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FAUNAL DIVERSITY–CLIMATE I GLOBAL WARMING I HUMAN INTERFERENCE

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Description of a new species of *Oricoruna* Bouček (Hymenoptera: Pteromalidae) associated with Egyptian cottony cushion scale, *Icerya aegyptiaca* (Douglas) (Hemiptera: Monophlebidae) on *Macaranga peltata* Roxb. (Malpighiales: Euphorbiaceae) from India

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ABSTRACT

Oricoruna Bouček is one of the least diverse genus of Pteromalinae (Hymenoptera: Pteromalidae) represented by only two species worldwide. Here we describe with illustrations a third species of the genus and validate its association with Egyptian cottony cushion scale *Icerya aegyptiaca* (Douglas) from Kerala, India.

Keywords: Pteromalidae, *Oricoruna*, new species, *Icerya aegyptiaca*, host association

INTRODUCTION

The genus *Oricoruna* Bouček (Pteromlidae: Pteromalinae) is a small genus comprising of only two species worldwide *viz*., *O. arcotensis* (Mani & Kurian 1953) and *O. orientalis* (Crawford 1910) (Noyes 2019). This genus possess an unusual combination of characters, which often leads to wrong identification. One of the major defining character of this genus is the thickened marginal vein of the fore wing and propodeum with distinct sub median channels (Bouček 1988).

Macaranga peltata Roxb. is a euphorbiaceous plant distributed along northern Thailand, Sri Lanka and India. It is one of the pioneer tree species distributed across primary and secondary forests. This species suffers from a high degree of herbivory, which is visually detectable. *M. peltata* is generally distributed in high light environments such as secondary forests and also in large tree-fall gaps within primary forests (Louda *et al*. 1987; Goodale *et al.* 2014).

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Scale insects (Hemiptera: Coccoidea) comprises a group of extremely invasive and serious agricultural pests which can cause primary and secondary damage on crop plants. They primarily affect the plant by sucking out the phloem sap, thereby weakening the plant body; secondarily through the production of honey dew which forms as a result of their sap feeding habit, which is considered to be more detrimental as it attracts fungal growth which will further lead to the complete plant damage (Morales *et al*. 2016).

Icerya aegyptiaca (Douglas) commonly known as Egyptian cottony cushion scale or breadfruit mealybug is a highly polyphagous and widespread scale insect occurring in the Afrotropical, Australasian, Indo-Malayan and Palearctic regions, and it is known to feed on 123 species of plants belonging to 49 plant families (Uesato et al. 2011). It acts as a minor pest on fruit trees, mainly breadfruit and jackfruit (*Artocarpus spp.*), and also on *Annona* spp., *Citrus* spp., *Mangifera indica*, *Manilkara zapota*, *Morus alba* and *Psidium guajava* (CABI, EPPO 2003).

The biology of *Oricoruna* species is reported by Mani & Kurian (1953) and Bouček (1979) as probable parasites on *Icerya* species. The present new species is recovered from *I. aegyptiaca* on *Macaranga peltata* which is described with illustrations here.

MATERIALS AND METHODS

The parasitoids were reared from scale insects on the twigs of *Macaranga peltata* collected near the roadsides from Poyilkaavu (11°24’39.6”N & 75°43’06.0”E, 2m) in Kozhikode district of Kerala. The twigs were kept in a clean rearing jar with the mouth covered by a fine cotton cloth to minimize damage to specimens caused by transpiration from the plant materials. The emerged parasitoids were aspirated from the rearing jar by keeping it towards the light. The collected specimens were passed through a series of alcohol concentrations (70, 80, 90 and 100) and later processed using standard HMDS protocol (Heraty & Hawks 1998). The specimens were then dried, card mounted and were studied under stereoscopic binocular microscope LEICA M 205A and the photographs were taken with LEICA DFC 500 camera. Measurements were obtained using Leica LAS (Leica Application Suite V3.80) microsystems by Leica (Heerburg, Switzerland). Images at varying depth were stacked using Leica Auto Montage Software V3.80 and the final illustrations were post-processed for contrast and brightness using Adobe® Photoshop® CS5 (Version 12.0 x64) software. The type specimens of the new species are deposited in the ‘National Zoological Collections’ of the Zoological Survey of India, Western Ghat Regional Centre, Kozhikode (**ZSIK**).

The terminology follows mainly that of Bouček (1988) and Sureshan (2000) unless noted otherwise. The nomenclature for cuticular sculpturing follows Harris (1979). The general abbreviations of the terms are as follows: **fu$_x$**: funicular segment, x being the tergite number; **Gt$_x$**: Gastral terga, x being the tergum number; **Gs$_x$**: Gastral sterna, x being the sternum number; **MV**: marginal vein; **OOL**: ocello-ocular distance; **PMV**: post-marginal vein; **POL**: post-ocellar distance; **SMV**: sub-marginal vein; **STV**: stigmal vein; **sp. nov.**: species nova, new species.

RESULTS

Genus *Oricoruna* Bouček, 1979

Oricoruna iceryophagus Surya, Binoy & Sureshan **sp. nov.**

(Figs 1A–H, 2A&B)

Type material. Holotype ♀, mounted on triangular card. **India**: Kerala, Kozhikode district, Poyilkaavu (11°24'39.6"N & 75°43'06.0"E, 2m), 22.xi.2019, ex. *Icerya aegyptiaca* on *Macaranga peltata,* coll. K. S. Surya, ZSIK Regd. No. ZSI/WGRC/IR/INV.13645. Paratype 5 ♀ and 11 ♂, same details as holotype. ZSIK Regd. No. ZSI/WGRC/IR/INV.13646, 13656–70. 5 ♀ and 6 ♂ specimen stored in 70% alcohol.

Diagnosis. The new species comes close to *O. orientalis* in general morphology in having distinct notauli; STV as long as MV, PMV longer and pronotum, anteriorly carinate, but differs in: head and mesosoma with uniform strong reticulations (in *O. orientalis*, head and mesosoma with fine thimble like punctures); legs pale yellow (except fore coxae brown), a characteristic black with metallic bluish refringence on dorsal surface of hind coxa (in *O.* orientalis, legs entirely testaceous); mesopleuron finely reticulate, mesepisternum bare, mesepimeron smooth (in *O. orientalis* mesopleura anteriorly punctured, posteriorly smooth and shiny); medial lobe of clypeus triangular, produced with a single short tooth on anterior margin (in *O. orientalis*, clypeus sub-quadrangular, produced with three short teeth on anterior margin). The new species differs from the other Indian species, *O. arcotensis* (Mani & Kurian) in having tridentate mandibles (in *O. arcotensis* mandibles with three and four teeth), scape just short of reaching median ocellus (in *O. arcotensis* antennal scape reaching upto median ocellus) and mesoscutum reticulate (in *O. arcotensis* mesoscutum rugoso-punctate).

Description. Holotype ♀ (fig. 1A–G, 2A) Body length 1.59 mm; forewing 1.02 mm. Body black with bluish metallic luster; eyes silvery and ocelli reflective; antennae uniformly testaceous; second flagellar segment onwards externally brown with long white sensillae and pubescence; mandibles brown; tegulae testaceous; wings hyaline with pale brown veins and pubescence; all legs pale yellow except fore coxae which is brown in colouration, a characteristic black colour present in the outer regions of hind coxa; metasoma brownish black in colour with metallic blue luster on the dorsal half visibly on the first three tergites; general pubescence dirty white.

Head. Head 0.32× as wide as long in dorsal view, in frontal view 1.21× as wide as high; eyes glabrous, 0.43× as high as wide in frontal view (Fig. 1C); POL almost equal to OOL (Fig. 1E); area below toruli strongly reticulate; face with sparse pubescence, convex along the median line, face below toruli with strong engraved reticulations; reticulation strong and regular on vertex; frons reticulate; clypeus convex and finely reticulate with a sharp medial protuberance flanged by lobes on either sides (Fig. 1C); both mandibles tridentate; malar groove distinct; malar space 0.4× as long as eye in profile; gena reticulate; occipital area reticulate; occipital carina absent (Figs 1B, 1E); antennae inserted at centre of face, distinctly above the lower margin of eyes, scape just short of reaching median ocellus; antenna with three equally thick and transverse anelli and five funicular segments with a three segmented clava; pedicel 1.4× as long as wide, distinctly shorter than fu_1, fu_1 a

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trifle longer than fu_2, fu_2 a bit longer than fu_3; club as long as three preceding segments combined, funicular segments with 2 rows of long white sensillae arranged irregularly with long pubescence (Fig. 1C).

Mesosoma. Moderately reticulate with sparse dirty white pubescence, 1.31× as long as wide; pronotum anteriorly carinate; mesoscutum 0.5× as broad as long; fine reticulations on lateral lobes of mesoscutum and scapulae; notauli complete, distinctly marked; scutellum convex, almost as broad as long, sculpture similar to that on mesoscutum; axillae finely reticulate; frenal line distinct, posterior sub margin triangular, reticulation finer on frenal area (Fig. 1E); dorsellum broad and shiny; propodeum with distinct nucha, moderately reticulate on median areas and finely reticulate on lateral areas and nucha, submedian area strongly raised and converging, submedian groove distinct, median carina not indicated; plicae indistinct and indicated anteriorly; spiracles small, oval, separated from hind margin of metanotum by little shorter than own diameter; callus with sparse pubescence not distinct; prepectus finely reticulate (Fig. 1G); mesopleuron finely reticulate except on mesepisternum, mesepimeron smooth; metapleuron almost shiny; metanotum partly reticulate; legs slender, hind tibia with one spur; hind coxa with fine reticulations, with three to four long bristles arising from black spots on the inner side; forewing 2× as long as broad, basally bare, with basal hairline indicated, uniform pubescence in the rest of the areas; speculum open below; marginal fringe moderately long, MV distinctly thickened, parallel sided, stigma moderately enlarged, uncus distinct; relative lengths of SMV, MV, PMV and STV in the ratio 2.9:1:1.3:1; costal cell completely hairy in the distal half (Fig. 1F).

Metasoma. Non collapsive; petiole short, longer than wide, almost shiny with fine transverse striae (Fig. 1H); metasoma (including petiole) 1.12× as long as mesosoma; Gt_1 0.44× as long as metasoma (including epipygium); hind margin of Gt_1 medially incised, Gt_2 and Gt_3 straight, exposed part of Gt_3 little longer than Gt_4; petiolate abdomen with a short extension of the first gastral sternite embracing it (Fig. 2A); petiole shorter than hind coxa and not expanded in the middle; ovipositor and ovipositor sheath slightly exerted.

Male. Paratype ♂ (Fig.2B) Length 1.74 mm, forewing 1.14 mm; resembles female but differs from it in having a distinctly thickened third anellus which can be mistaken for a funicular segment, first and second anelli almost equally thick, transverse, flagellum with dense long pubescence; metasoma oval; legs testaceous except coxae, coxae concolourous with body; mesosoma with a not so strong bluish luster; Gt_1–Gt_3 brown along lateral sides.

Variability. Similar to type species except, female body length 1.54 – 1.63 mm; male body length 1.71–1.9 mm.

Etymology. Species epithet is after the host generic name *Icerya.*

Distribution. India: Kerala.

Host. Reared from *Icerya aegyptiaca* (Douglas) (Hemiptera: Coccoidea) (Figs 3C & D) on *Macaranga peltata* Roxb. (Figs 3A & B).

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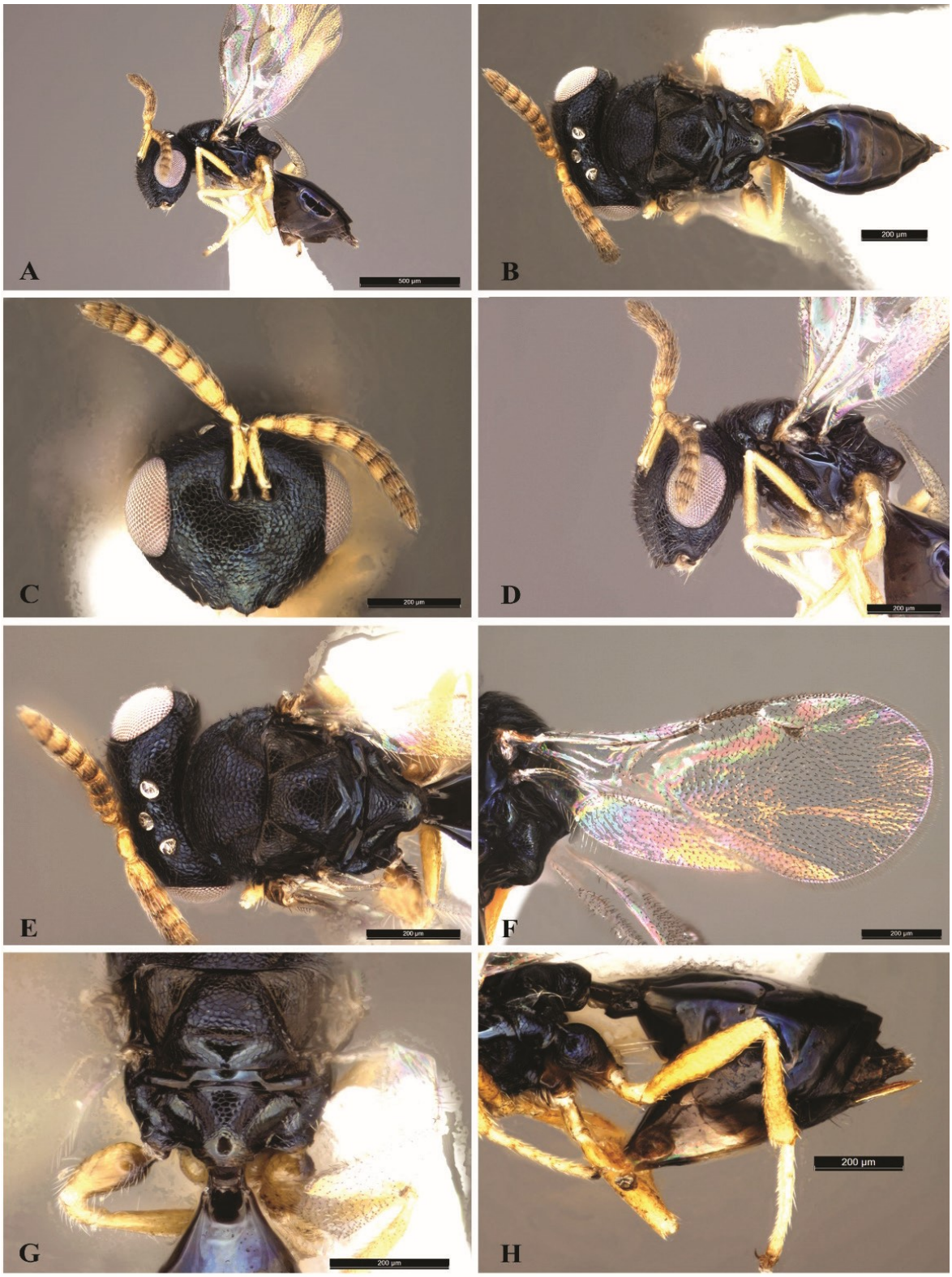
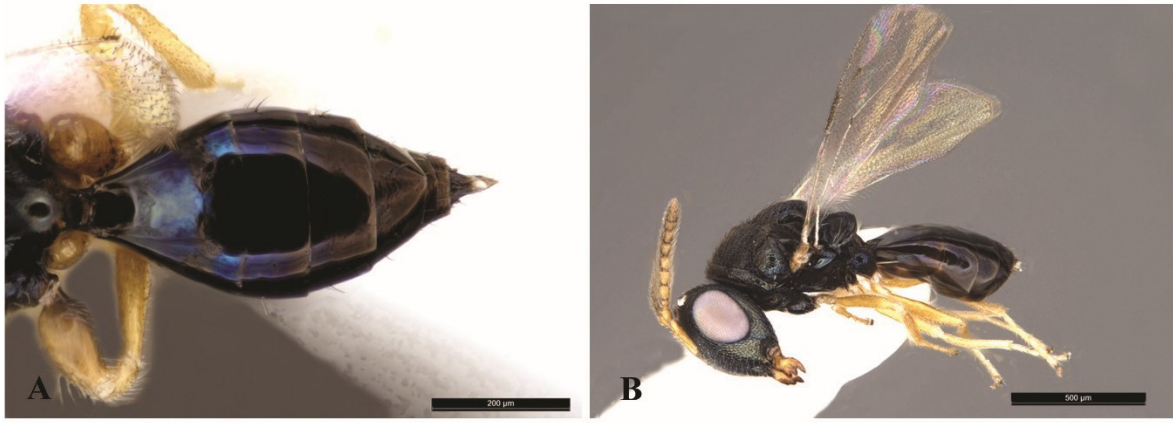
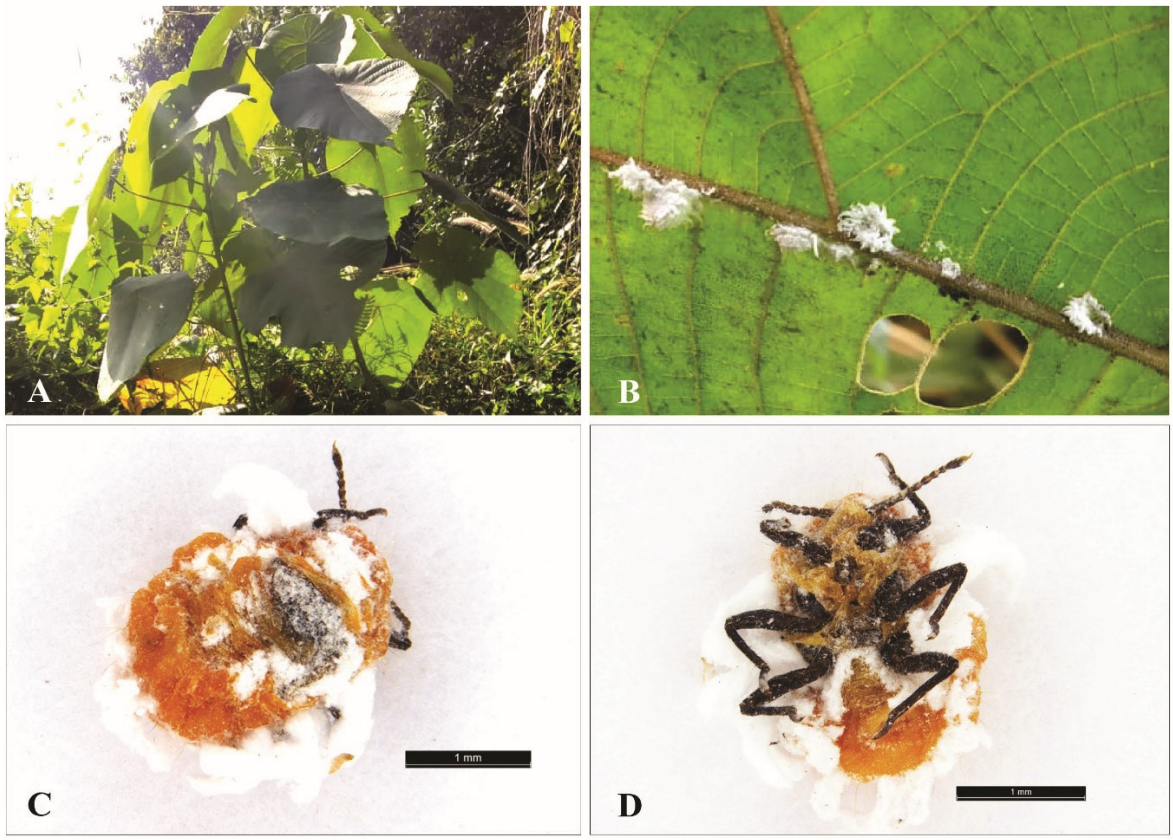


Figs 1A–H. *Oricoruna iceryophagus* Surya, Binoy & Sureshan, **sp. nov.**, Holotype ♀. A. Habitus, lateral view; B. Dorsal view; C. Head, frontal view; D. Head and mesosoma, lateral view; E. Head and mesosoma, dorsal view; F. Fore wing; G. Propodeum and metasoma (in part), dorsal view; Paratype ♀. H. Petiole and metasoma, lateral view.



Figs 2A–B. *Oricoruna iceryophagus* Surya, Binoy & Sureshan, **sp. nov.**, Holotype ♀. A. Petiole and metasoma, dorsal view; Paratype ♂. B. Habitus, lateral view.



Figs 3A–D. Host plant and herbivore. A. Host plant *Macaranga peltata* Roxb.; B. Scale infestation on underside of leaves of *M. peltata*; C–D. Egyptian cottony cushion scale *Icerya aegyptiaca* (Douglas). C. Dorsal view; D. Ventral view.