



Zootaxa 4929 (1): 001–100

<https://www.mapress.com/j/zt/>

Copyright © 2021 Magnolia Press

Monograph

ISSN 1175-5326 (print edition)

ZOOTAXA

ISSN 1175-5334 (online edition)

<https://doi.org/10.11646/zootaxa.4929.1.1>

<http://zoobank.org/urn:lsid:zoobank.org:pub:1290857D-36E6-47DE-81C7-70CBD7C0AE01>

ZOOTAXA

4929

An annotated and illustrated checklist of the Indian cuckoo wasps (Hymenoptera: Chrysididae)

PAOLO ROSA^{1*}, POKKATTU GOPI ASWATHI^{2,3} & CHENTHAMARAKSHAN BIJOY^{2,4}

¹*Via Belvedere 8D, I-20881 Bernareggio (MB), Italy.*

²*Shadpada Entomology Research Lab (SERL), Christ College Irinjalakuda, Thrissur, India.*

³ aswathipg19@gmail.com; <https://orcid.org/0000-0001-5819-9858>

⁴ drbijoyc@gmail.com; <https://orcid.org/0000-0002-5016-0454>

*Corresponding author: rosa@chrysis.net; <https://orcid.org/0000-0003-2919-5297>



Magnolia Press
Auckland, New Zealand

Accepted by C. Azevedo: 18 Jan. 2021; published: 17 Feb. 2021

Licensed under Creative Commons Attribution-N.C. 4.0 International <https://creativecommons.org/licenses/by-nc/4.0/>

PAOLO ROSA, POKKATTU GOPI ASWATHI & CHENTHAMARAKSHAN BIJOY
An annotated and illustrated checklist of the Indian cuckoo wasps (Hymenoptera: Chrysididae)
(*Zootaxa* 4929)

100 pp.; 30 cm.

17 Feb. 2021

ISBN 978-1-77688-184-0 (paperback)

ISBN 978-1-77688-185-7 (Online edition)

FIRST PUBLISHED IN 2021 BY

Magnolia Press

P.O. Box 41-383

Auckland 1041

New Zealand

e-mail: magnolia@mapress.com

<https://www.mapress.com/j/zt>

© 2021 Magnolia Press

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

Table of Contents

Abstract	3
Introduction	4
Materials and methods	5
C. List of the species	7
I. Subfamily Cleptinae	7
Genus <i>Lustrina</i> Kurian, 1955	7
II. Subfamily Amiseginae	8
Genus <i>Indothrix</i> Krombein, 1957	8
III. Subfamily Loboscelidiinae	9
Genus <i>Loboscelidia</i> Westwood, 1874	9
IV. Subfamily Chrysidinae	11
Tribe Elampini	11
Genus <i>Elampus</i> Spinola, 1806	11
Genus <i>Hedychridium</i> Abeille de Perrin, 1878	14
Genus <i>Hedychrum</i> Latreille, 1802	16
Genus <i>Holophris</i> Mocsáry, 1890	18
Genus <i>Holopyga</i> Dahlbom, 1845	18
Genus <i>Omalus</i> Panzer, 1801	21
Tribe Chrysidini	22
Genus <i>Chrysidea</i> Bischoff, 1913	22
Genus <i>Chrysis</i> Linnaeus, 1761	22
Genus <i>Chrysur</i> Dahlbom, 1845	71
Genus <i>Istiochrysis</i> Rosa & Xu in Rosa <i>et al.</i> , 2016c	71
Genus <i>Odontochrydium</i> Brauns, 1928	73
Genus <i>Praestochrysis</i> Linsenmaier, 1959	74
Genus <i>Primeuchroeus</i> Linsenmaier, 1968	78
Genus <i>Stilbum</i> Spinola, 1806	78
Genus <i>Trichrysis</i> Lichtenstein, 1876	79
Tribe Parnopini	85
Genus <i>Cephaloparnops</i> Bischoff, 1910	85
Genus <i>Parnopes</i> Latreille, 1796	85
Species doubtfully recorded from India	86
Key to subfamilies, tribes and genera of Indian Chrysidids	88
Discussion	91
Conclusions	93
Acknowledgments	94
References	94

Abstract

An illustrated and updated checklist of the Indian Chrysididae is presented, including synonyms and distributional summaries. The list includes 105 species in 20 genera. Six species are described as new: *Elampus gladiator* Rosa, **sp. nov.** (Himachal Pradesh, Jammu & Kashmir, and Uttar Pradesh), *Chrysis aswathiae* Rosa, **sp. nov.** (Tamil Nadu, *elegans* species group), *Chrysis baldocki* Rosa, **sp. nov.** (Tamil Nadu, *smaragdula* group), *Chrysis bernasconii* Rosa, **sp. nov.** (Tamil Nadu, *subsinnuata* group), *Chrysis polita* Rosa, **sp. nov.** (West Bengal, Uttaranchal, Myanmar, *ignita* group), and *Chrysis travancoriana* Rosa, **sp. nov.** (Kerala and Tamil Nadu, *praecipua* group). Six species are newly recorded: *Chrysis hecate* Mocsáry, 1889; *Chrysis jalala* Nurse, 1902; *Chrysis obscura* Smith, 1860; *Istiochrysis ziliolii* Rosa & Xu, 2016; *Praestochrysis furcifera* (Bingham, 1903); *Primeuchroeus siamensis* (Bischoff, 1910). Two new synonymies are proposed: *Chrysis abuensis* Nurse, 1902, **syn. nov.** of *Chrysis wroughtoni* du Buysson, 1896b; *Chrysis nursei* Bingham, 1903 **syn. nov.** of *Chrysis gujaratica* Nurse, 1903a. *Holopyga (Hedychridium) virescens* Mocsáry, 1914 is transferred to the genus *Hedychridium* Abeille de Perrin, 1878; the name *Hedychridium virescens* (Mocsáry, 1914) results a secondary homonym of *Hedychridium virescens* du Buysson, 1908 and it is here replaced with the new name *Hedychridium mocsaryi* Rosa, **nom. nov.** *Chrysis cotesi* du Buysson, 1893, **sp. resurr.** is here revalidated from the previous synonymy with *Chrysis palliditarsis* Spinola, 1838. *Chrysis bahadur* Nurse, 1903a is transferred from the *ignita* group to the *splendidula* group, *Chrysis bhavanae* Bingham, 1903 is transferred from the *ignita* group to the *maculicornis* group, and *Chrysis thakur* is transferred from the *smaragdula* group to the *oculata* group. *Chrysis nila* Bingham, 1903 and *Chrysis variipes* Mocsáry, 1911 are included in the newly established *nila* group. *Spinolia kashmirae* Kimsey in Kimsey & Bohart, 1991 is classified as unnecessary replacement name. The name *Parnopes oberthuri* du Buysson, 1904 is here emended into *Parnopes*

oberthueri (currently *Cephaloparnops oberthueri*). Potential erroneous data, misidentifications and dubious distributional records that may exist in the literature are also identified. We examined almost all type specimens, excluding taxa described by Cameron and Smith. We provide a key to Indian genera, including those expected for the country and not yet recorded, and colour images of type and non-type specimens belonging to 82 species.

Key words: Chrysidini, Elampini, Parnopini, distribution, new synonymy, new species

Introduction

The family Chrysididae includes more than 2,900 described species in 92 genera (Rosa *et al.* 2017b, unpubl. data) distributed all over the World, excluding fossils records. After the main revisional work by Kimsey & Bohart (1991), Chrysididae are divided into four subfamilies (Amiseginae, Chrysidinae, Cleptinae and Loboscelidiinae). A recent molecular phylogenetic study (Pauli *et al.* 2019) suggested a new arrangement of genera including synonymisation of some genera distributed in India or expected for the Palaearctic part of the country, such as *Chrysidea* Bischoff, 1913, *Chrysura* Dahlbom, 1845, *Praestochrysis* Linsenmaier, 1959, *Trichrysis* Lichtenstein, 1876 with *Chrysis* Linnaeus, 1761. However, as these taxonomic acts were not yet performed, previous classification by Kimsey & Bohart (1991) and Rosa *et al.* (2013, 2014) were followed in the present study.

Chrysidids can be distinguished from other aculeate wasps by the reduced number of visible metasomal segments: most subfamilies have only three, males of Parnopini have four, Cleptinae, Amiseginae and Loboscelidiinae have five external abdominal segments in males and four in females. Internal metasomal segments are modified to form a telescopic genital apparatus in males and an ovipositor tube in females. Other diagnostic characters are the same number of flagellomeres (11) in males and females; the anterior wings with at most six closed or partially closed cells, and the posterior wings completely devoid of closed cells; the body integument strongly chitinized and strengthened to protect them against their hosts in the subfamily Chrysidinae (Kimsey & Bohart 1991).

The Chrysididae are brightly coloured and shiny Hymenoptera, predominantly brilliantly metallic green, violet, gold and/or red and hence their vernacular name “gold wasps” or “jewel wasps”. Nevertheless, there are some brownish to dull black species, which are rare in the Palaearctic fauna (Finnamore & Brothers 1993), whereas they are frequent in the subfamilies Amiseginae and Loboscelidiinae, which are found in the Oriental part of India (Kimsey 1988, 2012; Kimsey & Bohart 1991). The chrysidids are also commonly known as cuckoo-wasps, for their parasitoid or cleptoparasitic behaviour. The females lay an egg in host nests or on prepupae, and the larvae develop at the expense of the host. As their larval development always results in the death of the host, they are named parasitoids. They have cleptoparasitic behaviour when the provisions of the host larvae in the nest are consumed as well. Hosts of Chrysidinae are Vespidae (Eumeninae, Masarinae and Zethinae sensu Bank *et al.* 2017), “Crabronidae” (such as Astatidae, Bembecidae, Sphecidae, Crabronidae, Pempredonidae, Philanthidae, and Psenidae sensu Sann *et al.* 2018) and solitary bees (Megachilidae), whereas Cleptinae species attack the sawfly families Tenthredinidae and Diapriidae (Paukkunen *et al.* 2015). Members of the subfamilies Amiseginae and Loboscelidiinae are parasites of phasmatid walking stick eggs and may have myrmecophilous behaviour (Hisasue & Mita 2020).

The first description of an Indian cuckoo wasp, *Chrysis oculata*, dates to Fabricius (1775). During the period between the end of the nineteenth century and the beginning of the twentieth century, two major works were published. The first one was the ‘*Première contribution a la connaissance des Chrysidides de l’Inde*’ contributed by du Buysson (1896), who recorded and keyed 25 species. The second one was the fundamental volume ‘*The Fauna of British India, including Ceylon and Burma. Hymenoptera, Vol. II. Ants and Cuckoo-wasps*’ by Bingham (1903). The latter, including keys and diagnoses of 78 species, is largely valid and is still in use. After Bingham and du Buysson, another important researcher was Nurse (1902, 1903a, b, 1904, 1914), who deeply contributed to the knowledge of chrysidids of both India and Pakistan. From then on, only a few articles with occasional descriptions of new species of Indian chrysidids or simple records can be found in the literature (du Buysson 1893, 1898a, b, 1900; Cameron 1897, 1902a, b; Mocsáry 1889, 1911, 1912a, b, 1913, 1914; Bingham 1908; Kurian 1955; Krombein 1957; Linsenmaier 1968, 1997; Jonathan *et al.* 1977; Bohart 1988a, b; Kimsey 1988; Strumia 1996; Rosa 2018, 2019a, b), and a few citations on local faunas (e.g. Sihag 1983; Roy & Kundu 1985; Kadirvelu 1991; Mathew *et al.* 1998; Suresh *et al.* 1999; Mathew 2004; Anbalagan *et al.* 2015; Thakkar & Parikh 2018; Johnson & Kunchithapatham 2019; Ahmed *et al.* 2020).

The objective of the present paper is to summarize information concerning the taxa previously recorded from

India, to identify potential misidentifications and dubious distributional records as a baseline for future studies on the diversity and distribution pattern of chrysidids in India. A comprehensive and critical list of Indian chrysidids with current known state-wise distribution is provided. The distributional analyses of records are presented to help in the identification of major undersampled areas where future sampling and taxonomic efforts should be focused.

Materials and methods

The present study is based on two sources of information: (1) data extracted from published papers and (2) specimens studied in European museums and in private collections. Type material and other specimens were studied at the Magyar Természettudományi Múzeum, Budapest (HNHM); Muséum National d'Histoire Naturelle, Paris (MNHN); Naturhistorisches Museum Wien, Vienna (NHMW); Museo Civico di Storia Naturale, Genova (MSNG); The Natural History Museum, London (NHMUK); and Natur Museum, Luzern (MNLU). A large portion of Indian chrysidids deposited in these museums as well as specimens collected and deposited in collections in India are still awaiting identification.

The subdivision of the former British India into India (Fig. 1) and Pakistan had generated ambiguity in the proper positioning of collecting localities on a map. In fact, several specimens found in museums with general labels "India" were in fact collected in Pakistan.

India covers the Oriental and Palaearctic zoogeographic regions. However, the border between these two regions is not obvious due to the landform and climate. Based on the scarce available data for Chrysidids, the Palaearctic and Oriental fauna might be mixed up in the southern slope of the Himalayas in a broad transition, as in western China (Chen *et al.* 2008). In fact, if species found over a certain altitude are clearly related to Palaearctic region (e.g. members of the *ignita* group), the geography of the area includes traveling channels in the valleys for flying hymenopterans. Therefore, in several areas at lower elevation it may include members belonging to either Palaearctic or Oriental region. In the present paper, we consider as Palaearctic those species collected in the States at the southern slopes of Himalayas as well as those collected in the north-western states with xeric shrublands, woodlands and steppes.

More in detail, species from the following biome are typically Palaearctic: from the Eastern Himalayan broad-leaf forests of across Sikkim, West Bengal and Arunachal Pradesh, which is found in the middle elevations of the eastern Himalayas; the northeastern Himalayan subalpine coniferous forest, extended from the middle to upper elevations of the eastern Himalayas, such as in Arunachal Pradesh; the montane grasslands and shrublands, which includes high altitude grasslands and shrublands; an example is the Eastern Himalayan alpine shrub and meadows, which lies between the tree line and snow line and alpine steppe of the Karakoram-West Tibetan Plateau found in Ladakh; the Northwestern and Western Himalayan alpine shrub and meadows is a similar biome found in Himachal Pradesh and Jammu and Kashmir in Northwestern India and northern Pakistan, as well as in the Uttarakhand. Lastly, we consider predominantly Palaearctic the cuckoo wasp fauna of the North-western Indian states, such as northern Gujarat, Rajasthan, and Punjab, with xeric woodlands, shrublands and steppes, which is apparently more related to the Central Asian fauna (e.g. for members of the *pallidicornis* and *maculicornis* groups).

In the list below, genera of Chrysidids are divided in subfamilies, which are listed in systematic order, whereas species are enumerated alphabetically. For each species, the general distribution is provided. New records for India are asterisked (*). Morphological terminology in this study mainly follows those of Kimsey & Bohart (1991, part.) and Lanes *et al.* (2020, part.).

Abbreviations used in the descriptions are as follows: F1, F2, F3, etc. = flagellomeres 1, 2, 3, etc., respectively; l/w=length/width ratio; MOD = median ocellus diameter (measured in frontal view); MS = malar space, the shortest distance between base of mandible and lowest margin of compound eye; OOL = oculo-ocellar line, the shortest distance between posterior ocellus and compound eye; P = pedicel; PD = puncture diameter; POL = posterior ocellar line, the shortest distance between posterior ocelli.

Images of the type specimens were taken mostly with Nikon D80, D700, D3400 connected to the microscope Tegal SCZ and stacked with the software Combine ZP; in some cases, a Leica photcamera and microscope were used (specimens from Naturhistorisches Museum, Vienna).

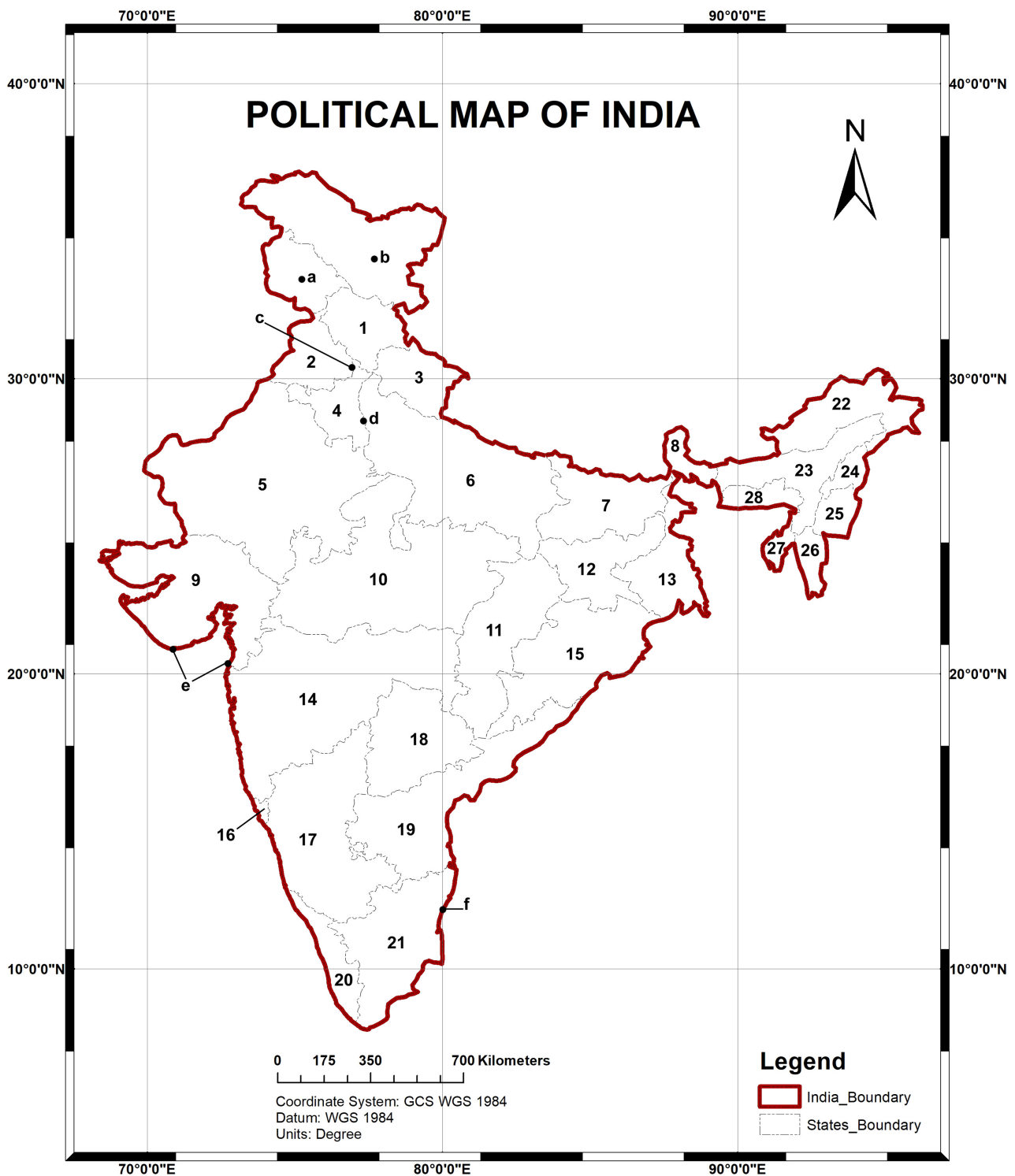


FIGURE 1. Indian States: 1. Himachal Pradesh, 2. Punjab, 3. Uttarakhand, 4. Haryana, 5. Rajasthan, 6. Uttar Pradesh, 7. Bihar, 8. Sikkim, 9. Gujarat, 10. Madhya Pradesh, 11. Chhattisgarh, 12. Jharkhand, 13. West Bengal, 14. Maharashtra, 15. Odisha, 16. Goa, 17. Karnataka, 18. Telangana, 19. Andhra Pradesh, 20. Kerala, 21. Tamil Nadu, 22. Arunachal Pradesh, 23. Assam, 24. Nagaland, 25. Manipur, 26. Mizoram, 27. Tripura, 28. Meghalaya. Union Territories: a. Jammu & Kashmir, b. Ladakh, c. Chandigarh, d. Delhi, e. Dadra & Nagar Haveli and Daman & Diu, f. Puducherry.

The definitions of holotype, neotype, lectotype etc. are used according to the International Code of Zoological Nomenclature (ICZN 1999), fourth edition. The following abbreviations are used: cat. (catalogue), comp. diagn. (comparative diagnosis), descr. (description), diagn. (diagnosis), distr. (distribution), fig. (figure), mis. (misidentification), pag. (page), s.s. (*sensu stricto*), syn. (synonym), typ. (discussion on type material).

Types and other specimens were deposited in the private collections of the first author (PRC), Gian Luca Agnoli collection (Bologna, Italy) (GLAC), Marek Halada collection (České Budějovice, Czech Republic) (MHC) and in the following institutions:

BME	Bohart Museum of Entomology, University of California, Davis, USA
NHMUK	Natural History Museum, London, United Kingdom
CNC	Canadian National Collection, Ottawa, Canada
HECO	Hope Entomological Collections, Oxford University Museum, Oxford, United Kingdom
HNHM	Magyar Természettudományi Múzeum, Budapest, Hungary
IFRI	Indian Forest Research Institute, Dehradun, India
ISEA-PAS	Instytut Systematyki i Ewolucji Zwierząt, Kraków, Poland
KUM	Kyushu University Museum, Faculty of Bioresource and Bioenvironmental Sciences and Faculty of Social and Cultural Studies, Fukuoka, Japan
MfN	Museum für Naturkunde, Berlin, Germany
MHNG	Muséum d'Histoire Naturelle, Genève, Switzerland
MMZ	Zoological Museum, Lomonosov State University, Moscow, Russia
MNHN	Muséum National d'Histoire Naturelle, Paris, France
MSNG	Museo Civico di Storia Naturale, Genova, Italy
MSNM	Museo Civico di Storia Naturale, Milano, Italy
MSNT	Museo Regionale di Storia Naturale, Torino, Italy
NBC	Naturalis Biodiversity Center, Leiden, The Netherlands
NHMW	Naturhistorisches Museum Wien, Vienna, Austria
MNLU	Natur Museum, Luzern, Switzerland
SCAU	South China Agricultural University, Guangzhou, China
USNM	United States National Museum of Natural History, Washington DC, USA
ZIN	Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia
ZMU	Statens Naturhistoriske Museum, Copenhagen, Denmark

C. List of the species

I. Subfamily Cleptinae

Genus *Lustrina* Kurian, 1955

Lustrina Kurian, 1955: 86. Type species: *Lustrina assamensis* Kurian, 1955. Original designation.

Lustrina assamensis Kurian, 1955

(Fig. 2)

Lustrina assamensis Kurian, 1955: 87. Holotype ♀; India: Assam (87 (descr.), 145 (figs (76–80))) (depository: IFRI) (examined).

Nagy 1968: 168 (descr., Assam), 169 (typ., fig. 1).

Cleptes assamensis: Kimsey & Bohart 1991: 53, 59 (cat., Assam).

Lustrina assamensis: Móczár 1996: 134 (key, cat.); Rosa *et al.* 2020b: 287 (descr., fig. 1A), 288 (fig. 2), 289 (typ., figs 3, 4).

Distribution. India (Assam); Vietnam (Rosa *et al.* 2020b).



FIGURE 2. *Lustrina assamensis* Kurian, 1955, female. Habitus, dorsal view. Photo: Toshiharu Mita.

II. Subfamily Amiseginae

Genus *Indothrix* Krombein, 1957

Indothrix Krombein, 1957: 198. Type species: *Indothrix longicornis* Krombein, 1957. Original designation.

***Indothrix longicornis* Krombein, 1957**

(Figs 3A–3B)

Indothrix longicornis Krombein, 1957: 198. Holotype ♂; India: Tamil Nadu: Kodaikanal, Pulney Hills (58 (key), 198–199 (descr.), pl. XIX (fig. 9), pl. XXI (fig. 23)) (USNM). Kimsey & Bohart 1991: 115 (cat., Southern India); Li & Xu 2016: 76 (Southern India), 77 (fig. 5), 77–78 (diag.), 78 (key).

Distribution. India (Tamil Nadu).



FIGURE 3. *Indothrix longicornis* Krombein, 1957, holotype, male. A. Head, frontal view. B. Habitus, lateral view.

III. Subfamily Loboscelidiinae

Genus *Loboscelidia* Westwood, 1874

Loboscelidia Westwood, 1874: 171. Type species: *Loboscelidia rufescens* Westwood, 1874: 172. Monotypic.

Loboscelidia incompleta Kimsey, 2012

(Figs 4A–4C)

Loboscelidia incompleta Kimsey, 2012: 18. Holotype ♂; India: Tamil Nadu: Nilgiri Hills (6 (key), 8 (fig. 13), 18 (descr.), 34 (fig. 27)) (CNC).

Distribution. India (Tamil Nadu).

Loboscelidia indica Kimsey, 1988

(Figs 5A–5D)

Loboscelidia indica Kimsey, 1988: 69. Holotype ♂; India: Tamil Nadu: Nilgiri Hills (69–71 (descr.), 70 (figs 2, 6)) (CNC).
Kimsey & Bohart 1991: 147 (cat., South India); Kimsey 2012: 9 (key), 19 (diagn., India: Nilgiri).

Distribution: India (Tamil Nadu).

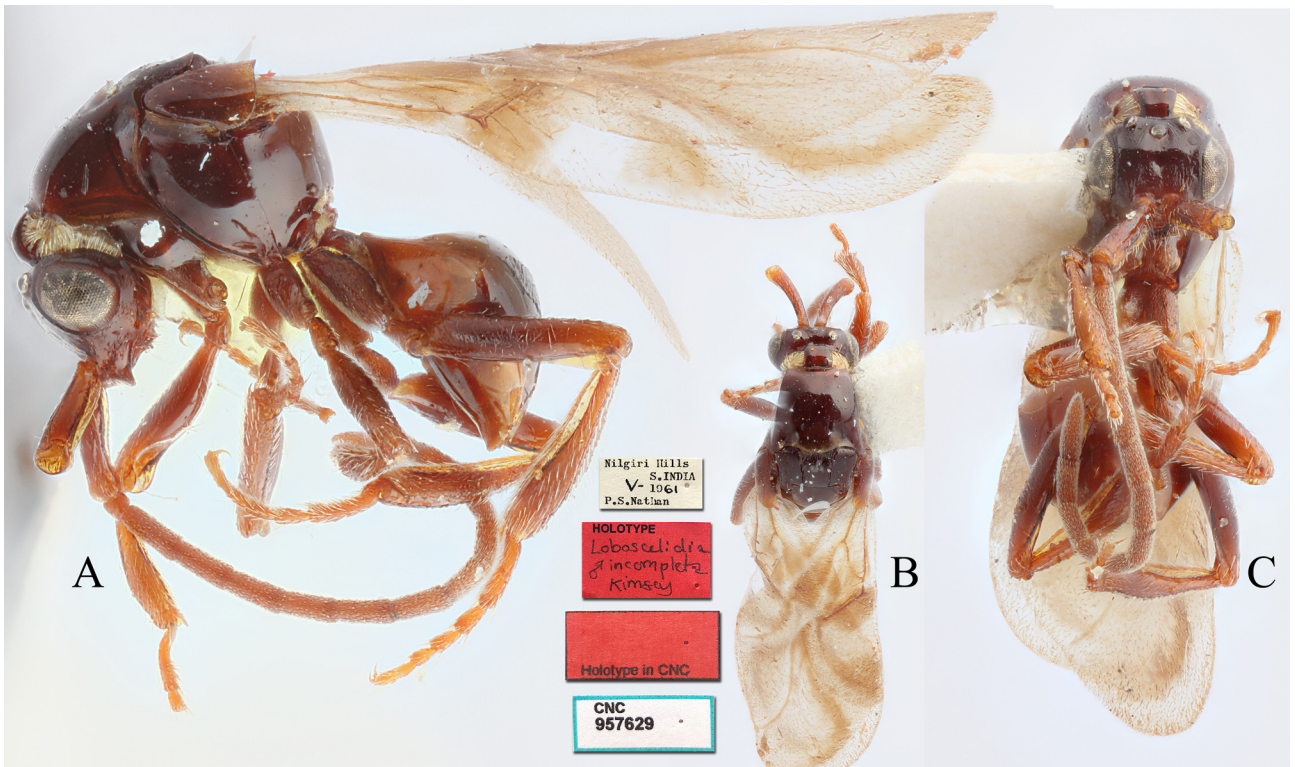


FIGURE 4. *Loboscelidia incompleta* Kimsey, 2012, holotype, male. A–C. Habitus, lateral (A), dorsal (B) and ventral (C) views.

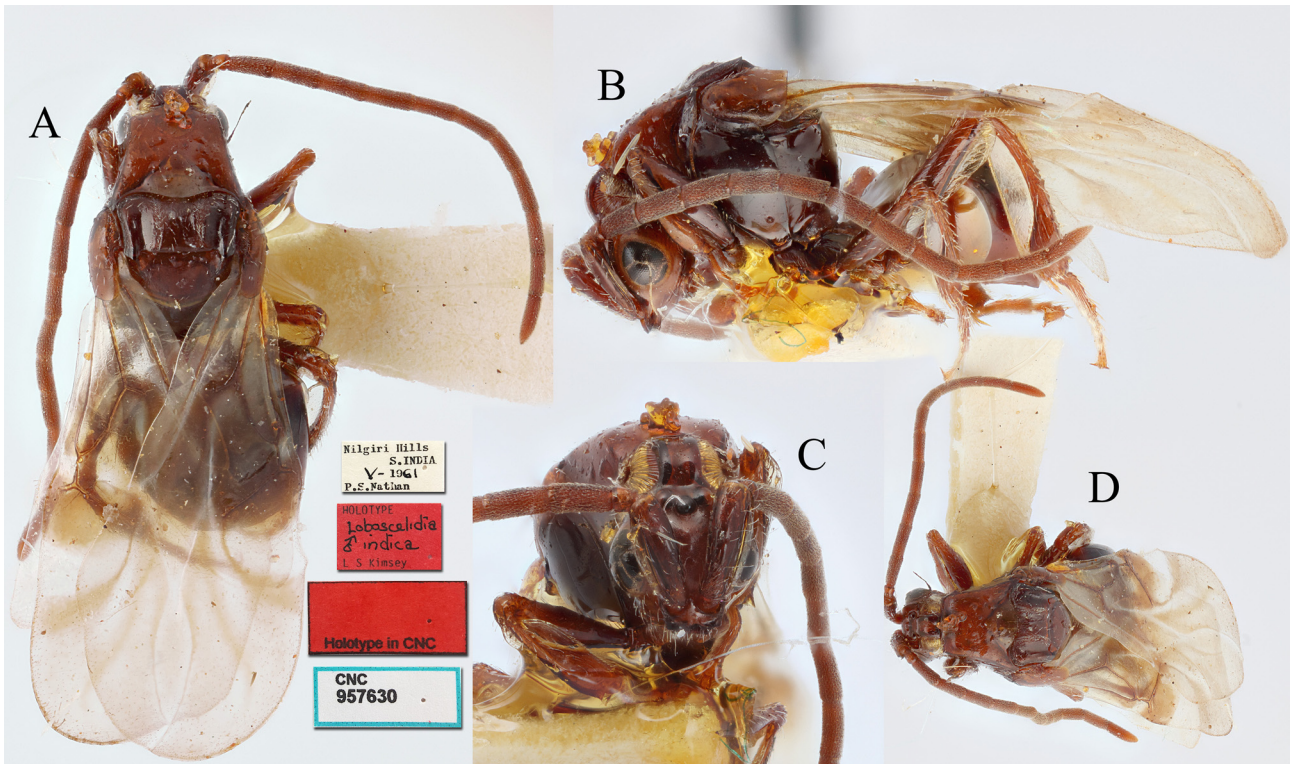


FIGURE 5. *Loboscelidia indica* Kimsey, 1988, holotype, male. A, B, D. Habitus, dorsal (A), lateral (B) and dorsal (D) views. C. Head, frontal view.

IV. Subfamily Chrysidinae

Tribe Elampini

Genus *Elampus* Spinola, 1806

Elampus Spinola, 1806: 10. Type species: *Chrysis panzeri* Fabricius, 1804 [= *Elampus panzeri* (Fabricius, 1804)], by subsequent designation of Latreille 1810: 437.

Ellampus Agassiz, 1846: 136. Unjustified emendation of *Elampus* Spinola, 1806.

Notozus Förster, 1853: 351. Type species: *Notozus frivaldszkii* Förster, 1853 [= *Elampus spina* (Lepelletier, 1806)], by subsequent designation of Ashmead 1902: 228.

Elampus assamensis (Mocsáry, 1911)

(Figs 6A–6C)

Ellampus (Notozus) assamensis Mocsáry, 1911: 443. Holotype ♂; India: Meghalaya [formerly Assam]: Shillong (HNHM).

Notozus assamensis: Bischoff 1913: 5 (cat., Assam [actually Meghalaya]).

Elampus assamensis: Kimsey & Bohart 1991: 166 (cat., North India); Rosa *et al.* 2017c: 8 (diagn.), 9 (fig. 3).

Material examined. 1 ♂, Shillong 9.[19]03, Assam Shillong, *assamensis* typ. Mocs. det. Mocsáry, Collect. Bingham, Typus *assamensis* Mocs., Holotypus *Ellampus assamensis* ♂ Mocsáry (L.D. French), id. nr. 134900 HNHM Hym. Coll. (HNHM).

Distribution. India (Meghalaya); Russia (Far East) (Rosa *et al.* 2017c).

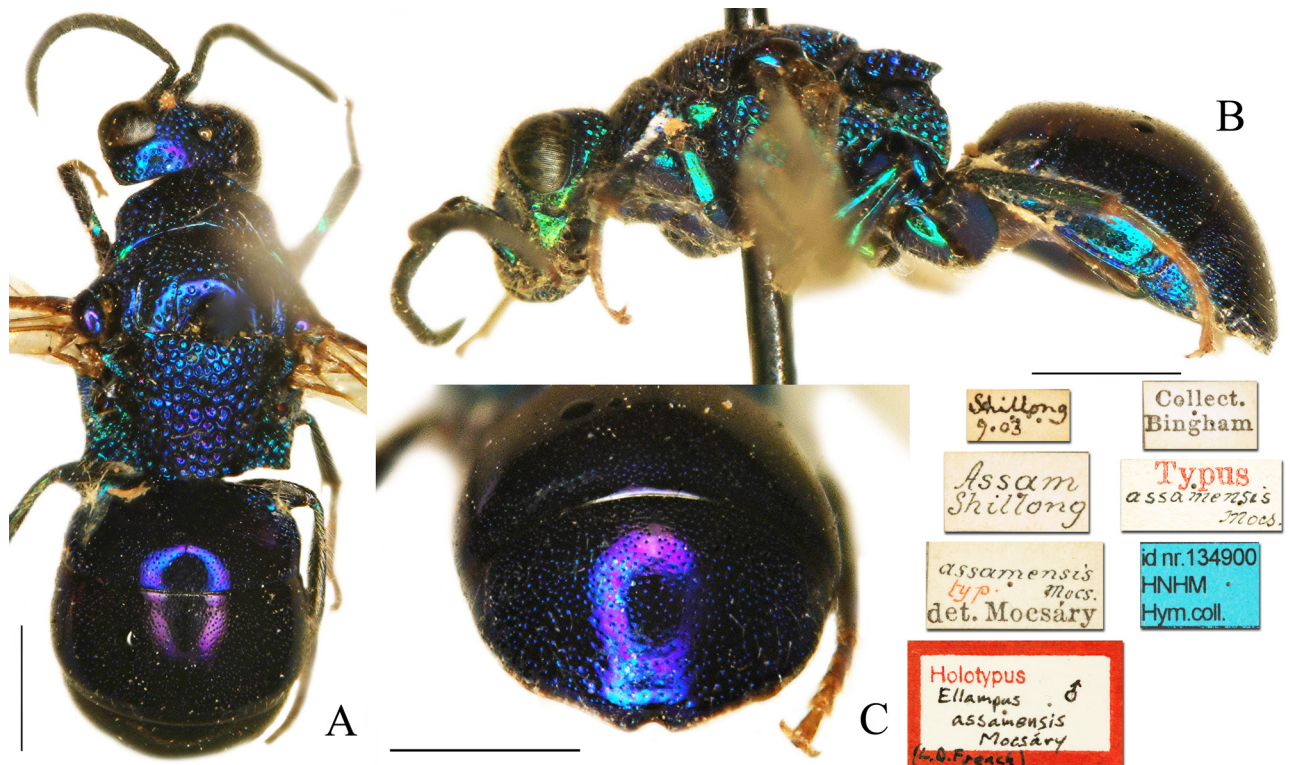


FIGURE 6. *Elampus assamensis* (Mocsáry, 1911), holotype, male. A. Habitus, dorsal view. B. Habitus, lateral view. C. Third tergum, posterior view. Scale bars 1.0 mm.

***Elampus gladiator* Rosa, sp. nov.**

(Figs 7A–7D)

Material examined. Holotype: ♂; India: Himachal Pradesh, Manali/Mahri, 3300–3600m, 21.–22.vi.1989, leg. A. Riedl, GBIF_Chr00002090 (MNLU). Paratypes: 1 ♂: Jammu, Kishtwar, Inshan, ca. 33.30N, 75.30E, 2200m, 17.–19.vii.1980, leg. J. & K., H., U. & Ch. Aspöck & H. Rausch, GBIF_Chr00002090 (MNLU); 1 ♀, Uttar Pradesh, 15km S Badarinath, 30 km N Joshimath, 2800m, 10.vii.1994, leg. M. Šnizek (MHC).

Diagnosis. Blue coloured species with elongate, transversal depression running on antero-lateral pronotal area (Fig. 7A) and on metasomal tergum I antero-laterally (Fig. 7A); posterior propodeal projections markedly diverging (Fig. 7A); metascutellar projection narrow and elongate; posterior truncation of apical margin of tergum III narrow, falcate (Figs 7G, 7H).

Description. *Male.* Body length 7.0 mm. Forewing length 5.2 mm. OOL $3.6 \times \text{MOD}$; POL $2.0 \times \text{MOD}$; MS $0.5 \times \text{MOD}$; relative length of P:F1:F2:F3 = 1.0:1.6:0.3:0.5.

Head. Vertex and frons with medium-sized (up to $0.5 \times \text{MOD}$) and contiguous punctures, without polished interspaces, with impunctate area lateral to posterior ocelli and along eye margin on temple and gena; scapal basin striate, with distinct, fine striations, closed together and curved, following basin contour; scapal basin medially impunctate below frons and close to clypeus (Fig. 7D); subantennal space about $1.0 \times \text{MOD}$; apical margin of clypeus almost straight; temple enlarged, in lateral view, about $2.7 \times \text{MOD}$; post-ocellar line faint.

Mesosoma. Pronotum with elongate, transverse depression running on antero-lateral pronotal area; punctation on pronotum deep and dense, with polished interspaces, $0.1\text{--}1.0 \times \text{PD}$ apart; lateral pronotal area irregularly striate; mesoscutum with larger punctures, deep with large and polished interspaces on lateral area; notauli deep, as fine lines; parapsidal signum [= parapsidal line] fully developed; mesoscutellum with deep, larger and contiguous punctures, without polished interspaces in the holotype, with some polished interspaces along anterior margin in the paratype; metanotum with large, irregular foveate punctures without interspaces; metascutellar projection narrow and elongate, apically lanceolate (Fig. 7A); posterior propodeal projections [= propodeal teeth] triangular, large and divergent (Fig. 7A); mesopleuron ventrally angulated and carinate with large, contiguous foveate punctures, without polished interspaces (Fig. 7B). Profemur ventrally carinate, not angled or toothlike. Wings with nervures unmodified.

Metasoma. Tergum I antero-laterally depressed; punctation on terga I and II shallow, with scattered and small punctures dorsally with large polished interspaces, up to $5.0\text{--}6.0 \times \text{PD}$ apart or even larger medially; on terga I and II laterally with double punctation, narrow and corrugated interspaces, on tergum II apically with tiny dots on interspaces; on tergum III with double punctation and closer punctures, laterally denser with corrugated interspaces; lateral margin of tergum III sinuate anterior to apical truncation; apical truncation narrow and falcate, with pointed margins ventrally (Figs 7G, 7H).

Colouration. Body dark blue, with some violet reflections on mesosoma and black metanotal projection; scape blue, pedicel shining black, flagellum black; tarsi dark brown, tarsomere V lighter; tegula dark brown. Wing membrane brown, with dark brown veins. Metasoma ventrally metallic green.

Vestiture. Head with whitish, erect, and short setae, about $1.0 \times \text{MOD}$ long; longer on mesosoma and metasoma, about $1.5 \times \text{MOD}$.

Female. Similar to male in habitus and colouration, with similar body punctation, metascutellar projection and apical truncation of tergum III. It can be easily recognized for dimorphic sexual characters such as: gena with row of dense, short and aligned setae, head in frontal and dorsal view differently shaped (Figs 7E–F), showing the same dimorphic difference between male and female of the Euroasian species *Elampus bidens* (Förster, 1853); flagellomeres distinctly longer than in male (median segments $l/w = 3$; in male $l/w = 2$); anterior femur ventrally carinate (Fig. 7C).

Distribution. India (Palearctic part: Himachal Pradesh, Jammu & Kashmir, Uttar Pradesh).

Etymology. The specific name *gladiator* (masculine, noun in apposition) derives from the Latin word *gladiator* (swordsmen), an armed combatant who fights with the *gladius*, an elongate sword similar to the metascutellar projection of this species.

Remarks. The genus *Elampus* Spinola needs revision. Currently several blue species occur in Asia, namely *Elampus assamensis* (Mocsáry, 1911), *E. caeruleus* Dahlbom, 1854, *E. hyrcanus* (Semenov-Tian-Shanskij, 1967), *E. komarovi* (Radoszkowski, 1893), *E. montanus* (Mocsáry, 1890), *E. pliginskii* (Semenov-Tian-Shanskij, 1967),

and *E. ussurensis* (Semenov-Tian-Shanskij, 1967). Among them, the only similar species for its general habitus is the latter. *Elampus gladiator* is separated from *E. ussurensis* by pronotum with antero-lateral depressions (vs. unmodified); deep, dense and coarse punctures on pronotum (vs. shallow and sparser, with polished interspaces); second metasomal tergum with scattered small punctures (vs. dense small punctures). All the other species have different shape of metanotal projection, metasomal truncation, and posterior propodeal projections.

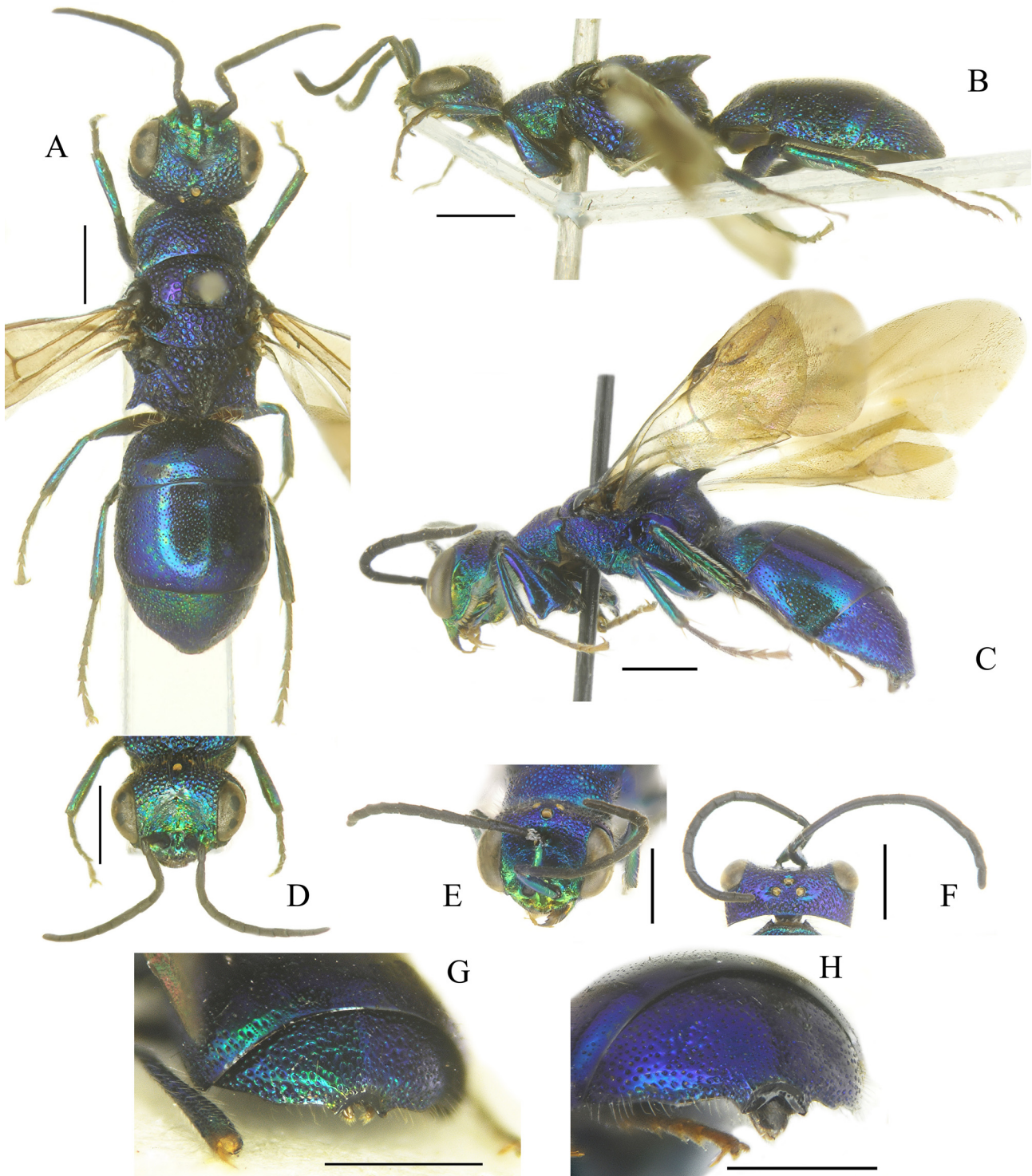


FIGURE 7. *Elampus gladiator* Rosa, **sp. nov.**, holotype, male. A. Habitus, dorsal view. B. Habitus, lateral view. D. Head, frontal view. G. Third tergum, posterior view. *Elampus gladiator* Rosa, **sp. nov.**, paratype, female. C. Habitus, lateral view. E. Head, frontal view. F. Head, dorsal view. H. Third tergum, posterior view. Scale bars 1.0 mm.

Genus *Hedychridium* Abeille de Perrin, 1878

Hedychridium Abeille de Perrin, 1878: 3. Type species: *Hedychrum minutum* Lepeletier, 1806 [= *Hedychridium ardens* (Coquebert, 1801)], by subsequent designation of Ashmead 1902: 227.

Hedychridium aeruginosum (Mocsáry, 1914)

Holopyga (*Hedychridium*) *aeruginosa* Mocsáry, 1914: 6. Holotype ♀ [not ♂]; India: Sikkim (NHMUK).

Hedychridium aeruginosum: Kimsey & Bohart 1991: 186 (cat., India: Sikkim); Strumia 1999: 49 (key), 50 (typ., descr., Sikkim), 52 (figs 25–28), 74 (*incrassatum* group).

Distribution. India (Sikkim).

Hedychridium amatum Nurse, 1904

Hedychridium amatum Nurse, 1904: 19. Holotype ♂ [not ♀]; India: Gujarat: Deesa (19 (descr.), 20 (comp. notes)) (NHMUK). Bischoff 1913: 14 (cat.); Kimsey & Bohart 1991: 187 (cat., India: Deesa); Strumia 1999: 49 (key), 51 (figs 1–3), 52–54 (typ., descr., Deesa), 74 (*incrassatum* group).

Hedychridium (*Hedychridium*) *amatum*: Linsenmaier 1999: 75 (key), 77 (descr., North-West India, *incrassatum* group), 88 (fig. 134).

Distribution. India (Gujarat, North-West India).

Hedychridium mocsaryi Rosa, nom. nov.

Holopyga (*Hedychridium*) *virescens* Mocsáry, 1914: 5. Holotype ♀; India: Uttar Pradesh: Bulandshahr (NHMUK). Kimsey & Bohart 1991: 236 (cat., India).

Hedychridium mocsaryi Rosa, replacement name for *Hedychridium virescens* (Mocsáry, 1914) *nec* du Buysson, 1908.

Distribution. India (Uttar Pradesh, Gujarat).

Remarks. *Holopyga virescens* was described by Mocsáry (1914) in the subgenus *Hedychridium*, which was considered as a valid genus by all following and contemporary authors. The type of *Holopyga virescens* was no longer checked after the description, not even by Kimsey & Bohart (1991). We here transfer *Holopyga virescens* to the genus *Hedychridium*, where the name is pre-occupied by *Hedychridium aheneum* var. *virescens* du Buysson, 1908 (currently *Hedychridium virescens*). We here propose *Hedychridium mocsaryi* replacement name for *Holopyga* (*Hedychridium*) *virescens* Mocsáry, 1914 *nec* du Buysson, 1908.

Hedychridium rotundum Nurse, 1904

Hedychridium rotundum Nurse, 1904: 20. Holotype ♀; India: Gujarat: Deesa (NHMUK). Bischoff 1913: 16 (cat.);

Kimsey & Bohart 1991: 203 (cat., India: Deesa); Strumia 1999: 50 (key), 51 (figs 9–10), 66 (descr.), 74 (unknown species group).

Distribution. India (Gujarat); Pakistan (Strumia 1999).

Hedychridium sikkimium Strumia, 1999

Hedychridium sikkimium Strumia, 1999: 69. Holotype ♀; India: Sikkim: Chumtang, 5,120 ft, 18–29.vi.1959, leg. F. Schmidt (50 (key), 57 (figs 29–31), 69 (descr.)) (NBC).

Distribution. India (Sikkim).

***Hedychridium wroughtoni* du Buysson, 1896b**

(Figs 8A–8D)

Hedychridium wroughtoni du Buysson, 1896b: 466. Holotype ♀; India: Central Provinces (Inde Anglaise) (466 (descr.), pl. II (figs 5, 6), pl. V (fig. 4)) (MNHN). Bingham 1908: 347 (cat., Oudh: Lucknow, Central India); Kimsey 1986: 108 (invalid lectotype designation); Jonathan *et al.* 1977: 85 (India: Gujarat); Kimsey & Bohart 1991: 207 (cat. India: Central Prov.); Strumia 1999: 49 (key), 53 (figs 11–14), 71 (descr., India: Nilgiri Hills; Coimbatore).

Hedychrum wroughtoni Bingham, 1903: 425 (cat., India: Central provinces of India, species unknown to Bingham), 424 (key), 425 (descr.).

Material examined. 2 ♂, 3 ♀, Tamil Nadu: Nilgiri Hills, Nadawaram, without further data (NHMW); 1 ♂, Tamil Nadu, Coimbatore, 29.ix.1953, leg. Nathan (MNLU); 1 ♀, Tamil Nadu: Pulney Hills [= Palni Hills], Kodaikanal, 6500 ft, v.19, leg. Nathan (MNLU).

Distribution. India (Central Provinces (locality not specified), Tamil Nadu, Uttar Pradesh, Gujarat). Nepal (Bingham 1908), Myanmar, Sri Lanka (Strumia 1999).

Remarks. Kimsey & Bohart (1991) proposed the name *Hedychridium attenuatum* group, for those species sharing general habitus similar to *Hedychrum*; a pit on the hind tibia; mandible without subsidiary tooth; elongate clypeus; elongate pronotum and metanotum; mesopleuron ventrally rounded; forewing radial sector (Second radial cross & Radial sector) longer than stigma. Linsenmaier (1968) and Rosa & Agnoli (2019) named this species group *Hedychridium planifrons* group. It was named *Hedychridium wroughtoni* group by Strumia (1999) after synonymisation of *H. attenuatum* Mocsáry, 1914 with *H. wroughtoni*. The group includes the following species: *Hedychridium wroughtoni*; *H. aegyptiacum* du Buysson, 1898a; *H. planifrons* du Buysson, 1900; *H. iocosum* Linsenmaier, 1959; *H. laetificum* Linsenmaier, 1959; and probably *H. tarbinskyi* Rosa & Agnoli, 2019, and *H. nevadae* Kimsey in Bohart & Kimsey, 1978 (not examined).

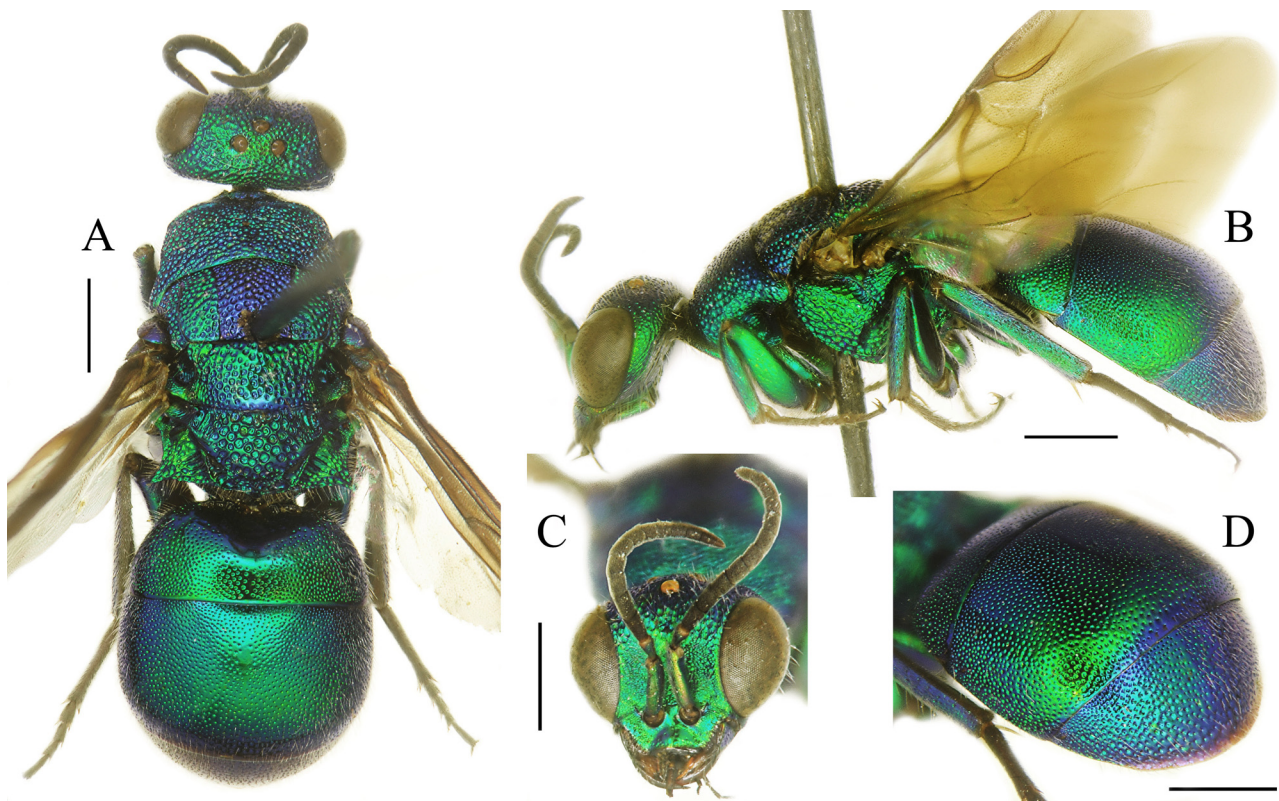


FIGURE 8. *Hedychridium wroughtoni* du Buysson, 1896, female from Tamil Nadu. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, dorso-lateral view. Scale bars 1.0 mm.

Genus *Hedychrum* Latreille, 1802

Hedychrum Latreille, 1802: 317. Type species: *Chrysis lucidula* Fabricius, 1775 (= *Sphex nobilis* Scopoli, 1763). Monotypic.

Hedychrum crassitarse Rosa, 2019b

(Figs 9A–9E)

Hedychrum crassitarse Rosa, 2019b: 2. Holotype ♀; India: Tamil Nadu: Kumili (3 (descr.), 4 (figs 1–4), 5 (figs 5–7)) (MSNM).

Material examined. India: 1 ♀, Tamil Nadu, Kumili, vi.1986, leg. T. Nathan (MSNM).

Distribution. India (Tamil Nadu).

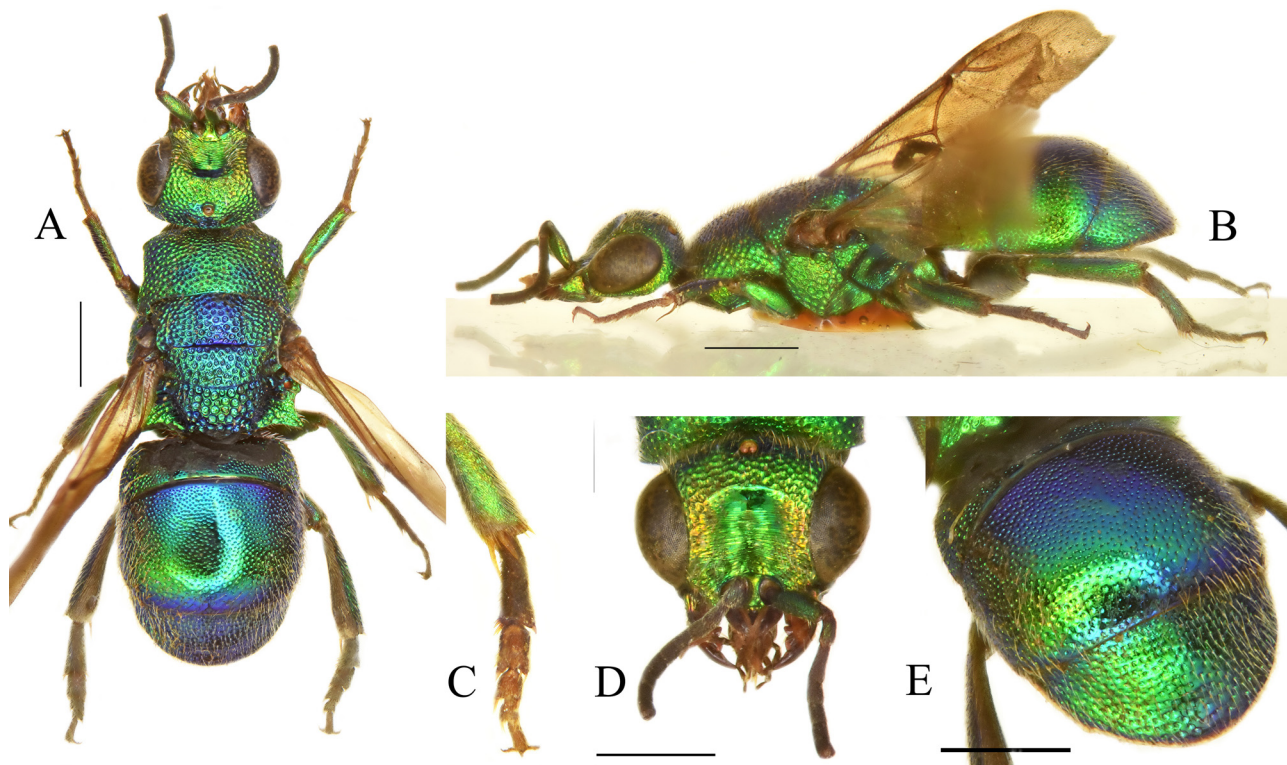


FIGURE 9. *Hedychrum crassitarse* Rosa, 2019, holotype, female. A. Habitus, dorsal view. B. Habitus, lateral view. C. Metaleg. D. Head, frontal view. E. Metasoma, dorso-lateral view. Scale bars 1.0 mm.

Hedychrum flammulatum Smith, 1859

Hedychrum flammulatum Smith, 1859: 26. Holotype ♂; Celebes [= Sulawesi]: Makassay (HECO). du Buysson 1896b: 464 (key), 466 (descr., India: Central provinces, Bombay: Poona [= Pune]), pl. II (fig. 7); du Buysson 1898b: 521 (descr., Bengal).

Distribution. India (Maharashtra; Bengal (locality not specified)); Indonesia (Sulawesi). Throughout Oriental sub-region (Jonathan *et al.* 1977).

Hedychrum gracilentum Mocsáry, 1911

Hedychrum gracilentum Mocsáry, 1911: 456. Holotype ♂; India: India orientalis: Lonauli [= Lonavala]: Bombay (HNHM). Bischoff 1913: 19 (cat.); Kimsey & Bohart 1991: 214 (cat., India: Lonauli).

Distribution. India (Maharashtra).

***Hedychrum lugubre* Cameron, 1897**

(Fig. 10)

Hedychrum lugubre Cameron, 1897: 6. Holotype ♂; India: Barrackpore (6–7 (descr.), pl. 16 (fig. 10)) (NHMUK). Bingham 1903: 428 (key), 430 (descr., Barrackpore); Bischoff 1913: 19 (cat.); Kimsey & Bohart 1991: 216 (cat., India: Bengal).

Material examined. 1 ♂, Type, Cameron Coll. 1909-182, *Hedychrum lugubrum* [!] Cam. Type Bengal, B.M. Type Hym. 13.31, BMNH(E) #970961 (NHMUK).

Distribution. India (West Bengal).

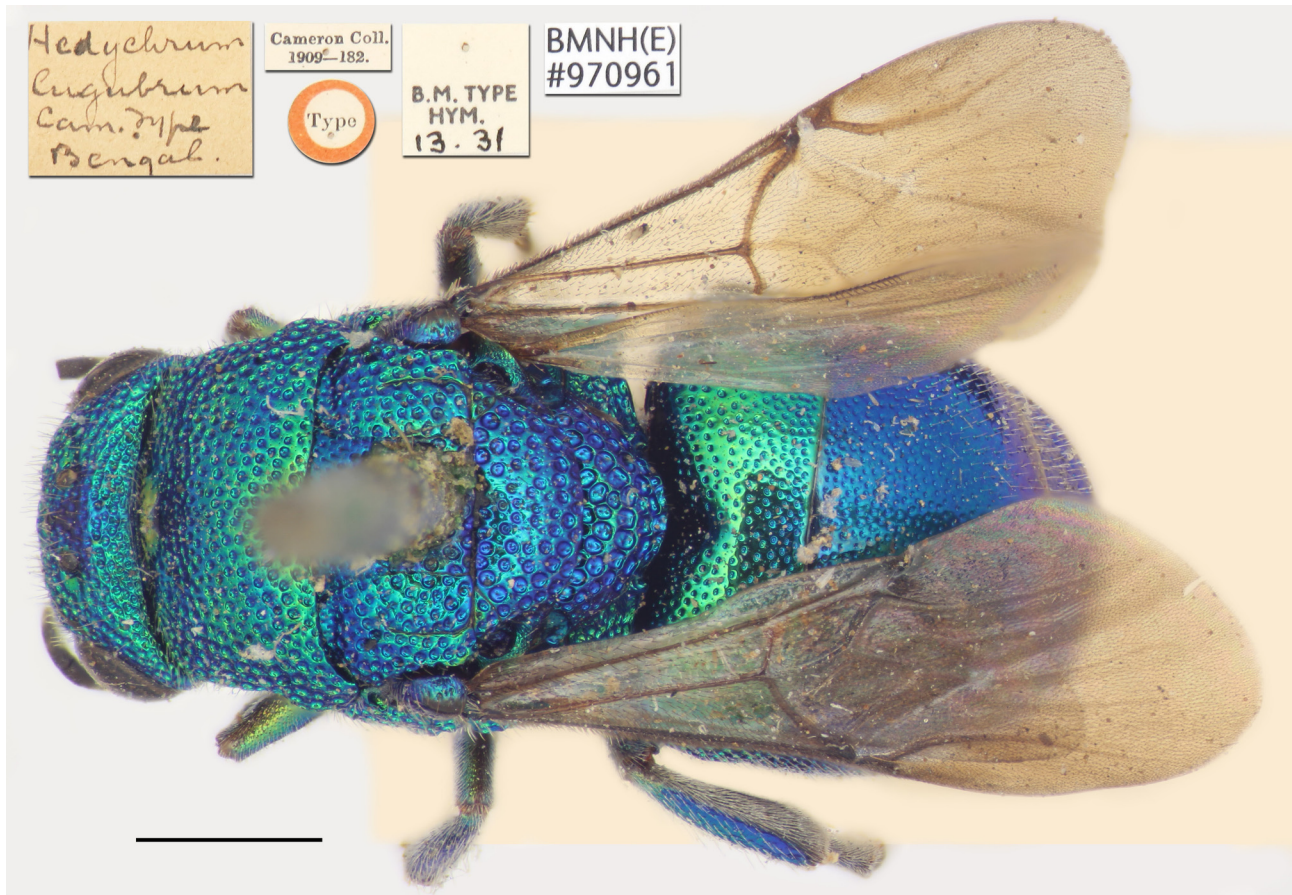


FIGURE 10. *Hedychrum lugubre* Cameron, 1897, holotype, female. Habitus, dorsal view. Scale bar 1.0 mm.

***Hedychrum timidum* Dahlbom, 1854**

(Figs 11A–11C)

Hedychrum timidum Dahlbom, 1854: 65. Holotype ♀; India: Bengal (58 (key), 65–66 (descr.)) (MZLU). Mocsáry 1889: 160 (descr., Bengal); Dalla Torre 1892: 35 (cat.); Bingham 1903: 428 (key), 428–429 (descr., Bengal, Punjab, Lahore, Delhi, Gujarat); Bischoff 1913: 20 (cat.); Jonathan *et al.* 1977: 85 (India); Kimsey & Bohart 1991: 221 (cat., India: Bengal); Rosa 2019a: 8 (comp. diag.), 10 (fig. 10).

Material examined. 1 ♀, Bengalen, *H. timidum* Dhlb., Typ., MZLU Type no. 6008: 1 (MZLU).

Distribution. India (Delhi; Gujarat; Punjab; Bengal (locality not specified)).

Remarks. Records of *Hedychrum timidum* from Pakistan (Quetta) (Bingham 1903) are related to *Hedychrum linsenmaieri* Rosa, 2019a.

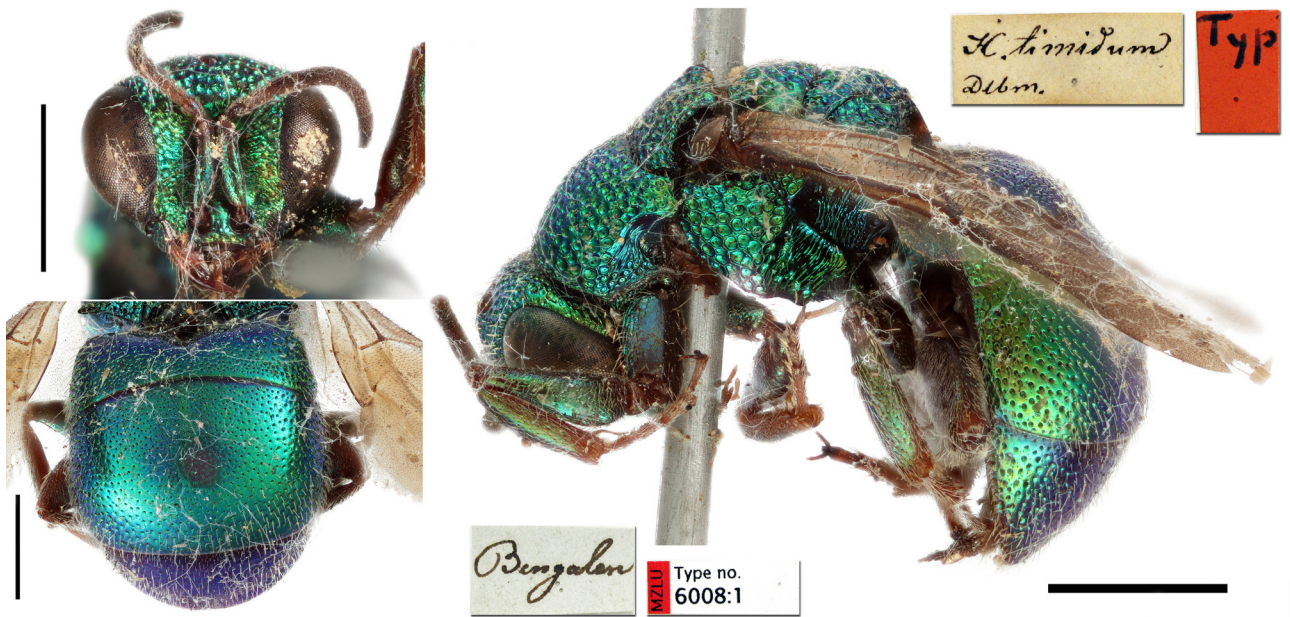


FIGURE 11. *Hedychrum timidum* Dahlbom, 1854, holotype, female. A. Head, frontal view. B. Metasoma, dorsal view. C. Habitus, lateral view. Scale bars 1.0 mm. (© The Trustees of the NHMUK)

Genus *Holophris* Mocsáry, 1890

Holophris Mocsáry, 1890: 51 (as subgenus of *Ellampus* Agassiz, 1846). Type species: *Ellampus (Holophris) marginellus* Mocsáry, 1890. Monotypic.

Holophris taiwana (Tsuneki, 1970)

(Figs 12A–12D)

Omalus taiwanus Tsuneki, 1970: 2. Holotype ♂; Taiwan: Nantou (KUM).

Holophris taiwana: Rosa *et al.* 2016b: 205 (key), 207–209 (descr., diagn., distr., 1♀, Tamil Nadu: Coimbatore; ♀, Karnataka: Bangalore).

Material examined. 1 ♂, Tamil Nadu, Pulney Hills [= Palni Hills], Kodaikanal, 6500 ft 7.v.1953, leg. Nathan (MNLU).

Distribution. India (Karnataka; Tamil Nadu); China (Taiwan, Guangdong, Hainan), Indonesia, Laos, and Thailand (Rosa *et al.* 2016b).

Genus *Holopyga* Dahlbom, 1845

Holopyga Dahlbom, 1845: 4. Type species: *Holopyga amoenula* Dahlbom, 1845, by subsequent designation of Ashmead 1902.

Holopyga cupreata Nurse, 1902

Holopyga cupreata Nurse, 1902: 305. Lectotype ♂ designated by Kimsey in Kimsey & Bohart 1991: 230; Kashmir, 5000–6000 ft (NHMUK). Bingham 1903: 421 (key), 423 (descr., Kashmir); Kimsey & Bohart 1991: 230 (cat., India: Kashmir).

Distribution. Kashmir.

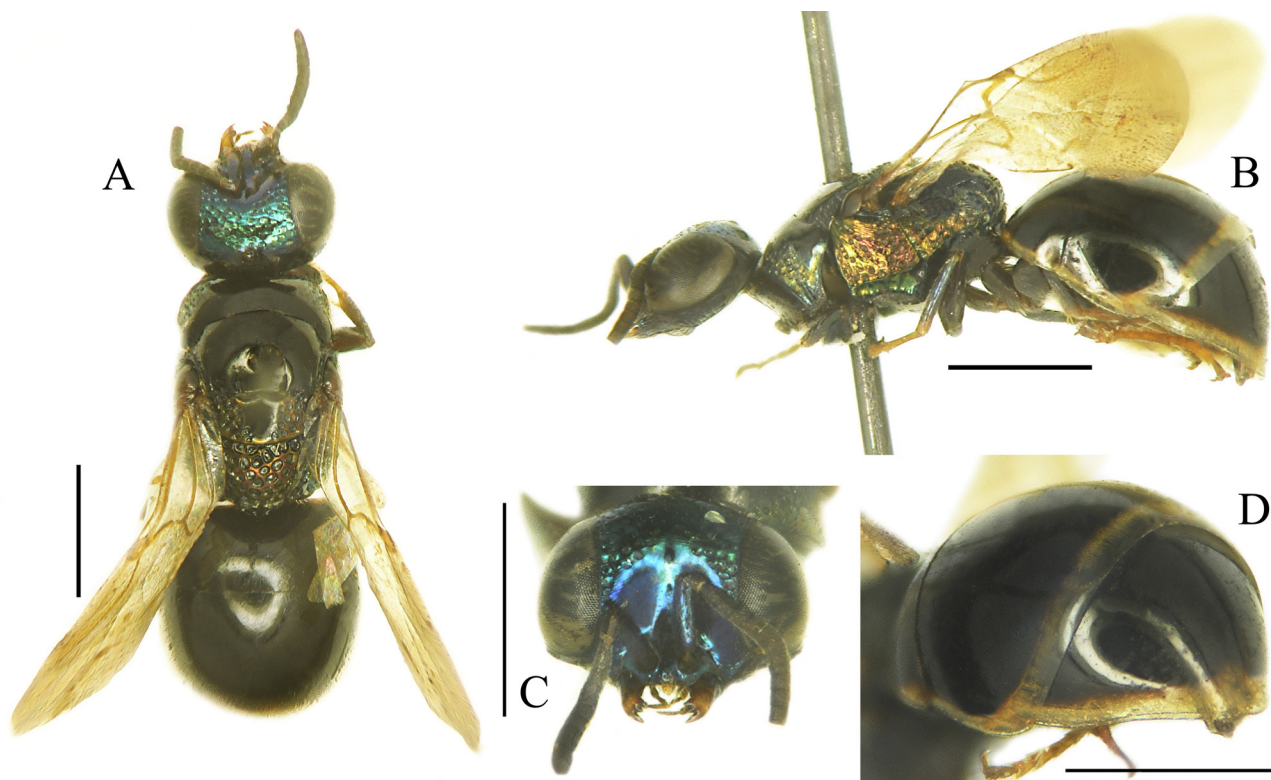


FIGURE 12. *Holophris taiwana* (Tsuneki, 1970), female from Tamil Nadu. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, postero-lateral view. Scale bars 1.0 mm.

***Holopyga indica* Mocsáry, 1889**
(Figs 13A–13D)

Holopyga (Holopyga) Indica Mocsáry, 1889: 118. Syntypes ♀; India orientalis (118 (descr.)) (HNHM).

Holopyga indica: Dalla Torre 1892: 27 (cat., India); du Buysson 1896b: 465 (cat., Central Provinces, Bangalore [= Bengaluru]), pl. I (fig. 12), pl. V (fig. 3); Bingham 1903: 421 (key), 422 (descr., India orientalis, Delhi, Rajputana, Mount Abu, fig. 149); Bischoff 1913: 13 (cat., India); Kimsey & Bohart 1991: 232 (cat., India).

Material examined. 1 ♂, Uttar Pradesh, Kawupore [= Kanpur], Anwarganj, without further data (NHMW); 10 ♂, 3 ♀, Karikal, without further data (NHMW).

Distribution. India (Karnataka; Delhi; Rajasthan; Uttar Pradesh; India orientalis (locality not specified); Central provinces (locality not specified)).

***Holopyga nursei* Bingham, 1903**
(Figs 14A–14G)

Holopyga Nursei Bingham, 1903: 423. Syntypes ♂; India: Gujarat: Deesa (421 (key), 423 (descr.)), pl. IV (fig. 16) (NHMUK). Bischoff 1913: 13 (cat., India); Kimsey & Bohart 1991: 234 (cat., India: Deesa).

Material examined. 1 ♂, Pakistan Quetta, vi.[19]03, Co. C.G. Nurse Collection. 1920–72, spec.? det. Linsenmaier, NML_ENT GBIF_Chr 00005380 (MNLU).

Distribution. India (Gujarat). Pakistan.

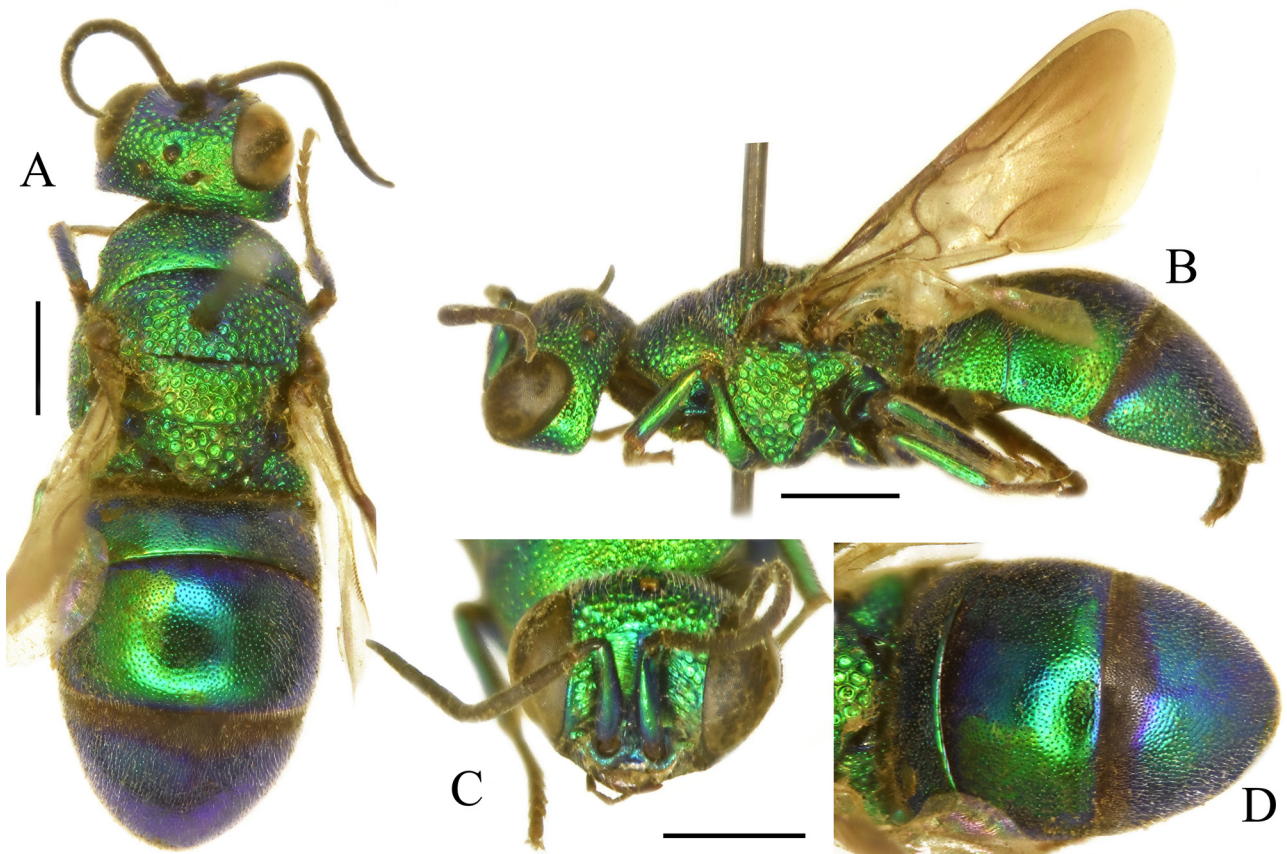


FIGURE 13. *Holopyga indica* Mocsáry, 1889, female from *Uttar Pradesh*. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, dorsal view.

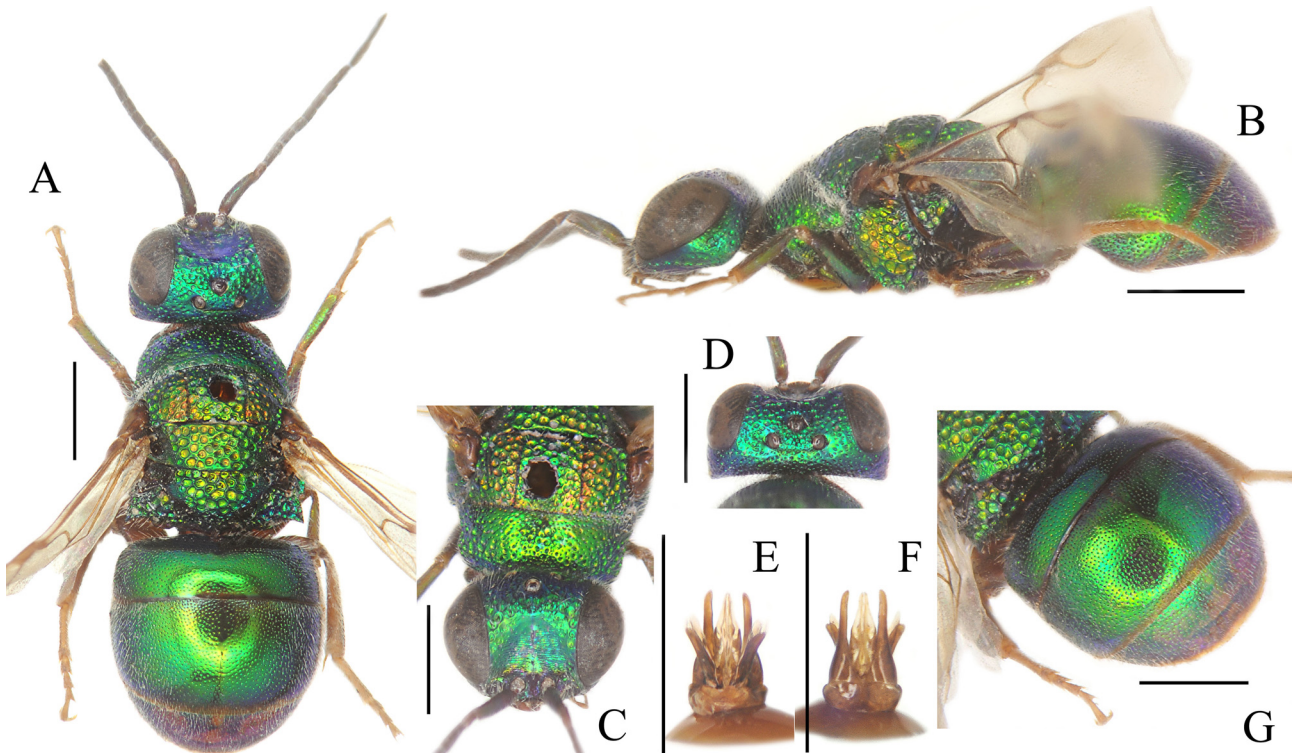


FIGURE 14. *Holopyga nursei* Bingham, 1903, male from *Gujarat*. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Head, dorsal view. E. Genital capsule, ventral view. F. Genital capsule, dorsal view. G. Metasoma, dorso-lateral view. Scale bars 1.0 mm.

Holopyga rugosa (Smith, 1852)

Hedychrum rugosa Smith, 1852: 45. Type series and sex unknown; India: Maharashtra: Poona [= Pune] (NHMUK).

Holopyga (Holopyga) rugosa: Mocsáry 1889: 125 (descr., Poona [= Pune]).

Hedychridium (?) rugosum: Bingham 1903: 424 (key), 425–426 (descr., Western India, Poona [= Pune]).

Holopyga rugosa: Dalla Torre 1892: 29 (cat., India); Bischoff 1913: 13 (cat., India); Kimsey & Bohart 1991: 235 (cat., India: Poona).

Distribution. India (Maharashtra; Western India (locality not specified)).

Holopyga solskyi (Radoszkowski, 1877)

Hedychrum solskyi Radoszkowski, 1877: 7. Syntypes ♂, ♀; Uzbekistan: Kizil-Kum Desert (MSNG, ISEA-PAS, MMZ).

Holopyga solskyi: Radoszkowski 1889: 9. Emendation of *H. solskyi* Radoszkowski, 1877.

Holopyga solskii: Kimsey & Bohart 1991: 235 (cat., North-East India).

Distribution. India (North-eastern India (locality not specified)).

Remarks. *Holopyga solskyi* is a Central Asian species, distributed in semidesert and desert areas. The record for North-East India, without further data (Kimsey & Bohart 1991) could be related to North-West India (Gujarat or Kashmir) instead of North-East India.

Genus *Omalus* Panzer, 1801

Omalus Panzer, 1801: 13. Type species: *Chrysis aenea* Fabricius, 1787 [= *Omalus aeneus* (Fabricius, 1787)]. Monotypic.

Omalus timidus (Nurse, 1902)

(Figs 15A–15F)

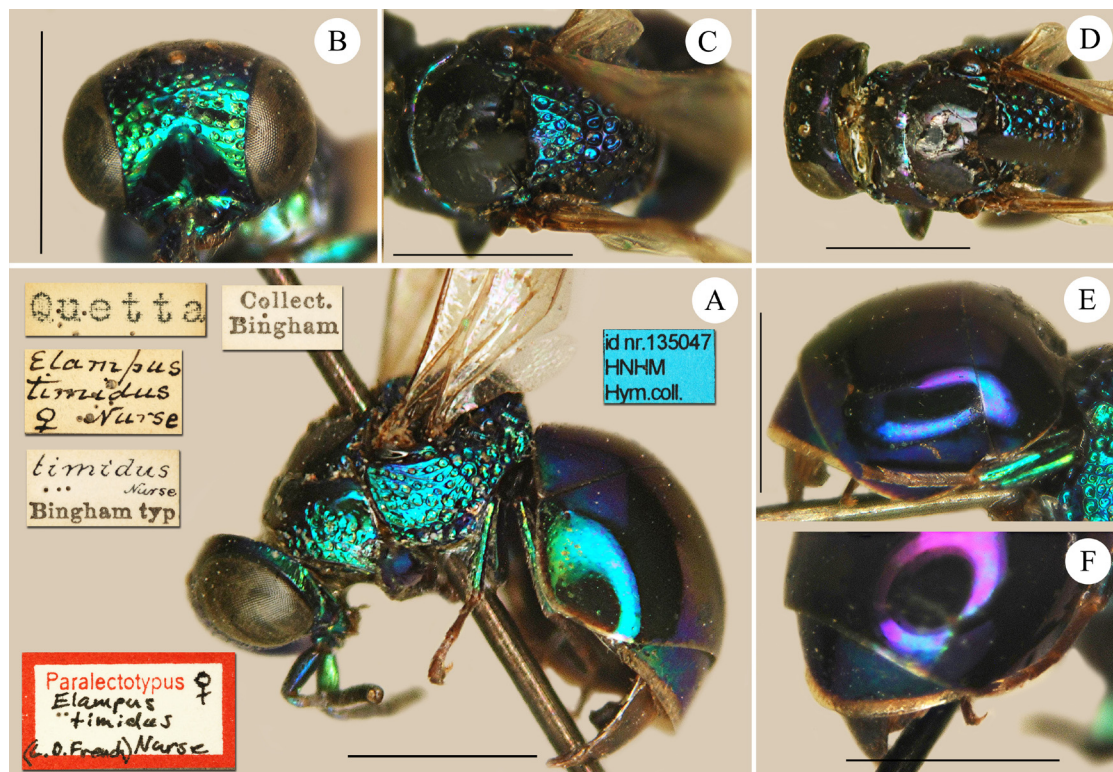


FIGURE 15. *Omalus timidus* (Nurse, 1902), paralectotype, female. A. Habitus, lateral view. B. Head, frontal view. C. Mesosoma, dorsal view. D. Head and mesosoma, dorsal view. E. Metasoma, lateral view. F. Metasoma, dorso-lateral view. Scale bars 1.0 mm.

Ellampus timidus Nurse, 1902: 305. Lectotype ♂ designated by Kimsey 1986: 107; Pakistan: Peshin (NHMUK). Bingham 1908: 347 (Assam).

Omalus (Philoctetes) timidus: Jonathan *et al.* 1977: 85 (India: Delhi).

Omalus timidus: Rosa *et al.* 2015c: 68 (key), 73 (descr.), 74 (diagn., fig. 4).

Distribution. India (Assam; Delhi). Palaearctic: Pakistan (Rosa *et al.* 2015c). Oriental: China (Guandong) (Rosa *et al.* 2014).

Remarks. Kimsey & Bohart (1991) transferred *Ellampus timidus* in the genus *Holophris* Mocsáry, 1890. Rosa *et al.* (2015c) transferred this species in the genus *Omalus* Panzer, 1801. du Buysson (in Nurse 1904) synonymised *Omalus timidus* with *Pseudomalus hypocrita* (du Buysson, 1893). However, based on type specimens, these two species belong to separate genera.

Tribe Chrysidini

Genus *Chrysidea* Bischoff, 1913

Chrysidea Bischoff, 1913: 34. Type species: *Chrysis pumila* Klug, 1845. Original designation.

Chrysidea furiosa (Cameron, 1897)

Chrysis furiosa Cameron, 1897: 3. Holotype ♀; India: West Bengal: Barrackpore (3–4 (descr.), Pl. 16 (fig. 9)) (HECO). Bingham 1903: 436 (key), 448 (descr., Barrackpore).

Chrysis (Dichrysis) furiosa: Bischoff 1913: 44 (cat., India).

Chrysidea furiosa: Kimsey & Bohart 1991: 314 (cat., South India).

Distribution. India (West Bengal).

Chrysidea pumila (Klug, 1845)

Chrysis pumila Klug, 1845: tav 45, fig. 13. Neotype ♂ designated by Rosa & Xu 2015: 10; Egypt: Fayoum (NMLU).

Chrymogona pumila: Bingham 1903: 431 (key), 431–432 (descr., Bombay [= Mumbai], Poona [= Pune]), 432 (fig. 150).

Chrymogona assimilis Dahlbom, 1854: du Buysson 1896b: 467 (cat., Bombay: Poona), pl. II (figs 8, 10), pl. V (fig. 5).

Distribution. India (Maharashtra). Subcosmopolitan species, distributed in the Afrotropical, Palaearctic and Oriental regions (Kimsey & Bohart 1991).

Genus *Chrysis* Linnaeus, 1761

Chrysis Linnaeus, 1761: 414. Type species: *Sphex ignita* Linnaeus, 1758 [= *Chrysis ignita* (Linnaeus, 1758)], by subsequent designation of Latreille 1810: 437.

Chrysis acceptabilis Radoszkowski, 1891

(Figs 16A–16F)

Chrysis acceptabilis Radoszkowski, 1891: 197. Lectotype ♂ designated by Rosa *et al.* 2015d: 7; Iran [not Turkmenistan]: Sarakhs (ISEA-PAS) (examined) (*cerastes* group).

Chrysis (Cornuchrysis) acceptabilis: Linsenmaier 1968: 113 (descr., North-West India), 118 (key to ♂), 119 (key to ♀).

Chrysis thalia Nurse, 1903b: 41. Syntypes ♂, ♀; Pakistan: Quetta (HMNH) (examined). Bingham 1903: 437 (key), 462–463 (descr., Delhi); Jonathan *et al.* 1977: 86 (cat., India: Delhi).

Distribution. India (Delhi; North-West India (without precise locality)). As far as we know, it is a semidesert species distributed in Afghanistan, Iran, Pakistan and Central Asian countries; it was also recorded from Saudi-Arabia, Egypt, Chad, Sudan (Linsenmaier 1968, 1994). Records from Delhi, Myanmar and Sri Lanka, need confirmation.

Remarks. du Buysson (in Nurse 1904) synonymised *Chrysis thalia* with *Ch. acceptabilis* Radoszkowski, 1891. We agree with du Buysson's interpretation, nevertheless, more specimens of both sexes are needed to confirm this synonymisation. Kimsey & Bohart (1991) listed *Chrysis thalia* as a valid species, without type examination, and placed *Ch. acceptabilis* in synonymy of *Ch. kokandica* Radoszkowski, 1877. Linsenmaier (1994) reinstated *Chrysis acceptabilis* from the previous synonymy. This species is often misidentified with other green and blue species belonging to different species groups (P.R., unpubl. note).

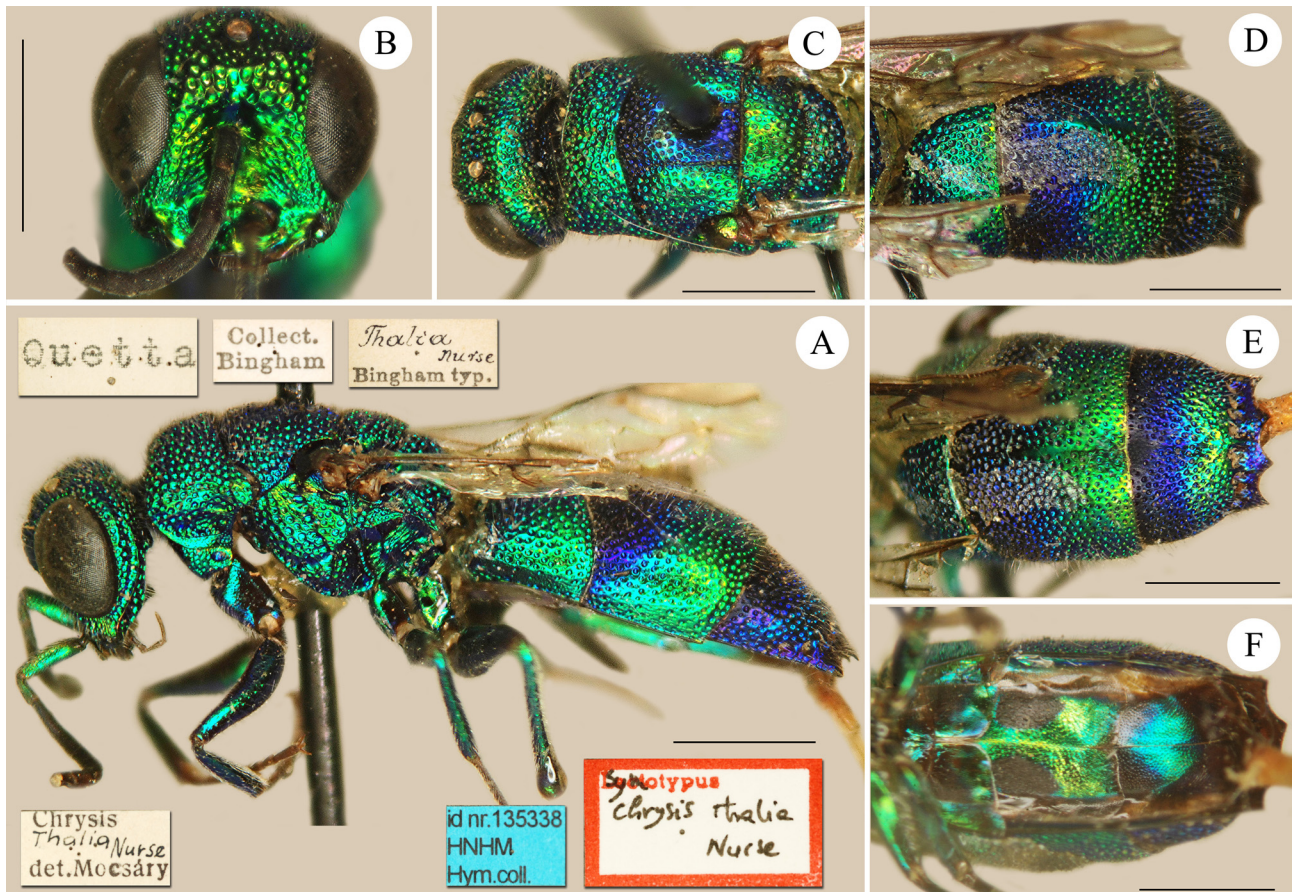


FIGURE 16. *Chrysis acceptabilis* Radoszkowski, 1891 (syntype of the synonym *C. thalia* Nurse, 1903), female. A. Habitus, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, dorsal view. E. Metasoma, posterior view. F. Metasoma ventral view. Scale bars 1.0 mm.

Chrysis angolensis Radoszkovsky, 1881

(Figs 17A–17D)

Chrysis angolensis Radoszkovsky, 1881: 219. Holotype [sex unknown]; Angola (depository unknown) (*angolensis* group).

Thakkar & Parikh 2018: 22 (cat., Gujarat); Ahmed *et al.* 2020: 199 (cat., Haryana, Tamil Nadu).

Chrysis fuscipennis Brullé, 1846 *nec* Dahlbom, 1829: du Buysson 1896b: 472 (key, cat., Central Provinces, Bombay [= Mumbai]: Poona [= Pune], Bangalore [= Bengaluru], Pondicherry); Bingham 1903: 438 (key), 467 (descr., comp. notes, recorded as a common species throughout India); Bingham 1908: 348 (cat., Purneah [= Purnia], Siliguri, Calcutta [= Kolkata]); Thakkar & Parikh 2018: 22 (cat., Gujarat); Sihag 1983: 375 (Haryana: Hissar); Kadirvelu 1991: 466 (Coimbatore).

Chrysis fuscipennis var. *mossullensis* [!] du Buysson, 1887: du Buysson 1896b: 472 (Poona [= Pune]; Karnataka: Mysore).

Chrysis fuscipennis var. *dorsata* du Buysson, 1896b: 472 *nec* Brullé, 1833. Syntypes; India: Poona [= Pune] (MNHN).

Material examined. 1 ♀, Tamil Nadu: Coimbatore (NHMW); 1 ♀, Jammu and Kashmir, Srinagar 19.vii.1935, leg. Guannar Jarring (MNLU); 2 ♂, Delhi 3.–5.XI.29, Dr. Enslin (MNLU); 4 ♀, Tamil Nadu, Omalur, Salem, iii.1978,

leg. W. Perraudin (MNLU); 1 ♀, idem, 20.xii.1975 (MNLU); 1 ♀, idem, 15.x.1975 (MNLU); 1 ♀, idem, 28.ii.1976 (MNLU); 1 ♀, idem, 13.vii.1976 (MNLU); 1 ♀, idem, 3.iii.1978 (MNLU); 6 ♀, Tamil Nadu, Settipatti, xi.1979, leg. W. Perraudin (MNLU); 1 ♀, idem, 13.vii.1976 (MNLU).

Distribution. India (Bihar; Haryana; Jammu and Kashmir; Karnataka; Maharashtra; Tamil Nadu; West Bengal; Gujarat; Central Provinces (locality not specified)). Cosmopolitan species, widespread and/or introduced in all Zoogeographical regions (Kimsey & Bohart 1991).

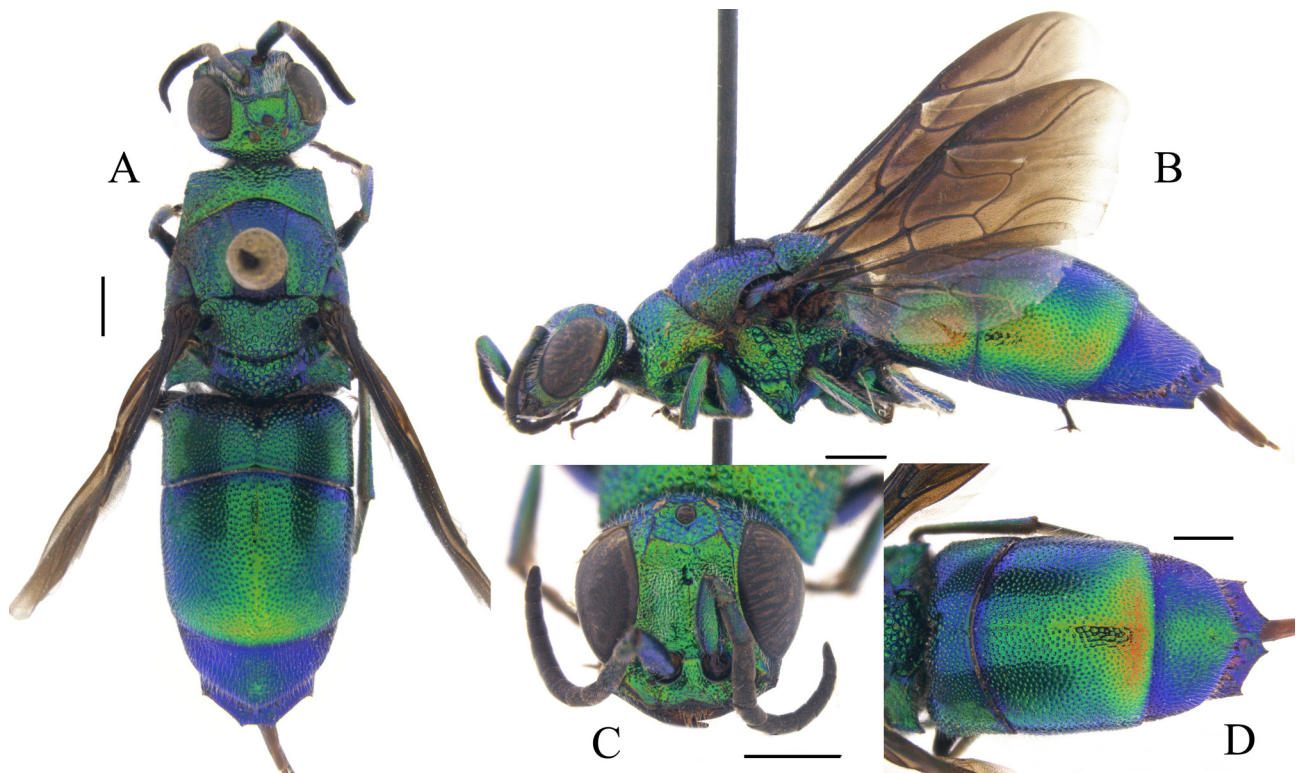


FIGURE 17. *Chrysis angolensis* Radoszkowski, 1881, female from Tamil Nadu. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, dorsal view. Scale bars 1.0 mm.

Chrysis arrestans Nurse, 1903b

Chrysis arrestans Nurse, 1903b: 42. Holotype ♀; India: Gujarat: Deesa (NHMUK). Bingham 1903: 439 (key), 487 (descr., Deesa); Kimsey & Bohart 1991: 385 (cat., India, *smaragdula* group).

Chrysis (Hexachrysis) arrestans: Bischoff 1913: 64 (cat., India).

Distribution. India (Gujarat). Pakistan (Nurse 1903b).

Chrysis aswathiae Rosa, sp. nov.

(Figs 18A–18G)

Material examined. Holotype: ♂; India: Tamil Nadu: Tranquebar [= Tharangambadi], ii.1953, collector unknown, NML_ENT GBIF_Chr 00022780 (MNLU).

Diagnosis. Species with densely punctate body, covered by small and contiguous punctures, without polished intervals among punctures (Figs 18A, 18F), particularly on metasoma; apical margin of tergum III edentate, without undulations, corners, or teeth. Body colour green with golden stripe on tergum II. Black spots on sternum II elongate, medially close and separated from lateral margins (fig. 18G).

Description. *Male.* Body length 6.5 mm. Forewing length 3.2 mm. OOL $1.6 \times$ MOD; POL $2.0 \times$ MOD; MS $0.7 \times$ MOD; relative length of P:F1:F2:F3 = 1.0:1.2:1.0:1.0.

Head. Vertex and frons with small (about $0.3 \times$ MOD) and contiguous punctures, on ocellar triangle with pol-

ished intervals $0.1\text{--}0.3 \times \text{PD}$ apart; polished areas laterally to posterior ocelli; punctation smaller and dense from ocelli triangle to occiput; transverse frontal carina weak, vaguely M-shaped, with two weak branches extended around anterior ocellus (Fig. 18C); scapal basin fully punctate with small punctures, covered by appressed whitish vestiture; apical margin of clypeus medially incurved; subantennal space $1.5 \times \text{MOD}$; genal carina weak, extended from mid gena to mandible insertion; temples, seen in dorsal view, noticeably expanded, about $2.5 \times \text{MOD}$ (Fig. 18D).

Mesosoma. Medial pronotal line [= pronotal groove] weak, narrow, and well visible only on anterior margin; pronotum with small and dense punctation; mesoscutum with dense and larger punctures at base of mesoscutal median area; notauli as line of small rounded punctures, basally deeper and larger; parapsidal signum [= parapsidal line] weakly developed; mesoscutellum with dense and double punctation; metascutellum with dense and irregular punctation; metapectal-propodeal disc unmodified; posterior propodeal projections [= propodeal teeth] small, subparallel, and basally concave; mesopleuron with small, even and dense punctures, with defined posterior oblique sulcus [= scrobal sulcus] formed by large and subrectangular foveae. Spurs of metatibia distinctly unequal in length, with longest as long as $\frac{1}{2}$ of tarsomere I; mesotarsomere I longer than following three together, fifth as long as third and fourth together. Forewing with medial vein unusually angled basally; Rs not reaching anterior wing margin.

Metasoma. Punctation with small-sized and contiguous punctures, dorsally without polished intervals, yet with narrow polished intervals laterally on terga I and II; pits of pit row deep and small, with same diameter of punctures on tergum III; medial pits larger and fused together. Apical margin of tergum III edentate, with brownish rim, and with slight concavity on lateral side, in proximity to pit row endings. Metasomal terga without median longitudinal carina. Black spots on sternum II subtrapezoidal, not connected to lateral margins and medially narrowly separated by $0.5 \times \text{MOD}$ (Fig. 18G).

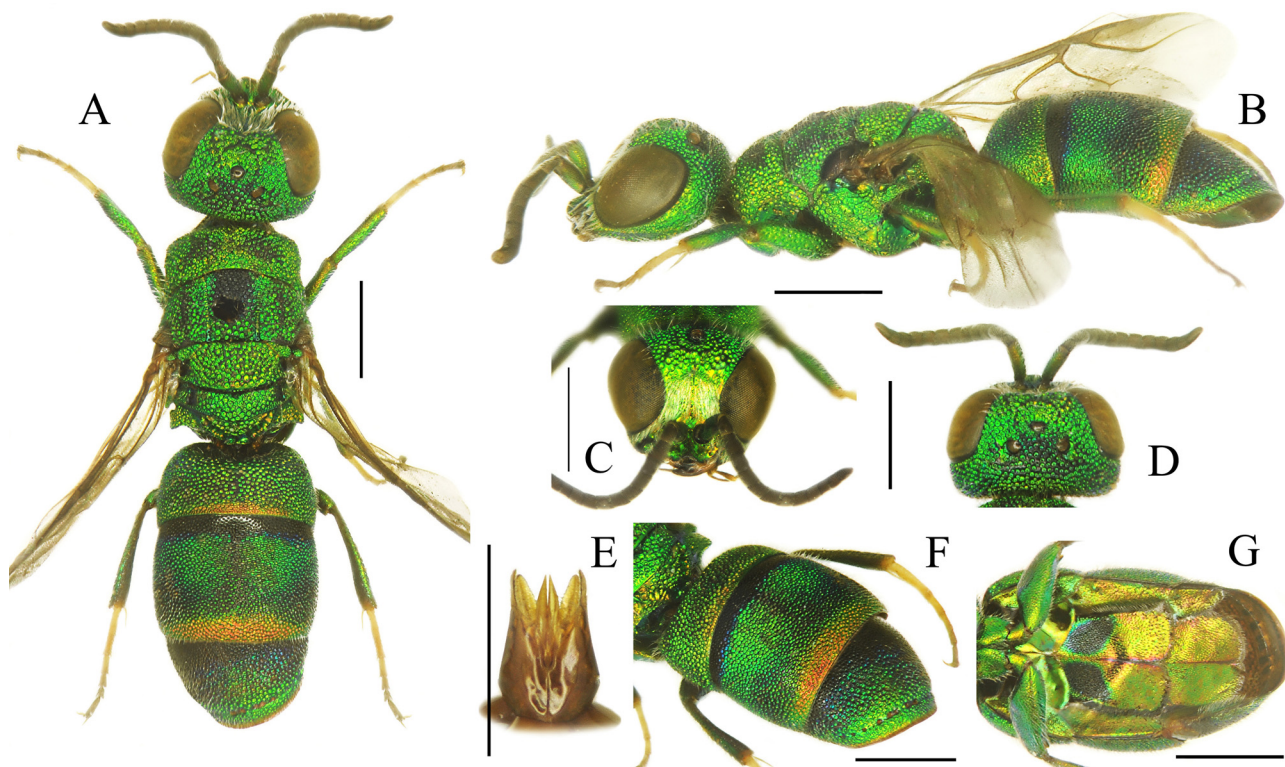


FIGURE 18. *Chrysis aswathiae* Rosa, **sp. nov.**, holotype, male. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, dorsal view. D. Head, frontal view. E. Genital capsule, dorsal view. F. Metasoma, dorso-lateral view. G. Metasoma, ventral view. Scale bars 1.0 mm.

Colouration. Body entirely metallic green with blackish areas on: ocellar triangle; two lateral spots dorsally on pronotum; median area of mesoscutum; basally on terga II and III; with contrasting golden-red stripe apically on terga I and II. Tegula brown, without metallic reflections; legs metallic green with tarsi 1–3 proximally whitish and apically yellowish, tarsi IV–V brownish. Scapus and pedicel metallic, flagellum black. Wings clear, slightly brownish on radial sector.

Vestiture. Body with whitish, short, and erect setae (about $1.0 \times \text{MOD}$ long).

Female. Unknown.

Distribution. India (Oriental part: Tamil Nadu).

Etymology. The specific epithet *aswathiae* (feminine noun in genitive) is dedicated to Pokkattu Gopi Aswathi for her studies on Indian Chrysididae.

Remarks. *Chrysis aswathiae* sp. nov. belongs to the *Chrysis elegans* species group. This is mostly a West Palaearctic group and includes only two Oriental species: *Chrysis dissimilis* Dahlbom, 1854 (Fig. 34), known from India, and *Ch. lapislazulina* Rosa, Wei & Xu in Rosa *et al.* 2017e, known from China (Rosa *et al.* 2017e). *Chrysis aswathiae* sp. nov. can be separated from *Ch. dissimilis* by dense body punctation, with small and contiguous punctures, without polished intervals among punctures (Figs 18A, 18F), particularly on metasoma (vs. medium-sized punctures with polished intervals about $1.0 \times \text{PD}$ apart on mesosoma, and $1.0\text{--}2.0 \times \text{PD}$ apart on metasoma in *C. dissimilis*); apical margin of tergum III edentate, without undulations, corners or teeth (vs. medially sinuous and with blunt lateral teeth in *Ch. dissimilis*); body colour green with a golden stripe on tergum II (vs. scutellum and metanotum red to golden-red contrasting with rest of body green to blue). It can be distinguished from *Chrysis lapislazulina* by dense body punctation, small dimensions and shape of the black spots on the second sternum (Fig. 18G), medially close and separated from lateral margins (vs. subrectangular, medially broadly separated and fused to lateral margins in *Ch. lapislazulina*). There is no evidence that *Chrysis aswathiae* may be the male of the other two Oriental species, so far known only on females.

Chrysis bahadur Nurse, 1903a

(Figs 19A–19D)

Chrysis bahadur Nurse, 1903a: 11. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 388; Kashmir (NHMUK). Kimsey & Bohart 1991: 388 (cat., typ., Pakistan: Kashmir, *ignita* group).

Material examined. 1 ♀, Syntype [actually lectotype], Kashmir 5–6000 feet, 5.01, Col. C.G. Nurse Collection, 1920–72, *Chrysis bahadur* (Nurse), ♀, Type, B.M. Type, Hym. u13.96, BMNH(E) #970886 (NHMUK).

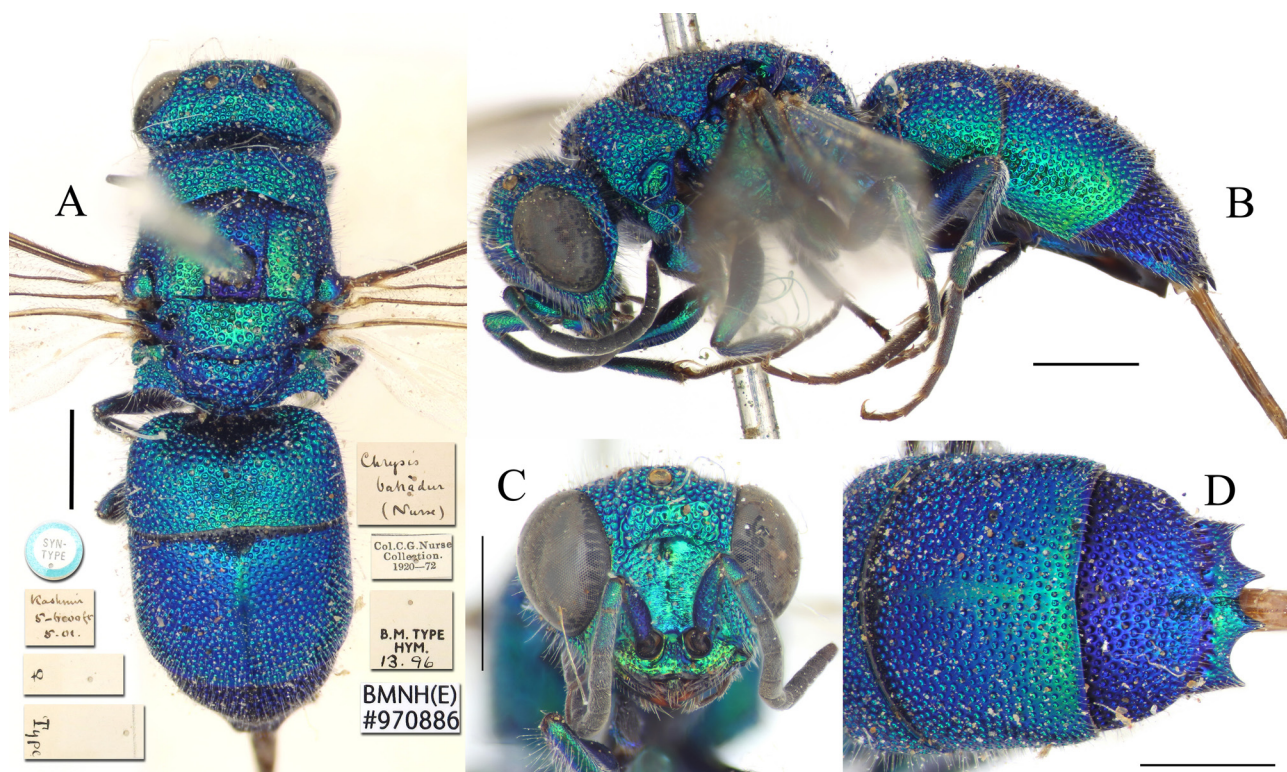


FIGURE 19. *Chrysis bahadur* Nurse, 1903, syntype, female. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, posterior view. Scale bars 1.0 mm. (© The Trustees of the NHMUK)

Distribution. Kashmir.

Remarks. Kimsey & Bohart (1991) placed *Chrysis bahadur* Nurse in the *ignita* species group, based on the lectotype designated by Bohart in Kimsey & Bohart (1991) at NHMUK. Nevertheless, the lectotype belongs to the *splendidula* group whereas other specimens, as the paralectotype currently deposited in Mocsáry's collection at HMNH, belong to the *ignita* group.

***Chrysis baldocki* Rosa, sp. nov.**

(Figs 20A–20F, 21A–21F)

Material examined. Holotype: ♀; India: Tamil Nadu: Coimbatore, 12.x.1955, leg. Nathan, GBIF_Chr00043090, spec.? ♂♀ Abd [Abdomen] Pkt [Punctuation] fein [fine] Coll. Linsenmaier, ex synoptic collection (MNLU). Paratypes: 1 ♂: Coimbatore, 1.vii.1954, leg. Nathan, GBIF_Chr00043089, spec.? ♂♀ Abd [Abdomen] Pkt [Punctuation] fein [fine] Coll. Linsenmaier, ex synoptic collection (MNLU); 1 ♂, Tamil Nadu: 60 km SW Madurai, 200m, 09°21,6'N, 77°26,6'E, 6.v.2005, leg. M. Halada (MHC).

Diagnosis. Species with body metallic light blue with green reflections. Tergum I with large punctures widely separated, with interspaces densely punctate by small punctures (Fig. 20A); transverse frontal carina well developed and raised, appearing as double (Fig. 20C). Pit row on metasomal tergum III with small and longitudinally elongate pits in ♀ (Fig. 20D). Metasomal sternum II with large black spots (Fig. 20F).

Description. *Female.* Body length 8.5 mm. Forewing length 5.5 mm. OOL 2.3 × MOD; POL 1.7 × MOD; MS 1.2 × MOD; relative length of P:F1:F2:F3 = 1.0:1.5:1.0:0.9.

Head. Vertex and frons with small (about 0.3 × MOD) and contiguous punctures, without polished interspaces; punctures smaller on ocelli triangle; without polished areas laterally to posterior ocelli; with larger punctures between ocelli triangle and occipital area; transverse frontal carina strong and somewhat arcuate (Fig. 20C), with lateral endings close to eye margin; scapal basin transversally micropunctate, with punctures somehow aligned; frons declivity and scapal basin medially impunctate; subantennal space less than 1.0 × MOD; apical margin of clypeus almost straight; genal carina fully developed to mandibular insertion.

Mesosoma. Medial pronotal line [= pronotal groove] shallow, as long as $\frac{3}{4}$ length of pronotum; pronotum with larger punctures (0.5 × MOD), with scattered tiny dots on interspaces; mesoscutum with slightly larger punctures, increasing mesad; notauli as line of large and round foveae, black coloured, and larger at base; lateral areas of mesoscutum with scattered punctures, with double punctuation and tiny dots on interspaces; parapsidal signum [= parapsidal line] hardly visible; mesoscutellum with large punctures, contiguous at base; metanotum with large, foveate punctures without interspaces; metapectal-propodeal disc with metapostnotal-propodeal suture strong and raised; posterior propodeal projections [= propodeal teeth] subparallel, posteriorly concave; mesopleuron with posterior oblique sulcus of the mesopleuron [= scrobal sulcus], formed by large, irregular foveate punctures; with tiny punctures and corrugation on interspaces; with oblique wrinkles on anterior margin, anteriorly to subalar impression. Tarsomere I of mesoleg as long as II–IV together. Forewing with second radial cell (the marginal cell located apical to the pterostigma) slightly open because radial sector vein (Second radial cross & Radial sector) does not reach wing margin.

Metasoma. Tergum I with double punctuation, larger punctures broadly separated with dense, small punctures on interspaces; laterally with double punctuation, but interspaces among large punctures are narrow; apical margin of the tergum polished and impunctate; tergum II dorsally with even punctuation, with medium-sized punctures, becoming double at sides; along median longitudinal line polished, with tiny dots; tergum III densely punctate, with double punctures of small and medium size; pits of pit row small and longitudinally elongate (Figs 20D, 20E); tergum III transversally gibbous before pit row apical margin with four short, triangular median teeth and lateral angle (Figs 20D, 20E). Metasomal terga without distinct median longitudinal carina. Black spots on sternum II large, medially fused and connected to lateroterga (Fig. 20F).

Colouration. Body entirely metallic light blue with green reflections all over body, on face, on bottom of mesosomal punctures, on lateral sides, on legs and sterna. Scape, pedicel and flagellomere I light blue, other flagellomeres black. Wings fuscous, with brownish veins.

Vestiture. Body with short and whitish setae.

Male. Similar to female. The following dimorphic features are observed: apical margin of tergum III straight and pits of pit row larger and partly confluent, anyway smaller than other species of the group; post pit row shorter;

median longitudinal carina on terga II and III more visible. Body colour darker blue.

Distribution. India (Oriental part: Tamil Nadu).

Etymology. The specific epithet *baldocki* (masculine noun in genitive) is dedicated to the late David W. Baldock (Surrey, UK), who friendly supported the first author works on Chrysididae, providing materials and expertise.

Remarks. *Chrysis baldocki* sp. nov. belongs to the *Ch. smaragdula* species group. Twenty species of the group are known for India and the Oriental region: *Chrysis apricata* Bohart in Kimsey & Bohart, 1991; *Ch. arachne* Mocsáry 1913; *Ch. arrestans* Nurse, 1903b; *Ch. baliana* Mocsáry, 1913; *Ch. bhoutanensis* (du Buysson, 1908); *Ch. buddhae* Mocsáry, 1913; *Ch. ceylonica* Mocsáry, 1913; *Ch. comotti* Gribodo 1884; *Ch. decemdentata* Linsenmaier, 1959; *Ch. durbar* Bingham, 1903; *Ch. igniceps* Mocsáry, 1893; *Ch. laglaizei* du Buysson, 1898b; *Ch. lamellata* Mocsáry, 1914; *Ch. musa* Semenov-Tian-Shanskij in Semenov-Tian-Shanskij & Nikol'skaya, 1954; *Ch. parallela* Brullé, 1846; *Ch. principalis* Smith, 1874; *Ch. rani* Mocsáry, 1913; *Ch. schioedtei* Dahlbom, 1854; *Ch. takasago* Tsuneki, 1963; *Ch. vicaria* Mocsáry, 1913 (Kimsey & Bohart 1991). Whereas other two species included in the *smaragdula* group by Kimsey & Bohart (1991), are considered here members of the *oculata* group: *Chrysis thakur* Mocsáry, 1913, and *Ch. obscura* Smith, 1860. However, more species were described from the Oriental Region, and synonymised by Kimsey & Bohart (1991); a double check of these taxa is needed to confirm these synonymies. Indian and Oriental species of the *smaragdula* group can be separated from *Chrysis baldocki* sp. nov. by the following characters: narrow black spots on the sternum II (*Ch. baliana*, *Ch. buddhae*, *Ch. ceylonica*, *Ch. comotti*, *Ch. durga*, *Ch. schioedtei*); larger black spots on the sternum II (*Ch. arachne*); deep and large pits of the pit row on the tergum III, almost confluent (*Ch. bhoutanensis*, *Ch. rani*, *Ch. principalis*, *Ch. takasago*, *Ch. vicaria*); pits of the pit row very small, almost indistinct (*Ch. musa* Semenov-Tian-Shanskij in Semenov-Tian-Shanskij & Nikol'skaya, 1954); metascutellum posteriorly lamellate and projecting over metapectal-propodeal disc (*Ch. decemdentata* and *Ch. lamellata*); different colouration *Ch. comottii* sensu auct. (mesonotum olive coloured) and *Ch. igniceps* (red head); metasomal punctation (*Ch. parallela* with large and deep punctures on tergum I, scattered and shallow punctures dorsally on terga II and III). Among the Oriental species, only *Chrysis laglaizei* du Buysson, from Indonesia, shares a similar shape of black spots of sternum II and small pits of the pit row. Nevertheless, pits are rounded and not longitudinally elongate, the post pit row area is shorter and the metasomal punctation is different, unmodified on the tergum I, with even punctation, not densely micropunctate between larger punctures; lastly, the transverse frontal carina, seen in dorsal view is distinctly raised and bilobed.

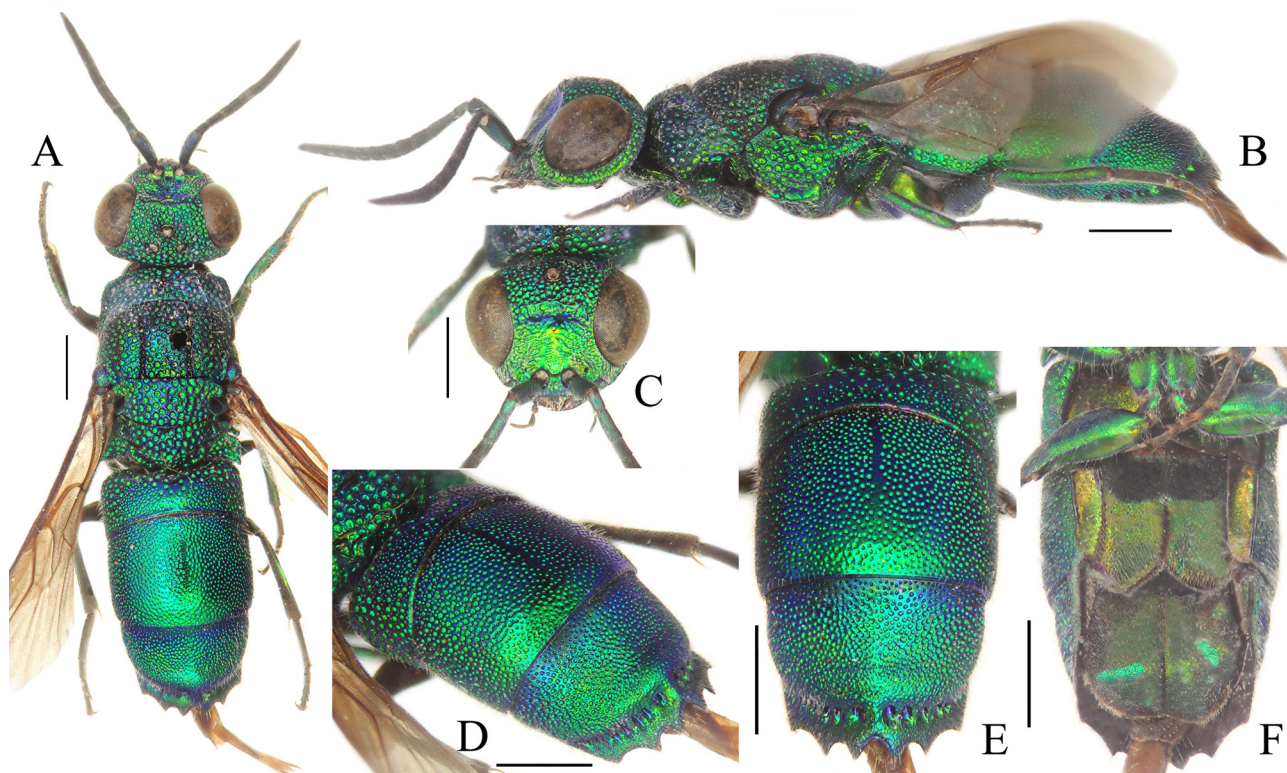


FIGURE 20. *Chrysis baldocki* Rosa, sp. nov., holotype, female. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, dorsal view. D. Metasoma, dorso-lateral view. E. Metasoma, dorsal view. F. Metasoma, ventral view. Scale bars 1.0 mm.

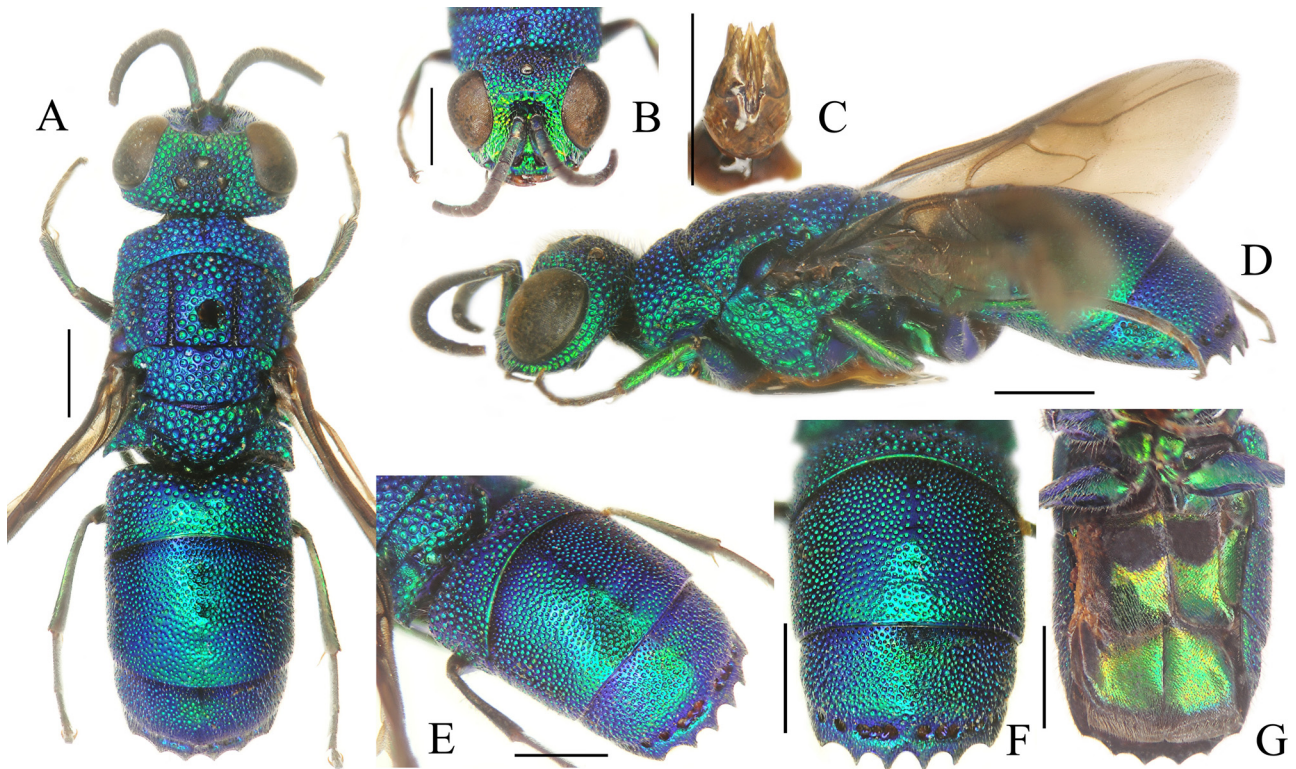


FIGURE 21. *Chrysis baldocki* Rosa, **sp. nov.**, paratype, male. A. Habitus, dorsal view. B. Head, frontal view. C. Genital capsule, dorsal view. D. Habitus, lateral view. E. Metasoma, dorso-lateral view. F. Metasoma, dorsal view. G. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis bayadera* du Buysson, 1896b**

(Figs 22A–22B)

Chrysis bayadera du Buysson, 1896b: 470. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 388; India: Maharashtra: Poona [= Pune] (469 (key), 470 (descr.), 470 (comp. notes), pl. II (fig. 15), pl. III (figs 1, 3), pl. V (fig. 6)) (MNHN) (examined). Bingham 1903: 436 (key), 444 (descr., Central Provinces; Poona), 447 (comp. notes); Kimsey & Bohart 1991: 388 (cat., India, *capitalis* group); Rosa *et al.* 2020a: 37 (cat., typ., fig. 9).

Chrysis (Gonochrysis) bayadera: Bischoff 1913: 42 (cat., India).

Material examined. 1 ♀, syntype, Indes, Poona [= Pune], det. du Buysson (NHMW); 1 ♀, same labels (MNHN).

Distribution. India (Maharashtra).

***Chrysis begam* Mocsáry, 1912b**

(Figs 23A–23F)

Chrysis (Tetrachrysis) begam Mocsáry, 1912b: 554. Holotype ♀; India: Sikkim (HNHM); Bischoff 1913: 48 (cat., India).

Chrysis begam: Kimsey & Bohart 1991: 388 (cat., Sikkim, *succincta* s.s. group).

Material examined. 1 ♀, Sikkim, Collect. Bingham, *Begam* Mocs. det. Mocsáry, red label, Holotypus *Chrysis begam* (♀) Mocs. RMBohart / id. nr. 135335 HNHM Hym.coll. (HMNH).

Distribution. India (Sikkim).

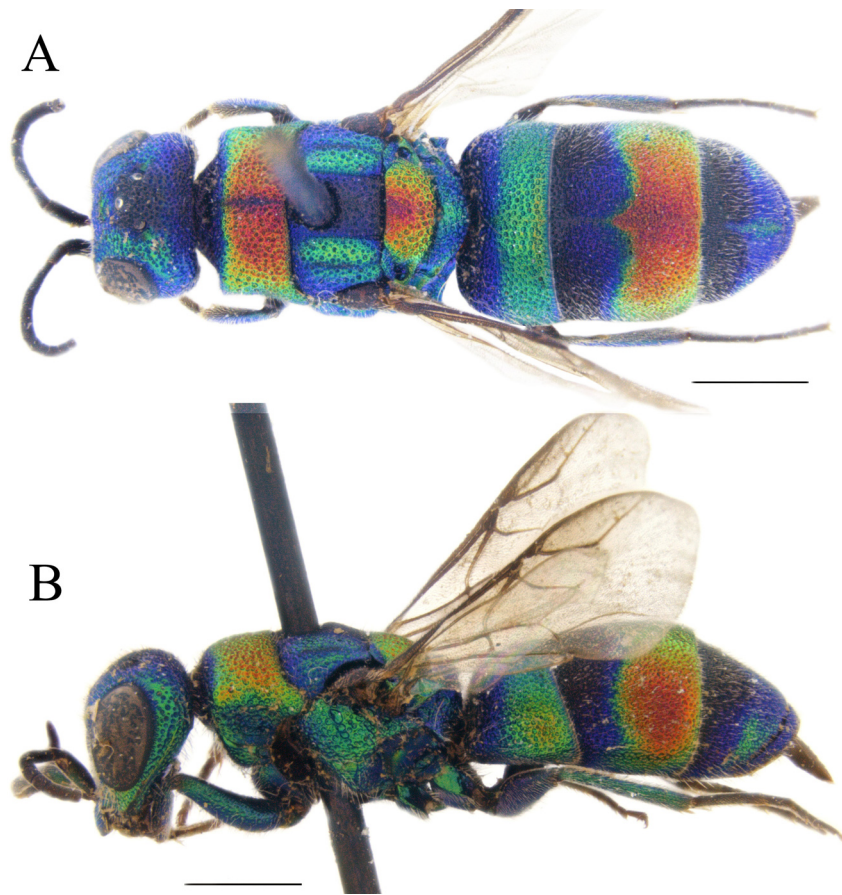


FIGURE 22. *Chrysis bayadera* du Buysson, 1896, paralectotype, female. A. Habitus, dorsal view. B. Habitus, lateral view. Scale bars 1.0 mm.

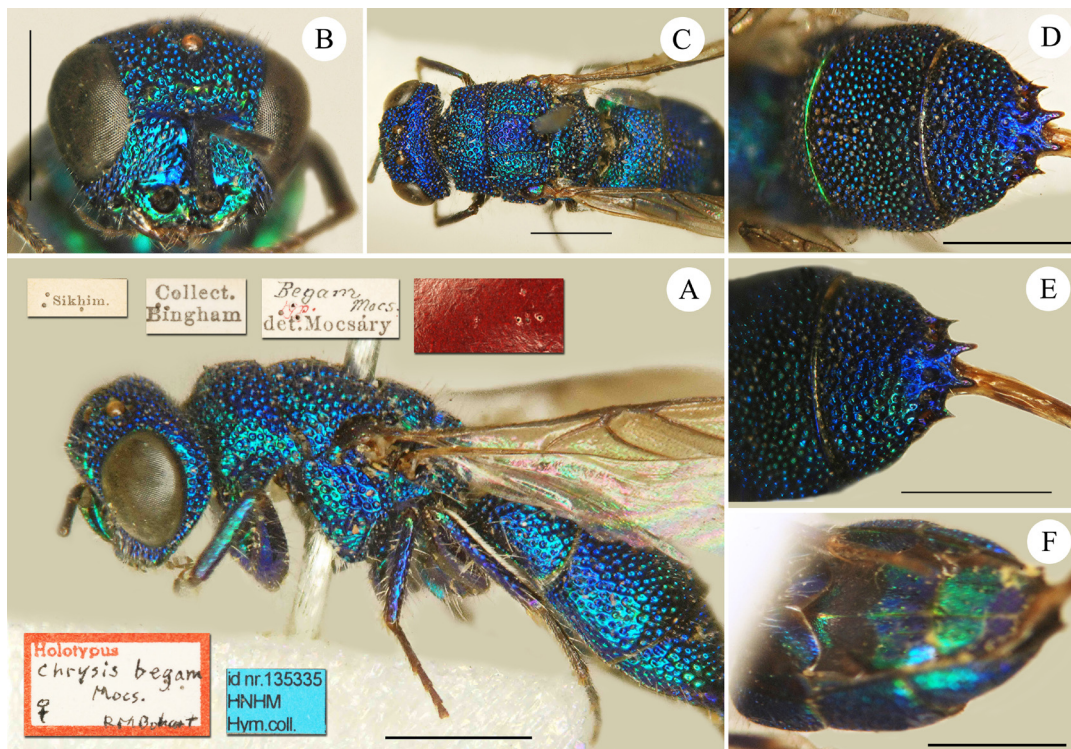


FIGURE 23. *Chrysis begam* Mocsáry, 1912, holotype, female. A. Habitus, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, posterior view. E. Metasoma, postero-lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis bernasconii* Rosa, sp. nov.**

(Figs 24A–24F)

Material examined. Holotype: ♀; India: Tamil Nadu; Kumili, vi.1986, leg. Nathan, ex coll. Rosa, NML_ENT GBIF_Chr00046454 (MNLU).

Diagnosis. Species with fully blue metallic body colouration. Malar space subparallel; tergum I with pair of submedian, large humps at front of dorsal area. Tergum III elongate, with four short, triangular teeth. Sternum II with pair of small and elongate black spots.

Description. *Female.* Body length 7.3 mm. Forewing length 4.9 mm. OOL $1.6 \times \text{MOD}$; POL $1.7 \times \text{MOD}$; MS $1.0 \times \text{MOD}$; relative length of P:F1:F2:F3 = 1.0:1.3:1.0:1.0.

Head. Vertex and frons with small (about $0.3 \times \text{MOD}$) and contiguous punctures, smaller on ocelli triangle and along eye margin; without polished areas laterally to posterior ocelli; transverse frontal carina strong and vaguely M-shaped (Fig. 24C), with lateral endings close to eye margin, with two posterior branches almost encircling anterior ocellus; scapal basin transversally microstriate, with frons declivity impunctate; malar spaces subparallel (Fig. 24C); subantennal space less than $1.0 \times \text{MOD}$ (about $0.75 \times \text{MOD}$); apical margin of clypeus almost straight; genal carina well developed to mandibular insertion; distinct and strong subgenal carina.

Mesosoma. Medial pronotal line [= pronotal groove] shallow, barely visible, as long as half length of pronotum; pronotum with contiguous, irregular punctation, with small- to medium-sized punctures, both rounded and irregularly shaped, with tiny dots on narrow interspaces; mesoscutum with slightly larger and contiguous punctures; notauli as a line of small, deep and subrectangular foveae, black coloured, contrasting with blue mesoscutum; parapsidal signum [= parapsidal line] hardly visible among punctation; mesoscutellum with larger, contiguous and corrugate punctures; metanotum with large, foveate punctures without interspaces; metapectal-propodeal disc unmodified; posterior propodeal projections [= propodeal teeth] subparallel with apex slightly divergent and apically concave; mesopleuron with posterior oblique sulcus of the mesopleuron [= scrobal sulcus], formed by large, irregular foveate punctures, transversally fused with other punctures of pleuron; with small punctures on interspaces. Spurs of metatibia distinctly unequal in length; mesotarsomere I as long as second and third together, fifth tarsomere as long as third and fourth together. Wings with unmodified nervures.

Metasoma. Double punctation on tergum I, with narrow interspaces ($0.1\text{--}0.5 \times \text{PD}$ apart), and smaller punctures along apical margin, with shallow, tiny dots on interspaces; tergum I with pair of submedian, large humps at front of dorsal area (Figs 24A, D); tergum II with even, small- to medium-sized punctures equally separate, along the longitudinal line largely polished, with small punctures toward the apical and lateral margins; tergum III, in lateral view, noticeably elongate, as long as tergum II; tergum III with double punctures and polished interspaces; pits of the pit row deep, blackish and small, almost same size of largest punctures on tergum; ovipositor broad and strongly chitinous; apical margin with four short, triangular teeth. Metasomal terga without median longitudinal carina. Black spots on sternum II narrow and elongate, placed at side of sternum, distant $3.0 \times \text{MOD}$ from each other (Fig. 24F).

Colouration. Body entirely metallic blue, with green reflections on face, on tergum II postero-laterally, on legs and sterna. Tegula, scape, pedicel and flagellomere I blue, other flagellomeres black. Wings clear, with brownish veins.

Vestiture. Body with black, thick, erect and long setae; about $1.0 \times \text{MOD}$ long on head, and $1.5 \times \text{MOD}$ laterally on apical margin of tergum III. Ventrally with whitish setae on legs and sterna.

Male. Unknown.

Distribution. India (Oriental part: Tamil Nadu).

Etymology. The specific epithet *bernasconii* (masculine noun in genitive) is dedicated to Marco Bernasconi, curator of the Natur Museum (Luzern), for his continuous support in my study of Linsenmaier's collection, for permissions to examine type materials during the years and for the loan of unidentified Indian specimens.

Remarks. *Chrysis bernasconii* sp. nov. is the first known member of *subsiniuata* group from the Oriental region and with a fully blue metallic colouration. In the Middle East (Iran and Turkmenistan), three species are known with green body colouration (*Ch. echidna* Semenov-Tian-Shanskij, 1967, *Ch. hydra* Semenov-Tian-Shanskij, 1967, and *Ch. orienticola* Linsenmaier, 1994); they are easily recognizable by apical margin of the tergum III medially sinuate and laterally with corners, whereas *Ch. bernasconii* sp. nov. has four short, triangular teeth. Only another member of the *subsiniuata* group has four apical teeth, *Ch. draco* Semenov-Tian-Shanskij, 1967, from Central Asia (Rosa 2019c), with bicoloured and elongate body (up to 10 mm). We include *Chrysis bernasconii* sp. nov. in the *Ch. sub-*

sinuata group for the peculiar feature of a pair of submedian humps at front of dorsal area; other diagnostic features are as follow: elongate shape of tergum III and subparallel malar spaces. The small and elongate black spots, shared with the Middle East green species, are unusual for this group; these concolor species possibly represent a separate subgroup.

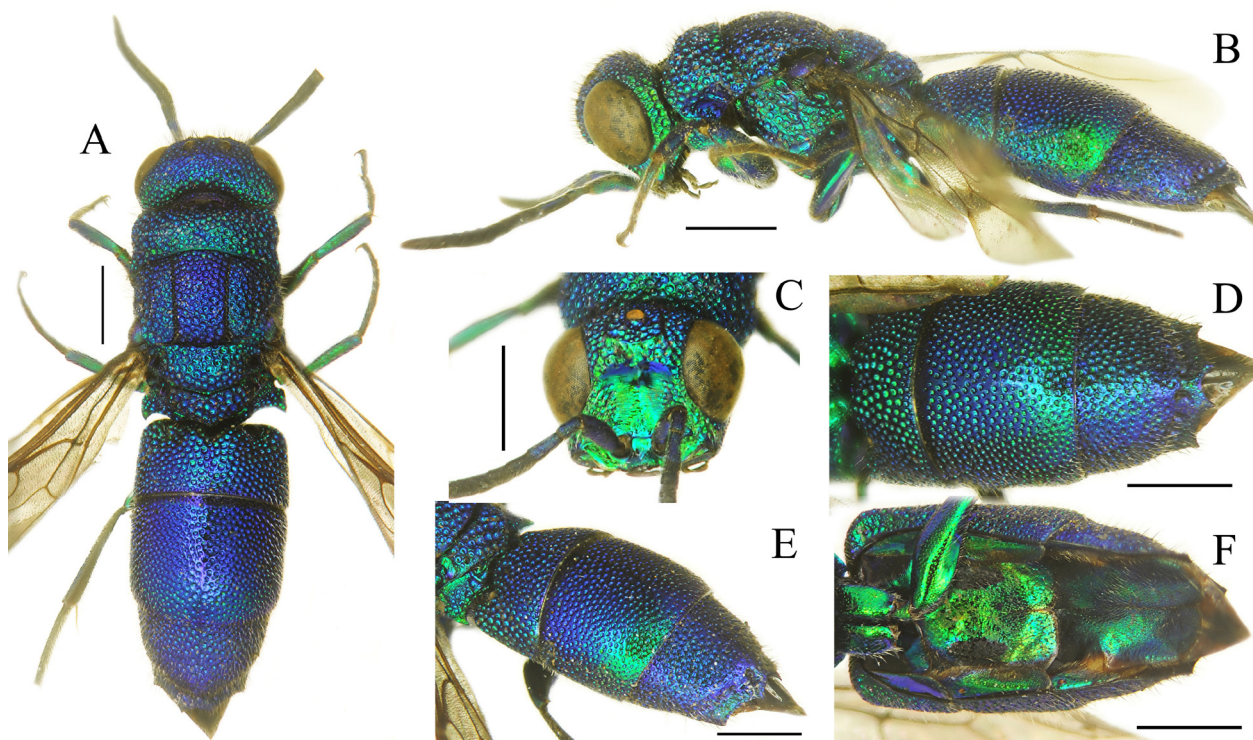


FIGURE 24. *Chrysis bernasconii* Rosa, **sp. nov.**, holotype female. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, dorsal view. E. Metasoma, postero-lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis bhavanae* Bingham, 1903**

(Figs 25A–25F)

Chrysis bhavanae Bingham, 1903: 472. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 389; Myanmar: Tenasserim (HNHM) (examined). Kimsey & Bohart 1991: 389 (cat., *ignita* group).

Chrysis bhavanne (!): Jonathan *et al.* 1977: 87 (cat., India: Uttar Pradesh, Punjab, Haryana).

Material examined. 1♀; India: Tamil Nadu, Nalgiri Hills, Kallar, 1500 ft, 3.vii.1954, leg. Nathan, GBIF_Chr00033252 (MNLU). 1♀: Devala, Nalgiri Hills, without further data (NHMW), 1♀, Mysore State, Shimoga Dist., Agumbe Ghat, 2000 ft, 05.1995, leg. T. Nathan (GLAC).

Redescription. *Female.* Body length 7.0 mm. Forewing length 4.2 mm. OOL $1.7 \times \text{MOD}$; POL $1.5 \times \text{MOD}$; MS $0.6 \times \text{MOD}$; relative length of P:F1:F2:F3 = 1.0:1.2:1.0:0.8.

Head. Frons with large (up to $0.5 \times \text{MOD}$) and contiguous punctures; vertex with double punctation and smaller punctures, with tiny dots on intervals; ocellar triangle and occiput with smaller punctures; transverse frontal carina distinctly angled, short, ending less than $1.0 \times \text{MOD}$ from eye's inner margin; scapal basin transversally microstriate; subantennal space about $1.0 \times \text{MOD}$; apical margin of clypeus incurved and thickened; genal carina sharp to mandibular insertion; distinct subgenal carina.

Mesosoma. Medial pronotal line [= pronotal groove] shallow, barely visible, and differently coloured, darker blue, reaching almost the posterior margin of pronotum; pronotum with even punctation, with tiny dots on interspaces, $0.1\text{--}1.0 \times \text{PD}$ apart; mesoscutum with larger punctures, with abundant tiny dots on interspaces; notauli as lines of small, deep and rounded foveae, dark blue contrasting with colour of mesoscutum; parapsidal signum [= parapsidal line] fully developed and visible; mesoscutellum postero-medially with larger and contiguous punctures; metanotum with large, irregular foveate punctures without interspaces; metapectal-propodeal disc unmodified; posterior propodeal projections [= propodeal teeth] subparallel; mesopleuron with posterior oblique sulcus [= scrobal

sulcus], formed by foveate punctures, transversally confluent with other punctures of pleuron; with tiny dots on interspaces. Spurs of mesotibia distinctly unequal in length; mesotarsomere I as long as II–IV together, V as long as II. Wings with nervures unmodified.

Metasoma. Tergum I and tergum II with similar punctation, punctures decreasing in diameter to apical margin and double on lateral margins; tergum III denser, with double punctures, with deeper tiny dots on interspaces, somewhere corrugated; pits of pit row deep, distinctly larger than other punctures on tergum; ovipositor broad; apical margin with four short, triangular teeth. Metasomal terga without median longitudinal carina. Black spots on sternum II narrow and elongate, placed at side of sternum, $2.5 \times \text{MOD}$ distant from each other.

Colouration. Body metallic green to light blue, darker blue on median area of mesoscutum, medially on mesoscutellum, and at base of terga II and III. Tegula brown in the holotype and metallic light blue in the paratype; scape, pedicel and flagellomere I blue, other flagellomeres black. Wings clear, with brownish veins.

Vestiture. Head with brownish, erect, and short setae, about $1.0 \times \text{MOD}$ long, white to silvery on scapal basin, whitish and short on meso- and metasoma; on meso- and metatibiae whitish, erect and longer (about $1.5 \times \text{MOD}$).

Male. Unknown.

Distribution. India (Uttar Pradesh; Punjab; Haryana; Mysore; Tamil Nadu). Oriental: Malaysia, Myanmar, Philippines (Kimsey & Bohart 1991).

Remarks. *Chrysis bhavanae* Bingham was included in the *Ch. ignita* group by Kimsey & Bohart (1991). We tentatively include it in the *Chrysis maculicornis* species group for the noticeably short malar space, the subgenal carina and the narrow and elongate black spots on the sternum II; however, its placement in this group is doubtful without examination of the male. It resembles *Chrysis gracilentia* Mocsáry, 1889, in the *ignita* group, for its general habitus; however, the shape of head and the black spots on sternum II are diagnostic and do not match the diagnostic features of this group. *Chrysis bhavanae* is separated from *Ch. gracilentia*, by shorter malar spaces; shorter distance between inner margin of eyes; shorter flagellomere I [$l/w = 2$ in *Ch. bhavanae* (width taken at base of F1) vs. $l/w = 3$]; transverse frontal carina arcuate (vs. medially straight and downcurved toward eye); black spots on sternum II small (vs. large, oval and covering half sternum), punctation on tergum II even (vs. double and more spaced).

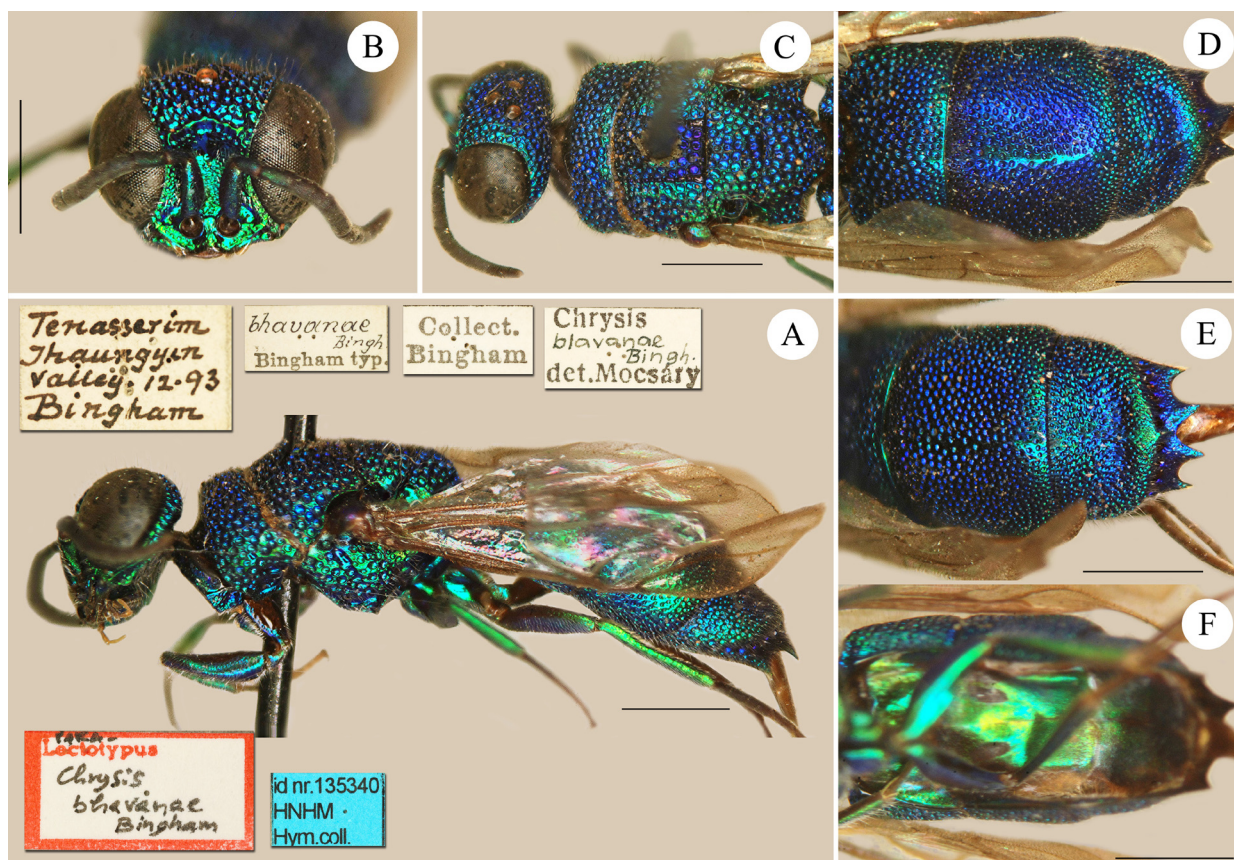


FIGURE 25. *Chrysis bhavanae* Bingham, 1903, paralectotypus, female. A. Habitus, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, dorsal view. E. Metasoma, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis bhoutanensis* (du Buysson, 1908)**

(Figs 26A–26F)

Hexachrysis bhoutanensis du Buysson, 1908: 212. Holotype ♀; India: English Bhutan [= West Bengal], Maria Basti (MNHN) (examined).

Chrysis bhoutanensis: Kimsey & Bohart 1991: 389 (cat., Philippines (sic): Bhutan, *smaragdula* group).

Material examined. 1 ♀, Museum Paris, Bhoutan, Maria Basti, R. Oberthür 1900, *Chrysis Bhoutanensis* type Buys. R. du Buysson det. 1909, Type (MNHN).

Distribution: India (West Bengal).

Remarks. The type locality of *Chrysis bhoutanensis* (du Buysson) is in fact British Bootang (Bhoutan) which is in West-Bengal, India, and Maria Basti is now in Kalimpong environs in Darjeeling (West Bengal). Other distributional records (Philippines, Indonesia in Kimsey & Bohart 1991) are in error or doubtful.

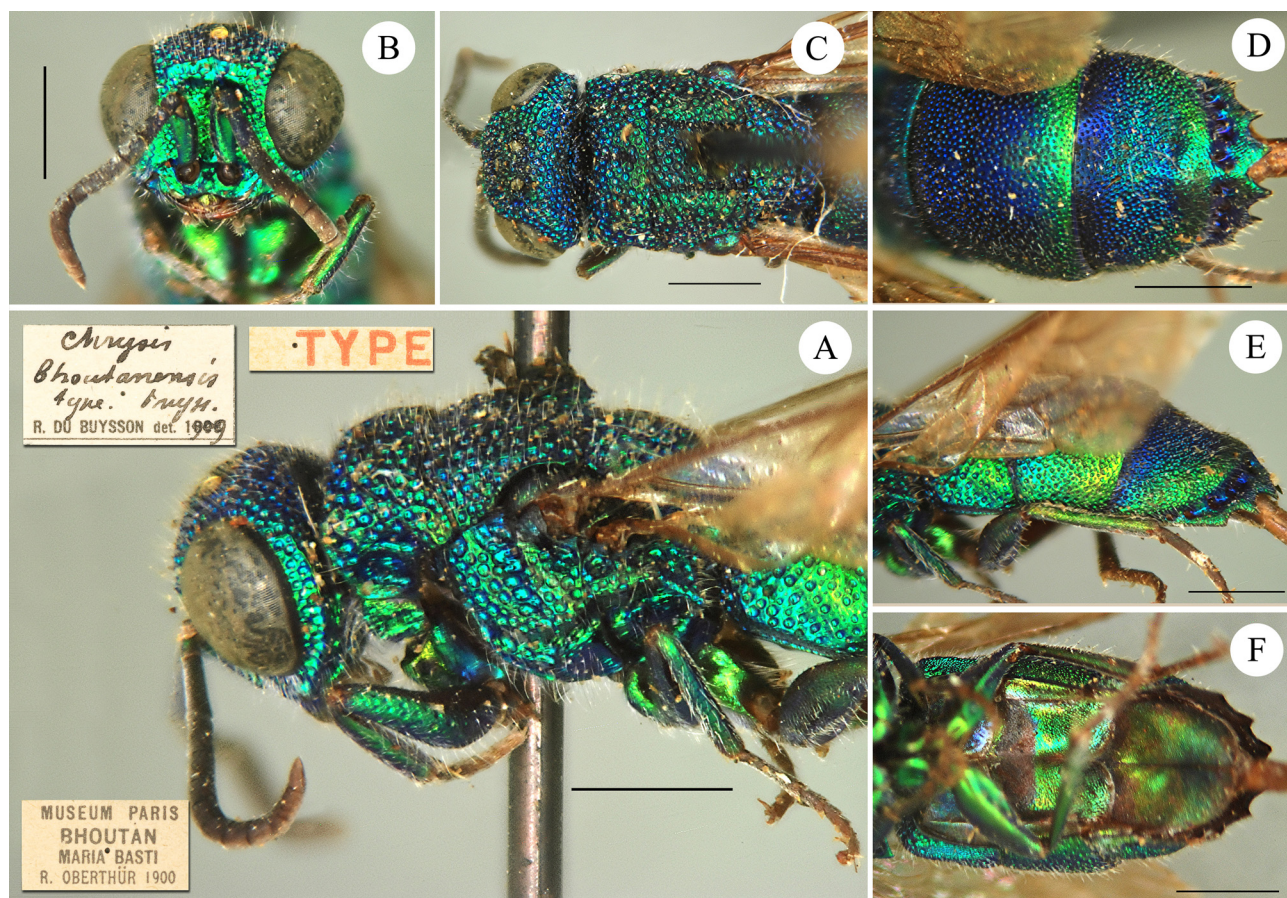


FIGURE 26. *Chrysis bhoutanensis* (du Buysson, 1908), holotype, female. A. Mesosoma, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, posterior view. E. Metasoma, lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis buddhae* Mocsáry, 1913**

(Figs 27A–27F)

Chrysis (*Hexachrysis*) *buddhae* Mocsáry, 1913: 25. Lectotype ♂ designated by Bohart in Bohart & French 1986: 341; Taiwan: Takao [= Kaohsiung] (HMNH) (examined).

Chrysis buddhae: Kimsey & Bohart 1991: 392 (cat., South India, *smaragdula* group).

Distribution. India (South India (locality not specified)); Taiwan, Borneo (Kimsey & Bohart 1991).

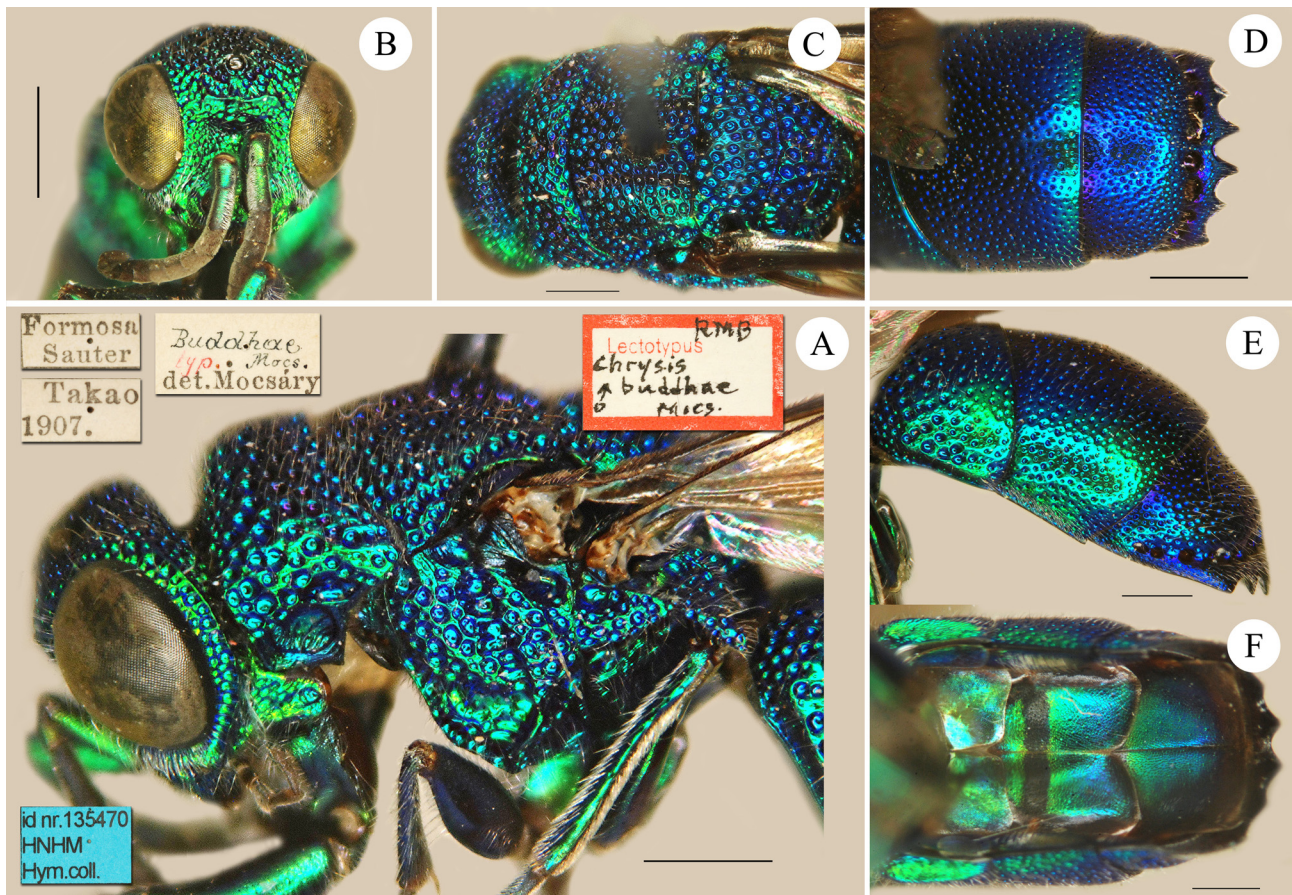


FIGURE 27. *Chrysis buddhae* Mocsáry, 1913, lectotype, male. A. Mesosoma, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, dorsal view. E. Metasoma, lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

Chrysis comottii Gribodo, 1884

(Figs 28A–28F)

Chrysis insularis Smith, 1859: 26, *nec* Guérin-Méneville, 1842. Holotype ♀; Indonesia: Celebes [= Sulawesi] (HECO).

Chrysis comottii Gribodo, 1884: 367: replacement name for *Chrysis insularis* Smith, 1859, *nec* Guérin-Méneville, 1842, 367–368 (descr., India: West Bengal: Rajahrampoor; Tamil Nadu: Neelgherries [= Nilgiris], Pondichery [= Puducherry]); Dalla Torre 1892: 52 (cat., India); Bingham 1903: 440(key), 491 (descr., Pondicherry).

Chrysis (Hexachrysis) comottii: Mocsáry 1889: 560 (descr., Pondichery [= Puducherry]); Bischoff 1913: 64 (cat., India).

Distribution. India (Tamil Nadu; Puducherry; West Bengal); Indonesia, Sumatra, Java (Kimsey & Bohart 1991).

Remarks. We could not examine Smith's type specimen deposited at Oxford. However, we examined the series of *Chrysis comottii* from Celebes deposited in Gribodo's collection (MSNG). Gribodo examined Smith's type (handwritten label pinned with Gribodo specimen) and for this reason we consider reliable his identifications. Gribodo's specimens match the original description, in particular for colouration and punctation on mesosoma, whereas in the major European collections of Mocsáry (HNHM), Linsenmaier (MNLU), and Zimmermann (NHMW), another species from Celebes and Java was identified as *Chrysis comottii*. This species is characterized by mesosoma with sparse punctation and green olive colouration. For this reason, all specimens identified as *Chrysis comottii* from India should be double checked.

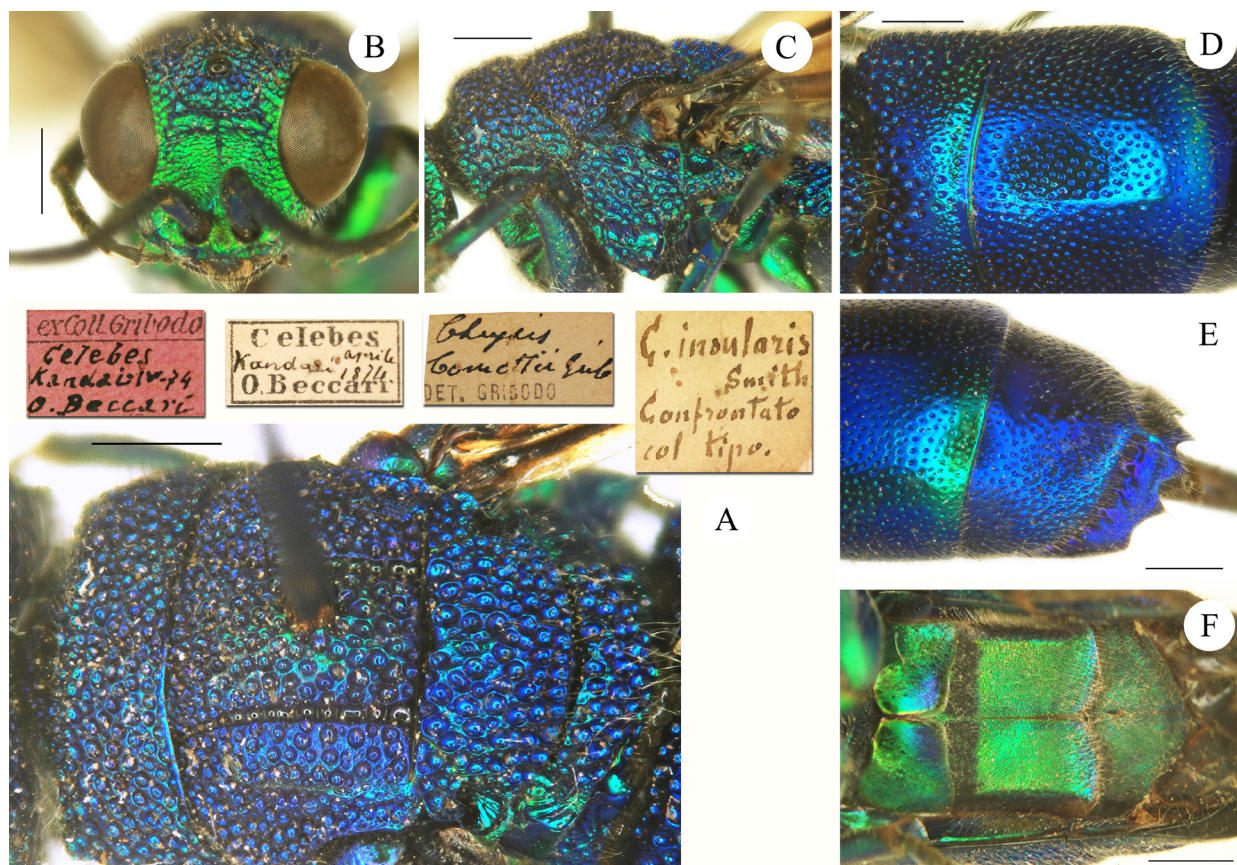


FIGURE 28. *Chrysis comottii* Gribodo, 1884, female from Celebes. A. Mesosoma, dorsal view. B. Head, frontal view. C. Mesosoma, lateral view. D. Metasoma, dorsal view. E. Metasoma, dorso-lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis cotesi* du Buysson, 1893, sp. resurr.**

(Figs 29A–29F, 30A–30E)

Chrysis (*Tetrachrysis*) *cotesi* du Buysson, 1893: 249. Lectotype ♂ designated by Bohart in Kimsey & Bohart 1991: 447; India: Karnataka: Bangalore [= Bengaluru] (MNHN) (examined).

Chrysis cotesi: du Buysson 1896b: 472 (key, descr., quadridentatae group, Maharashtra: Poona [= Pune]; Karnataka: Kanara; South Guzerat [= Gujarat], Central provinces, Bangalore, Mysore); Bischoff 1913: 50 (cat., India); du Buysson 1898a: 134 (cat., North Konkan, Matheron); du Buysson 1898b: 529 (cat., Bengal), 552 (cat., Pondicherry); Bingham 1903: 438 (key), 470–471 (descr., Gujarat: Deesa, Central Provinces and Western India, Karnataka: Bangalore [= Bengaluru], Mysore, probably throughout continental India); Jonathan *et al.* 1977: 87 (widely distributed species in India).

Chrysis palliditarsis Spinola, 1838: Kimsey & Bohart 1991: 447 (cat., syn., Bangalore, *comparata-scutellaris* group).

Material examined. 1 ♂, Lectotype, Museum Paris Inde, Bangalore, Coll. R. du Buysson 1900, ♂ (MNHN); 1 ♀, South India, Karikal, without further data (NHMW).

Distribution. India (Gujarat; Karnataka; Maharashtra; Bengal and Central provinces (locality not specified)).

Remarks. Kimsey & Bohart (1991) synonymised *Chrysis cotesi* du Buysson, 1893 with *Ch. palliditarsis* Spinola, 1838. Nevertheless, this rather common Indian species does not belong to the *scutellaris* group, but to the similar *viridissima* group. We agree with all other authors who treated *Chrysis cotesi* as a distinct species and revalidate it here. *Chrysis cotesi* can be easily separated from *Ch. palliditarsis* by transverse frontal carina vanishing (vs. sharp and M-shaped), face longitudinally elongate (vs. transverse), male with darker brown tarsi (vs. yellowish to whitish in *C. palliditarsis*), pronotum medially elongate (vs. unmodified), mesoscutal punctation shallow, with large, polished interspaces (vs. punctation coarse, without interspaces), mesoscutellum distinctly elongate (vs. unmodified), postero-lateral mesoscutal corner dentate before tegula (vs. unmodified), metasomal punctation shallow and with large, polished interspaces (vs. largely and densely punctate).

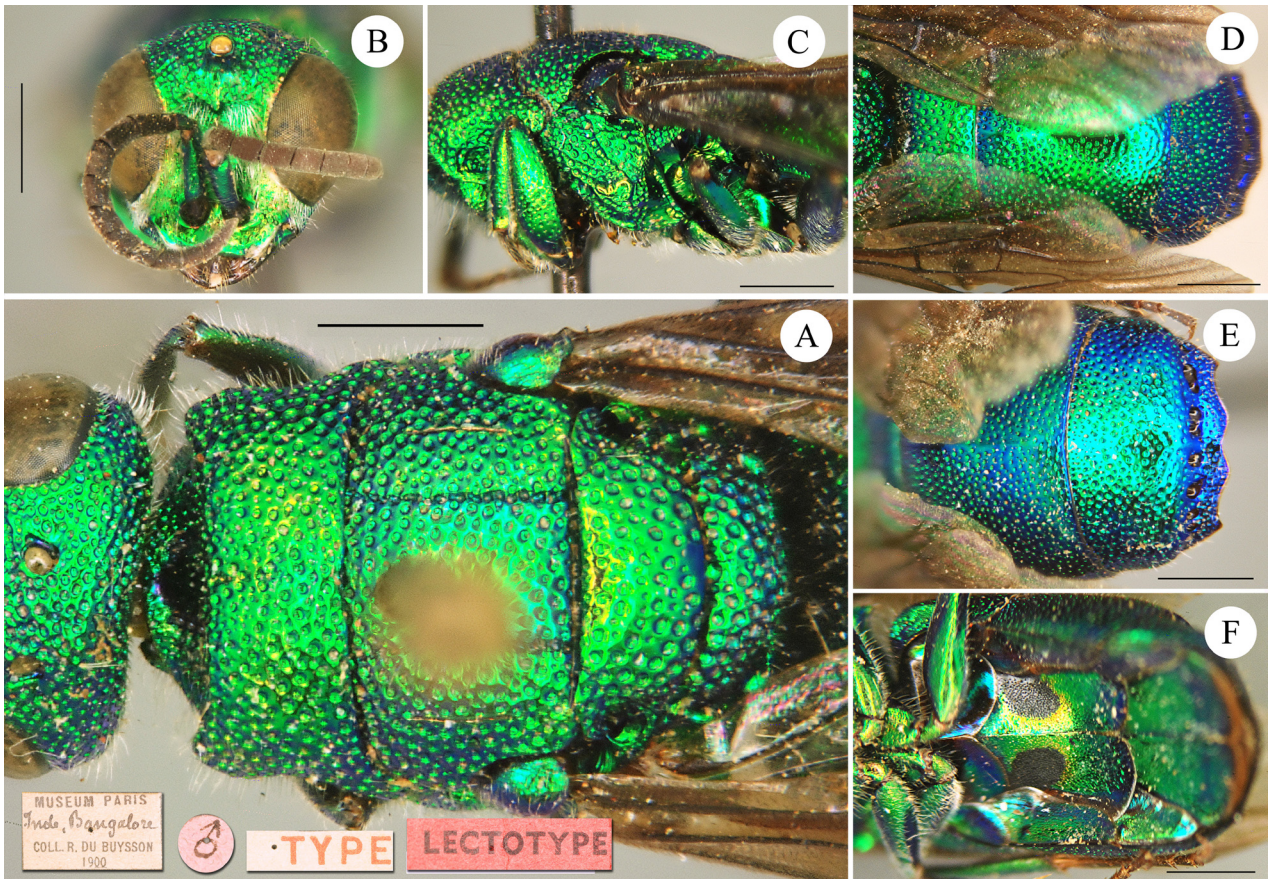


FIGURE 29. *Chrysis cotesi* du Buysson, 1893, lectotype, male. A. Mesosoma, dorsal view. B. Head, frontal view. C. Mesosoma, lateral view. D. Metasoma, dorsal view. E. Metasoma, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

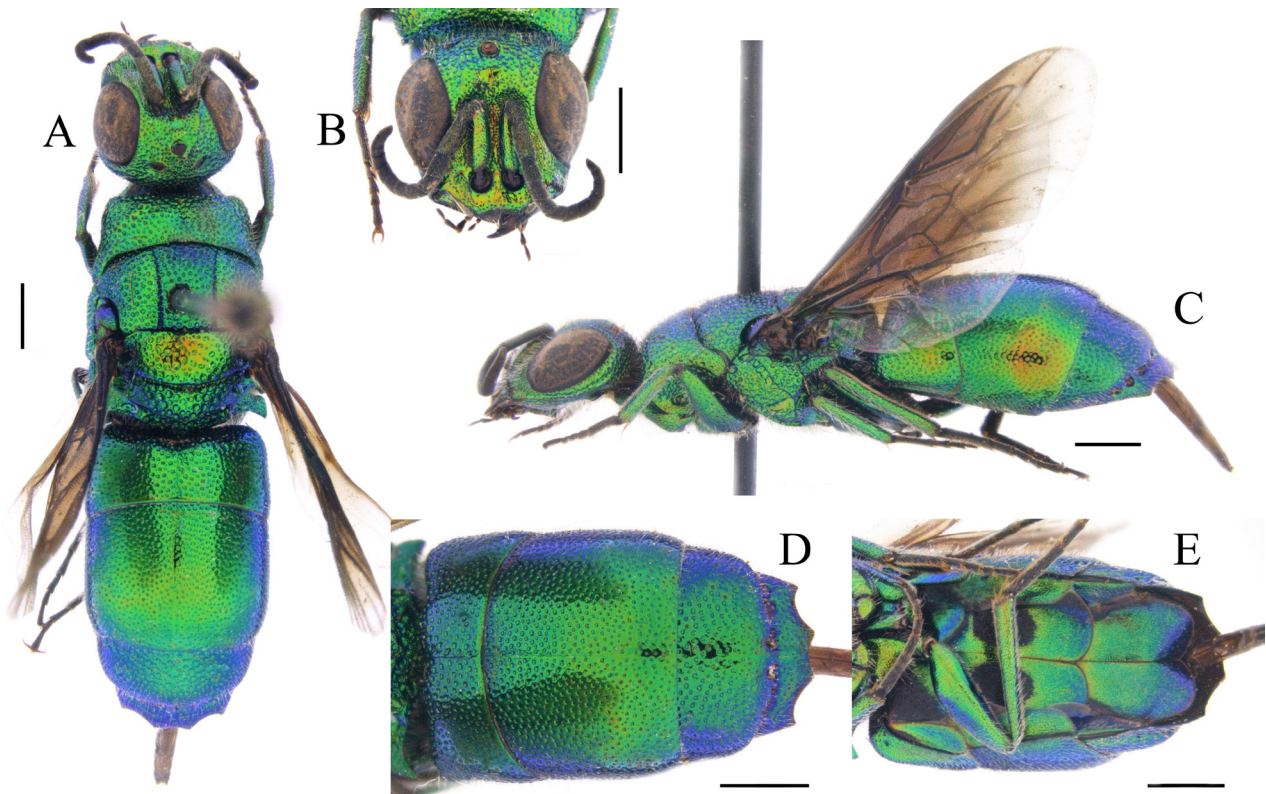


FIGURE 30. *Chrysis cotesi* du Buysson, 1893. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorsal view. E. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis cupreiventris* Bingham, 1898**

(Figs 31A–31E)

Chrysis cupreiventris Bingham, 1898: 117. Holotype ♀; India: Himachal Pradesh: Simla [= Shimla] (NHMUK) (examined). Bingham 1903: 437 (key), 465–466 (descr., Himalayas, Simla, Sikkim); Bingham 1908: 348 (Himalayas: Phagu near Simla); Kimsey & Bohart 1991: 401 (cat., Simla, *ignita* group).

Chrysis cupriventris (!): Jonathan *et al.* 1977: 86 (Himalayas).

Chrysis (Tetrachrysis) cupreiventris: Bischoff 1913: 50 (cat., Himalaya, Sikkim).

Material examined. 1 ♂, Sikkim Runjit Valley 1000 ft 5.94 Bingham, *cupreiventris* Bingh. Bingham typ., *Chrysis cupreiventris* (m) Bingh. type; 1 ♂, Pakistan: Chitral, Madaglasbt, 9.ix.1929, leg. B.N. Chopra (NHMW).

Distribution. India (Himachal Pradesh, Sikkim); Pakistan (new record).

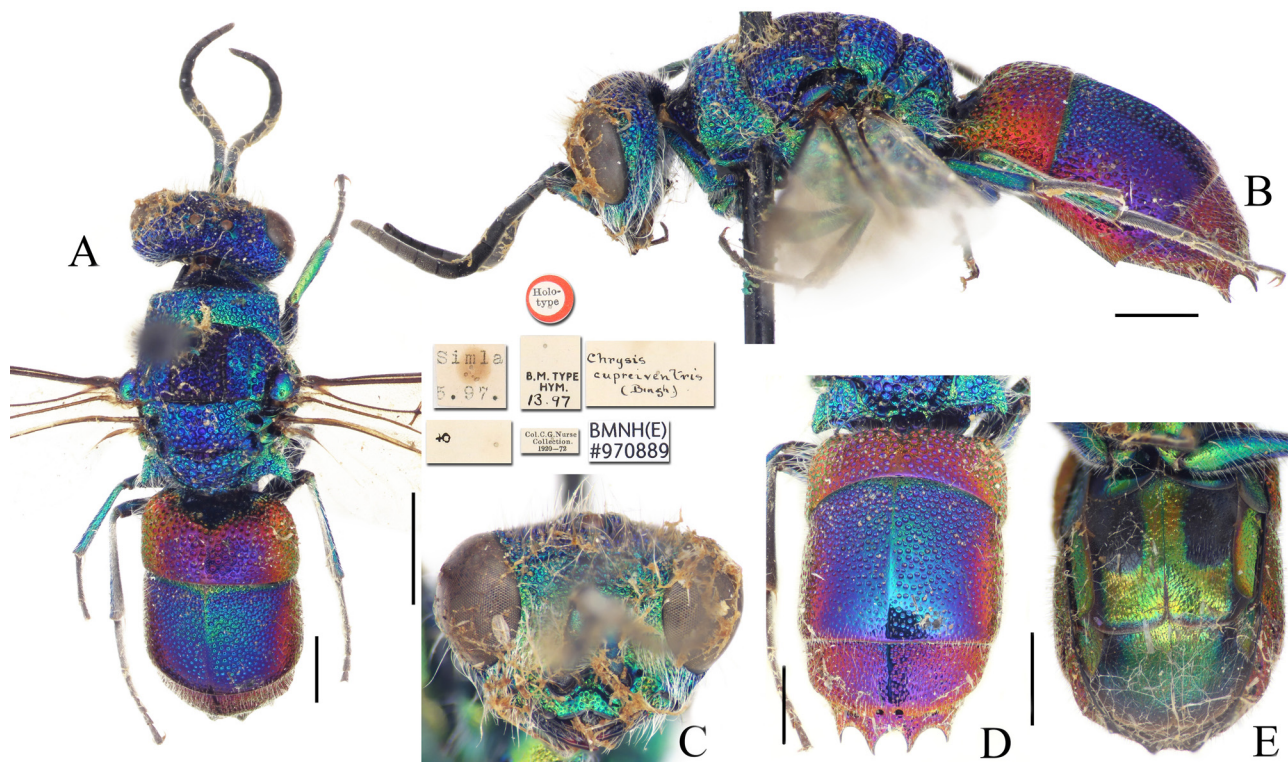


FIGURE 31. *Chrysis cupreiventris* Bingham, 1898, holotype, female. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, dorsal view. E. Metasoma, ventral view. Scale bars 1.0 mm. (© The Trustees of the NHMUK)

***Chrysis disparilis* Cameron, 1897**

(Figs 32A–32F)

Chrysis disparilis Cameron, 1897: 5. Holotype ♀; India: West Bengal: Barrackpore (HECO). Bingham 1903: 437 (key), 461–462 (descr., Barrackpore, Deesa); Jonathan *et al.* 1977: 87 (cat., India: Barrackpore, Deesa); Kimsey & Bohart 1991: 404 (cat., India: Barrackpore, *splendidula-senegalensis* group).

Chrysis (Tetrachrysis) disparilis: Bischoff 1913: 50 (cat., India).

Material examined. 1 ♀; Karaikal, Kurumbagaram, ix.1951, leg. Nathan, Paratype *Chrysis karikalensis* Linsenmaier, det. Linsenmaier 1987 (MNLU).

Distribution. India (Gujarat; Puducherry; West Bengal); Sri Lanka (Kimsey & Bohart 1991).

Remarks. Linsenmaier labelled some specimens as *Chrysis karikalensis* (nomen in collection) that we identify as *Ch. disparilis* Cameron. However, we examined only specimens of *Ch. disparilis* (Fig. 32) identified by Bingham, who studied Cameron materials, and that we considered as reliable identifications.

Specimens examined by Linsenmaier from Karikal shows some alteration on the terga II and III: the apical margin of the tergum II is not evidently raised as in *Chrysis disparilis* (this is the same diagnostic character of the

common Palearctic species *Ch. splendidula*), and the pits of the pit row are distinctly smaller and rounded. We cannot evaluate if these characters can be considered as intraspecific variations or may represent different taxa.

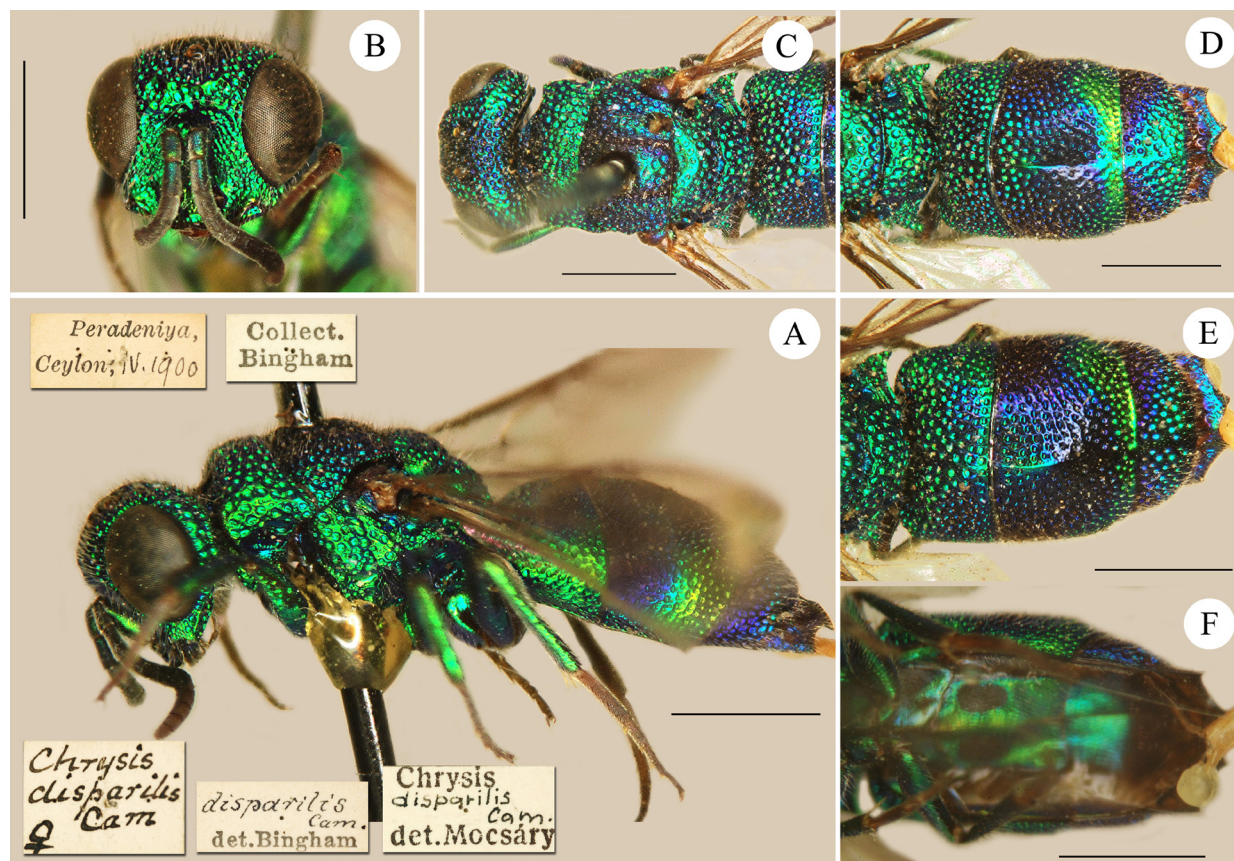


FIGURE 32. *Chrysis disparilis* Cameron, 1897, female from Sri Lanka. A. Habitus, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, dorsal view. E. Metasoma, dorsal view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis dissimilanda* du Buysson, 1896b**

(Figs 33A–33F)

Chrysis dissimilanda du Buysson, 1896b: 470. Holotype ♂; India: Bombay: Poona [= Pune] (469 (key), 470–471 (descr.)) (MNHN) (examined). Bingham 1903: 436 (key), 447 (descr., Bombay, Poona); Kimsey & Bohart 1991: 404 (cat., Bombay: Poona, *ceciliae* group).

Chrysis (Holo-chrysis) dissimilanda: Bischoff 1913: 38 (cat., India, Bombay, Poona).

Material examined. 1 ♂, Presid. Bombay Poona R.C. Wroughton, Museum Paris Poona Coll. R. du Buysson 1900, *Chrysis dissimilanda* type Buyss. R. du Buysson det., Type (MNHN).

Distribution. India (Maharashtra).

***Chrysis dissimilis* Dahlbom, 1854**

(Figs 34A–34D)

Chrysis dissimilis Dahlbom, 1854: 202. Holotype ♀; India: Bengal (ZMUC) (examined). Dalla Torre 1892: 57 (cat.); Kimsey & Bohart 1991: 404 (cat., India: Bengal, *elegans* group); Rosa *et al.* 2017e: 81 (typ., fig. 10).

Chrysis (Tetrachrysis) dissimilis: Mocsary 1889: 376 (descr., India Orientalis: Bengal); Bischoff 1913: 50 (cat., India).

Material examined. 1 ♀, *C. dissimilis* Dahlb. Bengal, May 1808, Mus. Westerm. ZMUC 00240117 (ZMUC).

Distribution. India (Bengal (locality not specified)).

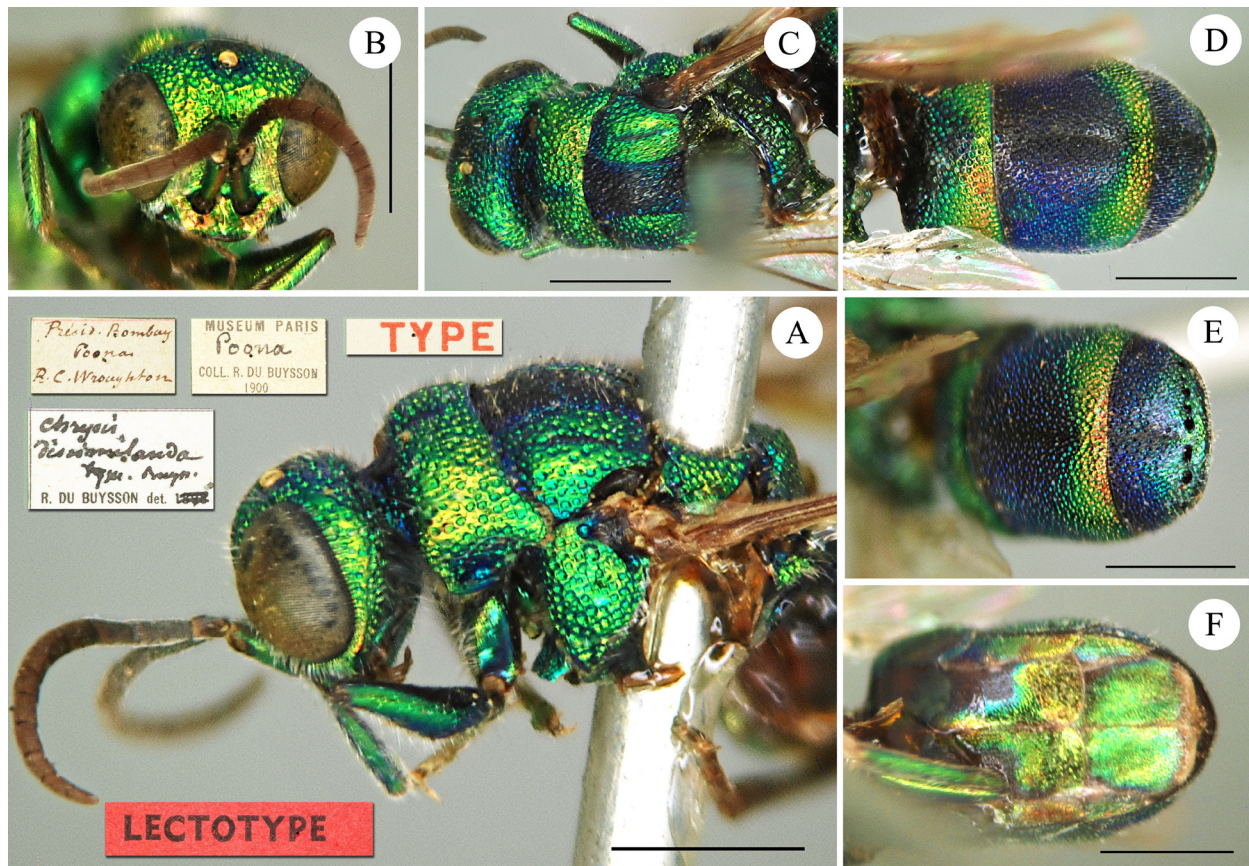


FIGURE 33. *Chrysis dissimilanda* du Buysson, 1896, holotype [not lectotype], female. A. Head and mesosoma, lateral view. B. Head, frontal view. C. Mesosoma, dorsal view. D. Metasoma, dorsal view. E. Metasoma, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

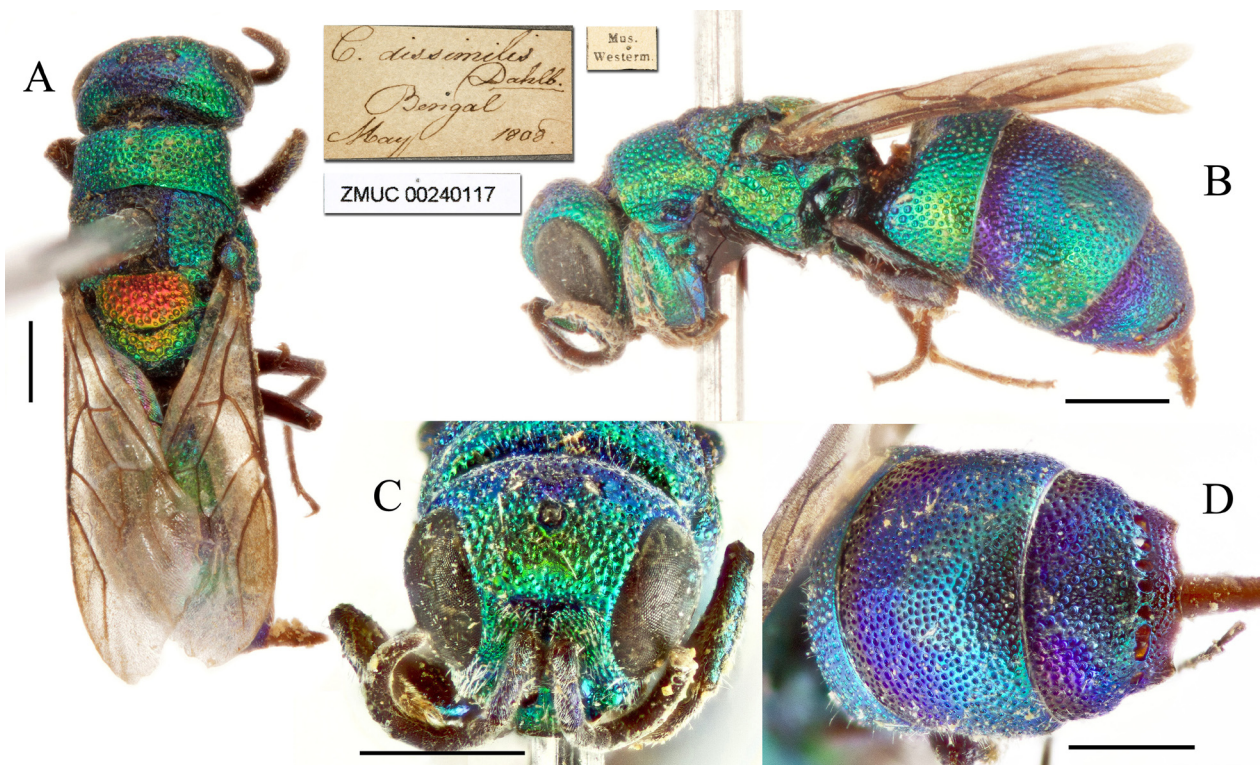


FIGURE 34. *Chrysis dissimilis* Dahlbom, 1854, holotype, female. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, posterior view.

***Chrysis distincta* Mocsáry, 1887**

Chrysis analis var. *incerta* Radoszkovsky, 1880: 145. Holotype ♀; Caucasus (ISEA-PAS) (examined), *nec* Dahlbom, 1854.
Chrysis distincta Mocsáry, 1887: 13. Replacement name for *Chrysis analis incerta* Radoszkovsky, 1880.
Chrysis distincta: Kimsey & Bohart 1991: 404 (cat., North India, *maculicornis* group).

Distribution. India (North India, locality not specified).

***Chrysis durbar* Mocsáry, 1914**

(Figs 35A–35D)

Chrysis (Tetrachrysis) durbar Mocsáry, 1914: 46. Holotype ♀; India: Meghalaya: Northern Khasia Hills (NHMUK) (examined).

Chrysis durbar: Kimsey & Bohart 1991: 406 (cat., Northern Khasia Hills, *ignita* group).

Material examined. 1 ♀, Type H.T., N. Khasia Hills. 96–135, *Tetrachrysis durbar* Mocs. Typ., 129, B.M. Type Hym. 13.98, BMNH(E) #970873 (NHMUK).

Distribution. India (Meghalaya).

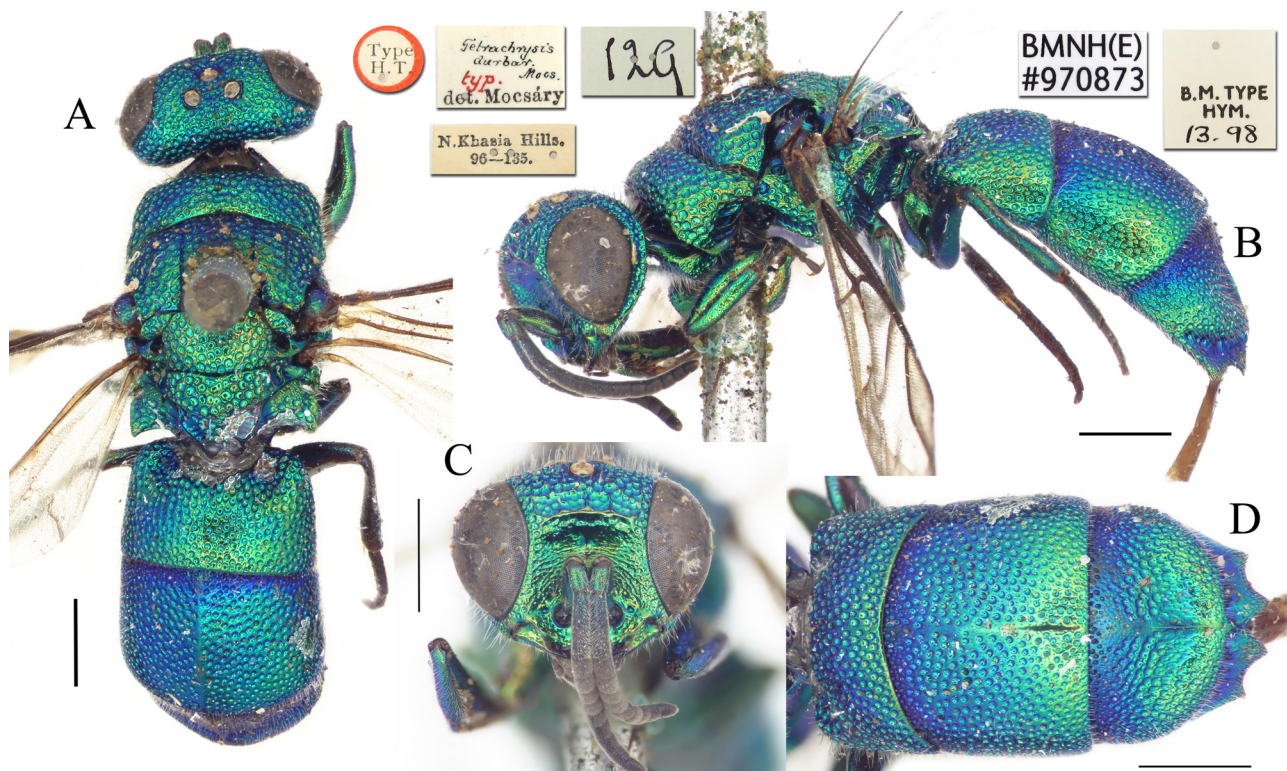


FIGURE 35. *Chrysis durbar* Mocsáry, 1914, holotype, female. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, dorsal view. Scale bars 1.0 mm. (© The Trustees of the NHMUK)

***Chrysis durga* Bingham, 1903**

(Figs 36A–36F)

Chrysis durga Bingham, 1903: 487. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 406; Myanmar: Mandalay (BMNH) (examined). Nurse 1914: 447 (Assam, Sadiya); Kimsey & Bohart 1991: 406 (cat., typ., *smaragdula* group).

Distribution. India (Assam); China, Laos, Malaysia, Myanmar (Kimsey & Bohart 1991).

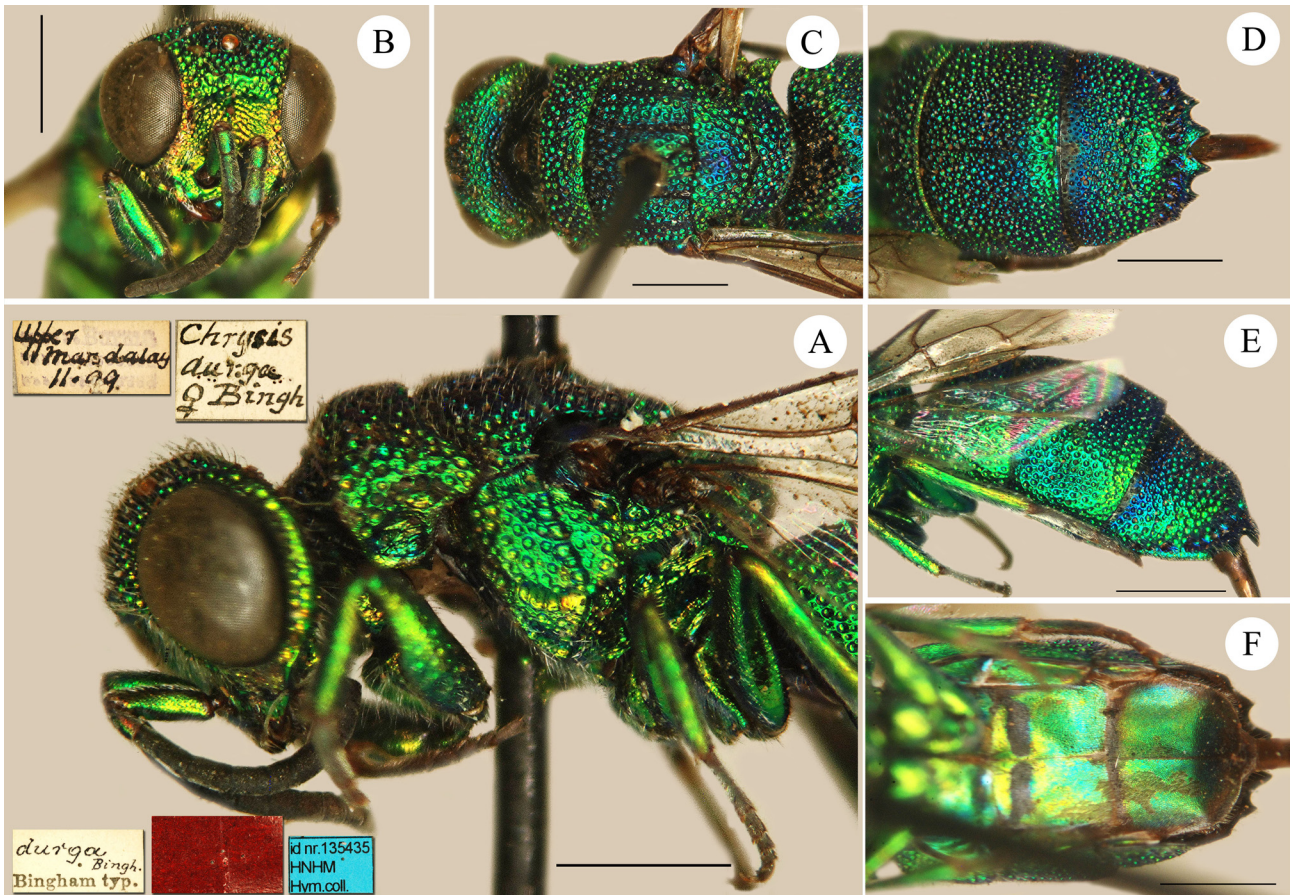


FIGURE 36. *Chrysis durga* Bingham, 1903, lectotype, female. A. Mesosoma, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, posterior view. E. Metasoma, lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis excellens* Linsenmaier, 1997**

(Figs 37A–37H)

Chrysis (Chrysis) excellens Linsenmaier, 1997: 279. Holotype ♀; Pakistan: Karachi (MNLU) (examined) (paratype from India: Rajasthan: Jaisalmer) (*pallidicornis* group).

Distribution. India (Rajasthan); Pakistan (Linsenmaier 1997).

***Chrysis gujaratica* Nurse, 1903a**

(Figs 38A–38D, 39A–39D)

Chrysis gujaratica Nurse, 1903a: 11. Lectotype ♂ designated by Bohart in Kimsey & Bohart 1991: 416; India: Gujarat: Deesa (NHMUK). Bingham 1903: 437 (key), 456 (descr., Northern Gujarat: Deesa; Delhi), pl. I (fig. 3); Linsenmaier 1959: 239 (descr., India); Kimsey & Bohart 1991: 416 (cat., India: Deesa, *pallidicornis* group); Rosa *et al.* 2020a: 48 (cat., typ., fig. 18).

Chrysis nursei Bingham, 1903: 463. Holotype ♂; India: Gujarat: Deesa (437 (key), 463–464 (descr.), 463 (fig. 156)) (NHMUK) (examined), **syn. nov.** Kimsey & Bohart 1991: 444 (cat., India: Deesa, *pallidicornis* group).

Chrysis (Tetrachrysis) gujaratica: Bischoff 1913: 52 (cat., India).

Chrysis (Hexachrysis) nursei: Bischoff 1913: 66 (cat., India).

Chrysis (Chrysis) gujaratica: Linsenmaier 1968: 92 (descr., North-West India, *pallidicornis* group).

Material examined. 1 ♀, Syntype, Deesa, 3.01, ♀, Type, Col. C.G. Nurse Collection 1920-72, *Chrysis gujaratica*

(Nurse), B.M. Type Hym. 13.89, BMNH(E) #970899 (NHMUK); 1 ♂, Holotype, Deesa, 12.01, ♂, *Chrysis nursei* ♂ Bing. Type, B.M. Type Hym. 13.99, BMNH(E) #970898 (NHMUK); 1 ♀, Deesa 3.01, Baluchistan Deesa C.G. Nurse 1909, *Chrysis gujaratica* Nurse (NHMW); 1 ♂, Deesa 3.01, Baluchistan Deesa C.G. Nurse 1909, *Chrysis gujaratica* Nurse (NHMW); 2 ♂, Gujarat, Deesa, iii.1901, leg. C.G. Nurse (MNLU).

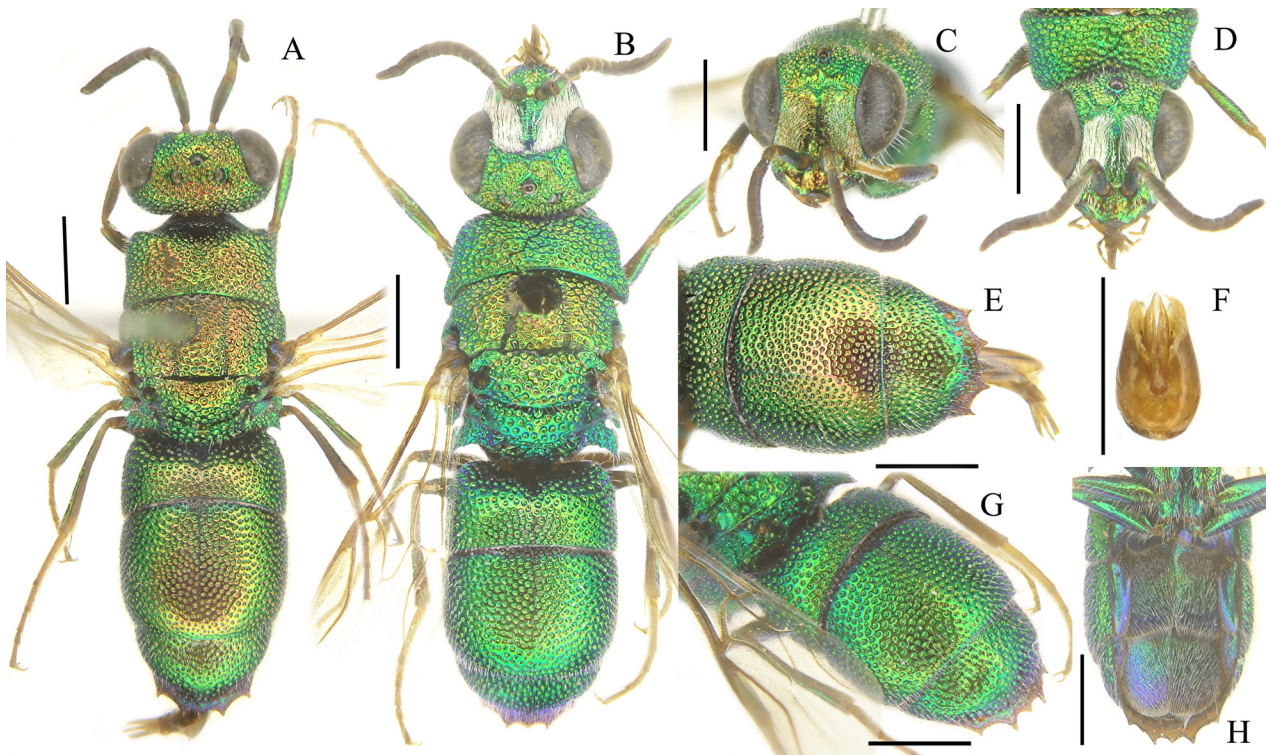


FIGURE 37. *Chrysis excellens* Linsenmaier, 1997, holotype female. A. Habitus, dorsal view. C. Head, dorsal view. E. Metasoma, dorsal view. Paratype male from Pakistan. B. Habitus, dorsal view. D. Head, dorsal view. F. genital capsule, dorsal view. G. Metasoma, dorso-lateral view. H. Metasoma, ventral view. Scale bars 1.0 mm.

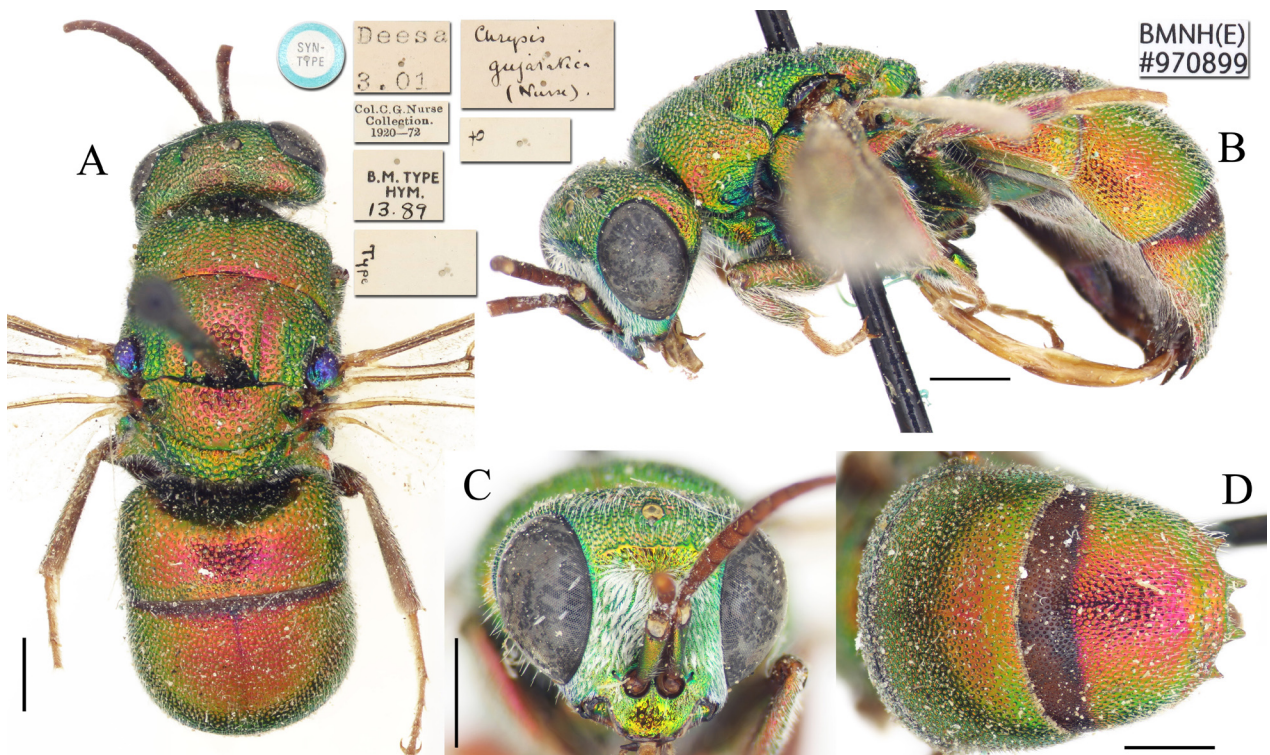


FIGURE 38. *Chrysis gujaratica* Nurse, 1903, lectotype, female. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, posterior view. Scale bars 1.0 mm. (© The Trustees of the NHMUK)

Distribution: India (Delhi; Gujarat). Pakistan (*Nurse 1903b*).

Remarks. *Chrysis nursei* Bingham (Fig. 39) is the dimorphic ♂ of *Ch. gujaratica* Nurse (Fig. 38), both collected in numbers at Quetta by Nurse during the years 1901–1903, and for this reason we here propose the new synonymy: *Chrysis nursei* Bingham, 1903, syn. nov. of *Ch. gujaratica* Nurse, 1903b.

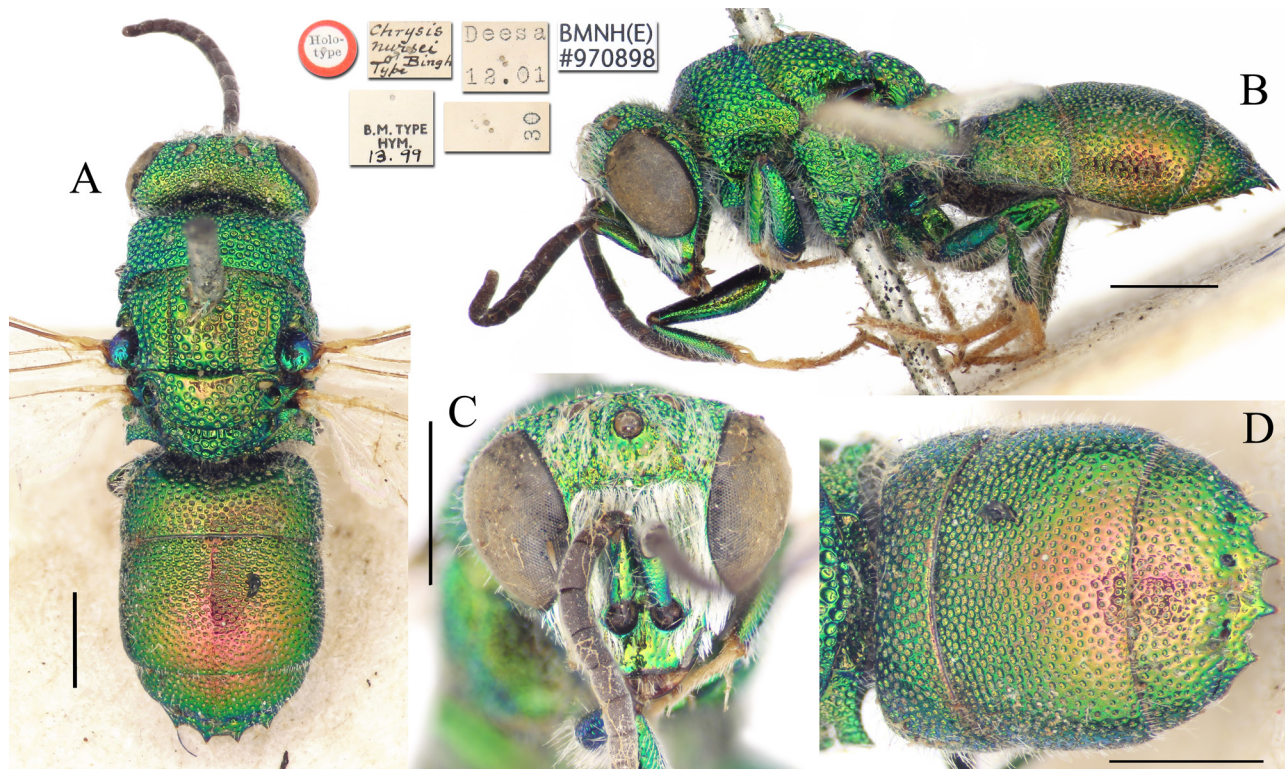


FIGURE 39. *Chrysis nursei* Bingham, 1903 (= *Chrysis gujaratica* Nurse), holotype, male. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, posterior view. Scale bars 1.0 mm. (© The Trustees of the NHMUK)

Chrysis hecate Mocsáry, 1889

(Figs 40A–40F)

Chrysis (*Tetrachrysis*) *hecate* Mocsáry, 1889: 378. Holotype ♀; Indonesia: Java (HNHM) (examined) (*splendidula-senegalensis* group).

Material examined. 1 ♀, Tamil Nadu: Coimbatore, viii.1953, leg. Nathan (MNLU).

Distribution. *India (Tamil Nadu); Indonesia (Java) (Mocsáry, 1889).

Chrysis ignita (Linnaeus, 1758)

Sphex ignita Linnaeus, 1758: 571. Lectotype ♀ designated by Richards 1935: 159; Europe (Linnean Society, London). *Chrysis ignata* (!): Thakkar & Parikh 2018: 23 (cat., Gujarat).

Distribution. India (Gujarat). West-Palaeartic: from West Europe to central Asia (Linsenmaier 1997). Linsenmaier (1968) reported one specimen from Pakistan (Chillagh Hills).

Remarks. Thakkar & Parikh (2018) identification should be considered as *sensu lato*, being *Chrysis ignita* the most complicated taxonomical species group, including more than 100 species, sometimes impossible to identify without molecular analyses (Paukkunen *et al.* 2015). The occurrence in India should be confirmed.

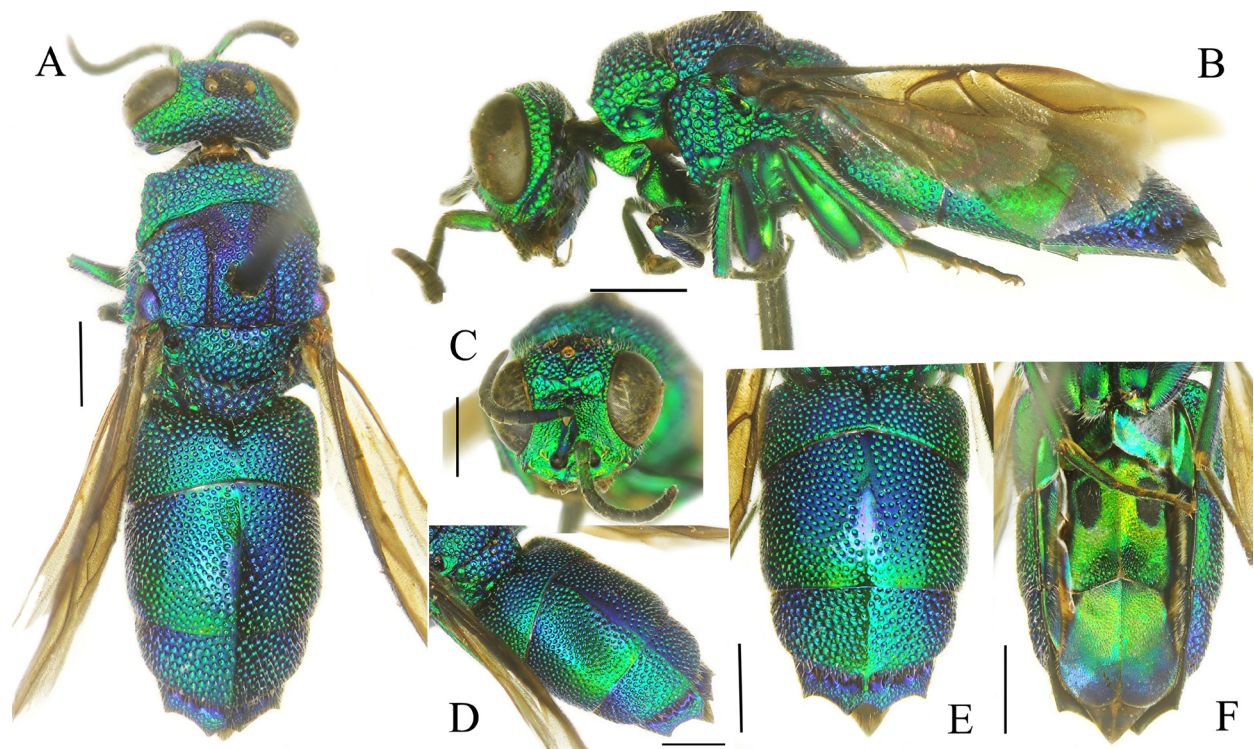


FIGURE 40. *Chrysis hecate* Mocsáry, 1889, female from Tamil Nadu. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, dorso-lateral view. E. Metasoma, dorsal view. F. Metasoma, ventral view. Scale bars 1.0 mm.

Chrysis imperialis Westwood, 1842

Chrysis fasciata Donovan, 1800: 56, Fig. 1, *nec* Olivier, 1790. Type unknown; India: Tamil Nadu: Tranquebar [= Tharangambadi] (113 (fig.), 114 (descr.)) (depository unknown).

Chrysis imperialis Westwood, 1842: 87. Replacement name for *Chrysis fasciata* Donovan, 1800, *nec* Olivier 1790; Dalla Torre 1892: 70 (cat., India).

Chrysis (Tetrachrysis) imperialis: Bischoff 1913: 53 (cat., India); Kimsey & Bohart 1991: 421 (cat., East and Central India).

Distribution. India (Tamil Nadu).

Chrysis ionophris Mocsáry, 1893

(Figs 41A–41E)

Chrysis (Tetrachrysis) ionophris Mocsáry, 1893: 226. Holotype ♀; Burma [= Myanmar] (MSNG).

Chrysis ionophris: Jonathan *et al.* 1977: 86 (cat., India: Arunachal Pradesh).

Chrysis ionophris: Kimsey & Bohart 1991: 425 (cat., *splendidula-senegalensis* group).

Material examined. 1 ♀, India: Kerala, Walayar forest, without further data (NHMW); 1 ♀, Tamil Nadu: Settipatti, 9.i.1976, leg. W. Perraudin (MNLU); 1 ♀, *idem*, 17.xi.1979, leg. W. Perraudin (MNLU).

Distribution. India (Arunachal Pradesh; Kerala; Tamil Nadu). China (Taiwan; Hong Kong), Laos, Myanmar, Sumatra, Thailand (Rosa *et al.* 2014).

Remarks. The examined specimen from Kerala (Figs 41A, 41D) has a different apical margin of the tergum III (compare with Fig. 41E, *Chrysis ionophris* from Myanmar). Other two examined specimens from Tamil Nadu have apical margin similar to *Chrysis talitha* Mocsáry, 1913; however, they are separated from the latter by small and ovoid shape of black spots on sternum II. We temporarily consider these modified apical teeth as aberrations. Anyway, more material is needed to evaluate the intra- and interspecific variability in species of the *senegalensis* group.

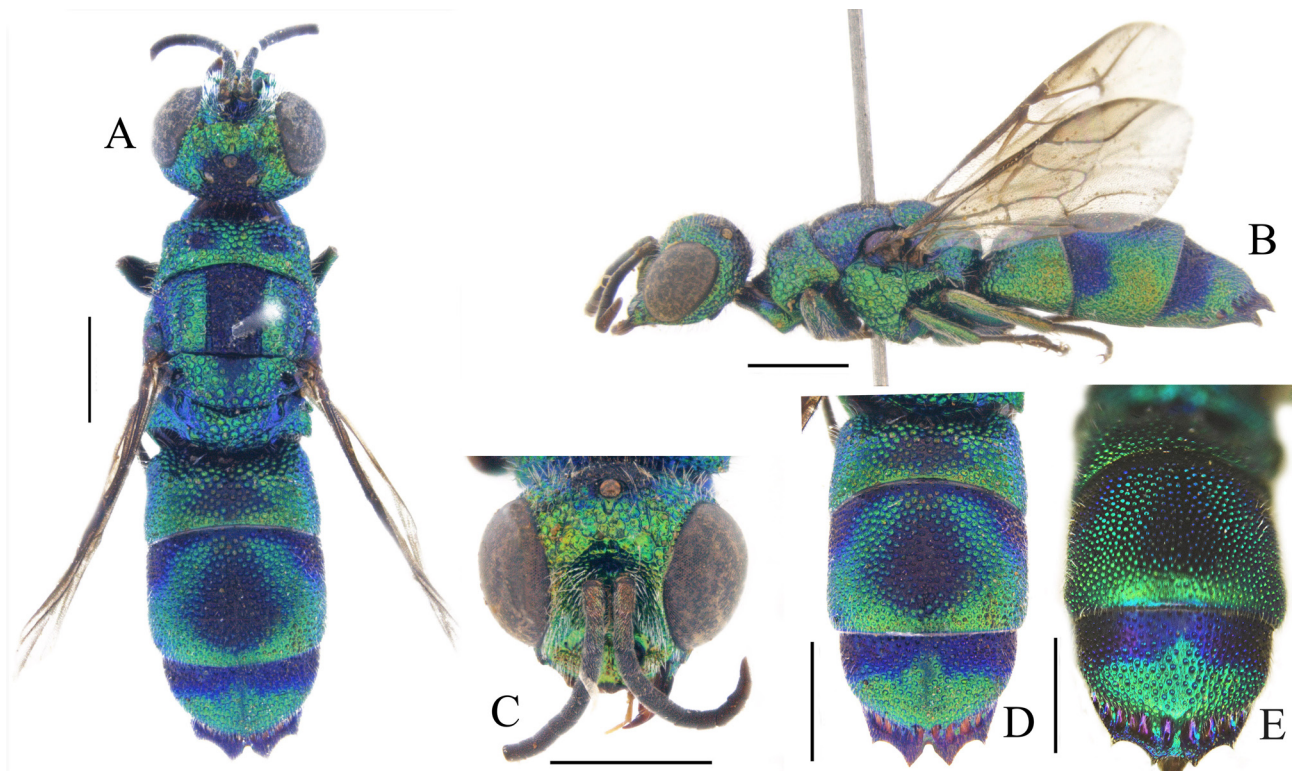


FIGURE 41. *Chrysis ionophris* Mocsáry, 1893, females from Tamil Nadu. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, posterior view. E. Metasoma, posterior view. Scale bars 1.0 mm.

***Chrysis jalala* Nurse, 1902**

(Figs 42A–42D)

Chrysis jalala Nurse, 1902: 306. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 426; Pakistan: Kashmir (BMNH) (examined).

Chrysis jalala: Kimsey & Bohart 1991: 426 (cat., typ., *capitalis* group).

Material examined. 1 ♂, Sikkim, without further data (MNLU); 1 ♀, Jammu & Kashmir Kishtwar, Yourdu-Sarkandu ca. 33°30 N 75°30 E, 2200m, 17.–19.vii.1980 / Kashmir exped. 1980 Indien, J.& K., H., U. & Ch. Aspöck, H. Rausch leg. (MNLU).

Distribution. *India (Sikkim, Jammu and Kashmir).

***Chrysis lyncea* Fabricius, 1775**

Chrysis vomerina Costa, 1864: 67. Type unknown; India (doubtfully) (type lost).

Chrysis lyncea Fabricius, 1775: 367. Holotype unknown; Sierra Leone (depository unknown). Kimsey & Bohart 1991: 322 (key), 326 (fig 106u), 331 (fig 108o, p), 357 (fig 113f), 433 (cat., widespread Oriental, *lyncea* group).

Distribution. India. Subcosmopolitan: Afrotropical, Palearctic (North Africa), Oriental, Australian.

Remarks. The incorrect subsequent spelling *lyncea* is currently in almost universal use (Madl & Rosa 2012) and is therefore deemed to be the correct original spelling (Article 33.3.1, ICZN 1999).

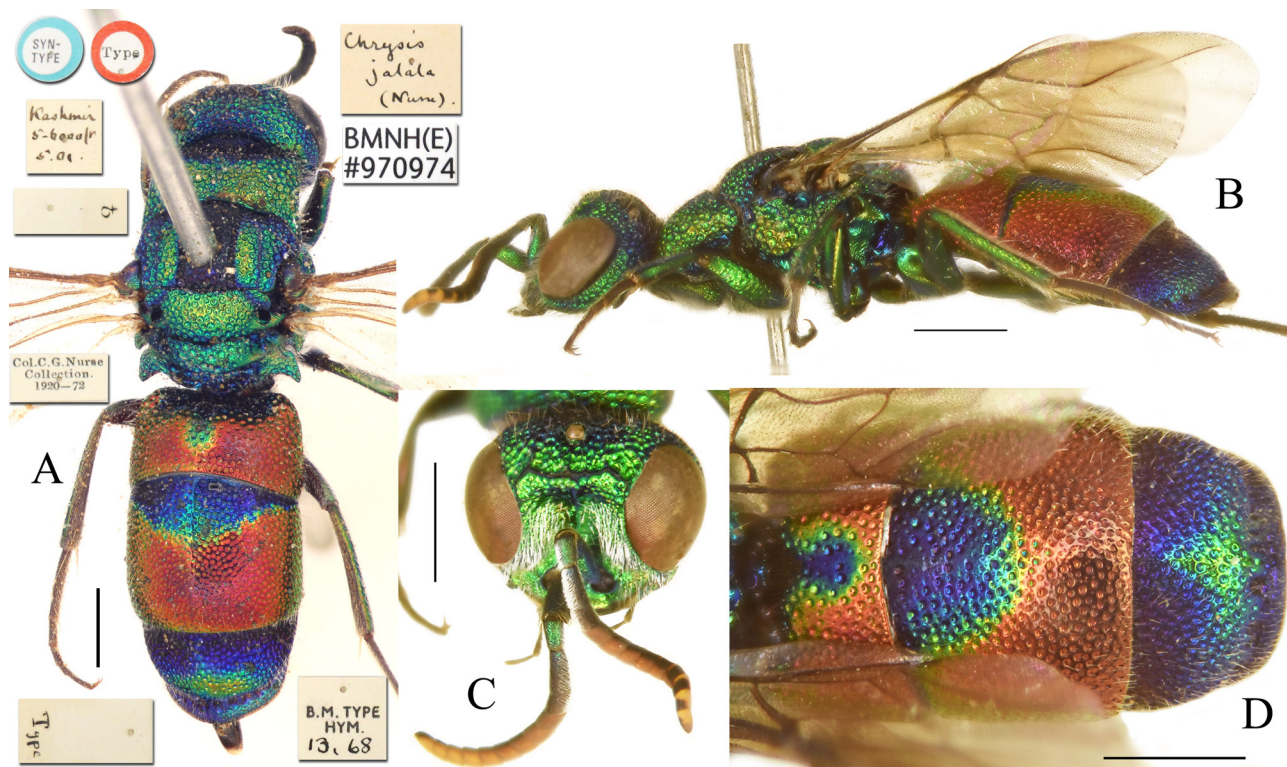


FIGURE 42. *Chrysis jalala* Nurse, 1902, holotype, female from Jammu and Kashmir. A. Habitus, dorsal view. (© The Trustees of the NHMUK). Male from Sikkim. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, dorsal view. Scale bars 1.0 mm.

***Chrysis mir* Mocsáry, 1912b**
(Figs 43A–43F)

Chrysis (Tetrachrysis) mir Mocsáry, 1912b: 556. Holotype ♂; India orientalis (HNHM). Bischoff 1913: 55 (cat., India).
Chrysis mir: Kimsey & Bohart 1991: 439 (cat., East India).

Material examined. 1 ♂, India orientalis, Collect. Bingham, *Mir* Mocs. typ. det. Mocsáry, Holotypus *Chrysis mir* ♂ Mocs. RM Bohart, id nr. 135343 Hym.coll. (HNHM).

Distribution. India orientalis (locality not specified). The occurrence of this species in India is needed, since the type locality corresponds precisely to what today we would call “Southern Asia”.

Remarks. *Chrysis mir* belongs to the *comparata-scutellaris* group and could be the male of *Chrysis oblita* Bohart in Kimsey & Bohart, 1991. Examination of more specimens is needed to confirm this hypothesis.

***Chrysis musa* Semenov-Tian-Shanskij, 1954**
(Figs 44A–44F)

Chrysis (Hexachrysis) musa Semenov-Tian-Shanskij in Semenov-Tian-Shanskij & Nikol’skaya, 1954: 133. Holotype ♀; Iran: Megas (ZIN) (examined). Linsenmaier 1968: 122 (North-western India, descr., *jousseaumei* group).

Chrysis musa: Kimsey & Bohart 1991: 441 (cat., North-western India, *smaragdula* group); Rosa *et al.* 2017a: 40 (typ.), 155 (plate 92).

Distribution. India (North-western India (locality not specified)); Iran, Kazakhstan, Tajikistan, Uzbekistan, Turkmenistan (Semenov-Tian-Shanskij & Nikol’skaya 1954).

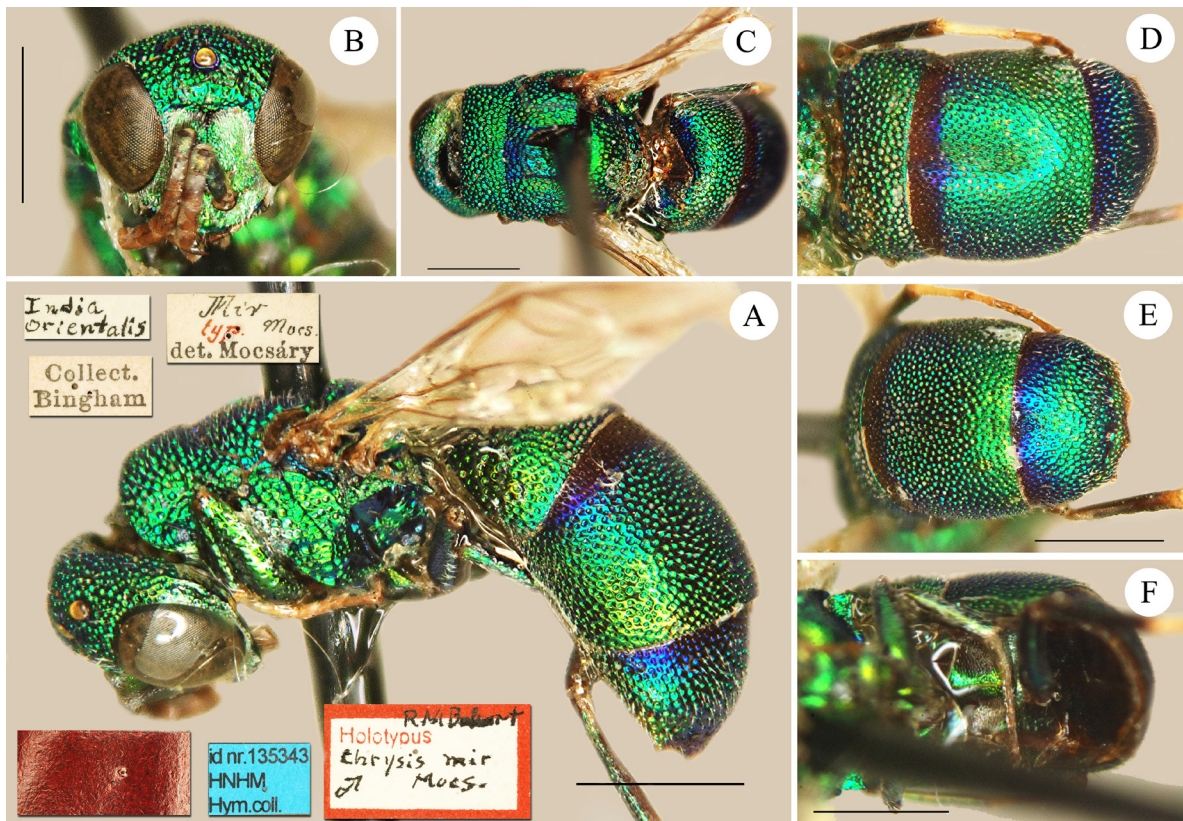


FIGURE 43. *Chrysis mir* Mocsáry, 1912, holotype, male. A. Habitus, lateral view. B. Head, frontal view. C. Habitus, dorsal view. D. Metasoma, dorsal view. E. Metasoma, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

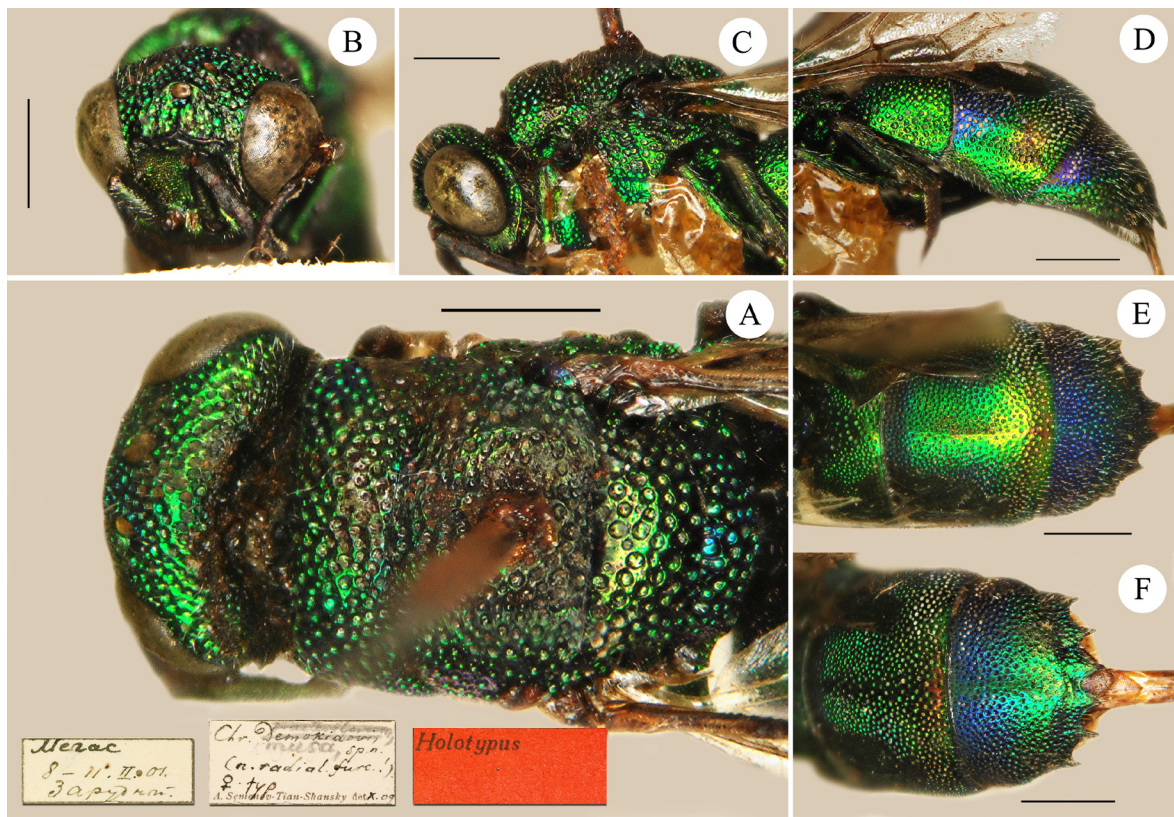


FIGURE 44. *Chrysis musa* Semenov-Tian-Shanskij, 1954, holotype, female. A. Head and mesosoma, dorsal view. B. Head, frontal view. C. Head and mesosoma, lateral view. D. Metasoma, lateral view. E. Metasoma, dorsal view. F. Metasoma, posterior view. Scale bars 1.0 mm.

Chrysis nila Bingham, 1903

(Figs 45A–45D)

Chrysis nila Bingham, 1903: 441. Holotype ♂; India: Gujarat: Deesa (435 (key), 441 (descr.)) (NHMUK) (examined).

Chrysis (Holochrysis) nila: Bischoff 1913: 40 (cat., India).

Chrysis nila: Kimsey & Bohart 1991: 443 (cat., India: Deesa).

Material examined. 1 ♂, Type, Deesa 12.01, Col. C.G. Nurse Collection. 1920-72, *Chrysis neela* [!] ♂ Bingham Type, *Chrysis nila* (Bingh), B.M. Type Hym. 13.71, BMNH(E) #970902 (NHMUK).

Distribution. India (Gujarat).

Remarks. *Chrysis nila* Bingham was not included in any species group by Kimsey & Bohart (1991). We here place it in the newly established *Chrysis nila* species group, together with *Ch. variipes* Mocsáry, 1911. The *nila* group includes species of small dimensions (3.5–4.5 mm), face micropunctate medially; transverse frontal carina faint; malar spaces 1.0–1.5 × MOD; subantennal space 1.0 × MOD; forewing second radial cell open, with radial sector vein (Second radial cross & Radial sector) ending far from anterior wing margin; tergum III edentate, broadly rounded. Kimsey & Bohart (1991) placed *Chrysis variipes* doubtfully in the *millenaris* group, nevertheless members of the *nila* group can be recognized by the modified forewing venation, with second radial cell widely open, and sterna brown, apparently without visible black spots on the sternum II (wing venation unmodified and black spots large, almost medially connected in the *millenaris* group).

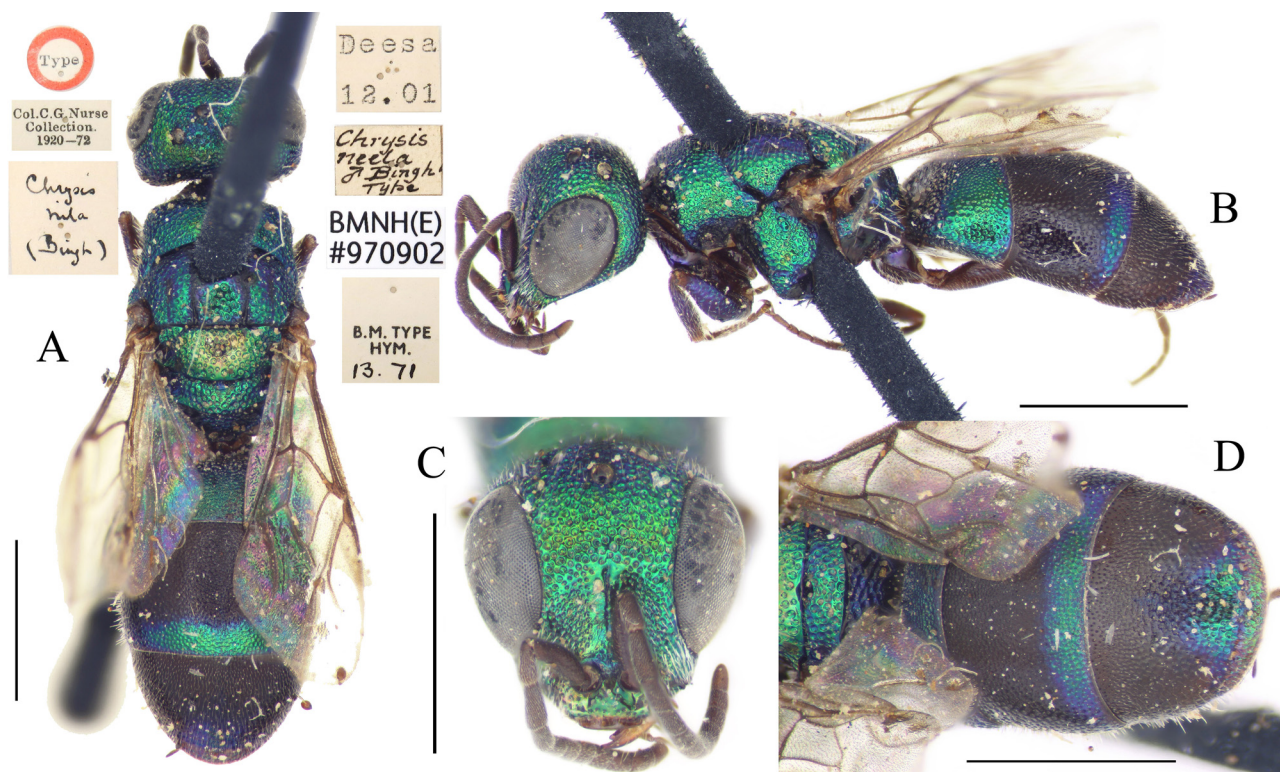


FIGURE 45. *Chrysis nila* Bingham, 1903, holotype, male. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, dorsal view. Scale bars 1.0 mm. (© The Trustees of the NHMUK)

Chrysis oblita Bohart in Kimsey & Bohart, 1991

(Figs 46A–46F)

Chrysis orientalis Dahlbom, 1854: 225, *nec* Guérin-Méneville, 1842. Holotype ♀; India Orientalis (ZMUC) (examined).

Chrysis obliterata Mocsáry, 1887: 15. Replacement name for *Chrysis orientalis* Dahlbom, 1854, *nec* Abeille de Perrin, 1879.

Dalla Torre 1892: 81 (cat., India); du Buysson 1896b: 472 (key), 473 (descr., Central provinces, Bombay: Poona [= Pune]), pl. III (fig. 5); Bingham 1908: 348 (North, Center and West India).

Chrysis (Tetrachrysis) obliterata: Bingham 1903: 437 (key), 460–461 (descr., Delhi; Gujarat: Deesa; Bombay: Poona [= Pune]);

Central Provinces), 460 (fig. 155); Bischoff 1913: 56 (cat., India).

Chrysis oblita Bohart in Kimsey & Bohart, 1991: 444. Replacement name for *Chrysis orientalis* Mocsáry, 1887 (cat., India, *comparata-scutellaris* group).

Material examined. 1 ♀, Delhi, iv.1900, leg. Bingham (HNHM); 1 ♂, West Bengal, Siligori [= Siliguri], 30.i.1897, leg. E. Saundes (MNLU); 1 ♀, Tamil Nadu, Dohnavur, Tinnevely [= Tirunelveli], 28.ix.1938, B.M.—C.M. Expedn. to S. India Sept.—Oct., 1938 (MNLU); 1 ♂, 1 ♀, Tamil Nadu: Tranqbar [= Tharangambadi], vii.1953, leg. Nathan (MNLU); 1 ♀, Tamil Nadu, Madras [= Chennai], 7 mi SW Bhakini, 250m, 7.iii.1962, leg. E.S. Ross & D.Q. Cavagnaro (MNLU); 1 ♀, Tamil Nadu: Settipatti, 2.vi.1976, leg. W. Perraudin (MNLU); 1 ♀, Tamil Nadu: Pondicherry [= Puducherry], Karaikal, v.1973, leg. T. Nathan (PRC).

Distribution. India (Delhi; Gujarat; Maharashtra; Tamil Nadu; West Bengal; India Orientalis (locality not specified); Central provinces (locality not specified)). Widely distributed in plains of India (Jonathan *et al.* 1977); Pakistan (Nurse 1903b).

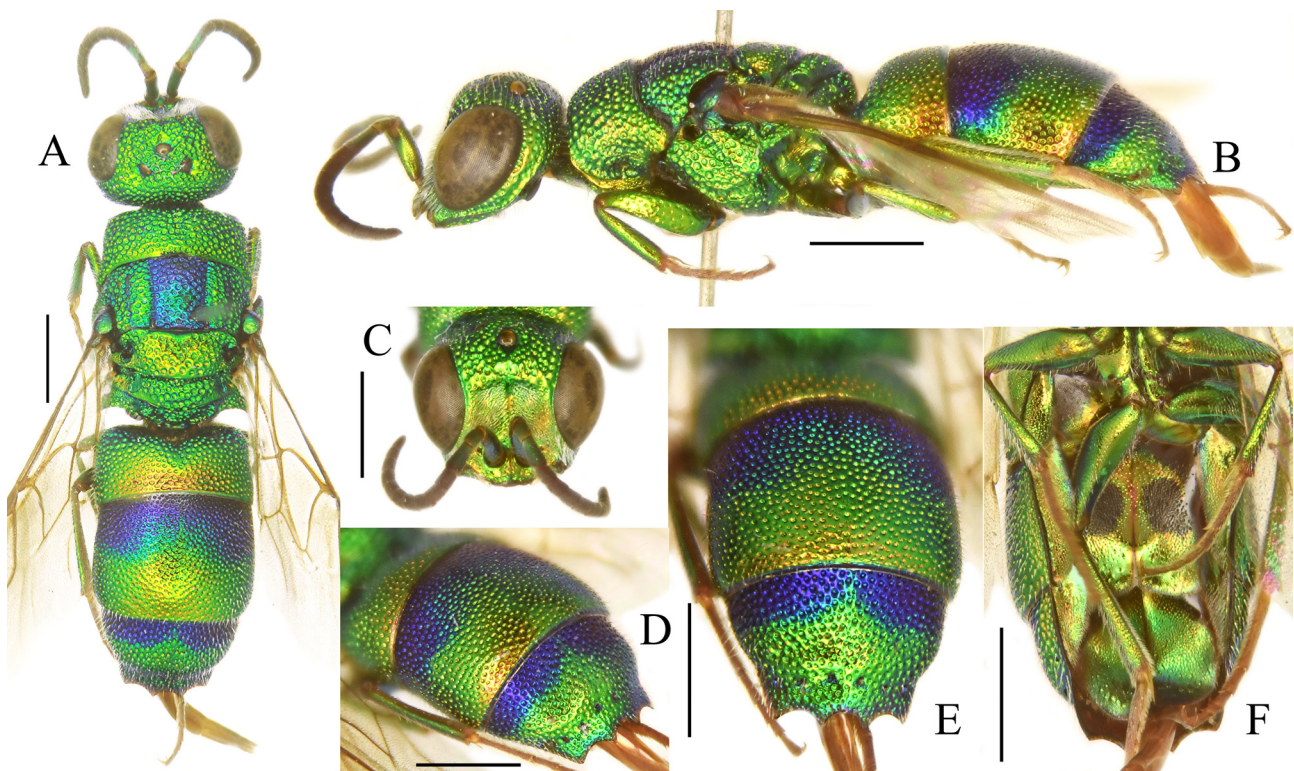


FIGURE 46. *Chrysis oblita* Bohart, 1991, female from Tamil Nadu. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, dorso-lateral view. E. Metasoma, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

Chrysis obscura Smith, 1860

(Figs 47A–47E)

Chrysis obscura Smith, 1860: 67. Holotype ♀; Celebes: Makassar (HECO). Kimsey & Bohart 1991: 444 (cat., *smaragdula* group).

Material examined. 1 ♂, India: West Bengal: Birbhum district, without further data (NHMW).

Distribution. *India (West Bengal); Myanmar (new record), Indonesia (Sulawesi) (Smith, 1860).

Chrysis oculata Fabricius, 1775

(Figs 48A–48E)

Chrysis oculata Fabricius, 1775: 357. Holotype ♀; India: Malabar (ZMUC) (examined). Fabricius 1781: 455 (cat., India: Mala-

bar); Gmelin 1790: 2744 (descr., Malabar); Donovan 1800: 114 (descr., Tranquebar [= Tharangambadi]); Fabricius 1804: 171 (descr., Tranquebar [= Tharangambadi]); Dahlbom 1854: 310–311 (descr., Tranquebar); Dalla Torre 1892: 82 (cat., India); du Buysson 1896b: 477–478 (Calcutta [= Kolkata], Poona [= Pune] Raipur, Pondichery, Mysore), 477 (key), pl. III (fig. 8); Bingham 1903: 439 (key), 488–489 (descr., probably the whole of Continental India), pl. I (fig. 15); Bingham 1908: 349 (Purneah [= Purnia]); Jonathan *et al.* 1977: 87 (cat., India); Kimsey & Bohart 1991: 445 (cat., India, *oculata* group); Thakkar & Parikh 2018: 23 (cat., Gujarat).

Stilbum oculata: Blanchard 1840: 297 (descr., India Orientalis).

Chrysis siva Mocsáry, 1889: 545. Holotype ♀; India: Bengal (HNHM).

Pyria oculata: Brullé 1846: 19 (descr., India Orientalis).

Chrysis (Hexachrysis) oculata Gribodo: Mocsáry 1889: 543–544 (descr., India Orientalis); Bischoff 1913: 67 (cat., India).

Material examined. India: 3 ♀, Karikal, without further data (NHMW); 1 ♀, Karnataka, Bellary, 1883, leg. Chater (NHMW); 1 ♀, Karnataka, Mysore, Shimoga, 1865 ft, 24.vii.1937, leg. P.S. Nathan (MNLU); 1 ♀, Kerala, Wailayar forest, Malabar, without further data (NHMW); 1 ♀, Sikkim, Coll. Bingham (HNHM); 2 ♀, Tamil Nadu, Coimbatore, without further data (NHMW); 2 ♀, Tamil Nadu: Pondicherry [= Puducherry], without further data (NHMW); 2 ♀, Tamil Nadu: Nettapakam, Pondicherry [= Puducherry], without further data (NHMW); 1 ♀, Tamil Nadu: Nilgiri Hills, Moyar Camp, 2900 feet, v.1954, leg. Nathan (NHMW); 1 ♀, Tamil Nadu, Tranquebar [= Tharangambadi], x.1951, leg. S. Nathan (MNLU); 4 ♀, Tamil Nadu, Kurumbagaram, ix.1951, leg. Nathan (MNLU); 1 ♀, Tamil Nadu: Nilgiri Hills, Moyar Camp, 2600 feet, iv.1954, leg. Nathan (MNLU); 2 ♀, Tamil Nadu, Omalur, Settipatti, iii.1978, leg. W. Perraudin (MNLU); 1 ♀, Tamil Nadu, Pudukkottai, x.1984, leg. Nathan (PRC); 1 ♀, Tamil Nadu: Pondicherry [= Puducherry], Karaikal, x.1997, leg. T. Nathan (PRC); 1 ♀, Uttarakhand, Haldwani Distr., Kumaon, leg. F.G. Champion (MNLU); 1 ♀, India (likely Gujarat or Pakistan), 1934, leg. T.R. Bell (MNLU); 1 ♀, India, without further data (NHMW); 1 ♀, Bombay Stockinger, 755-2, *Chrysis L. oculata* Fabr. Linsenmaier det. 62, Holotypus *Chrysis siva* ♀ Mocs. RMB, id nr. 135 414 HNHM Hym.coll. (HNHM).

Distribution. India (Bihar; Chhattisgarh; Puducherry; Karnataka; Kerala; Maharashtra; Sikkim; Tamil Nadu; Uttarakhand; West Bengal; Bengal (locality not specified); Malabar (locality not specified); India Orientalis (locality not specified); Myanmar, Sri Lanka (Jonathan *et al.* 1977).

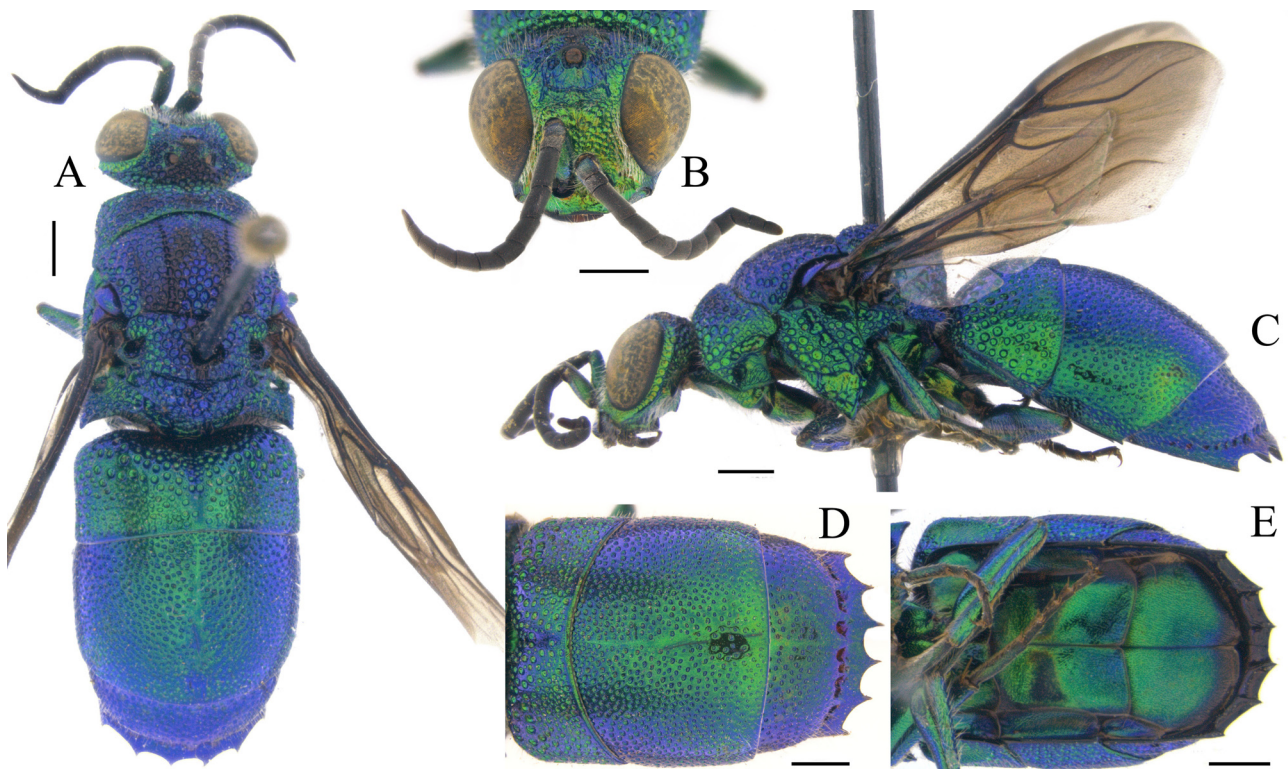


FIGURE 47. *Chrysis obscura* Smith, 1860, male from West Bengal. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorsal view. E. Metasoma, ventral view. Scale bars 1.0 mm.

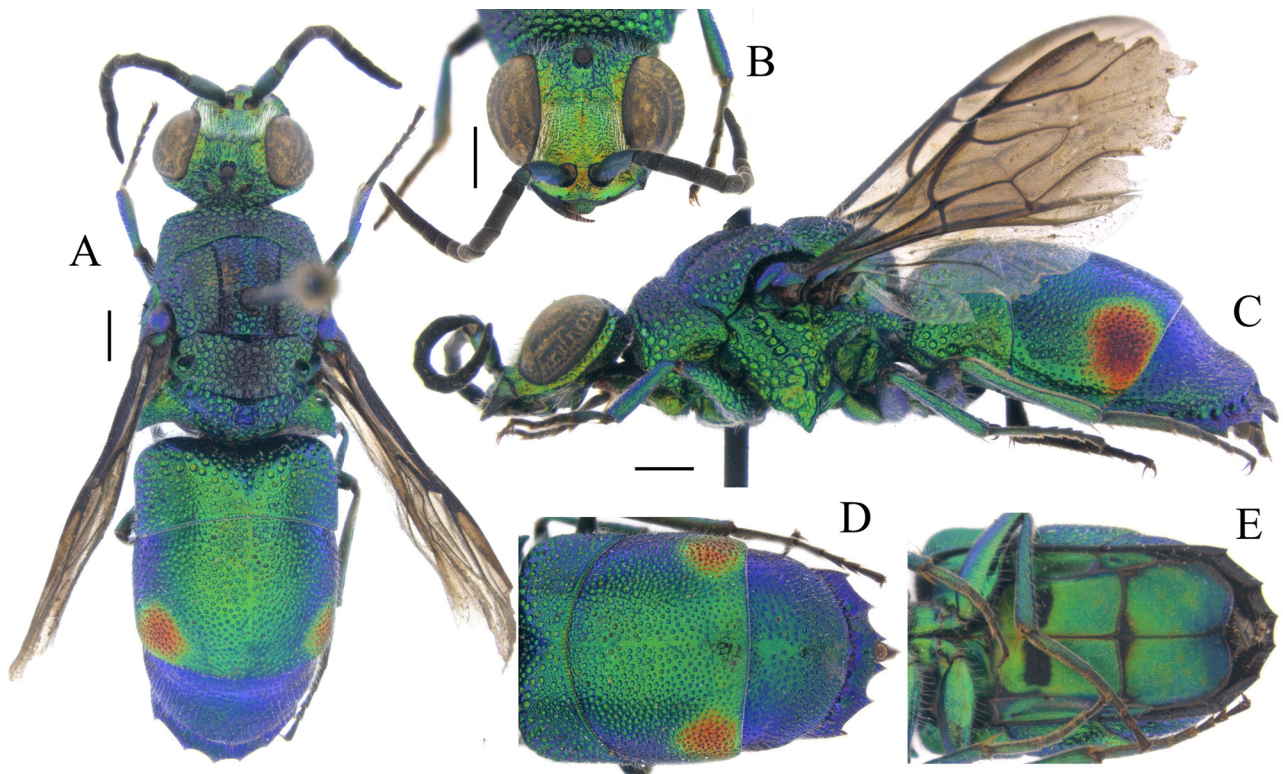


FIGURE 48. *Chrysis oculata* Fabricius, 1775, female from Tamil Nadu. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorsal view. E. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis orientalis* Guérin-Méneville, 1842**

(Figs 49A–49E)

Chrysis orientalis Guérin-Méneville, 1842: 146. Holotype ♂; Indonesia: Sumatra (MSNG) (examined). Dalla Torre 1892: 82 (cat., India); du Buysson 1896b: 477 (key, descr., India: Chhattisgarh: Raipur; Maharashtra: Poona [= Pune]; Mysore); Bingham 1903: 439 (key), 485–486 (descr., India: Uttar Pradesh: Allahabad, Delhi; Gujarat: Deesa; Poona [= Pune] to Karnataka: Mysore; Central Provinces); Bingham 1908: 349 (cat., West Bengal: Calcutta [= Kolkata], spread generally throughout India, but not as yet recorded from Assam); Nurse 1903: 42 (descr., Deesa); Kimsey & Bohart 1991: 446 (cat., India, *oculata* group); Thakkar & Parikh 2018: 22 (cat., Gujarat).

Chrysis (Hexachrysis) orientalis: Mocsáry 1889: 592–593 (descr., India Orientalis); Bischoff 1913: 67 (cat., India).

Chrysis (Pyria) stilboides ssp. *duplomaculata* Linsenmaier, 1968: 123. Holotype ♀; India: Gujarat: Deesa (NHMUK) (synonymised by Kimsey & Bohart 1991: 446).

Material examined. 1 ♀, Tamil Nadu: Pondicherry [= Puducherry], without further data (NHMW); 1 ♂, 5 ♀, Tamil Nadu, Coimbatore, without further data (NHMW); 1 ♀, Karikal, without further data (NHMW); 1 ♀, Tamil Nadu: Nilgiri Hills, Moyar Camp, 2600 feet, iv.1954, leg. Nathan (NHMW); 2 ♂, Odisha, Bhubaneswar, without further data (NHMW); 1 ♀, Tamil Nadu, Coimbatore, ix.1951, leg. Nathan (sub *Chrysis stilboides duplomaculata* MNLU).

Distribution. India (Chhattisgarh; Delhi; Gujarat; Karnataka; Maharashtra; Odisha; Uttar Pradesh; West Bengal; Central Provinces (locality not specified); Western India (locality not specified); Indonesia (Sumatra) (Guérin-Méneville 1842).

Remarks. All examined Indian specimens are conspecific with *Chrysis duplomaculata* Linsenmaier, 1968, synonymised by Kimsey & Bohart (1991). The holotype male of *Chrysis orientalis* Guérin-Méneville has a different structure of mesopleuron, with episternal sulcus differently shaped and smaller toothed subtended area; it is also different for colouration (which is uniform blue-green, with dark blue on median area of mesoscutum) and sparser metasomal punctation. More material from the Oriental region is needed to evaluate the variability *Chrysis orientalis* and if *Chrysis duplomaculata* is a valid species.

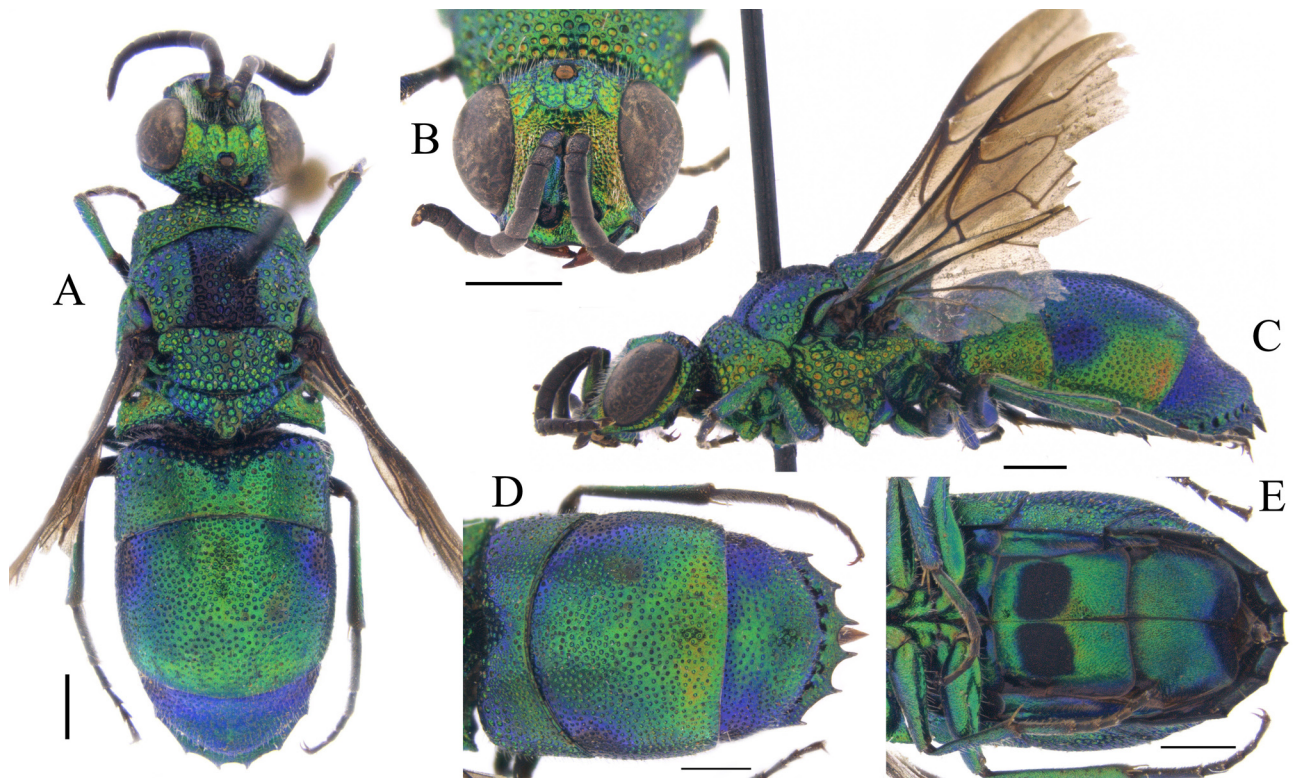


FIGURE 49. *Chrysis orientalis* Guérin-Ménéville, 1842, female from Tamil Nadu. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorsal view. E. Metasoma, ventral view. Scale bars 1.0 mm.

Chrysis parallela Brullé, 1846

Chrysis parallela Brullé, 1846: 29. Holotype ♀ [not ♂]; Indonesia: Timor Isl. (MNHN) (examined). Kimsey & Bohart 1991: 447 (cat., India, *smaragdula* group).

Chrysis (Tetrachrysis) lepcha Cameron, 1902a: 206. Holotype ♀, India: Khasia [= Meghalaya, Khasia Hills?] (NMNH) (synonymised by Kimsey & Bohart 1991: 447).

Distribution. India (Meghalaya: Khasia).

Remarks. According to Kimsey & Bohart (1991) *Chrysis parallela* is widespread in Indo-Malaysian region, from India to Taiwan and Indonesia, nevertheless this distribution includes records of *Ch. assamensis* (here synonymised with *Ch. rani* Mocsáry, 1913) and *Ch. lepcha* (type not examined). Any Indian specimen of *Ch. parallela* was examined and the occurrence of *Chrysis parallela* in India should be better evaluated. In fact, all Indian specimens identified as *Ch. parallela* from several collections (e.g. at HMNH and MNLU), belong to different species, and the synonymy of *Ch. lepcha* should be confirmed.

Chrysis perfecta Cameron, 1897

Chrysis perfecta Cameron, 1897: 1. Holotype ♂; India: West Bengal: Barrackpore (NHMUK). Bingham 1903: 438 (key), 471–472 (descr., Barrackpore); Kimsey & Bohart 1991: 448 (cat., India: Sikkim, *maculicornis* group).

Chrysis (Holochrysis) perfecta: Bischoff 1913: 40 (cat., India).

Chrysis (Tetrachrysis) perfecta: Bischoff 1913: 57 (cat., in error, India).

Material examined. 1 ♂, West Bengal, Birbhum, without further data (NHMW).

Distribution. India (West Bengal; Sikkim).

***Chrysis polita* Rosa, sp. nov.**

(Figs 50A–50F, 51A, 51E, 52A–52E)

Material examined. Holotype: ♂; India: Darjeeling, Ramam, 2450m, 19.v.1975, leg. W. Wittmer, *Chrysis fulgidaria* Ts. det. Linsenmaier, GBIF_Chr00037886 (MNLU). Paratypes: 3 ♀, Uttaranchal st, 30 km NW Bageshwar, 2400m, 25–30.vi.2003, leg. Kejval & Tryzna (PRC, MHC); Myanmar: 1 ♀, N.E. Burma: Kambaiti, 2000m, 14.v.1934, leg. Malaise, *Chrysis fulgidaria* ? det. Linsenmaier, NML_ENT GBIF_Chr00037887 (MNLU).

Diagnosis. Species with head, mesosoma and tergum I metallic blue, partly with green reflections; terga II and III red with purple-violet reflections on tergum II dorsally. Metasomal tergum II with scattered punctation. Tergum III, with deep and dense small punctures, contrasting with scattered punctation of tergum II; pits of pit row deep and large; apical margin with four pointed, triangular teeth. Terga II and III with median longitudinal carina. Black spots on sternum II relatively small.

Description. *Male.* Body length 8.0 mm. Forewing length 5.3 mm. OOL $2.1 \times \text{MOD}$; POL $1.4 \times \text{MOD}$; MS $1.2 \times \text{MOD}$; relative length of P:F1:F2:F3 = 1.0:1.6:1.0:0.8.

Head. Frons with small (about $0.2 \times \text{MOD}$) and contiguous punctures, smaller around ocelli and along eye margin; vertex between ocelli and eye with larger punctures and with polished areas posterior to ocelli and on occipital area; transverse frontal carina strong and slightly arcuate, with lateral endings close to inner eye margin, about $0.5 \times \text{MOD}$ apart; scapal basin micropunctate, medially irregularly punctate; subantennal space about $1.0 \times \text{MOD}$; apical margin of clypeus slightly incurved; genal carina well developed to mandibular insertion, very close to eye margin on malar space.

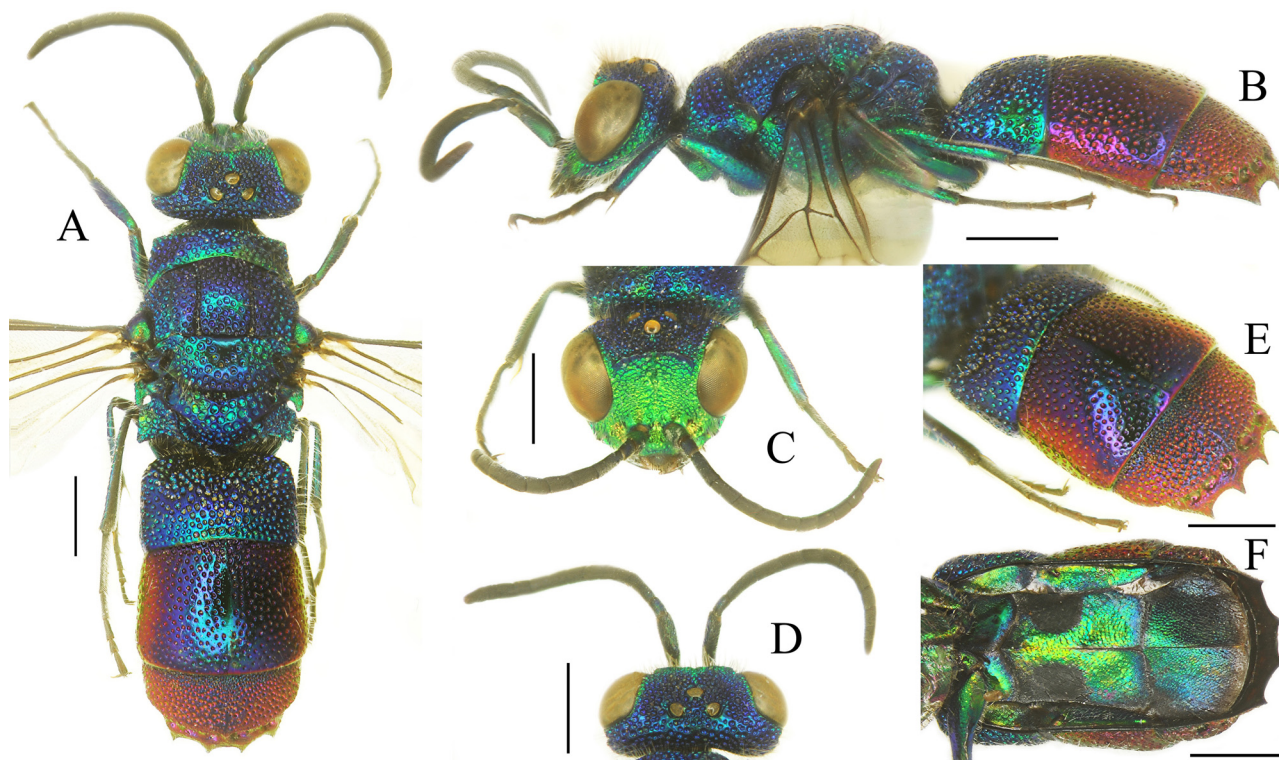


FIGURE 50. *Chrysis polita* Rosa, **sp. nov.**, holotype, male. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Head, dorsal view. E. Metasoma, dorso-lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

Mesosoma. Pronotum narrow as in *ruddii* subgroup; medial pronotal line [= pronotal groove] incise, as long as $\frac{3}{4}$ length of pronotum; pronotum with double punctation; dorsally with large and polished interspaces, with tiny dots; mesoscutum with slightly larger punctures, denser posteriorly on median area of mesoscutum; notauli basally as deep and elongate foveae; parapsidal signum [= parapsidal line] hardly visible; mesoscutellum with double punctation and scattered punctures, antero-dorsally polished; metanotum with foveate punctures, anteriorly larger punctures; metapectal-propodeal disc unmodified; posterior propodeal projections [= propodeal teeth] subparallel, slightly divergent; mesopleuron with posterior oblique sulcus [= scrobal sulcus], formed by large, foveate punc-

tures, with small punctures on interspaces. Spurs of mesotibia almost equal in length; mesotarsomere I as long as following three together. Wings with nervures unmodified.

Metasoma. Tergum I medially with large and contiguous punctures, slightly smaller than those on metascutellum; laterally with smaller punctures (ca. $0.5 \times PD$) with larger interspaces, $1.0\text{--}2.0 \times PD$ apart; tergum II with even punctures of small diameter, ca. $0.5 \times PD$ of largest punctures on tergum I, equally spaced, $1.0\text{--}2.0 \times PD$ apart; with tiny dots on interspaces; largely polished along median longitudinal line; tergum III, with deep and dense small punctures, contrasting with scattered punctation of the tergum II; pits of pit row deep and large, ca. $1.0 \times MOD$; apical margin with four pointed, triangular teeth. Terga II and III with weak median longitudinal carina. Black spots on sternum II relatively small, $1.5 \times MOD$ distant from each other.

Colouration. Head, mesosoma and tergum I metallic blue, with green reflections on face and genae, anteriorly and posteriorly on pronotum, tegula, mesopleuron, posterior propodeal projections, sterna, and ventrally on legs and sterna; terga II and III red with purple-violet reflections on tergum II dorsally. Scape and pedicel green to blue, flagellum black. Wings clear, slightly brownish in the cells.

Vestiture. Body with whitish, erect and long setae, about $1.0 \times MOD$ long on head, about $1.5 \times MOD$ laterally on metasomal tergum; meso-, metafemora and tibiae with erect, whitish setae, $1.5 \times MOD$ long.

Female. Similar to male in habitus and colouration, with flagellomere I fully metallic blue. Body punctation similar to male (Fig. 52A, 52D). Black spots on the sternum II smaller and subrectangular (Fig. 52E); pit row with large pits, and post pit row area elongate; apical rim with characteristic, widely arcuate interval between median apical teeth, and deeply concave interval between median and lateral tooth.

Distribution. India (Palearctic part: West Bengal, Uttaranchal); Myanmar.

Etymology. The specific name *polita* (feminine, adjective) derives from Latin adjective *politus*, meaning both elegant (referred to the general habitus of this species), and polished (referred to punctation on the tergum II, with large and polished interspaces).

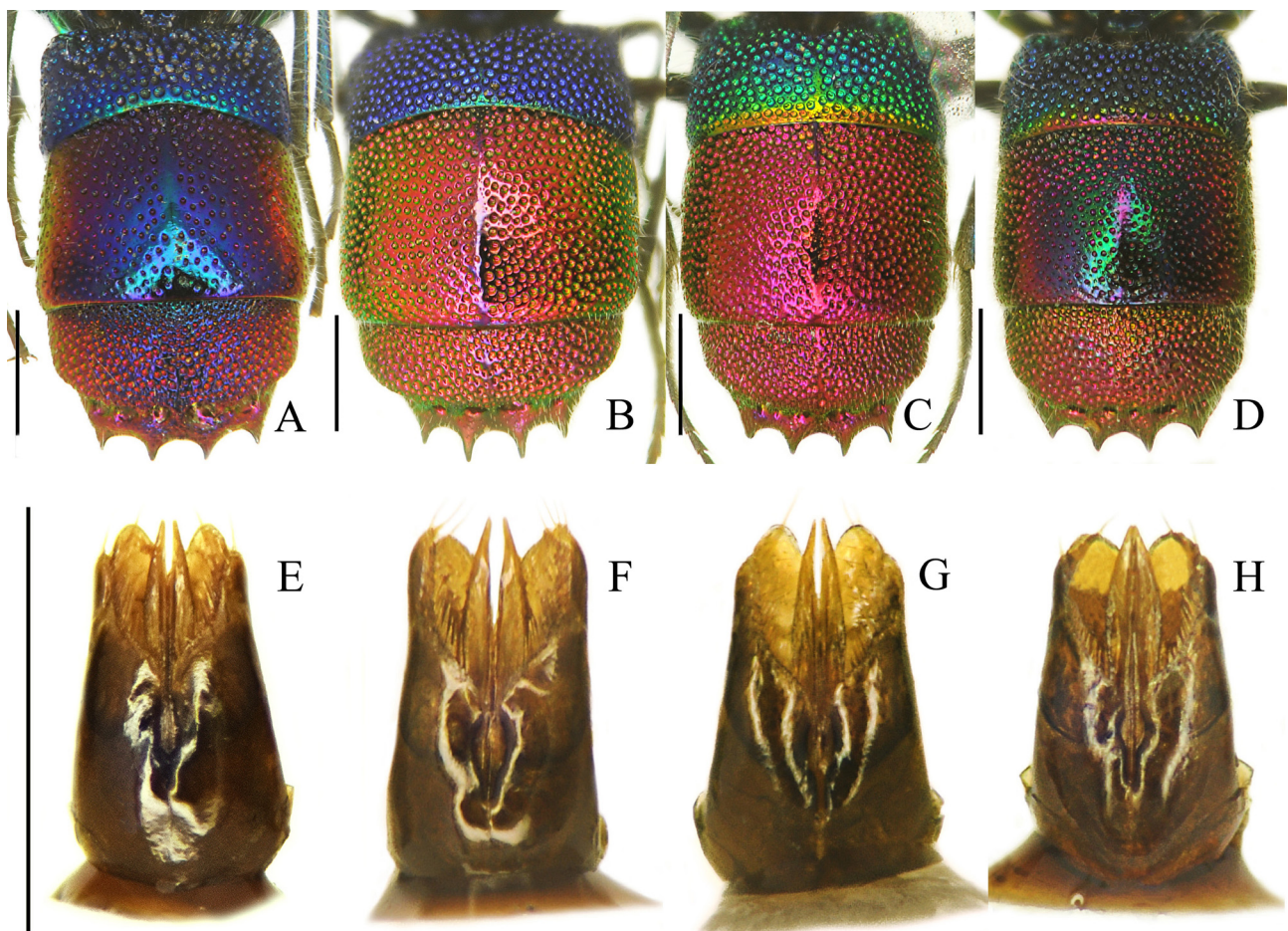


FIGURE 51. *Chrysis metasoma*, dorsal view, and genital capsule. A, E. *Chrysis polita* Rosa, **sp. nov.** B, F. *Chrysis exsulans* Dahlbom, 1844. C, G. *Chrysis castigata* Linsenmaier, 1959. D, H. *Chrysis immaculata* du Buysson, 1898. Scale bars 1.0 mm.

Remarks. *Chrysis polita* **sp. nov.** belongs to the *Ch. ignita* species group. It is related to *Ch. castigata*, *Ch. immaculata* du Buysson, 1898a, and *Ch. exsulans* Dahlbom, 1854, for general habitus, genitalia and colouration, with tergum I blue, contrasting with the other two red metasomal terga. *Chrysis polita* **sp. nov.** can be easily separated from other similar species for the scattered punctation of the metasomal tergum II (Fig. 51A) and for the shape of the genital capsule (Fig. 51E); moreover, it is separated from *Ch. castigata* and *Ch. immaculata* by different colour pattern of the tergum I, which is apically red to golden red, whereas it is fully blue in *Ch. polita* **sp. nov.** Besides different punctation and genitalia, it is separated from *Chrysis exsulans* by different shape of tergum III, and its apical teeth.

Another two species have contrasting blue tergum I, the females of *Chrysis fulgida* Linnaeus, 1761 and *Ch. fulgidaria* Tsuneki, 1952. The first is a relatively common species in the Palearctic region but genetically belongs to a different subgroup, together with *Ch. iris* Christ, 1791 (Pauli *et al.* 2019); besides the morphological differences, the male of *Ch. fulgida* is also differently coloured, having a large blue dorsal spot on tergum II. *Chrysis fulgidaria* was described on a single female Korean specimen, and it can be easily separated from *Ch. polita* **sp. nov.** by dense metasomal punctation and narrow and spine-like apical teeth on tergum III.

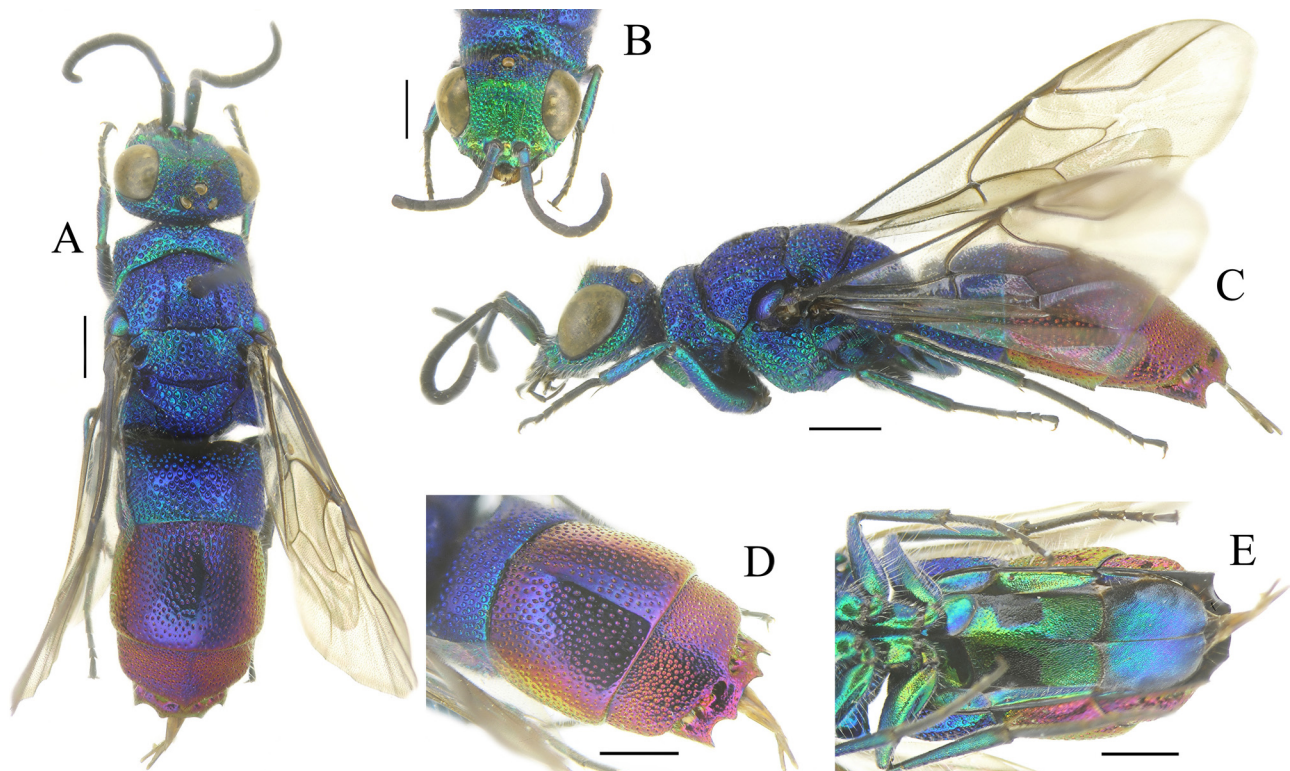


FIGURE 52. *Chrysis polita* Rosa, **sp. nov.**, paratype, female. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorso-lateral view. E. Metasoma, ventral view. Scale bars 1.0 mm.

Chrysis principalis Smith, 1874

(Figs 53A–53E)

Chrysis principalis Smith, 1874: 461. Holotype ♀; China: Shanghai (HECO). du Buysson 1896b: 477 (key), 478 (cat., Maharashtra: Bombay: Poona [= Pune]); Bingham 1903: 440 (key), 490–491 (descr., the Himalayas, Bengal; Poona), 491 (comp. notes); Jonathan *et al.* 1977: 87 (India); Kimsey & Bohart 1991: 450 (cat., North India, *smaragdula* group).

Chrysis (Hexachrysis) principalis: Mocsáry 1889: 559–560 (descr., Himalayas, Bengal); Bischoff 1910: 490 (cat., Darjeeling); Roy & Kundu 1985: 228 (Arunachal Pradesh: Namdhapa [= Namdapha]).

Material examined. 2 ♀, Meghalaya, Khasia Hills, without further data (ETHZ).

Distribution. India (Himalayas; Meghalaya; Maharashtra; Bengal (locality not specified)). China, Myanmar, and Malayan subregion (Jonathan *et al.* 1977); Korea (Kimsey & Bohart 1991).

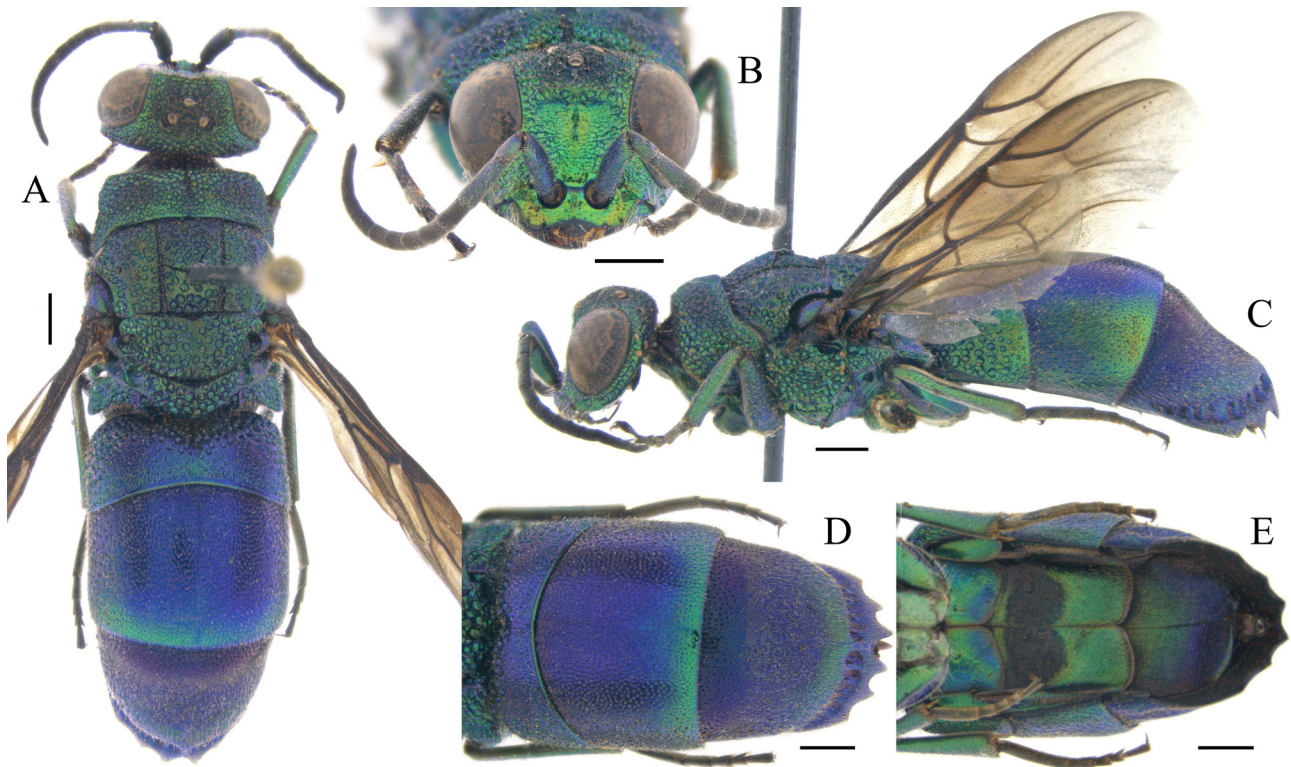


FIGURE 53. *Chrysis principalis* Smith, 1874, female from China. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorsal view. E. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis pubescens* Smith, 1852**

(Figs 54A–54F)

Chrysis pubescens Smith, 1852: 45. Holotype [sex unknown]; India: Maharashtra: Bombay [= Mumbai] (NHMUK). Dalla Torre 1892: 86 (cat., India); Kimsey & Bohart 1991: 452 (cat., India, *comparata-scutellaris* group).

Chrysis (Tetrachrysis) pubescens: Mocsáry 1889: 376 (descr., India Orientalis: Bombay); Bischoff 1913: 57 (cat., India).

Material examined. 1 ♂, Bihar, Dacca [= Dhaka], v.1938 (MNLU); 1 ♀, Karaikal, Nadungadu [= Nedungadu], 10.iv.1933 (MNLU); 1 ♀, Maharashtra, Bombay Presidency (Mumbai) 1910, leg. E. Comber (MNLU); 1 ♀, Tamil Nadu, Madras [= Chennai], Chetpat-Polur, 15.iv.1931, leg. P.S. Nathan (MNLU); 2 ♀, Tamil Nadu, Settipatti, 30.ix–10.x.1975, leg. W. Perraudin (MNLU); 1 ♀, idem, xi.1979 (MNLU); 2 ♀, Tamil Nadu, Omalur, Settipatti, 27.xii.1975, leg. W. Perraudin (MNLU); 1 ♀, idem, 6.i.1976 (MNLU); 1 ♀, idem, 26.iii.1976 (MNLU); 1 ♂, idem, 30.iii.1976 (MNLU); 1 ♀, Tamil Nadu, Omalur, Salem, iii.1978, leg. W. Perraudin (MNLU).

Distribution. India (Bihar; Maharashtra; Tamil Nadu); Sri Lanka (Kimsey & Bohart 1991).

***Chrysis quaerita* Nurse, 1902**

(Figs 55A–55D)

Chrysis quaerita Nurse, 1902: 307. Holotype ♂; India: Deesa (NHMUK) (examined). Bingham 1903: 444 (Deesa), 435 (key), 444 (descr.); Kimsey & Bohart 1991: 455 (cat., India).

Chrysis (Gonochrysis) quaerita: Bischoff 1913: 43 (cat., India).

Material examined. 1 ♂, Holotype, Deesa, 9.01, ♂, Type, Col. C.G. Nurse Collection 1920-72, BMNH(E) #970924 (NHMUK).

Distribution. India (Gujarat).

Remarks. *Chrysis quaerita* belongs to the *comparata-scutellaris* group.

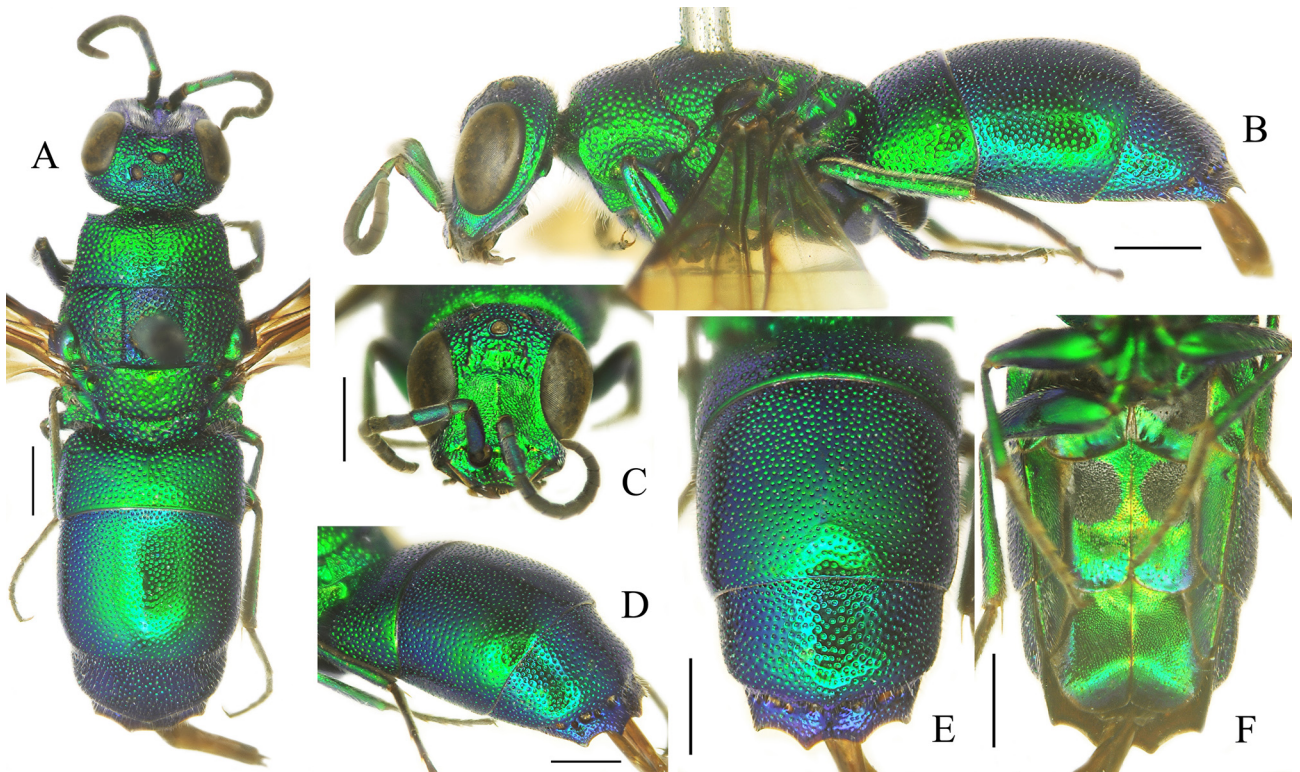


FIGURE 54. *Chrysis pubescens* Smith, 1852, female from Maharashtra. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, postero-lateral view. E. Metasoma, dorsal view. F. Metasoma, ventral view. Scale bars 1.0 mm.

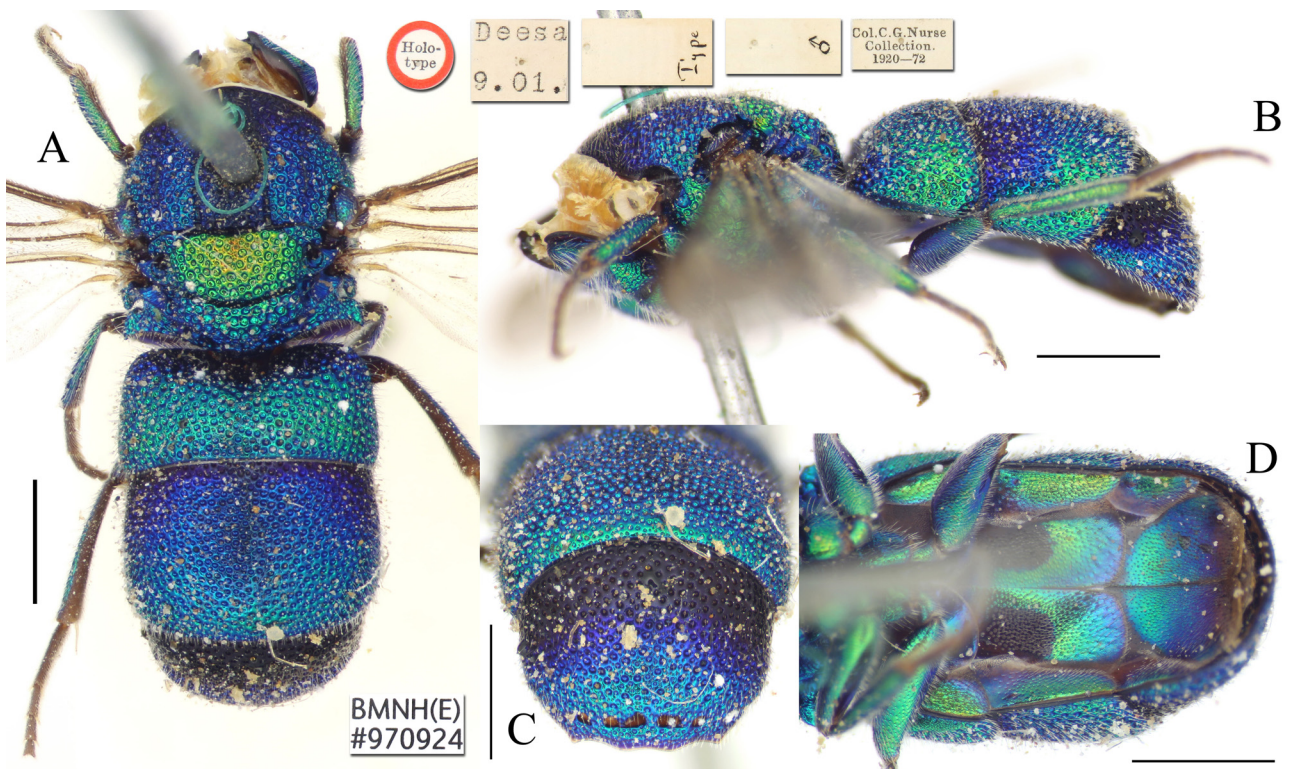


FIGURE 55. *Chrysis quaerita* Nurse, 1902, holotype, male. A. Habitus, dorsal view. B. Habitus, lateral view. C. Metasoma, posterior view. D. Metasoma, ventral view. Scale bars 1.0 mm. (© The Trustees of the NHMUK)

Chrysis rani Mocsáry, 1913

(Figs 56A–56F)

Chrysis (Hexachrysis) Rani Mocsáry, 1913: 23. Holotype ♀; India orientalis: Sikkim (HNHM) (examined). Bischoff 1913: 67 (cat., Sikkim).

Chrysis rani: Kimsey & Bohart 1991: 455 (cat., North India, *smaragdula* group).

Chrysis (Hexachrysis) assamensis Mocsáry, 1913: 24. Holotype ♀; India: Assam (HNHM) (examined) (*smaragdula* group). Bischoff 1913: 64 (cat., Assam).

Material examined. 1 ♀, Sikkim iv.–v.1900 Bingham Coll., Collect. Bingham, *Rani* Mocs. typ. det. Mocsáry, Holotypus *Chrysis rani* (♀) Mocs. RMBohart, id nr. 135461 Hym.coll. (HNHM); 1 ♀, Asia mer. Assam, *assamensis* Mocs. det. Mocsáry, Holotypus *Chrysis assamensis* (♀) Mocs. RMB, id. nr. 135475 HNHM Hym.coll. (HNHM).

Distribution. India (Assam; Sikkim).

Remarks. Kimsey & Bohart (1991) synonymised *Chrysis assamensis* Mocsáry, 1913 with *Ch. parallela* Brullé, 1846, nevertheless *Ch. assamensis* can be recognized by frontal transverse carina $1 \times \text{MOD}$ far from the anterior ocellus (vs. $1.5\text{--}2.0 \times \text{MOD}$ in *Ch. parallela*), different sculpture of mesoscutellum with spaced punctures (vs. mesoscutellum with larger, deeper and closer punctures), tergum I with double punctation and tergum II with small, even punctures, antero-medially $1 \times \text{PD}$ apart (vs. tergum I with large punctures and small dots in the interspaces, tergum II with a few shallow and very sparse punctures), tergum III with different shape of apical teeth. *Chrysis assamensis* (see figures in Rosa *et al.* 2014) is a colour aberration, and diagnostic morphological characters match *Ch. rani* Mocsáry, 1913.

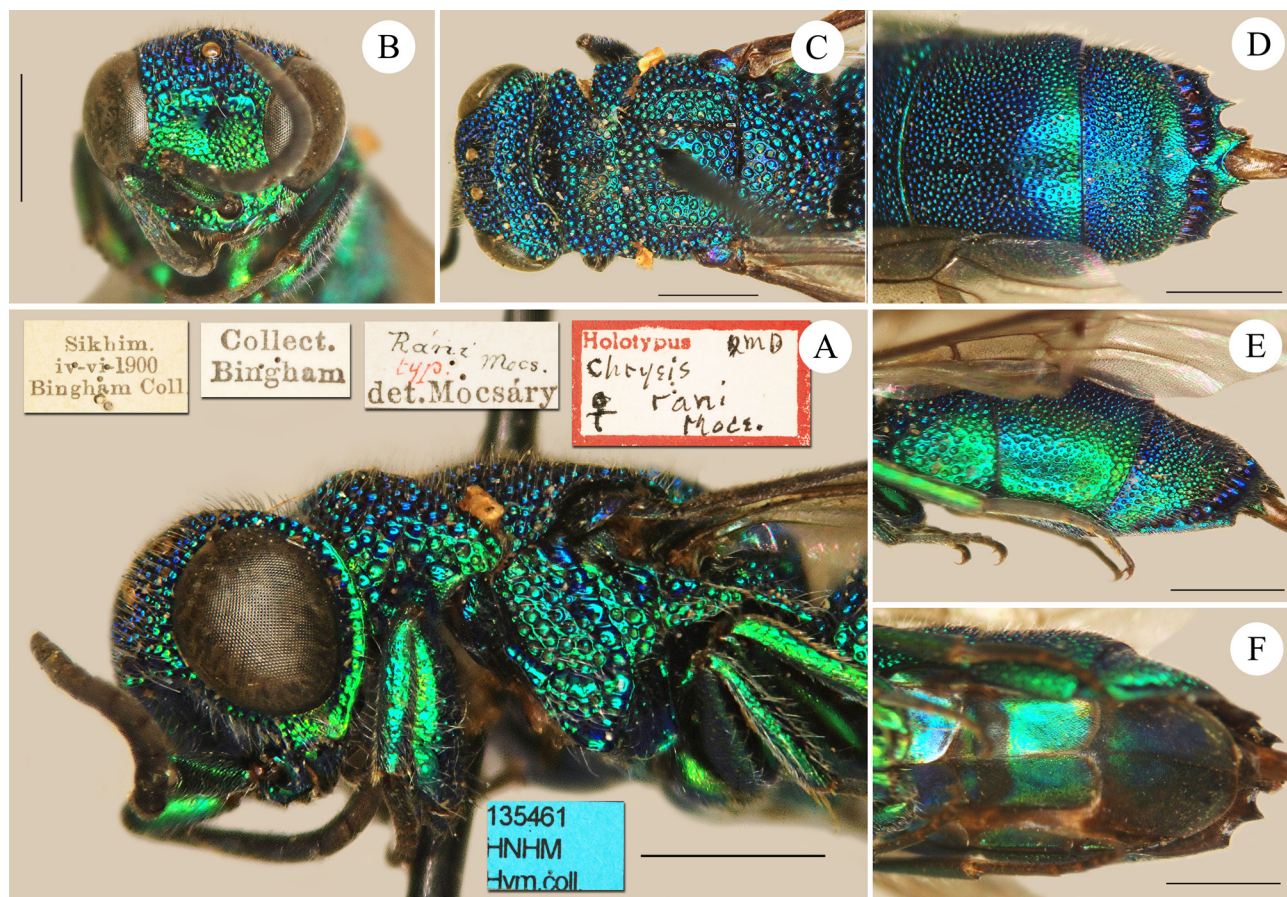


FIGURE 56. *Chrysis rani* Mocsáry, 1913, holotype, female. A. Head and mesosoma, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, dorsal view. E. Metasoma, lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

Chrysis sandaracata Bingham, 1903

(Figs 57A–57D)

Chrysis sandaracata Bingham, 1903: 466. Holotype ♀; India: Sikkim: Rungaroom, 7000 ft (438 (key), 466–467 (descr.)) (NHMUK) (examined). Kimsey & Bohart 1991: 459 (cat., India, *ignita* group).

Chrysis (Tetrachrysis) sandaracata: Bischoff 1913: 58 (cat., Sikkim).

Material examined. 1 ♀, Holotype, Sikkim Rungaroom 7000ft iv.1900 Bingham, *Chrysis sandaracatus* [!] Type Bingh. ♀, Col. Bingham 1902-120, B.M. Type Hym. 13.93, BMNH(E) #970888 (NHMUK).

Distribution. India (Sikkim).

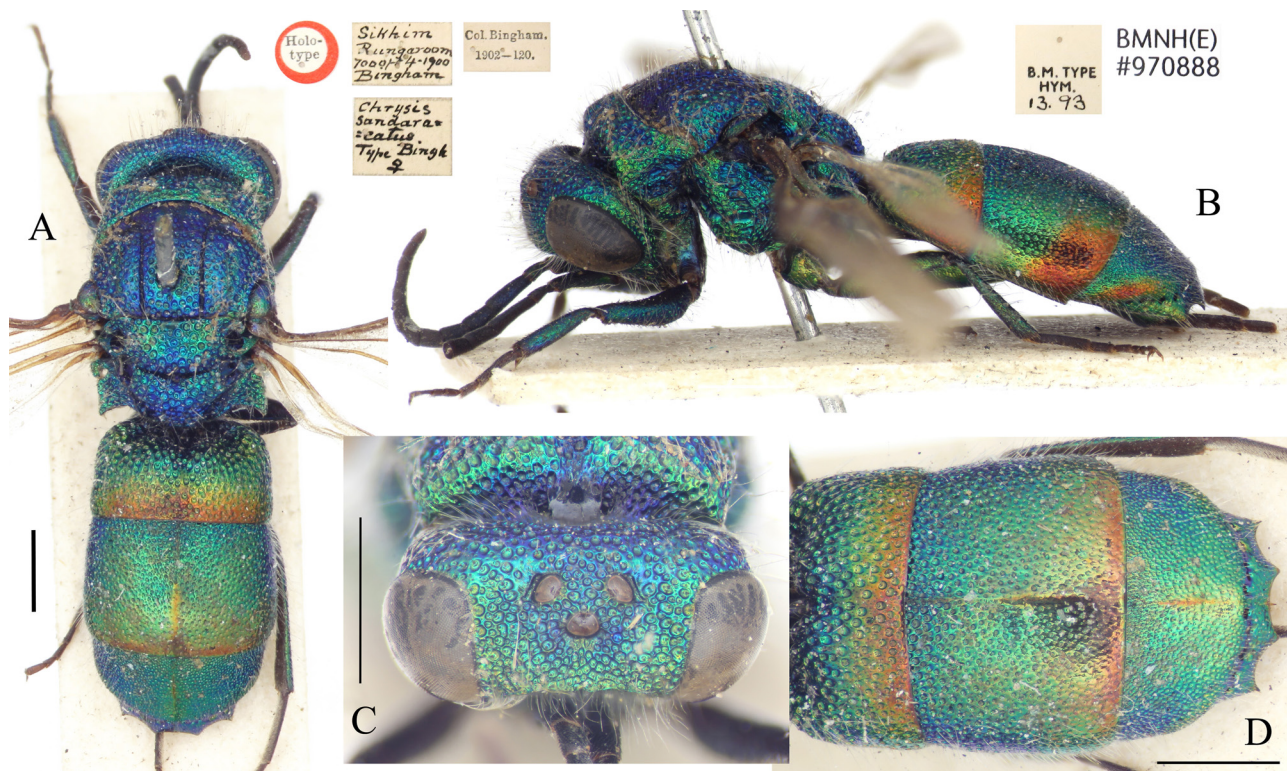


FIGURE 57. *Chrysis sandaracata* Bingham, 1903, holotype, female. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, dorsal view. D. Metasoma, dorsal view. Scale bars 1.0 mm. (© The Trustees of the NHMUK)

Chrysis saraksensis Radoszkowski, 1891

Chrysis saraksensis Radoszkowski, 1891: 195. Holotype ♂; Iran [not Turkmenistan]: Sarakhs (ISEA-PAS). Bingham 1903: 438 (key), 475 (descr., Central provinces; Maharashtra: Bombay [= Mumbai]).

Chrysis seraxensis (!): du Buysson 1896b: 472 (key), 473 (descr., Central provinces, Maharashtra: Poona [= Pune]).

Chrysis seraxensis (!) var. *viridipes* du Buysson 1896b: 473. Holotype ♀; India: Province Centrales (depository unknown).

Chrysis sarakhsensis (!): Bingham 1908: 348 (cat., Bengal: Saraghat).

Chrysis (Tetrachrysis) seraxensis (!): Bischoff 1913: 59 (cat., India).

Chrysis kokandica Radoszkowski, 1877: Kimsey & Bohart 1991: 428 (cat., syn., *splendidula* group).

Distribution. India (Maharashtra; Central provinces (locality not specified); Saraghat; Western India (locality not specified)); Central Asia (Kimsey & Bohart 1991).

Remarks. Indian records are doubtful and should be checked. Radoszkowski (1893) emended the name *Chrysis saraksensis* to *Ch. seraxensis*, without any comment. The name *Chrysis seraxensis* was later used by du Buysson in André (1896a: 728), Bischoff (1913: 59) and Semenov-Tian-Shanskij & Nikol'skaya (1954: 128). The emendation is unjustified according to the Art. 32.5.1 of the Code: incorrect transliteration or latinisation in the original description are not to be considered inadvertent errors. The name *Chrysis saraksensis* is the incorrect transliteration of a locality name written in Arabic (Rosa *et al.* 2015d). *Chrysis saraksensis* belongs to the *maculicornis* group and not to the *splendidula* group (Kimsey & Bohart 1991) or *cerastes* group (Linsenmaier 1994; Rosa *et al.* 2015d).

***Chrysis schioedtei* Dahlbom, 1854**

(Figs 58A–58E)

Chrysis Schiödtei Dahlbom, 1854: 309. Holotype ♀; India: Tamil Nadu: Tranquebaria (ZMUC) (examined). Dalla Torre 1892: 92 (cat., India); du Buysson 1896b: 477 (key), 478 (cat., Assam: Margherita; Chhattisgarh: Raipur; Maharashtra: Poona [= Pune]; Tamil Nadu: Pondicherry).

Chrysis (Hexachrysis) Schiödtei: Mocsáry 1889: 544–545 (descr., India Orientalis, Pondicherry); Bischoff 1913: 67 (cat., Assam).

Chrysis schioedtei: Bingham 1903: 440(key), 489–490 (descr., Gujarat: Punjab; Central Provinces; Maharashtra: western India, Poona [= Pune], Gujarat: Deesa); du Buysson 1904: 273 (cat., Sikkim).

Chrysis schiodti (!): Jonathan *et al.* 1977: 87 (widely distributed in India).

Chrysis schiodtei (!): Kimsey & Bohart 1991: 459 (cat., India, *smaragdula* group).

Material examined. 1 ♀, Kerala, Walayar forest, Malabar, without further data (NHMW); 2 ♀, Meghalaya, Khasia Hills, without further data (ETHZ); 2 ♂, 1 ♀, Odisha, Bhubaneswar, without further data (NHMW); 5 ♀, Tamil Nadu, Coimbatore, without further data (NHMW); 1 ♀, Tamil Nadu, Kurumbagaram, I.1952, leg. Nathan (MNLU); 1 ♂, 4 ♀, idem, IX.1951, leg. Nathan (MNLU); 1 ♀, Tamil Nadu, Settipatti, 13.vii.1975, leg. W. Perraudin (MNLU); 1 ♀, idem, 21.vii.1975 (MNLU); 1 ♀, Tamil Nadu, Pondicherry [= Puducherry], Karaikal, iv.2002, leg. T. Nathan (PRC); 1 ♀, Tamil Nadu, Coimbatore, viii.1975, leg. Nathan (PRC).

Distribution. India (Assam; Chhattisgarh; Gujarat; Kerala; Maharashtra; *Meghalaya*; *Odisha*; Sikkim; Tamil Nadu; India Orientalis (locality not specified); Central Provinces (locality not specified); Western India (locality not specified)). Oriental and Australian (Kimsey & Bohart 1991).

Remarks. Bohart (in Kimsey & Bohart 1991: 460) designated the lectotype based on the holotype specimen. Dahlbom (1854) described *Chrysis schioedtei* on a single holotype specimen “*Specimen unicum in Tranquebaria lectum communicavit D. Westermann*”.

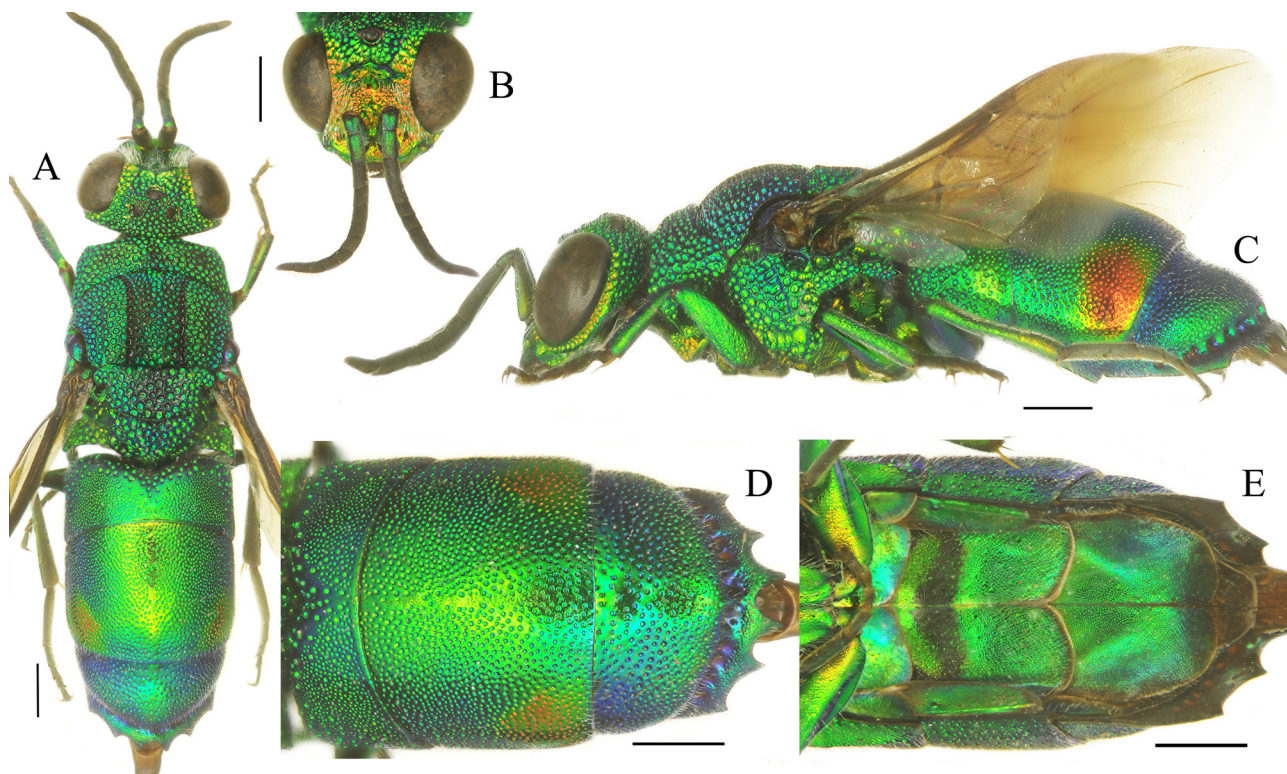


FIGURE 58. *Chrysis schioedtei* Dahlbom, 1854, female from Tamil Nadu. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorsal view. E. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis sikkimensis* Mocsáry, 1912b**

(Figs 59A–59F)

Chrysis (Tetrachrysis) sikkimensis Mocsáry, 1912b: 554. Holotype ♀; India: Sikkim (HNHM). Bischoff 1913: 59 (cat., India).
Chrysis sikkimensis: Kimsey & Bohart 1991: 462 (cat., India: Sikkim, *splendidula-senegalensis* group).

Material examined. 1 ♀, Sikkim, Collect. Bingham, *sikkimensis* Mocs. Typ. det. Mocsáry, Holotypus *Chrysis sikkimensis* Mocs. ♀ RMB, id nr. 135336 HNHM Hym. coll. (HNHM).

Distribution. India (Sikkim).

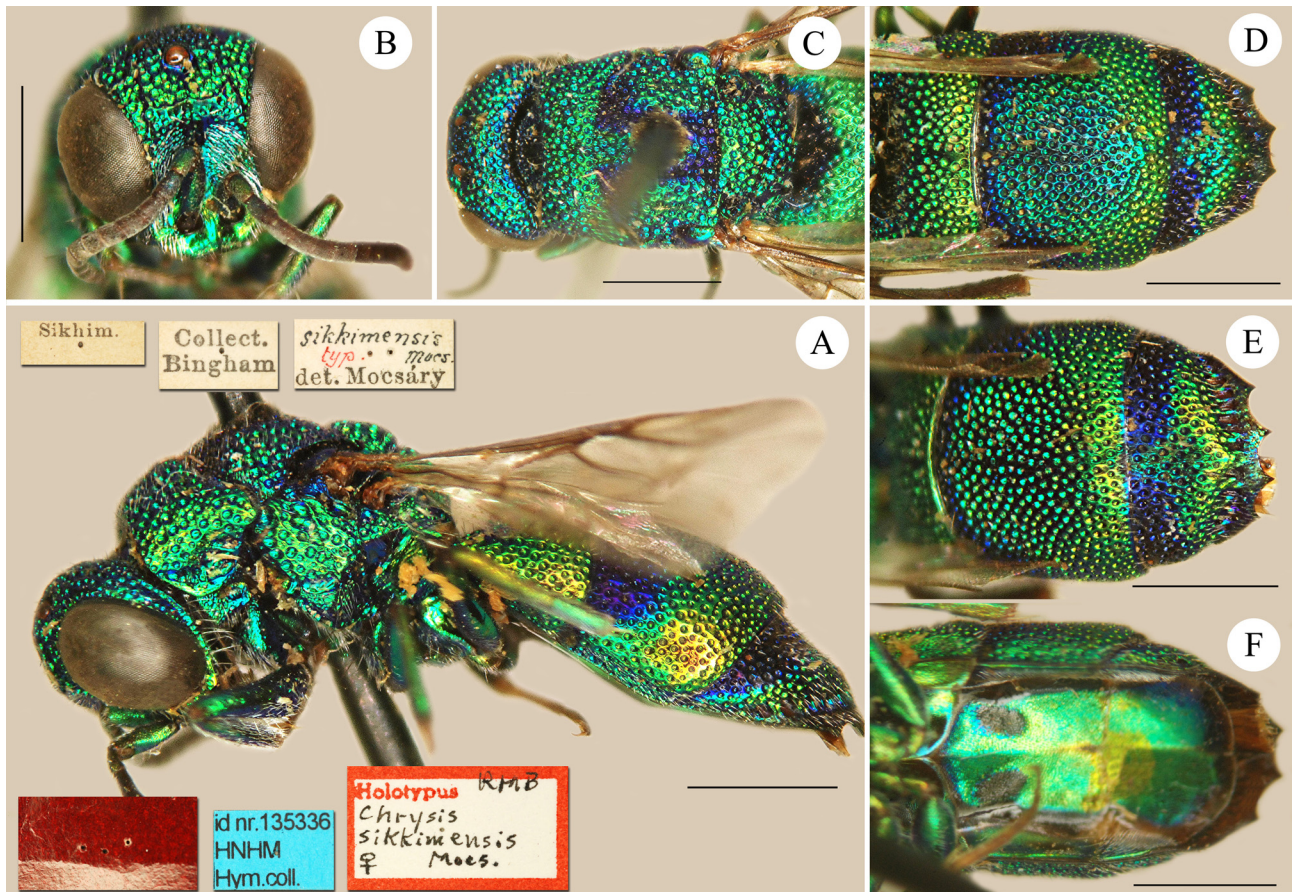


FIGURE 59. *Chrysis sikkimensis* Mocsáry, 1912, holotype, female. A. Habitus, lateral view. B. Head, frontal view. C. Mesosoma, dorsal view. D. Metasoma, dorsal view. E. Metasoma, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis speculata* du Buysson, 1896b**

(Figs 60A–60F)

Chrysis speculata du Buysson, 1896b: 473. Holotype ♀; India: Maharashtra: Bombay: Poona [= Pune] (471 (key), 473–474 (descr.), pl. III (fig. 4)) (MNHN) (examined). Bingham 1903: 437 (key), 465 (descr., Bombay: Poona [= Pune]); Kimsey & Bohart 1991: 464 (cat., India: Bombay: Poona [= Pune], *succincta* s.s. group).

Chrysis (Tetrachrysis) speculata: Bischoff 1913: 59 (cat., India).

Material examined. 1 ♀, Type, Présid. Bombay: Poona, R.C. Wroughton, Museum Paris, Inde Poona coll. R. du Buysson 1900, *Chrysis speculata* type. Buyss. R. du Buysson det.

Distribution. India (Maharashtra).

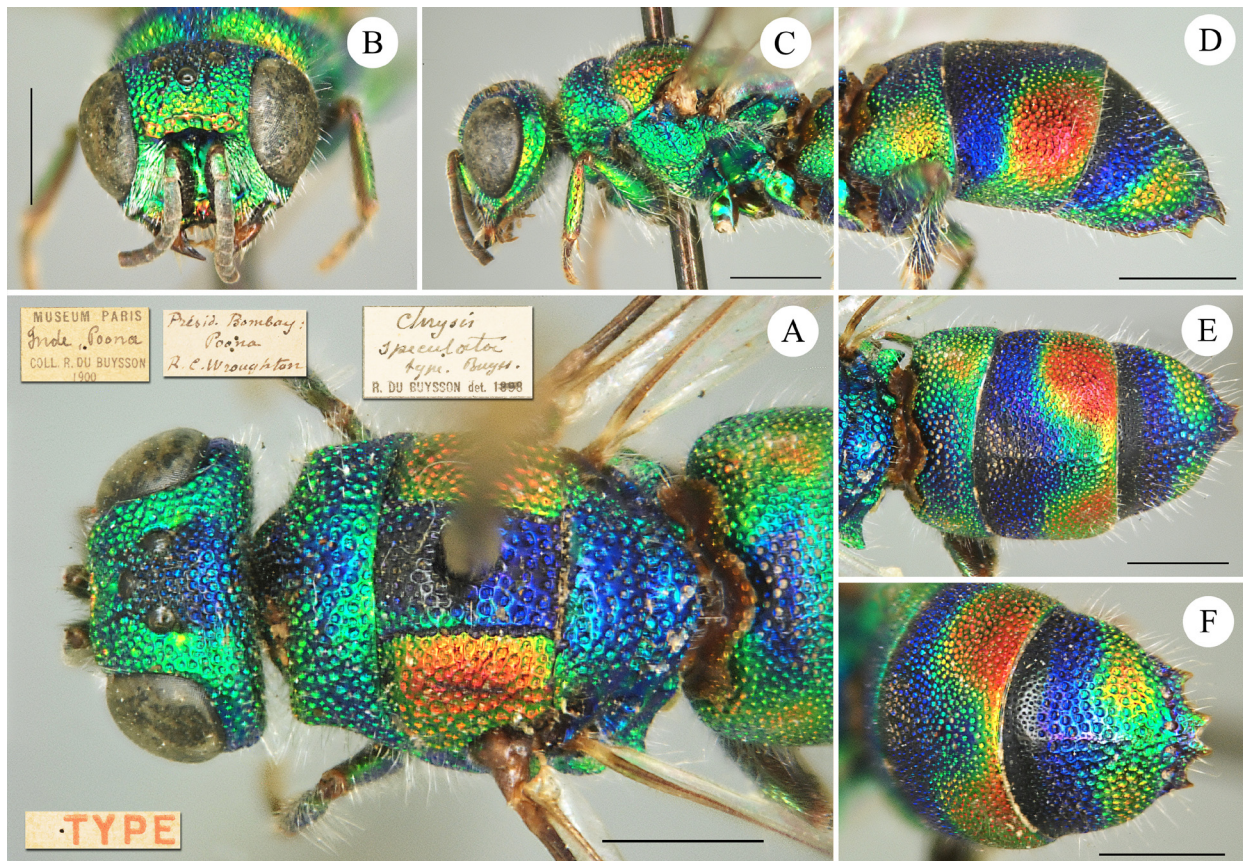


FIGURE 60. *Chrysis speculata* du Buysson, 1896, holotype, female. A. Head and mesosoma, dorsal view. B. Head, frontal view. C. Head and mesosoma, lateral view. D. Metasoma, lateral view. E. Metasoma, dorsal view. F. Metasoma, posterior view. Scale bars 1.0 mm.

Chrysis stilboides Spinola, 1838

(Figs 61A–61E)

Chrysis stilboides Spinola, 1838: 446. Holotype ♀; Egypt (MSNT) (examined). Kimsey & Bohart 1991: 466 (cat., India).

Chrysis (Hexachrysis) indica Mocsáry, 1889: 591, nec Schrank, 1802. Holotype ♂; India Orientalis (HNHM) (examined). Bischoff 1913: 65 (cat., India).

Chrysis indica: Dalla Torre 1892: 72 (cat., India or.); Bingham 1903: 439 (key), 486 (descr., India Orientalis); Bingham 1908: 349 (cat., Bihar: Purneah [= Purnia]).

Material examined. 1 ♂, India: Baluchistan, 1931 (NHMW).

Distribution. India (Bihar; India Orientalis [= Himalaya]). Subcosmopolitan: Afrotropical, Palearctic (Turkey to Iran and India), Oriental (Thailand) (Kimsey & Bohart 1991).

Remarks. The holotype of *Chrysis indica* examined at HMNH bears the locality label Himalaya and it was examined and identified by Linsenmaier as *Chrysis stilboides indica* Mocs. in 1962.

Chrysis tamerlana Mocsáry, 1912b

(Figs 62A–62F)

Chrysis (Tetrachrysis) Tamerlana Mocsáry, 1912b: 551. Holotype ♂; India: Himachal Pradesh: Matiana, 8000 ft, Simla Hills (HNHM) (examined). Bischoff 1913: 60 (cat., India).

Chrysis (Tetrachrysis) Maharani Mocsáry, 1912b: 553. Holotype ♀; India: Sikkim (HNHM) (examined). Bischoff 1913: 55 (cat., India).

Chrysis (Tetrachrysis) Kali Mocsáry, 1912b: 553. Holotype ♀; India: Sikkim (HNHM) (examined). Bischoff 1913: 54 (cat., India).

Chrysis tamerlana: Kimsey & Bohart 1991: 470 (cat., North-East India).

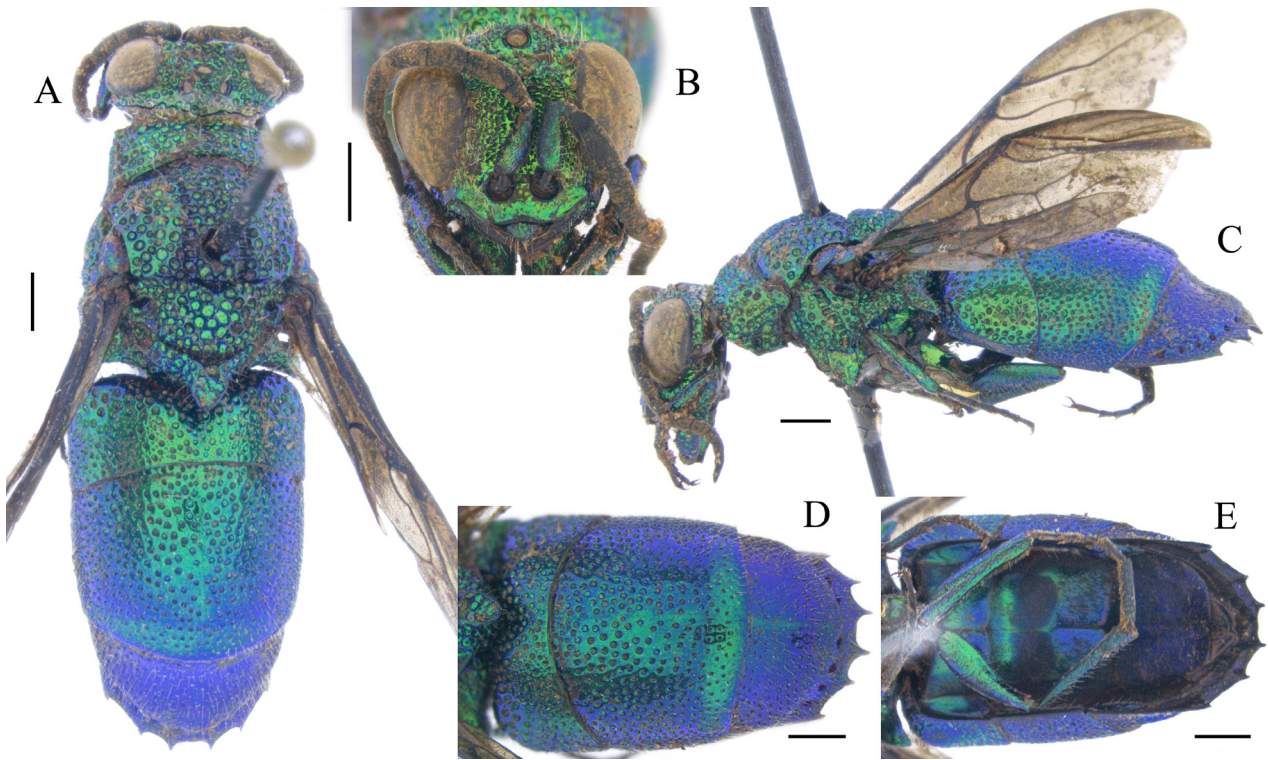


FIGURE 61. *Chrysis stilboides* Spinola, 1838, female from Baluchistan. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorsal view. E. Metasoma, ventral view. Scale bars 1.0 mm.

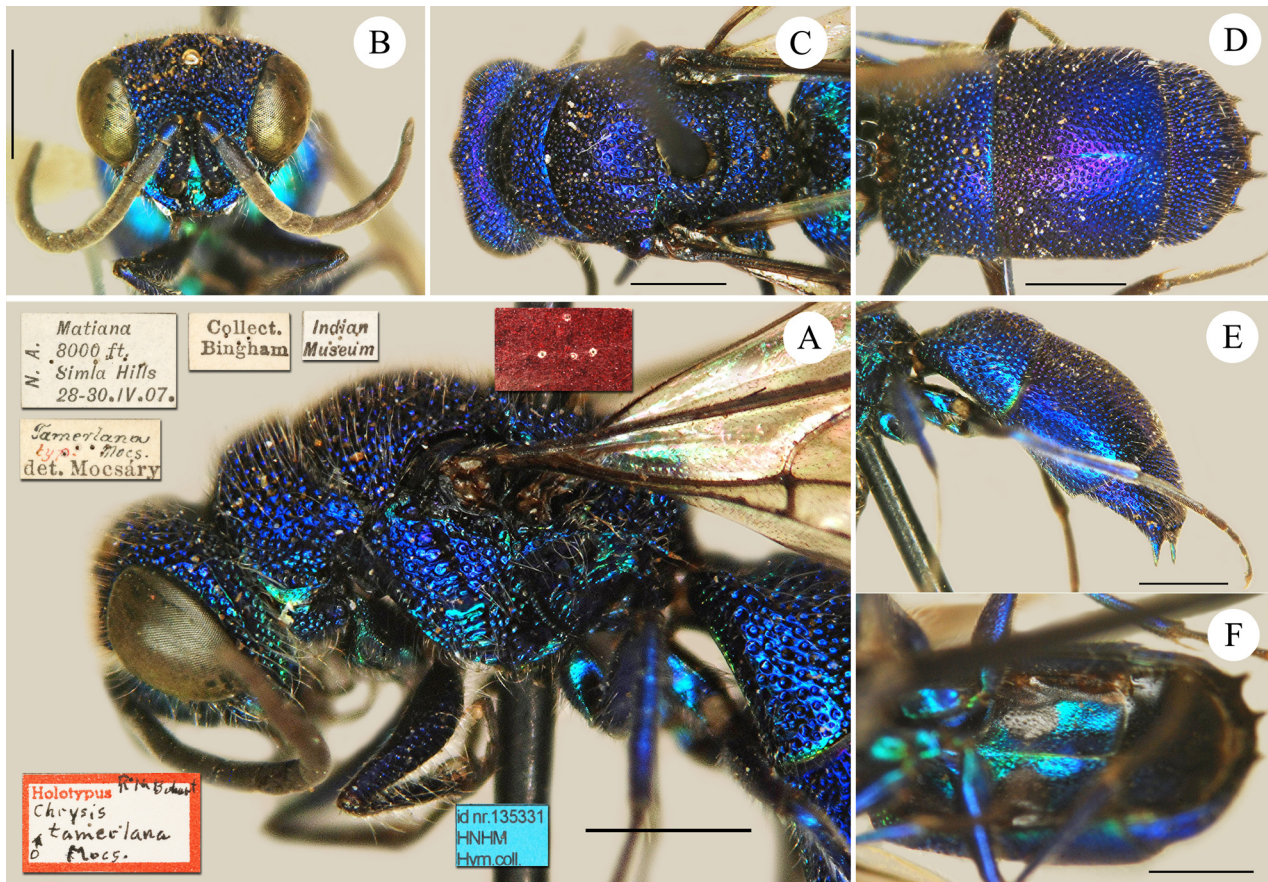


FIGURE 62. *Chrysis tamerlana* Mocsáry, 1912, holotype, male. A. Head and mesosoma, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, dorsal view. E. Metasoma, lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

Material examined. 1 ♂, N.A. Matiana 8000 ft Simla Hills 28.–30.iv.07, Collect. Bingham, *Chrysis annandali* [!] ♂ Bingh. Type, Indian Museum, *tamerlana* Mocs. typ. det. Mocsáry, Holotypus *Chrysis tamerlana* ♂ Mocs. RMB, id nr. 135331 Hym.coll.; 1 ♀, Sikkim, 950-31, *Maharani* Mocs. typ. det. Mocsáry, *Chrysis L. tamerlana* Mocs. Linsenmaier det. 59, Holotypus *Chrysis maharani* ♀ Mocs. RMB, id nr. 135332 Hym.coll.; 1 ♀, Sikkim Rungaroon 7000' iv.1900 Bingham Coll., Collect. Bingham, *Kali* Mocs. typ. det. Mocsáry, *Chrysis L. tamerlana* Mocs. Linsenmaier det. 61, Holotypus *Chrysis kali* ♀ Mocs. RMBohart, id nr. 135334 Hym.coll.; 4 ♀, Darjeeling, Rimbick—Raman, 19.v.1975, 1950–2450m, leg. W. Wittmer (MNLU); 1 ♀, Jammu & Kashmir, Gulmarg, 10.vii.1931, leg. Fletcher (MNLU).

Distribution. India (Himachal Pradesh; Jammu and Kashmir; Sikkim; West Bengal); Nepal (Kimsey & Bohart 1991).

Chrysis thakur Mocsáry, 1913

(Figs 63A–63F)

Chrysis (*Hexachrysis*) *Thakur* Mocsáry, 1913: 22. Lectotype ♂ designated by Bohart in Bohart & French 1986: 343; Myanmar: Tenasserim (HMNH) (examined).

Chrysis thakur: Kimsey & Bohart 1991: 471 (cat., Western India, *smaragdula* group).

Distribution. India (Western India (locality not specified)). Widespread from Western India to Taiwan (Kimsey & Bohart 1991).

Remarks. *Chrysis thakur* belongs to the *oculata* group and not to the *smaragdula* group, for its shortened flagellomere I. It could be the male of *Ch. schioedtei* however more material is needed to confirm this speculation.

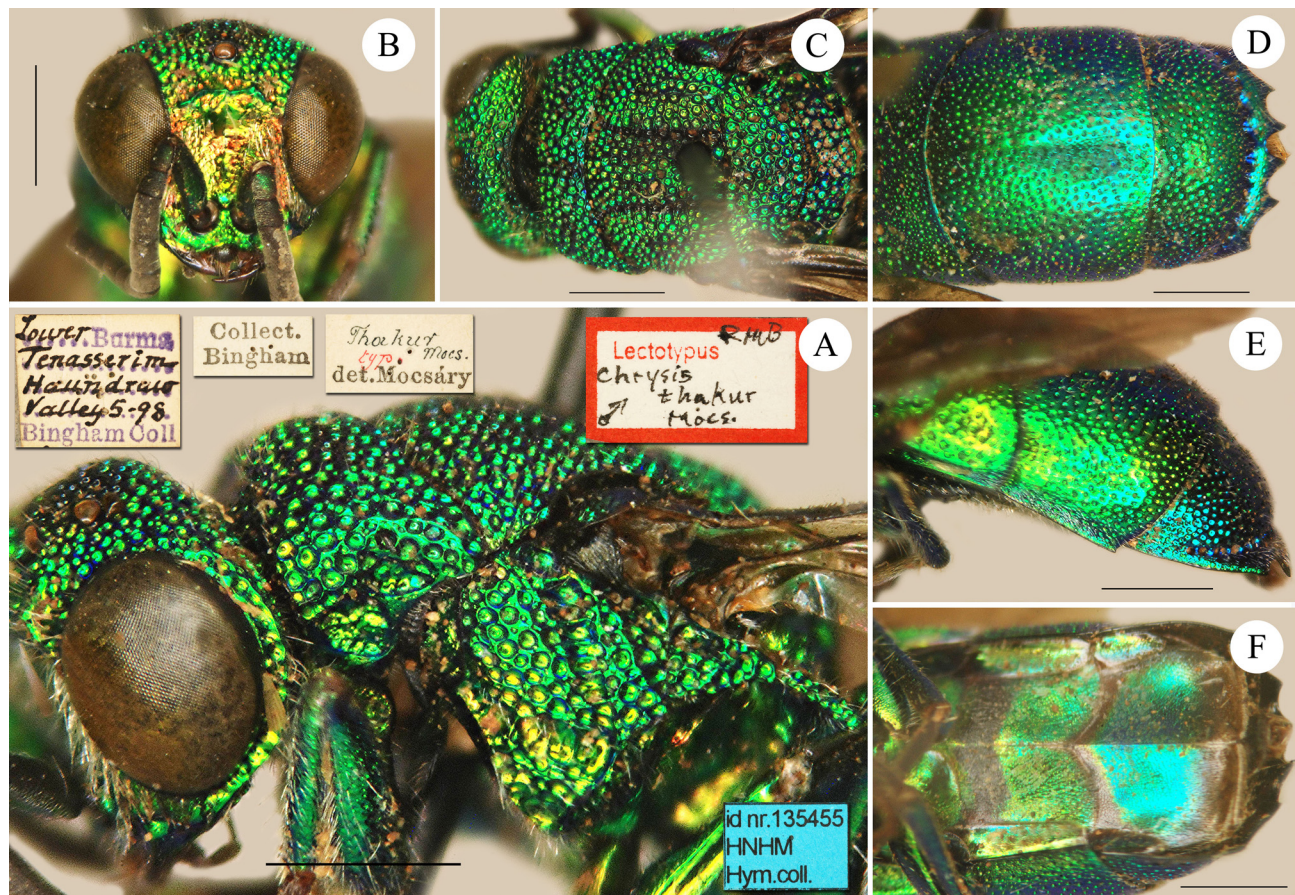


FIGURE 63. *Chrysis thakur* Mocsáry, 1913, holotype, male. A. Head and mesosoma, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, dorsal view. E. Metasoma, lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis travancoriana* Rosa, sp. nov.**

(Figs 64A–64F)

Material examined. Holotype: ♀; India: Travancore, x.1942, collector unknown, NML_ENT GBIF_Chr 00019304 (MNLU). Paratype: 1 ♀, Tamil Nadu: 60 km SW Madurai, 200m, 09°21,6' N, 77°26,6'E, 6.v.2005, leg. M. Halada (MHC).

Diagnosis. Species with body colouration green and blue, with golden reflections postero-laterally on metasomal terga I–II; lateral area of mesoscutum with peculiar punctuation: between notauli and parapsidal signum [= parapsidal line] punctures are transversally contiguous to fused each other, appearing as transversally elongate foveae; tergum III hexadentate, with triangular medial tooth on lateral edge; pits of pit row deep and large.

Description. *Female.* Body length 6.7 mm. Forewing length 3.9 mm. OOL 1.5 × MOD; POL 6.7 × MOD; MS 1.7 × MOD; relative length of P:F1:F2:F3 = 1.0:1.5:0.7:0.7.

Head. Vertex and frons with small (about 0.3 × MOD) and contiguous punctures; with two polished area lateral to posterior ocelli; punctuation from ocelli triangle to occiput smaller and sparser; transverse frontal carina faint, yet frons distinctly prominent over scapal basin; scapal basin fully punctate with small punctures, decreasing in size toward malar spaces; clypeus micropunctate; subantennal space less than 1.0 × MOD; apical margin of clypeus slightly incurved medially.

Mesosoma. Medial pronotal line [= pronotal groove] deep, narrow, and almost reaching the posterior margin of pronotum; pronotum with double punctuation, with relatively medium-sized (up to 0.5 × MOD) and smaller punctures on interspaces; median area of mesoscutum with slightly larger and contiguous punctures; lateral area of mesoscutum with peculiar punctuation: between notauli and parapsidal signum [= parapsidal line] punctures are transversally contiguous or fused, appearing as transversally elongate foveae; notauli as thin irregular lines among mesoscutal punctuation; parapsidal signum hardly visible among the coarse punctuation; mesoscutellum with contiguous and corrugate punctures, antero-medially with dense, smaller punctures; metanotum with large antero-medial fovea on mesoscuto-mesoscutellar suture; metapectal-propodeal disc unmodified; posterior propodeal projections [= propodeal teeth] subparallel; mesopleuron with two large foveae: anterior mesopleural fovea close to pronotal lobe, and subalar fovea, followed by posterior oblique sulcus of mesopleuron [= scrobal sulcus], formed by large, subquadrate foveate punctures. Spurs of mesotibia distinctly unequal in length; mesotarsomere I as long as II–III together, V as long as III–IV together. Wings with nervures unmodified.

Metasoma. Punctuation on tergum I, with small- to medium-sized punctures, widely separate medially (1.0–2.0 × PD apart), denser along posterior margin, and medially with fine, shallow dots on interspaces; tergum II with even medium-sized punctures equally separate, with fine, shallow dots on interspaces; punctuation double, closer and deeper on lateral margins; punctuation on tergum III double, contiguous, without polished interspaces; pits of pit row deep and large (2–3 × size of largest punctures); median pits of pit row not aligned; apical margin with four triangular, pointed teeth, and with additional elongate tooth in basal 1/3 of lateral edge, on each side. Metasomal terga without median longitudinal carina. Black spots on sternum II with inner and posterior side rounded.

Colouration. Body entirely metallic green with contrasting blue on ocelli triangle; median area of mesoscutum; median area of tergum I; antero-medially on terga II and III; golden to red postero-laterally on tergum II. Tegula brown, with weak bluish metallic reflections; legs metallic green with tarsi brown; scapus and pedicel metallic green, flagellum black. Wings clear, slightly brownish on radial sector.

Vestiture. Body with whitish, short, and erect setae (about 1.0 × MOD long).

Male. Unknown.

Distribution. India (Oriental part).

Etymology. The specific name *travancoriana* is named after the collecting locality Travancore. The Kingdom of Travancore was an important Indian kingdom from 870 A.D. and 1949 A.D. In the period of its maximum extension, it covered most of modern central and southern Kerala, part of Tamil Nadu state (the Kanyakumari district) and of the Cochin Kingdom on the Malabar Coast.

Remarks. Linsenmaier (1987) established the *Chrysis praecipua* species group, based only on this outstanding species. *Chrysis travancoriana* sp. nov. shares all the main diagnostic feature of this group, which include the unusual six-toothed apical margin, with the lateral tooth apically blunt, not aligned but placed in basal 1/3 of lateral edge; black spots similar to some species of the *Chrysis ignita* group, largely separated medially (not medially fused as in members of the *smaragdula* group, also with six teeth on the apical margin of the tergum III); transverse frontal

carina faint and frons prominent over the scapal basin; habitus slender, compared to members of the *smaragdula* group.

Chrysis travancoriana **sp. nov.** is closely related only to *Ch. praecipua* Linsenmaier, 1987, from which it is separated by body colouration green and blue, with golden reflections postero-laterally on the first and second metasomal terga (vs. metasomal terga I–II red, contrasting with green III one in *Chrysis praecipua*); posterior ocelli close to each other ($1.7 \times \text{MOD}$ vs. $2.0 \times \text{MOD}$); lateral area of mesoscutum with peculiar punctuation: between notauli and parapsidal signum [= parapsidal line] punctures are transversally contiguous to fused each other, appearing as transversally elongate foveae (vs. unmodified mesoscutal punctation); median teeth of metasomal tergum III triangular (vs. apically lobate); pits of the pit row deep and large (vs. shallow and small, as large as punctures on the tergum).

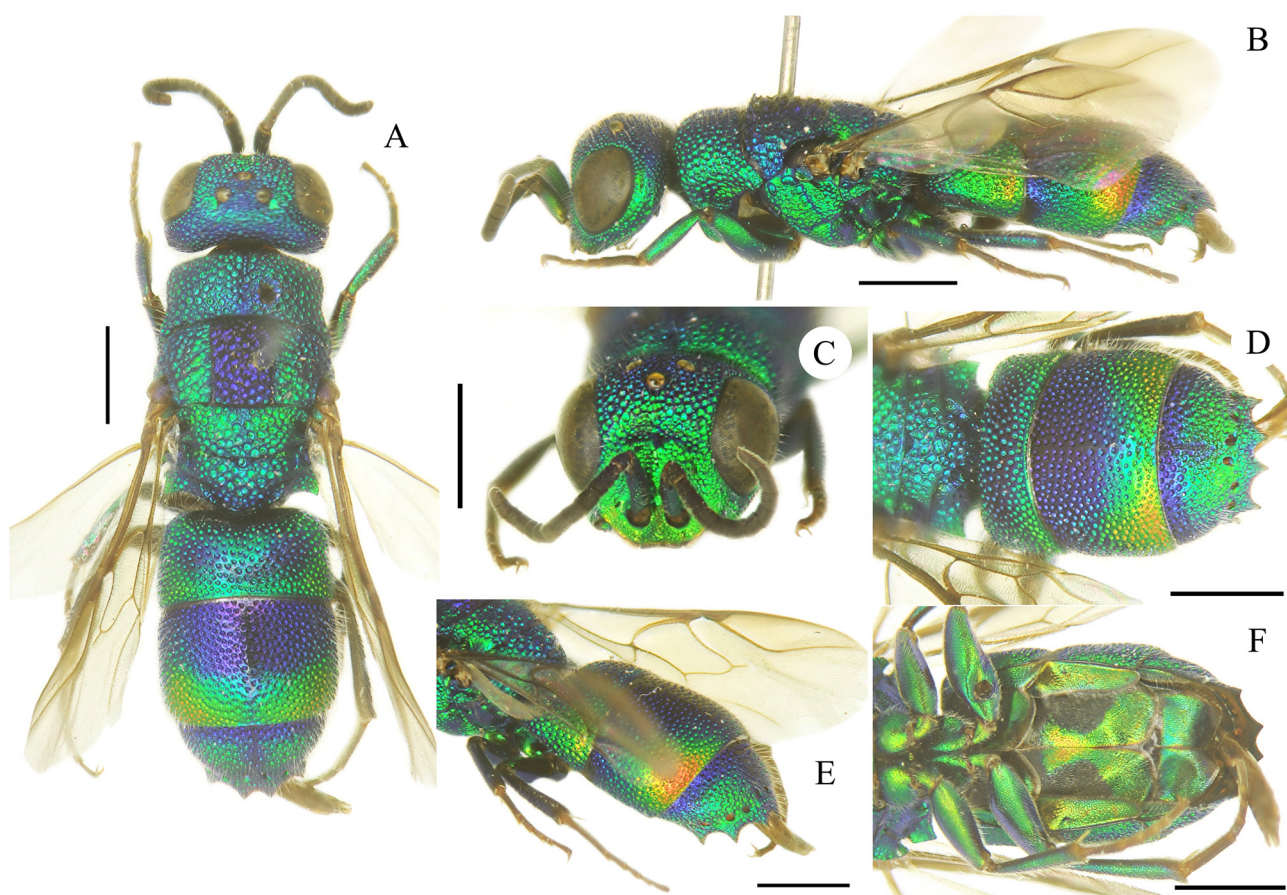


FIGURE 64. *Chrysis travancoriana* Rosa, **sp. nov.**, holotype, female. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, posterior view. E. Metasoma, postero-lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis variipes* Mocsáry, 1911**
(Figs 65A–65D)

Chrysis (Holochrysis) variipes Mocsáry, 1911: 467. Lectotype ♂ designated by Bohart in Bohart & French 1986: 343; India Orientalis: Maharashtra: Lonauli [= Lonavala] (HNHM) (examined). Bischoff 1913: 42 (cat., India).

Chrysis variipes: Bohart & French 1986: 343 (India); Kimsey & Bohart 1991: 475 (cat., India).

Material examined. 1 ♂, Lonauli Ind. or. Biró, *varripes* [!] Mocs. typ. det. Mocsáry, Lectotypus *Chrysis variipes* ♂ Mocs. RMB, id nr. 135179 Hym.coll. (HNHM).

Distribution. India (Maharashtra).

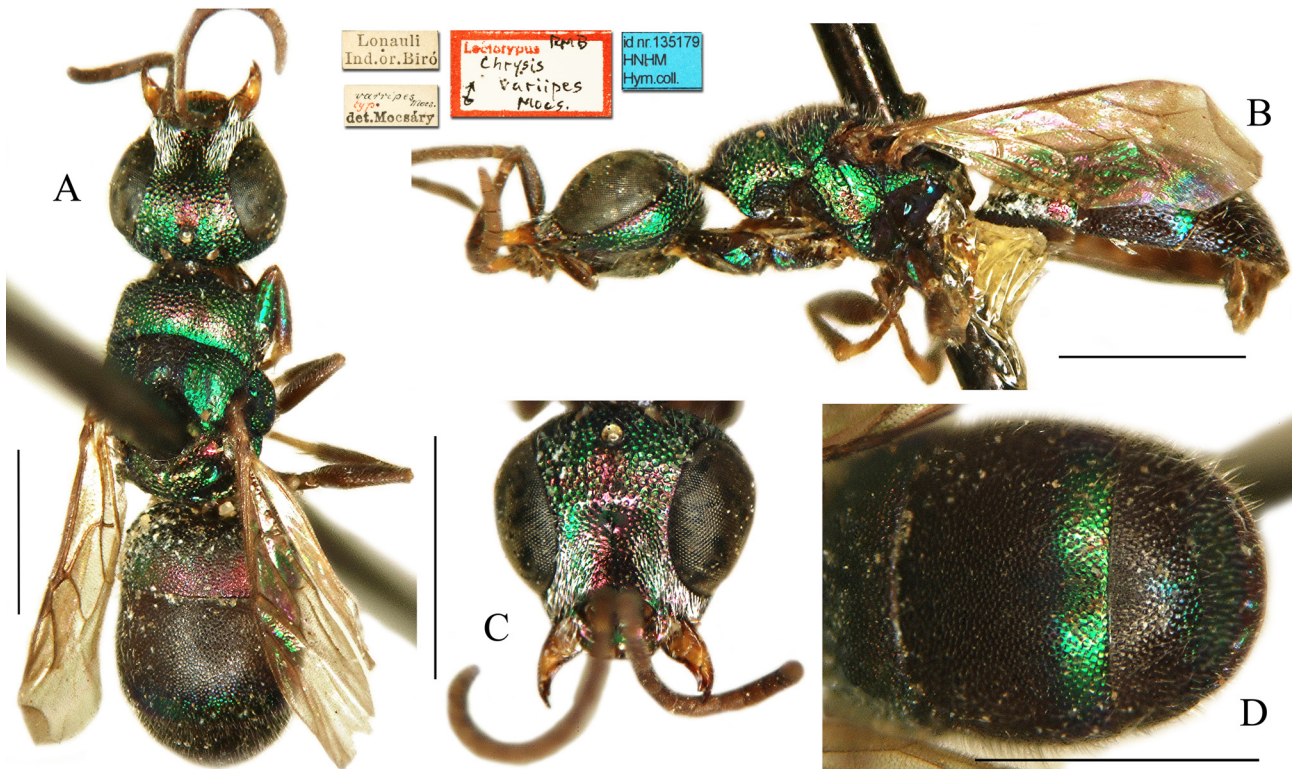


FIGURE 65. *Chrysis variipes* Mocsáry, 1911, holotype, male. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, posterior view. Scale bars 1.0 mm.

***Chrysis violenta* Linsenmaier, 1968**

(Figs 66A–66E)

Chrysis (Chrysis) violenta Linsenmaier, 1968: 97. Holotype ♀, Pakistan: Luru Sar (MNLU).

Chrysis violenta: Kimsey & Bohart 1991: 476 (cat., North India, *ignita* group).

Material examined. 1 ♀, Jammu & Kashmir, Aru Valley, 2740–3050 m, 2.ix.1970, leg. Y. Arita (MNLU).

Distribution: India (Jammu & Kashmir); Nepal, Pakistan, Tibet (Kimsey & Bohart 1991).

***Chrysis vishnu* Mocsáry, 1912b**

(Figs 67A–67F)

Chrysis (Tetrachrysis) vishnu Mocsáry, 1912b: 557. Holotype ♀; India: Assam [currently Meghalaya]: Shillong (HNHM) (examined). Bischoff 1913: 61 (cat., Assam).

Chrysis (Chrysis) vishnu: Linsenmaier 1968: 101 (descr., East India).

Chrysis vishnu: Kimsey & Bohart 1991: 478 (cat., east India, *ignita* group).

Material examined. 1 ♀, Shillong xi.03, Collect. Bingham, *Vishnu* Mocs. typ. det. Mocsáry, Holotypus *Chrysis vishnu* ♀ Mocs. RMB, id nr. 135344 Hym.coll. (HNHM); 1 ♀, Sikkim: Gantok, 5000ft 1.vi.1924 Maj. R.W.G. Hingston / Everest Exp. Brit. Mus. 1924-386

Distribution. India (Meghalaya; Sikkim); Malaysia (Kimsey & Bohart 1991).

Remarks. The female of *Chrysis vishnu* is closely related to females identified as *Ch. tamerlana* (described on a single male). The main differences between the females of these two species are the relative length of the flagellomere I and the shape of the black spots on the sternum II. An examination of more specimens is needed to confirm the previous synonymies of *Chrysis tamerlana* and the validity of *Ch. vishnu*, which could be also a synonymous of *Ch. tamerlana*.

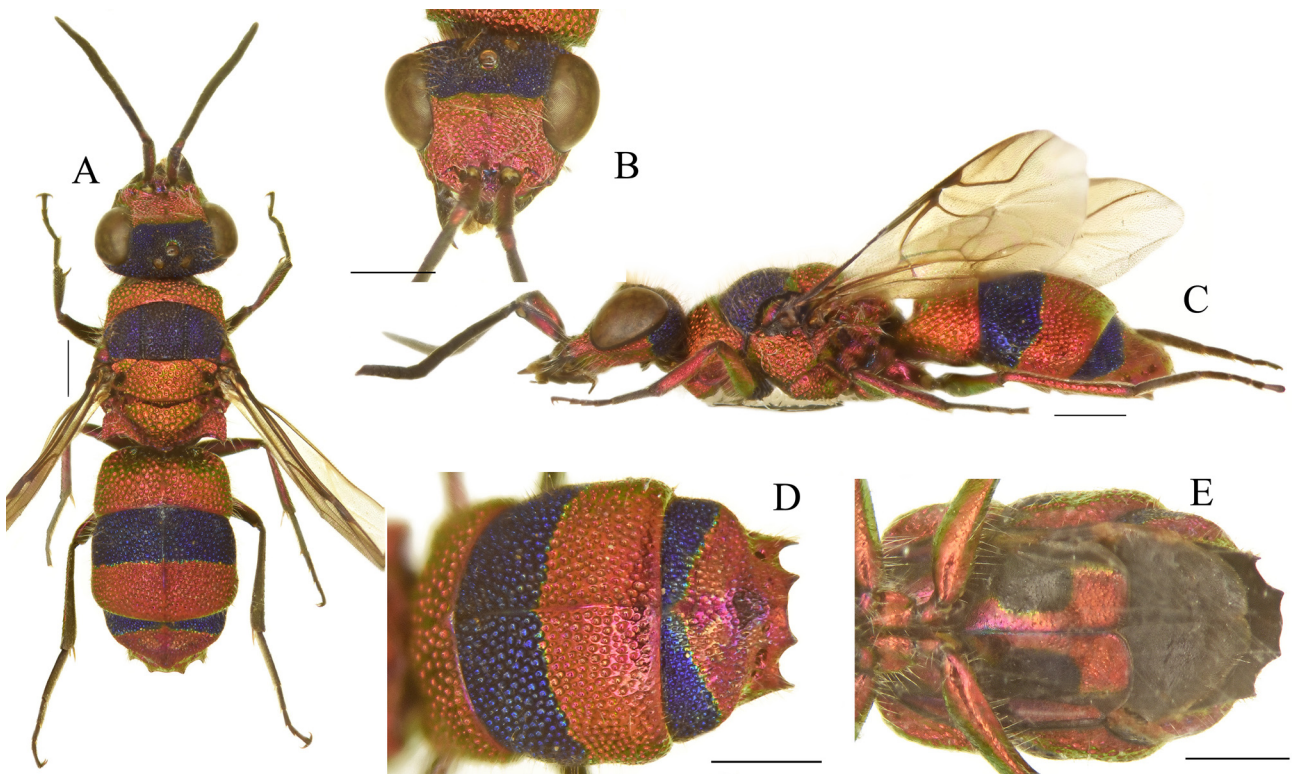


FIGURE 66. *Chrysis violenta* Linsenmaier, 1968, female from Jammu & Kashmir. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, posterior view. E. Metasoma, ventral view. Scale bars 1.0 mm.

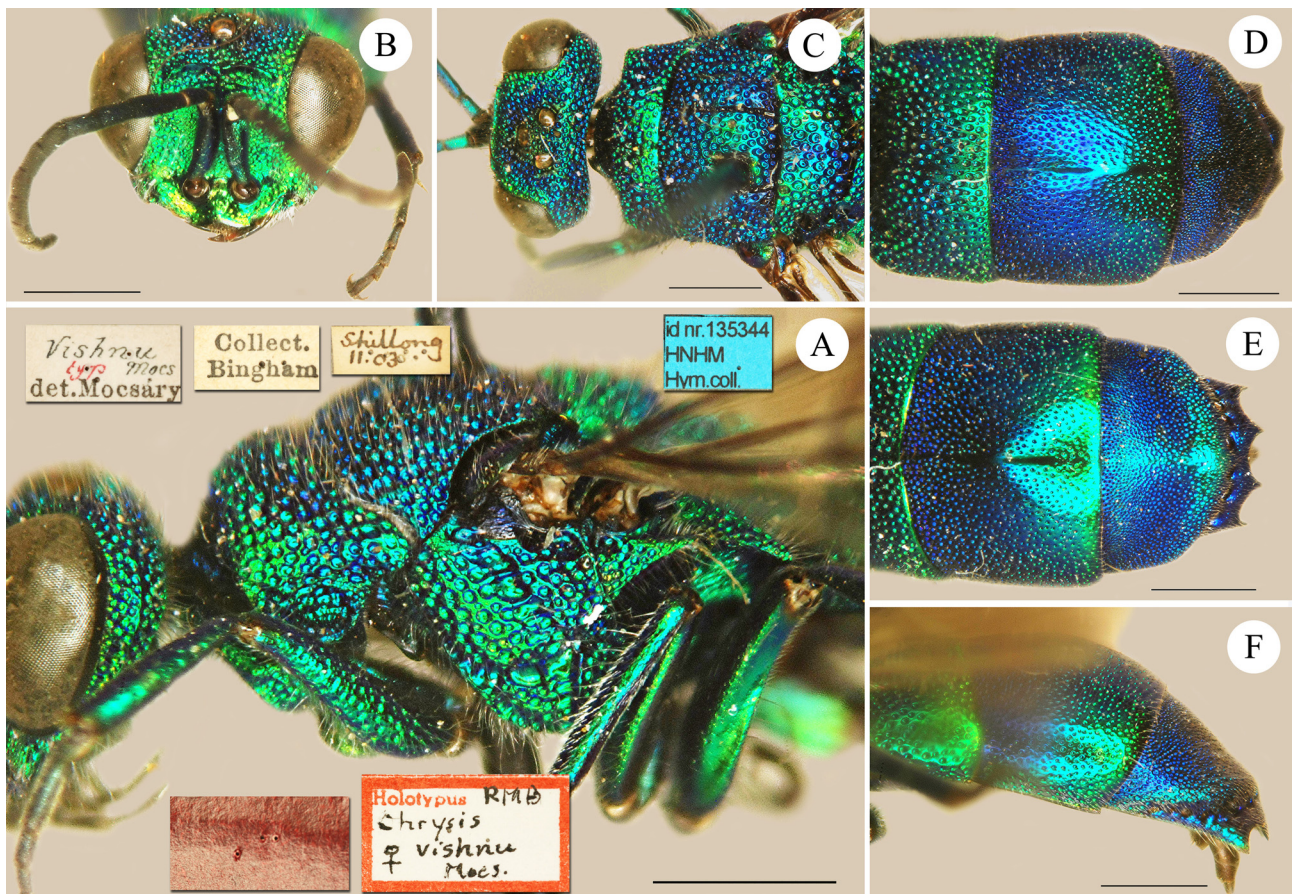


FIGURE 67. *Chrysis vishnu* Mocsary, 1912, holotype, female. A. Mesosoma, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, dorsal view. E. Metasoma, lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Chrysis wroughtoni* du Buysson, 1896b**

(Figs 68A–68D, 69A–69E)

Chrysis Wroughtoni du Buysson, 1896b: 469. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 479; India: Maharashtra: Bombay: Poona [= Pune] (469 (key), 469–470 (descr.), pl. III (fig. 2), pl. V (fig. 7)) (MNHN) (examined).

Chrysis abuensis Nurse, 1902: 307. Syntypes ♀ ♂, India: Rajasthan: Mount Abu (HMNH, NHMUK, NHMW) (examined), **syn. nov.** Bingham 1903: 436 (key), 446–447 (descr., Mount Abu, 4000 ft, in Rajputana), pl. I (fig. 10); Kimsey & Bohart 1991: 379 (cat., India, *capitalis* group); Rosa *et al.* 2017d: 17 (cat., typ., India: Mt. Abu); Rosa *et al.* 2020a: 27 (cat., typ., fig. 1).

Chrysis wroughtoni: Bingham 1903: 435 (key), 443 (descr., Bombay presidency, Poona (Wroughton)); Kimsey & Bohart 1991: 479 (cat., India, *capitalis* group).

Chrysis (Holochrysis) abuensis: Bischoff 1913: 37 (cat., India).

Chrysis (Holochrysis) wroughtoni: Bischoff 1913: 42 (cat., India).

Material examined. 1 ♀, syntype, Baluchistan, Abu, leg. G. Nurse, det. du Buysson (NHMW); 5 ♀, syntypes, same labels (HNHM).

Distribution. India (Maharashtra; Rajasthan).

Remarks. Apparently, Nurse (1902) did not know du Buysson (1896b) and redescribed *Chrysis wroughtoni* with the name *Ch. abuensis*. Specimens of *Chrysis abuensis* are distinctly larger (9–11 mm) than the types of *Ch. wroughtoni* (6–7 mm), nevertheless any other morphological difference was observed and therefore we here synonymise *Ch. abuensis* Nurse, 1902, **syn. nov.** with *Ch. wroughtoni* du Buysson, 1896b.

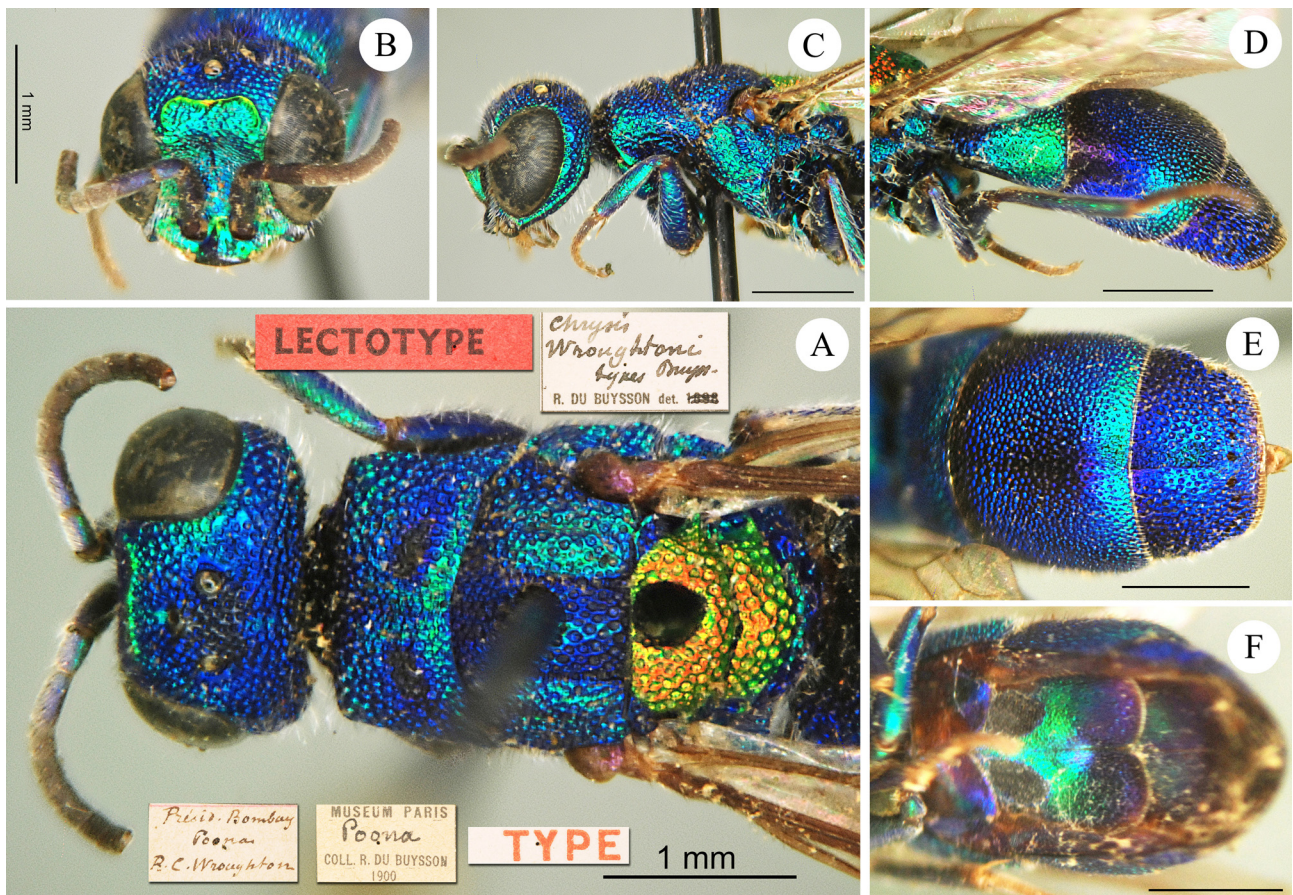


FIGURE 68. *Chrysis wroughtoni* du Buysson, 1896, holotype, female. A. Head and mesosoma, dorsal view. B. Head, frontal view. C. Head and mesosoma, lateral view. D. Metasoma, lateral view. E. Metasoma, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

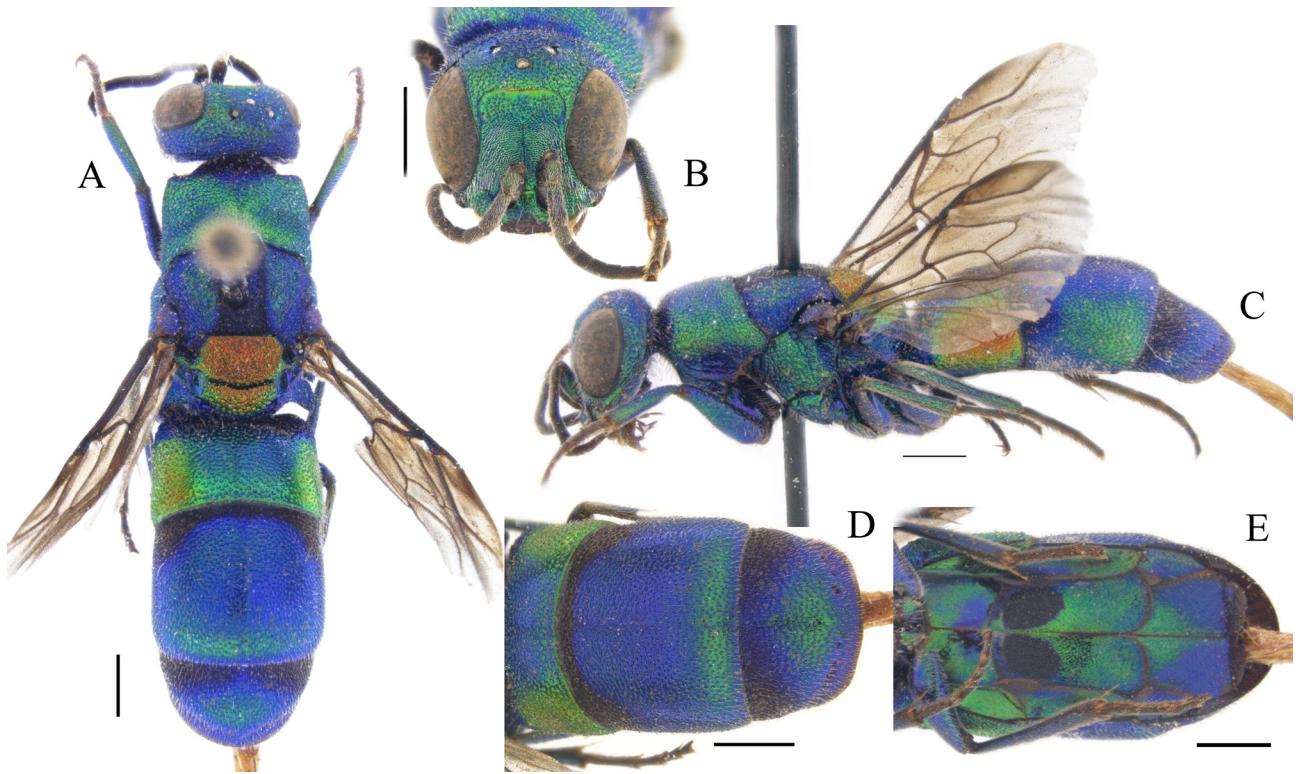


FIGURE 69. *Chrysis abuensis* Nurse, 1902 (= *Chrysis wroughtoni* du Buysson), syntype, female. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, posterior view. E. Metasoma, ventral view. Scale bars 1.0 mm.

Genus *Chrysur* Dahlbom, 1845

Chrysur Dahlbom, 1845: 6. Type species: *Chrysis austriaca* Fabricius, 1804, by subsequent designation of Bodenstein 1939: 125.

Chrysur kashmirensis (Nurse, 1902)

(Figs 70A–70F)

Chrysis kashmirensis Nurse, 1902: 305. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 491; Kashmir (BMNH) (examined).

Chrysis kashmirensis: Kimsey & Bohart 1991: 491 (cat., Pakistan: Kashmir).

Material examined. 1 ♀, Syntype, Kashmir, 5–6000 ft, 5.01, Type, *Chrysis kashmirensis* (Nurse), Col. C.G. Nurse Collection 1920-72, B.M. Type 13.67, BMNH(E) #970975 (NHMUK); 1 ♀, same labels (HNHM).

Distribution. Kashmir.

Genus *Istiochrysis* Rosa & Xu in Rosa *et al.*, 2016c

Istiochrysis Rosa & Xu in Rosa *et al.* 2016c: 592. Type species: *Istiochrysis ziliolii* Rosa *et al.* 2016c. Original designation.

Istiochrysis ziliolii Rosa, Feng & Xu, in Rosa *et al.* 2016c

(Figs 71A–71E)

Istiochrysis ziliolii Rosa, Feng & Xu in Rosa *et al.*, 2016c: 596. Holotype ♂; China: Yunnan: Tengchong, Qushi (SCAU) (examined).

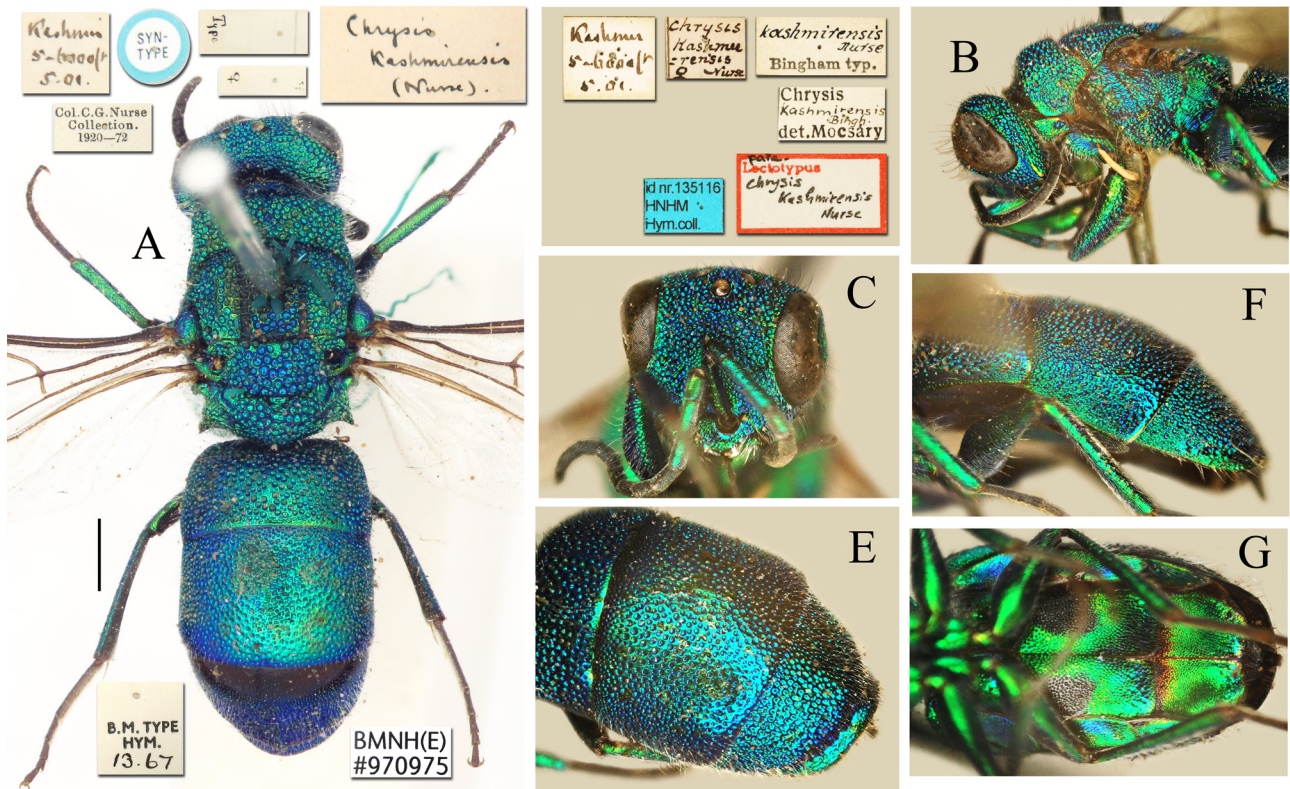


FIGURE 70. *Chrysura kashmirensis* (Nurse, 1902), lectotype, female. A. Habitus, dorsal view. (© The Trustees of the NH-MUK) Paralectotype female. B. Head, frontal view. C. Metasoma, dorso-lateral view. D. Head and mesosoma, lateral view. E. Metasoma, lateral view. F. Metasoma, ventral view. Scale bar 1.0 mm.

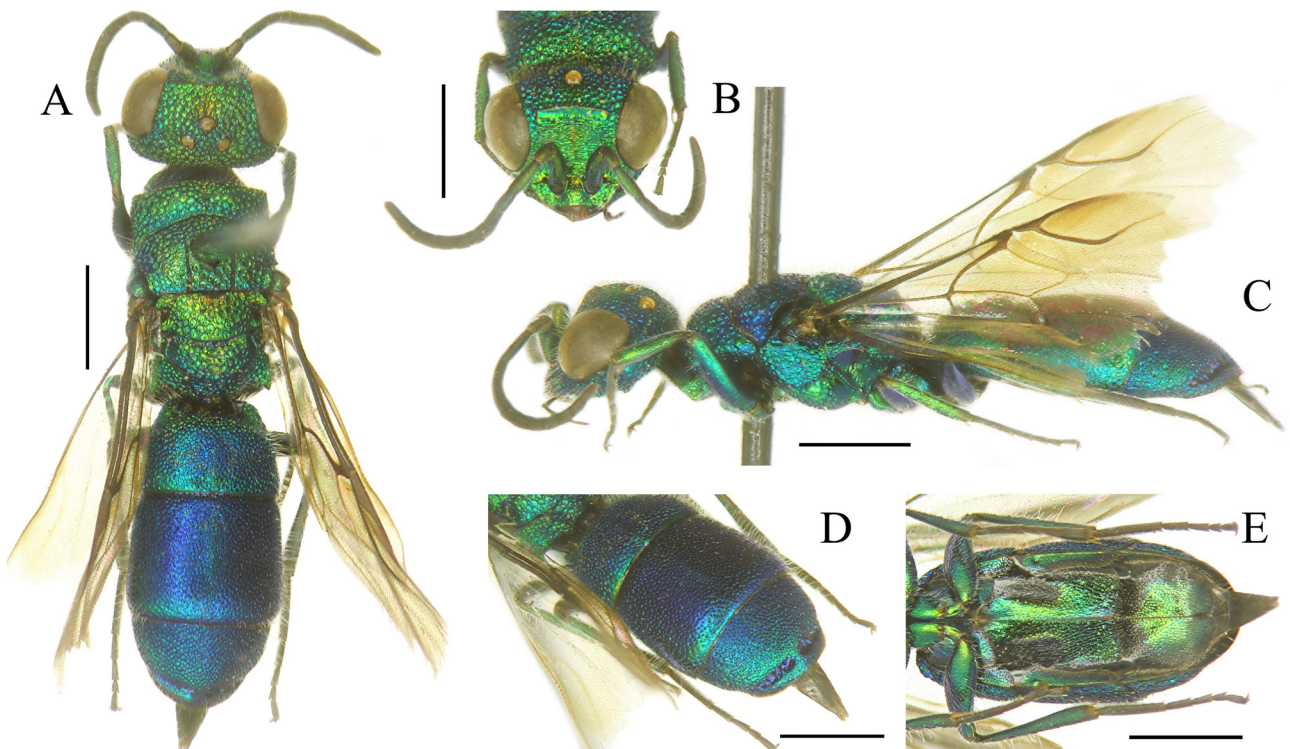


FIGURE 71. *Istiochrysis ziliolii* Rosa et al. 2016c, female from Uttarakhand. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, postero-lateral view. E. Metasoma, ventral view. Scale bars 1.0 mm.

Material examined. 2 ♂, 2 ♀, Uttarakhand, 30km NW Bageshwar, 2400m, 25.–30.vi.2003, leg. Kejval & Tryzna (PRC, MHC).

Distribution. *India (Uttarakhand); China (Yunnan) (Rosa *et al.* 2016c). The type locality in China is closely located to the bordering area between the Chinese Palaearctic and Oriental regions, which is actually not a line with a clear circumscription, but a transitional belt based on the distribution data several insectes and vertebrates (Chen *et al.* 2008).

Genus *Odontochrydium* Brauns, 1928

Odontochrydium Brauns, 1928: 389. Type species: *Odontochrydium trautmanni* Brauns, 1928 [= *Odontochrydium irregulare* (Mocsáry, 1914)]. Monotypic.

Odontochrydium xui Rosa, 2018

(Figs 72A–72D)

Odontochrydium xui Rosa, 2018: 451. Holotype ♀; Tamil Nadu: Nilgiri Hills, Paratype ♂, Tamil Nadu: Tiruchchirappalli (446 (key), 451–453 (descr.), 454 (fig. 8), 455 (fig. 9)) (NHMW) (examined); Rosa *et al.* 2020a: 105 (cat., typ., India: Nilgiri Hills Moyat Camp).

Material examined. 1 ♀, holotype, Tamil Nadu, Western Ghats, Nilgiri Hills, Moyat Camp, without collecting date (NHMW); 1 ♂, paratype, Tamil Nadu, Tiruchchirappalli, Pudukkottai, X.2000, leg. T. Nathan (GLAC).

Distribution. India (Tamil Nadu).

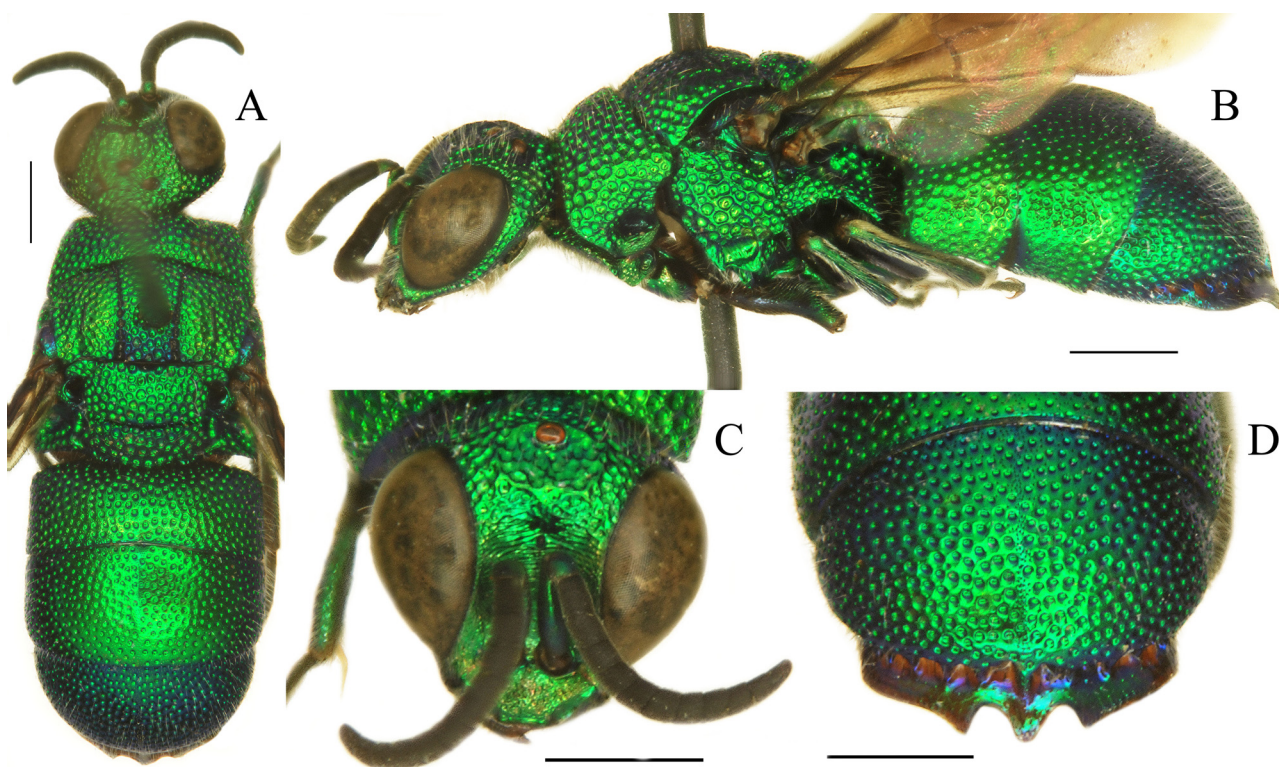


FIGURE 72. *Odontochrydium xui* Rosa, 2018, holotype, female. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, posterior view. Scale bars 1.0 mm.

Genus *Praestochrysis* Linsenmaier, 1959

Praestochrysis Linsenmaier, 1959: 164 (as subgenus of *Chrysis* Linnaeus, 1761). Type species: *Chrysis shanghaiensis* Smith, 1874. Original designation.

Praestochrysis amoenula (Mocsáry, 1899)

(Figs 73A–73E)

Chrysis (*Pentachrysis*) *amoenula* Mocsáry, 1899: 487. Holotype ♀; India: Maharashtra: Sangli (HNHM) (examined). Bischoff 1913: 62 (cat., India).

Chrysis amoenula: Bingham 1903: 439 (key), 481–482 (descr., India Orientalis).

Praestochrysis amoenula: Kimsey & Bohart 1991: 531 (cat., India).

Material examined. 1 ♀, Sangli, *amoenula* Mocs. typ. det. Mocsáry, Holotypus *Chrysis amoenula* ♀ Mocs. RMB, id nr. 135522 HNHM Hym.coll. (HNHM); 1 ♀, Maharashtra: Bombay [= Mumbai] (NHMW) (identified as *Chrysis libita* by du Buysson); 1 ♂, Tamil Nadu, Kilakarai [= Keelakarai] x.1935 (MNLU); 1 ♀, Tamil Nadu, Coimbatore, viii.1952 (MNLU).

Distribution. India (Maharashtra; Tamil Nadu; India Orientalis (locality not specified)).

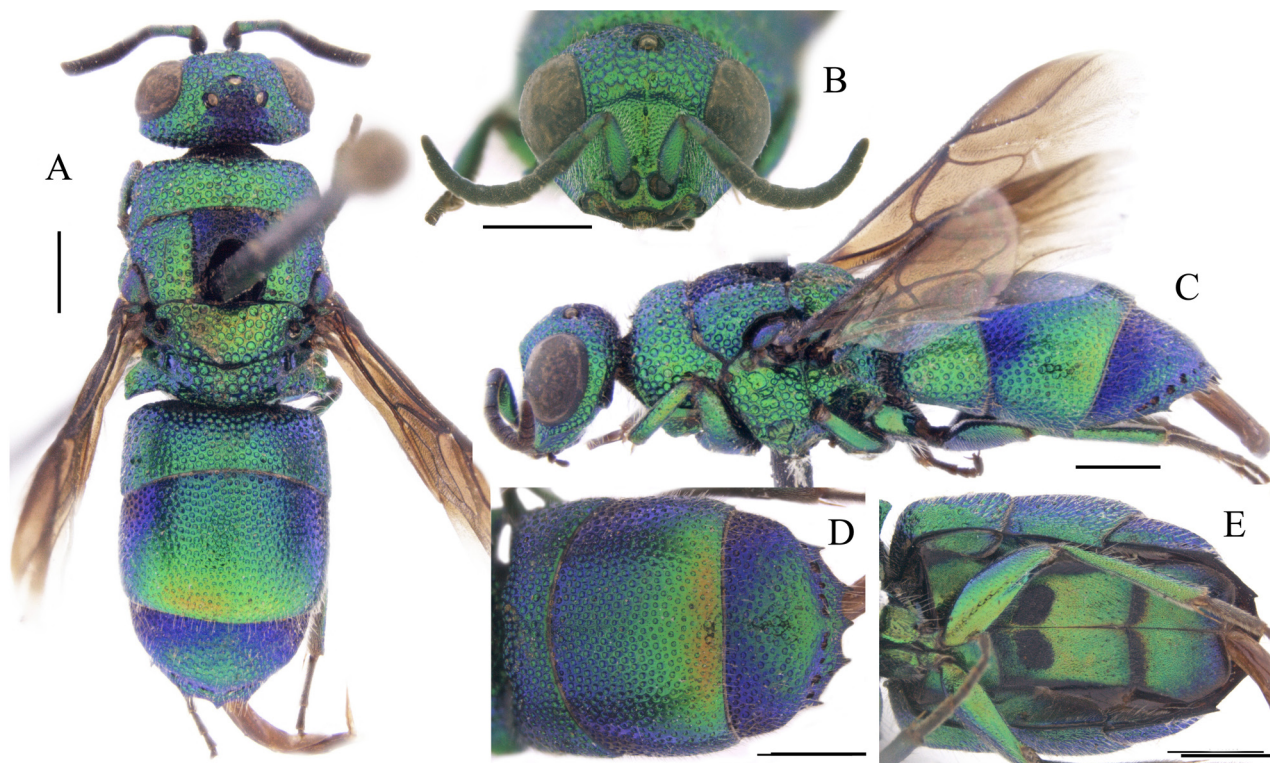


FIGURE 73. *Praestochrysis amoenula* (Mocsáry, 1899), female from Tamil Nadu. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorsal view. E. Metasoma, ventral view. Scale bars 1.0 mm.

Praestochrysis crassiscuta (Mocsáry, 1889)

Chrysis (*Pentachrysis*) *crassiscuta* Mocsáry, 1889: 524. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 531; India Orientalis (MHNG). du Buysson 1893: 251 (West Bengal: Calcutta [= Kolkata]).

Chrysis crassiscuta: Dalla Torre 1892: 52 (cat., Ind. or. [India orientalis]).

Chrysis (*quinquedentatae*) *crassiscuta*: du Buysson 1896b: 475 (key, Calcutta [= Kolkata], Indes orientales).

Praestochrysis crassiscuta: Kimsey & Bohart 1991: 531 (cat., India orientalis).

Material examined. 1 ♀, Maharashtra: Bombay [= Mumbai], 23.–28.x.1929 (MNLU).

Distribution. India (West Bengal; India Orientalis (locality not specified)). Indonesia (Sumatra), Malaysia, Thailand (Kimsey & Bohart 1991).

***Praestochrysis furcifera* (Bingham, 1903)**

(Figs 74A–74E)

Chrysis furcifera Bingham, 1903: 480. Holotype ♀ [not ♂]; Myanmar: Mandalay (HMNH) (examined).

Material examined. 1 ♀, Tamil Nadu, Coimbatore, without further data (NHMW).

Distribution. *India (Tamil Nadu); Myanmar.

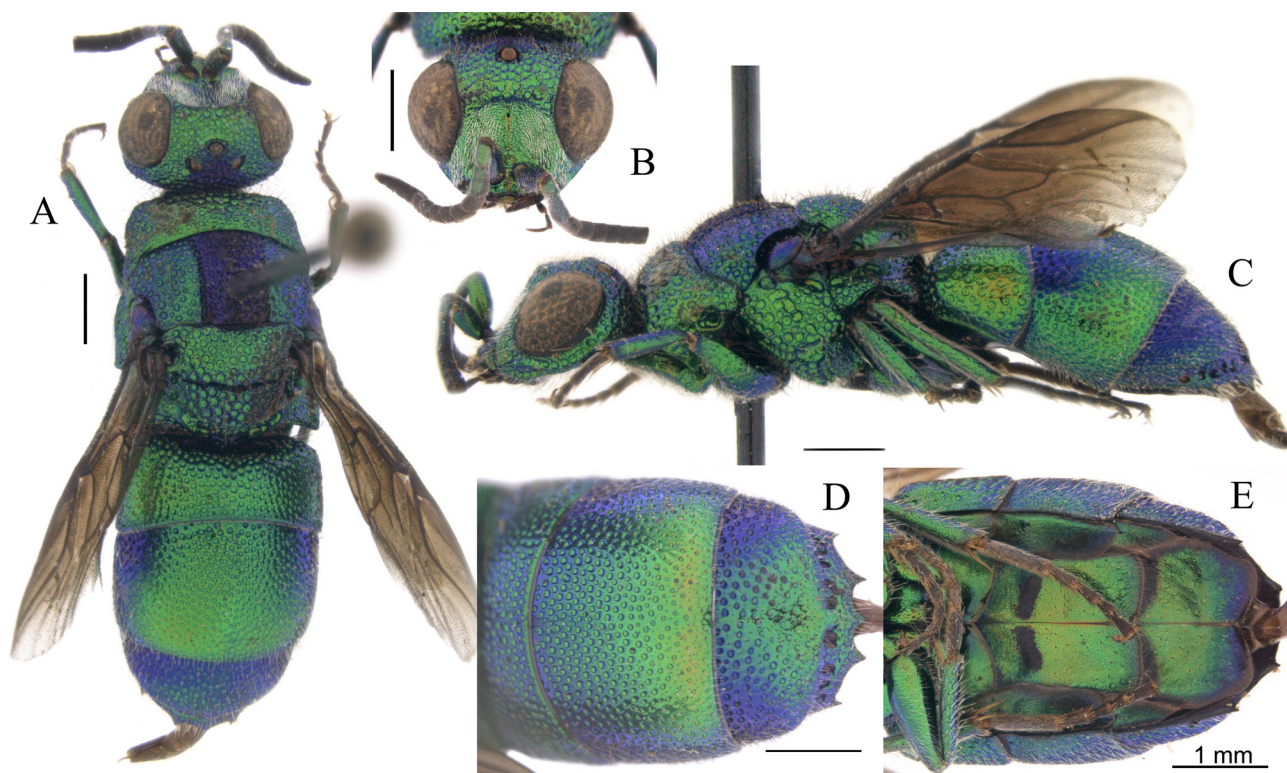


FIGURE 74. *Praestochrysis furcifera* (Bingham, 1903), female from Tamil Nadu. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorsal view. E. Metasoma, ventral view. Scale bars 1.0 mm.

***Praestochrysis libita* (du Buysson, 1896b)**

(Figs 75A–75E)

Chrysis libita du Buysson, 1896b: 476. Lectotype ♂ designated by Bohart in Kimsey & Bohart 1991: 533; India: Maharashtra: Bombay, Poona [= Pune] (475 (key), 476–477 (descr.), pl. III (fig. 6)) (MNHN) (examined). du Buysson 1898b: 536 (Tamil Nadu: Pondicherry); Bingham 1903: 438 (key), 478–479 (descr., Poona [= Pune]); Kimsey & Bohart 1991: 533 (cat., India).

Chrysis (*Pentachrysis*) *libita*: Bischoff 1913: 62 (cat., India: Bombay, Poona).

Material examined. 1 ♂, 4 ♀, Tamil Nadu, Coimbatore, without further data (NHMW).

Distribution. India (Maharashtra; Tamil Nadu).

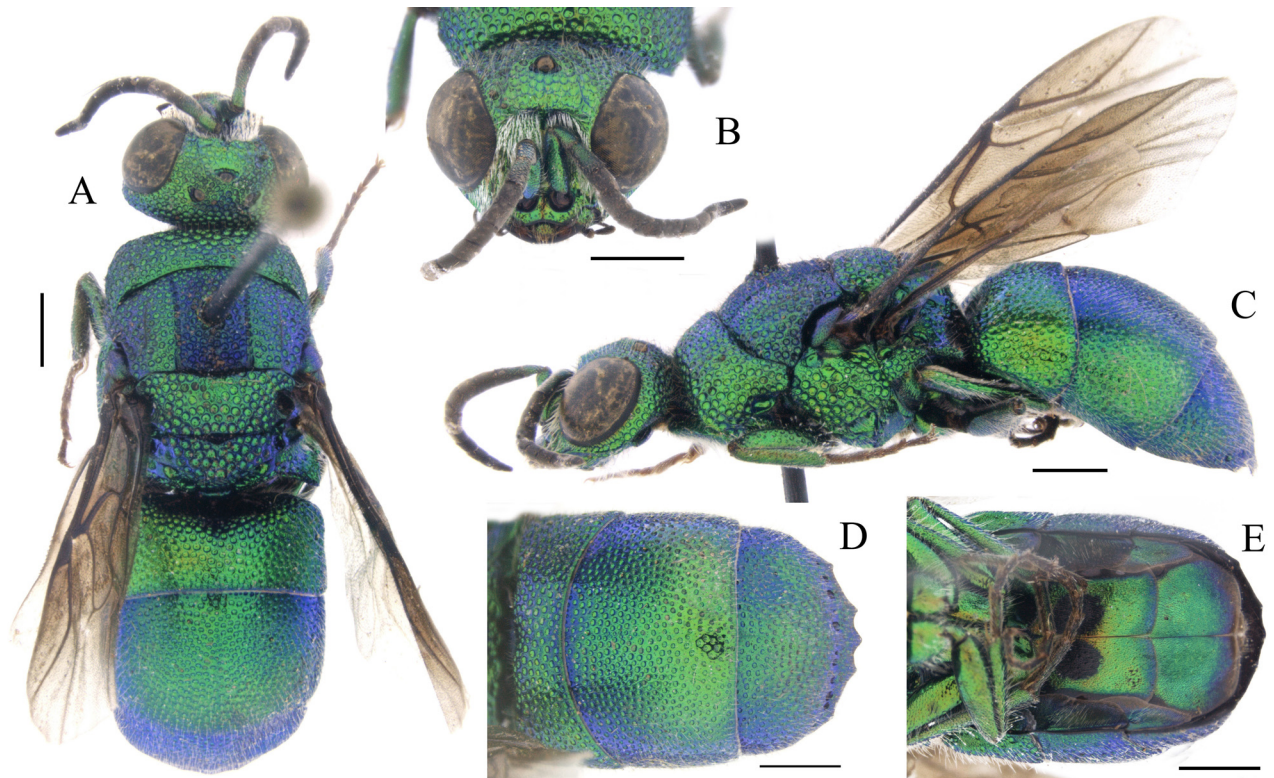


FIGURE 75. *Praestochrysis libita* (du Buysson, 1896), male from Tamil Nadu. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorsal view. E. Metasoma, ventral view. Scale bars 1.0 mm.

***Praestochrysis palawanensis* (Mocsáry, 1899)**

(Figs 76A–76F)

Chrysis (*Pentachrysis*) *Palawanensis* Mocsáry, 1899: 487. Holotype ♀; Philippine: Palawan Isl. (HMNH) (examined).

Chrysis (*Pentachrysis*) *binghami* Mocsáry, 1913: 6. Holotype ♀; India Orientalis (HNHM). Bischoff 1913: 62 (cat., India).

Praestochrysis palawanensis: Kimsey & Bohart 1991: 534 (cat., India); Strumia 1996: 61 (fig. 3d), 62 (descr., India: Karnataka: Karwar).

Distribution. India (Karnataka; India Orientalis (locality not specified)). Malaysia, Borneo (Sarawak) (Strumia 1996).

***Praestochrysis pradeshi* Strumia, 1996**

Praestochrysis pradeshi Strumia, 1996: 57. Holotype ♂; India: Telangana: Hyderabad/Patancheru (57–60 (descr.), 58 (fig. 1), 59 (fig. 2)) (NHMUK).

Distribution. India (Telangana).

***Praestochrysis shanghaiensis* (Smith, 1874)**

(Figs 77A–77E)

Chrysis shanghaiensis Smith, 1874: 460. Holotype ♀; China: Shanghai (NHMUK). Bingham 1903: 438 (key), 477 (descr., Himalaya; Bengal), 477 (fig. 158).

Praestochrysis shanghaiensis: Kimsey & Bohart 1991: 534 (cat., India).

Distribution. India (Himalayas; Bengal (locality not specified)); India to China and Korea (Kimsey & Bohart 1991).

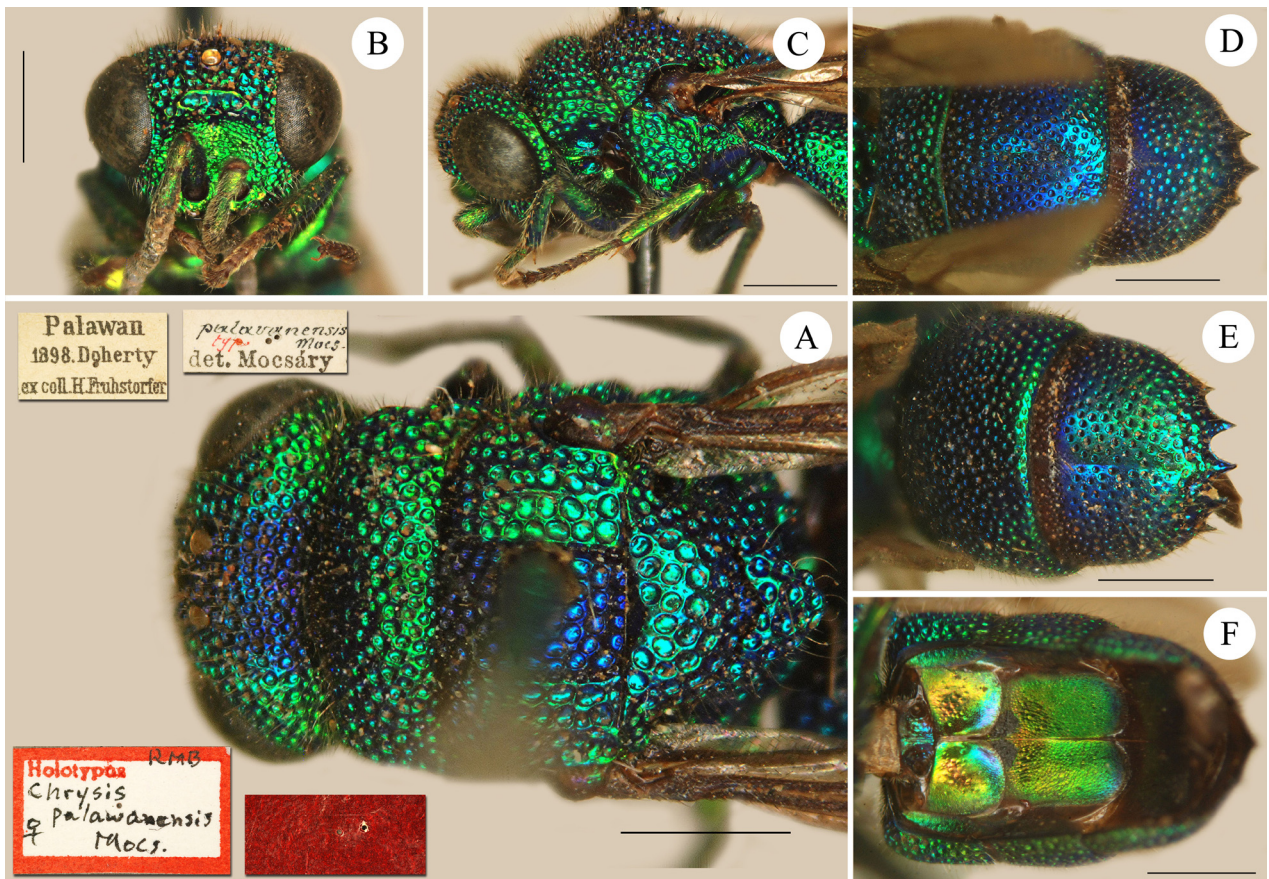


FIGURE 76. *Praestochrysis palawanensis* (Mocsáry, 1899), holotype, female. A. Head and mesosoma, dorsal view. B. Head, frontal view. C. Head and mesosoma, lateral view. D. Metasoma, dorsal view. E. Metasoma, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

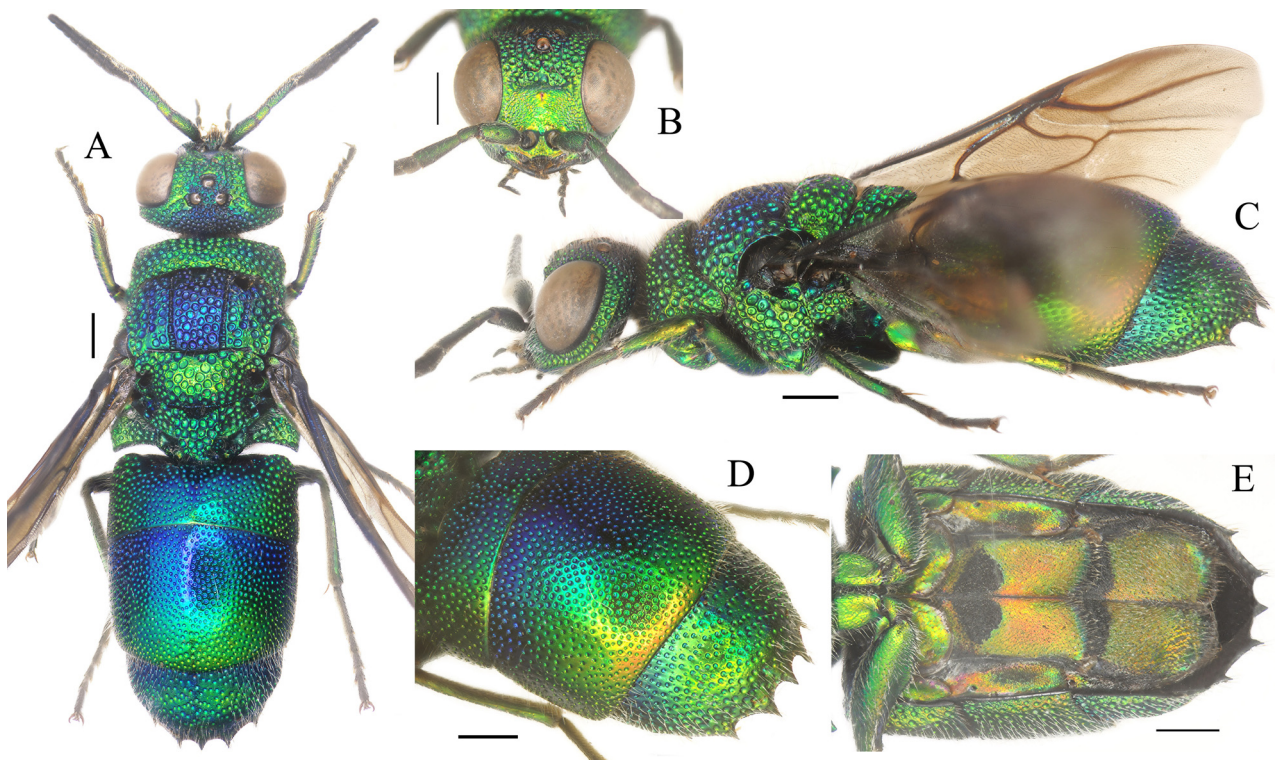


FIGURE 77. *Praestochrysis shanghaiensis* (Smith, 1874), female from Japan. A. Habitus, dorsal view. B. Head, frontal view. C. Habitus, lateral view. D. Metasoma, dorso-lateral view. E. Metasoma, ventral view. Scale bars 1.0 mm.

Genus *Primeuchroeus* Linsenmaier, 1968

Primeuchroeus Linsenmaier, 1968: 38 (as subgenus of *Euchroeus* Latreille, 1809). Type species: *Chrysis papuana* Mocsáry, 1899: 484 [= *Primeuchroeus papuanus* (Linsenmaier, 1959)]. Original designation.

Primeuchroeus indiacus Bohart, 1988a

Primeuchroeus indiacus Bohart, 1988a: 26. Holotype ♀; India: Uttarakhand: Dehradun (21–24 (key), 26 (descr.)) (BME) (*siamensis* group). Kimsey & Bohart 1991: 542 (cat., India).

Distribution. India (Uttarakhand).

Primeuchroeus siamensis (Bischoff, 1910)

Chrysogona siamensis Bischoff, 1910: 451. Holotype ♀; Thailand: Muok-Lek (MfN) (examined).

Primeuchroeus siamensis: Kimsey & Bohart 1991: 543 (*siamensis* group).

Material examined. 1 ♀, Tamil Nadu, Nilgiri Hills, Kotagiri env., Elk falls, 11°23'N 76°52'E, 2.ii.1994, leg. Z. Kejval (PRC).

Distribution. *India (Tamil Nadu); Laos, Philippines, Thailand, Vietnam (Kimsey & Bohart 1991).

Remarks. Linsenmaier (1997) described the subgenus *Chrysidella* based on *Chrysogona siamensis*.

Genus *Stilbum* Spinola, 1806

Stilbum Spinola, 1806: 9. Type species: *Chrysis calens* Fabricius, 1781: 455 [= *Stilbum calens* (Fabricius, 1781)], by subsequent designation of Latreille, 1810: 437.

Stilbum cyanurum (Forster, 1771)

(Figs 78A–78B)

Chrysis cyanura Forster, 1771: 89. Holotype ♂; Spain (NHMUK).

Chrysis splendida Fabricius, 1775: Donovan 1800–1804: 115 (descr. Tamil Nadu: Tranquebar [= Tharangambadi]).

Stilbum cyanurum: Bingham 1903: 431 (key), 433–434 (descr., Sikkim [= Sikkim], the variety *amethystinum* is common and the true *Stilbum cyanurum* is not seen in India), 433 (fig. 151); Bingham 1908: 349 (Bihar: Purneah [= Purnia]); Suresh *et al.* 1999: 2 (Kerala: Parambikulam Wildlife Sanctuary), tab. 1; Mathew *et al.* 1998: 109 (Kerala: Silent Valley, Nelliampathy, Sholayar, Parambikulam); Mathew 2004: 219 (cat., Kerala); Anbalagan *et al.* 2015: 102 (cat., Tamil Nadu); Tamil Nadu Thirupathisaram, Kanyakumari District).

Stilbum splendidum: du Buysson 1896b: 478 (West Bengal: Calcutta [= Kolkata]; Maharashtra: Poona [= Pune]; Gujarat: Surat, S Guzerat [= S Gujarat]; Chhattisgarh: Raipur; Tamil Nadu: Pondichery; Karnataka: Mysore), pl. III (figs 11, 12), pl. V (fig. 8).

Stilbum splendidum var. *Lereillei* (sic) du Buysson, 1896a: 678. Syntypes, India: Maharashtra: Bombay [= Mumbai] (MNHN). Emended into *leveillei* by Kimsey & Bohart 1991: 567.

Stilbum cyanurum splendidum Spinola: Jonathan *et al.* 1977: 87 (India).

Stilbum sp. (*superbum*): Thakkar & Parikh 2018: 23 (cat., Gujarat).

Material examined. 1 ♂, Maharashtra: Bombay [= Mumbai], 23–28.x.1929; 1 ♂, Maharastra, 6mi. E Bhandara, 200m, 30.Ii.1962, leg. E.S. Ross & D.Q. Cavagnaro; 1 ♀, Tamil Nadu, Pennadam, 1932; 1 ♀, Tamil Nadu, Settipatti, 17.v.1974, leg. W. Perraudin; 1 ♀, idem, 16.v.1975; 1 ♀, idem, 18.viii.1975; 1 ♀, idem, 21.viii.1975; 1 ♀, idem, 30.viii.1975; 5 ♂, 1 ♀, idem, 17.–18.x.1975; 1 ♀, idem, 19.x.1975; 1 ♀, idem, 2.vi.1976; 1 ♀, Tamil Nadu, Omalur, Settipatti, 9.x.1975, leg. W. Perraudin; 1 ♀, idem, 10.x.1975; 1 ♀, idem, 18.xi.1975; 1 ♀, idem, 3.xii.1975; 1 ♀, idem, 22.ii.1976; 1 ♀, idem, 29.iii.1976; 4 ♀, idem, iii.1978; 1 ♀, Tamil Nadu, Nagercoil, 50ft, 26.iii.1962, leg. E.S. Ross & D.Q. Cavagnaro; 1 ♀, Tamil Nadu, Coimbatore, ix.1971 (PRC); 2 ♀, Pondicherry, Karaikal, ii.1983, leg. Nathan (PRC); 1 ♀, idem, xi.1987, leg. Nathan (PRC); 1 ♀, idem, x.1980 (PRC); 1 ♀, Tamil Nadu, Tanjore [= Thanjavur], 21.iv.1938, leg. D.Y. Nedung; 1 ♀, Uttar Pradesh, Agra, 6.–8.xi.1929; 1 ♀, Tamil Nadu, Pudukkottai,

x.1984, leg. Nathan (PRC); all examined specimens are deposited at MNLU.

Distribution. India (Bihar; Chhattisgarh; Gujarat; Karnataka; Kerala; Maharashtra; Sikkim; Tamil Nadu; Uttar Pradesh; West Bengal). Subcosmopolitan: Afrotropical, Australian, Oriental, Palearctic, in tropics and warm temperate areas (Kimsey & Bohart 1991).

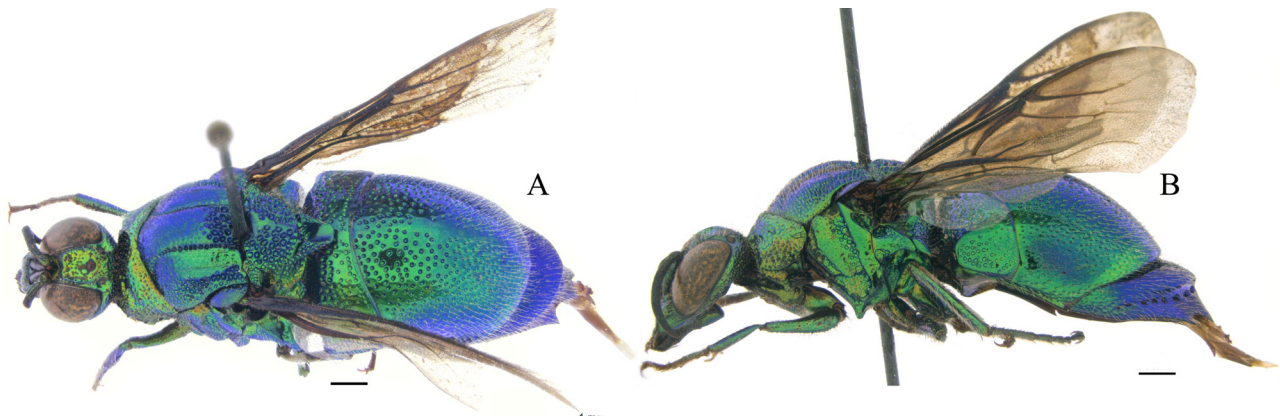


FIGURE 78. *Stilbum cyanurum* (Forster, 1771), female. A. Habitus, dorsal view. B. Habitus, lateral view. Scale bars 1.0 mm.

Genus *Trichrysis* Lichtenstein, 1876

Trichrysis Lichtenstein, 1876: 27 (as subgenus of *Chrysis* Linnaeus, 1761). Type species: *Sphex cyanea* Linnaeus, 1758: 572 [= *Trichrysis cyanea* (Linnaeus, 1758)]. Monotypic.

Trichrysis excisifrons (Mocsáry, 1912a)

(Figs 79A–79F)

Chrysis (Trichrysis) excisifrons Mocsáry, 1912a: 379. Holotype ♀; India: Sikkim (HNHM). Bischoff 1913: 45 (cat., India).
Trichrysis excisifrons: Kimsey & Bohart 1991: 572 (cat., North India).

Distribution. India (Sikkim); Nepal (Kimsey & Bohart 1991).

Trichrysis imperiosa (Smith, 1874)

(Figs 80A–80F)

Chrysis imperiosus Smith, 1874: 460. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 533; Australia: Queensland, Moreton Bay (NHMUK).

Chrysis imperiosa: du Buysson 1898a: 142 (Hindustan [= India]: Karnataka: Kanara; Maharashtra: Poona [= Pune]); Bingham 1903: 438 (key), 479–480 (descr., Sikkim [= Sikkim]; West Bengal: Barrakpore), 479 (fig. 159), pl. I (fig. 13).

Chrysis (Pentachrysis) imperiosa: Bischoff 1910: 486 (cat., Assam, West Bengal: Darjeeling).

Chrysis (Trichrysis) imperiosa: Roy & Kundu 1985: 227 (Arunachal Pradesh: Namdhapa [= Namdapha]).

Praestochrysis imperiosa: Strumia 1996: 62 (India, descr.), 61 (fig. 3).

Material examined: 2 ♀, Meghalaya, Khasia Hills, without further data (ETHZ); 1 ♀, Kerala, Travancore, v.1935 (MNLU); 1 ♀, Kerala, Quilon, Thenmala, leg. Nathan, without further data (PRC).

Distribution. India (Assam; Karnataka; Kerala; Maharashtra; Meghalaya; Sikkim; West Bengal; Arunachal Pradesh); China (Taiwan, Hunan, Guangdong, Hainan) (Rosa *et al.* 2016a); Australia, Myanmar, Sri Lanka (Bingham 1903); Vietnam (Kimsey & Bohart 1991); Indonesia, Nepal, Papua New Guinea, Thailand (Rosa *et al.* 2016a).

Remarks. Several species are currently found under the name *Trichrysis imperiosa* (B. Wiśniowski, *in litteris*). The Indian species should belong to *Trichrysis cupreidorsus* (Tsuneki, 1963) (holotype from Thailand), which was synonymized by Kimsey & Bohart (1991: 533) with *Praestochrysis lusca* (Fabricius, 1804), without type examination. Also, the Chinese specimens identified as *T. imperiosa* from Guandong (Rosa *et al.* 2016a) should belong to a different species.

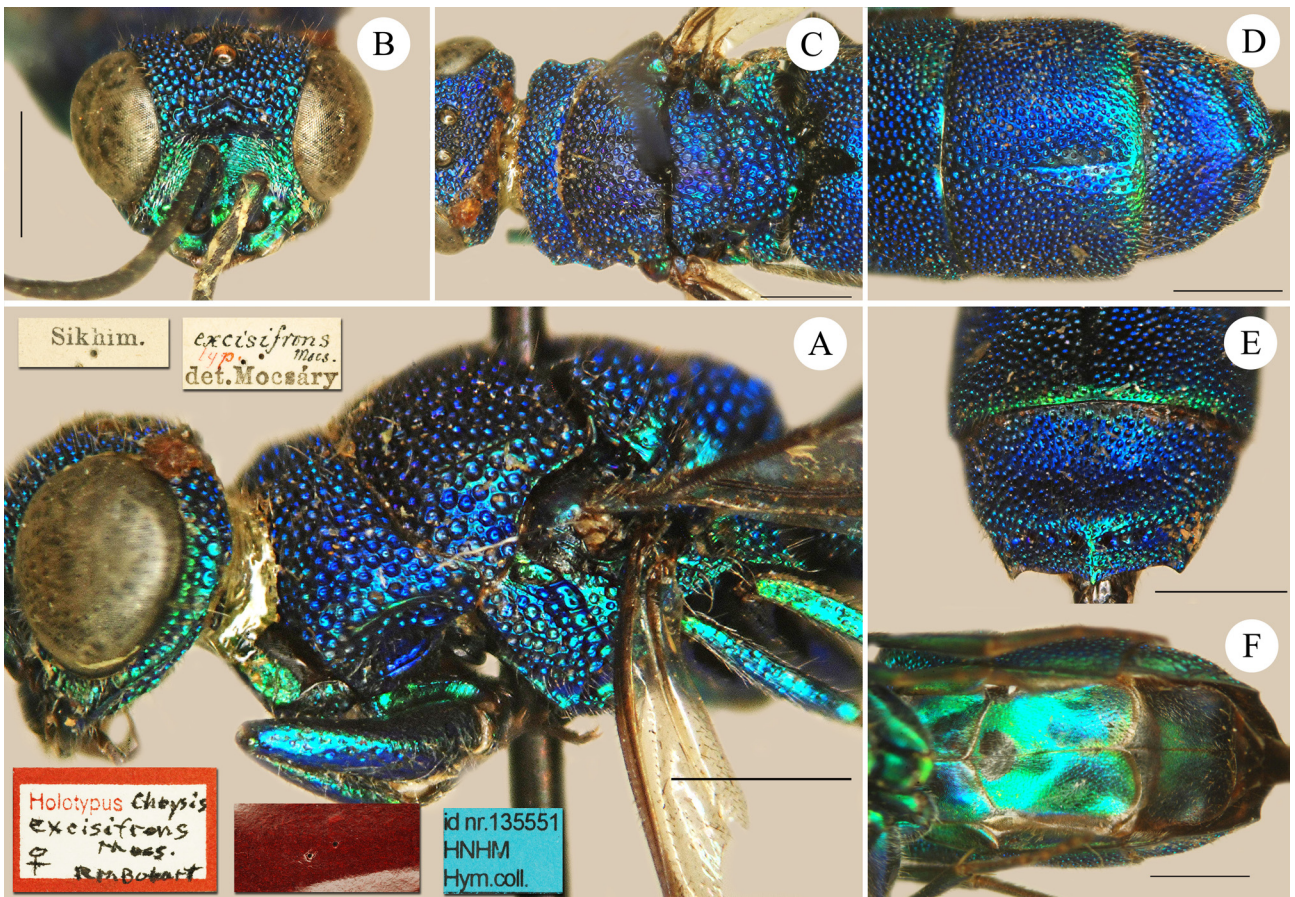


FIGURE 79. *Trichrysis excisifrons* (Mocsary 1912), holotype, female. A. Mesosoma, lateral view. B. Head, frontal view. C. Mesosoma, dorsal view. D. Metasoma, dorsal view. E. Third tergum, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

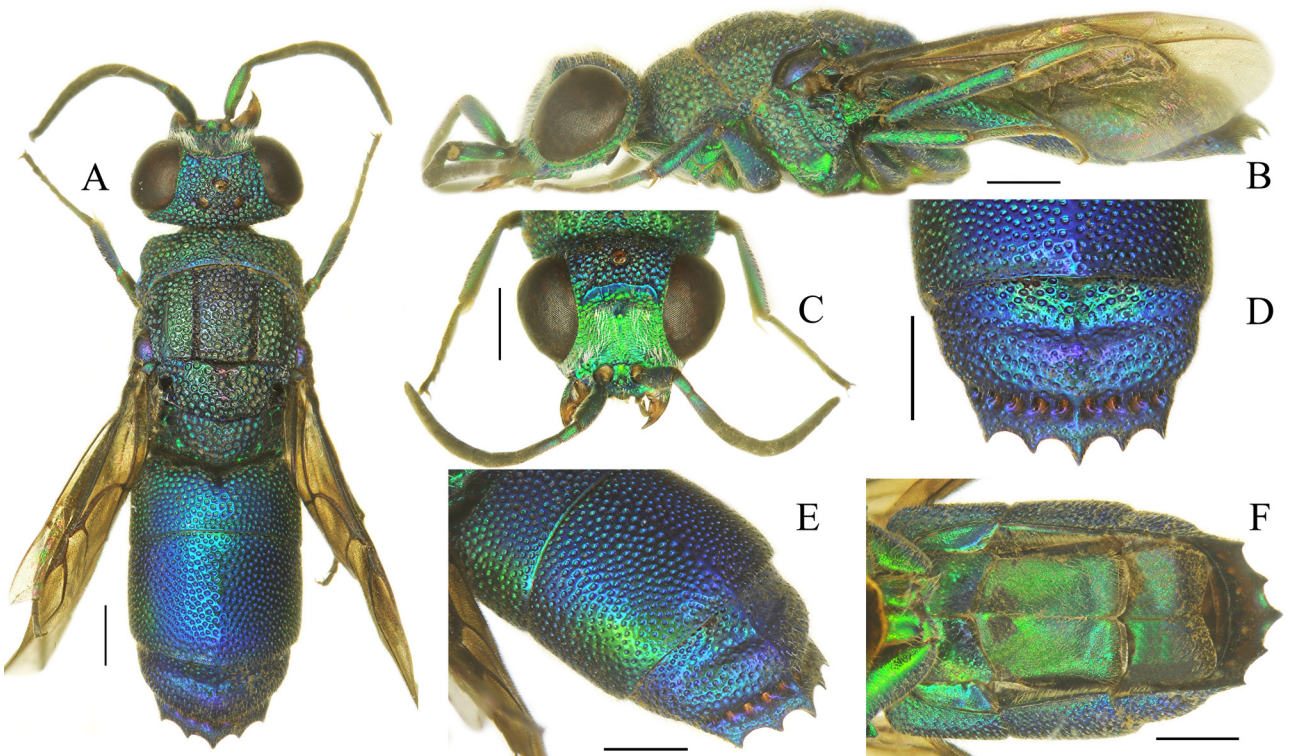


FIGURE 80. *Trichrysis imperiosa* (Smith, 1874), female from Kerala. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Third tergum, posterior view. E. Metasoma, postero-lateral view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Trichrysis lanka* (Bingham, 1903)**

(Figs 81A–81F)

Chrysis lanka Bingham, 1903: 451. Holotype ♀; Sri Lanka: Peradeniya (NHMUK).

Trichrysis lanka: Bohart 1988b: 348 (key, cat., South India); Kimsey & Bohart 1991: 572 (cat., South India).

Material examined. 1 ♀, Tamil Nadu, Coimbatore, x.1958 (MNLU).

Distribution. India (Tamil Nadu). Sri Lanka (Bingham 1903).

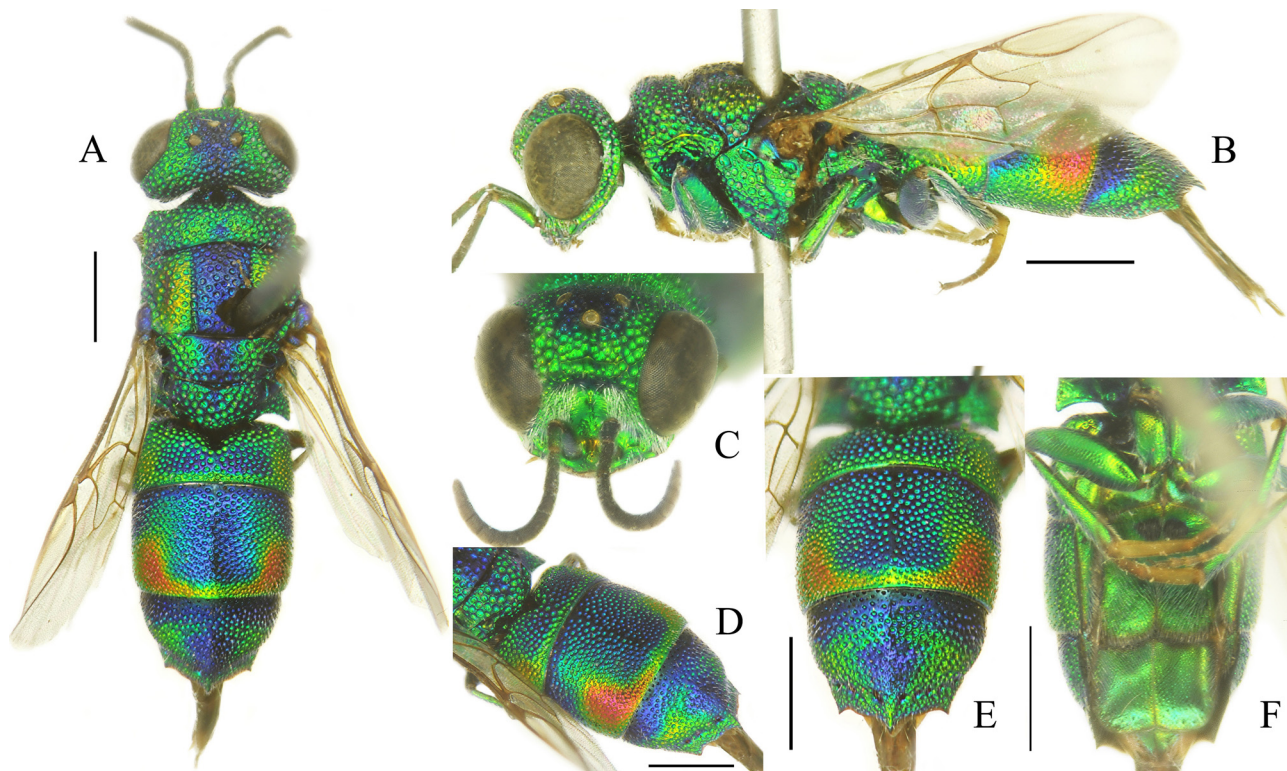


FIGURE 81. *Trichrysis lanka* (Bingham, 1903), female from Tamil Nadu. A. Habitus, dorsal view. B. Habitus, lateral view. C. Head, frontal view. D. Metasoma, postero-lateral view. E. Metasoma, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

***Trichrysis lusca* (Fabricius, 1804)**

(Figs 82A–82D)

Chrysis lusca Fabricius, 1804: 171. Holotype ♀; Italy (accidentally introduced) (ZMUC) (examined). du Buysson 1896: 475 (key), 476 (Central provinces; Chhattisgarh: Raipur; Karnataka: Bangalore [= Bengaluru], Rajabrampoor, Mysore; Tamil Nadu: Pondicherry); Dalla Torre 1892: 76 (cat., India); du Buysson 1898b: 76 (Hindoustan [= India]: North Konkan); du Buysson 1900: 153 (Balasore [= Baleshwar]); Bingham 1903: 439 (key), 484 (descr., throughout India); Bingham 1908: 349 (West Bengal: Murshidabad, it occurs throughout India); Jonathan *et al.* 1977: 87 (India: Arunachal Pradesh); Thakkar & Parikh 2018: 22 (cat., Gujarat).

Chrysis (*Pentachrysis*) *lusca*: Mocsáry 1889: 527–528 (descr., India orientalis, Rajarampore, Neelgherries, Tamil Nadu: Pondicherry, Tranquebar [= Tharangambadi]); Bischoff 1913: 62 (cat., India).

Praestochrysis lusca: Kimsey & Bohart 1991: 533 (cat., India).

Chrysis bengalensis Mocsáry, 1889: 527. Holotype ♀; India Orientalis, Maharashtra: Bombay (HNHM). Dalla Torre 1892: 47 (cat., India); Bingham 1903: 439 (key), 482–483 (descr., Maharashtra: Bombay, Madras [= Chennai]); Bingham 1908: 349 (Bihar: Purneah [= Purnia]).

Chrysis (*Pentachrysis*) *bengalensis*: Bischoff 1913: 62 (cat., India).

Trichrysis lusca: Suresh *et al.* 1999: 2 (Kerala: Parambikulam Wildlife Sanctuary) (tab.1); Mathew 2004: 219 (cat., Kerala).

Material examined. 1 ♀, Bombay leg. Stockinger, 755-1, Bengalensis Mocs. typ. det. Mocsáry *Chrysis lusca* F. Linsenmaier det. 62, Holotypus *Chrysis bengalensis* ♀ Mocs. RMB, id nr. 135510 HNHM Hym.coll. (HNHM); 2 ♀,

Karikal, Malabar, without further data (NHMW); 1 ♀, Kerala, Thenmala, v.1985, leg. Nathan (PRC); 12 ♀, Tamil Nadu, Coimbatore, without further data (NHMW); 1 ♀, Tamil Nadu, Coimbatore, viii.1932, leg. Nathan (MNLU); 1 ♀, Tamil Nadu, Kurumbagaram, 22.ix.1951, leg. S. Nathan (MNLU); 3 ♀, idem, ix.1951 (MNLU); 1 ♀, Tamil Nadu, Settipatti, 13.vi.1975, leg. W. Perraudin (MNLU); 1 ♀, idem, 16.vi.1975 (MNLU); 1 ♀, idem, 3.vii.1976 (MNLU); 3 ♀, idem, xi.1979 (MNLU); 1 ♀, Tamil Nadu, Omalur, Salem, Settipatti, 14.x.1975, leg. W. Perraudin (MNLU); 1 ♀, idem, 5.xi.1975 (MNLU); 1 ♀, idem, 29.xi.1975 (MNLU); 4 ♀, idem, iii.1978 (MNLU).

Distribution. India (Bihar; Chhattisgarh; Karnataka; Kerala; Maharashtra; Odisha; Puducherry, Tamil Nadu; West Bengal; Rajarampore; Nilgiris); China (Hubei, Hunan, Taiwan, Fujian, Guangdong, Macao, Hainan, Guizhou, Yunnan) (Rosa *et al.* 2016a); Australia, Japan, Korea, Madagascar, Myanmar, Philippines, Thailand (Kimsey & Bohart 1991); Bangladesh, Cambodia, Indonesia, Malaysia, Myanmar (Jonathan *et al.* 1977), Sri Lanka, Vietnam (Rosa *et al.* 2016a). Afrotropical: Mauritius and Réunion (Azevedo *et al.* 2010).

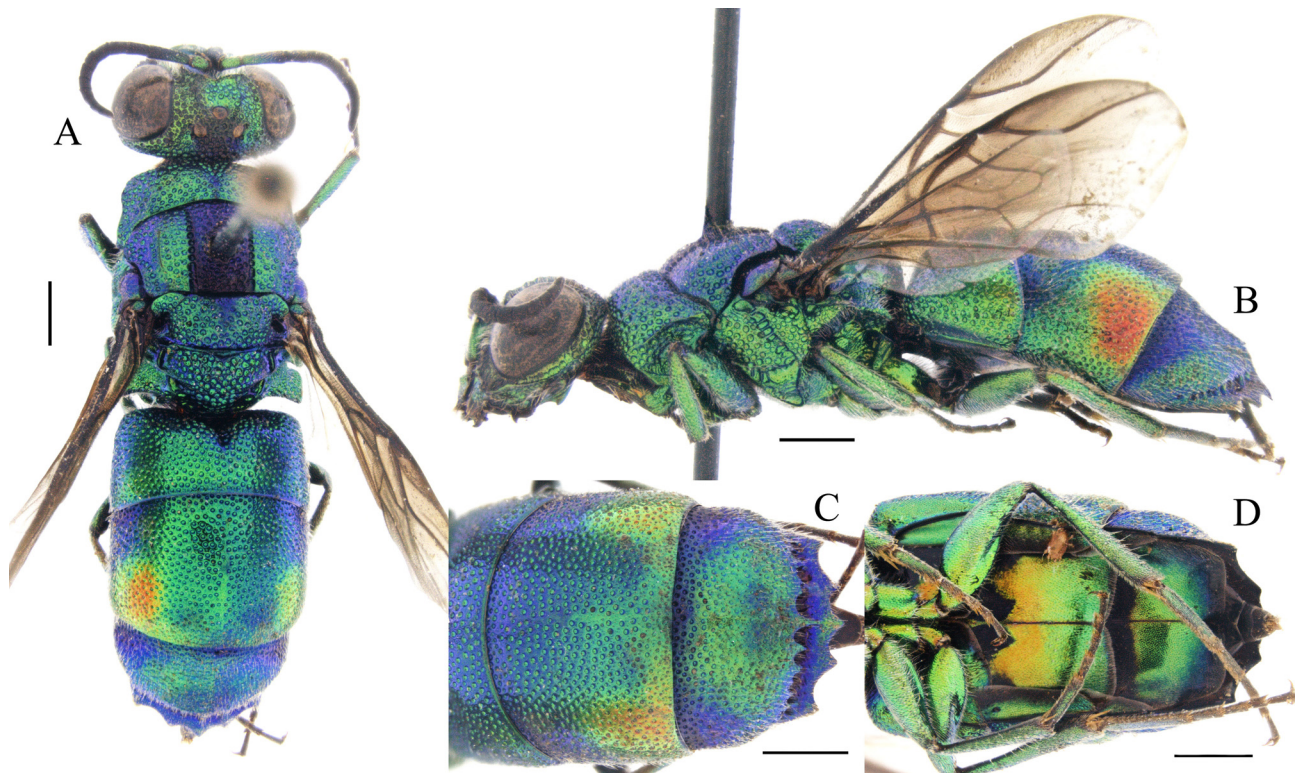


FIGURE 82. *Trichrysis lusca* (Fabricius, 1804), female from Tamil Nadu. A. Habitus, dorsal view. B. Habitus, lateral view. C. Metasoma, posterior view. D. Metasoma, ventral view. Scale bars 1.0 mm.

***Trichrysis mendicalis* (Cameron, 1897)**

(Figs 83A–83F)

Chrysis mendicalis Cameron, 1897: 4. Holotype ♀; India: West Bengal: Barrackpore (HECO). Bingham 1903: 436 (key), 451 (descr., Barrackpore); Bingham 1908: 347 (Bihar: Purneah).

Chrysis (Trichrysis) mendicalis: Bischoff 1913: 45 (cat., India).

Chrysis (Pentachrysis) mendicalis: Bischoff 1913: 63 (cat., in error, India).

Trichrysis mendicalis: Kimsey & Bohart 1991: 573 (cat., India).

Distribution. India (Bihar, West Bengal).

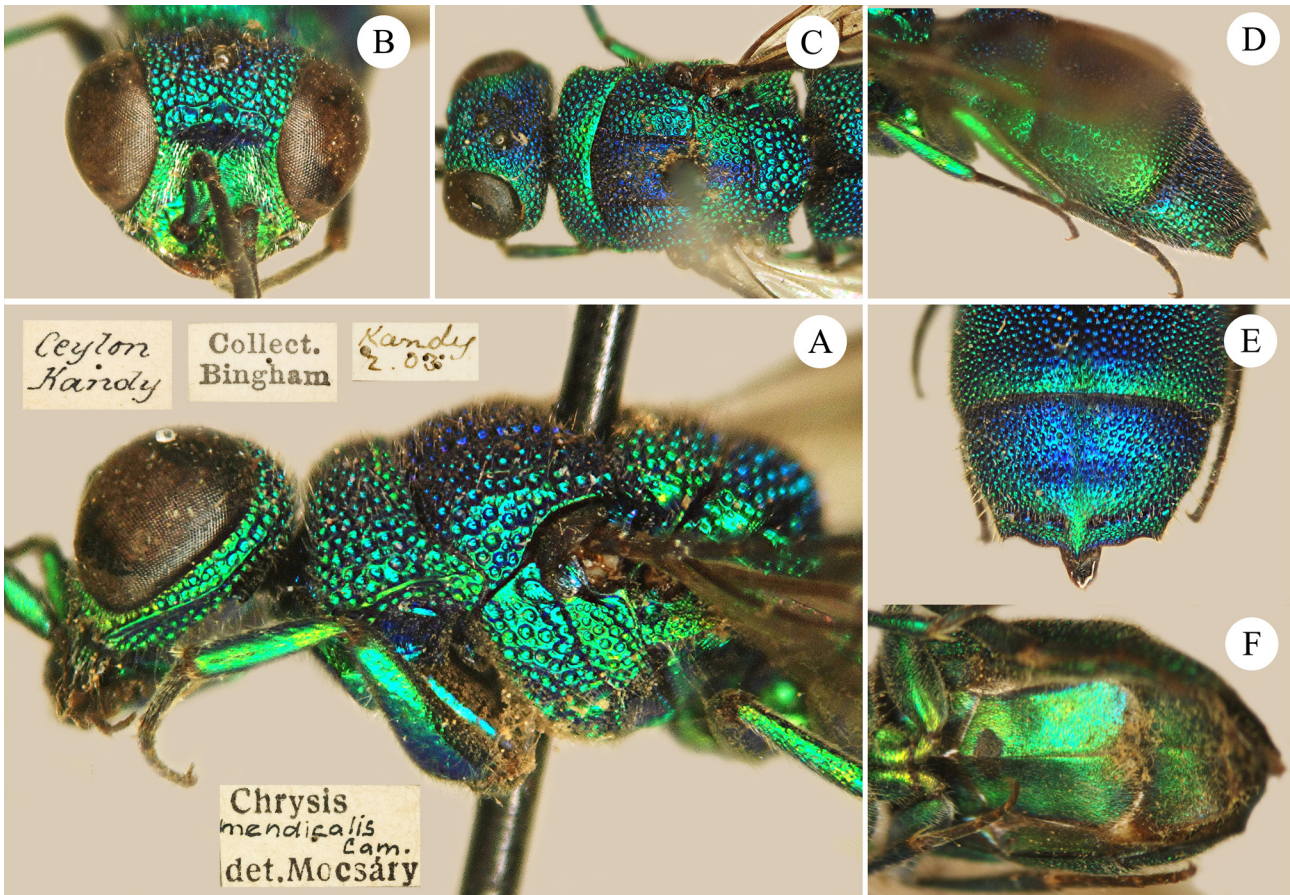


FIGURE 83. *Trichrysis mendicalis* (Cameron, 1897), female from Sri Lanka. A. Head and mesosoma, lateral view. B. Head, frontal view. C. Head and mesosoma, dorsal view. D. Metasoma, lateral view. E. Third tergum, posterior view. F. Metasoma, ventral view.

***Trichrysis tonkinensis* (Mocsáry, 1914)**
(Figs 84A–84F)

Chrysis (Trichrysis) tonkinensis Mocsáry, 1914: 25. Holotype ♀ [not ♂]; Vietnam: Tonkin (HNHM) (examined).
Trichrysis tonkinensis: Rosa *et al.* 2016a: 126 (diagn., Karaikal, Nedungadu X.1932, figs 61–66), 127 (descr., distr.).

Distribution. India (Puducherry). China (Fujian, Yunnan); Vietnam; Philippines; Indonesia, Malaysia (Rosa *et al.* 2016a).

***Trichrysis triacantha* (Mocsáry, 1889)**
(Figs 85A–85F)

Chrysis (Trichrysis) triacantha Mocsáry, 1889: 325. Syntypes ♀; Indonesia: Sumatra (NHMW) (examined). du Buysson 1893: 247 (Calcutta [= Kolkata]); Bischoff 1913: 46 (cat., India).
Chrysis triacantha Mocsáry: du Buysson 1896b: 471 (key, Calcutta [= Kolkata]); Bingham 1903: 436 (key), 453 (descr., Calcutta [= Kolkata]), 453 (fig. 154); Bingham 1908: 348 (Bihar: Purneah [= Purnia], West Bengal: Calcutta [= Kolkata]); Jonathan *et al.* 1977: 86 (India: Orissa [= Odisha], West Bengal: Calcutta [= Kolkata], Sri Lanka extending to the Malayan subregion).

Distribution. India (Bihar; West Bengal); China (Fujian, Taiwan, Guangdong, Hong Kong, Hainan, Yunnan) (Rosa *et al.* 2016a). Widely distributed in the Oriental Region (Kimsey & Bohart 1991).

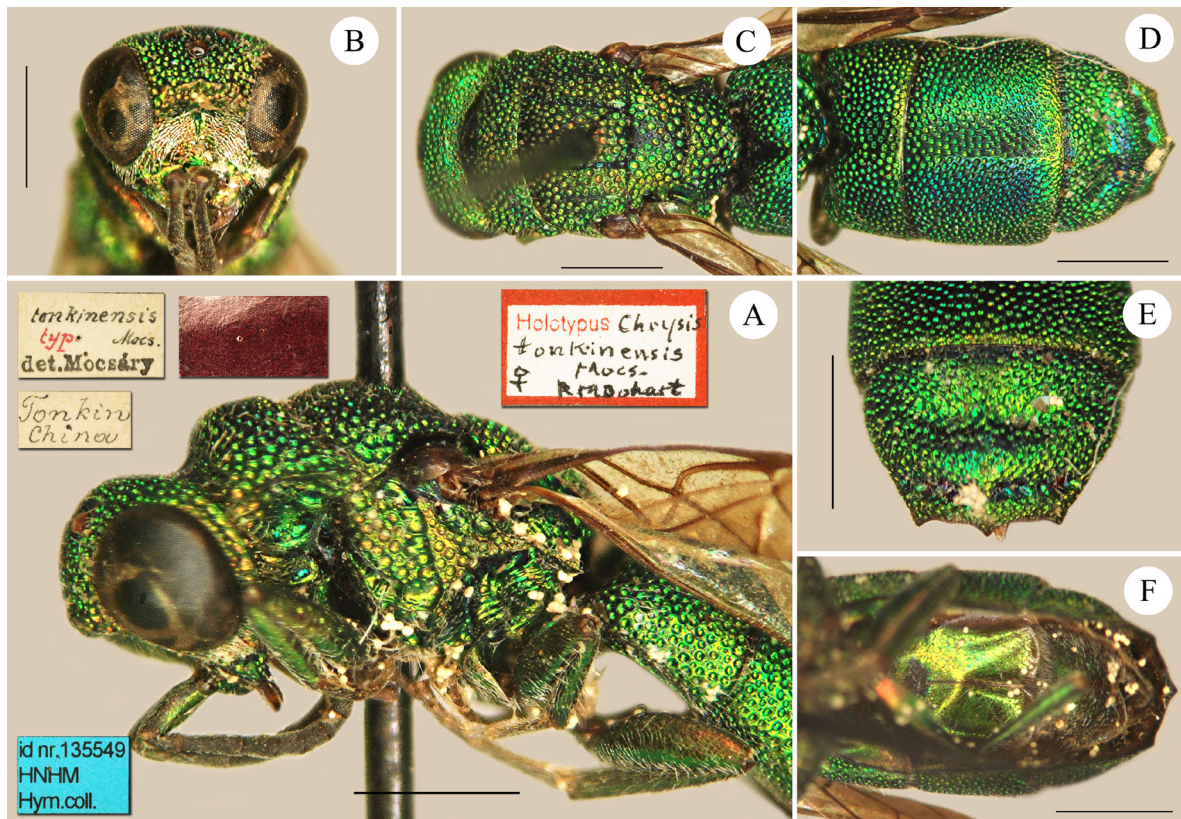


FIGURE 84. *Trichrysis tonkinensis* (Mocsáry, 1914), holotype, female. A. Mesosoma, lateral view. B. Head, frontal view. C. Mesosoma, dorsal view. D. Metasoma, dorsal view. E. Third tergum, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

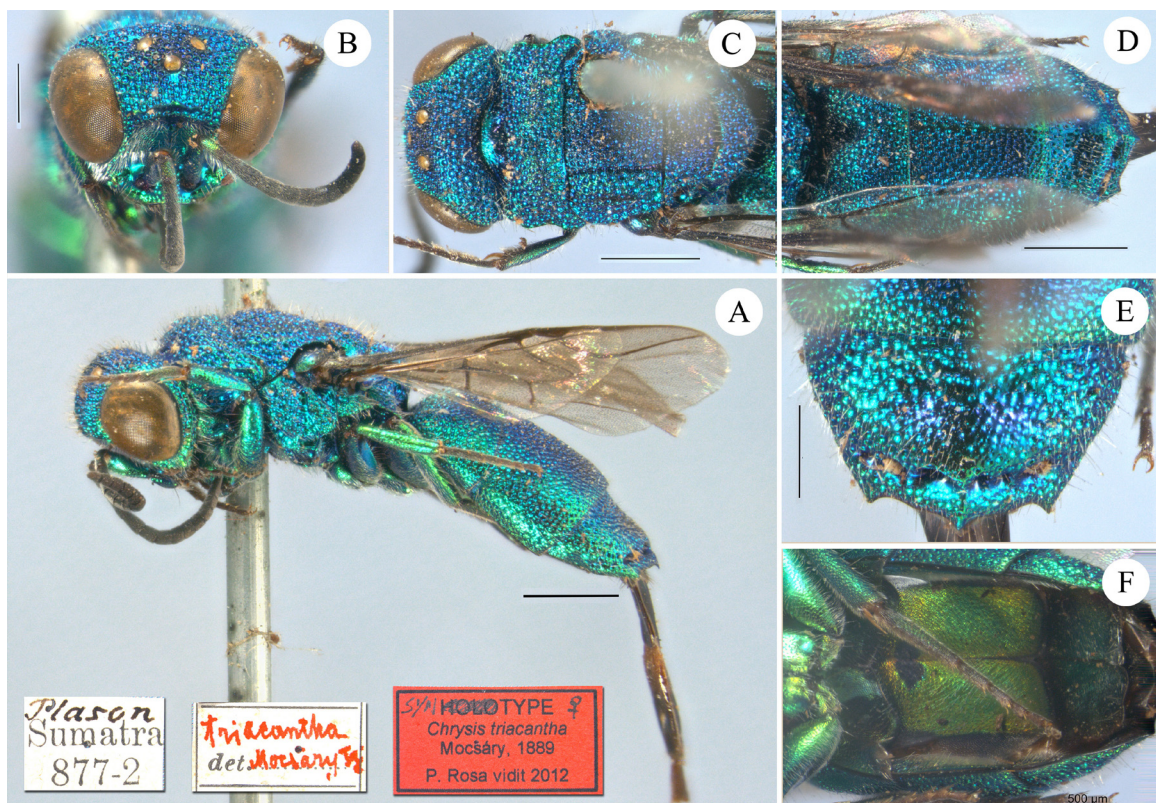


FIGURE 85. *Trichrysis triacantha* (Mocsáry, 1889), lectotype, female. A. Habitus, lateral view. B. Head, frontal view. C. Mesosoma, dorsal view. D. Metasoma, dorsal view. E. Third tergum, posterior view. F. Metasoma, ventral view. Scale bars 1.0 mm.

Tribe Parnopini

Genus *Cephaloparnops* Bischoff, 1910

Cephaloparnops Bischoff, 1910: 435. Type species: *Parnopes elegans* Klug, 1845: table 45, fig. 1 [= *Cephaloparnops denticulatus* (Spinola, 1838)]. Monotypic.

Cephaloparnops oberthueri (du Buysson, 1904)

Parnopes Oberthuri du Buysson, 1904: 273. Holotype ♀; India: Karnataka: Maissoor, Silvapooro [= Silvepura] (MNHN).

Parnopes oberthuri: Bischoff 1913: 33 (cat., India).

Cephaloparnops oberthuri: Kimsey & Bohart 1991: 578 (cat., India).

Distribution. India (Karnataka).

Remarks. du Buysson (1904) clearly dedicated this species to R. Oberthür (“*Je dedie cette jolie Parnope à M. R. Oberthür*”). As the name is mentioned in the original description, the emendation of the name by du Buysson (1904: 273) is justified and the right spelling is *Chrysis oberthueri* du Buysson. Oberthür is a German family name.

Genus *Parnopes* Latreille, 1796

Parnopes Latreille, 1796: 126 (No species included). Latreille, 1802: 317. Type species: *Chrysis carnea* Fabricius 1775: 357 [= *Parnopes grandior* (Pallas, 1771)]. Monotypic.

Parnopes indicus Linsenmaier, 1968

(Fig. 86)

Parnopes indicus Linsenmaier, 1968: 124. Holotype ♂; India, without locality (NHMUK) (examined). Kimsey & Bohart 1991: 586 (cat., India).

Distribution. India (without precise locality).

Remarks. As already noticed by Linsenmaier (1968), *Parnopes indicus* is very likely a Palaearctic species, probably originated from Gujarat or Pakistan, still part of India at the time of the British collector T. R. Bell.

Parnopes viridis Brullé, 1846

(Figs 87A–87B)

Parnopes viridis Brullé, 1846: 13. Holotype ♂; India Orientalis: Tamil Nadu: Pondicherry (MNHN). Smith 1874: 453 (Tamil Nadu: Pondicherry); Mocsáry 1889: 610 (descr., Tamil Nadu: Pondicherry); Dalla Torre 1892: 112 (cat., India); du Buysson 1896b: 478 (West Bengal: Calcutta [= Kolkata]), pl. III (fig. 13), pl. IV (fig. 11), pl. V (fig. 9); Bingham 1903: 495–496 (descr., Tamil Nadu: Pondicherry; West Bengal: Calcutta [= Kolkata]; Sikkim; Gujarat: Deesa), 496 (fig. 161); Bischoff 1913: 33 (cat., India).

Euchroeus cupreiventris Cameron, 1902b: 423. Holotype ♀; India: Gujarat: Deesa (NHMUK) (examined). Bingham 1903: 495 (descr., Gujarat: Deesa).

Material examined. 1 ♀, Tamil Nadu, Coimbatore, without further data (NHMW); 1 ♀, Gujarat: Deesa 4.[18]99, Cameron Coll. 1909–182, *Euchroeus cupreiventris* Cam. Type Deesa, B.M. Type HYM. 13.164b, this is the type = ♀ *Parnopes* det. I.H.H. Yarrow. 1959, BMNH(E) #970941 (NHMUK).

Distribution. India (Gujarat; Sikkim; Tamil Nadu; West Bengal).

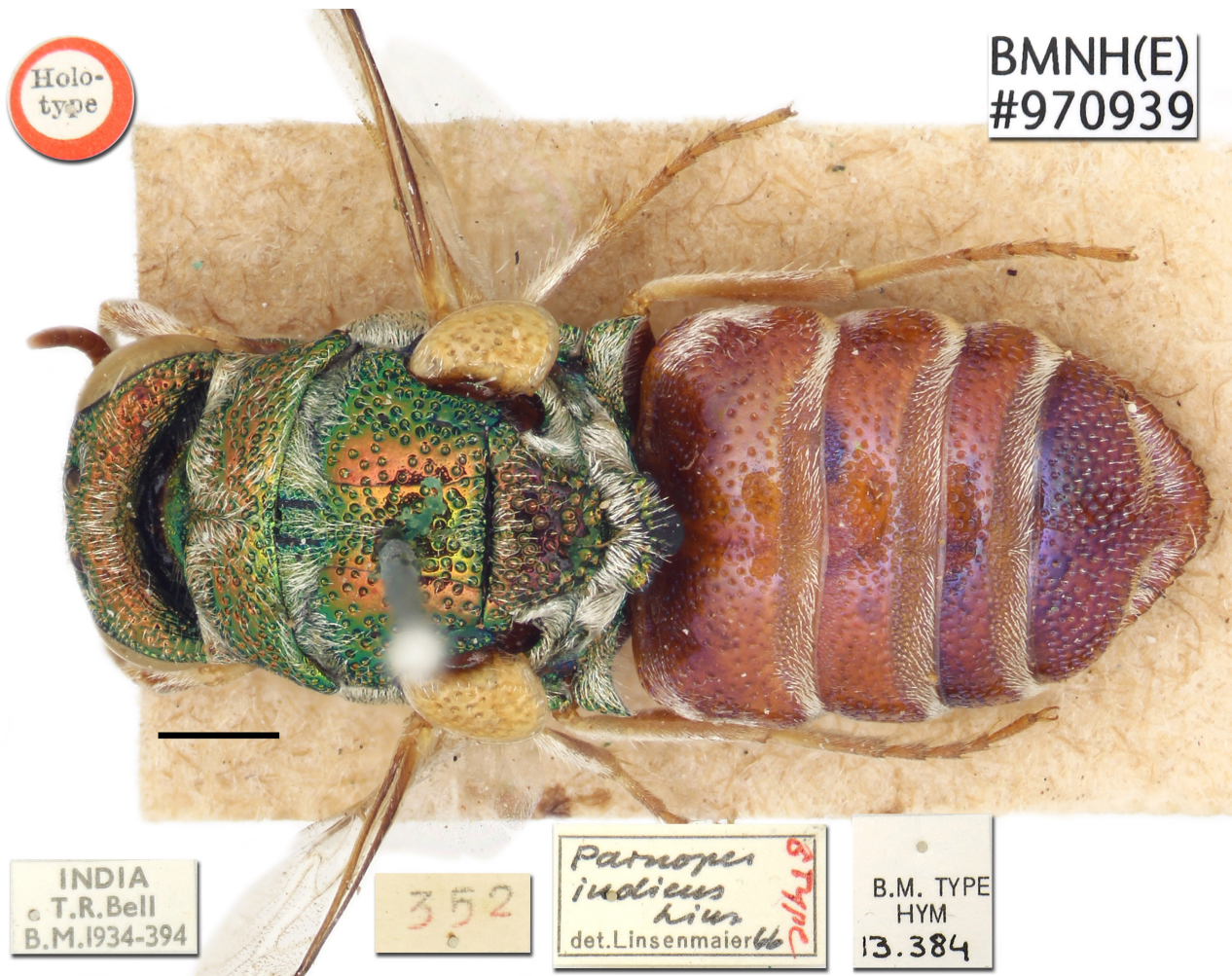


FIGURE 86. *Parnopes indicus* Linsenmaier, 1968, holotype, male. Habitus, dorsal view. (© The Trustees of the NHMUK)



FIGURE 87. *Parnopes viridis* Brullé, 1846, female from Tamil Nadu. A. Habitus, dorsal view. B. Habitus, lateral view. Scale bars 1.0 mm.

Species doubtfully recorded from India

Some species cited in the earlier literature have been found to be misidentified or their collecting locality is no longer part of India. As mentioned above, some specimens recorded in old literature and preserved in museum collections do not have precise locality, but they bear a generic locality label such as “Northwest Provinces”, “Western India”, “Himalaya”, “Panchmarhi Hills”, “Kashmir”, or “India” only to mention a few. These specimens might be

actually collected in other countries, for example in Pakistan (see the case of *Parnopes indicus*), Myanmar or other South-East Asian countries. Furthermore, some records of Indian chrysidids were found to be misidentifications as chrysidid taxonomy is a difficult discipline and species definitions change with taxonomic revisions. The following species have records from India considered dubious and we provide brief explanation about their questionable status.

***Elampus kashmirensis* (Nurse, 1902)**

Notozus kashmirensis Nurse, 1902: 305. Lectotype ♀ designated by Kimsey 1986: 109; Pakistan: Kashmir, on the banks of Jhelum (NMHN). Bischoff 1913: 6 (cat., Kashmir); Kimsey 1986: 109 (lectotype designation, Kashmir).

Elampus kashmirensis: Bingham 1903: 420 (key, Kashmir (5000 ft), 420–421 (descr.).

Omalus (Notozas) (!) kashmirensis: Jonathan *et al.* 1977: 85. Kashmir.

Omalus kashmirensis: Linsenmaier 1959: 25, 16 (key), 25 (descr., *panzeri* group).

Elampus kashmirensis: Kimsey & Bohart 1991: 168 (cat., India: Kashmir).

Distribution. Pakistan (Kashmir).

Remarks. Kimsey & Bohart (1991) reported *Elampus kashmirensis* for India, nevertheless the river Jhelum (type locality) is currently located in Pakistan. This species is anyway expected for the Palaearctic part of India.

***Hedychridium ardens* (Coquebert, 1801)**

Hedychridium minutum Lepeletier, 1806: du Buysson 1900: 128 (mis., Calcutta [= Kolkata]); Bingham 1903: 424 (key), 427 (descr., Calcutta [= Kolkata]); Nurse 1904: 19 (comp. notes).

Hedychridium ardens: Strumia 1999: 49 (key), 55 (distr.).

Remarks. The record of *Hedychridium ardens* for India is either a misidentification or the given locality ‘Calcutta’ is in error. *Hedychridium ardens* is a Euro-Siberian species and we here consider this record as questionable. Strumia (1999) already considered it doubtful.

***Chrysis conserta* du Buysson, 1891**

Chrysis conserta du Buysson, 1891: Bingham 1903: 474 (India: Sikkim (Hermann), Rungaroon 7000 ft near Darjiling (Bingham), 438 (key), 474–475 (descr.)); Jonathan *et al.* 1977: 86 (Sikkim: Rangiroon [misspelt]).

Chrysis nitidula Fabricius, 1775: Bingham 1908: 348 (Assam: Margherita).

Chrysis (Tetrachrysis) conserta: Bischoff 1913: 50 (cat., Sikkim, Himalaya).

Remarks. *Chrysis conserta* du Buysson, 1891, is a Holarctic species, currently synonymous of *Ch. nitidula* Fabricius, 1775. The specimens identified by Bingham (1903, 1908) are misidentified; they belong to a blue coloured species of the *Chrysis ignita* group and they are still unidentified.

***Chrysis indigotea* Dufour & Perris, 1840**

Chrysis indigotea Dufour & Perris, 1840: 38. Syntypes; France (MNHN). Bingham 1903: 438 (key), 475–476 (descr., Sikkim [= Sikkim], Rungaroon, 7000ft).

Remarks. The occurrence of *Chrysis indigotea* in India is doubtful because this species is documented from Western Europe to Caucasus (Paukkunen *et al.* 2015; Rosa *et al.* 2015d). Bingham’s (1903) record may be related to another of the blue species of the *ignita* group described after the publication and should be double checked.

***Chrysis nugatrix* Bingham, 1903**

Chrysis nugatrix Bingham, 1903: 450. Holotype ♀; India: Delhi (436 (key), 450–451 (descr.), 450 (fig. 152)).

Trichrysis nugatrix Bingham: Bischoff 1913: 46 (cat., India: Delhi).

Caenochrysis tridens Lepageletier & Serville, 1825: Kimsey & Bohart 1991: 305. (cat., syn., Delhi)

Remarks. *Chrysis nugatrix* was synonymised with *Caenochrysis tridens* by Kimsey & Bohart (1991). *Caenochrysis* is a Nearctic and Neotropical genus, not distributed in the Oriental region. For this reason, the specimen labelled as type of *Chrysis nugatrix* is either erroneously labelled or the species was occasionally introduced by commerce.

***Spinolia dusmeti* Trautmann, 1921**

Spinolia dusmeti Trautmann, 1921: 35. Syntypes ♀ [not holotype ♀]; Pakistan: Punjab, Warzirabad (MfN).

Spinolia kashmirae Kimsey in Kimsey & Bohart, 1991: 552. Unnecessary replacement name (India: Kashmir, Grenze).

Distribution. Pakistan.

Remarks. Trautmann (1921) described *Spinolia dusmeti* based on more females. In MfN there are two female syntypes collected at the same locality and bearing the same label: Warzirabad [= Warzirabat], West Indies, April 1909. Kimsey (in Kimsey & Bohart 1991) replaced the name *Spinolia dusmeti* with *Spinolia kashmirae* Kimsey in Kimsey & Bohart, 1991 because she considered the species described in the genus *Chrysis*. However, this species was described in the genus *Spinolia* and therefore *Spinolia dusmeti* is neither a primary nor a secondary homonym of *Chrysis dusmeti* García Mercet, 1904. The replacement name is consequently unnecessary. Kimsey & Bohart (1991) listed this species for India, but Warzirabat is currently located in Pakistan; however, this species is expected for the Palaearctic part of India.

***Trichrysis scioensis* (Gribodo, 1879)**

Chrysis scioensis Gribodo, 1879: 344. Holotype ♀; East Africa (MSNG). Bingham 1903: 436 (key), 454–455 (descr., Delhi).

Chrysis (Trichrysis) scioensis: Bischoff 1913: 46 (cat., India).

Remarks. *Trichrysis scioensis* is an Afrotropical species. We consider Bingham's (1903) record questionable, and likely related to another species later described in this genus.

Key to subfamilies, tribes and genera of Indian Chrysidids

We provide an identification key to subfamilies, tribes and genera of Indian Chrysidids. We expand the key by nine Cleptinae and Chrysidinae genera not yet recorded from India, but anyway expected in the region. Keys to Ceylonese Amiseginae are provided by Krombein (1980, 1983), and to *Loboscelidia* by Kimsey (2012).

It is still too early to provide a dichotomous key for the Indian species of cuckoo wasps, because the fauna is still poorly recognized, and we expect that the number of known species will increase in a relatively short time. The key to species is therefore postponed to future publications.

- 1 Metasoma with four (female) or five (male) external tergites, ventral surface convex. Metapectal-propodeal complex generally with elongate dorsal surface, usually carinate or rugulose (polished in *Loboscelidiinae*) **2**
- Metasoma with three external tergites (four in *Parnopes* male), ventral surface flat or concave. Metapectal-propodeal complex short, abruptly declivitous posteriorly, without distinct dorsal surface **(Chrysidinae) 5**
- 2 Face above antennal sockets convex, without scapal basin; clypeus with protruding medial truncation; pronotum campanulate, narrowed submedially and bisected by transverse groove; female ovipositor robust **(Cleptinae) 3**
- Face above antennal sockets flat or concave with some scapal basin, or antennae insertion on frontal projection; clypeus without protruding medial truncation; pronotum not campanulate, without transverse groove, at most narrowed apically; female ovipositor needle like **4**
- 3 Tarsal claws with one minute, perpendicular submedial or subbasal tooth, sometimes indistinct to fading; forewings hyaline, rarely slightly banded; metasomal terga usually anteriorly non-metallic orange and posteriorly black, often with blue-green

- metallic reflections, or entirely black, or rarely entirely metallic (not yet recorded in India) *Cleptes* Latreille, 1802
- Tarsal claws bifid, with broadened, subapical tooth, as broad as the upper tooth; forewings banded, metasomal terga fully black, with blue to violet metallic reflections and with transverse golden or greenish golden bands (Fig. 2) *Lustrina* Kurian, 1955
- 4 Head with large cervical projection; tegula large and broad, covering base of forewing and hindwing and held in place by ridge on mesopleuron; forewing venation reduced without costal vein or stigma (Figs 4, 5) (Loboscelidiinae) *Loboscelidia* Westwood, 1874
- Head without cervical projection; tegula small, covering only base of forewing and without associated ridge on mesopleuron; forewing with costal vein and stigma, or strongly brachypterous; only one genus known from India so far (Fig. 3), several genera known from Sri Lanka (see conclusions) (Amiseginae) *Indothrix* Krombein, 1957
- 5 Metasoma with three (♀) or four (♂) external tergites (Figs 86, 87); mouthparts (galea and glossa) strongly developed, longer than the rest of the head; tegula large and broad, covering base of forewing and hindwing (Parnopini) 6
- Metasoma with three external tergites in both sexes; mouthparts short; tegula small, covering only base of forewing 7
- 6 Metanotal projection large, apical margin trilobate; profemur without ventral tooth; posterior propodeal angle not deeply emarginate posteriorly (Figs 86, 87) *Parnopes* Latreille, 1796
- Metanotal projection small, non-metallic yellowish, with apical margin bilobate, truncate or rounded; profemur with ventral tooth; posterior propodeal angle usually deeply emarginate posteriorly *Cephaloparnops* Bischoff, 1910
- 7 Tarsal claws with one or more subapical teeth; forewing radial sector vein (Second radial cross & Radial sector) short and basally curved; head without preoccipital carina; T3 without subapical pit row and apical teeth (Elampini) 8
- Tarsal claws simple, without subapical teeth; forewing radial sector vein (Second radial cross & Radial sector) elongate to wing margin or nearly so, basally straight; head with preoccipital carina, ending in hook; T3 with subapical pit row, with or without apical teeth (Chrysidini) 16
- 8 Tarsal claws with one subsidiary tooth 9
- Tarsal claws with more than one subsidiary tooth 10
- 9 Tarsal claws with one perpendicular and submedian tooth; T3 without angular projection (Fig. 8) *Hedychridium* Abeille de Perrin, 1878
- Tarsal claws with one subparallel and subsidiary tooth; T3 usually with two small angular projections (Figs 9-11) *Hedychrum* Latreille, 1802
- 10 Forewing medial cell with setae; vein M strongly curved; T3 without apical notch (Figs 13, 14) *Holopyga* Dahlbom, 1845
- Forewing medial cell asetosae; vein M slightly curved; T3 with or without apical notch 11
- 11 Metanotum produced to form horizontal tongue-like projection (Fig. 7B, 7C), rarely with a short projection (Fig. 6B); T3 with apical notch, usually with horseshoe-shaped or falcate rim (Fig. 7G, 7H), rarely without rim (Fig. 6C); female gena with row of setae *Elampus* Spinola, 1806
- Metanotum rounded; T3 with or without apical notch, without horseshoe-shaped or falcate rim; female gena without row of setae 12
- 12 Mesoscutum impunctate, at most with wrinkles 13
- Mesoscutum with large punctures 14
- 13 Head, in frontal view, with convex upper profile; temples narrow ($< 1.0 \times \text{MOD}$); mesopleuron subquadrate or trapezoid with distinct double carinate omaulus; transpleural carina extending below propodeal angle; T3 without notch, with wide semi-transparent rim ($> 1.0 \times \text{MOD}$) (Fig. 12) *Holophris* Mocsáry, 1890
- Head, in frontal view, lenticular; temples broad ($> 1.0 \times \text{MOD}$); mesopleuron subrectangular with simple omaulus, sometimes with large punctures resembling double omaulus; transpleural carina extending to apex of propodeal angle; T3 usually with notch, usually without rim, sometimes with narrow semi-transparent rim ($< 0.5 \times \text{MOD}$), rarely wider (Fig. 15) *Omalus* Panzer, 1801
- 14 MS not bisected by genal carina; metanotum usually elevated or gibbous to mucronate (not yet recorded in India, expected for the Palaearctic part) *Philoctetes* Abeille de Perrin, 1879
- MS bisected by genal carina; metanotum evenly rounded 15
- 15 Mesoscutum with large punctures mostly concentrated posteromedially between notauli; mesopleuron with ventral margin V-shaped, strongly projecting; head and mesosoma with polished intervals between punctures; T3 apical notch without spine or tooth at its sides (not yet recorded in India, expected for the Palaearctic part) *Pseudomalus* Ashmead, 1902
- Mesoscutum with large punctures evenly distributed or concentrated along notauli (in Palaearctic species); mesopleuron with ventral margin extending at oblique angle; head and mesosoma with colliculate sculpture on intervals between punctures (see Rosa *et al.* 2015b); T3 apical notch usually with two spines or teeth at its sides, rarely blunted (not yet recorded in India) *Chrysellampus* Semenov-Tian-Shanskij, 1932
- 16 Radial sector vein (Second radial cross & Radial sector) of forewing ending largely before wing margin, at least $3.0 \times \text{MOD}$ far or at distance approximately equal to length of pterostigma 17
- Radial sector vein (Second radial cross & Radial sector) of forewing extending to wing margin, or nearly so 21
- 17 Radial sector vein (Second radial cross & Radial sector) very short, Rs vein about two-thirds as long as stigma, and ending abruptly far away from the wing margin; mesopleuron simple, without scrobal sulcus *Primeuchroeus* Linsenmaier, 1959 (part., *siamensis* group)
- Radial sector vein (Second radial cross & Radial sector) complete and elongate, although ending $3 \times \text{MOD}$ before wing margin; mesopleuron with distinct scrobal sulcus bisecting mesopleuron horizontally, with exception of other *Primeuchroeus* groups 18
- 18 Head in frontal view narrow and elongated; mesopleuron inferiorly tridentate; metanotum posteriorly mucronate with one large

- projection, hollowed like calyx; T3 with very pronounced transverse swelling before pit row; T3 apical margin with four well developed teeth (Fig. 78) ***Stilbum* Spinola, 1806**
- Head in frontal view at most only slightly longer than wide; mesopleuron inferiorly U-shaped or V-shaped, at most bidentate under scrobal sulcus; metanotum simple, rounded; T3 without distinctly elevated transverse swelling before preapical pit row; T3 apical margin without teeth, or with series of irregular teeth **19**
- 19** Mesopleuron inferiorly bidentate; T3 apical margin with a series of irregular teeth; female with unmistakable pink colouring in living specimens, often more or less green-coloured in preserved specimens, and with a violet pattern on T2 and T3 in some species; male blue or green, with blue patterns on T2 and T3; both sexes often with legs at least partly non-metallic yellow, (not yet recorded in India, expected for the Palaearctic part) ***Euchroeus* Latreille, 1809**
- Mesopleuron inferiorly U-shaped or V-shaped without distinct teeth; anal margin of T3 smooth or finely crenulated with angle at lateral end; different coloration, with unicoloured metasoma, at most with T3 entirely blue-green, contrasting with red T1 and T2 **20**
- 20** Scapal basin micropunctate, without transverse wrinkles; lower mesopleuron U-shaped or V-shaped; T3 apical margin laterally with angular protrusion (not yet recorded in India, expected for the Palaearctic part) ***Spinolia* Dahlbom, 1854**
- Scapal basin transversely striate; mesopleuron simple, inferiorly unmodified; T3 apical margin continuous, without teeth (not yet recorded in India, expected for the Palaearctic part) ***Pseudochrysis* Semenow, 1891**
- 21** Mesopleuron without horizontal scrobal sulcus ***Primeuchroeus* Linsenmaier, 1959**
- Mesopleuron with distinct horizontal scrobal sulcus **22**
- 22** Discoidal cell incomplete, its outer veins either not or only partly sclerotized; T3 apical margin usually with two lateral teeth and medially undulate, rarely with median tooth; scapal basin hollowed, striate, topped by convex TFC, S2 black spots oval or round, usually separated by 1–2 × MOD; green to blue species ***Chrysidea* Bischoff, 1913**
- Discoidal cell complete; T3 apical margin differently shaped, if with two lateral teeth and medially undulate, then body colour not entirely green to blue or TFC not topping the scapal basin; scapal basin various and TFC not topping the scapal basin; S2 black spots variously shaped; body colour various **23**
- 23** T3 apical margin with three or five teeth **24**
- T3 apical margin without teeth, with undulations, or with even number of teeth; if T3 apical margin with three teeth, then without pronotal lateral carina (*Chrysis ear* group, not yet recorded in India); if with five teeth, then without pronotal lateral carina and with unmodified flagellomeres (*Chrysis excellens* group, Fig. 37). **28**
- 24** T3 apical margin with three teeth, lateral teeth may be simple angular projections (Figs 79E, 83E), or with three median teeth and two lateral angles (Fig. 72D). **25**
- T3 apical margin with five teeth. **26**
- 25** TFC with branches encircling mid-ocellar area; anterior ocellus lidded; pronotum without lateral carina; mesopleuron with ventral margin tridentate; T3 lateral edge biconvex; black spots on S2 rounded to sub-oval, almost connected to lateral margin of second metasomal sternite and medially well separated (Fig. 72). ***Odontochrydium* Brauns, 1928**
- TFC simple, not encircling mid-ocellar area; anterior ocellus not lidded; pronotum with lateral carina; mesopleuron unmodified, without teeth; T3 lateral edge not biconvex; black spots on S2 small, medially fused and well separated from lateral margins (Figs 79, 81, 83, 84, 85) ***Trichrysis* Lichtenstein, 1876**
- 26** Pronotum with lateral carina fully developed (Figs 79, 83). ***Trichrysis* Lichtenstein, 1876**
- Pronotum without lateral carina **27**
- 27** F1 ≥ 5 × as long as broad; flagellum not broadened, slender; in frontal view, malar spaces parallel-sided or slightly diverging; metanotum convex; species usually bicoloured, with blue to green head and mesosoma and red or golden red metasoma, rarely with blue median line, or male blue with a large lateral red spot on T2—Parasitoid of Vespidae (Eumeninae) (not yet recorded in India) ***Pentachrysis* Lichtenstein, 1876**
- F1 less than 3 × as long as broad; flagellum usually broadened; in frontal view, malar spaces converging below; metanotum convex, with posterior spine or mucron; species coloured blue to green, at most with darker blue area on ocellar triangle, on median area of mesoscutum and at base of T2 and T3 (Figs 73–77)—Parasitoid of limacodid moths (Lepidoptera) ***Praestochrysis* Linsenmaier, 1959**
- 28** Face flat, without scapal basin and transverse frontal carina; male usually with F2 to F5 ventrally bulging; apical margin of T3 without apical teeth or angular prominences (Fig. 70). ***Chrysura* Dahlbom, 1845**
- Face with scapal basin and more or less sharp transverse frontal carina; male usually with cylindrical flagellomeres, rarely F2 to F5 ventrally hardly bulging; apical margin of T3 waved, with apical teeth or angular prominences, or rarely rounded without teeth (in *Spintharina* and *Chrysis capitalis*, *ceciliae*, *elegans*, and *succincta* species groups) **29**
- 29** Flagellomeres F4 to F10 ventrally bulging; TFC markedly sharp; deep scapal basin; propodeal angles, in postero-dorsal view, slightly lobed and restricted basally (character sometimes not clearly evident); T3 apical margin simple and continuous with very thin hyaline rim, in some species with a lobe on lateral edge at base of T3; golden red specimens in nature, usually greenish-copper in collections (not yet recorded in India, expected for the Palaearctic part) ***Spintharina* Semenow, 1892**
- Flagellomeres cylindrical, if ventrally bulging, then TFC faint and scapal basin almost flat, evenly micropunctate; TFC various, propodeal angles various, not basally lobed or restricted; T3 apical margin various, without hyaline rim; body colour various. **30**
- 30** Apex of T3 without teeth; male genitalia with longitudinal crest on aedeagus; one species, blue coloured, with scapal basin hollowed, striate, topped by convex TFC; metanotum with raised subtriangular median area, shallowly concave medially; black spots on S2 large, subrectangular and connected to lateral margins (Fig. 71). . . ***Istiochrysis* Rosa & Xu in Rosa et al., 2016c**
- Apex of T3 various; male genitalia unmodified, aedeagus without subsidiary structure; in case of edentate T3, then TFC vanishing; metanotum convex or mucronate; black spots on S2 differently shaped ***Chrysis* Linnaeus, 1761**

Discussion

Distributional data for 105 species are provided, representing 20 chrysidid genera grouped in 4 subfamilies. In terms of species richness, Cleptinae are represented only by a single species so far, whereas Chrysidinae are the most represented subfamily with 101 species (96% of Indian fauna). Among Chrysidinae, Chrysidini is the most speciose tribe (78 species, 77%), then Elampini (20 species, 19%), and Parnopini (3 species, 3%). Anyway, the Indian fauna is still too poorly known for a complete analysis of species richness and composition. For example, the subfamilies Amiseginae and Lobosceliinae are completely underestimated (see below).

Indian Amiseginae and Lobosceliinae

At present, only one species of the subfamily Amiseginae, *Indothrix longicornis* Krombein, 1957, is recorded from India. Nevertheless, the occurrence of Amiseginae for India is largely underrated. The diversity of this subfamily was studied by Krombein (1980, 1983) in Sri Lanka, where he found 10 Amiseginae genera and 20 species, namely: *Atoposega rieki* (Krombein, 1957); *Baeosega humida* Krombein, 1983; *Baeosega laticeps* Krombein, 1983; *Baeosega torrida* Krombein, 1983; *Cladobethylus aridulus* Krombein, 1980; *Cladobethylus ceylonicus* Krombein, 1980; *Imasega rufithorax* Krombein, 1983; *Indothrix wijesinhei* Krombein, 1983; *Isegama aridula* (Krombein, 1980); *Isegama meaculpa* Krombein, 1983; *Mahinda saltator* Krombein 1983; *Perissosega venablei* Krombein, 1983; *Saltasega bella* Krombein, 1983; *Saltasega distorta* Krombein 1983; *Serendibula deraniyagalai* Krombein, 1980; *Serendibula gracilis* Krombein, 1983; *Serendibula insolita* Krombein, 1983; *Serendibula karunaratnei* Krombein, 1983; *Serendibula kasyapai* Krombein, 1983; *Serendibula paradoxa* Krombein, 1983. Some of these species, and likely some still undescribed ones, should be distributed in India too.

The occurrence of Lobosceliinae in the country is also underestimated. Currently only two species are known: *Loboscelidia incompleta* Kimsey, 2012 and *Loboscelidia indica* Kimsey, 1988. Another two species are distributed in Sri Lanka: *Loboscelidia atra* Krombein, 1983 and *Loboscelidia castanea* Krombein, 1983. More than forty species of Lobosceliinae are known in the Oriental region (Kimsey 2012) and therefore other species of *Loboscelidia* are expected for India as well. Although nothing is known about their biology, they were considered as egg parasitoids of walking stick insects (Phasmatodea), and their peculiar structural modifications imply a myrmecophilous behaviour (Krombein 1983; Kimsey 2012). It was recently supposed that also members of *Rhadinoscelidia* Kimsey, 1988, the second known genus of Lobosceliinae, may be myrmecophilous (Hisasue & Mita 2020). This unusual behaviour in Chrysididae could explain why *Loboscelidia* and *Rhadinoscelidia* have rarely been collected so far.

Endemism

From a total of 105 species, 49 species (47%) are so far considered endemic to India. The endemism rate of Indian chrysidid fauna is currently somehow similar to that of endemic amphibians (49%), and it is much higher than for birds (4.3%), fish (8%), angiosperms (10%), mammals (11%), and reptiles (29%) (Bharti *et al.* 2016). Compared with other Hymenoptera, it is even higher than the number of endemic ants (Formicidae), estimated at 31% (Bharti *et al.* 2016). However, Indian and Asian Chrysididae are less studied than ants, represented in the country by ca. 830 species.

Among the endemic taxa, 16 species occur in the Palaearctic part of India (*Elampus gladiator*, *Hedychridium aeruginosum*, *Hedychridium mocsaryi*, *Hedychridium sikkimium*, *Holopyga cupreata*, *Holopyga cupreata*, *Chrysis bahadur*, *Chrysis begam*, *Chrysis bhoutanensis*, *Chrysis rani*, *Chrysis sandaracata*, *Chrysis sikkimensis*, *Chrysuru kashmirensis*, *Primeuchroeus indiacus*). Two endemic species generally described from “India” are anyway considered Palaearctic for their close relation to other Palaearctic species (*Parnopes indicus* and *Cephaloparnops oberthueri*).

Another 29 endemic species occur in the Oriental part of India (*Indothrix longicornis*, *Loboscelidia incompleta*, *Loboscelidia indica*, *Hedychrum crassitarse*, *Hedychrum gracilentum*, *Hedychrum lugubre*, *Hedychrum timidum*, *Holopyga rugosa*, *Chrysidea furiosa*, *Chrysis aswathiae*, *Chrysis baldocki*, *Chrysis bayadera*, *Chrysis bernasconii*, *Chrysis cotesi*, *Chrysis dissimilanda*, *Chrysis dissimilis*, *Chrysis durbar*, *Chrysis imperialis*, *Chrysis nila*, *Chrysis perfecta*, *Chrysis quaerita*, *Chrysis speculata*, *Chrysis travancoriana*, *Chrysis variipes*, *Odontochrydium xui*, *Praestochrysis amoenua*, *Praestochrysis libita*, *Praestochrysis pradeshi*, *Trichrysis mendicalis*).

Three species occur both in the Oriental and Palaeartic part of India (*Holopyga indica*, *Chrysis wroughtoni* and *Parnopes viridis*). Finally, *Chrysis mir* was described from “India orientalis” without any precise locality, and must be considered endemic with reservations, as it could be related to other countries in south-eastern Asia.

From a chorological point of view (Fig. 88), 24 species (23%) have an Oriental distribution (*Lustrina assamensis*, *Hedychrum flammulatum*, *Holophris taiwana*, *Chrysis bhavanae*, *Chrysis buddhae*, *Chrysis comottii*, *Chrysis disparilis*, *Chrysis durga*, *Chrysis hecate*, *Chrysis ionophris*, *Chrysis obscura*, *Chrysis oculata*, *Chrysis orientalis*, *Chrysis parallela*, *Chrysis polita*, *Chrysis pubescens*, *Chrysis vishnu*, *Praestochrysis crassiscuta*, *Praestochrysis furcifera*, *Praestochrysis palawanensis*, *Primeuchroeus siamensis*, *Trichrysis lanka*, *Trichrysis tonkinensis*, *Trichrysis triacantha*), 15 species have Palaeartic distribution (*Elampus assamensis*, *Hedychridium rotundum*, *Holopyga solskyi*, *Chrysis arrestans*, *Chrysis cupreiventris*, *Chrysis distincta*, *Chrysis excellens*, *Chrysis gujaratica*, *Chrysis ignita*, *Chrysis jalala*, *Chrysis musa*, *Chrysis saraksensis*, *Chrysis tamerlana*, *Chrysis violenta*, *Trichrysis excisifrons*); seven species occur in both the Palaeartic and Oriental region (*Hedychridium wroughtoni*, *Omalus timidus*, *Chrysis oblita*, *Chrysis principalis*, *Chrysis thakur*, *Istiochrysis ziliolii*, *Praestochrysis shanghaiensis*); 2 species both in the Palaeartic and in the Afrotropical region (*Hedychridium amatum* and *Chrysis acceptabilis*); two species both in the Oriental and in the Australian region (*Chrysis schioedtei* and *Trichrysis imperiosa*); five species are widespread in the Old World and are therefore considered subcosmopolitan (*Stilbum cyanurum*, *Trichrysis lusca*, *Chrysis lyncea*, *Chrysis stilboides*, and *Chrysidea pumila*, even if the latter two do not occur in the Australian region); and finally *Chrysis angolensis* has a cosmopolitan distribution.

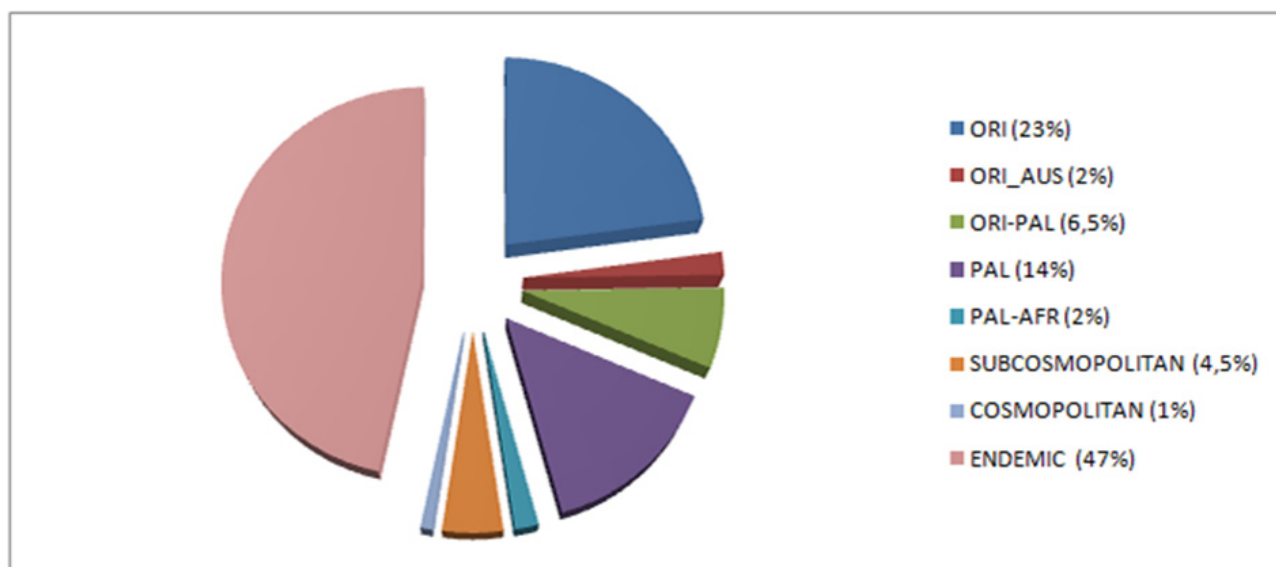


FIGURE 88. Chorological composition of the Indian fauna.

Regional diversity

Although most of the Indian states are underrepresented in the existing data, based on the currently available data we can state that the highest number of species was recorded in Tamil Nadu (29 species). In nine Indian states 21 to 25 species were recorded (the highest number in Maharashtra with 23 species); in another nine states 16 to 20 species were recorded [e.g. West Bengal (20), Gujarat (18), Sikkim (16)]; in eight states 11 to 15 species [e.g. Karnataka (11)]; in another eight states 6 to 10 species [e.g. Bihar (8), Kerala (7), New Delhi (7), Assam (6), Meghalaya (6), Uttar Pradesh (7)]; in twelve states only one to five species were recorded [Chhattisgarh (5), Jammu and Kashmir (4), Puducherry (4), Odisha (3), Rajasthan (3), Uttarakhand (3), Himachal Pradesh (3), Arunachal Pradesh (2), Punjab (2), Haryana (2), Telangana (1), Uttaranchal (1)]. Finally, no species was recorded so far in the following eight states, at the best of our knowledge: Andhra Pradesh, Goa, Jharkhand, Madhya Pradesh, Manipur, Mizoram, Nagaland, and Tripura.

The most widespread species is *Stilbum cyanurum* (Forster) recorded in 10 Indian states. This is not surprising, because *Stilbum cyanurum* is one of the most common species in the Old World, the largest and the easiest species to identify. *Chrysis oculata* Fabricius was collected in nine states and in New Delhi, *Chrysis schioedtei* Dahlbom in nine states, *Chrysis angolensis* Radoszkovsky, *Trichrysis lusca* (Fabricius) and *Trichrysis imperiosa* (Smith) in eight states, and *Chrysis orientalis* Guérin-Méneville, was collected in seven states and in New Delhi.

Expected species for India

Several Palaearctic species either described or collected in Pakistan by C.G. Nurse are expected for Jammu and Kashmir, Gujarat, Rajasthan, Punjab, and/or Himachal Pradesh: *Chrysis annulata* (= *Chrysis balucha* Nurse, 1903b) (known from Pakistan); *Chrysis autocrata* Nurse, 1903b (described from Pakistan); *Chrysis chavanae* Nurse, 1902 (described from Pakistan); *Chrysis dentipes* Radoszkowski, 1877 (known from Pakistan (Nurse, 1904)); *Chrysis deposita* Nurse, 1904 (described from Pakistan); *Chrysis gilgitensis* Linsenmaier, 1968 (described from Pakistan); *Chrysis komarowi* Radoszkowski, 1891 (known from Pakistan (Kimsey & Bohart 1991)); *Chrysis korbiana* Mocsáry, 1912a (known from Pakistan (Kimsey & Bohart 1991)); *Chrysis paria* Bingham, 1903 (described from Pakistan); *Chrysis proba* Linsenmaier, 1959 (described from Pakistan); *Chrysis psittacina* du Buysson, 1887 (known from Pakistan (Nurse, 1904)); *Chrysis retracta* Linsenmaier, 1959 (described from Pakistan); *Chrysis sara* Nurse, 1904 (described from Pakistan); *Chrysis urakensis* Linsenmaier, 1968: (described from Pakistan); *Chrysis urana* Nurse, 1904 (described from Pakistan); *Chrysis xanthocera* Klug, 1845 (= *Chrysis lucinda* Nurse, 1903a, known from Pakistan (Kimsey & Bohart 1991); *Euchroeus purpuratus* (Fabricius, 1787) (known from Pakistan (Nurse, 1904)); *Hedychridium monochroum* du Buysson, 1888 (known from Pakistan (Nurse, 1904)); *Hedychridium selectum* Nurse, 1902 (described from Pakistan); *Hedychrum perversum* Nurse, 1902 (known from Pakistan); *Hedychrum lama* du Buysson, 1891 (misidentification?, known from Pakistan (Nurse, 1904)); *Pentachrysis seminigra* (Walker, 1871) (= *Chrysis reparata* Nurse, 1904 (known from Pakistan (Nurse, 1904)); *Spinolia stchurovskyi* Radoszkowski, 1877 (= *Euchreoides oblatius* Nurse 1904: known from Pakistan (Nurse, 1904)); *Spinolia unicolor* (= *Chrysis hedychroides* Bingham, 1903) (known from Pakistan (Bingham 1903)); *Cephaloparnops vareillesi* (du Buysson, 1900) (known from Pakistan (Nurse, 1904)).

Chrysis hoggei Nurse, 1903b is another species described from Pakistan, and its occurrence in India is possible. However, this species is still under investigation: Bingham (1903) synonymised *Chrysis hoggei* with *Chrysis perfecta*; Nurse (1904) sent some syntypes to R. du Buysson, who identified the female as *Chrysis subcoerulea* and the male as *Chrysis chlorochrysa* (currently *C. keriensis*), whereas Kimsey & Bohart 1991 considered *Chrysis hoggei* a valid species. Another syntype is housed in Mocsáry's collection and belongs to another unidentified species. It is therefore necessary to designate a lectotype to clarify the taxonomic status of this species.

The evaluation of Oriental species expected for India is more complicated, for the few available data. Sinhalese chrysidids may be distributed in southern India as well, namely: *Hedychridium attenuatum* (Mocsáry, 1914); *Hedychridium karli* Strumia, 1999; *Hedychridium krombeinicum* Strumia, 1999; *Chrysis ceylonica* Mocsáry, 1913; *Chrysis greeni* Bingham, 1903; *Trichrysis hexapholis* Bohart, 1988b. It is likely that other species found in Myanmar and other Oriental countries may also be found in India; expected species for Mizoram, Tripura, Manipur, Nagaland and Assam are: *Chrysis angustata* Mocsáry, 1893; *Chrysis elizabethae* Bingham, 1903; *Chrysis ignifascia* Mocsáry, 1893; *Chrysis maharadsha* Mocsáry, 1913; *Chrysis undulella* Mocsáry, 1912b. Finally, the distribution of other species known from Thailand to Vietnam and Southern China is still too poorly known to predict their occurrence in India.

Conclusions

With 105 species of cuckoo wasps recorded, Indian fauna remains less studied than Chinese one, which includes 204 species recorded (Rosa *et al.* 2014, 2015a, b, c, 2016a, b, c, d) and those of Iran (291 taxa, Rosa 2020) and Central Asia (420 taxa, Rosa 2019d). Considering the geographic position of Indian states and their climatic ranges, with semi-arid climates, wet and dry tropical, humid subtropical and tropical moist forest ecosystems, the faunal richness should be much higher than currently recognised. Considering the under sampling of most states, we expect that the real richness of Indian Chrysididae may be estimated in more than 300 species. Due to this largely incomplete knowledge, the richness of the Indian chrysidid fauna cannot be assessed with confidence yet. Gaps in the current knowledge underline the need of studying, collecting and identification programs in all Indian states.

At present, 47% of Indian Chrysidid are endemic, and for this reason more efforts should be directed to this family to evaluate species diversity and ecology, and assess their real distribution in the country.

Acknowledgments

We are grateful to all curators who allowed the study of type materials: Sergey Belokobylskij (St. Petersburg, Russia), Marco Bernasconi (Luzern, Switzerland), Sophie Cardinal (CNC, Canada), Michael Greeff (Zurich, Switzerland), Toshiharu Mita (Fukuoka, Japan), David Notton (London, England), Michael Ohl (Berlin, Germany), Roberto Poggi (Genova, Italy), Fabrizio Rigato (Milan, Italy), Villu Soon (Tartu, Estonia), Zoltan Vas (Budapest, Hungary), Lars Vilhelmsen (Copenhagen, Denmark), Claire Villemant (Paris, France), Herbert Zettel and Dominique Zimmermann (Vienna, Austria). A special thanks to Marek Halada (České Budějovice, Czech Republic) for the loan of some specimens, Toshiharu Mita (Fukuoka, Japan) for providing the picture of *Lustrina assamensis* and David Notton (London, England) for providing pictures of the chrysidid types deposited at NHMUK. We are indebted to Bogdan Wiśniowski (Rzeszów, Poland), Maxim Proshchalykin (Vladivostok, Russia) who revised this manuscript and Celso Azevedo (Vitória, Brazil) for the revision and editing of the manuscript, and Prof. P. K. Prasad (Wayanad, India) for the English proofreading of the text. We are grateful to the Principal of the Christ College (Autonomous) Irinjalakuda, Kerala for providing us with the facilities for undertaking this work. We offer sincere gratitude to CSIR, Government of India for financial support of P.G. Aswathi in the form of CSIR Junior Research Fellowship.

References

- Abeille de Perrin, E. (1878) *Diagnoses de Chrysidés nouvelles*. Published by the author, Marseille, 6 pp.
- Abeille de Perrin, E. (1879) Synopsis critique et synonymique des Chrysidés de France. *Annales de la Société Linnéenne de Lyon*, 26, 1–108.
- Agassiz, L. (1846) *Nomenclatoris zoologici index universalis, continens nomina systematica classium, ordinum, familiarum et generum animalium omnium, tam viventium quam fossilium, secundum ordinem alphabeticum unicum disposita, adjectis homonymiis plantarum, nec non variis adnotationibus et emendationibus*. Jent et Gassmann, Soloduri, viii + 393 pp.
<https://doi.org/10.5962/bhl.title.1819>
- Ahmed, I., Saini, J., Singh, L.R.K., Gupta, D. & Chandra, K. (2020) Insecta: Hymenoptera. In: Fauna of Haryana. Zoological Survey of India. *State Fauna Series*, 24, 189–220.
- Anbalagan, V., Paulraj, M.G. & Ignacimuthu, S. (2015) Diversity and abundance of Hymenoptera families in vegetable crops in north-eastern District of Tamil Nadu, India. *International Journal of Fauna and Biological Studies*, 2 (3), 100–104.
- Ashmead, W.H. (1902) Classification of the fossorial, predaceous and parasitic wasps, or the superfamily Vespoidea. *The Canadian Entomologist*, 34 (9), 219–231.
<https://doi.org/10.4039/Ent34219-9>
- Azevedo, C.O., Madl, M. & Olmi, M. (2010) A Catalogue of the Bethyliidae, Chrysididae, Dryinidae, Embolemidae, Sclerogibbidae and Scolebythidae of the Malagasy Subregion (Hymenoptera, Chryridoidea). *Linzer Biologische Beiträge*, 42 (2), 845–918.
- Bank, S., Sann, M., Mayer, C., Meusemann, K., Donath, A., Podsiadlowski, L., Kozlov, A., Petersen, M., Krogmann, L., Meier, R., Rosa, P., Schmitt, T., Wurdack, M., Liu, S., Zhou, X., Misof, B., Peters, R.S. & Niehuis, O. (2017) Transcriptome and target DNA enrichment sequence data provide new insights into the phylogeny of vespid wasps (Hymenoptera: Aculeata: Vespidae). *Molecular Phylogenetics and Evolution*, 116, 213–226.
<https://doi.org/10.1016/j.ympev.2017.08.020>
- Bharti, H., Guénard, B., Bharti, M. & Economo, E.P. (2016) An updated checklist of the ants of India with their specific distributions in Indian states. *ZooKeys*, 551, 1–83.
<https://doi.org/10.3897/zookeys.551.6767>
- Bingham, C.T. (1898) On some new species of Indian Hymenoptera. *Journal of the Bombay Natural History Society*, 12, 115–130.
- Bingham, C.T. (1903) *The Fauna of British India, including Ceylon and Burma. Hymenoptera. Vol. II. Ants and Cuckoo-wasps*. Taylor & Francis, London, 528 pp.
- Bingham, C.T. (1908) Notes on Aculeate Hymenoptera in the Indian Museum. Part I. *Records of the Indian Museum*, 2 (4/32), 347–349.
- Bischoff, H. (1910) Die Chrysididen des Königlichen Zoologischen Museums zu Berlin. *Mitteilungen aus dem Zoologischen Museum in Berlin*, 4 (3), 427–493, pl. 7.
- Bischoff, H. (1913) *Hymenoptera. Fam. Chrysididae*. In: Wytsman, P. (Ed.), *Genera insectorum. Fascicule 151*. L. Desmet-Verteneuil, Bruxelles, pp. 1–86, 5 pls.
- Blanchard, C.E. (1840) *Histoire naturelle des animaux articulés, Annelides, Crustacés, Arachnides, Myriapodes et insectes*, Vol. 3, Tom. III P. Dumenil, Paris, 622 pp. [Chrysididae: 294–298]
- Bodenstein, W.G. (1939) The genotypes of the Chrysididae. *Transactions of the American Entomological Society*, 65, 123–

- Bohart, R.M. (1988a) A key to species of the genus *Primeuchroeus* and descriptions of new species (Hymenoptera: Chrysididae). *Insecta Mundi*, 2 (1), 21–27.
- Bohart, R.M. (1988b) A key to *Trichrysis* and new species from Sri Lanka and Africa (Hymenoptera: Chrysididae). *The Pan Pacific Entomologist*, 63 (4), 347–351.
- Bohart, R.M. & French, L.D. (1986) Designation of Chrysidid lectotypes in the Mocsáry collection at the Hungarian National Museum, Budapest (Hymenoptera: Chrysididae). *The Pan-Pacific Entomologist*, 62 (4), 340–343.
- Bohart, R.M. & Kimsey, L.S. (1978) A revision of the New World species of *Hedychridium* (Hymenoptera, Chrysididae). *Proceedings of the Biological Society of Washington*, 91 (3), 590–635.
- Brauns, H. (1928) Beitrag zur Kenntnis afrikanischer Chrysididen. *Entomologische Mitteilungen*, 17 (6), 383–393.
- Brullé, G.A. (1833) *Expédition scientifique de Morée. Section des sciences physiques. Tome III. Zoologie et Botanique. 1^{re} partie. Zoologie. Deuxième Section. Des animaux articulés*. F.G. Levrault, Paris, pp. 289–400. [1833]
- Brullé, G.A. (1846) *Des Hyménoptères*. In: Lepeletier de Saint-Fargeau, A. (Ed.), *Histoire Naturelle des Insectes. Tome Quatrième*. Libraire De Roret, Paris, pp. 1–680. [Chrysididae: 1–55, pl. 37]
- Cameron, P. (1897) Hymenoptera Orientalia, or contribution to a knowledge of the Hymenoptera of the Oriental Zoological Region. Part VI. *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, 41 (13), 1–28.
- Cameron, P. (1902a) On some new genera and species of Hymenoptera (Ichneumonidae, Chrysididae, Fossores, and Apidae). *The Entomologist*, 35, 206–208.
- Cameron, P. (1902b) Descriptions of new genera and species of Hymenoptera collected by Major C. S. Nurse. *Journal of the Bombay Natural History Society*, 14, 419–449.
- Chen, L., Song, Y. & Xu, S. (2008) The boundary of palaeartic and oriental realms in western China. *Progress in Natural Science*, 18, 833–841.
<https://doi.org/10.1016/j.pnsc.2008.02.004>
- Christ, J.L. (1791) *Naturgeschichte, Klassifikation und Nomenclatur der Insekten vom Bienen, Wespen und Ameisengeschlecht: als der fünften Klasse fünfte Ordnung des Linneischen Natursystems von den Insekten, Hymenoptera: mit häutigen Flügeln*. Hermannischer Buchhandlung, Frankfurt am Main, 535 pp., 60 pls.
- Coquebert, A.J. (1801) *Illustratio iconographica insectorum quae in Musaeis parisinis observavit et in lucem edidit Joh. Christ. Fabricius. Praemissis ejusdem descriptionibus; accedunt species plumariae, vel minus aut nondum cognitae. Tabularum decas secunda*. Petri Didot, Paris, 43 pp. [pp. 48–90 + pls. xi–xx]
<https://doi.org/10.5962/bhl.title.65970>
- Costa, A. (1864 [“1862”]) Elenco delle specie animali immesse per acquisti. *Annali del Museo Zoologico della R. Università di Napoli*, 2, 12–93.
- Dahlbom, A.G. (1829) *Monographia Chrysidum Sveciae*. Gothorum, Londini [Lund], 19 pp.
- Dahlbom, A.G. (1845) *Dispositio Methodica Specierum Hymenopterorum, secundum Familias Insectorum naturales. Particula secunda*. Dissert, Berlingianis, Lund, 20 pp.
<https://doi.org/10.5962/bhl.title.66977>
- Dahlbom, A.G. (1854) *Hymenoptera Europaea praecipue borealia, formis typicis nonnullis specierum generumve exoticorum propter nexum systematicum associatis, per familias, genera, species et varietates disposita atque descripta. Tomus secundus. Chrysis in sensu Linnaeano*. Friedrich Nicolai, Berolini [Berlin], xxiv + 412 pp., 12 pls.
<https://doi.org/10.5962/bhl.title.15890>
- Dalla Torre, C.G. de (1892) *Catalogus hymenopterorum hucusque descriptorum systematicus et synonymicus. Vol. VI. Chrysididae (Tubulifera)*. Wilhelm Engelmann, Leipzig [Lipsia], viii + 118 pp.
<https://doi.org/10.5962/bhl.title.10348>
- Donovan, E. (1800) *An epitome of the natural history of the insects of India : and the islands in the Indian seas: comprising upwards of two hundred and fifty figures and descriptions of the most singular and beautiful species, selected chiefly from those recently discovered, and which have not appeared in the works of any preceding author; the figures are accurately drawn, engraved, and coloured, from specimens of the insects; the descriptions are arranged according to the system of Linnaeus; with references to the writings of Fabricius, and other systematic authors*. Privately published by the Author, printed by T. Bensley, London.
- du Buysson, R. (1887) Descriptions de Chrysidides nouvelles. *Revue d'Entomologie*, 6, 167–201.
- du Buysson, R. (1888) Descriptions de Chrysidides nouvelles. *Revue d'Entomologie*, 7, 1–13.
- du Buysson, R. (1891) Contribution aux Chrysidides du Globe. *Revue d'Entomologie*, 10, 29–47.
- du Buysson, R. (1893) Contribution aux Chrysidides du Globe (2^e série). *Revue d'Entomologie*, 12, 245–252.
- du Buysson, R. (1896a) Les Chrysidides. In: André, E. (Ed.), (1891–1896) *Species des Hyménoptères d'Europe & d'Algérie. Tome Sixième*. Vve Dubosclard, Paris, pp. I–XII + 13–758 + [64 unnumbered], 32 pls. (1896), pp. 625–758.
<https://doi.org/10.5962/bhl.title.10281>
- du Buysson, R. (1896b) Première contribution a la connaissance des Chrysidides de l'Inde. *Journal of the Bombay Natural History Society*, 10, 462–481.
- du Buysson, R. (1898a) Contribution aux Chrysidides du Globe (3^e série). *Revue d'Entomologie*, 17, 125–147.
- du Buysson, R. (1898b [“1897”]) Étude des Chrysidides du Muséum de Paris. *Annales de la Société Entomologique de France*, 66, 518–580, pls. 1–2.

- du Buysson, R. (1900) Contribution aux Chrysidides du Globe (4^e série). *Revue d'Entomologie*, 19, 125–165.
- du Buysson, R. (1904) Contribution aux Chrysidides du Globe (5^e série). *Revue d'Entomologie*, 23, 253–275.
- du Buysson, R. (1908) Hyménoptères nouveaux. *Revue d'Entomologie*, 27, 207–213.
- Dufour, L. & Perris, E. (1840) Mémoire sur les Insectes Hyménoptères qui nichent dans l'intérieur des tiges sèches de la Ronce. *Annales de la Société Entomologique de France*, 9, 5–53.
- Fabricius, J.C. (1775) *Systema entomologiae, sistens Insectorum classes, ordines, genera, species, adiectis synonymis, locis, descriptionibus, observationibus*. Korti, Flensburgi et Lipsiae, 832 pp.
<https://doi.org/10.5962/bhl.title.36510>
- Fabricius, J.C. (1781) *Species insectorum, exhibentes eorum differentias specificas, synonyma auctorum, loca natalia, metamorphosin adiectis observationibus, descriptionibus*. Tom. I. C.E. Bohnii, Hambugi et Kiloni [Kiel], 522 pp + i-viii.
<https://doi.org/10.5962/bhl.title.11658>
- Fabricius, J.C. (1787) *Mantissa Insectorum sistens eorum species nuper detectas adiectis characteribus genericis, differentiis, specificis, emendationibus, observationibus*. Tom. I. Impensis Christ. Gottl. Froft, Hafniae [Copenhagen], xx + 348 pp.
<https://doi.org/10.5962/bhl.title.11657>
- Fabricius, J.C. (1804) *Systema piezatorum secundum ordines, genera, species, adiectis synonymis, locis, observationibus, descriptionibus*. Carolum Reichard, Brunsvigae [Brunswick], iii–xiv, 439 + 30 pp.
<https://doi.org/10.5962/bhl.title.12548>
- Finnamore, A.T. & Brothers, D.J. (1993) Chapter 7 Superfamily Chrysoidea. In: Goulet, H. & Huber, J.T. (Eds.), *Hymenoptera of the World: An Identification Guide to Families*. Research Branch, Agriculture Canada, Ottawa, pp. 130–160.
- Forster, J.R. (1771) *Novae species insectorum*. Centuria I. T. Davies & B. White, London, VIII + 100 pp.
- Förster, A. (1853) Eine Centurie neuer Hymenopteren. Beschreibungen neuer Arten aus der Familie der Chrysididen. *Verhandlungen des Naturhistorischen Vereins der Preussischen Rheinlande und Westfalens*, 10, 266–362.
- García Mercet, R. (1904) Especies nuevas de crisididos. *Boletín de la Real Sociedad Española de Historia Natural*, 4, 83–89.
- Gmelin, J.F. (1790) s.n. In: *Caroli a Linné. Systema naturae per regna tria naturae: secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis (13th edn)*. Vol. 1. Regnum Animalia. Part 5. G. E. Beer., Lipsiae, pp. 2250–3020.
- Gribodo, G. (1879) Note imenotterologica. *Annali del Museo civico di Storia naturale di Genova*, 14, 325–347.
- Gribodo, G. (1884) Sopra alcuni Imenotteri raccolti a Minhla nel regno di Birmania dal Cap. G.B. Comotto. *Annali del Museo civico di Storia Naturale di Genova*, 21, 349–368.
- Guérin-Méneville, M. (1842) Description de quelques Chrysidides nouvelles. *Revue Zoologique*, 5 (5), 144–150.
- Hisasue, Y. & Mita, T. (2020) *Rhadinoscelidia lixa* sp. nov. (Hymenoptera, Chrysididae, Loboscelidiinae) found on an ant nest in Thailand. *ZooKeys*, 975, 1–9.
<https://doi.org/10.3897/zookeys.975.54952>
- International Commission on Zoological Nomenclature (ICZN) (1999) *International Code on Zoological Nomenclature*. 4th Edition. ICZN, London, xxx + 306 pp.
- Johnson, A.D. & Kunchithapatham, R. (2019) Diversity of parasitic Hymenoptera in three rice-growing tracts of Tamil Nadu, India. *Journal of Threatened Taxa*, 11 (13), 14681–14690.
<https://doi.org/10.11609/jott.4529.11.13.14681-14690>
- Jonathan, J.K., Roy, S.B. & Dhar, M. (1977) On a collection of cuckoo wasps from India and Bhutan (Hymenoptera: Chrysididae). *Newsletter Zoological Survey of India*, 32, 85–87.
- Kadirvelu, P. (1991) First report of *Chrysis fuscipennis* Brulle in south India. *Journal of the Bombay natural History Society*, 87 (3), 466.
- Kimsey, L.S. (1986) Designation of chrysidid lectotypes. *The Pan-Pacific Entomologist*, 62, 105–110.
- Kimsey, L.S. (1988) Loboscelidiinae, new species and a new genus from Malaysia (Chrysididae, Hymenoptera). *Psyche: A Journal of Entomology*, 95 (1–2), 67–79.
- Kimsey, L.S. (2012) Review of the odd chrysidid genus *Loboscelidia* Westwood, 1874 (Hymenoptera, Chrysididae, Loboscelidiinae). *ZooKeys*, 213, 1–40.
<https://doi.org/10.3897/zookeys.213.2985>
- Kimsey, L.S. & Bohart, R.M. (1991 [“1990”]) *The Chrysidid Wasps of the World*. Oxford University Press, New York, 652 pp.
- Klug, F. (1845) s.n. In: *Symbolae Physicae seu icones et descriptiones insectorum quae ex itinere per Africam borealem et Asiam occidentalem Friderici Guilelmi Hemprich et Christiani Godofredi Ehrenberg Medicinae et Chirurgiae Doctorum studio novae aut illustratae redierunt*. Decas Quinta. Officina Academica, Berolini [Berlin], pp. 41–50.
- Krombein, K.V. (1957) A generic review of the Amiseginae, a group of phasmatid egg parasites, and notes on the Adelphinae (Hymenoptera, Bethyloidea, Chrysididae). *Transactions of the American Entomological Society*, 82, 147–215.
- Krombein, K.V. (1980) *Biosystematic studies of Ceylonese wasps, I: A preliminary revision of the Amiseginae (Hymenoptera: Chrysididae)*. P.E.P. Deraniyagala Commemoration Volume. Lake House Investments, Colombo, 392 pp.
- Krombein, K.V. (1983) Biosystematic studies, XI: A monograph of the Amiseginae and Loboscelidiinae. *Smithsonian Contributions to Zoology*, 376, 1–79.
- Kurian, C. (1955) Bethyloidea (Hymenoptera) from India. *Agra University Journal of Research*, 4, 86–88.
- Lanes, G.O., Kawada, R., Azevedo, C.O. & Brothers, D.J. (2020) Revisited morphology applied for systematics of flat wasps

- (Hymenoptera, Bethyridae). *Zootaxa*, 4752 (1), 1–127.
<https://doi.org/10.11646/zootaxa.4752.1.1>
- Latreille, P.A. (1796) *Précis des caractères génériques des Insectes, disposés dans un ordre naturel. Par le Citoyen Latreille*. F. Bordeaux, Brive, Prévot and Paris, xiv + 201 + [7] pp., 1 pl.
- Latreille, P.A. (1802) *Histoire naturelle générale et particulière des Crustacés et des Insectes. Ouvrage faisant suite à l'Histoire Naturelle générale et particulière, composée par Leclercq de Buffon, et rédigée par C.S. Sonnini, membre de plusieurs Sociétés savantes. Familles naturelles des genres. Tome troisième*. F. Dufart, Paris, xii + 455 pp.
<https://doi.org/10.5962/bhl.title.15764>
- Latreille, P.A. (1809) *Genera Crustaceorum et Insectorum secundum ordinem naturalem in familias disposita, iconibus exemplisque plurimis explicata. Tomus quartus et ultimus*. Amand Koenig, Parisiis et Argentorati [Paris and Strasbourg], 399 pp.
- Latreille, P.A. (1810) *Considérations générales de l'ordre des animaux composant les classes des Crustacés, des Arachnides, et des Insectes; avec un tableau méthodique de leurs genres, disposés en familles*. F. Schoell, Paris, 444 pp.
<https://doi.org/10.5962/bhl.title.39620>
- Lepeletier de Saint Fargeau, A.L.M. & Audinet-Serville, J.G. (1825) *Encyclopédie méthodique. Histoire naturelle. Entomologie, ou histoire naturelle des Crustacés, des Arachnides et des insectes*. Veuve Agasse, Paris, 344 pp.
- Lepeletier, [A.L.M.] (1806) Mémoire sur quelques espèces nouvelles d'insectes de la section des Hyménoptères appelés les Portetuyaux, et sur les caractères de cette famille et des genres qui la composent. *Annales du Muséum National d'Histoire Naturelle*, 7, 115–129.
- Li, S.-s. & Xu, Z.f (2016) *Indothrix* Krombein, 1957 (Hymenoptera, Chrysididae) newly recorded genus from China, with description of one new species. *Zootaxa*, 4147 (1), 75–81.
<https://doi.org/10.11646/zootaxa.4147.1.5>
- Lichtenstein, J. (1876) Note sur les genre *Chrysis*. *Petites Nouvelles Entomologiques*, 2 (8/145), 27.
- Linnaeus, C. (1758) *Systema Naturae per Regna tria Naturae, secundum Classes, Ordines, Genera, Species, cum characteribus, differentiis, synonymis, locis. Editio Decima, Refurmata. Tomus I. Laurenti Salvii, Holmiae* [Stockholm], 824 + IV pp.
<https://doi.org/10.5962/bhl.title.542>
- Linnaeus, C. (1761) *Fauna Svecica sistens Animalia Sveciae Regni: Mammalia, Aves, Amphibia, Pisces, Insecta, Vermes. Distributa per Classes et Ordines, Genera et Species, cum Differentiis, Specierum, Synonymis, Auctorum, Nominibus Incolarum, Locis natalium, Descriptionibus Insectorum. Editio Altera, Auctior*. Laurentius Salvius, Stockholmiae, 578 pp., 2 pls.
<https://doi.org/10.5962/bhl.title.46380>
- Linsenmaier, W. (1959) Revision der Familie Chrysididae (Hymenoptera) mit besonderer Brücksichtigung der europäischen Spezies. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 32, 1–232.
- Linsenmaier, W. (1968) Revision der Familie Chrysididae (Hymenoptera). Zweiter Nachtrag. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 41 (1–4), 1–144.
- Linsenmaier, W. (1987) Revision der Familie Chrysididae (Hymenoptera). 4. Teil. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 60 (1–2), 133–158.
- Linsenmaier, W. (1994) The Chrysididae (Insecta: Hymenoptera) of the Arabian Peninsula. *Fauna of Saudi Arabia*, 14, 145–206.
- Linsenmaier, W. (1997) Altes und Neues von den Chrysididen. (Hymenoptera, Chrysididae). *Entomofauna*, 18 (19), 245–300.
- Linsenmaier, W. (1999) Die Goldwespen Nordafrikas (Hymenoptera, Chrysididae). *Entomofauna*, Supplement 10, 1–281.
- Madl, M. & Rosa, P. (2012) A Catalogue of the Chrysididae (Hymenoptera: Chryridoidea) of the Ethiopian Region excluding Malagasy Subregion. *Linzer Biologische Beiträge*, 44 (1), 5–169.
- Mathew, G. (2004) *Biodiversity documentation for Kerala. Part 7. Insects*. Kerala Forest Research Institute Peechi, Thrissur, 281 pp.
- Mathew, G., Rugmini, P. & Sudheendrakumar, V.V. (1998) Insect biodiversity in disturbed and undisturbed forests in the Kerala part of Western Ghats. *KFRI Research Report No. 135*, Kerala Forest Research Institute Peechi, Thrissur, 113 pp.
- Mocsáry, A. (1887) *Studia Synonymica. Természetráji Füzetek*, 11 (1), 12–17.
- Mocsáry, A. (1889) *Monographia Chrysididarum Orbis Terrarum Universi*. Hungarian Academy of Science, Typis Societatis Franklinianæ, Budapest, 643 pp.
- Mocsáry, A. (1890) Additamentum primum ad monographiam Chrysididarum Orbis Terrarum Universi. *Természetráji Füzetek*, 13 (2–3), 45–66.
- Mocsáry, A. (1893 [‘1892’]) Additamentum secundum ad monographiam Chrysididarum Orbis Terrarum Universi. *Természetráji Füzetek*, 15 (4), 213–240.
- Mocsáry, A. (1899) Species Chrysididarum novae in collectione Musaei Nationalis Hungarici. *Természetráji Füzetek*, 22, 483–494.
- Mocsáry, A. (1911) Species Chrysididarum novae. I. *Annales Historico-naturales Musei Nationalis Hungarici*, 9, 443–474.
- Mocsáry, A. (1912a) Species Chrysididarum novae. II. *Annales Historico-naturales Musei Nationalis Hungarici*, 10, 375–414.
- Mocsáry, A. (1912b) Species Chrysididarum novae. III. *Annales Historico-naturales Musei Nationalis Hungarici*, 10, 549–592.
- Mocsáry, A. (1913) Species Chrysididarum novae. IV. *Annales Historico-naturales Musei Nationalis Hungarici*, 11, 1–45.

- Mocsáry, A. (1914) Chrysididae plerumque exoticae novae. *Annales Historico-naturales Musei Nationalis Hungarici*, 12, 1–74.
- Móczár, L. (1996) Additions to American Cleptinae (Hymenoptera: Chrysididae). *Memoirs of the Entomological Society of Washington*, 17, 153–160.
- Nagy, C.G. (1968) A new record of Mesitinae. *Memorie della Società Entomologica Italiana*, 47, 168–176.
- Nurse, G.C. (1902) New species of Indian Chrysididae. *The Entomologist*, 35, 304–308.
- Nurse, G.C. (1903a) New species of Indian Chrysididae. *The Entomologist*, 36, 10–12.
- Nurse, G.C. (1903b) New species of Indian Chrysididae. *The Entomologist*, 36, 40–42.
- Nurse, G.C. (1904) New species of Indian Hymenoptera. *Journal of the Bombay Natural History Society*, 16, 19–26.
- Nurse, G.C. (1914) Zoological results of the Arbor Expedition, 1911–1912. Hymenoptera, V: Fossores, Diploptera, Chrysididae. *Records of the Indian Museum*, 8, 443–447.
- Olivier, G.A. (1790) *Chrysis*. In: Olivier, G.-A. (Ed.), *Encyclopédie méthodique. Histoire naturelle. Insectes. Vol. 5 (2)*. Panckoucke, Paris, pp. 669–678.
<https://doi.org/10.5962/bhl.title.7834>
- Pallas, P.S. (1771) s.n. In: *Reise durch verschiedene Provinzen des Russischen Reichs. Erster Theil*. Kayserlichen Akademie der Wissenschaften, St. Petersburg, pp. i–x + 3–504 pp., pls. 1–11.
- Panzer, G.W.F. (1801) *Faunae Insectorum Germaniae initia, oder, Deutschlands Insecten. Heft 80–85*. Felseckerschen Buchhandlung, Nürnberg. [unknown pagination 1801]
<https://doi.org/10.5962/bhl.title.15007>
- Pauli, T., Castillo-Cajas, R.F., Rosa, P., Kukowka, S., Berg, A., van den Berghe, E., Fornoff, F., Hopfenmüller, S., Niehuis, M., Peters, R.S., Staab, M., Strumia, F., Tischendorf, S., Schmitt, F. & Niehuis, O. (2019) Phylogenetic analysis of cuckoo wasps (Chrysididae) reveals the partially artificial nature of the current classification at the genus level in this family of Hymenoptera. *Systematic Entomology*, 44 (2), 322–335.
<https://doi.org/10.1111/syen.12323>
- Paukkunen, J., Berg, A., Soon, V., Ødegaard, F. & Rosa, P. (2015) An illustrated key to the cuckoo wasps (Hymenoptera, Chrysididae) of the Nordic and Baltic countries, with description of a new species. *ZooKeys*, 548, 1–116.
<https://doi.org/10.3897/zookeys.548.6164>
- Radoszkovsky, O. (1880 [“1879”]) Les Chrysidés et Sphegides du Caucase. *Horae Societatis Entomologicae Rossicae*, 15, 140–156.
- Radoszkovsky, O. (1881) Hyménoptères [d’Angola]. *Jornal de Sciencias Mathematicas, Physicas e Naturaes*, 8 (31), 197–221.
- Radoszkowski, O. (1877) *Chrysidiformes, Mutillidae et Sphegidae*. In: *Putieshestvie v Turkestan A.P. Fedtschenko [Voyage au Turkestan d’Alexis Fedtschenko]*, Sankt-Petersburg, Series 14, 2 (5), pp. 1–87, 8 pls. [in Russian and Latin]
- Radoszkowski, O. (1889 [“1888”]) Révision des armures copulatrices des mâles de la tribu des Chrysidés. *Horae Societatis Entomologicae Rossicae*, 23 (1–2), 3–40, 6 pls.
- Radoszkowski, O. (1891) Descriptions de Chrysidés nouvelles. *Revue d’Entomologie*, 10, 183–198.
- Radoszkowski, O. (1893 [“1892”]) Faune hyménoptérologique Transcaspienne. *Horae Societatis Entomologicae Rossicae*, 27 (1/2), 38–81.
- Richards, O.W. (1935) Notes on the nomenclature of the Aculeate Hymenoptera, with special reference to British genera and species. *Transactions of the Royal Entomological Society*, 83 (1), 143–176.
<https://doi.org/10.1111/j.1365-2311.1935.tb00420.x>
- Rosa, P. (2018) Review of *Odontochrydium* Brauns (Hymenoptera, Chrysididae) with description of two species from the Palearctic and Oriental regions. *Zootaxa*, 4450 (4), 445–457.
<https://doi.org/10.11646/zootaxa.4450.4.3>
- Rosa, P. (2019a) Two new species of *Hedychrum* Latreille from Middle East and Pakistan (Hymenoptera, Chrysididae). *Zoology in the Middle East*, 65 (1), 1–12.
<https://doi.org/10.1080/09397140.2019.1571742>
- Rosa, P. (2019b) Two new species of *Hedychrum* Latreille (Hymenoptera, Chrysididae) from India and Nepal, with review of the genus distribution in Asia. *Far Eastern Entomologist*, 385, 1–11.
<https://doi.org/10.25221/fee.385.1>
- Rosa, P. (2019c) A new remarkable species in the *Chrysis ignita* group (Hymenoptera, Chrysididae) and an overview on Central Asian species, with new synonymies. *Linzer Biologische Beiträge*, 51 (1), 397–417.
- Rosa P. (2019d) Cuckoo wasps (Hymenoptera: Chrysididae) of Central Asia. In: *IV Euroasian Symposium on Hymenoptera, Vladivostok, 9–15 September 2019, Abstracts*. FSC Biodiversity FEB RAS, Vladivostok, pp. 32–33.
- Rosa, P. (2020) New records of Chrysididae from Iran (Hymenoptera). *Linzer Biologische Beiträge*, 52 (1), 461–474.
- Rosa, P. & Agnoli, G.L. (2019) Two new remarkable *Hedychridium* Abeille from Kyrgyzstan (Hymenoptera: Chrysididae). *Zoosystematica Rossica*, 28 (1), 42–50.
<https://doi.org/10.31610/zsr/2019.28.1.42>
- Rosa, P., Belokobylskij, S.A. & Zaytseva, L.A. (2017a) The Chrysididae types described by Semenov-Tian-Shanskij and deposited at the Zoological Institute of the Russian Academy of Sciences, Saint Petersburg (Insecta, Hymenoptera). *Proceedings of the Zoological Institute RAS*, Supplement 5, 1–266.

- Rosa, P., Lelej, A.S., Belokobylskij, S.A., Loktionov, V.M. & Zaytseva, L.A. (2017b) Family Chrysididae. *In*: Lelej A.S., Proshchalykin M.Yu. & Loktionov V.M. (Eds.), Annotated catalogue of the Hymenoptera of Russia. Vol. 1. Symphyta and Apocrita: Aculeata. *Proceedings of the Zoological Institute RAS*, Supplement 6, pp. 126–144.
<https://doi.org/10.31610/trudyzin/2017.supl.6.5>
- Rosa, P., Lotfalizadeh, H. & Pourrafei, L. (2013) First checklist of the chrysidid wasps (Hymenoptera: Chrysididae) of Iran. *Zootaxa*, 3700 (1), 1–47.
<https://doi.org/10.11646/zootaxa.3700.1.1>
- Rosa, P., Madl, M., Zettel, H. & Zimmermann, D. (2020a) Annotated catalogue of the Chrysididae (Insecta, Hymenoptera) types deposited at the Naturhistorisches Museum, Vienna. *Annalen des Naturhistorischen Museums in Wien*, Serie B, 122, 17–140.
- Rosa, P., Proshchalykin, M. Yu., Lelej, A.S., Loktionov, V.M. & Mokrousov, M.V. (2017c) New records of Chrysididae (Hymenoptera) from Russia with description of five new species. *Far Eastern Entomologist*, 345, 1–33.
- Rosa, P., Thai, P.H. & Mita, T. (2020b) Rediscovery of *Lustrina* Kurian (Hymenoptera, Chrysididae), with redescription of *L. assamensis* Kurian. *Zootaxa*, 4718 (2), 285–291.
<https://doi.org/10.11646/zootaxa.4718.2.10>
- Rosa, P., Vas, Z. & Xu, Z.-F. (2017d) The Palearctic types of Chrysididae (Insecta, Hymenoptera) deposited in Hungarian Natural History Museum, Budapest. *Zootaxa*, 4252 (1), 1–130.
<https://doi.org/10.11646/zootaxa.4252.1.1>
- Rosa, P., Wei, N.-S., Feng, J. & Xu, Z.-F. (2016a) Revision of the genus *Trichrysis* Lichtenstein, 1876 from China, with description of three new species (Hymenoptera, Chrysididae). *Deutsche Entomologische Zeitschrift*, 63 (1), 109–136.
<https://doi.org/10.3897/dez.63.7347>
- Rosa, P., Wei, N.-S., Notton, D. & Xu, Z.-F. (2015a) The genus *Philoctetes* Abeille de Perrin, 1879 from China, with description of two new species (Hymenoptera, Chrysididae). *Zootaxa*, 4040 (4), 433–444.
<https://doi.org/10.11646/zootaxa.4040.4.3>
- Rosa, P., Wei, N.-S., Notton, D. & Xu, Z.-F. (2016b) Revision of the Oriental genus *Holophris* Mocsáry, 1890 and description of the genus *Leptopareia* Rosa & Xu, gen. nov. (Hymenoptera, Chrysididae). *Zootaxa*, 4083 (2), 201–220.
<https://doi.org/10.11646/zootaxa.4083.2.2>
- Rosa, P., Wei, N.-S. & Xu, Z.-F. (2014) An annotated checklist of the chrysidid wasps (Hymenoptera, Chrysididae) from China. *ZooKeys*, 455, 1–128.
<https://doi.org/10.3897/zookeys.455.6557>
- Rosa, P., Wei, N.-S. & Xu, Z.-F. (2015b) Revalidation of genus *Chrysellampus* Semenov, 1932, with description of two new species from China (Hymenoptera, Chrysididae). *Zootaxa*, 4034 (1), 148–160.
<https://doi.org/10.11646/zootaxa.4034.1.7>
- Rosa, P., Wei, N.-S. & Xu, Z.-F. (2015c) Contribution to the genus *Omalus* Panzer, 1801 of China, with descriptions of two new species (Hymenoptera, Chrysididae). *Zootaxa*, 4013 (1), 67–76.
<https://doi.org/10.11646/zootaxa.4013.1.4>
- Rosa, P., Wei, N.-S. & Xu, Z.-F. (2016c) *Istiochrysis* gen. nov., a new chrysidid genus from Oriental China (Hymenoptera, Chrysididae, Chrysidini). *Zootaxa*, 4111 (5), 591–597.
<https://doi.org/10.11646/zootaxa.4111.5.5>
- Rosa, P., Wei, N.-S. & Xu, Z.-F. (2017e) One new species and three new records of *Chrysis* Linnaeus from China (Hymenoptera, Chrysididae). *ZooKeys*, 669, 65–88.
<https://doi.org/10.3897/zookeys.669.12398>
- Rosa, P., Wiśniowski, B. & Xu, Z.-F. (2015d) Annotated type catalogue of the Chrysididae (Insecta, Hymenoptera) deposited in the collection of Radoszkowski in the Polish Academy of Sciences, Kraków. *ZooKeys*, 486, 1–100.
<https://doi.org/10.3897/zookeys.486.8753>
- Rosa, P. & Xu, Z.-F. (2015) Annotated type catalogue of the Chrysididae (Insecta, Hymenoptera) deposited in the collection of Maximilian Spinola (1780–1857), Turin. *ZooKeys*, 471, 1–96.
<https://doi.org/10.3897/zookeys.471.6558>
- Roy, S.B. & Kundu, B.G. (1985) Insecta: Hymenoptera. *Records of the Zoological Survey of India*, 82 (1–4), 221–229.
- Sann, M., Niehuis, O., Peters, R. S., Christoph, M., Kozlov, A., Podsiadlowski, L., Bank, S., Meusemann, K., Misof, B., Bleidorn, C., Ohl, M. (2018) Phylogenomic analysis of *Apoidea* sheds new light on the sister group of bees. *BMC Evolutionary Biology*, 18 (1), 71.
<https://doi.org/10.1186/s12862-018-1155-8>
- Schrank, F. von Paula (1802) *Fauna Boica. Durchgedachte Geschichte der in Baiern einheimischen und zahmen Thiere. Vol. 3. Teil 2*. W. Krull, Nurnberg, 372 pp.
- Scopoli, J.A. (1763) *Entomologia Carniolica exhibens Insecta Carnioliae indigena et distributa in ordines, genera, species, varietates, Methodo Linneana*. Typis Ioannis Thomae Trattner, Vindobonae [Vienna], xxxvi + 420 pp.
<https://doi.org/10.5962/bhl.title.119976>
- Semenov-Tian-Shanskij, A. (1932) Supplementa ad Chrysididarum monographias ab A.G. Dahlbom (1854), A. Mocsáry (1889), R. du Buysson (1896) et H. Bishoff (1913) editas. I. *Horae Societatis Entomologicae Rossicae*, 42, 1–48.
- Semenov-Tian-Shanskij, A.P. (1967) New species of gold wasps (Hymenoptera, Chrysididae). *Proceedings of the Zoological*

- Institute, Academy of Sciences of the USSR*, 43, 118–184. [in Russian]
- Semenov-Tian-Shanskij, A. & Nikol'skaya, M.N. (1954) Gold wasps (Hymenoptera, Chrysididae) of Tajikistan. *Trudy Zoologicheskogo Instituta Akademiy, Nauk SSSR*, 15, 89–137. [in Russian]
- Semenov, A. (1891) *Pseudochrysis (Spintharis) virgo*, sp. n. *Horae Societatis Entomologicae Rossicae*, 25, 441–444.
- Semenow, A. (1892) De genere *Pseudochrysis* m. *Horae Societatis Entomologicae Rossicae*, 26, 480–491.
- Sihag, R.C. (1983) Life cycle pattern, seasonal mortality, problem of parasitization and sex ratio pattern in alfalfa pollinating megachilid bees. *Zeitschrift für Angewandte Entomologie*, 96 (4), 368–379.
<https://doi.org/10.1111/j.1439-0418.1983.tb03683.x>
- Smith, F. (1852) Descriptions of some Hymenopterous Insects captured in India, with notes on their Economy, by Ezra T. Downes, Esq. who presented them to the Honourable the East India Company. *The Annals and Magazine of Natural History*, 9 (2), 44–50.
- Smith, F. (1859) Catalogue of Hymenopterous Insects collected at Celebes by Mr. A. R. Wallace. *Journal of the Proceedings of the Linnean Society of London, Zoology*, 3, 4–27.
<https://doi.org/10.1111/j.1096-3642.1858.tb02506.x>
- Smith, F. (1860) Descriptions of new species of hymenopterous insects collected by Mr. A. R. Wallace at Celebes. *Proceedings of the Linnean Society of London, Zoology*, 5, 57–93.
<https://doi.org/10.1111/j.1096-3642.1860.tb01021.x>
- Smith, F. (1874) A revision of the Hymenopterous genera *Cleptes*, *Parnopes*, *Pyria* and *Stilbum*, with descriptions of new species of those genera, and also of new species of the genus *Chrysis* from North China and Australia. *Transactions of the Entomological Society of London*, 7, 451–471.
<https://doi.org/10.1111/j.1365-2311.1874.tb00175.x>
- Spinola, M. (1806) *Insectorum Liguriae species novae aut rariores, quas in agro Ligustico nuper detexit, descripsit et iconibus illustravit, Maximilianus Spinola, adjecto catalogo specierum auctoribus jam enumeratarum, quae in eadem regione passim occurrunt. Vol. 1.* Yves Gravier, Genuae, xvii + 160 pp., 2 pls. [1806]
<https://doi.org/10.5962/bhl.title.65985>
- Spinola, M. (1838) Compte rendu des hyménoptères recueillis par M. Fischer pendant son voyage en Égypte, et communiqués par M. le docteur Walzl a Maximilien Spinola. *Annales de la Société Entomologique de France*, 7, 437–457.
- Strumia, F. (1996) *Praetochrysis* from India and South-East Asia (Hymenoptera Chrysididae). *Bollettino della Società Entomologica Italiana*, 128 (1), 57–64.
- Strumia, F. (1999) Revision of the Oriental species of the Genus *Hedychridium*: new species and new synonymies (Hymenoptera Chrysididae). *Bollettino della Società Entomologica Italiana*, 131 (1), 47–76.
- Suresh, P.V., Sudheendrakumar, V.V., Binoy, C.F., Mathew, G. & Narendran, T.C. (1999) The macro hymenopteran fauna of Parambikulam Wildlife Sanctuary. *Zoos' Print*, 24 (4), 1–2.
<https://doi.org/10.11609/JoTT.ZPJ.14.4.1-2>
- Thakkar, B. & Parikh, P. (2018) An inventory on diversity and distribution pattern of Hymenopteran Insects in Gujarat, India. *International Journal of Research in Applied, Natural and Social Sciences*, 6, 19–32.
<https://doi.org/10.26438/ijrsbs/v6i5.1925>
- Trautmann, W. (1921) Neue paläarktische Goldwespen. *Neue Beiträge zur Systematischen Insektenkunde*, 2 (5), 35–36.
- Tsuneki, K. (1952) Two new species of Chrysididae from Japan and Korea. *Insecta Matsumurana*, 18 (1–2), 31–33.
- Tsuneki, K. (1963) Chrysididae and Sphecidae from Thailand (Hymenoptera). *Etizenia*, 4, 1–3.
- Tsuneki, K. (1970) Ein Beitrag zur Goldwespen-fauna Formosas. *Etizenia*, 49, 1–21.
- Walker, F. (1871) *A list of Hymenoptera collected by J.K. Lord, Esq. in Egypt, in the neighbourhood of the Red Sea and in Arabia, with descriptions of the new species.* E.W. Janson, London, 63 pp.
<https://doi.org/10.5962/bhl.title.8818>
- Westwood, J.O. (1842) *Natural history of the insects of India by E. Donovan. New Revised Edition.* H.G. Bohn, London, vi + 102 pp., 58 pls.
- Westwood, J.O. (1874) *Thesaurus Entomologicus Oxoniensis.* Clarendon Press, Oxford, 205 pp.