The cuckoo wasps of the Himalayas (Insecta: Hymenoptera: Chrysididae)

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Abstract

Eighty-two species from 16 genera are reported in this first contribution to the Himalayan Chrysididae. Four new species are described: *Chrysis gabriellae* Rosa, sp. nov. from India (Sikkim) (*ignita* group), *Chrysis hartmanni* Rosa, sp. nov. from Nepal (*maculicornis* group), *Chrysis uncia* Rosa & Jacobs, sp. nov. from India (Ladakh) (*comparata* group), and *Chrysellampus himalayanus* Rosa, sp. nov. from Nepal. *Chrysis ultramonticola* Linsenmaier, 1968 is elevated to species rank. *Chrysis volatis* Smith, 1874 is transferred from the *ignita* group to the *taczanovskii* group. Four species from Afghanistan, fourteen from Nepal, four from Pakistan and one from India are reported for the first time. Forty-four species in 11 genera are considered endemic to the Himalayas, including all known members of the genus *Hedychridium* Abeille de Perrin, 1878. The regions with the highest number of recorded species are Nepal (24 species) and Sikkim (19). In total, the Indian Himalayan states count 41 species.

Key words: new records, new status, distribution, catalogue, taxonomy.

Introduction

The family Chrysididae includes more than 2,900 described species in 92 genera distributed globally, excluding fossil records (Lucena & Almeida 2021). They are subdivided in four subfamilies, but only Chrysidinae and Clepinae are currently known for the Himalayas (Rosa et al. 2021a). The other two subfamilies, Amiseginae and Loboscelidinae are both know from southern India, but they are clearly under sampled and could be present at the foothills of the Himalayan range.
The Chrysidinae and Cleptinae are brightly coloured and shiny Hymenoptera characterised by their brilliantly metallic colours hence their vernacular name "jewel wasps". They are also commonly known as "cuckoo-wasps", for their parasitoid or cleptoparasitic behaviour. In fact, the female lays an egg in the host nest and the larvae develop at the expense of the host. The cuckoo wasp larva feeds directly on the host prepupa or the pupa (acting as parasitoid) or on the host prey items stored in the nest (cleptoparasite), normally after killing the owner of the nest. Hosts of the subfamily Chrysidinae are solitary bees (Megachilidae), solitary wasps of the family Vespidae (Eumeninae, Masarinae and Zethinae), and hunting wasps in the loose grouping of Spheciformes (such as Astatidae, Bembecidae, Sphecidae, Crabronidae, Pemphredonidae, Philanthidae, and Psenidae), whereas members of the subfamily Cleptinae attack the sawfly families Tenthredinidae and Diaprionidae. Amiseginae and Loboscelidinae are known to be parasite of Phasmid eggs (Kimsey & Bohart 1991).
Although Chrysididae are considered one of the most visually attractive insect family due to their vivid colouration and for their intriguing biology, their taxonomy remains incompletely known and only recent molecular studies have begun to shed light on their phylogenetic relationships. They are still largely understudied in the East Palaearctic and Oriental biogeographic regions (Rosa et al. 2021a).

From a morphological point of view, chrysidids can be distinguished from other aculeate wasps by the reduced number of visible metasomal segments: Chrysidinae have only three visible terga and sterna and 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 reduced veins and at most six closed or partially closed cells, and the posterior wings completely devoid of closed cells; the body integument strongly chitinised and strengthened to protect them against their hosts (Kimsey & Bohart 1991).

The study of the Himalayan cuckoo wasps is limited and fragmented. It mostly follows the history of the Indian Chrysididae (Rosa et al. 2021a), with the first record for the Indian Himalaya coming from Bingham (1903) in the volume 'The Fauna of British India, including Ceylon and Burma. Hymenoptera, Vol. II. Ants and Cuckoo-wasps'. At the same time, Nurse (1902, 1903a, b, 1904) provided a good overview of the species from Pakistan and Gujarat. Soon later, Mocsáry (1912, 1913, 1914) described some species from the Indian Himalaya. A few records were published by Balthasar (1957) from Afghanistan and finally Linsenmaier (1959, 1968) described some new species from Tibet and Pakistan. Kimsey & Bohart (1991) in the catalogue of the world species listed 27 cuckoo wasps for the Himalayas, as it is here considered. Five species were later described by Strumia (1996), Wei et al. (2013, 2014) and Rosa (2019a). The first list of the Indian Himalayan Chrysidids was published by Rajmohana et al. (2018) who listed 15 species found in the literature. More recently Rosa et al. (2021a) listed 35 species from the Indian states of the Himalayan region.
For the present study I received unidentified specimens from the nature museums of Erfurt (NME), Leiden (RMNH), Linz (BZL) and Luzern (NMLU). Their examination led to the identification of four new species for Afghanistan, thirteen for Nepal, four for Pakistan, ten for Tibet and four new to science. The checklist of the Himalayan cuckoo wasps currently includes 82 species, which is undoubtedly only a baseline for future studies on the diversity and distribution of Himalayan chrysidids.

Material and Methods

The present study is based on two sources of information: (i) data extracted from published papers and (ii) specimens received for this study from the Naturkundemuseum Erfurt (Germany), the Natur-Museum, Luzern (Switzerland), the Biodiversitätszentrum

Oberöstereich, Linz (Austria), and Naturalis Biodiversity Center, Leiden (The Netherlands); (iii) specimens from private collections. A large portion of Himalayan and Indian chrysidids deposited in European museums as well as specimens collected and deposited in collections in India are still awaiting identification.

All types of the species listed in this catalogue were examined and are deposited in the following museums:

BZL = Biodiversitätszentrum Oberöstereich in Linz (Austria);
ETHZ = Eidgenössische Technische Hochschule in Zürich (Switzerland);
HNHM = Magyar Természettudományi Múzeum, Budapest (Hungary);
ISEA-PAS = Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Kraków (Poland);
LUOMUS: Finnish Museum of Natural History, Helsinki);
MMZU = Zoological Museum, Moscow Lomonosov State University (Russia);
MNHN = Muséum National d'Histoire Naturelle, Paris (France);
MNHP = Museum of Natural History, Prague, (Czech Republic);
MfN = Museum für Naturkunde, Berlin (Germany);
MSNG = Museo Civico di Storia Naturale, Genova (Italy);
MSNM = Museo Civico di Storia Naturale, Milan (Italy);
NHMUK = Natural History Museum, London (UK);
NHMW = Naturhistorisches Museum Wien (Vienna);
NME = Naturkundemuseum Erfurt (Germany);
NMLU = Natur-Museum, Luzern (Switzerland);
NRS = Naturhistoriska Riksmuseet, Stockholm (Sweden);
OUMUK = Oxford University Museum, Oxford (UK);
SCAU = South China Agricultural University, Guangzhou (China);
RMNH = Naturalis Biodiversity Center, Leiden (The Netherlands);
ZIN = Zoological Institute, St. Petersburg (Russia);
ZMUC = Zoologisk Museum, Copenhagen (Denmark).

Other material was examined from the private collections of

MHC = Marek Halada collection, České Budějovice (Czech Republic);
MJC = Maarten Jacobs collection, Herentals (Belgium);
PRC = Paolo Rosa Private Collection, Bernareggio (Italy).

Images were taken with a Camera Olympus OMD E-M1 Mark II with the Olympus Zuiko 60 mm objective and a Marumi lens for general habitus and a Mitutoyo plan achromatic lens LWD for details images were stacked with the Helicon© software and then enhanced with Adobe Photoshop© CS6.

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), pag. (page), s.s. (sensu stricto), syn. (synonym), typ. (discussion on type material). An asterisk (*) indicates a new record for the country.

Names of valid genera are listed alphabetically within tribes, and valid species names are listed alphabetically within genera. The classification proposed in Rosa et al. 2021a is followed.

Abbreviations used in the taxonomic part and in the descriptions are as follows: cat. = catalogue; descr. = description; diagn. = diagnosis; F1, F2, F3, etc. = flagellomeres 1, 2, 3, etc., respectively; 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; POL = posterior ocellar line, the shortest distance between posterior ocelli; S = metasomal sternum; T = metasomal tergum.

The sudied area includes the Himalayan states and provinces as in Figure 1.

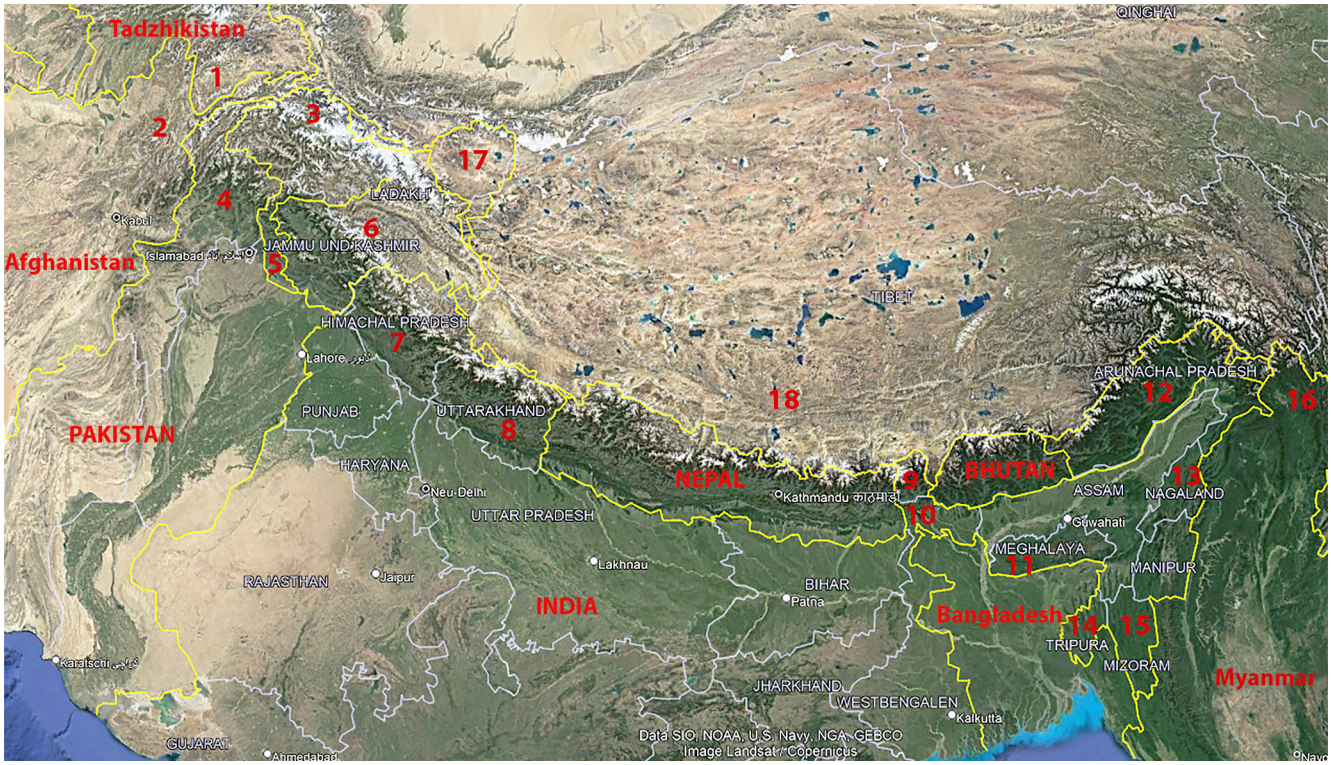

Fig. 1. Geographic map of the Himalayas and surrounding territories. **Tajikistan**: 1 = Gorno-Badakhshan Province; **Afghanistan**: 2 = Badakhshan Province; **Pakistan**: 3 = Gilgit-Baltistan; 4 = Khyber Pakhtunkhwa; 5 = Azad Jammu and Kashmir; **India**: 6 = Jammu and Kashmir; 7 = Himachal Pradesh; 8 = Uttarakhand; 9 = Sikkim; 10 = Darjeeling district of West Bengal; 11 = Meghalaya; 12 = Arunachal Pradesh; 13 = Nagaland; 14 = Tripura; 15 = Mizoram; **Myanmar**: 16 = Kachin State; **China**: 17 = Aksai Chin; 18 = Tibet (Xizang). **Bhutan**; **Nepal**.

Taxonomic part
Subfamily Cleptinae

***Cleptes tibetensis* Wei, Rosa & Xu, 2013**

Cleptes tibetensis Wei, Rosa & Xu, 2013: 87. Holotype ♂; Tibet: Pailongxiang (*asianus* group) (SCAU).
Distribution. Tibet.

Subfamily Chrysidinae
Tribe Elampini

Genus *Chrysellampus* Semenov-Tian-Shanskij, 1932

Chrysellampus Semenov-Tian-Shanskij, 1932: 5. Type species: *Ellampus heros* Semenow, 1892: 71 [= *Chrysellampus heros* (Semenow, 1892)], by original designation.

***Chrysellampus himalayanus* Rosa sp. nov.**
(Figs 2A-2F, 3A-3F)

Material examined. Holotype, ♂, Nepal: Bajhang, 29 km NE of Chainpur, Ghatganga Khola, NE of Shima, 2300m, 19.vi.2009, leg. A. Weigel, riverside (NME).
Diagnosis. At present, the genus *Chrysellampus* includes ten Asian species (Rosa et al. 2015b). Three of them, namely *C. sculpticollis* (Abeille de Perrin, 1878), *C. medanae* (du Buysson in Magretti, 1890), and *C. tatianae* Semenov-Tian-Shanskij, 1967 can be immediately separated from *C. himalayanus* by their red colour of the metasoma. Six species share a similar blue body colour: *C. heros* (Semenow, 1892), *C. pici* (du Buysson, 1900) (= *C. nigromaculatus* Linsenmaier, 1997), *C. praeteritorum* (Semenov-Tian-Shanskij, 1932), *C. duplipunctatus* Tsuneki, 1948, *C. obtusidentibus* Rosa, Wei & Xu, 2016 and *C. proximocellis* Rosa, Wei & Xu, 2016. Finally, a Japanese species, *C. harmandi* (du Buysson, 1903) shows a black body colour with green spots, similar to other Far Eastern Asian species, like *Pseudomalus punctatus* (Uchida, 1927). Despite the bad conditions of the holotype, missing both pedicel and flagellum and large part of tarsi, *Chrysellampus himalayanus* sp. nov. can be still easily separated from all the blue central Asian species by the piriform shape of the metasoma, with second tergum distinctly enlarged on the second half (Figs. 2A, 3D) (*vs.* subparallel or with gently convex sides in other species); face with wide scapal basin (Fig. 2B), upper part slightly arcuate (*vs.* deep scapal basin with upper part strongly arcuate); large punctures on mesoscutum widely separated and somehow clumped along notauli (Fig. 3A) (*vs.* covering all mesoscutum in *C. duplipunctatus*, *C. heros*, *C. obtusidentibus*, *C. pici, C. proximocellis*); apex of third tergum with deep, large, round notch and two lateral pointed teeth (Fig. 3E) (*vs.* blunt in *C. obtusidentibus* and *C. praeteritorum*). *Chrysellampus himalayanus* sp. nov. is more closely related to *C. harmandi* for general habitus (see Terayama & Suda 2016, Plate 85, type examined at MNHN), but it can be easily separate by the wide and rounded median notch at apex of third tergum (*vs.* narrow and arcuate in *C. harmandi*), and by body colour, deep blue on head and mesosoma, with light blue stripe on apical and basal margin of pronotum, basal margin of scutellum and propodeal angles and by the purple metasoma (*vs.* body dorsally black, with green median spot on mesoscutum and two lateral green spots on scutellum, green propodeal projections and legs; face, mesosoma and metasoma laterally green).
Description.
Male. Holotype (Fig. 2, 3). Body length 6.0 mm. Fore wing length 3.9 mm.
Head. Vertex with deep, medium-sized punctures, (0.3-0.5 × MOD) (Fig. 2E); two impunctate areas close to posterior ocelli, colliculate, with reticulate microsculpture; area from ocelli triangle to occiput and gena colliculate on intervals between the punctures; face on lateral sides of scapal basin with shallow punctures; scapal basin slightly deep and transversely weakly striate; gena obliquely wrinkled, with sharp genal carina; ocellar triangle isosceles; postocellar line indistinct. OOL = 2.5 × MOD; POL = 1.8 × MOD; MS = 1.0 × MOD.
Mesosoma. Interspaces between punctures colliculate (Fig. 3A). Pronotum antero-medially with deep and large punctures, 1.0 × MOD, smaller at sides and posteriorly, intermixed with shallow and tiny punctures, irregularly distributed; anterior pronotal margin with sharp carina. Mesoscutal median area with punctures mostly clumped along notauli, larger at base; lateral areas with shallower and sparser punctures clumped along notauli, parapsidal furrows and tegulae; notauli visible, as fine line; parapsidal furrows deep and complete, developed from basal suture to pronotum; mesoscutellum with wide antero-median area impunctate, fully colliculate; remaining part with large and round punctures; mesopleuron with deep, large and contiguous punctures, covering almost the whole surface; omaulus carinate (Fig. 2F). Metanotum elongate and gibbous, with very large, up to 1.5 × MOD, deep, irregularly shaped, aereolate punctures; propodeal angles acute, divergent; metapectal-propodeal disc semicircular (Fig. 3C).
Metasoma. First tergum antero-medially impunctate, posterior half, second and third tergum with fine, even, shallow and spare dots (Fig. 3D); second tergum laterally expanded on posterior half; apex of third tergum with a deep, semicircular notch, bidentate at its margins (Figs 3D, 3E). First and second tergum at sides with scattered white setae, 1 × MOD long; third tergum with similar setae distributed all over the surface. Genital capsule with one broken gonocoxa as in Figs 3F, 3G.
Colouration. Body metallic blue with light blue reflections on face, anterior and posterior margin of pronotum, scutellar through, propodeal projections (Figs 2A, 3C); terga purple (Fig. 3D), sterna light blue. Fore wing darker on distal half, with unusual lighter outer margin (Fig. 3B).
Female. Unknown.
Distribution. Nepal.
Etymology. *Chrysellampus himalayanus* is named after the Himalayas, the type locality.

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* (Lepeletier, 1806)], by subsequent designation of Ashmead 1902: 228.

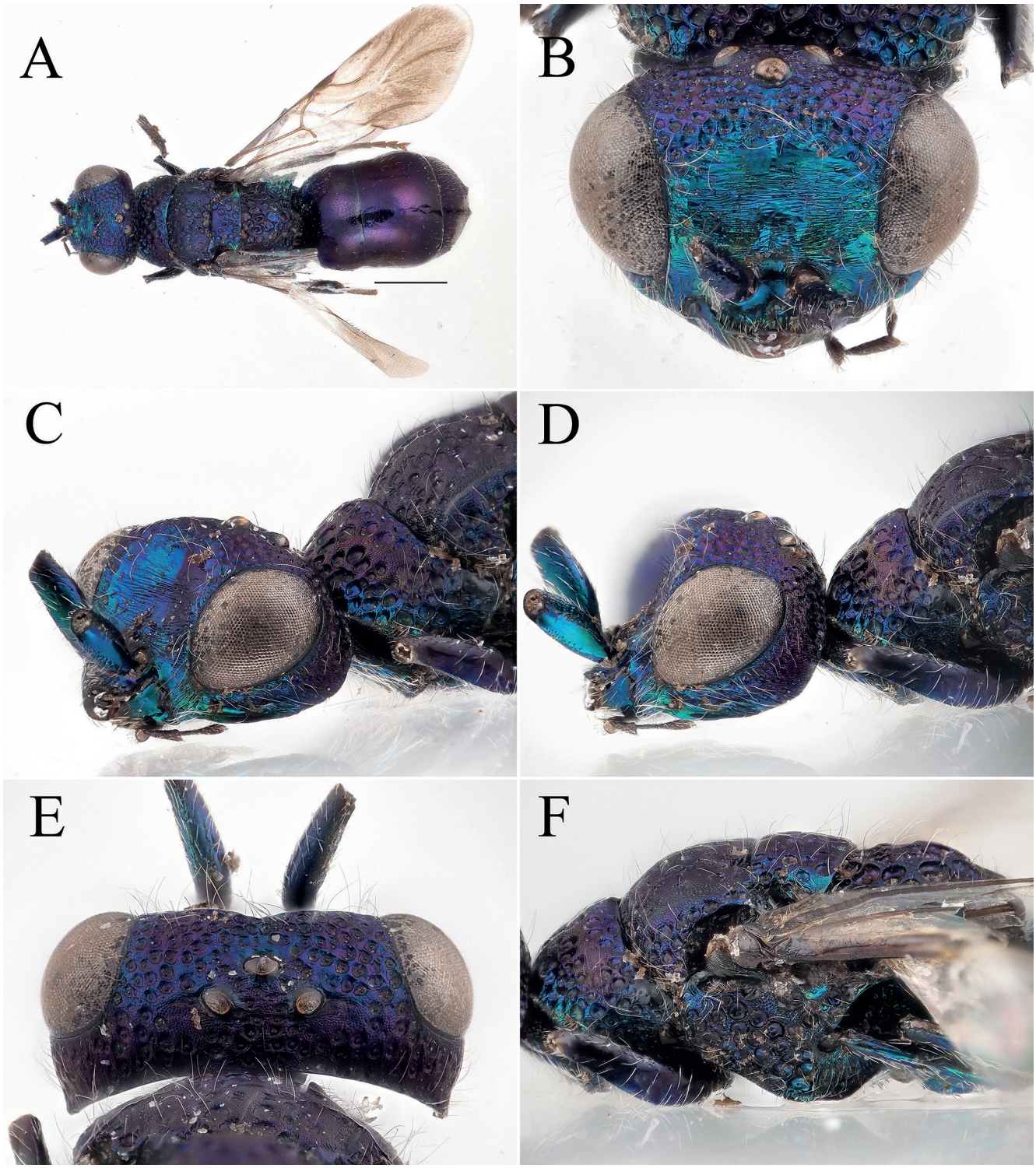

Figure 2. *Chrysellampus himalayanus* sp. nov., male, holotype. A) Habitus, dorsal view. B) Face, frontal view. C) Head, fronto-lateral view. D) Head, lateral view. E) Head, dorsal view. F) Mesosoma, lateral view. Scale bar = 1 mm.

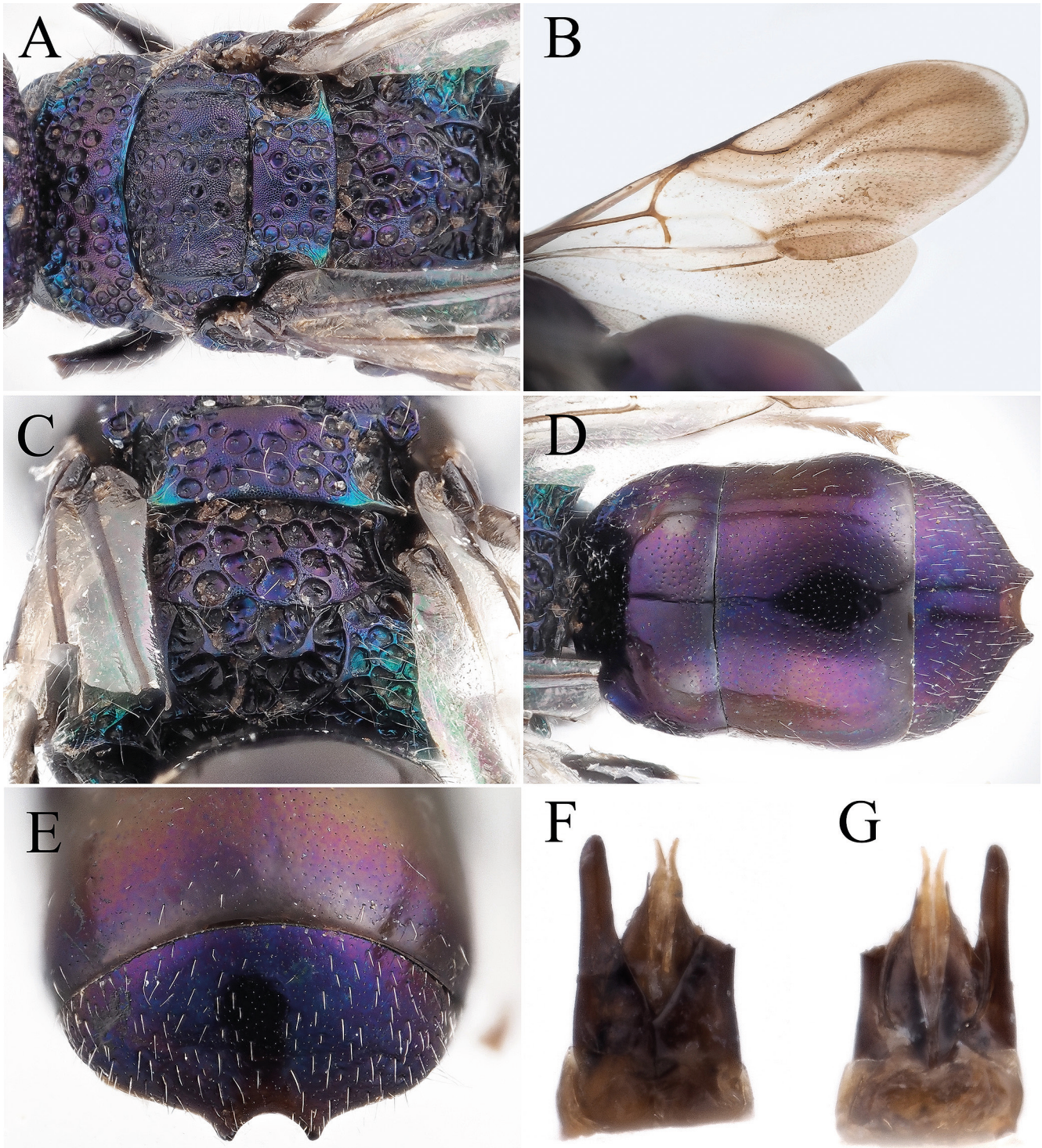

Figure 3. *Chrysellampus himalayanus* sp. nov., male, holotype. A) Mesosoma, dorsal view. B) Fore wing. C) Metanotum, posterior view. D) Metasoma, dorsal view. E) Metasoma, posterior view. F) Genital capsule, dorsal view. G) Genital capsule, ventral view.

***Elampus assamensis* (Mocsáry, 1911)**

Ellampus (*Notozus*) *assamensis* Mocsáry, 1911: 443. Holotype ♂; India: Assam [actually Meghalaya]: Shillong (HNHM).
Notozus assamensis: Bischoff 1913: 5 (cat., Assam [actually Meghalaya]).
Elampus assamensis: Kimsey & Bohart 1991: 166 (cat., North India); Rosa et al. 2021a: 11 (cat., distr., Fig. 6, pictures of the type).

Material examined. India: 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). Nepal: Gandaki: Manang, way from Kharche to Goa, 28°35'31''N 84°25'07'', 2700m, tp 28°34'00''N 84°24'13''E, 2500m, 26.v.2013, leg. A. Kopetz (NME).
Distribution. India (Meghalaya); Nepal*. Russia (Far East) (Rosa et al. 2021a).

***Elampus gladiator* Rosa, 2021**

Elampus gladiator Rosa in Rosa et al., 2021a: 12. Holotype ♂; India: Himachal Pradesh, Manali/Mahri, 3300-3600m, 21.-22.vi.1989, leg. A. Riedl (NMLU).

Material examined. India: 1♂, Himachal Pradesh, Manali/Mahri, 3300-3600m, 21.-22.vi.1989, leg. A. Riedl, GBIF_Chr00002090 (NMLU); 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 (NMLU); 1♂, Joshimath, Auli, 2800m, 13.-17.vii.1994, leg. M. Snizek (BZL); 1♀, Uttar Pradesh, 15km S Badarinath, 30 km N Joshimath, 2800m, 10.vii.1994, leg. M. Šnizek (MHC). ♀, India: Sikkim, Chateng, 5120 ft, 18.-29.vii.1959, leg. F. Schmidt (RMNH Naturalis). Nepal: 2♂, 1♀, Maharigaon Nördli. 29°20'24''N 82°23'21''E, 3400-3445m, Weißschale, 20.vi.1997, on *Euphorbia*, leg. F. Creutzburg (NME); 4♂, Bajura, Simikot, 19 km W of Kuwadi Khola, 3500m, 29°53'14''N 81°38'40''E, 5.vii.2021, leg. Creutzburg (NME); 1♂, Karlali, env. Churta, 3000-3400m, 31.v.2007, leg. F. Creutzburg (NME);
Distribution. India (Himachal Pradesh, Jammu & Kashmir, Uttar Pradesh), Nepal*.

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

Notozus kashmirensis Nurse, 1902: 305. Lectotype ♀ designated by Kimsey 1986: 109; Pakistan: Kashmir, on the banks of Jhelum (MNHN). Bischoff 1913: 6 (cat., Kashmir); Kimsey 1986: 109 (lectotype designation, Kashmir).
Ellampus kashmirensis: Bingham 1903: 420 (key, Kashmir (5000 ft), 420-421 (descr.), Rosa 2023:1412, Fig. 7, photos of the type.
Omalus (*Notozus*) (!) *kashmirensis*: Jonathan et al. 1977: 85. Kashmir.
Elampus kashmirensis: Kimsey & Bohart 1991: 168 (cat., India: Kashmir); Rajmohana et al. 2018: 381 (cat., Himalaya).

Distribution. Pakistan (Kashmir).

***Elampus panzeri* (Fabricius, 1804)**

Chrysis scutellaris Panzer, 1798: fig. 51, p.11, nom. praeocc., nec Fabricius, 1794. Holotype unknown; Germany: Nürnberg (MfN?).
Chrysis Panzeri Fabricius, 1804: 172. Replacement name for *Chrysis scutellaris* Panzer, 1798, nec Fabricius, 1794.

Material examined. Afghanistan: 1♂, Badakshan, Mirkan, 12.viii.1888, Coll. Dr. Enslin Linsenmaier (NMLU); 1♂, same data, 3.vii.1911 (NMLU). Pakistan: 1♀, Gilgit-Baltistan, Baltit [= Karimabad], 18.vi.1954, J. Klapperich (NMLU).
Distribution. Afghanistan* (Badakshan), Pakistan* (Gilgit-Baltistan). Trans-Palaearctic species, widely distributed from western Europe and northern Africa to China (Rosa et al. 2014).
Remarks. Two male specimens are deposited in the Linsenmaier collection (NMLU) and identified as *Omalus* (*Elampus*) *constrictus* (Förster, 1853). The names of *Elampus constrictus* (Förster, 1853) and *E. panzeri* (Fabricius, 1804) were accidentally interchanged by Trautmann (1927) and other authors (e.g. Linsenmaier 1959). The confusion between the two names was originated by a mislabelled type specimen (Móczár 1964).

***Elampus spina* (Lepeletier, 1806)**

Hedychrum spina Lepeletier, 1806: 121. Holotype ♀ [not ♂]; France: Meudon (Paris or Turin).

Material examined. Pakistan: 1♀, Gilgit-Baltistan, Imit, 3.viii.1954, J. Klapperich (NMLU).
Distribution. Pakistan*. West-Palaearctic, from southern Europe and northern Africa to western Asia (Linsenmaier, 1959, 1999).
Remarks. Identification by Linsenmaier to be confirmed; the species may refer to *Elampus foveatus*, unknown to Linsenmaier, or another central Asian species.

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); Rajmohana et al. 2018: 381 (cat.); Rosa et al. 2021a: 14 (cat., distr.), Rosa 2023: 1415, Fig. 9, photos of the holotype.

Distribution. India (Sikkim).

***Hedychridium nepalense* Strumia, 1999**

Hedychridium nepalense Strumia, 1999: 65. Holotype ♀; Nepal: Gendaki, nr. Pokhara, Phewa Tal, 28°14'N 83°59'E, 22.xi.1975 (RMNH) (*ardens* group).

Distribution. Nepal (Kaski District).

***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.)) (RMNH) (*ardens* group).

Distribution. India (Sikkim).

Genus *Hedychrum* Latreille, 1802

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

***Hedychrum* cf. *formosanum* Mocsáry, 1911**

Hedychrum formosanum Mocsáry, 1911: 458. Holotype ♂, Taiwan: Takao [= Kaohsiung] (HNHM).

Material examined. Nepal: 1♂, Narayani, Sauraha Rapti River, 27°34’80’’N 84°29’49’’E, 180m, 14.-15.vii.2001, leg. F. Creutzburg (NME).
Distribution. Nepal*. Burma* (Shwego Myo, x.1895, leg. L. Fea, MSNG). China (Taiwan).
Remarks. This species was observed in several collections in Europe and China, and it was often identified as *Hedychrum flammulatum* Smith, 1858. However, the latter, described from Celebes, clearly belongs to a distinct species. The closest species for this taxon is *Hedychrum formosanum*, which could be actually widely distributed in the Oriental region and misidentified with other blue *Hedychrum* species. In any case, additional material is needed for a revision of the blue Asian *Hedychrum*.

***Hedychrum migliaccioi* Rosa, 2019**

Hedychrum migliaccioi Rosa, 2019a: 5. Holotype ♀; Nepal: Janakpur Zone, Jiri, 1850 m, 20.v.1980, leg. E. Migliaccio (MSNM).

Distribution. Palaearctic: Nepal.

***Hedychrum striatum* Mocsáry, 1911**

Hedychrum striatum Mocsáry, 1911: 457. Holotype female; Malaysia: Malacca, Perak (HMNH). Rosa & Halada 2021: 195 (India: Arunachal Pradesh).

Material examined. India: 1♀, Arunachal Pradesh, vicinity of Durang, 1800 ± 100m, 27°21′N 92°13′E, 8-22.V.2006, P. Pacholátko leg. (MHC).
Distribution. India (Arunachal Pradesh); Malaysia (Kimsey & Bohart 1991).

Genus *Holophris* Mocsáry, 1890

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

***Holophris marginella* (Mocsáry, 1890)**

Ellampus (*Holophris*) *marginellus* Mocsáry, 1890: 51. Holotype ♀: Sumatra (ETHZ).
Holophris marginella: Rosa & Halada 2021: 195 (India: Uttarakhand).

Material examined. India: 1 ♀, Uttarakhand, 20 km NE of Rishikesh, Ganga River valley, vicinity of Kaudiyala, ca. 500 m, 25-27.VII.2003, Z. Kejval & M. Trýzna leg. (MHC).
Distribution. India (Uttarakhand); China (Yunnan, Hainan), Indonesia (Sumatra), Malaysia, Philippines, Vietnam, Thailand (Rosa et al. 2016c).
Remarks. *Holophris marginella* is a variable species (Rosa et al. 2016c), and some cryptic species may be hidden under this name (see Nguyen & Wiśniowski 2021).

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); Rajmohana et al. 2018: 381 (cat.); Rosa et al. 2021a: 18 (cat., distr.). Rosa 2023: 1418 (Fig. 11, photos of the lectotype).

Distribution. Kashmir.

***Holopyga indica* Mocsáry, 1889**

Holopyga (*Holopyga*) *Indica* Mocsáry, 1889: 118. Syntypes ♀; India orientalis [actually Himalaya] (118 (descr.)) (HNHM).
Holopyga indica: Bingham 1903: 421 (key), 422 (descr., India orientalis, India: Delhi, Rajputana, Mount Abu).

Material examined. 1♀, Himalaya, *indica* Mocs typ. det. Mocsáry, Holotypus *Holopyga indica* Mocsáry (L.D. French), id nr. 134925 HNHM Hym. coll.
Distribution. Himalaya. India (Karnataka; Delhi; Rajasthan; Uttar Pradesh; India orientalis (locality not specified; central provinces - localities not specified).

***Holopyga monticola* Balthasar, 1957**

Holopyga monticola Balthasar, 1957: 145. Holotype ♀; Afghanistan: Sarekanola, Badakschan (MNHP).

Distribution. Afghanistan (Badakschan).

Genus *Omalus* Panzer, 1801

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

Omalus aeneus (Fabricius, 1787)

Chrysis aenea Fabricius, 1787: 284. Holotype ♀; Germany: Halae Saxonum [currently Halle] (ZMUC).
Omalus aeneus: Rosa & Halada 2021: 195 (Uttarakhand).

Material examined. India: 1♀, Uttarakhand, 30 km N of Bageshwar, vicinity of Khati Vill., 2100-2300 m, 27-30.VI.2003, Kejval & Trýzna leg. (PRC).
Distribution. India (Uttarakhand); China (Inner Mongolia, Taiwan), Japan. Widespread in the Holarctic and Oriental Regions (Kimsey & Bohart 1991; Rosa et al. 2014).
Remarks. The specimen examined shows some unusual features, in particular shallow punctation and a deep apical notch medially on the tergum III.

***Omalus imbecillus* (Mocsáry, 1889)**

Ellampus (*Ellampus*) *imbecillus* Mocsáry, 1889: 98. Lectotype ♀ designated by French in Bohart & French 1986: 341; Turkmenistan: Pendgikent (HMNH).
Holophris imbecillus: Kimsey & Bohart 1991: 225.
Omalus imbecillus: Pavesi & Rosa 2013: (cat., distr., Kashmir).

Material examined. Pakistan: 1 specimen (sex unknown), Baltistan, Shigartang Valley, 3300 m, 15.vii.1976, leg. G. Osella, *Omalus imbecillus* Mocs. det. M. Pavesi 1985. Nepal: 1♀, Humla, Simikot ca. 10 km S of Karnali valley, ca. 2200m, 9.vii.2001, leg. F. Creutzburg (NME).
Distribution. Pakistan (Gilgit-Baltistan), Nepal*. Iran (Khorasan, Sistan and Baluchestan), Oman, Saudi Arabia, Turkey, Tajikistan, United Arab Emirates, China (Farhad et al. 2018).

Omalus tibetanus Wei, Rosa, Liu & Xu, 2014

Omalus tibetanus Wei, Rosa, Liu & Xu, 2014: 49. Holotype ♀, China: Tibet, Chayu, Cibagou (SCAU).

Distribution. Tibet.

Genus *Philoctetes* Abeille de Perrin, 1879

Philoctetes Abeille de Perrin, 1879: 27. Type species: *Holopyga cicatrix* Abeille de Perrin, 1879 [= *Philoctetes micans* (Klug, 1835)], by subsequent designation of Ashmead 1902: 228.

***Philoctetes cynthiae* Rosa, 2017**

Philoctetes cynthiae Rosa in Rosa et al., 2017b: 35. Holotype f#; Russia: Tuva Rep., 13 km SW Samagaltai, Dyttyg-Khem River, 9.vii.2013, leg. V. Loktionov & M. Proshchalykin (ZIN)*.

Material examined. Pakistan: 1♀, Gilgit-Baltistan, Mahthantir Gah, 10.viii.1954, J. Klapperich, *Omalus mongolicus* Buyss. det. Linsenmaier 1989 (NMLU). Nepal: 1♀, Humla, Simikot 20 km NW of Wacholder-Wiese, 29°58'49''N 81°38'23''E, ca. 3500m, 28.vi.2001, leg. F. Creutzburg (NME).
Distribution. Nepal*, Pakistan*. China, Mongolia, Russia.
Remarks. The two examined specimens have a distinctly rectangular, elongate metanotal plate compared with the triangular one of *Philoctetes mongolicus* and *P. cynthiae* from Mongolia and Siberia. More specimens are needed to evaluate their real identity.

Tribe Chrysidini
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 acanthophora* Bischoff, 1910**

Chrysis acanthophora Bischoff, 1910: 473. Holotype ♀; Himalaya (MfN).

Distribution. Himalaya (without further information).

***Chrysis afghana* Balthasar, 1957**

Chrysis viridula afghana Balthasar, 1957: 148. Holotype ♀; Afghanistan: Sarekanda (NMLU).
Chrysis (*Chrysis*) *afghana*: Linsenmaier 1968: 80 (cat., descr., Afghanistan: Sarekanda).

Material examined. Afghanistan: 1♀, Sarekanda, 3800m, 22.vii.1953, Gebirge Badakschan NO - Afghanistan, J. Klapperich, *Chrysis viridula afghana* n.var. Dr. V Balthasar, *Chrysis viridula* ssp. *afghana* n. Balth. Holotypus (NMLU).
Distribution. Afghanistan (Badakschan).

Chrysis alticata Bohart, 1991

Chrysis (*Tetrachrysis*) *alticola* Mocsáry, 1914: 42. Holotype ♀; Tibet: Gyangtse, 13.000 ft. (NHMUK) *nec* Semenov-Tian-Shanskij 1912.
Chrysis alticata Bohart in Kimsey & Bohart, 1991: 381. Replacement name for *Chrysis alticola* Mocsáry, 1914, nec Semenov-Tian-Shanskij 1912 (*ignita* group).

Distribution. Tibet.

***Chrysis amoena* (Balthasar, 1957)**

Plexichrysis amoena Balthasar, 1957: 147, nom. praeocc. nec Eversmann, 1858. Holotype ♀; Afghanistan: Badakschan Mt., Anjuman Pass, 4200 m (Prague).
Spintharina tenellula (Semenov-Tian-Shansky, 1910): Kimsey & Bohart 1991: 558 (synonymised).
Chrysis amoena: Rosa 2019b: 22. Reinstated and transferred to the genus *Chrysis*.

Distribution. Afghanistan (Badakschan).

***Chrysis angustata* Mocsáry, 1893**

Chrysis (*Tetrachrysis*) *angustata* Mocsáry, 1893: 225. Holotype ♀; Burma: Mandalay (MSNG) (*viridissima* group).
Chrysis angustata: Chauhan et al. 2021: 884 (Himachal Pradesh: Lahaul and Spiti).

Distribution. India (Himachal Pradesh). Burma.

***Chrysis arkadyi* Rosa, Baiocchi, Halada & Proshchalykin, 2021**

Chrysis arkadyi Rosa, Baiocchi, Halada & Proshchalykin, 2021b: 286. Holotype, ♀, India: Uttaranchal: Haldwani, Kathgodam, ca 800 m, 21.-22.vii.2003, Z. Kejval & M. Trýzna leg. (MSNM) (*succincta* group).

Material examined India: 1♀, Uttaranchal: Haldwani, Kathgodam, ca 800 m, 21.-22.vii.2003, Z. Kejval & M. Trýzna leg. (MSNM). Pakistan: 1♂, 2♀♀, Khyber Pakhtunkhwa, NE of Mansehra, ca 1200 m, Barhadi env., 34°24'00"N, 73°19'48"E, 20.v.2019, D. Baiocchi leg. (DBC, MHC, PRC).
Distribution. Palaearctic: India (Uttaranchal), Pakistan (Khyber Pakhtunkhwa).

***Chrysis bahadur* Nurse, 1903**

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); Rosa et al. 2021a: 26 (cat., distr., Fig. 19, pictures of the type), 27 (distr., *splendidula* 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).
Distribution. Kashmir.
Remarks. Kimsey & Bohart (1991) designated the lectotype and placed *Chrysis bahadur* Nurse in the *ignita* species group. However, the lectotype belongs to the *splendidula* group (Rosa et al. 2021a) whereas other specimens, as the paralectotype currently deposited in Mocsáry's collection at HMNH, belong to the *ignita* group.

***Chrysis begam* Mocsáry, 1912**

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); Rajmohana et al. 2018: 381 (cat., Himalaya); Rosa et al. 2021a: 29 (cat., distr.), 29 (Fig. 23, pictures of the type).

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

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

Hexachrysis bhoutanensis du Buysson, 1908: 212. Holotype ♀; India: English Bhutan [= West Bengal], Maria Basti (MNHN).
Chrysis bhoutanensis: Kimsey & Bohart 1991: 389 (cat., Philippines (sic): Bhutan, *smaragdula* group); Rosa et al. 2021a: 34 (cat., distr., Fig. 26, pictures of the type).

Material examined. India: 1♀, Bhoutan, Maria Basti, R. Oberthür 1900, *Chrysis Bhoutanensis* type Buyss. R. du Buysson det. 1909, Type (MNHN).
Distribution: India (West Bengal).
Remarks. The type locality of *Chrysis bhoutanensis* (du Buysson), Maria Basti, is currently in Kalimpong environs in Darjeeling (West Bengal, India) and not in the Philippines (Kimsey & Bohart 1991). Other distributional records (Philippines, Indonesia in Kimsey & Bohart 1991) are doubtful.

***Chrysis buddhae* Mocsáry, 1913**

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

Material examined. Nepal: 1♂, Gorkha, 30.v.1992, leg. Ivo Jeniš (MHC).
Distribution. Nepal*. China (Taiwan), Borneo, India (Kimsey & Bohart 1991).

***Chrysis chlorochrysa* Mocsáry, 1898**

Chrysis (*Tetrachrysis*) *chlorochrysa* Mocsáry in Radoszkowski, 1889 [not Mocsáry, 1883]: 23. Syntypes ♂, ♀; Turkmenistan [not Iran]: Askhabad (ISEA-PAS).

Material examined. Afghanistan: 1♂, Schau, 2000m 19.vii.1953, Kokschatal, Badakschan NO Afghanistan, J. Klapperich (NMLU).
Distribution. Afghanistan* (Badakschan). Iran, Turkmenistan (Rosa et al., 2013).
Remarks. The male specimen deposited in the Linsenmaier collection was identified as *Chrysis subcoerulea* Radoszkowski, 1891. The latter was recently synonymized with *Chrysis chlorochrysa* by Rosa et al. 2015b.

***Chrysis cupreiventris* Bingham, 1898**

Chrysis cupreiventris Bingham, 1898: 117. Holotype ♀; India: Himachal Pradesh: Simla [= Shimla] (NHMUK). Bingham 1903: 437 (key), 465-466 (descr., Himalayas, Simla, Sikhim); Bingham 1908: 348 (Himalayas: Phagu near Simla); Kimsey & Bohart 1991: 401 (cat., Simla, *ignita* group); Rajmohana et al. 2018: 381 (cat., Himalaya); Rosa et al. 2021a: 38 (cat., Fig. 31 photo of the type).
Chrysis cupriventris (!): Jonathan et al. 1977: 86 (Himalayas).
Chrysis (*Tetrachrysis*) *cupreiventris*: Bischoff 1913: 50 (cat., Himalaya, Sikkim).

Material examined. India: 1♂, Sikhim Runjit Valley 1000 ft 5.94 Bingham, *cupreiventris* Bingh. Bingham typ., *Chrysis cupreiventris* (m) Bingh. Type. 2♀♀, Ladakh, Leh Tehsil: Rumbak, 34,06N 77.42E, 1.ix.2015, leg. M. Jacobs (MJC). Pakistan: 1♂, Chitral, Madaglasbt, 9.ix.1929, leg. B.N. Chopra (NHMW); 1♀, Azad Kashmir, Paras, Shogran, 34.642N 73.467E, 25.v.2019, leg. M. Kafka (MHC).
Distribution. India (Ladakh, Himachal Pradesh, Sikkim); Pakistan (Rosa et al. 2021a).
Remarks. The specimens from Ladakh were collected on stones.

***Chrysis duplopilosa* Linsenmaier, 1968**

Chrysis (*Chrysis*) *duplopilosa* Linsenmaier, 1968: 101. Holotype ♀; Tibet: Gyangtse (*ignita* group) (HNMUK).
Chrysis duplopilosa: Kimsey & Bohart 1991: 406 (Tibet: Gyangtse, cat., *ignita* group).

Distribution. Tibet.

***Chrysis elvira* Balthasar, 1957**

Chrysis (*Tetrachrysis*) *elvira* Balthasar, 1957: 151. Holotype ♀; Afghanistan: Badakschan Mts., Sarekanda (NRS) (*taczanovskii* group).

Material examined. Afghanistan: 1♀, Badakschan, 4100m, NO - Afghanistan J. Klapperich, allotype (NMLU); Sarekanda, 4100m, 28.vii.1953, Gebirge Badakschan, NO - Afghanistan, J. Klapperich (NMLU).
Distribution. Afghanistan (Badakschan).

***Chrysis fuscipennis* Brullé, 1846**

Chrysis fuscipennis Brullé, 1846: 38. Syntypes ♀♀; Philippines (MNHN) (fuscipennis group).
Chrysis angolensis Radkoszkovsky, 1881: Rosa et al. 2021a: 23 (cat.), 24 (Fig. 17, distr.). Rosa 2023: 1046 (Jammu and Kashmir).

Material examined. India: 1♀, Jammu and Kashmir, Srinagar 19.vii.1935, leg. Guannar Jarring (MNLU); 2 ♂, Delhi 3.-5. XI.29, Dr. Enslin (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 biogeographical regions (Kimsey & Bohart 1991). The name *Chrysis fuscipennis* was reinstated by Rosa (2024).

***Chrysis gabriellae* Rosa, sp. nov.**
(Figs 4A, 4B, 5A-5F)

Material examined. Holotype ♀, India: Sikkim, Chateng, 8700 ft, 12.vi.1959, leg. F. Schmidt (RMNH Naturalis). Paratypes: 3♀♀, ♀, India: Sikkim, Namnasa, 10000 ft, 1.vii.1959, leg. F. Schmidt (RMNH Naturalis, PRC).
Diagnosis. The *ignita* group is the largest species group of the family, including more than a hundred species (Soon et al. 2014). However, only a few are entirely or partially red or purple (Rosa 2019c): *Chrysis mane* Semenov-Tian-Shanskji, 1912 (known from China: Gansu, Qinghai, Inner Mongolia; Russia: Eastern Siberia), *C. kukunorensis* Semenov-Tian-Shanskji, 1967 (China: Qinghai, Gansu), *C. matutina* Semenov-Tian-Shanskji, 1967 (China: Gansu, Hubei), *C. violenta* Linsenmaier, 1968 (North India, Pakistan, Tibet, Nepal, see below), *C. ultramonticola* Linsenmaier, 1968 (Tibet, Nepal, see below), *C. lyubae* Rosa, 2019. Three of these, *Chrysis lyubae*, *C. violenta* and *C. ultramonticola* belong to the *Chrysis ruddii* subgroup, for their short pronotum, its length less than one fourth of its width; F1 fully black or largely non-metallic; scapal basin with dense, appressed, white pubescence; they share a characteristic banded colouration of the mesosoma (*C. lyubae*) or of the metasoma (*C. violenta* and *C. ultramonticola*, Figs. 10, 11) and therefore can be immediately separated from *C. gabriellae* sp. nov. which belongs to the *ignita* group s.str. and show a uniform body colouration. *Chrysis gabriellae* sp. nov. can be easily separated from the other three red Asian species of the group by the different metasoma punctation, distinctly deep and denser on the anterior half of the second tergum, sparse and shallow on the posterior part with small punctures (even and dense in *C. mane* and *C. matutina*, dense and double in *C. kukunorensis*), the shape of the apical teeth (Fig. 5E) (compare apical teeth of other species in Rosa 2019, Figs 15-18), and the purple body colouration, (red to golden-green in the other species). Interestingly, *Chrysis gabriellae* sp. nov. shows more affinities with blue species of the *ignita* group distributed on the Himalayas, like *C. vishnu* Mocsáry, 1912 and *C. tamerlana* Mocsáry, 1912 for the similar shape of TFC and metasomal punctation; besides its colouration, *C. gabriellae* sp. nov. can be separated by longer POL 1.5 × MOD, different genal carina, almost straight at its base on temple (bent in other species), larger black spots on the second sternum (Fig. 5F).
Description
Female. Holotype (Fig. 4). Body length 8.6 mm. Fore wing length 7.0 mm.
Head. TFC strong and noticeably sharp (Fig. 5A), medially substraight, laterally bent down, its distal margin ending less than 1.0 × MOD far to eye margin; scapal basin covered by dense and small punctures, below TFC with a wide facial pit almost as wide as 1.0 × MOD; punctures on vertex and frons small (0.1-0.4 × MOD), larger posteriorly from ocellar area to occipital area; with two wide polished areas posterior to ocelli; malar space longer than 1.0 × MOD, as long as F2; subantennal distance as long as

1.0 × MOD; apex of clypeus almost straight; subgenal carina sharp, complete (Fig. 5C), extending to mandible joint; mandible without subapical tooth; in lateral view, mandible relatively thin. Head covered by erect, whitish and long setae (1.5-2.0 × MOD). OOL = 2.0 × MOD; POL = 1.5 × MOD; MS = 1.3 × MOD; relative length of P:F1:F2:F3 = 1.0:2.0:1.3:1.0.

Mesosoma. Pronotum with deep and wide anteromedian groove, as long as ¾ of propodeal length; punctation double, deep, with tiny dots on narrow interspaces (Fig. 5B); mesoscutum double punctate, punctures large and dense, larger basally among notauli, with very narrow polished interstices; lateral area of mesoscutum with scattered punctures between notaulus and parapsidal furrow and tiny dots on polished interstices; notauli deep, as row of dark, subrectangular foveae, decreasing from posterior to anterior margin; parapsidal lines hardly visible medially; mesoscutellum double punctate, with large punctures and smaller punctures laterally and posteriorly; scutellar-metanotal suture wide and deep; metanotum with large, round, even and contiguous punctures; mesopleuron with large and continuous punctures; episternal sulcus formed by deep and large foveae (Fig. 5C); propodeal teeth large, hardly divergent, pointing backwards.

Metasoma. First tergum with double punctures, larger and contiguous antero-medially, with tiny dots on interstices; second tergum densely punctured anteriorly, with uneven punctures and tiny dots on interstices; punctures becoming scattered and smaller posteriorly, with larger polished interstices, and only sparse tiny dots; third tergum with even, dense punctures and polished interstices, post-pit row densely punctate; pits of the pit row relatively small, round and deep (Fig. 5E); apical teeth short, subequal in length, and with similar indenture, median one more arcuate. Median longitudinal carina well visible on second and third tergum. Black spots on S2 large, elongate see Fig. 5F.

Coloration. Body entirely purple, lighter and with greenish

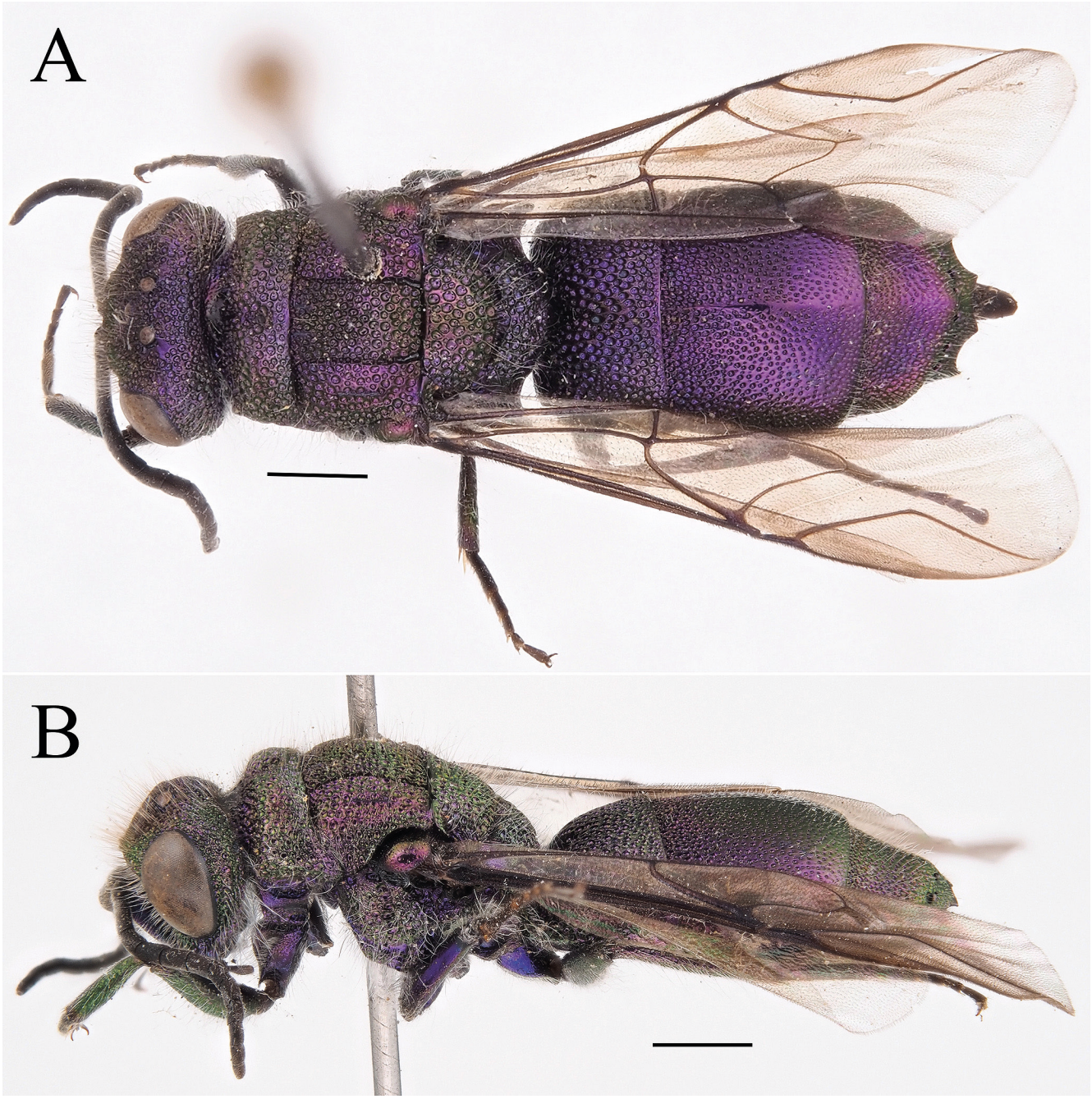

Figure 4. *Chrysis gabriellae* sp. nov., female, holotype. A) Habitus, dorsal view. B) Habitus, lateral view. Scale bars = 1 mm.

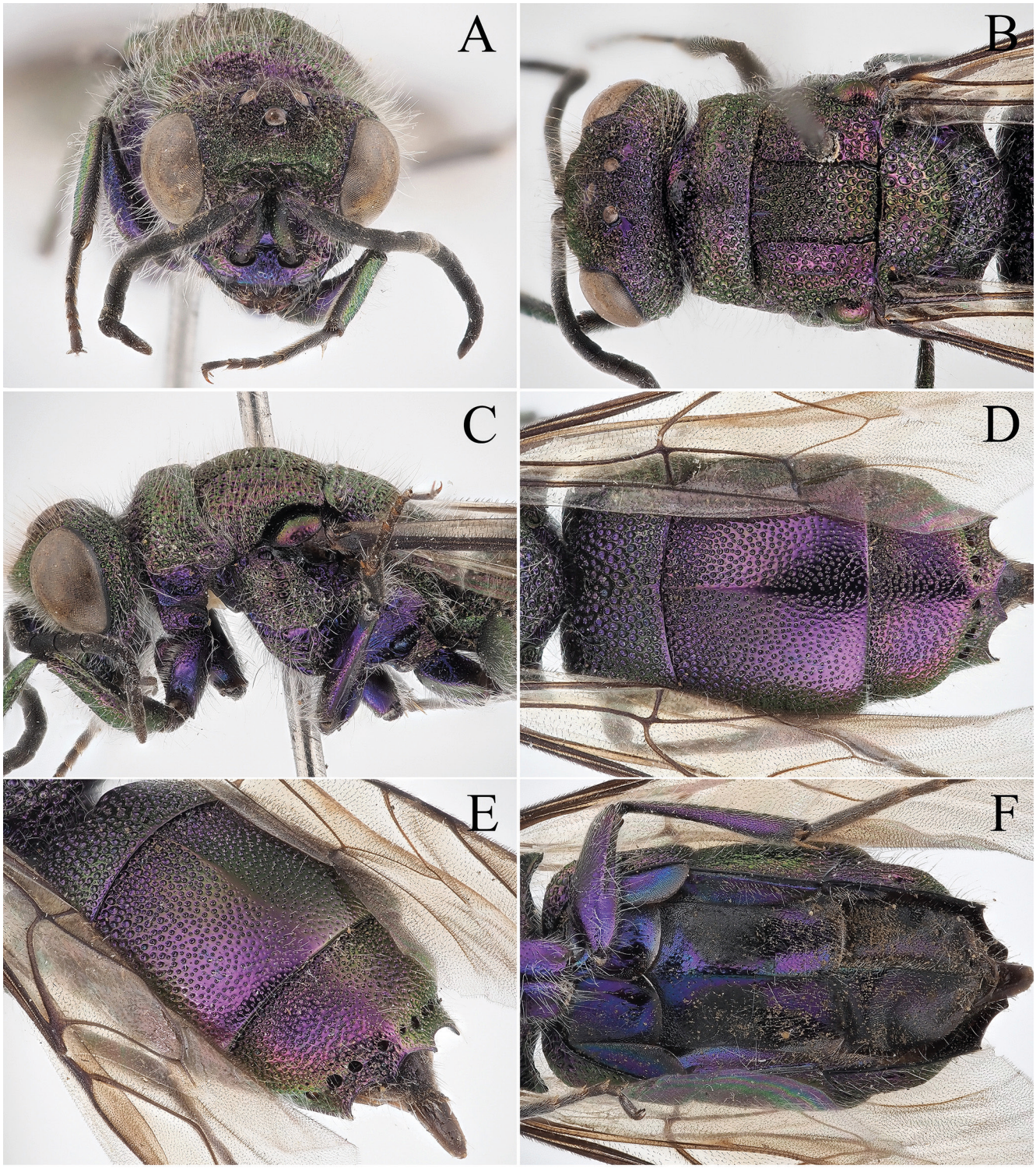

Figure 5. *Chrysis gabriellae* sp. nov., female, holotype. A) Head, frontal view. B) Head and mesosoma, dorsal view. C) Head and mesosoma, lateral view. *D)* Metasoma, dorsal view. E) Metasoma, postero-lateral view. F) Metasoma, ventral view.

reflections, depending on light, on head and mesosoma. Ventrally darker (Fig. 5F). Mandibles dark brown, medially lighter, basally purplish. Scape and pedicel purplish, F1 purplish at base, the rest of the flagellomere and F2-F11 black. Legs purple, tarsi dark brown. Wings slightly brownish.
Male. Unknown.
Distribution. India (Sikkim).
Etymology. The specific epithet *gabriellae* (feminine name in genitive case) is named after my mother Gabriella Fossati (Bernareggio, Italy) in recognition of her continuous support in my study of cuckoo wasps.

***Chrysis gilgitensis* Linsenmaier, 1968**

Chrysis (*Chrysis*) *gilgitensis* Linsenmaier, 1968:104. Holotype ♀; Pakistan: Gilgit (NMLU) (*ignita* group).

Material examined. Pakistan: 1♀, Gilgit, 20.vii.1954, Coll. Linsenmaier (NMLU).
Distribution. Pakistan (Gilgit-Baltistan).

***Chrysis grumorum* Semenow, 1892**

Chrysis grumorum Semenow, 1892: 92. Holotype ♂ (not ♀), Tibet: Amdo (92 (descr.) (ZIN).
Chrysis (*Tetrachrysis*) *grumorum*: Bischoff 1913: 52 (Amdo, cat.).
Chrysis grumorum: Kimsey & Bohart 1991: 416 (Tibet: Amdo, cat., *ignita* group).

Distribution. Tibet.

***Chrysis hartmanni* Rosa, sp. nov.**
(Figs 6A-6B, 7A-7F)

Material examined. Holotype: Nepal: ♀, Bagmati, Kathmandu valley, Godavari village, 23.vi.2007, leg. M. Hartmann (NME). Paratypes: 1♀, Myagdi Beni, 28°20'45''N 83°34'01''E, 850m, 29.ix.2014, leg. F. Creutzburg (NME), 1♀, Myagdi Distr., Tatopani, 28°30'N 83°38', 1100-1400m, 28.vi.1986, leg. C. Holzschuh (BZL).
Diagnosis. *Chrysis hartmanni* sp. nov. (Fig. 6) can be included in the *maculicornis* group due to the transverse shape of the head in frontal view, with short malar spaces (Fig. 7A), however examination of the unknown male is needed to confirm this placement. The only similar species in the region is *Chrysis bhavanae* Bingham, 1903 (known from India, Malaysia, Myanmar, Philippines), which was previously included in the *ignita* group by Kimsey & Bohart (1991) and only recently moved to *maculicornis* group following type examination (Fig. 8). *Chrysis hartmanni* sp. nov. can be separated from *C. bhavanae* by: strong transverse frontal carina, waived with two branches downward directed to anterior ocellus (vs. V-inverted in *C. bhavanae*); F1 elongate (l/w 2.8) and non-metallic (vs. short (l/w 2.4) and almost fully metallic); punctation on second and third tergum dense with small, aligned punctures distinctly smaller than punctures on first tergum (Fig. 7D) (vs. punctures on second and third tergum larger, as large as punctures on first tergum, Fig. 8A); black spots on second sternum large and laterally connected to lateroterga (Fig. 7F) (vs. small, elliptic, separated from later margins, Fig. 8B).
Description. Holotype (Fig. 6).
Female. Body length 10.0 mm. Forewing length 6.5 mm.
Head. Frons with wide and irregular punctures between the ocellar area and the transverse frontal carina (about 1.0 × MOD close to carina), vertex and ocellar area with small, contiguous punctures, becoming larger in proximity of compound eye, with polished interspaces and sparse micro-punctures; without polished areas laterally to posterior ocelli; transverse frontal carina strong and waved (Fig. 7A), with lateral endings close to eye margin; area below carina polished, impunctate; scapal basin longitudinally impunctate till clypeus, laterally fully micro-punctate; clypeus impunctate and arcuate; malar spaces polished, with sparse tiny dots; genal carina strong and raised, fully developed until mandibular insertion; preoccipital hook elongate and clearly visible below genal carina; subantennal space less than 1.0 × MOD; apical margin of clypeus medially arcuate.
OOL 1.7 × MOD; POL 1.6 × MOD; MS 0.7 × MOD; relative length of P:F1:F2:F3 = 1.0:1.7:1.1:0.9.
Mesosoma. Medial pronotal line [= pronotal groove] narrow, deep, as long as ¾ length of pronotum (Fig. 7B); pronotum with medium sized punctures (0.3-0.5 × MOD), polished interspaces with scattered tiny dots; mesoscutum with smaller punctures anteriorly and larger punctures basally; notauli as large and subrectangular foveae, mostly black coloured, larger at base; lateral areas of mesoscutum with larger punctures on sides toward tegulae, with double punctation and tiny dots on interspaces; parapsidal signum [= parapsidal line] black, hardly visible; sculpture on mesoscutellum similar to metascutellum with large, square to polygonal, contiguous punctures; metanotum with large, foveate punctures without interspaces; metapectal-propodeal disc with metapostnotal-propodeal suture strong and raised; posterior propodeal projections [= propodeal teeth] slightly divergent, slightly concave posteriorly; mesopleuron double punctate on mesepisternum, with large punctures, and small, scattered punctures on mesepimeron (Fig. 7C). Tarsomere I of mesoleg as long as II-IV together. Forewing with second radial cell (the marginal cell located apical to the pterostigma) close.
Metasoma. First tergum with punctures evenly separated and with small to tiny dots on interspaces; larger punctures along anterior declivitous margin; apical margin of tergum polished and impunctate; tergum II with small, even and dense punctation, punctures smaller than on first tergum; punctures appear diagonally aligned (Fig. 7D); median longitudinal line polished; second tergum similarly sculptured and densely punctate; transversally swollen before pit row (Fig. 7D); pits of pit row large and rounded (Fig. 7E); apical margin with four sharp, triangular teeth (Fig. 7E). Second and third tergum with weak median longitudinal carina. Black spots on sternum II large, connected to lateral margins (Fig. 7F).
Colouration. Body entirely metallic light blue with green reflections on face and ventral side. Scape, and pedicel light blue, flagellomeres black. Wings fuscous, with brownish veins and darker area along the anterior margin of second radial cell in forewing.
Vestiture. Head and mesosoma with long (1.0-1.5 × MOD), black setae; metasoma with very short whitish, setae, longer on apical margin of third tergum.
Male. Unknown.
Paratypes. One paratype is distinctly smaller than the holotype, with length 7.5 mm.
Distribution. Nepal.
Etymology. The specific epithet *hartmanni* (masculine noun in genitive) is dedicated to Matthias Hartmann (Erfurt, Germany), who collected the holotype specimen, for his continuous effort in the study of fauna and flora of Himalaya.

***Chrysis ionophris* Mocsáry, 1893**

Chrysis (*Tetrachrysis*) *ionophris* Mocsáry, 1893: 226. Holotype ♀; Burma [= Myanmar] (MSNG).
Chrysis ionophris: Jonathan et al. 1977: 86 (cat., India: Arunachal Pradesh); Kimsey & Bohart 1991: 425 (cat., *splendidula-senegalensis* group); Rosa et al. 2021a: 45 (cat., distr.), 46 (Fig. 41).

Distribution. India (Arunachal Pradesh; Karnataka; Kerala; Tamil Nadu). China (Taiwan; Hong Kong), Laos, Myanmar, Sumatra, Thailand (Rosa et al. 2021a).

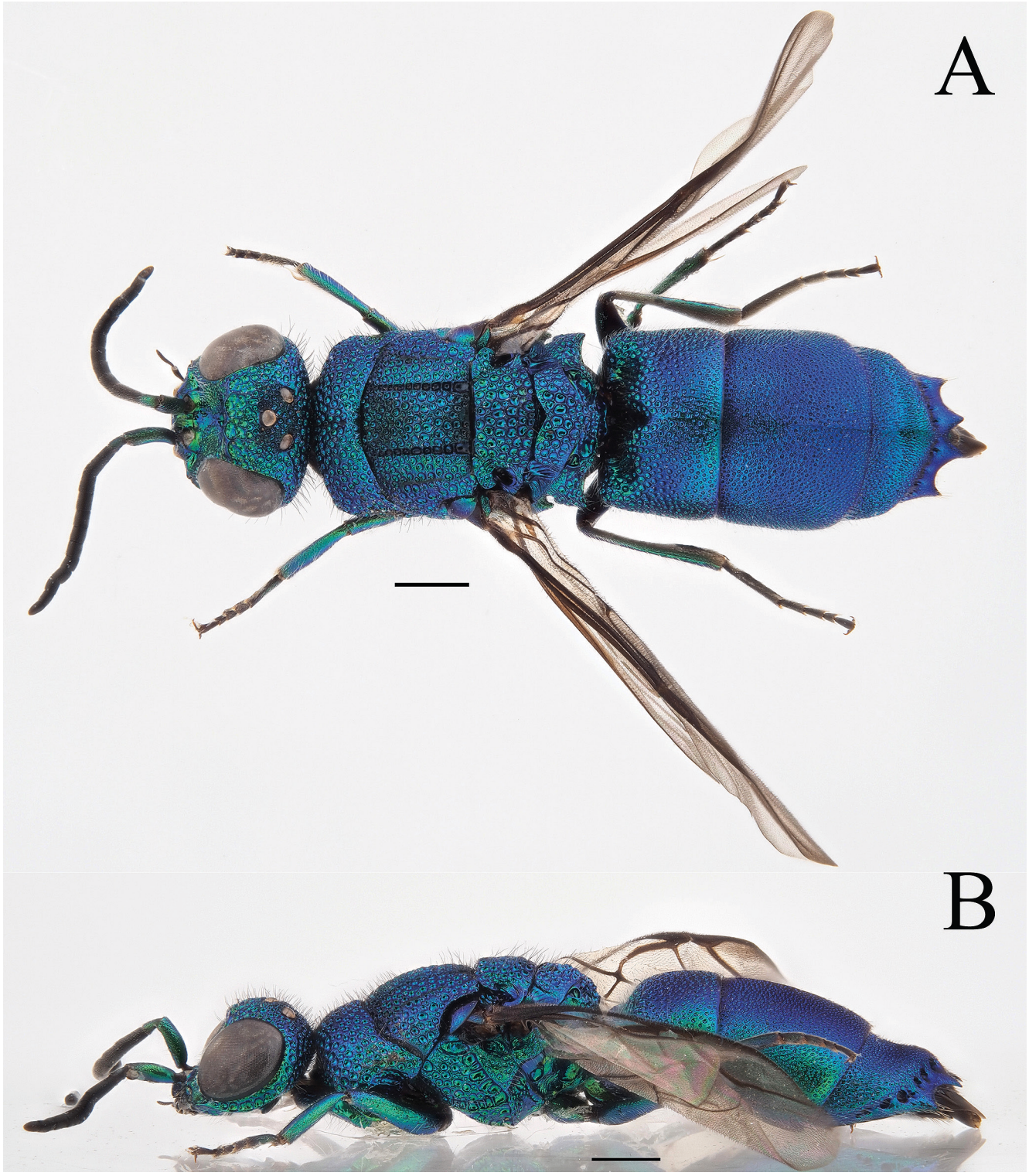

Figure 6. *Chrysis hartmanni* sp. nov., female, holotype. A) Habitus, dorsal view. B) Habitus, lateral view. Scale bars = 1 mm.

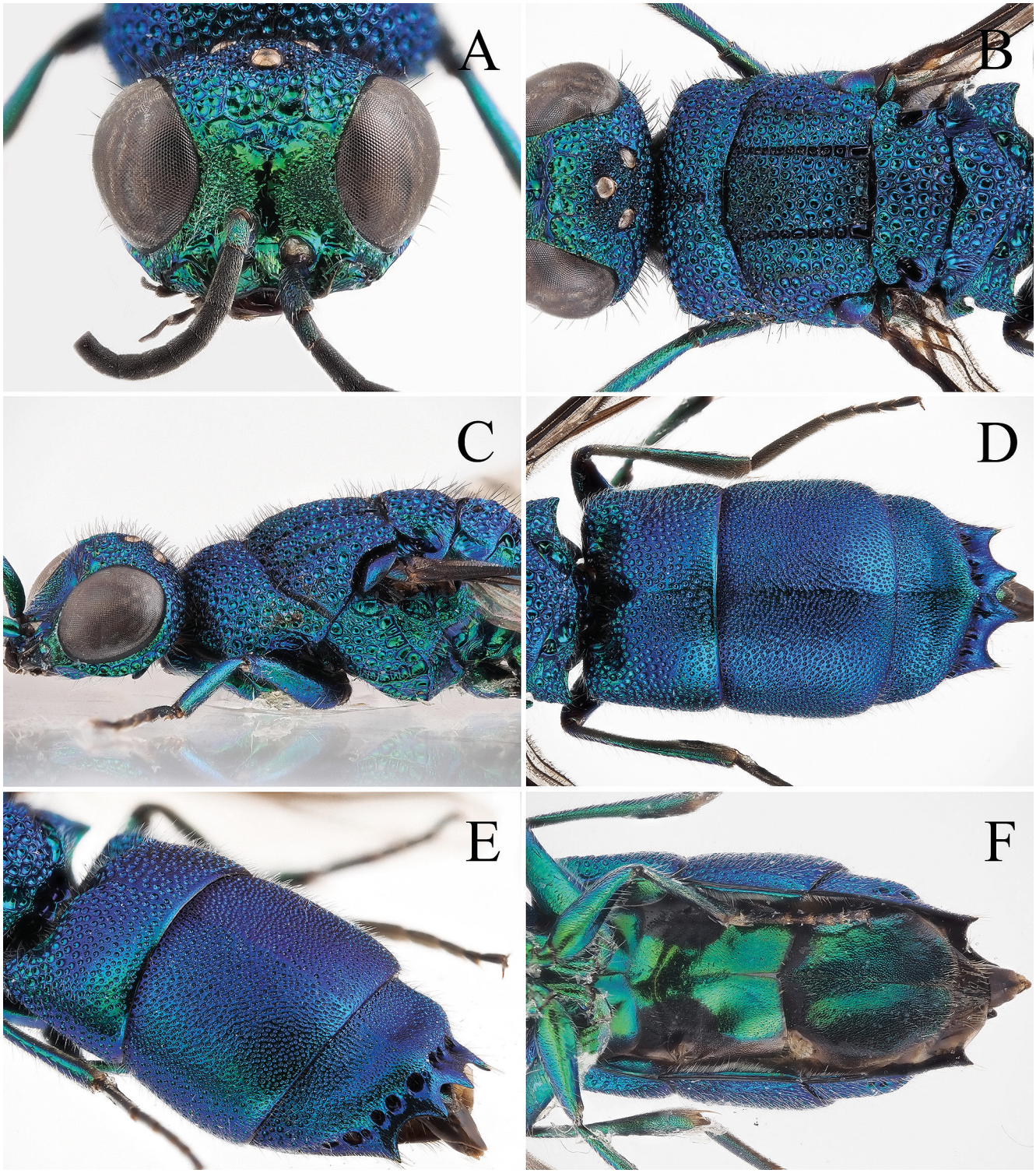

Figure 7. *Chrysis hartmanni* sp. nov., female, holotype. A) Head, frontal view. B) mesosoma, dorsal view. C) Head and mesosoma, lateral view. D) Metasoma, dorsal view. E) Metasoma, postero-lateral view. F) Metasoma, ventral view. Scale bar = 1 mm.

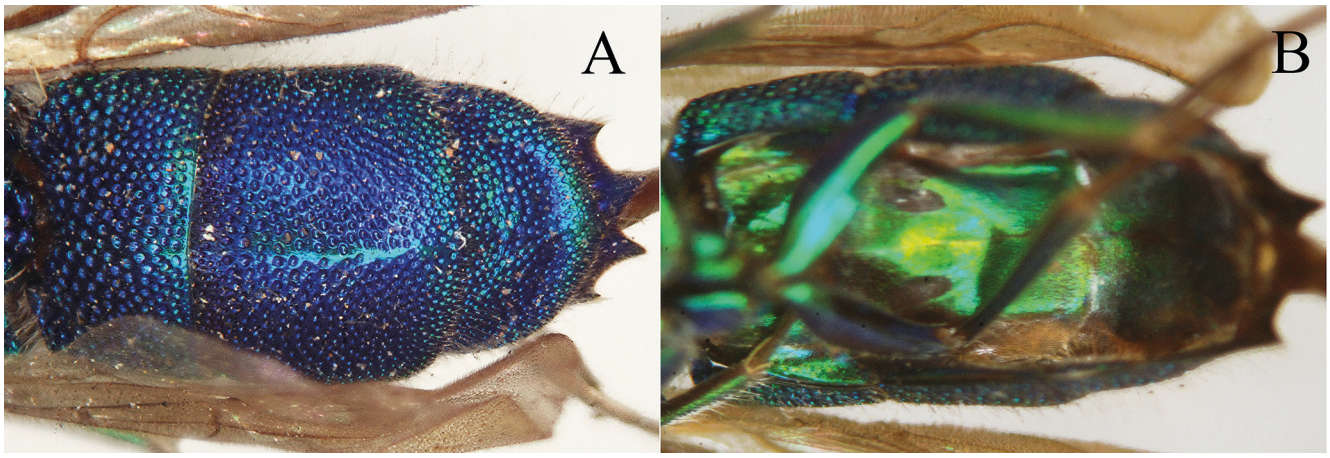

Figure 8. *Chrysis bhavanae* Bingham, 1903, female, paralectotype, from Tenasserim (HMNH). A) Metasoma, dorsal view. B) Metasoma, lateral view.

***Chrysis jalala* Nurse, 1902**
(Fig. 9)

Chrysis jalala Nurse, 1902: 306. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 426; Pakistan: Kashmir (NHMUK). Kimsey & Bohart 1991: 426 (cat., typ., Kashmir, *capitalis* group). Rosa et al. 2021a: 46 (cat., distr.), 47 (Fig. 42, photo of the type). Rosa 2023: 1407 (Kashmire)

Material examined. India: 1♂, Sikkim, without further data (NMLU); 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. (NMLU). Nepal: 1♂, Karnali, D: Jumla way kot (29°22'83''N 82°04'50'') to Hatsinja (Himal Nadi) (29°24'64''N 82°01'17''), 2840-2470m, 14.vi.2011, leg. J. Kussner (NME).
Distribution. India (Sikkim, Jammu and Kashmir), Nepal*.

***Chrysis kashgarica* Mocsáry, 1912**

Chrysis (*Tetrachrysis*) *kashgarica* Mocsáry, 1912: 550. Holotype ♂; China: Xinjiang, Kashgar (HNHM) (*ignita* group).

Material examined. Afghanistan: 1 ♂, Sarekanda, 3500m, Gebirge, Badakschan 26.vii.1953, NO - Afghanistan, J. Klapperich (NMLU).
Distribution. Afghanistan* (Badakschan). China, Kyrgyzstan (Tarbinsky 2000).

***Chrysis komarowi* Radoszkowski, 1891**

Chrysis komarowi Radoszkowski, 1891: 190. Holotype ♀; Turkmenistan: Ashkabad (ISEA-PAS) (*cerastes* group).

Material examined. Pakistan: 1♀, Gilgit, 7.-20.vii.1954, Coll. Linsenmaier (NMLU).
Distribution. Pakistan (Gilgit-Baltistan) (Kimsey & Bohart 1991). Iran, Turkmenistan (Rosa et al. 2013).

***Chrysis korbiana* Mocsáry, 1912**

Chrysis korbiana Mocsáry 1912: 412. Lectotype ♀ designated by Bohart in Bohart & French 1986: 342; Uzbekistan: Fergana (HMNH) (*ignita* group).

Material examined. India: 1♀, Ladakh, Leh Tehsil: Rumbak, 34,06N 77.42E, 1.ix.2015, leg. M. Jacobs (MJC). Pakistan: 3♂, 2♀, Gilgit-Baltistan: Darkot [=Darkut], 25.viii.1954, Coll. Linsenmaier (NMLU); 1♂, Yasin 1.-6.ix.1954, Coll. Linsenmaier (NMLU).
Distribution. India* (Ladakh). Pakistan (Gilgit-Baltistan) (Linsenmaier 1959). Central Asia.
Remarks. *Chrysis korbiana* was considered an expected species from India by Rosa et al. (2021a). The specimen from Ladakh was collected on a wall of a shed in the village of Rumbak.

***Chrysis lama* Mocsáry, 1914**

Chrysis (*Tetrachrysis*) *lama* Mocsáry, 1914: 45. Lectotype ♂ designated by Bohart in Kimsey & Bohart 1991: 431; Tibet: Gyantse (NHMUK).
Chrysis lama: Kimsey & Bohart 1991: 431 (Tibet: Gyantse, lectotype design., cat., *ignita* group).

Material examined. Tibet: 1♂, Gyangtse 13,000 ft. June 1904 Tibet Exped. H.J. Walton, 30.VI.1904, *Tetrachrysis lama* Mocs. typ. det. Mocsáry, id nr. 135325 HNHM Hym. coll. (HNHM).
Distribution. Tibet.

***Chrysis martinella* du Buysson, 1900**

Chrysis martinella du Buysson, 1900: 142. Holotype ♀; Iran: Teheran (MNHN) (*aestiva* group).
Chrysis klapperichi Balthasar, 1957: 148. Holotype ♀; Afghanistan: Sarekanda (MNHP).
Chrysis martinella solox: Linsenmaier 1968: 74 (senior synonym of *C. klapperichi* Balthasar, 1957).

Material examined. Afghanistan: 1♂, 1♀, Sarekanda, 2800m, 21.vii.1953, Gebirge, Badakschan, J. Klapperich (NMLU);

Figure 9. *Chrysis jalala* Nurse, 1902, male from Nepal (Karnali). Habitus, dorsal view, and genital capsule. Scale bar = 1 mm.

1♀, Schau, 2000m, 19.vii.1953, Kokscha-tal, Badakschan (NMLU); Kalasau, 2000m, 4.viii.1953 Kokschatal, Badakschan, J. Klapperich (NMLU). All specimens are paratypes of *Chrysis klapperichi* Balthasar, 1957.
Distribution. Afghanistan (Sarekanda).

Chrysis oblita Bohart in Kimsey & Bohart, 1991

Chrysis orientalis Dahlbom, 1854: 225, nec Guérin-Méneville, 1842. Holotype ♀; India Orientalis (ZMUC).
Chrysis obliterata Mocsáry, 1887: 15. Replacement name for *Chrysis orientalis* Dahlbom, 1854, nec Abeille de Perrin, 1879. Bingham 1908: 348 (northern, central, and western India).
Chrysis oblita Bohart in Kimsey & Bohart, 1991: 444. Replacement name for *Chrysis orientalis* Mocsáry, 1887 (cat., India, *comparata-scutellaris* group).

Material examined. India: 1 ♂, West Bengal, Siligori [= Siliguri], 30.i.1897, leg. E. Saunders (MNLU).
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).

Chrysis oculata Fabricius, 1775

Chrysis oculata Fabricius, 1775: 357. Holotype ♀; India: Malabar (ZMUC) (*oculata* group).
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*: Mocsáry 1889: 543-544 (descr., India Orientalis); Bischoff 1913: 67 (cat., India).

Material examined. India: 1♀, Sikkim, Coll. Bingham (HNHM); 1♀, Uttarakhand, Haldwani Distr., Kumaon, leg. F.G. Champion (MNLU); 1♀, India (likely Gujarat or Kashmir), 1934, leg. T.R. Bell (MNLU). Nepal: 2♀, E-Nepal Koshi Simraghat Lumbughat, 450m, 14.vi.1985, M. Brancucci (NMLU); 1♀, Pokhara, 12.vi.1990, leg. M. Homoláč (MHC).
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); Nepal*. Myanmar, Sri Lanka (Jonathan et al. 1977). 1♀, Janakpur, SE Charikoi, Tamba-Koshi Khola, 23°39N 86°03E, 900-1200m, 16.-25.vi.8[?], leg. C. Holzschuh (BZL).

Chrysis perfecta Cameron, 1897

Chrysis perfecta Cameron, 1897: 1. Holotype ♂; India: West Bengal: Barrackpore (OUMUK) (*viridissima* group). Kimsey & Bohart 1991: 448 (cat., India: Sikkim, *maculicornis* group); Rajmohana et al. 2018: 381 (cat., Himalaya); Rosa et al. 2021a: 53 (cat., distr.). Rosa 2023: 1426 (Fig.17, pictures of a syntype).

Material examined. India: 1 ♂, West Bengal, Birbhum, without further data (NHMW).
Distribution. India (West Bengal; Sikkim).
Remarks. After type examination at OUMUK, *Chrysis perfecta* belong to the *viridissima* group (Rosa 2023).

Chrysis polita Rosa in Rosa et al., 2021

Chrysis polita Rosa in Rosa et al., 2021a: 52 (descr., Fig. 50), 55 (Fig. 51), 56 (Fig. 52). Holotype ♂; India: Darjeeling, Ramam, 2450m, 19.v.1975, leg. W. Wittmer (NMLU) (*ignita* group).

Material examined. India: 1♂, Darjeeling, Ramam, 2450m, 19.v.1975, leg. W. Wittmer, *Chrysis fulgidaria* Ts. det. Linsenmaier, GBIF_Chr00037886 (NMLU); 3 ♀, Uttaranchal, 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_Chr0037887 (NMLU).
Distribution. India (West Bengal, Uttaranchal); Myanmar.

Chrysis principalis Smith, 1874

Chrysis principalis Smith, 1874: 461. Syntypes ♀; China: Shanghai (OUMUK). Bingham 1903: 440 (key), 490-491 (descr., the Himalayas, Bengal; Poona), 491 (comp. notes); Kimsey & Bohart 1991: 450 (cat., North India, *smaragdula* group); Rosa et al. 2021a: 56 (cat., distr.), 57 (Fig. 53).
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. India: 2♀, Meghalaya, Khasia Hills, without further data (ETHZ).
Distribution. India (Himalayas; Arunachal Pradesh; Meghalaya; Maharashtra; Bengal (locality not specified)). China, Myanmar, and Malayan subregion (Jonathan et al. 1977); Korea (Kimsey & Bohart 1991).

Chrysis rani Mocsáry, 1913

Chrysis (*Hexachrysis*) *Ráni* Mocsáry, 1913: 23. Holotype ♀; India orientalis: Sikkim (HNHM). Bischoff 1913: 67 (cat., Sikkim).
Chrysis rani: Kimsey & Bohart 1991: 455 (cat., North India, *smaragdula* group); Rajmohana et al. 2018: 381 (cat., Himalaya); Rosa et al. 2021a: 59 (cat., distr., Fig. 56, pictures of the type).
Chrysis (*Hexachrysis*) *assamensis* Mocsáry, 1913: 24. Holotype ♀; India: Assam (HNHM). Bischoff 1913: 64 (cat., Assam).

Material examined. India: 1♀, Sikhim 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).

Chrysis retracta Linsenmaier, 1959

Chrysis retracta Linsenmaier, 1959: 103. Holotype female; Pakistan: Gilgit (NMLU) (*pulchella* group).

Material examined. Pakistan: 1♀, Gilgit, 7.-20.vii.1954 Coll. Linsenmaier (NMLU).
Distribution. Pakistan (Gilgit-Baltistan).

Chrysis sandaracata Bingham, 1903

Chrysis sandaracata Bingham, 1903: 466. Holotype ♀; India: Sikkim: Rungaroon, 7000 ft (438 (key), 466-467 (descr.)) (NHMUK). Kimsey & Bohart 1991: 459 (cat., India, *ignita* group); Rajmohana et al. 2018: 381 (cat., Himalaya); Rosa et al. 2021a: 60 (cat., distr., Fig. 57, pictures of the type).
Chrysis (*Tetrachrysis*) *sandaracata*: Bischoff 1913: 58 (cat., Sikkim).

Material examined. India: 1♀, Holotype, Sikhim 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).

Chrysis saraksensis Radoszkowski, 1891

Chrysis saraksensis Radoszkowski, 1891: 195. Holotype ♂; Iran [not Turkmenistan]: Sarakhs (ISEA-PAS).
Chrysis sarakhsensis (!): Bingham 1908: 348 (cat., Uttarakhand (not Bengal): Saraghat).
Chrysis kokandica Radoszkowski, 1877: Kimsey & Bohart 1991: 428 (cat., syn., *splendidula* group).

Distribution. India (Maharashtra; Central provinces (locality not specified); Uttarakhand; Western India (locality not specified)); Central Asia (Kimsey & Bohart 1991).
Remarks. Indian records are doubtful and should be checked (Rosa et al. 2021a).

Chrysis schioedtei Dahlbom, 1854

Chrysis Schiödtei Dahlbom, 1854: 309. Holotype ♀; India: Tamil Nadu: Tranquebaria (ZMUC). Du Buysson 1896: 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: du Buysson 1904: 273 (cat., Sikkim); Rosa et al. 2021a: 61 (cat., distr., Fig. 58).
Chrysis schiodti (!): Jonathan et al. 1977: 87 (widely distributed in India).
Chrysis schiodtei (!): Kimsey & Bohart 1991: 459 (cat., India, *smaragdula* group).

Material examined. Nepal: 1♀, E-Nepal, Arun Valley, Sobae Kohla, 400m, 1.-3.vi.1992, leg. J. & J. Probst (NMLU); 1♀, E-Nepal, Arun Valley, Sobae-Kohla/Kokuwa, 400-600m, 20.-25.vi.1992, leg. J. & J. Probst (NMLU); 1♀, central Nepal, Bagmati Distr. Trisuli Bazar-Samri Bhanjyang, 540-1900m, 8.vi.1993, leg. Probst (NMLU).
Distribution. India (Assam; Chhattisgarh; Gujarat; Kerala; Maharashtra; Meghalaya; Rajasthan, Sikkim; Tamil Nadu; India Orientalis (locality not specified); Nepal*. Central Provinces (locality not specified); Western India (locality not specified). Distributed in the Oriental and Australasian Regions (Kimsey & Bohart 1991).

Chrysis sikkimensis Mocsáry, 1912

Chrysis (*Tetrachrysis*) *sikkimensis* Mocsáry, 1912b: 554. Holotype ♀; India: Sikkim (HNHM).
Chrysis sikkimensis: Kimsey & Bohart 1991: 462 (cat., India: Sikkim, *splendidula-senegalensis* group); Rajmohana et al. 2018: 381 (cat. Himalaya); Rosa et al. 2021a: 62 (cat., distr., Fig. 59, pictures of the type).

Material examined. India: 1♀, Sikhim, Collect. Bingham, *sikkimensis* Mocs. Typ. det. Mocsáry, Holotypus *Chrysis sikkimensis* Mocs. ♀ RMB, id nr. 135336 HNHM Hym. coll. (HNHM).
Distribution. India (Sikkim).
Remarks. *Chrysis sikkimensis* is potentially a synonym of *Chrysis ionophris* Mocsáry, 1893.

Chrysis speculata du Buysson, 1896

Chrysis speculata du Buysson, 1896: 473. Holotype female; India: Bombay, Poona (MNHN) (*succincta* group).

Material examined. Pakistan: 1♀, Khyber Pakhtunkhwa: NE of Mansehra, ca 1200 m, Barhadi env., 34°24'00"N, 73°19'48"E, 20.v.2019, M. Kafka leg. (MHC). Nepal: 1♀, Chhumchaur, 29°21'30"N, 82°23'46"E, 16.vi.1997 (PRC).
Distribution. Pakistan (Khyber Pakhtunkhwa), India (Maharashtra), Nepal (Rosa et al. 2021b).

Chrysis stilboides Spinola, 1838

Chrysis stilboides Spinola, 1838: 446. Holotype ♀; Egypt (MSNT). Rajmohana et al. 2018: 381 (cat., Himalaya); Rosa et al. 2021a: 63 (cat., distr.), 64 (Fig. 61) (*oculata* group).
Chrysis (*Hexachrysis*) *indica* Mocsáry, 1889: 591, *nec* Schrank, 1804. Holotype ♂; India Orientalis (HNHM).
Chrysis indica: Dalla Torre 1892: 72 (cat., India or.); Bingham 1903: 439 (key), 486 (descr., India Orientalis); Bingham 1908: 349 (cat., Bihar: Purneah [= Purnia]).

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

Chrysis tamerlana Mocsáry, 1912

Chrysis (*Tetrachrysis*) *Tamerlana* Mocsáry, 1912: 551. Holotype ♂; India: Himachal Pradesh: Matiana, 8000 ft, Simla Hills (HNHM). Bischoff 1913: 60 (cat., India).
Chrysis (*Tetrachrysis*) *Maharani* Mocsáry, 1912: 553. Holotype ♀; India: Sikkim (HNHM). Bischoff 1913: 55 (cat., India).
Chrysis (*Tetrachrysis*) *Kali* Mocsáry, 1912: 553. Holotype ♀; India: Sikkim (HNHM).
Chrysis tamerlana: Kimsey & Bohart 1991: 470 (cat., northeast India, *ignita* group); Rajmohana et al. 2018: 381 (cat., Himalaya); Rosa et al. 2021a: 63 (cat.), 64 (Fig. 62, pictured of the type), 65 (distr.).

Material examined. India: 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♀, Sikhim 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). Nepal: 1♂, Rejangu, 2000m, 5.viii.1962, leg. G. Ebert & H. Falkner (NMLU); 1♀, West Nepal 10.vi.1986, Myagdi Distr. Sig.: 86N7 Hille-Ghorepani, 28.23N 83.42 E, 1600-2600m, leg. Carolus Holzschuh (NMLU); 2♂, Godawari, 1500m, 5.vi.1993, leg. Noger (NMLU); 9♂, Uttarakhand, 30 km NW of Bageshwar, 2400 m, 25-30.VI.2003, Kejval & Trýzna leg., 9 males (MHC, PRC); 1♀, Gandaki: Manang way from Yak Kharka to Goa 28°35'50''N 84°26'51''E to 28°34'00''N 84°24'13''E, 3040-2500m, 26.v.2013, leg. M. Hartmann (NME); 1♂, Seti: Bajhang, wat from vic. Shima (29°43'30''N 81°21'24''E) to pass SW Dhalaun (29°42'28''N 81°21'54''E), 2200-2950m,

26.vi.2009, leg. A. Weigel (NME); 2♀, Sikkim, Mamnasla, 10000 ft, 1.vii.1959, leg. F. Schmidt (RMNH Naturalis); 1♀, Sikkim, Lachung, 8610 ft, 13.vii.1959, leg. F. Schmidt (RMNH Naturalis).
Distribution. India (Himachal Pradesh, Jammu and Kashmir, Sikkim, Uttarakhand, West Bengal) (Rosa et al. 2021a); Nepal (Kimsey & Bohart 1991).

Chrysis tibetana Mocsáry, 1914

Chrysis (*Tetrachrysis*) *tibetana* Mocsáry, 1914: 43. Lectotype ♂ designated by Bohart in Kimsey & Bohart 1991: 471, Tibet: Gyangtse (NHMUK).
Chrysis tibetana: Kimsey & Bohart 1991: 471 (Tibet: Gyangtse, lectotype design., cat., *ignita* group).
Material examined. Tibet: 1♂, Gyangtse. 13,000ft June 1904 Tibet Exp. H.J. Walton 1905-173; 1♀, Tibet: Kyishong. 14,500 ft 10.VII.1924 Maj. R.W.G.Hingston / Everest Exp. Brit. Mus. 1924-386; both specimens identified by Linsenmaier in 1966 (NMLU).
Distribution. Tibet.

Chrysis uljanini Radoszkowski, 1877

Chrysis uljanini Radoszkowski, 1877: 22. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 473; Uzbekistan: Tashkent desert, Zarafshan Valley (MMZU) (*ignita* group).

Material examined. Afghanistan: 1♂, Anjuman, 2900m, 9.viii.1952, Anjuman Gebirge, Badakschan NO - Afghanistan,

Figure 10. *Chrysis ultramonticola* Linsenmaier, 1968, female from Nepal. Habitus, dorsal view. Scale bar = 1 mm.

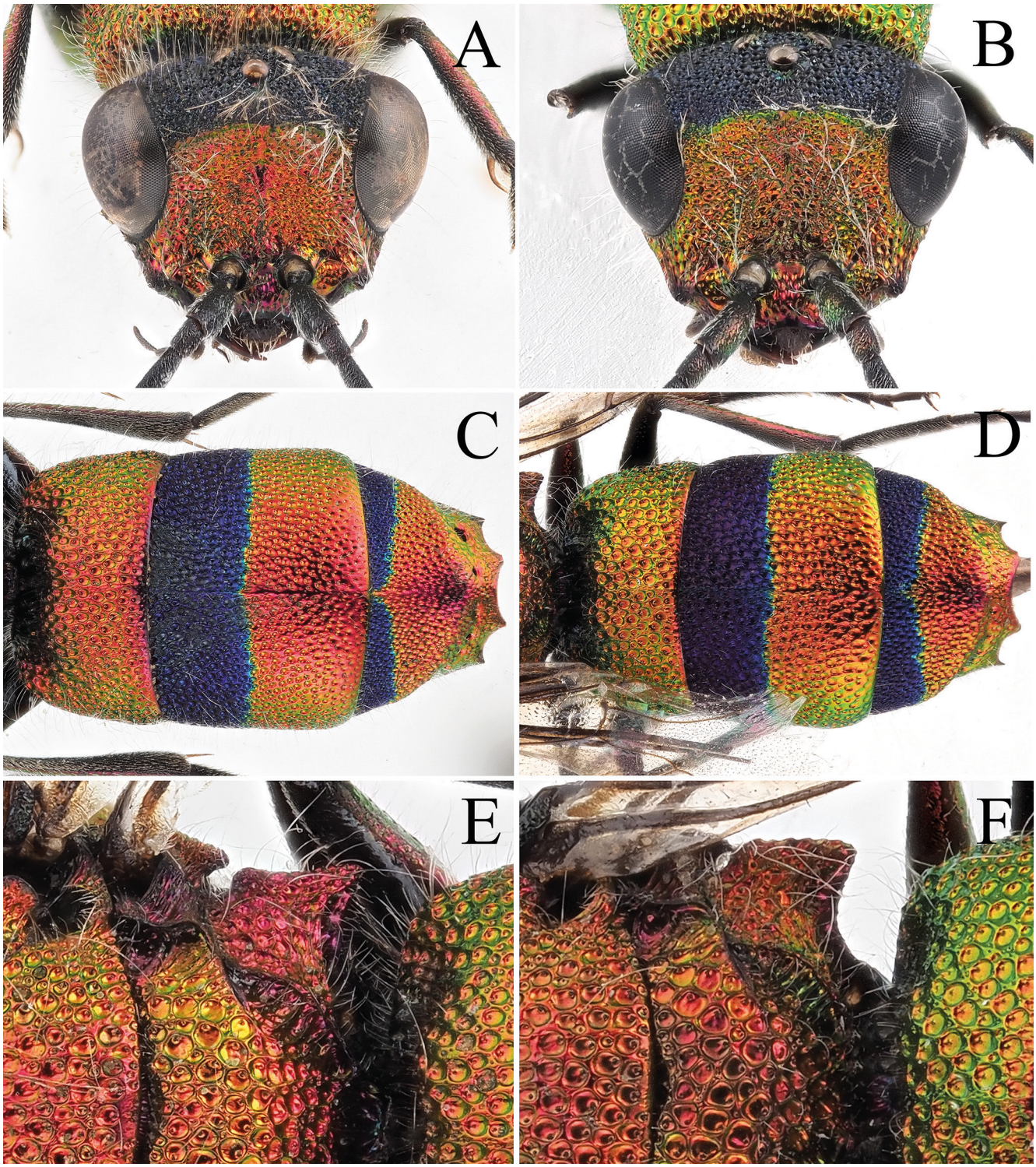

Figure 11. A, C, E - *Chrysis ultramonticola* Linsenmaier, 1968, female from Nepal; B, D, F - *Chrysis violenta* Linsenmaier, 1968, female from Nepal. A, B) Head, frontal view. C, D) Metasoma, dorsal view. E, F) Propodeal posterior projects.

J. Klapperich, *Chrysis* L. *mesembrina* Sem. det. Linsenmaier 1973 (NMLU).
Distribution. Afghanistan* (Badakschan). Kyrgyzstan, Tadjkistan, Uzbekistan.

***Chrysis ultramonticola* Linsenmaier, 1968 stat. nov.**
(Figs 10, 11A, 11C, 11E)

Chrysis (*Chrysis*) *violenta ultramonticola* Linsenmaier, 1968: 97. Holotype ♀, Tibet: Tropde, 11.000 ft, Rongshar, 13.000 ft (BMNH) (*ignita* group).

Chrysis violenta ultramonticola: Kimsey & Bohart 1991: 477 (Tibet, Everest Region: Tropde, cat., *ignita* group). Boesi et al. 2005: 137 (biol., Kangyuma, 3700m).
Material examined. Tibet: 1♀, Rongshar Valley 13.000ft 1.VII.1924 Maj. R.W.G. Hingston, Everest Exp. Brit. Mus. 1924-386 (NMLU); 1♂, 1♀, Nyalam, 3700m, 18.vii.2000, leg. V. Major (MHC). Nepal: 1♂, 1♀, Gandaki, D: Gorkha, way from Lho Bazar to Syrah, 28°34’27’’N 84°42’04’’, 3100m, to 28°32’N 84°44’E, 2780m, 16.v.2013, leg. A. Kopetz (NME); 1♂, 1♀, same data, 17.v.2013 (NME); 1♀, Seti/D: Bajhang 30 km NE of Chainpur, Ghatganga Khola NE Shima, 29°45’05’’N 81°23’24’’E, 2400m, 25.vi.2009, forest, leg.

A. Weigel (NME); 1♀, Manang Gyaru surround, 28°38'N 84°08'E, 3600m, 14.ix.2014, leg. F. Creutzburg (NME).
Distribution. Tibet, Nepal (Boesi et al. 2005).
Host. Boesi et al. (2005) found three specimens of *C. ultramonticola* in the nest of *Ancistrocerus sikhimensis* Bingham (Hymenoptera, Vespidae, Eumeninae).
Remarks. I here upgrade to species level *Chrysis ultramonticola* Linsenmaier, 1968. The Swiss author originally described it as a subspecies of *Chrysis violenta* Linsenmaier, 1968. These two species share the similar vivid and distinctive colouration, nevertheless they can be immediately separated from one another by their different metasomal punctation (Figs 11C, 11D) (with smaller and denser punctures on the second tergum in *C. ultramonticola*), the shape of the propodeal posterior projections, slightly concave laterally (Fig. 11E) in *C. ultramonticola* and straight to convex in *C. violenta*; shorter MS in *C. ultramonticola* (Fig. 11A); longer l/w of first flagellomere (l/w = 4.2, width taken basally) than in *C. violenta* (l/w = 3.5). Linsenmaier (1959, 1968) was always very conservative in describing new taxa in the *ignita* group (Rosa et al. 2015a) and preferred to describe subpecies rather than species. The experience based on barcoding the northern European fauna of the *ignita* group (Soon et al. 2014) proved that all Linsenmaier's subspecies are actually distinct species. Although I cannot sequence and barcode fresh specimens of *C. violenta* and *C. ultramonticola*, I think that the differences listed above are sufficient to consider *C. ultramonticola* a valid species.

***Chrysis uncia* Rosa & Jacobs, sp. nov.**
(Figs 12A-12B, 13A-13F, 14A-14C)

Material examined. Holotype: India: ♀, Leh Tehsil: Rumbak, 34.06N 77.42E, 1.ix.2015, leg. Maarten Jacobs (NMLU). Paratypes: 2♀, same collecting data (PRC, MJC).
Diagnosis.
Chrysis uncia sp. nov. (Fig. 12) belongs to the *comparata* group, *analis* subgroup. All members of this group share similar colour pattern and size, making their separation often difficult and based mostly on the shape of apical margin, metasomal punctation, shape of the black spots on the second sternum and genitalia. In the case of *Chrysis uncia* sp. nov. the combination of the following diagnostic characters separates it from other similar members from Central Asia: mesonotum punctation shallow (Fig. 13C), metasomal punctures sparse (Fig. 13D), metasomal sterna blue with large black spots on second sternum (Fig. 13F). The mesonotal punctation is the key character to separate *Chrysis uncia* sp. nov. from all the other known species. Moreover, the following species are separate from *Chrysis uncia* sp. nov. by: *C. alma* Semenov-Tian-Shanskij, 1967 (known from Kazakhstan) for its red sternites, small, rounded black spots on second sternum, forebody with greenish colour (see images in Rosa et al. 2017a); *C. altaica* Mocsáry, 1912 (from Mongolia, Altai) for the different apical margin, and denser metasomal punctures (see Rosa et al. 2017c); *C. posticoexcisa* Tarbinsky, 2002 (from Tian-Shan) for the different apical margin, V-inverted incised between medial teeth; *C. turkestana* Semenov-Tian-Shanskij, 1954 (from Kazakhstan and Tajikistan) for forebody colour pattern (see Rosa et al. 2017a), green with contrasting blue median area of mesoscutum, and denser metasomal punctures. Another similar species is known for the Himalayas: *Chrysis valkeilai* Linsenmaier, 1968 (from Sarekanda, Afghanistan); the latter can be immediately separated by the large, impunctate scapal basin, the narrow post-pit row apical margin, bending downwards, small and denser punctures on metasoma and colour pattern of forebody, with green polished areas on head and mesosoma, excluding the median area of mesoscutum.
Description. Female. Body length 8.5-9.5 mm (holotype 9.0 mm). Forewing length 4.5-5.0 mm (holotype 4.7 mm).
Head. Punctation on vertex and brow even, dense, with small (0.1-0.2 × MOD) and contiguous punctures; punctation on ocellar area fully to largely with medium-sized punctures (0.5 × MOD); polished area lateral to posterior ocellus present and variable; transverse frontal carina strong and M or W-inverted shaped (Fig. 13A), with lateral endings close to eye margin, 0.5 × MOD distant; area below carina with irregular, elongate punctures; scapal basin medially impunctate till clypeus, laterally punctate and micro-punctate on lower margin, each puncture bearing thick, elongate and white seta, altogether hiding part of the face; clypeus impunctate, with row of small punctures along margins; malar space shallowly microsculptured; genal carina raised, fully developed until mandibular insertion; gena narrow; subantennal space less than 1.0 × MOD; apical margin of clypeus medially arcuate. OOL 1.8 × MOD; POL 2.0 × MOD; MS 1.0 × MOD; relative length of P:F1:F2:F3 = 1.0:1.7:1.1:0.9.
Mesosoma. Medial pronotal line [= pronotal groove] narrow, with small aligned punctures, as long as ¾ of pronotal length; pronotum with small-sized punctures (0.2-0.4 × MOD), polished interspaces with scattered smaller punctures or tiny dots; lateral sides of pronotum with small, shallow punctures: mesonotum with shallow punctures; mesoscutum with small punctures anteriorly and larger punctures basally; notauli formed by subrectangular foveae, black coloured, larger at base; lateral areas of mesoscutum with smaller punctures; parapsidal signum [= parapsidal line] black; sculpture on mesoscutellum with shallower and spaced punctures; on metascutellum with larger, polygonal, and contiguous yet still shallowly incised punctures; metanotum with large, foveate punctures without interspaces; posterior propodeal projections small, triangular, slightly divergent, and slightly concave posteriorly; mesopleuron shallowly sculptured. Forewing with second radial cell (the marginal cell located apical to the pterostigma) open, with radial sector ending about 1 × MOD away from wing margin.
Metasoma. Punctures deep, even, medium-sized (0.4 × MOD) anteriorly on terga, becoming smaller and sparser posteriorly; first tergum with micropunctures on shining interspaces; second tergum with sparser micropuncture on interspace, punctation double on lateral margin; second tergum longitudinally with large (1-2 PD), impunctate, polished median stripe (Fig. 13E); apical margin of second tergum of holotype medially arcuate (Fig. 13E), due to a malformation; third tergum similarly sculptured, without distinct longitudinal median carina or stripe; not transversally swollen before pit row (Fig. 12B); pits of pit row round and fused together in groups of 2-3 pits (Fig. 13E); apical margin of the third tergum highly variable (Figs 14A-14C): holotype as in *Chrysis analis* Spinola, 1808 with waived medial teeth and a small, triangular, lateral tooth; paratypes with four distinct teeth (Figs 14B-14C), and longer post-pit row area; the shape of teeth is different in between the two paratypes; due to the high variability this morphological character is considered

unreliable for identification based on this type series. Black spots on second sternum ovoid, large, medially separate by thin line and covering about 2/3rds of segment (Fig. 13F).
Colouration. Colour pattern typical of the *analis* subgroup, with blue head, mesosoma and apical margin of the third tergum, from pit row to apical teeth; metasoma red to violet dorsally, bluish ventrally. Scape light blue, pedicel and flagellomeres black. Wings hyaline, with brownish veins and darker area along anterior margin of second radial cell.
Male. Unknown.
Distribution. India (Ladhak).
Etymology. The specific epithet *uncia* (feminine noun) is related to the name of the snow leopard, *Panthera uncia*, because the type series was collected by Maarten Jacobs during an expedition looking for this felid. As *Chrysis uncia* sp. nov. was found within a snow leopard territory, it is expected that the cuckoo wasp inabits the same alpine and subalpine areas at elevations between 3000 and 4500 m. (Fig. 15).

***Chrysis valkeilai* Linsenmaier, 1968**

Chrysis valkeilai Linsenmaier, 1968: 93. Holotype ♀; Afghanistan: Sarekanda (NMLU) (*comparata* group).

Material examined. Afghanistan: 1♀, Sarekanda, 4100m, 28.vii.1953, Gebirge Badakschan NO Afghanistan, J. Klapperich (NMLU).
Distribution. Afghanistan (Badakschan).

***Chrysis violenta* Linsenmaier, 1968**
(Figs 10, 11B, 11D, 11F)

Chrysis (*Chrysis*) *violenta* Linsenmaier, 1968: 97. Holotype ♀, Pakistan: Luru Sar (MNLU) (*ignita* group).
Chrysis violenta: Kimsey & Bohart 1991: 476 (cat., North India). Rosa et al. 2021a: 68 (cat., distr.), 69 (Fig. 66).

Material examined. India: 1♀, Jammu & Kashmir, Aru Valley, 2740-3050 m, 2.ix.1970, leg. Y. Arita (MNLU). Nepal: 1♀, Manang Ledar, 28°44’27’’N 83°58’27’’E, 4300m, 18.ix.2014, yellow trap, leg. F. Creutzburg (NME). Nepal: 1♀, Sagarmatha N. P., Kyang Juma, 3600m, 27°49’N 86°44’E, 21.v.1996, leg. O. Biström, K. Mikkola, A. Albrecht, A. Wikberg, http://id.luomus.fi/GP.113356 (LUOMUS).
Distribution: India (Jammu & Kashmir); Nepal, Pakistan, Tibet (Kimsey & Bohart 1991).

***Chrysis vishnu* Mocsáry, 1912b**

Chrysis (*Tetrachrysis*) *vishnu* Mocsáry, 1912b: 557. Holotype ♀; India: Assam [currently Meghalaya]: Shillong (HNHM). Bischoff 1913: 61 (cat., Assam).
Chrysis (*Chrysis*) *vishnu*: Linsenmiaer 1968: 101 (descr., East India, *ignita* group).
Chrysis vishnu: Kimsey & Bohart 1991: 478 (cat., east India, *ignita* group); Rosa et al. 2021a: 68 (cat., distr.), 69 (Fig. 67, pictures of the type).

Material examined. India: 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 (NMLU). Nepal: 1♂, 1♀, W. Nepal Chifre/Ghar Khola 2400m, 28.v.1984, Coll. W. Perraudin, leg. Holzschuh (NMLU).
Distribution. India (Meghalaya; Sikkim), Nepal*. Malaysia (Kimsey & Bohart 1991).

***Chrysis volatilis* Smith, 1874**
(Fig. 16A-16G)

Chrysis volatilis Smith, 1874: 459. Holotype ♀; China: Shanghai (NHMUK). Kimsey & Bohart 1991: 478 (cat., *ignita* group). Present paper: *taczanovskii* group.

Material examined. India: 1♀, Sikkim, Chongpung, 4920 ft, 27.ix.1959, leg. F. Schmidt (RMNH Naturalis).
Remarks. *Chrysis volatilis* was placed in the *ignita* group by Kimsey & Bohart (1991). After type examination (Fig. 16E-16G), I confirm that *C. volatis* belongs to the *taczanovskii* group and not to the *ignita* group for its subparallel and elongate malar spaces, the narrow shape of the head in dorsal view, the elongate and slender body, the unique pit row with the posterior margin of the pits merged together, for the elongate and narrow black spots on the second tergum, all typical features of the *taczanovskii* group.

Genus *Chrysura* Dahlbom, 1845

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

***Chrysura kashmirensis* (Nurse, 1902)**

Chrysis kashmirensis Nurse, 1902: 305. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 491; Kashmir (NHMUK).
Chrysura kashmirensis: Kimsey & Bohart 1991: 491 (cat., Pakistan: Kashmir, *radians* group). Rosa et al. 2021a: 71 (cat., distr.), 72 (Fig. 70, pictures of the type).

Material examined. 1♀, 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). India: 1♀, Bhimtal 1.-15.v.1978, 1400-1500m, W. Wittmer (NMLU).
Distribution. India (Uttarakand), Kashmir.

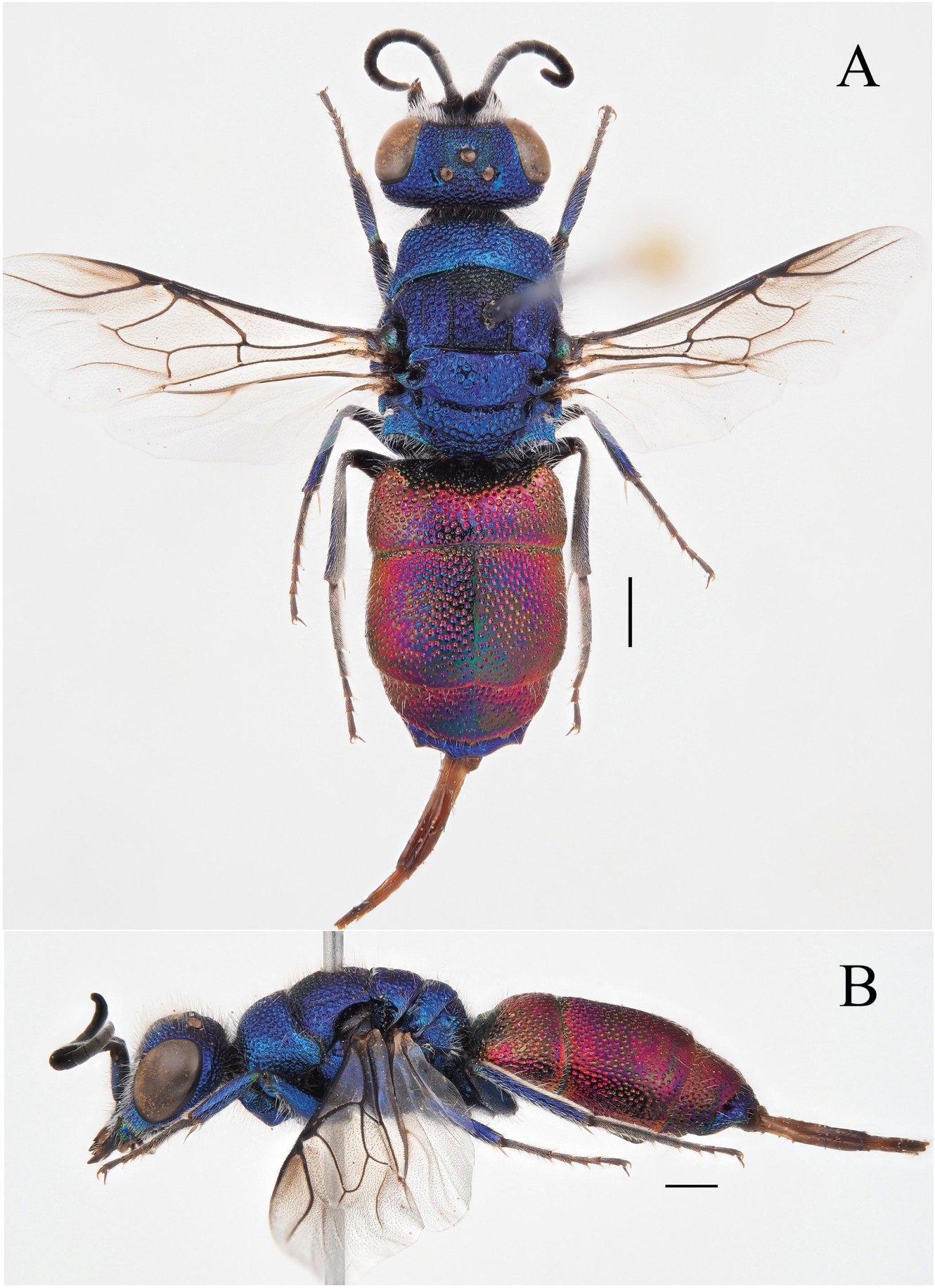

Figure 12. *Chrysis uncia* sp. nov., female, holotype. A) Habitus, dorsal view. B) Habitus, lateral view. Scale bars = 1 mm.

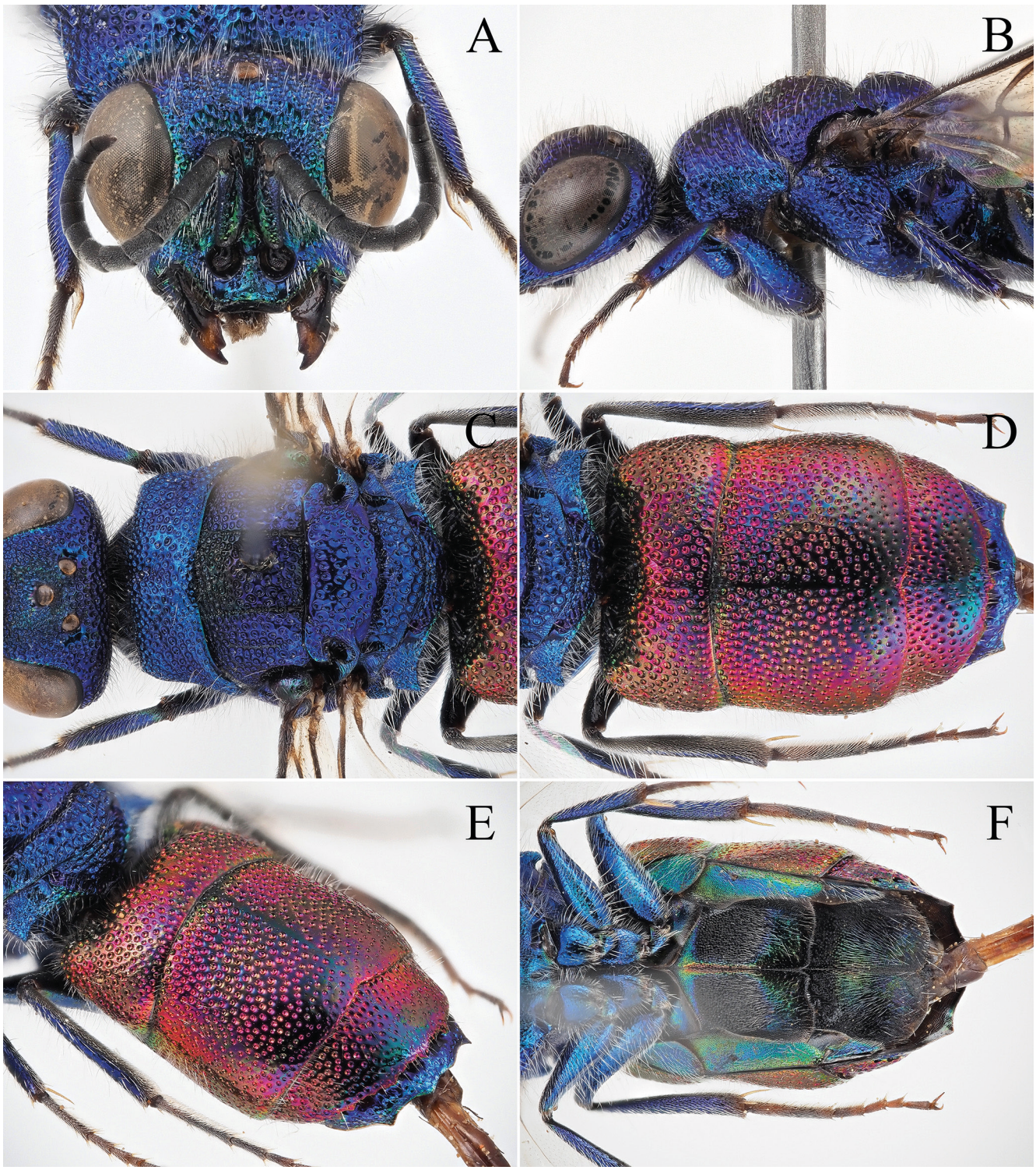

Figure 13. *Chrysis uncia* sp. nov., female, holotype. A) Face, frontal view, paratype. B) Head and mesosoma, lateral view, paratype. C) Head and mesosoma, dorsal view, holotype. D) Metasoma, dorsal view, holotype. E) Metasoma, postero-lateral view, holotype. F) Metasoma, ventral view, holotype.

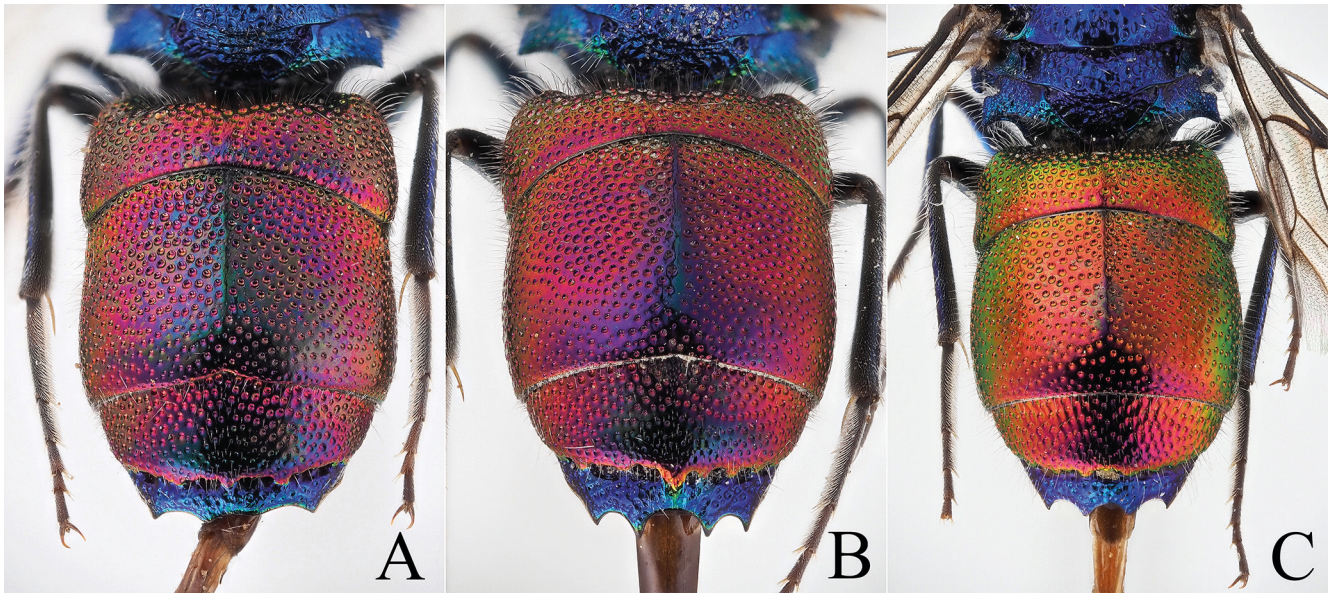

Figure 14. *Chrysis uncia* sp. nov., female metasoma, posterior view. A) holotype. B-C) paratypes.

Figure 15. Type locality of *Chrysis uncia* sp. nov. Left, India, Leh Tehsil: Rumbak. Right, same locality with Maarten Jacobs exploring the environment.

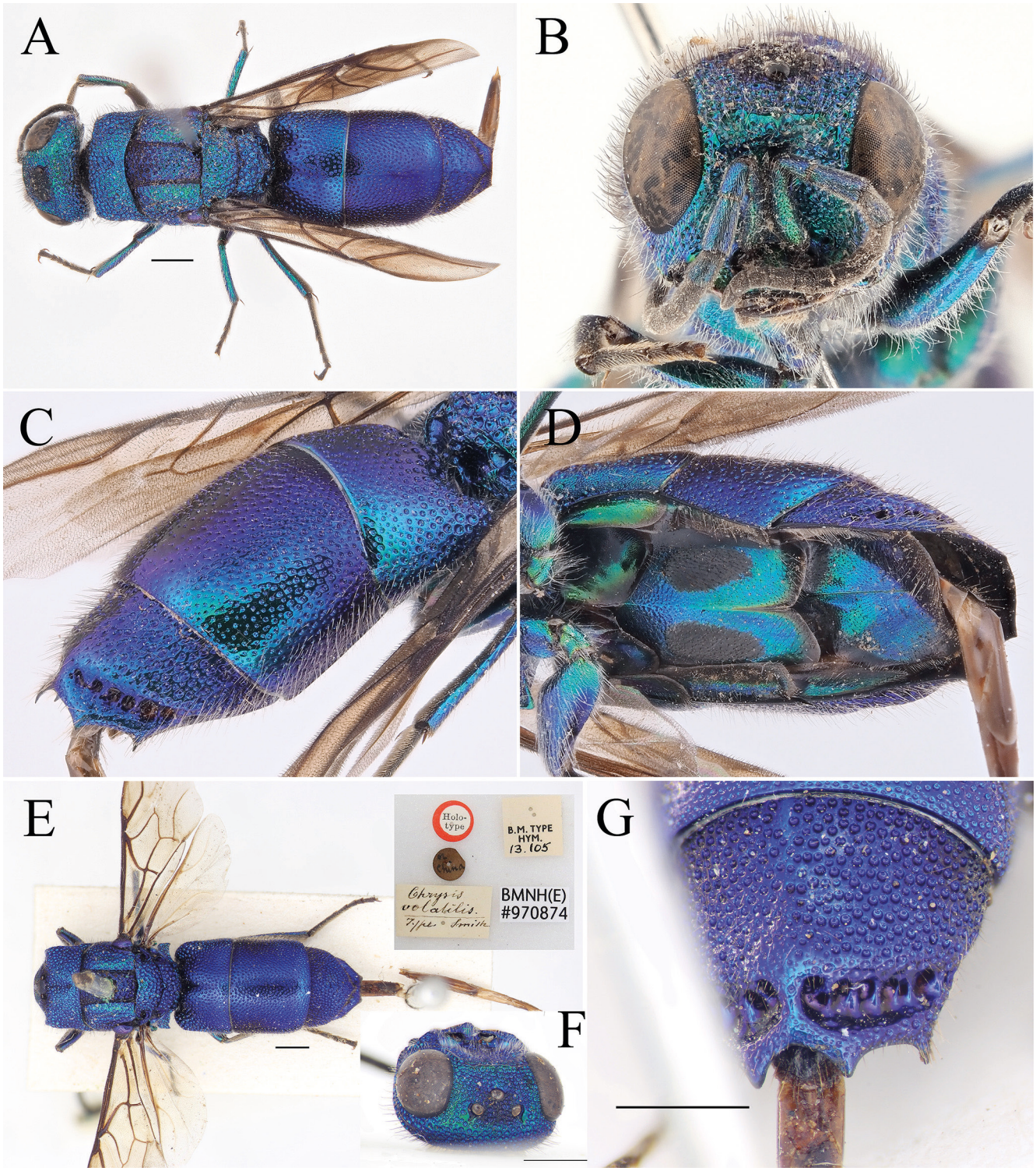

Figure 16. *Chrysis volatilis* Smith, 1874, female from Sikkim (A-D), female holotype (E-G). A) Habitus, dorsal view. B) Head, frontal view. C) Metasoma, postero-lateral view. D) Metasoma, ventral view. E) Habitus, dorsal view. F) Head, dorsal view. G) Third tergum, dorso-lateral view. Scale bars = 1 mm.

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

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

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

Istiochrysis ziliolii Rosa, Feng & Xu in Rosa et al., 2016a: 596. Holotype ♂; China: Yunnan: Tengchong, Qushi (SCAU). Rosa et al. 2021a: 71 (cat.), 72 (Fig. 71), 73 (distr.).

Material examined. India: 2♂, 2♀, Uttarakhand, 30km NW Bageshwar, 2400m, 25.-30.vi.2003, leg. Kejval & Tryzna (PRC, MHC). Nepal: 1♀, env. Lamri, 29°18'34''N 82°16'23''W, 2600m, 21.vi.1997, leg. F. Creutzburg (NME); 1♂, Karnali, Gothichaur, 29°11'54''N 82°18'36''E, 2850m, Sumpfwiese, 26.v.-5.vi.2007, leg. F. Creutzburg (NME); 1♂, 1♀, Gothichaur, 29°12'10N 82°18'56''E, 11.vi.1997 Weißschale leg. F. Creutzburg (NME).
Distribution. India (Uttarakhand); China (Yunnan) (Rosa et al. 2016a); Nepal*.

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)**

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). Rosa et al. 2021a: 74 (cat., distr., Fig. 73).

Material examined. Nepal: 1♀, Deppur 4,000ft, 30.x.1960, L. Swan (NMLU).
Distribution. India (Maharashtra; Tamil Nadu; India Orientalis (locality not specified)). Nepal*.

***Praestochrysis shanghaiensis* Smith, 1874**

Chrysis shanghaiensis Smith, 1874: 460. Holotype ♀; China: Shanghai (NHMUK). Bingham 1903: 438 (key), 477 (descr., Himalaya; Bengal), 477 (fig. 158).
Chrysis himalayensis Radoszkowski, 1888: 31. Holotype male; Himalaya (ISEA-PAS). Rosa et al. 2015b: 32 (cat., typ.), 33 (Plate 21).
Praestochrysis shanghaiensis: Kimsey & Bohart 1991: 534 (cat., India); Rajmohana et al. 2018: 381 (cat., Himalaya); Rosa et al. 2021a: 76 (cat., distr.), 77 (Fig. 77).

Distribution. India (Himalayas; Bengal (locality not specified)); India to China and Korea (Kimsey & Bohart 1991).
Remarks. *Praestochrysis himalayensis* is potentially a valid species (Rosa et al. 2015b) and its real status should be investigated.

Genus *Primeuchroeus* Linsenmaier, 1968

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

***Primeuchroeus indiacus* Bohart, 1988**

Primeuchroeus indiacus Bohart, 1988: 26. Holotype ♀; India: Uttarakhand: Dehradun (21-24 (key), 26 (descr.)) (Bohart Museum of Entomology, Davis, USA) (*siamensis* group). Kimsey & Bohart 1991: 542 (cat., India); Rajmohana et al. 2018: 381 (cat., Himalaya); Rosa et al. 2021a: 78 (cat., distr., Uttarakhand).

Material examined. India: 1♀, Uttarakhand, vicinity of Nainital, 1900-2100 m, 19-21.VI.2003, Z. Kejval & M. Trýzna leg., 1 female (PRC).
Distribution. India (Uttarakhand, Uttar Pradesh).

Genus *Spinolia* Dahlbom, 1854

Spinolia Dahlbom, 1854: 363. Type species: *Spinolia magnifica* Dahlbom, 1854 [= *Spinolia lamprosoma* (Förster, 1853)], by monotypy.

***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). Rajmohana et al. 2018: 381 (cat., Himalaya).

Distribution. Pakistan.
Remarks. Kimsey (in Kimsey & Bohart 1991) replaced the name *Spinolia dusmeti* with *Spinolia kashmirae* 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 therefore unnecessary.

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)**

Chrysis cyanura Forster, 1771: 89. Holotype ♂; Spain (NHMUK).
Stilbum cyanurum: Bingham 1903: 431 (key), 433-434 (descr., Sikhim [= Sikkim]), 433 (fig. 151); Bingham 1908: 349 (Bihar: Purneah [= Purnia]); Rosa et al. 2021a: 78 (cat., distr.), 79 (distr. Fig. 78).
Stilbum cyanurum amethystinum (Fabricius, 1775): Thapa 2000: 62 (cat., Nepal: Kaski-Pipar (Sano Khopang: 1750m).

Material examined. 1♀, Himalaya Kumaon 1895 Coll. Linsenmaier (NMLU); 1♀, Himalaya, Felder (NMLU). Nepal: 1♀, Dolaighat, 3,000 ft, 4.xi.1960, L. Swan (NMLU). Pakistan: 1♀, Gilgit, 4.vii.1954, J. Klapperich (NMLU).
Distribution. India (Bihar; Chhattisgarh; Gujarat; Karnataka; Kerala; Maharashtra; Sikkim; Tamil Nadu; Uttar Pradesh; West Bengal); Nepal, Pakistan*. Subcosmopolitan: Afrotropical, Australian, Oriental, Palaearctic, in tropics and warm temperate areas (Rosa et al. 2021a).

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)**

Chrysis (*Trichrysis*) *excisifrons* Mocsáry, 1912a: 379. Holotype ♀; India: Sikkim (HNHM). Bischoff 1913: 45 (cat., India).
Trichrysis excisifrons: Kimsey & Bohart 1991: 572 (cat., North India); Rajmohana et al. 2018: 381 (cat., Himalaya); Rosa et al. 2021a: 79 (cat., distr.), 80 (Fig. 79, pictures of the type).

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

***Trichrysis imperiosa* (Smith, 1874)**

Chrysis imperiosus Smith, 1874: 460. Lectotype ♀ designated by Bohart in Kimsey & Bohart 1991: 533; Australia: Queensland, Moreton Bay (NHMUK).
Chrysis imperiosa: Bingham 1903: 438 (key), 479-480 (descr., Sikhim [= 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).
Trichrysis imperiosa (Smith): Rosa et al. 2014: 76; Rosa et al. 2021a: 79 (cat., distr.), 80 (Fig. 80).

Material examined. Nepal: 1♀, West Nepal 13.VI. Myagdi District, Shikha Tatopani (28°28'N 83°40'E) C. Holzschuh (NMLS).
Distribution. India (Assam; Karnataka; Kerala; Maharashtra; Meghalaya; Sikkim; West Bengal; Arunachal Pradesh); China (Taiwan, Hunan, Guangdong, Hainan), Nepal. Australia, Indonesia, Myanmar, Papua New Guinea, Sri Lanka, Thailand, Vietnam (Rosa et al. 2016b).
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 syonymized 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. 2016b) should belong to a different species.

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

Chrysis lusca Fabricius, 1804: 171. Holotype ♀; Italy (accidentally introduced) (ZMUC). Bingham 1908: 349 (West Bengal: Murshidabad); Jonathan et al. 1977: 87 (India: Arunachal Pradesh).
Chrysis (*Pentachrysis*) *lusca*: Mocsáry 1889: 527-528 (descr., India orientalis, Rajarampore, Neelgherries, Tamil Nadu: Pondicherry, Tranquebar [= Tharangambadi]).
Trichrysis lusca: Rosa et al. 2021a: 81 (cat.), 82 (distr., Fig. 82).

Material examined. Nepal: 1♀, Narayani D: Chitwan, Sauraha Hotel Sweet Home, 27°35'09''N 84°29'30''E, 180m, LFF, 5.vi.2017, leg. A. Weigel (NME).
Distribution. India (Arunachal Pradesh; Bihar; Chhattisgarh; Karnataka; Kerala; Maharashtra; Odisha; Puducherry, Tamil Nadu; Rajarampore; Nilgiris), Nepal*. Australia, China, Japan, Korea, Myanmar, Philippines, Thailand, Bangladesh, Cambodia, Indonesia, Malaysia, Myanmar, Sri Lanka, Vietnam. Afrotropical: Mauritius and Réunion (Rosa et al. 2021a).

***Trichrysis poseidonia* Rosa, Aswathi, Wiśniowski & Bijoy, 2022**

Trichrysis poseidonia Rosa, Aswathi, Wiśniowski & Bijoy, 2022: 129. Holotype ♀; India: Tamil Nadu, Vilupparam, Auroville, Discipline village, 12°0.7′ N 79°47.97′ E, 1.v-31.vi.2017, local collector (NME).

Material examined. NEPAL: 1♀, Rapati Province, Rihar, 27°54′ N 82°20′ E, alt. 210 m, 1.vi.2007, leg. J. Weipert (NME).
Distribution. India (Tamil Nadu), Nepal (Rosa et al. 2022).

***Trichrysis triacantha* (Mocsáry, 1889)**

Chrysis (*Trichrysis*) *triacantha* Mocsáry, 1889: 325. Syntypes ♀♀ [not holotype]; Sumatra (NHMW).
Trichrysis triacantha: Rosa & Halada 2021: 210.

Distribution. India (Bihar, Kerala, West Bengal); China, Indonesia, Myanmar (Rosa et al. 2016b). Widely distributed in the Oriental Region (Kimsey & Bohart, 1991)

Tribe Parnopini
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 viridis* Brullé, 1846**

Parnopes viridis Brullé, 1846: 13. Holotype ♂; India Orientalis: Tamil Nadu: Pondicherry (MNHN). Bingham 1903: 495-496 (descr., Tamil Nadu: Pondicherry; West Bengal: Calcutta [= Kolkata]; Sikkim; Gujarat: Deesa), 496 (fig. 161); Rosa et al. 2021a: 85 (cat., distr.), 86 (Fig. 87).

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

Species listed from Himalaya, yet misidentified

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

Chrysis conserta du Buysson, 1891: Bingham 1903: 474 (India: Sikhim (Hermand), 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 a junior synonym of *C. nitidula* Fabricius, 1775. The specimens identified by Bingham (1903, 1908) are misidentified; they belong to a blue coloured species of the *ignita* group and they are still unidentified (Rosa et al. 2021a).

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

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

Remarks. The occurrence of *Chrysis indigotea* in India is doubtful because this species is documented only from western Europe to the Caucasus (Paukkunen et al. 2015). Bingham's (1903) record may relate to another one of the blue species of the *ignita* group described after his publications and should be double checked (Rosa et al. 2021a).

***Chrysis klio* Balthasar, 1953**

Chrysis (*Tetrachrysis*) *klio* Balthasar, 1953: 257. Holotype ♂; Palestine: Jerusalem [not holotype ♀ from Afghanistan, Kokscha-Tal, Badakschar Mts.] (Prague) (*varidens* group).

Remarks. The type locality was given as Afghanistan (Badakshar) by Kimsey & Bohart (1991) but the species was actually described from Palestine.

Discussion

Based on the scarce available data for chrysidids, the 54% (44 species) are endemic to the Himalayas. Of the remaining species, 21 species originate from the Oriental region, 12 from the Palaearctic, two are present in both regions (*Elampus panzeri* and *Omalus aeneus*), and three are subcosmopolitan, and are also present in the Afrotropical region (*Chrysis stilboides*, *Stilbum cyanurum* and *Trichrysis lusca*). The Palaearctic and Oriental faunas may become mixed in the Himalayas in broad transition zone, as in western China (Chen et al. 2008, Rosa et al. 2021a). More generally, species found over a certain altitude are clearly related to the Palaearctic region (e.g. members of the *ignita* group, *comparata* group, *viridula* group). However, as the geography of the area includes traveling channels in the valleys for flying hymenopterans, at lower elevation it may include members belonging to either the Palaearctic or Oriental regions.
More in detail, species from the following biome are typically related to the Palaearctic fauna: from the eastern Himalayan broadleaf 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. Rosa et al. (2021a) 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).
The distribution of the species in the different Himalayan states and provinces is summarised in Tab. 1.

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Table 1. Distribution of the Chrysididae species in the Himalaya.

	"Himalaya "	**India** Ladakh	**India** Jammu and Kashmir	**India** Himachal Pradesh	**India** Uttarakhand	**India** Sikkim	**India** West Bengal (Darjeeling and Kalimpong)	**India** Arunachal Pradesh	**Indian Himalaya**	**Bhutan**	**Nepal**	**Tibet**	**Pakistan**	**Afghanistan**
Cleptes tibetensis Wei, Rosa & Xu, 2013												x		
Chrysellampus himalayanus Rosa, sp. nov.											x			
Elampus assamensis (Mocsáry, 1911)											x			
Elampus gladiator Rosa, 2021			x	x		x			x		x			
Elampus kashmirensis (Nurse, 1902)			x						x					
Elampus panzeri (Fabricius, 1804)														x
Elampus spina (Lepeletier, 1806)													x	
Hedychridium aeruginosum (Mocsáry, 1914)						x			x					
Hedychridium nepalense Strumia, 1999											x			
Hedychridium sikkimium Strumia, 1999						x			x					
Hedychrum formosanum Mocsáry, 1911											x			
Hedychrum migliaccioi Rosa, 2019											x			
Hedychrum striatum Mocsáry, 1911								x	x					
Holophris marginella (Mocsáry, 1890)					x				x					
Holopyga cupreata Nurse, 1902			x						x					
Holopyga indica Mocsáry, 1889	x													
Holopyga monticola Balthasar, 1957														x
Omalus aeneus (Fabricius, 1787)					x				x					
Omalus imbecillus (Mocsáry, 1889)			x						x		x		x	
Omalus tibetanus Wei, Rosa, Liu & Xu, 2014												x		
Philoctetes cynthiae Rosa, 2017											x		x	
Chrysis acanthophora Bischoff, 1910	x													
Chrysis afghana Balthasar, 1957														x
Chrysis alticata Bohart, 1991												x		
Chrysis amoena (Balthasar, 1957)														x
Chrysis angolensis Radoszkovsky, 1881			x				x		x					
Chrysis angustata Mocsáry, 1893				x					x					
Chrysis arkadyi Rosa et al., 2021					x				x				x	
Chrysis bahadur Nurse, 1903			x						x					
Chrysis begam Mocsáry, 1912						x			x					
Chrysis bhoutanensis (du Buysson, 1908)							x							
Chrysis buddhae Mocsáry, 1913											x			
Chrysis chlorochrysa Mocsáry, 1898														x
Chrysis cupreiventris Bingham, 1898		x		x		x			x					
Chrysis duplopilosa Linsenmaier, 1968												x		
Chrysis elvira Balthasar, 1957														x
Chrysis gabriellae Rosa, sp. nov.						x			x					
Chrysis gilgitensis Linsenmaier, 1968													x	
Chrysis grumorum Semenov, 1892												x		
Chrysis hartmanni Rosa, sp. nov.											x			
Chrysis ionophris Mocsáry, 1893								x	x					

	"Himalaya"	**India** Ladakh	**India** Jammu and Kashmir	**India** Himachal Pradesh	**India** Uttarakhand	**India** Sikkim	**India** West Bengal (Darjeeling and Kalimpong)	**India** Arunachal Pradesh	**Indian Himalaya**	**Bhutan**	**Nepal**	**Tibet**	**Pakistan**	**Afghanistan**
Chrysis jalala Nurse, 1902			x			x			x		x			
Chrysis kashgarica Mocsáry, 1912b														x
Chrysis komarowi Radoszkowski, 1891													x	
Chrysis korbiana Mocsáry, 1912		x											x	
Chrysis lama Mocsáry, 1914												x		
Chrysis martinella du Buysson, 1900														x
Chrysis oblita Bohart, 1991							x		x					
Chrysis oculata Fabricius, 1775					x	x	x		x		x			
Chrysis perfecta Cameron, 1897						x	x		x					
Chrysis polita Rosa, 2021					x		x		x					
Chrysis principalis Smith, 1874	x						x	x	x					
Chrysis rani Mocsáry, 1913						x			x					
Chrysis retracta Linsenmaier, 1959													x	
Chrysis sandaracata Bingham, 1903						x			x					
Chrysis saraksensis Radoszkowski, 1891					x				x					
Chrysis schioedtei Dahlbom, 1854						x			x		x			
Chrysis sikkimensis Mocsáry, 1912						x			x					
Chrysis speculata du Buysson, 1896											x		x	
Chrysis stilboides Spinola 1838	x								x					
Chrysis tamerlana Mocsáry, 1912			x	x	x	x	x		x		x			
Chrysis tibetana Mocsáry, 1914												x		
Chrysis uljanini Radoszkowski, 1877														x
Chrysis ultramonticola Linsenmaier, 1968											x	x		
Chrysis uncia Rosa & Jacobs, sp. nov.		x												
Chrysis valkeilai Linsenmaier, 1968														x
Chrysis violenta Linsenmaier, 1968			x						x		x	x	x	
Chrysis vishnu Mocsáry, 1912b						x			x		x			
Chrysura kashmirensis Nurse, 1902			x		x				x					
Istiochrysis ziliolii Rosa, Feng & Xu, 2016					x				x		x			
Praestochrysis amoenula (Mocsáry, 1899)											x			
Praestochrysis shanghaiensis (Smith, 1874)	x													
Primeuchroeus indiacus Bohart, 1988					x				x					
Spinolia dusmeti Trautmann, 1921													x	
Stilbum cyanurum (Forster, 1771)						x			x		x		x	
Trichrysis excisifrons (Mocsáry, 1912)						x			x		x			
Trichrysis imperiosa (Smith, 1874)						x	x	x	x		x			
Trichrysis lusca (Fabricius, 1804)								x	x		x			
Trichrysis poseidonia Rosa et al., 2022											x			
Trichrysis triacantha (Mocsáry, 1889)							x		x					
Parnopes viridis Brullé, 1846						x			x					

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