson, 2004:142.

Euderomyia Girault, 1913:176. Type species – *Euderomyia carlylei* Girault, by monotypy and original designation. Synonymy by Bouček, 1988:727.

Chrysocharoideus Ashmead, 1904:370. Type species – *Chrysocharis thoracicus* Ashmead, by original designation. Synonymy by LaSalle & Schauff, 1992:12.

Chrysocharomyia Dodd, in Girault, 1915:207. Type species – *Chrysocharomyia elongata* Girault, by original designation. Synonymy by Bouček, 1988:727.

Paromphale Girault & Dodd, in Girault, 1915:211. Type species – *Paromphale flavicarpus* Girault, by original designation. Synonymy by Bouček, 1988:727.

Raphaelonia Girault, 1924:173. Type species – *Raphaelonia sulcatiscutum* Girault, by monotypy. Synonymy by Bouček, 1988:727.

Eugerium Graham, 1959:202. Type species – *Cirrospilus isander* Walker, by original designation. Synonymy by Hansson, 1996:5.

Exodontomphale Bouček, 1984:65. Type species – *Exodontomphale taborskyi* Bouček, by original designation. Synonymy by Schauff, 1991:61.

Diagnosis: Female: Body pale yellow to dark brown, rarely black. Head with frontal grooves weakly to strongly V-shaped; scrobal grooves always ending separately on frontal grooves, rarely united before frontal grooves (Fig. 1A); clypeus usually set off from surrounding by distinct suture (Fig. 3A). Antenna (Figs 1C, 2C) weak, tapering distally, either with three funiculars and two clavomeres, or with four funiculars and one clavomere; clava with a long spicula. Mesosoma shiny, with finely engraved reticulation, the meshes of which may be lengthened in various direction; pronotum strongly reduced dorsally; propodeum smooth, slightly convex transversely, without median carina. Fore wing with long setae, especially on marginal vein; marginal setae long; sparse pilosity below marginal vein; postmarginal vein well developed, rarely shorter than stigmal vein. Gaster sessile, usually oval to long lanceolate.

Male: Similar to female except sexual dimorphism and antenna with elongated whorled setae on the flagellomeres.

Host: Parastioids of cecidomyiids (Hansson & Shevtsova, 2012).

Distribution: Worldwide.

***Omphale ecola* Jamali & Zeya sp. nov. (Fig. 1)**

<http://zoobank.org/urn:lsid:zoobank.org:act:E2D934A1-091B-468F-A298-931B27C305A7>

Material examined. Holotype ♀ (on slide under four coverslips, slide No. EUL.236), INDIA: UTTARAKHAND: Ranikhet, Chaubatia, 27.xi.2009, Coll. F.R. Khan.

Paratype, 1 ♀ (on slide under four coverslips, slide No. EUL.237), INDIA: UTTARAKHAND: Dehradun, Malsi, 4.xi.2009, Coll. F.R. Khan. (ZDAMU).

Diagnosis: *Omphale ecola* Jamali & Zeya sp. nov. is a distinctive species, comes close to *O. prabha* Narendran in having fore wing infuscate beyond speculum. However, it differs from the latter in following characters: antennal flagellum with 3 anelli; fore wing with apical margin slightly narrower, speculum closed; radial cell bare. In *O. prabha*: antenna with 1 anellus; fore wing with apical margin rounded, speculum opened; radial cell setose.

Description: Female: Body length, 0.7–0.8 mm (holotype, 0.8 mm). Head dark brown with greenish reflection. Antenna pale brown to brown. Mesosoma dark brown with greenish reflection. Wings hyaline; fore wing (Fig. 1E) with a brown infuscate band below marginal vein extending to posterior margin of disc. Legs largely with pale white to pale brown except fore and mid coxae, hind femur and hind tibia brown and hind coxa dark brown. Gaster metallic brown.

Head (Fig. 1A), in frontal view, 1.4× as broad as high; smooth except vertex with transverse striations; eye height 3.7× as long as malar space; scrobal grooves joining frontal groove separately; mandible with many teeth, ventral two teeth are larger than others as in Fig. 1B; clypeus semicircular, 1.7× as broad as high; antennal toruli situated slightly above the lower eye margin. Antenna (Fig. 1C) with scape 5.5× as long as broad, 2.4× as long as pedicel; pedicel 2.3× as long as broad; pedicel + flagellum 2.7× as long as distance between eyes (55: 20); flagellum with 3 distinct anelli; Fu1 subequal to Fu2; Fu1 1.2× as broad as Fu2; Fu3 and Fu4 individually shorter than Fu1 individually; clava 3.2× as long as broad; all flagellomeres with long sensilla except anelli.

Mesosoma (Fig. 1D) almost smooth, 1.4× as long as broad; pronotum very narrow, not visible in dorsal view; mesoscutum shorter than mesoscutellum; notauli incomplete, present in anterior third; mid lobe of mesoscutum with 2 setae, lateral lobe with 1 lateroposterior seta; axillae elongate, extending posteriorly more than two-thirds length of mesoscutellum; mesoscutellum longer than broad with 2 long setae, each seta near lateral margin; dorsellum 0.38× as long as broad, and 0.58× as long as median length of propodeum; propodeal callus with 2 short setae. Fore wing (Fig. 1E) 2.6× as long as broad; speculum closed; admarginal setae 6 arising from marginal vein; radial cell bare; marginal vein + parastigma 1.4× as long as submarginal vein, 5.4× as long as stigmal vein; post marginal vein very short, about one-fifth of stigmal vein; stigmal vein slender; longest marginal seta 0.44× maximum wing width. Hind wing (Fig. 1F) 6.1× as long as broad with apex pointed; longest marginal seta 1.06× as long as maximum wing width.

Metasoma (Fig. 1G). Petiole as long as broad; gaster shorter than mesosoma; ovipositor occupying more than half of gaster length, hardly exerted beyond apex of gaster; ovipositor 1.55× as long as hind tibia.

Relative measurements (holotype slide, at 100×). Head height: width, 25: 36; eye height, 17; malar space, 4.5; clypeus height: width, 4: 7. Antennomeres length: width – scape, 18: 3.25; pedicel, 7.5: 3.25; Fu1, 10: 3; Fu2, 10: 2.5; Fu3, 8: 2.5; Fu4, 7.5: 2.5; clava, 6.5: 2; spicula, 2. Mesosoma length: width, 46: 31; propodeum length, 6. Fore wing length: width, 110: 42; longest marginal seta, 18.5; submarginal vein length, 28; parastigma length, 6; marginal vein length, 35; postmarginal vein length, 1.5; stigmal vein length, 7.5. Hind wing length: width, 99: 16; longest marginal seta, 17. Hind tibia length, 31. Metasoma. Petiole length: width, 4.5: 4.5; gaster length, 40; ovipositor length, 29.

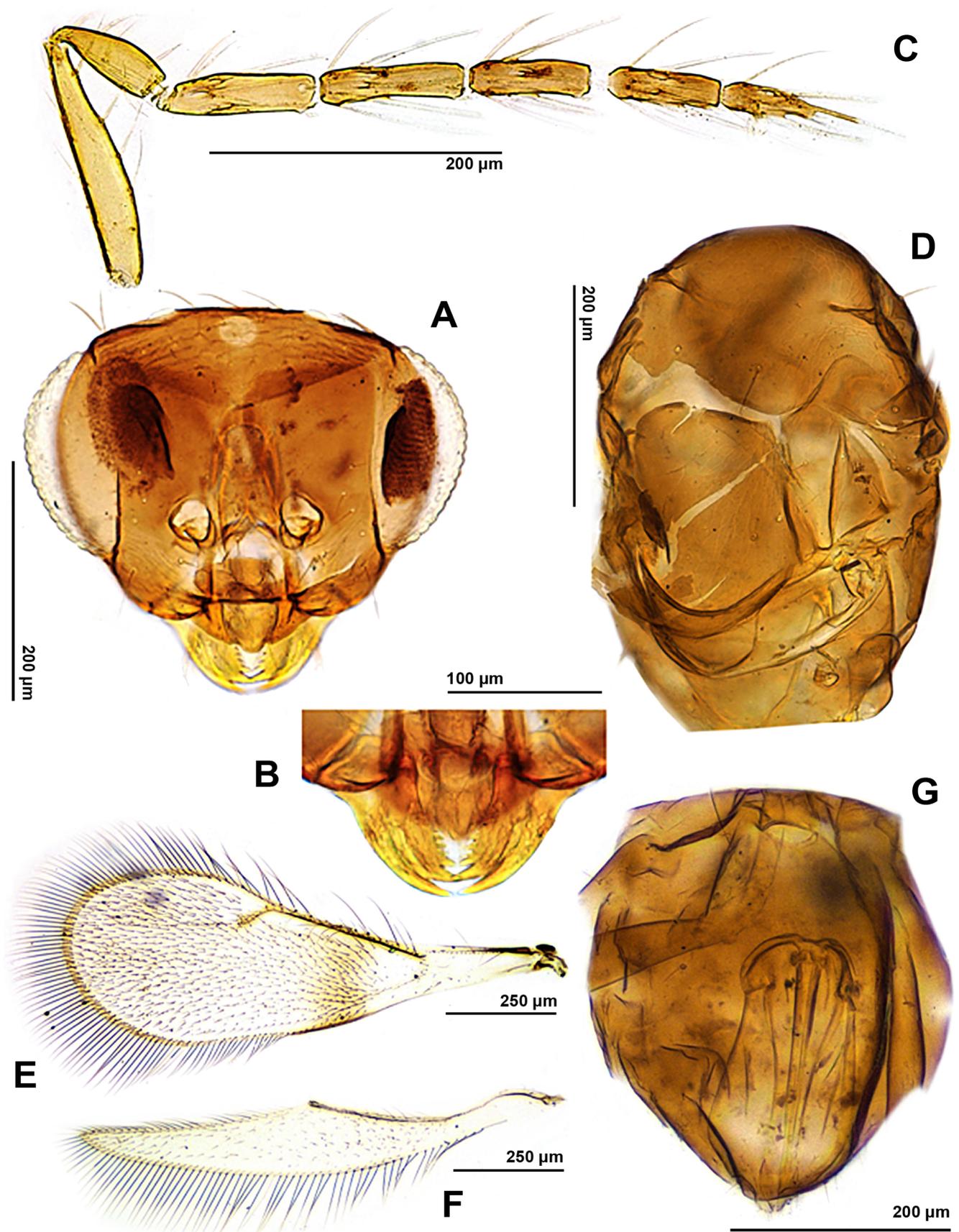


Figure 1. *Omphale ecola* Jamali & Zeya **sp. nov.**. Holotype, female: **A.** Head, frontal view; **B.** Mandibles; **C.** Antenna; **D.** Mesosoma, dorsal view; **E.** Fore wing; **F.** Hind wing; **G.** Metasoma, ventral view.

Male: Unknown.

Host: Unknown.

Etymology: The specific name is an arbitrary combination of letters and may be taken as a noun in apposition.

Distribution: India: Uttarakhand.

Omphale litera Jamali & Zeya **sp. nov.** (Fig. 2)

<http://zoobank.org/urn:lsid:zoobank.org:act:B559902F-DA6C-4693-9359-8F5473A9F162>

Material examined. Holotype ♀ (on slide under four coverslips, slide No. EUL.222), INDIA: UTTAR PRADESH: Jalesar, 6.iii.2013, Coll. M.T. Khan & S.K. Ahmed. (ZDAMU).

Diagnosis: *Omphale litera* Jamali & Zeya **sp. nov.** looks apparently similar to *Omphale ecola* Jamali & Zeya **sp. nov.** in having more or less similar body colour. However, it differs from *O. ecola* **sp. nov.** by the following characters: scape 4.2× as long broad; mid lobe of mesoscutum with 4 long and thick setae; fore wing with a broad infusate band below marginal vein beyond speculum, extending to stigmal vein and posterior margin of disc; postmarginal vein as long as stigmal vein; ovipositor 2.1× as long as hind tibia. In *O. ecola* Jamali & Zeya **sp. nov.**: scape 5.5× as long broad; mid lobe of mesoscutum with 2 relatively short and thin setae; fore wing with a narrow infusate band below below marginal vein beyond speculum extending to posterior margin of disc; postmarginal vein one 0.2× stigmal vein; ovipositor 1.5× as long as hind tibia.

Description: Female: Body length, 1.1 mm. Head with vertex and upper frons metallic green, lower frons pale yellow. Antenna brown to dark brown. Mesosoma pale yellow with metallic green reflection. Fore wing hyaline with a broad infusate band below marginal vein beyond speculum, extending to stigmal vein and posterior margin of disc (Fig. 2E). Fore and mid legs, including, coxae pale white; hind leg with coxa, femur basally three-fourth and last tarsomere brown, except femur one-fourth apically, tibia and tarsomeres 1–3 pale white. Gaster metallic pale yellow.

Head (Fig. 2A), in frontal view, 1.3× as broad as high; vertex with 12 long setae; eye height 2.7× as long as malar space; scrobal grooves joining frontal groove separately; mandible with many teeth, with ventral two teeth are larger (Fig. 2B); clypeus rectangular, 2.6× as broad as high; antennal toruli situated at the level of lower eye margin. Antenna (Fig. 2C) with scape 4.2× as long as broad, 2.4× as long as pedicel; pedicel 1.7× as long as broad; pedicel + flagellum 2.7× as long as distance between eyes (58: 21); flagellum with 1 distinct anellus; Fu1 0.9× as long and 1.4 as broad as Fu2; Fu3 subequal to Fu4; clava 3.8× as long as broad; clava shorter than all funiculars individually.

Mesosoma (Fig. 2D) 1.2× as long as broad, almost smooth except with hexagonal reticulation on anterior part of mesoscutum; pronotum narrow, visible in dorsal view; mesoscutum shorter than mesoscutellum; notauli incomplete, present in anterior third; mid lobe of mesoscutum with 4 long and thick setae; side lobe with 2 setae; axillae elongate, extending posteriorly more than half length of mesoscutellum; mesoscutellum longer than broad, with 2 long setae; dorsellum smooth, 0.2× as long as broad and 0.6× median length of propodeum; propodeal callus with 2 short setae. Fore wing (Fig. 2E) 2.3× as long as broad; admarginal setae 7 arising from marginal vein; radial cell setose; marginal vein + parastigma 1.6× as long as submarginal vein, 5.06 as long as stigmal vein; post marginal vein 0.8× stigmal vein; stigmal vein slender; longest marginal seta 0.2× maximum wing width. Hind wing (Fig. 2F) 5.6× as long as broad with apex pointed; longest marginal seta 0.7× maximum wing width.

Metasoma (Fig. 2G). Petiole 1.8× as broad as long; gaster distinctly longer than mesosoma; ovipositor occupying almost whole of gaster length, exerted beyond apex of gaster; ovipositor 2.1× as long as hind tibia.

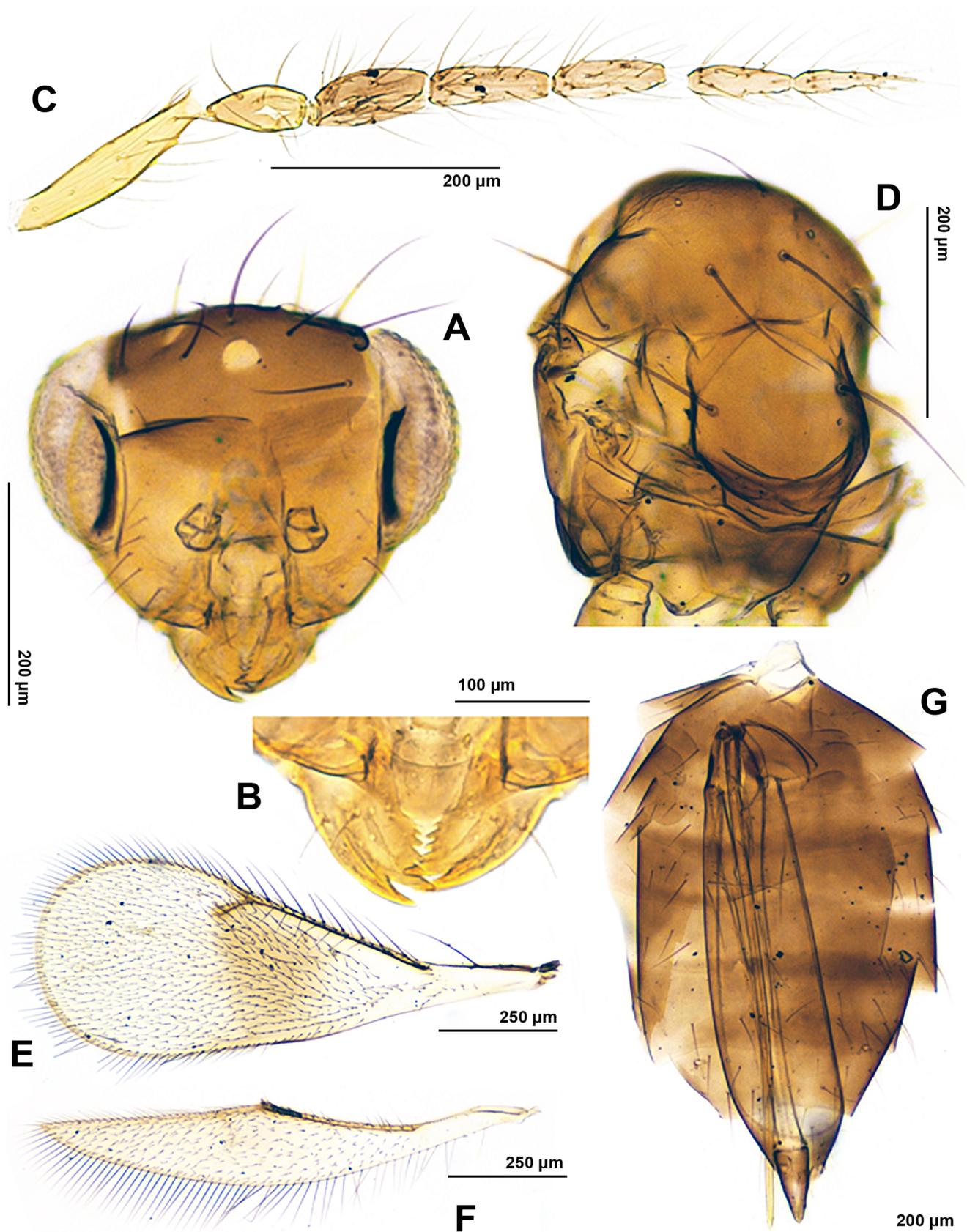


Figure 2. *Omphale litera* Jamali & Zeya sp. nov. Holotype, female: **A.** Head, frontal view; **B.** Mandibles; **C.** Antenna; **D.** Mesosoma, dorsal view; **E.** Fore wing; **F.** Hind wing; **G.** Metasoma, ventral view.

Relative measurements (holotype slide, at 100×). Head height: width, 27: 36; eye height, 19; malar space, 7; clypeus height: width, 2.5: 6.5. Antennomeres length: width – scape, 18: 4.25; pedicel, 7.5: 4.25; Fu1, 9: 4.75; Fu2, 10: 3.25; Fu3, 9: 3.25; Fu4, 8.75: 2.75; clava, 7.75: 2; spicula, 2.75. Mesosoma length: width, 41: 32; propodeum length, 5. Fore wing length: width, 105: 44; longest marginal seta, 12; submarginal vein length, 24.5; parastigma length, 2.5; marginal vein length, 13; postmarginal vein length, 7; stigmal vein length, 8. Hind wing length: width, 98: 17.5; longest marginal seta, 13. Hind tibia length, 33. Metasoma. Petiole length: width, 3.5: 5; gaster length, 60; ovipositor length, 70.

Male: Unknown.

Host: Unknown.

Etymology: The species name is an arbitrary combination of letters and is treated as a noun in apposition.

Distribution: India: Uttar Pradesh.

Omphale akhtari Jamali & Zeya **sp. nov.** (Figs 3, 5)

<http://zoobank.org/urn:lsid:zoobank.org:act:B272111E-10D5-48AC-A48A-91E04570C9ED>

Material examined. Holotype ♀ (on slide under four coverslips, slide No. EUL.207), INDIA: HIMACHAL PRADESH: Shimla, 28.viii.2014, Coll. K. Veenakumari (ZDAMU).

Paratypes, 3 ♀♀. 1 ♀ (on slide under four coverslips, slide Nos EUL.22); 2 ♀♀ (on cards), with same data as for holotype (ZDAMU).

Diagnosis: *Omphale akhtari* Jamali & Zeya **sp. nov.** comes close to *O. stonia* Narendran, but differs from the latter as follow: scrobal grooves fused before joining frontal groove; eye height 7× as long as malar space; mandible with many teeth, and ventral two larger teeth; antenna with 3 anelli. In *O. stonia* scrobal groove joining frontal groove separately; eye height 2.3× as long as malar space; mandible tridentate; antenna with 1 anellus (Narendran, 2006: fig. 12).

Description: Female: Body (Fig. 5A) length, 1.1 mm. Head metallic brown. Antenna brown except scape pale brown. Mesosoma pale yellow except mesoscutum anteriorly one-fourth, mesoscutellum posteriorly one-fifth and propodeum laterally brown. Fore wing hyaline, with slight yellow tinge (Fig. 3E). Legs, including coxae, pale brown to pale yellow. Petiole pale yellow; gaster metallic brown.

Head (Fig. 3A), in frontal view, 1.3× as broad as high, smooth, with 14 setae on vertex; scrobal grooves fused before joining frontal groove; eye height 7× as long as malar space; mandible (Fig. 3B) with several blunt teeth, and ventral two larger teeth; clypeus rectangular, 1.4× as broad as high; antennal toruli situated slightly above the lower eye margin. Antenna (Fig. 3C) with scape 5.8× as long as broad, 2.5× as long as pedicel; pedicel 2× as long as broad; pedicel + flagellum 2.6× as long as distance between eyes (63: 24); flagellum with 3 distinct anelli; Fu1, Fu2 and Fu3 subequal, Fu4 slightly shorter than Fu1; clava 3.5× as long as broad; clava shorter than all funiculars individually.

Mesosoma (Fig. 3D) almost smooth, except transverse striations on anterior part of mesoscutum; pronotum very narrow, not visible in dorsal view; mesoscutum shorter than mesoscutellum; notauli incomplete, present in anterior third; mid lobe of mesoscutum with 4 setae; side lobe with 1 posterolateral seta; axillae elongate, extending posteriorly more than two-thirds length of mesoscutellum; mesoscutellum longer than broad with 2 long setae; dorsellum smooth, 0.2× as long as broad, and 0.2× propodeum; propodeal callus with 2 short setae. Fore wing (Fig. 3E) 2.6× as long as broad; 11 admarginal setae arising from both marginal vein and from membrane below vein; radial cell setose; marginal vein + parastigma 1.7× as long as submarginal vein, 11.6 as long as stigmal vein; post marginal vein 2× as long as stigmal vein; longest marginal seta 0.2× maximum wing width. Hind wing (Fig. 3F) 6.3× as long as broad with apex pointed; longest marginal seta 0.7× maximum wing width.

Metasoma (Fig. 3G). Petiole 2.1× as broad as long; gaster distinctly longer than mesosoma; ovipositor occupying almost whole length of gaster, exerted beyond apex of gaster; ovipositor 1.5× as long as hind tibia.

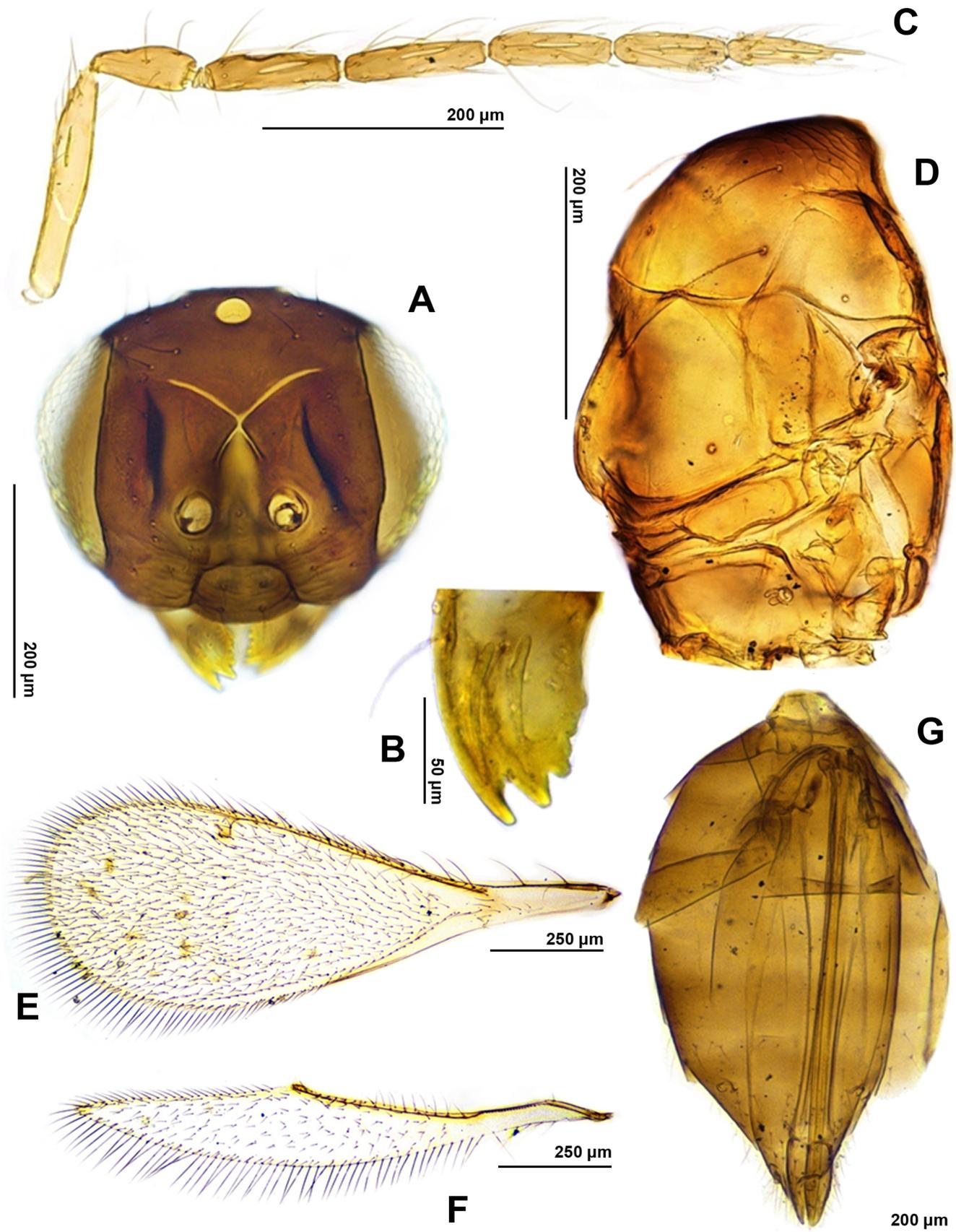


Figure 3. *Omphale akhtari* sp. nov. Holotype, female: **A.** Head, frontal view; **B.** Mandibles; **C.** Antenna; **D.** Mesosoma, dorsal view; **E.** Fore wing; **F.** Hind wing; **G.** Metasoma, ventral view.

Relative measurements (holotype slide at 100×). Head height: width, 29: 38; eye height, 20; malar space, 3; clypeus height: width, 5.5: 8. Antennomeres length: width – scape, 19: 3.25; pedicel, 7.5: 4.25; Fu1, 10.25: 3.25; Fu2, 10.75: 3; Fu3, 10: 3.25; Fu4, 9: 3.25; clava, 8: 2.25; spicula, 2. Mesosoma length: width, 42: 32; propodeum length, 6.5. Fore wing length: width, 122: 47; longest marginal seta, 11.5; submarginal vein length, 33; parastigma length, 6; marginal vein length, 52; postmarginal vein length, 10; stigmal vein length, 5. Hind wing length: width, 95: 15; longest marginal seta, 10.5. Hind tibia length, 38. Metasoma. Petiole length: width, 3.5: 7.5; gaster length, 60; ovipositor length, 70.

Male: Unknown.

Host: Unknown.

Etymology: The species named after the name of Late Akhtar Ali, the beloved teacher of the first author.

Distribution: India: Himachal Pradesh.

Omphale kamili Jamali & Zeya **sp. nov.** (Figs 4, 5)

<http://zoobank.org/urn:lsid:zoobank.org:act:21C78352-FFB0-4CA5-90D0-9831F9D4ACD8>

Material examined. Holotype ♀ (on slide under four coverslips, slide No. EUL.208) INDIA: HIMACHAL PRADESH: Shimla, 28.viii.2014, Coll. K. Veenakumari. (ZDAMU).

Paratype, 1 ♀ (on card), with same data as for holotype. (ZDAMU).

Diagnosis: *Omphale kamili* Jamali & Zeya **sp. nov.** resembles a Borneo species *O. heydoni* Narendran. However, it differs from *O. heydoni* by the following characters: eye height 2.7× as long as malar space; antenna with 1 distinct anellus; pedicel 1.6× as long as broad; mesoscutellum with longitudinal ridges-like striations; gaster subequal to mesosoma. In *O. heydoni*: eye height 1.7× as long as malar space; antenna without anellus; pedicel 2.1× as long as broad; mesoscutellum almost smooth; gaster 2× as long as mesosoma.

Description: Female: Body (Fig. 5B) length, 0.82 mm. Head dark brown. Antenna pale brown. Mesosoma dark brown with greenish reflection. Wings hyaline. Legs pale brown except coxae and femora brown. Gaster dark brown with greenish reflection.

Head (Fig. 4A) smooth, in frontal view, 1.3× as broad as high; vertex with 12 setae; scrobal groove with lateral margin fuse apically before joining frontal groove; eye height 2.7× as long as malar space; mandible (Fig. 4B) with many teeth, ventral two teeth larger than others; clypeus semicircular, 1.6× as broad as high; antennal toruli situated at the level of lower eye margin. Antenna (Fig. 4C) with scape 6× as long as broad, 2.7× as long as pedicel; pedicel 1.6× as long as broad; pedicel + flagellum 2× as long as distance between eyes (40: 19); flagellum with 1 distinct anellus; Fu1–Fu4 individually longer than pedicel; Fu1 0.93× as long and 1.08 as broad as Fu2; Fu3 longer than Fu4; clava 2.3× as long as broad; clava shorter than all funiculars individually.

Mesosoma (Fig. 4D) 1.3× as long as broad; pronotum narrow, hardly visible in dorsal view; mesoscutum shorter than mesoscutellum with transverse striations; notauli complete; mid lobe of mesoscutum with 4 long setae; side lobes with faintly raised polygonal reticulate sculpture; axillae elongate, extending more than two-thirds length of mesoscutellum; mesoscutellum longer than broad; mesoscutum, axillae and mesoscutellum with longitudinal ridges-like striations; metanotum smooth with 1 seta on each side; dorsellum smooth, with two lateral ridges-like striations converging anteriorly, 0.5× as long as broad and 0.4× median length of propodeum; propodeum smooth, with a median carina anteriorly bifurcate into two branches. Fore wing (Fig. 4E) 2.6× as long as broad; speculum closed; admarginal setae 9 arising from both marginal vein and from membrane below vein; radial cell setose; marginal vein + parastigma 1.6× as long as submarginal vein, 6.3× as long as stigmal vein; post marginal vein 0.83× stigmal vein; longest marginal seta 0.35× maximum wing width. Hind wing (Fig. 4F) 6.5× as long as broad with apex pointed; longest marginal seta 0.91× maximum wing width.

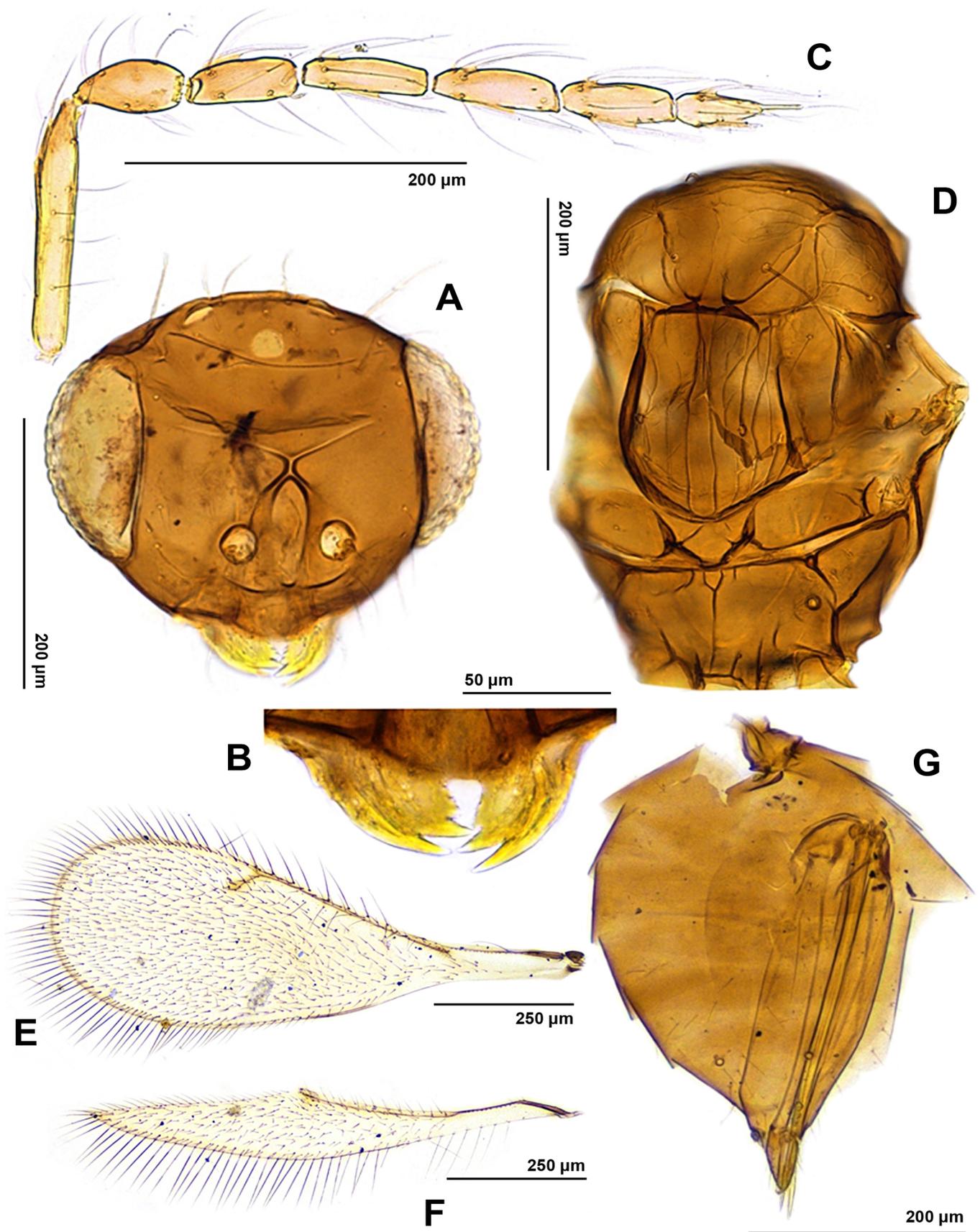


Figure 4. *Omphale kamili* sp. nov. Holotype, female: **A.** Head, frontal view; **B.** Mandibles; **C.** Antenna; **D.** Mesosoma, dorsal view; **E.** Fore wing; **F.** Hind wing; **G.** Metasoma, ventral view.

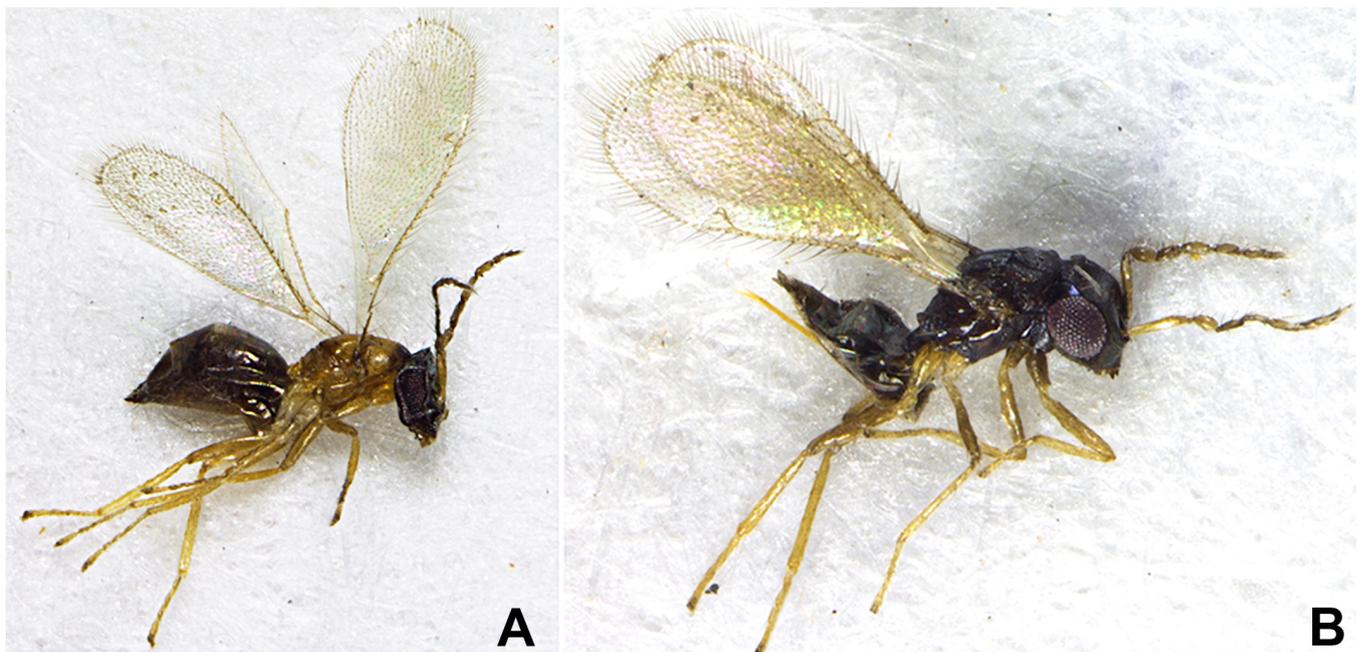


Figure 5. General habitus of the Holotype (female), in lateral view: **A.** *Omphale akhtari* sp. nov.; **B.** *Omphale kamili* sp. nov.

Metasoma (Fig. 4G). Petiole 1.7× as broad as long; gaster subequal to mesosoma; ovipositor with second valvifer inserted in Gt1, exerted beyond apex of gaster; ovipositor 1.8× as long as hind tibia.

Relative measurements (holotype slide, at 100×). Head height: width, 22: 30; eye height, 15; malar space, 5.5; clypeus height: width, 3: 5. Antennomeres length: width – scape, 15: 2.5; pedicel, 5.5: 3.25; Fu1, 5.25: 2.75; Fu2, 6.75: 2; Fu3, 6.75: 2.25; Fu4, 6: 2.5; clava, 4.75: 2; spicula, 2.25. Mesosoma length: width, 38: 28; propodeum length, 7.5. Fore wing length: width, 93: 35; longest marginal seta, 11.5; submarginal vein length, 23; parastigma length, 5; marginal vein length, 33; postmarginal vein length, 5; stigmal vein length, 6. Hind wing length: width, 78: 12; longest marginal seta, 11. Hind tibia length, 27. Metasoma. Petiole length: width, 3.5: 6; gaster length, 40; ovipositor length, 49.

Male: Unknown.

Host: Unknown.

Etymology: The species is named in honour of Prof. Mohd Kamil Usmani, for his contributions to the taxonomy of Indian Acrididae.

Distribution: India: Himachal Pradesh.

Omphale appannai (Kurian, 1953) **comb. nov.**

Achrysocharis appannai Kurian, 1953:114, female. Holotype, female, India, Bangalore, not examined.

Chrysonotomyia appannai (Kurian): Husain & Khan, 1986:214, checklist.

Omphale epilachni Singh & Khan, 1998:123, female. Holotype female, India, Uttarakhand, Pantnagar, examined. Synonymy by Hayat et al. 2005:6.

Omphale epilachni Singh & Khan: Narendran, 2006:297, record.

Diagnosis: The diagnosis of *Omphale appannai* (Kurian) is based on the original description and illustrations given by Kurian (1953). This species differs from the other Indian species by having 3-funiclars and 3-clavomeres in female and 4-funiclars and 2-clavomeres in male.

Description: See Kurian (1953).

Host: *Epilachna* eggs.

Distribution: India: Karnataka, Odisha, Uttar Pradesh, Uttarakhand.

***Omphale stonia* Narendran, 2006**

Omphale stonia Narendran, 2006:295, female. Holotype, female, India, Kerala, Calicut (DZUC), not examined.

Diagnosis: The diagnosis of *Omphale stonia* Narendran is based on the original description and illustrations given by Narendran (2006). *O. stonia* comes close to *O. calicuti* Narendran, but it differs from the latter in following characters: POL 1.5× as long as OOL; antenna with one anellus; pedicel 2.4× as long broad; Fu1 subequal to Fu2; fore wing (including marginal fringe) 2.4× as long as broad; marginal vein with 11 dorsal setae; postmarginal vein 2× as long as stigmal vein. In *O. calicuti* POL 2.5× as long as OOL; antenna without anellus; pedicel 1.63× as long broad; Fu1 slightly longer than Fu2; fore wing (including marginal fringe) 2× as long as broad; marginal vein with 7 or 8 dorsal setae; postmarginal vein 1.3× as long as stigmal vein.

Description: See Narendran (2006).

Host: Unknown.

Distribution: India: Kerala.

***Omphale calicuti* Narendran, 2006**

Omphale calicuti Narendran, 2006:296, female. Holotype, female, India, Kerala, Calicut, Thiruvannur (DZUC), not examined.

Diagnosis: The diagnosis of *Omphale calicuti* Narendran is based on the original description and illustrations given by Narendran (2006). It differs from *O. stonia* Narendran by the characters given under the comments of *O. stonia*.

Description: See Narendran (2006).

Host: Unknown.

Distribution: India: Kerala.

Key to Indian species of *Omphale* Haliday, females

1. Fore wing with infusate patch beyond speculum (Figs 1E, 2E). 2
 – Fore wing without any infusate patch (Figs 3E, 4E). 3
2. Fore wing with a narrow infusate patch, not extending to stigmal vein; postmarginal vein one-fifth of stigmal vein; longest marginal seta 2.4× as long as stigmal vein (Fig. 1E).
 *O. ecola* Jamali & Zeya **sp. nov.**
 – Fore wing with broad infusate patch extending to stigmal vein; postmarginal vein subequal to stigmal vein; longest marginal seta 1.5× as long as stigmal vein (Fig. 2E).
 *O. litera* Jamali & Zeya **sp. nov.**
3. Antenna with one clavomere (Fig. 3C). 4
 – Antenna with 2 or 3 clavomeres. 5
4. Mesosoma pale yellow and smooth; antenna with 3 anelli (Fig. 3C); fore wing with postmarginal vein 2× as long as stigmal vein (Fig. 3E). *O. akhtari* Jamali & Zeya **sp. nov.**
 – Mesosoma dark brown with transverse to longitudinal ridges on mesoscutum and mesoscutellum (Fig. 4D); antenna with 1 anellus (Fig. 4C); fore wing with postmarginal vein 0.83× stigmal vein (Fig. 4E).
 *O. kamili* Jamali & Zeya **sp. nov.**
5. Body small, 0.7 mm in size; antenna with 3 clavomeres. *O. appannai* (Kurian)
 – Body large more than 1 mm in size; antenna with 2 clavomeres. 6
6. Head bright metallic green; pedicel 2.4× as long as broad; postmarginal vein 2× as long as stigmal vein; gaster dark brown with metallic green reflection. *O. stonia* Narendran
 – Head pale yellow to dark brown; pedicel 1.6× as long; postmarginal vein 1.33× as long as stigmal vein; gaster pale yellow with dark brown marking on T1–T5. *O. calicuti* Narendran

DISCUSSION

Prior to this study, only 3 species of *Omphale* Haliday were known from India (Noyes, 2022). All these described species were collected from southern parts of country. Present study is based on a collection of *Omphale* made from northern parts of the country, aiming to provide a comprehensive study to understand Indian fauna of the genus. Seven species are included, on which four are described as new species. However, India is country with vast area and great variations in terms of climate and other environmental conditions and the description of four new species suggesting that many parts of the country are still unexplored, which need more intensive exploration. Key and figures of species included in this paper may help in the correct identification of the species and it would be expected that more species may be discovered. Furthermore the situation of earlier published species is unclear. Therefore further studies are yet required to reveal the situation of these species as well as male and host associations of all species.

AUTHOR'S CONTRIBUTION

The authors confirm contribution in the paper as follows: M.M. Jamali: identified the species, made the photography and wrote the manuscript; S.B. Zeya: supervised the study and reviewed the manuscript; S.A.H. Andrabi: mounted the specimens and edited the manuscript. All authors read and approved the final version of the manuscript.

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The authors declare that there is no conflict of interest regarding the publication of this paper.

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معرفی جنس *Omphale* Haliday (Hymenoptera, Chalcidoidea, Eulophidae) از هند به همراه توصیف چهار گونه جدید

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چکیده: گونه‌های جنس *Omphale* Haliday در هند مورد بررسی قرار گرفتند. هفت گونه در هند وجود دارد، که چهار گونه شامل *O. akhtari* Jamali & Zeya **sp. nov.**، *O. ecola* Jamali & Zeya **sp. nov.**، *O. kamili* Jamali & Zeya **sp. nov.** و *O. appannai* **sp. nov.** توصیف و مصور شده‌اند. گونه‌ی *O. litera* Jamali & Zeya **sp. nov.** از جنس *Chrysonotomyia* Ashmead به جنس *Omphale* Haliday منتقل شد. ویژگی‌های شناسایی برای دو گونه *O. stonia* Narendran و *O. calicuti* Narendran و کلید شناسایی برای گونه‌های هند ارائه شد.

واژگان کلیدی: بال‌غشاییان، Entedoninae، کلید شناسایی، منطقه Oriental، رده‌بندی