



First report of *Methocha ubiquita* Krombein (Hymenoptera: Tiphidae: Methochinae) from India

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ABSTRACT. The Sri Lankan species, *Methocha ubiquita* Krombein, 1982 is newly reported for the fauna of India. Differential characters, figures, distribution map and comparisons of the newly recorded species with original description of type material are provided.

Key words: Tiphid wasp, Kerala, Cicindelidae, ectoparasitoid

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INTRODUCTION

The family Tiphidae is a relatively small group of parasitic aculeate wasps, comprising approximately 2000 described species and ninety genera worldwide and consists of seven subfamilies: Anthoboscinae, Tiphinae, Brachycistidinae, Myzininae, Thynninae, Diamminae and Methochinae (Kimsey, 1991). The subfamily Methochinae includes two genera, *Methocha* Latreille, 1804 and *Karlissa* Krombein, 1979. The genus *Methocha* includes 93 species, known worldwide except for the Australian region (Hanima et al., 2021). Of these, 14 are known from the Indian subcontinent and six are exclusively from India, six from Sri Lanka, one from both India and Sri Lanka and another one from both India and Myanmar (Hanima et al., 2019; 2021). Eight species are known occurring in India, *Methocha bicolor* (Cameron, 1897), *M. keralaensis* Hanima & Girish Kumar, 2019, *M. krombeini* Hanima, Girish Kumar & Binoy, 2021, *M. litoralis* Krombein, 1982, *M. paraceylonica* Hanima, Girish Kumar & Binoy, 2021, *M. shyamagatra* Hanima, Girish Kumar & Sureshan, 2021, *M. smithii* (Magretti, 1892) and *M. violaceipennis* (Cameron, 1899) (Hanima et al., 2021). Members of the genus *Methocha* are slender aculeate wasps with females that are often mistaken with ants. Putative hosts of *Methocha* species are larvae of tiger beetles (Coleoptera: Cicindelidae) dwelling in perpendicular burrows in the ground (Krombein, 1982). Here, the species *Methocha ubiquita* Krombein, 1982 is newly reported from India.

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MATERIAL AND METHODS

The specimen was collected using yellow pan traps from Cherukulam of the Kozhikode district of Kerala (India), further attempts to collect more specimens of this species during 2020–2021 were not successful. The specimen was examined under LEICA® M205A stereomicroscopes and imaged using LEICA® DFC 500 digital cameras attached. Measurements were obtained using Leica® LAS (Leica Application Suite V3.80) microsystems and the final illustrations were post-processed for contrast and brightness using Adobe® Photoshop CS5 (ver. 12.0) software. Distribution map of *Methocha ubiquita* Krombein was constructed using ArcGIS Online by Environmental Systems Research Institute, Redlands, California (ESRI, 2021). The terms used for morphology followed Krombein (1982) and Agnoli (2021). The following abbreviations were used for the morphometric characters, in the text: **HW** – Head Width; **IOD** – Inter Ocular Distance (distance between two eyes); **LOL** – Lateral Ocellar Length (distance between anterior ocellus and posterior ocellus); **OOL** – Ocello-Ocular Length (the minimum distance between a posterior ocellus and eye); **POL** – Posterior Ocellar Length (distance between the two posterior ocelli). The following abbreviations have been used for depositories: **USNM** – National Museum of Natural History, Washington, D.C., USA; **ZSIK** – Western Ghat Regional Centre, Zoological Survey of India, Kozhikode, India. The specimen is deposited in ZSIK.

RESULTS

Taxonomic Accounts

Order: Hymenoptera Linnaeus, 1758

Superfamily: Vespoidea Latreille, 1802

Family: Tiphidae Leach, 1815

Subfamily: Methochinae Rohwer, 1916

Genus: *Methocha* Latreille, 1804

Methocha ubiquita Krombein, 1982 (Figs 2A–K)

Methocha (Methocha) ubiquita Krombein, 1982:92–94. Holotype: ♂, Sri Lanka: Eastern Province, Trincomalee District, Trincomalee (NMNH); Paratypes: 41♂♂, 17♀♀, all across Sri Lanka (USNM) (Fig. 1).

Material examined. India: Kerala, Kozhikode district, Kakkodi, Cherukulam (11°20'06" N, 75°46'20" E, 7 m a.s.l.), 1♀, 21.viii.2021, Coll. T.K. Viswanath, ZSIK Regd. No. ZSI/WGRC/I.R.-INV.18313.

Diagnosis. Female. Posterior half of mesopleuron with coarser oblique rugulae (Fig. 2C); scutum and scutellum bulged dorsally and separated by a constriction (Fig. 2D); pronotal disk with a median longitudinal groove (Fig. 2F); POL 2.2 × LOL and 0.9 × OOL (Fig. 2G); Clypeus without lateral lobe, medially with convex swelling (Fig. 2H); malar space absent (Fig. 2I); inner surface of mandible with one sub-apical tooth (Fig. 2I); lower front protuberant above antennae and with a shallow groove medially (Fig. 2I); HW 1.9 × minimum distance of IOD (Fig. 2I); long ovipositor sheath visible dorsally (Fig. 2K).

Colour. Frons, pronotum, scutum, scutellum, propodeum, metanotum and metasoma with dark brown to black erect vestiture, other areas with white vestiture (Figs. 2A–2D); trochanter brownish, tibia beneath brown, tarsi yellowish orange with joints brownish (Fig. 2A); head, mesopleuron, metasomal segments, coxa and femora black (Figs. 2B, 2C, 2G, 2J); mesosoma with pronotum and propodeum orange red, scutum, scutellum, metanotum and pronotal collar reddish brown (Fig. 2D); scape and pedicel shiny reddish brown, 1st to 6th flagellum reddish brown, 7th flagellum black mixed with reddish brown, 8th to 10th flagellum black (Fig. 2E); mandible dark brown (Fig. 2I); ovipositor sheath orange (Fig. 2K).

Size. 7.6 mm.

Male. Unknown.

Distribution. Oriental: India, Kerala (**New record**); Sri Lanka (Krombein, 1982).

Table 1. Comparison of specimens.

Characters	Origin of specimens	
	India (New material)	Sri Lanka (Krombein, 1982)
Body length	7.6 mm	5.3 mm
Colour of the first metasomal tergite	Black	Red, narrow portions of basal and apical parts black
Number of black antennal segments	Segments 8–10	Segments 9–10
Colour of seventh antennal segment	Black mixed with reddish brown colour	Red
Colour of scape and pedicel	Shiny reddish brown	Red
Colour of 1st to 6th flagellum	Reddish brown	Red

These minor differences seem to be due to individual differences in geographically separated populations.

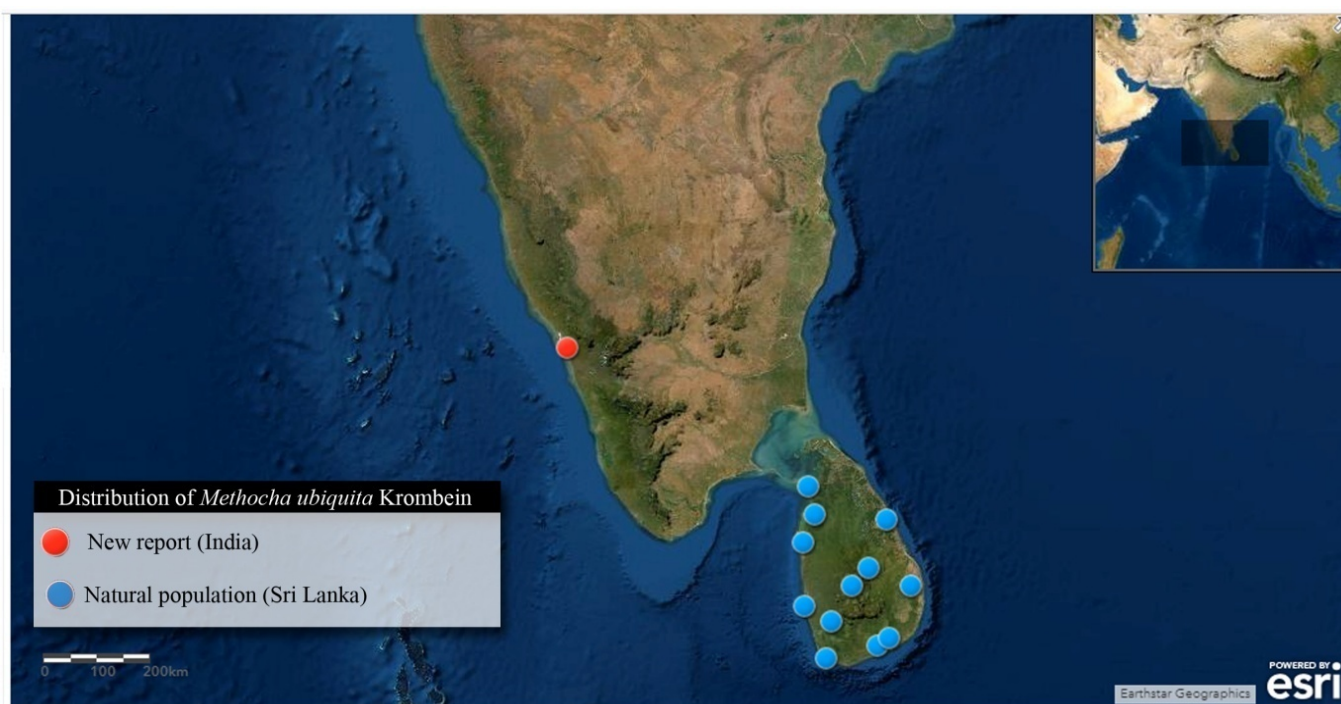


Figure 1. Distribution map of *Methocha ubiquita* Krombein from India and Sri Lanka.

DISCUSSION

Methocha ubiquita Krombein has known as the most widely distributed species in the genus *Methocha* in Sri Lanka, where it occurs in both the Dry Zone and the Wet Zone and at altitudes from 50 to about 2000 ft (Krombein, 1982). Until now, 39 species of *Methocha* are recorded from Oriental region, of which eight species occurred in India (Agnoli, 2021; Hanima et al., 2021). Distribution of all species from India are restricted to the Oriental region. There are no *Methocha* species found commonly in both the Palaearctic and Oriental areas. Distribution of eight *Methocha* species is documented only in the Palaearctic region (Agnoli, 2021). There are about 220 species of Tiger beetles in India with 114 (51.8%) of them being endemics species (Bhardwaj et al., 2008). The diversity of cicindelid beetles can reflects the diversity of their parasitic *Methocha* wasps. The number of distributed *Methocha* species from India is quite little comparing the number of the cicindelid beetles from India. In biological point of view, *Methocha* females are wingless, hence the yellow pan traps and pitfall traps are the most efficient methods for collection of these insects. Further studies are yet needed to reveal the host associations of *Methocha* species within their area of origin.

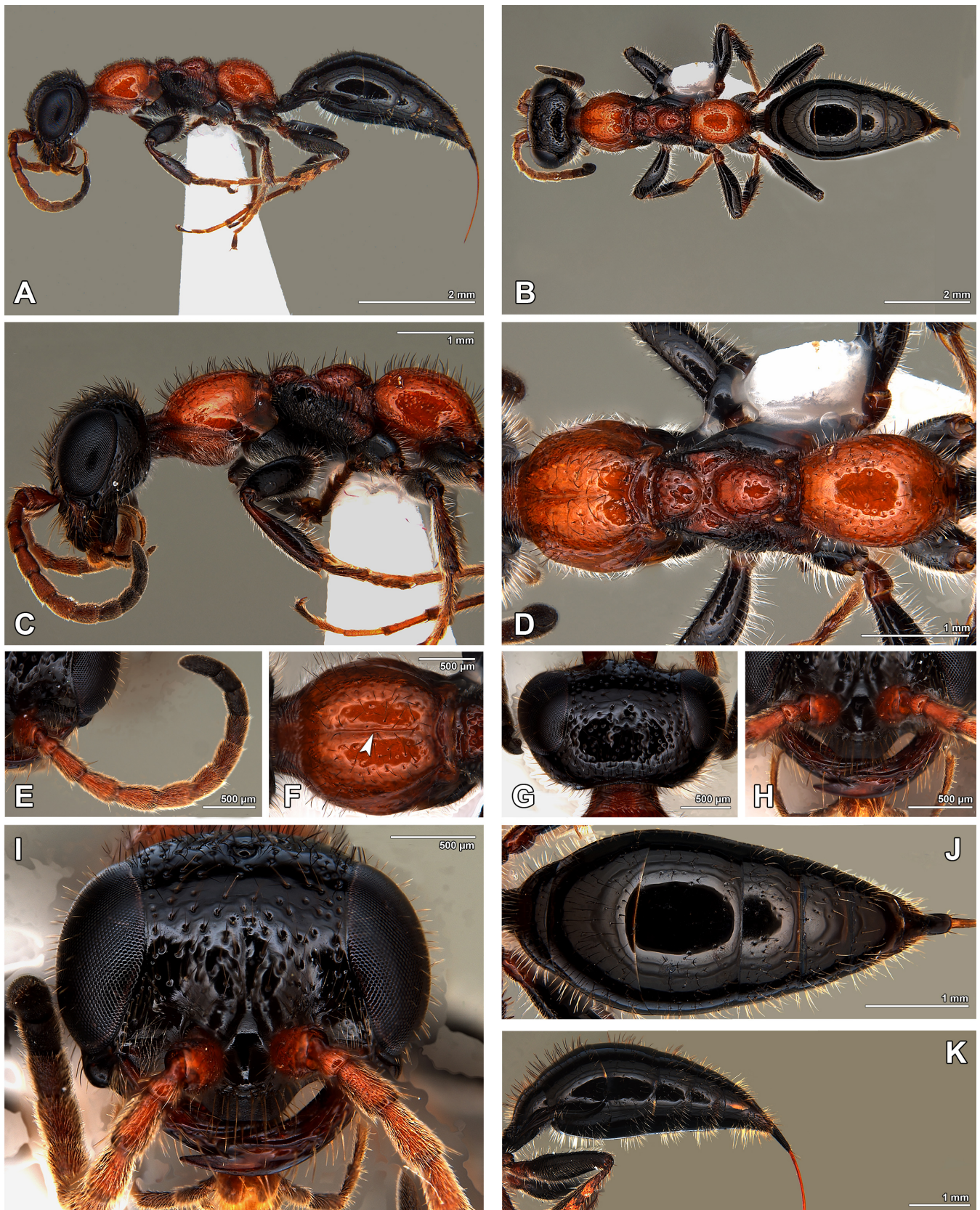


Figure 2. *Methocha ubiquita* Krombein, female. **A.** Habitus, lateral view; **B.** Habitus, dorsal view; **C.** Head & Mesosoma, lateral view; **D.** Mesosoma, dorsal view; **E.** Antennae; **F.** Pronotum, dorsal view (Arrow indicates carinae); **G.** Head, dorsal view; **H.** Clypeus; **I.** Head, frontal view; **J.** Metasoma, dorsal view; **K.** Metasoma, lateral view.

AUTHOR'S CONTRIBUTION

The authors confirm contribution to the paper as follows: R.K.P.H. and P.G.K. designed methodology. R.K.P.H. wrote the manuscript with support from P.G.K.; V.T.K. collected the specimen. All authors discussed the results and contributed to the final manuscript.

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AVAILABILITY OF DATA AND MATERIAL

The authors declare that the data and material during the study are publicly available after publication with proper citation.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The authors declare that this study received ethics approval and also the consent for the publication of details including the photographs and details within the text to be published in the journal.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTERESTS

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

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اولین گزارش *Methocha ubiquita* Krombein (Hymenoptera: Tiphiidae: Methochinae) از هند

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چکیده: گونه *Methocha ubiquita* Krombein, 1982 توصیف شده از سریلانکا، برای فون هند گزارش شد. صفات افتراقی، تصاویر و نقشه پراکنش ارایه و خصوصیات مرفولوژیک گونه تازه گزارش شده با توصیف اصلی مقایسه شد.

واژگان کلیدی: زنبورهای Tiphiidae، کراالا، سوسک‌های ببری، انگل خارجی