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Review of *Odontochrydium* Brauns (Hymenoptera, Chrysididae) with description of two species from the Palaearctic and Oriental regions

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Abstract

The genus *Odontochrydium* Brauns, 1928, previously known only from the Afrotropical Region, is recorded from the Palaearctic Region (Saudi Arabia) and the Oriental Region (Southern India) for the first time. *Odontochrydium bicristatum* **sp. nov.** from Kenya and Saudi Arabia and *O. xui* **sp. nov.** from India are described. Pictures and a key to the species of this genus are given.

Key word: Chrysidinae, cuckoo wasp, new species, Africa, India

Introduction

The genus *Odontochrydium* Brauns, 1928 is a small remarkable genus within Chrysidini. It is clearly separated from all related genera by the combination of several diagnostic features, such as the elongate clypeus, the transversely microridged scapal basin the tridentate apical margin of the last visible tergite, the quadridentate mesopleuron, the presence of well separated black spots on the second sternite (Kimsey & Bohart 1991) and robust, broad and convex general habitus (Fig. 1).

Odontochrydium was known only from a single Afrotropical species: *O. irregulare* (Mocsáry, 1914) (Kimsey & Bohart 1991; Madl & Rosa 2012). This species is widely distributed from South Africa to central-eastern Africa: Zimbabwe, Malawi, Kenya, Uganda (Kimsey & Bohart 1991; Madl & Rosa 2012) and southern part of Democratic Republic of Congo (unpubl. data).

During a recent examination of Stephan Zimmermann's collection housed at Naturhistorisches Museum in Vienna, Austria, and Walter Linsenmaier's collection in Luzern, Switzerland, I recognized two previously undescribed species, one from India and another from Africa and Saudi Arabia. Other specimens, recently collected, of these undescribed species were also found in the private collections of Gian Luca Agnoli (Bologna, Italy), Maurizio Pavesi (Milan, Italy) and Franco Strumia (Pisa, Italy). Additional specimens of *O. irregulare* deposited at the Natural History Museum, London (United Kingdom), Museum für Naturkunde, Berlin (Germany), Iziko Museums of South Africa (Cape Town, South Africa) and Ditsong (ex Transvaal Museum, Pretoria, South Africa) have been also examined.

Materials and methods

Specimens were examined and described under a Carton Togal stereomicroscope. Photographs of specimens were taken with Nikon D-80 connected to the stereomicroscope Togal SCZ and stacked with the software Combine ZP. Morphological terminology follows Kimsey & Bohart (1991). Abbreviations used in the descriptions as follows: F1, F2, F3, etc. = flagellomere 1, 2, 3 and so on; MOD = midocellus diameter; MS = malar space, the shortest distance between the base of the mandible and the lower margin of the compound eye; OOL = the shortest distance between the posterior ocellus and the compound eye; P = pedicel; PD = puncture diameter; POL = the shortest distance between posterior ocelli; TFC = transverse frontal carina.

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Depositories

Ditsong	Ditsong National Museum of Natural History, Pretoria (South Africa).
FSPC	Franco Strumia private collection, Pisa (Italy).
GLAC	Gian Luca Agnoli private collection, Bologna (Italy).
IZIKO	Iziko South Africa Museum, Cape Town (South Africa).
MfN	Museum für Naturkunde, Berlin (Germany).
MPPC	Maurizio Pavesi private collection, Milano (Italy).
NHMUK	The Natural History Museum, London (United Kingdom).
NHMW	Naturhistorisches Museum, Vienna (Austria).
NMLS	Natur-Museum, Luzern (Switzerland).
PRPC	Paolo Rosa private collection, Bernareggio (Italy).

Genus *Odontochrydium* Brauns, 1928

Odontochrydium Brauns, 1928: 389. Type species: *Odontochrydium trautmanni* Brauns, 1928: 389 (= *Chrysis irregularis* Mocsáry, 1914). Kimsey & Bohart 1991: 517; Madl & Rosa 2012: 107.

Diagnosis. Clypeus and scapal basin elongate; midocellus lidded; TFC with branches encircling mid-ocellar area; lower mesopleuron tetradentate, posterior tooth digitate close to metapleuron; apical margin of metasomal tergite 3 tridentate; small black spots on sternite 2 widely separated (Kimsey & Bohart 1991); large species with robust, broad, convex habitus (Fig. 1).

Description. Head subquadrate in frontal view (l/w = 1), scapal basin elongate, transversely microridged (Figs 2B, 4B, 5B, 6B); F1 1.5 × as long as broad in female, 1.3 × in male; subantennal space 1.8–2.0 × MOD; malar space 1.0–1.5 × MOD; genal carina full developed, running under eye to mandibular joint; subgenal area faint; TFC nearly straight, with branches encircling mid-ocellar area; mid-ocellus lidded; pronotum with dorsal surface ending abruptly, medially narrow (almost half than pronotal length measured at sides), sides apically convergent, anterior angles acute (Fig. 2B); lateral lobes of mesoscutum broadened over part of tegulae; metanotum simple, without metanotal projection; mesopleuron with ventral margin tridentate, and with fourth digitate tooth positioned posteriorly on mesopleuron, close to metapleuron; posterior propodeal projection (= propodeal angle) large, incurved behind; tergites broad, metasomal tergite 2 with shallow longitudinal carina; metasomal tergite 3 apically tridentate; metasomal tergite 3 lateral edge biconvex; black spots on metasomal sternite 2 rounded to sub-oval, almost connected to lateral margin of metasomal sternite 2 and medially well separated.

Distribution. South and East Sub-Saharan Africa, Saudi Arabia and southern India.

Key to the species of *Odontochrydium*

1. Median area of mesoscutum with two longitudinal ridges (Figs 6D, 7D), medially with transversally enlarged foveae (Figs 3A–3B); punctation on metasoma with scattered, large punctures (Fig. 6A–7A); Kenya, Saudi Arabia . . . . . *O. bicristatum* **sp. nov.**
- Median area of mesoscutum without longitudinal ridges (Fig. 2D), medially with contiguous, reticulate punctures (Figs 5D, 9D); punctation on metasoma evenly punctate (Figs 2A, 4A, 5A, 8A, 9A) 2
2. Lateral margin of pronotum almost straight (Fig. 8D); pits of metasomal tergite 3 pit row deep, large, somewhere confluent (Figs 8F, 9F); areas anterior and posterior to pit row in lateral view forming distinct concave angle (Figs 8E, 9E); malar space short (1.0 × MOD); South India . . . . . *O. xui* **sp. nov.**
- Lateral margin of pronotum distinctly bisinuate (Fig. 2D); pits of metasomal tergite 3 pit row shallow, small, distinctly separate (Figs 2F, 4F); areas anterior and posterior to pit row in lateral view continuous with each other (Figs 2E, 4E); malar space long (1.3 × MOD); Afrotropical, widespread.. . . . . *O. irregulare*

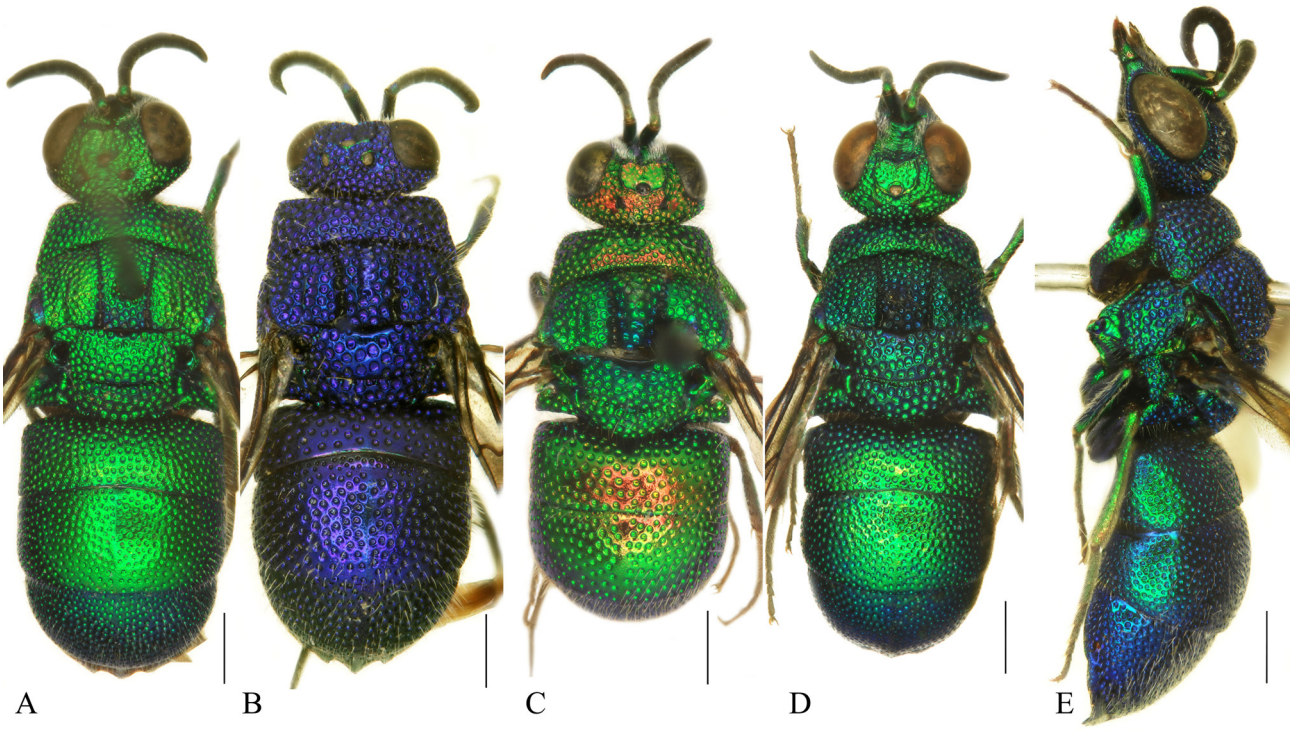

FIGURE 1. A. *Odontochrydium xui* **sp. nov.**, holotype female. **B.** *O. bicristatum* **sp. nov.**, female; **C.** *O. bicristatum* **sp. nov.**, holotype male; **D.** *O. irregulare* (Mocsáry), male from Zimbabwe; **E.** *O. irregulare*, female from South Africa, lateral view.

Odontochrydium irregulare (Mocsáry, 1914)

(Figs 1A–1B, 2A–2F, 4A–4F, 5A–5F)

Chrysis (*Pentachrysis*) *irregularis* Mocsáry, 1914: 60. Holotype ♀; Malawi: Lilongwe (NHMUK) (examined).
Odontochrydium irregulare: Kimsey & Bohart 1991: 516 (fig. 127), 517 (figs 128a-e), 519 (tax., Malawi (not Tanzania), South Africa, cat.); Madl & Rosa 2012: 107.
Odontochrydium Trautmanni Brauns, 1928: 389. Syntypes ♂, ♀; South Africa, Natal Province, Malvern (Ditsong) (examined), synonymized by Kimsey & Bohart (1991: 519).
Chrysis (*Trichrysis*) *trautmanni*: Edney 1952: 406 (tax.); Edney 1953: 532 (key, tax., descr., South Africa, Zimbabwe), pl. 1 (fig. e).

Material examined. ANGOLA (new record): 1♀, Mocamedes Distr.: Bruco, 26.II.-2.III.1972, Southern African Exp. British Museum 1972-I, NHMUK010812298 (NHMUK). DEMOCRATIC REPUBLIC OF CONGO (new record): 2♀, Kapanga (NHMW). MALAWI: 1♀, holotype, (Central Angoniland) Lilongwe Distr., 4,000–5,000 ft, 28.V–2.VI.1910, leg. S.A. Neave, NHMUK010812294 (NHMUK); 1♂, (Nyasaland) Mlanje [currently Mulanje], 29.IV.1913, leg. S.A. Neave, NHMUK010812295 (NHMUK). NAMIBIA (new record): 1♀, Waterberg, 15–17.I.1993, leg. F. Koch (MfN); 1♀, Waterberg, Main-Camp, 9–11.II.2007, 20°30'S / 17°14'E, leg. F. Koch (MfN); 1♀, Popa Falls, Kavango, 2.III.1994, 18°07'S / 21°35'E, leg. H. Schumann (MfN); 1♀, East Caprivi, Katima Mulilo, 17°29'S / 24°17'E, 4–7.III.1992, leg. F. Koch (MfN). SOUTH AFRICA: 1♀, Western Transvaal Retief's Kloof Nature Reserve, 30.III.1960, Empey Collection (NMLS); 1♀, Limpopo, Modimolle, 30.XII.2008, leg. Snižek (PRPC); 1♀, Western Cape, S of Barrydale, 16.XII.2002, leg. Snižek (GLAC); 1♂, Cape Prov., Worcester. I.1934, leg. R.E. Turner (Brit. Mus. 1934-106), NHMUK010812296 (NHMUK); 1♂, 1♀, Mpumalanga, Blyde River Canyon Reserve, 24°39'S / 30°50'E, 1–3.IV.2001, leg. F. Koch (MfN). UGANDA: 1♀, Pro. Tero Forest, S.E. Buddu 3,800ft, 26–30.IX.1911, leg. S.A. Neave (NMLS). ZIMBABWE: 1♂, S. Rhodesia Umtali Christmas Pass, V.1932, leg. J. Ogilvie (NMLS); 1♀, same data, NHMUK010812297 (NHMUK); 1♂, Mavhuradonha, 15 km SE Muzarabani, 17.12.1998, leg. M. Halada (GLAC).

Diagnosis. *Odontochrydium irregulare* (Figs 1A, 1B) differs from *O. bicristatum* **sp. nov.** (Figs 1C, 1D) by

having the unmodified median mesoscutal area (with two longitudinal ridges in *O. bicristatum* (Fig. 6D, 7D)), the mesoscutum evenly punctate (vs. reticulate-foveate, with enlarged foveae medially on median area of mesoscutum); the metasoma evenly punctate, with mid-sized punctures (Figs 2A, 4A, 5A) (vs. with scattered, large punctures (Figs 6A, 7A)). It differs from the Indian *O. xui* **sp. nov.** by having the metasomal tergite 3 surface in lateral view evenly bent (vs. forming a concave angle at pit row level in *O. xui*) and longer MS (1.5 – 1.6 × MOD) (vs. 1 × MOD).

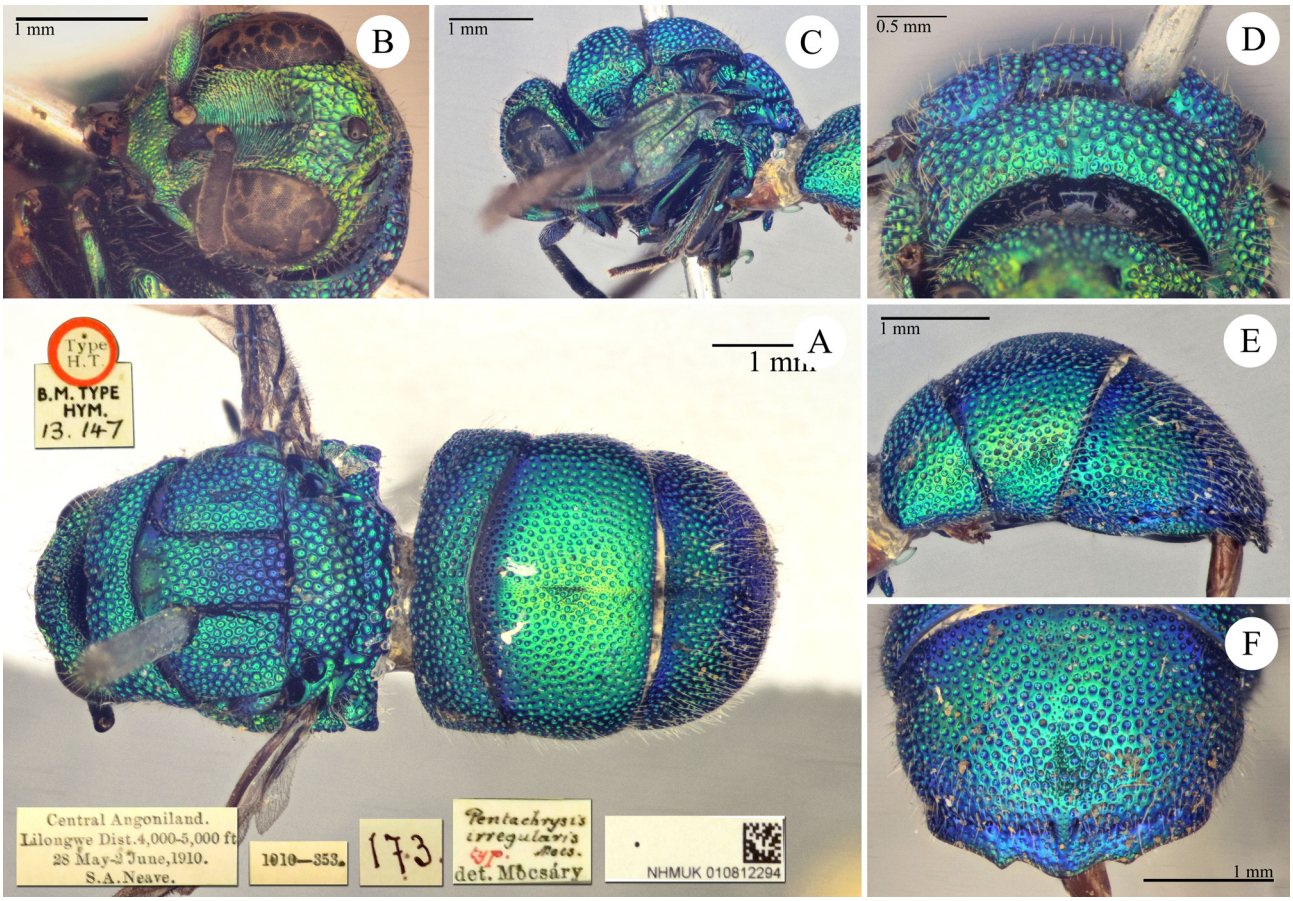

FIGURE 2. *Odontochrydium irregulare* (Mocsáry), holotype female. **A.** Habitus, dorsal view; **B.** head, frontal view; **C.** Mesosoma, lateral view; **D.** Mesosoma, frontal view; **E.** Metasoma, lateral view; **F.** Metasomal tergite 3, posterior view. Photo courtesy of The Natural History Museum, London ©.

Distribution. Angola, Democratic Republic of Congo, Kenya, Malawi, Namibia, South Africa, Uganda, Zimbabwe.

Remarks. *Odontochrydium irregulare* is widespread in the south-eastern Afrotropical Region (Kimsey & Bohart 1991; Madl & Rosa 2012). The species is rather variable in colour and shape of the apical teeth on metasomal tergite 3 (Kimsey & Bohart 1991). In particular, the coloration varies from blue to green or purple, and the median apical tooth may be stouter with a trace of a median longitudinal carina (Fig. 2F) or acute with a median carina (Fig. 4F) (form described as *O. trautmanni*, synonymised by Kimsey & Bohart 1991). I observed a third variation (specimen from the Democratic Republic of Congo) with median tooth distinctly longer and wider than the lateral teeth. *O. irregulare*, although widespread, is quite an uncommon species, seemingly known through a limited number of specimens. It is therefore difficult to evaluate whether the described variations match with the range of variability of *O. irregulare*, or conversely represent different, closely related species. A future investigation based on more material is required.

***Odontochrydium bicristatum* Rosa, sp. nov.**
(Figs 1C, 1D, 3A–3B, 6A–6F, 7A–7F)

Material examined. Holotype: ♂, KENYA, Archers post, 5–10.XII.1986, leg. W. Spillmann Coll. Lins. (labelled as Type of *Odontochrydium spillmanni* Linsenmaier, 1987, *in litt*.). Paratypes: KENYA: 2♂, SE Kenya, Voi, 10.XII.1999, leg. Snižek (PRPC, GLAC); 2♂, env. Voi (Tsavo), 22.XI–2.XII.1996, leg. Mi. Halada (PRPC) and leg. M. Snižek (MPPC); 2♂, same locality, 8–18.XI.1996, leg. Mi. Halada (PRPC, GLAC). **Additional specimens.** SAUDI ARABIA: ♀, Jizan, Marabah, Al-Hudaithy farm, 226m, 17°51'N 42°23'E, 9.III.2015, leg. H.A. Dawah, Malaise trap (FSPC).

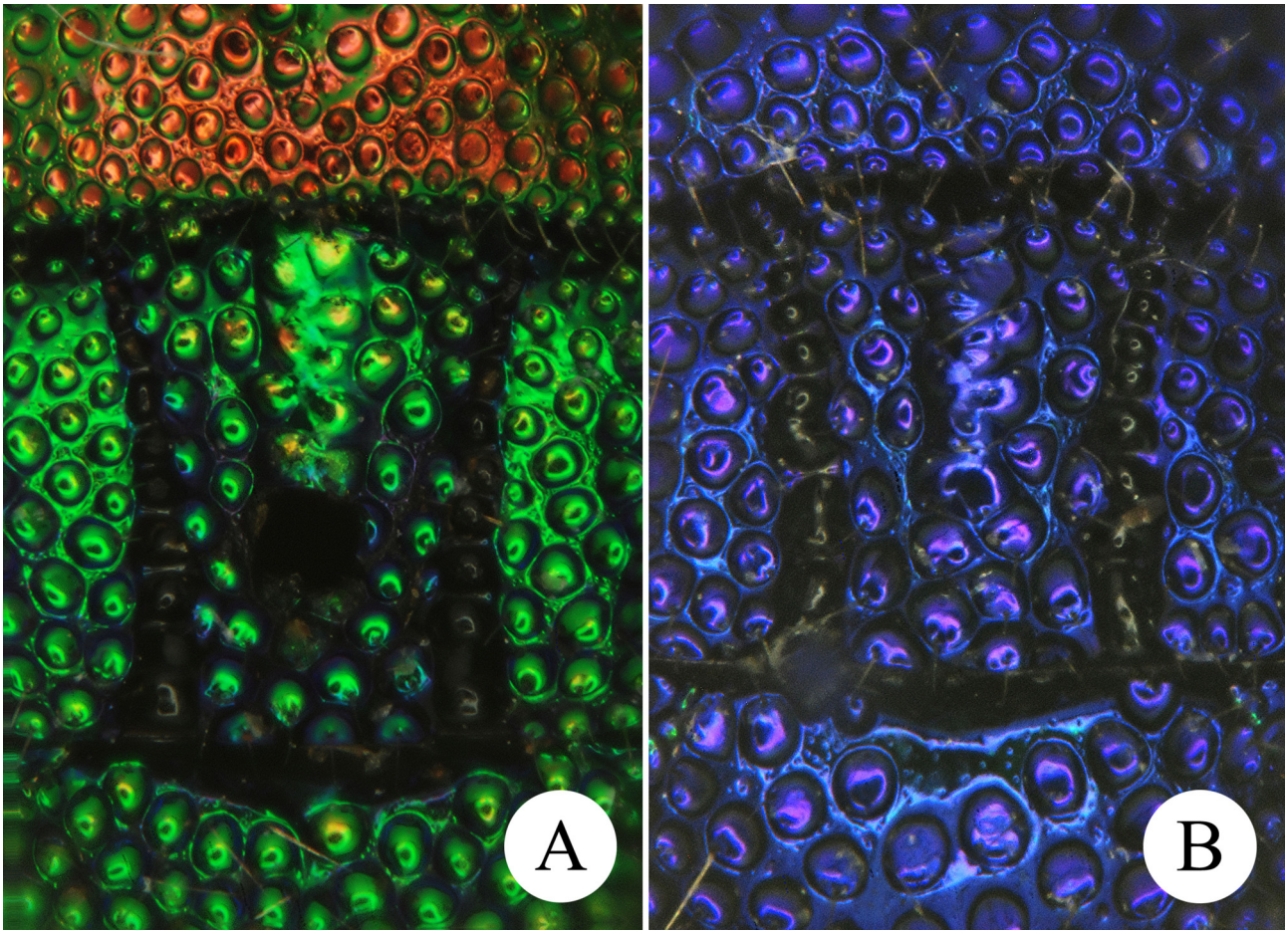

FIGURE 3. *Odontochrydium bicristatum* **sp. nov.**, median area of mesoscutum: **A.** Male; **B.** Female.

Diagnosis. Median mesoscutal area with two longitudinal ridges (Fig. 6D, 7D), feature not observed in other species; metasomal punctation scattered, with large punctures (Fig. 6A, 7A), whereas in the other species is evenly punctate to subreticulate-punctate (Fig. 2A, 4A, 5A, 8A, 9A). General habitus (Figs 1C, 1D) stouter than in *O. irregulare* (Fig. 1B).

Description. *Male*. Body length 6.5–9.0 mm (Fig. 1C). Fore wing length 5.0–6.5 mm. OOL 1.5 × MOD; POL 2.3 × MOD; MS 1.0 × MOD; relative length of P:F1:F2:F3 = 1.0:1.3:1.0:1.0.

Head. Frons with strong TFC, with branches encircling mid-ocellar area and forming roughly kidney-shaped carinate area, less deeply punctate than rest of vertex (Fig. 6B); vertex and frons with large, deep and contiguous punctures (Fig. 1C); scapal basin quite deep; medially strongly transversely ridged, impunctate, more laterally with small punctures between ridges, and covered with silvery setae, close to eye margin punctate, without ridges (Fig. 6B); clypeus elongate (subantennal distance 2 × MOD), with apical margin almost straight to weakly concave, irregularly to finely punctate, with tiny dots mixed with small punctures; antennal sockets close, 0.4 × MOD apart; malar space finely reticulate-micropunctate; genal carina strong and complete (Fig. 6C); mid-ocellus and posterior ocelli lidded. Mandible subdistally toothed.

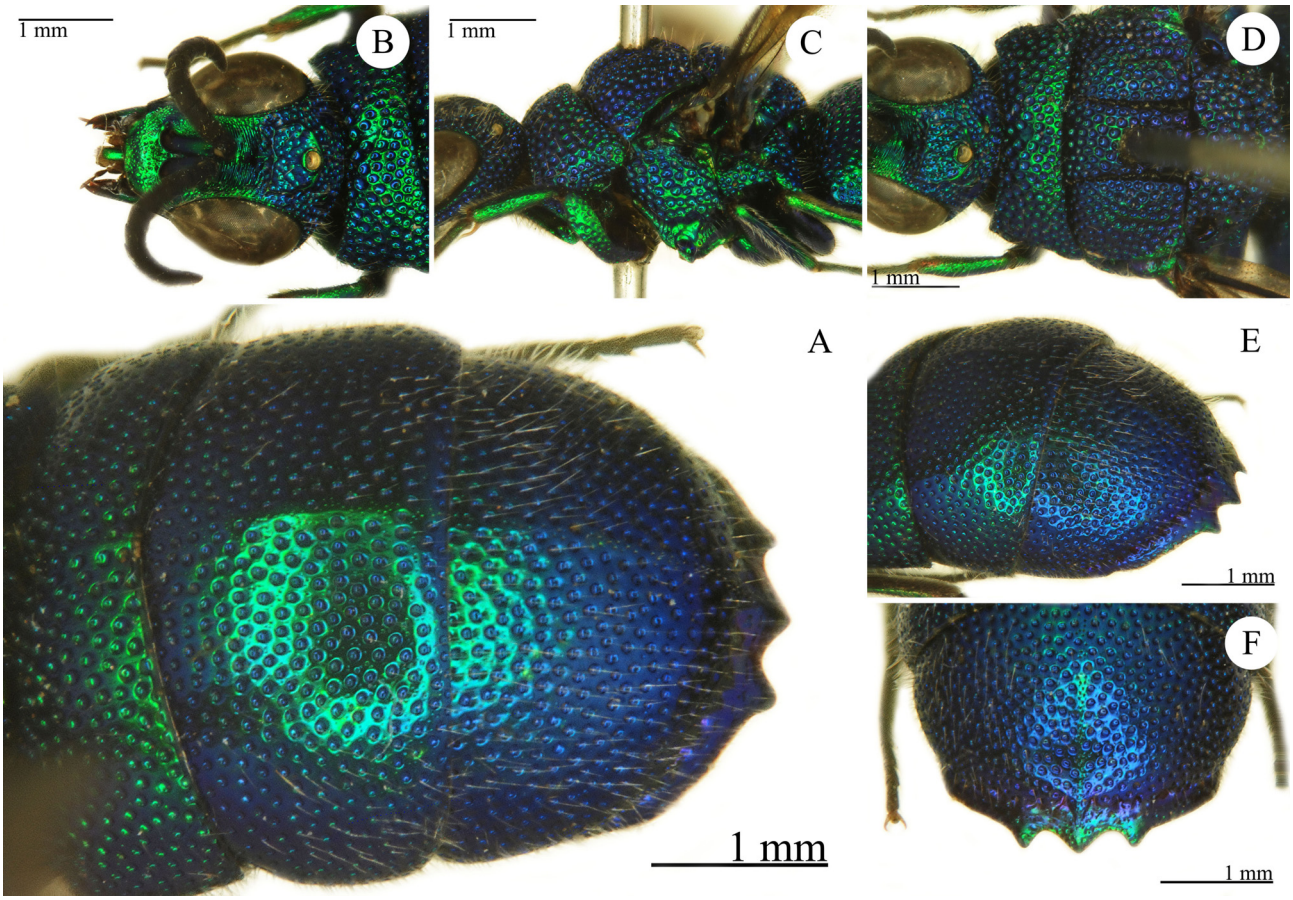

FIGURE 4. *Odontochrydium irregulare* (Mocsáry), female. **A.** Metasoma, dorso-lateral view; **B.** Head, frontal view; **C.** Mesosoma, lateral view; **D.** Mesosoma, dorsal view; **E.** Metasoma, postero-lateral view; **F.** Metasomal tergite 3, posterior view.

Mesosoma. Pronotal punctures large (up to 0.8 × MOD), separated by 0.1–0.3 × PD, with interspaces micropunctate; antero-median groove large and deep, impunctate and polished, reaching ¾ of pronotal length; anterior angles of pronotum distinctly convergent, sharp. Mesoscutum coarsely reticulate-punctate (Fig. 1C), with a few large, foveate-reticulate punctures (up to 0.8 × MOD), compared with mesoscutum punctation of *O. irregulare* (Figs 1B, 4D); median mesoscutal area with two longitudinal edges and deep, enlarged foveae in between; lateral mesoscutal areas more enlarged than in *O. irregulare* and partially hiding tegulae; notauli complete, deep and large, with foveae larger than in *O. irregulare*; parapsidal furrows raised and developed only until half scutal length; mesoscutellum with reticulate-punctate sculpture; metanotum rounded with similar sculpture; posterior propodeal projection narrower than in *O. irregulare* (Fig. 1C); lower mesopleuron armed with three strong teeth; upper teeth subequal, whereas in *O. irregulare* the anterior tooth is usually smaller than posterior one; lower mesopleuron between teeth nearly smooth; fourth sharp tooth is present posteriorly on mesopleuron, before metapleuron. Wing venation as in other Chrysidini, with distal area of Rs 1 × MOD apart from wing margin.

Metasoma. Metasomal tergite 2 and metasomal tergite 3 basally with weak longitudinal medial ridge; metasomal punctation with large and scattered punctures, interspaces smooth to weakly and finely punctulate (Fig. 6A); metasomal tergite 3 profile convex and continuous (Fig. 6E, 6F), without pre-pit swelling or post-pit sunken area; pits of pit row small and shallow, barely visible; apical margin with three median subtriangular teeth (Fig. 6F).

Coloration. Male body overall metallic green, a little darker bluish on mesoscutum, sometimes becoming rosy to golden red on head, pronotum and metasoma; legs metallic green, including first tarsomere; wings smoky, not distinctly dark brown as in *O. irregulare*; tegula metallic green, metasomal sterna metallic green. Female body from Saudi Arabia dark blue to violet, with greenish reflections on TFC.

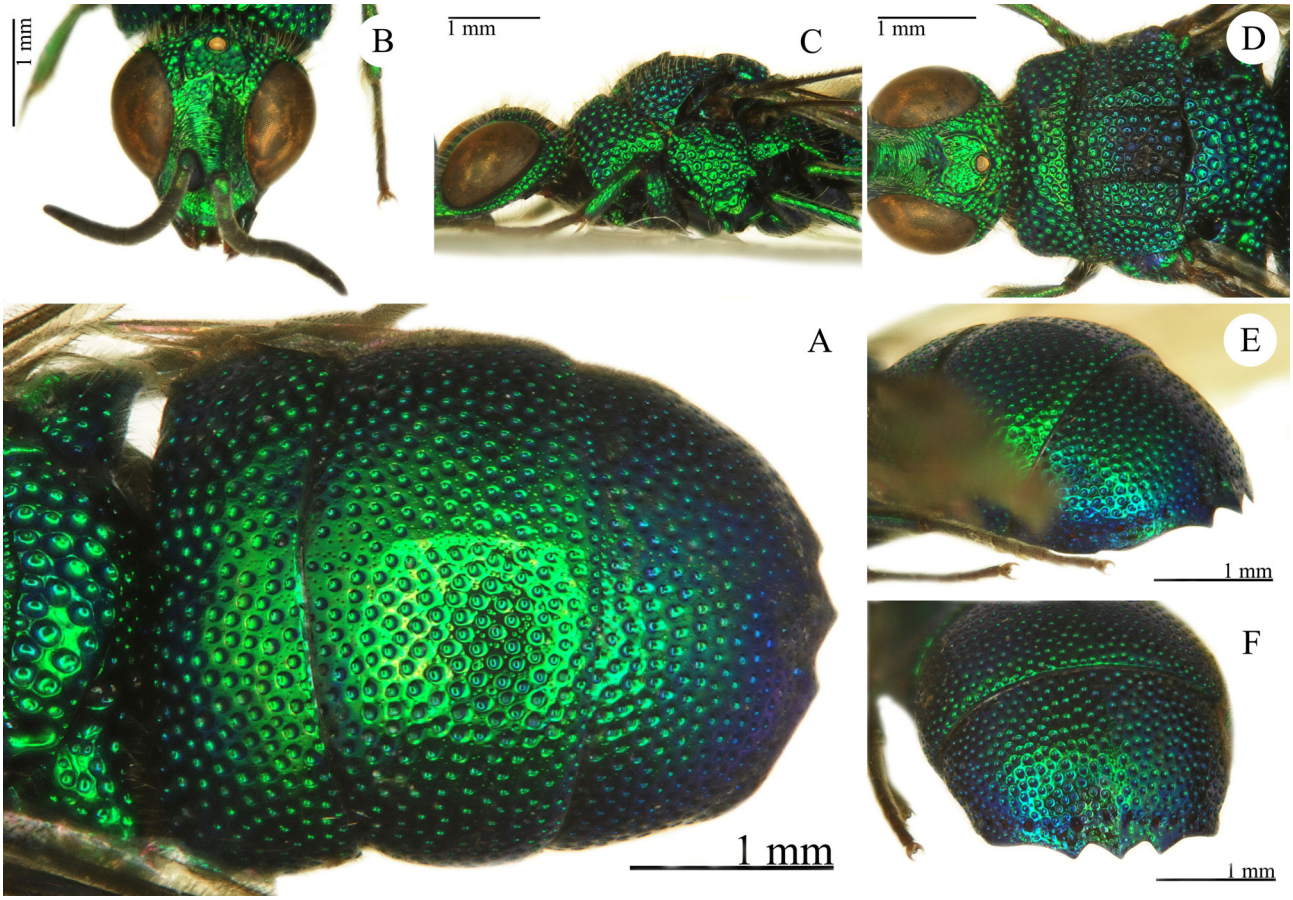

FIGURE 5. *Odontochrydium irregulare* (Mocsáry), male. **A.** Metasoma, dorso-lateral view; **B.** Head, frontal view; **C.** Mesosoma, lateral view; **D.** Mesosoma, dorsal view; **E.** Metasoma, postero-lateral view; **F.** Metasomal tergite 3, posterior view.

Remarks. *Odontochrydium bicristatum* **sp. nov.** is the first species of this genus recorded from the Palaearctic region. It has two longitudinal edges on the median mesoscutal area, which is unusual for the genus, and never observed in Chrysididae. Yet morphological modifications were previously known for the lateral area of mesoscutum (*Chrysis cavernosa* group) adjacent to the parascutal carina and tegula. *Odontochrydium bicristatum* **sp. nov.** apparently inhabits dry habitats, whereas the other African species, *O. irregulare*, prefers moist and richly vegetated areas (see below).

Distribution. Kenya and Saudi Arabia.

Etymology. The specific epithet *bicristatum* derives from the Latin adjective *cristatus* and refers to the two longitudinal ridges on the median lobe of the mesoscutum.

***Odontochrydium xui* Rosa, sp. nov.**
(Figs 1E, 9A–9F, 10A–10F)

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

Diagnosis. Apical margin of metasomal tergite 3, with anterior and posterior areas to pit row in lateral view forming distinct concave angle (Figs 8F, 9F), pits deep, enlarged, partly confluent and unmodified median mesoscutal area.

Description. *Female*. Body length 8.0 mm (Fig. 1E). Forewing length 5.5 mm. OOL 2.0 × MOD; POL 2.5 × MOD; MS 1.0 × MOD; relative length of P:F1:F2:F3 = 1.0:1.4:1.2:1.0.

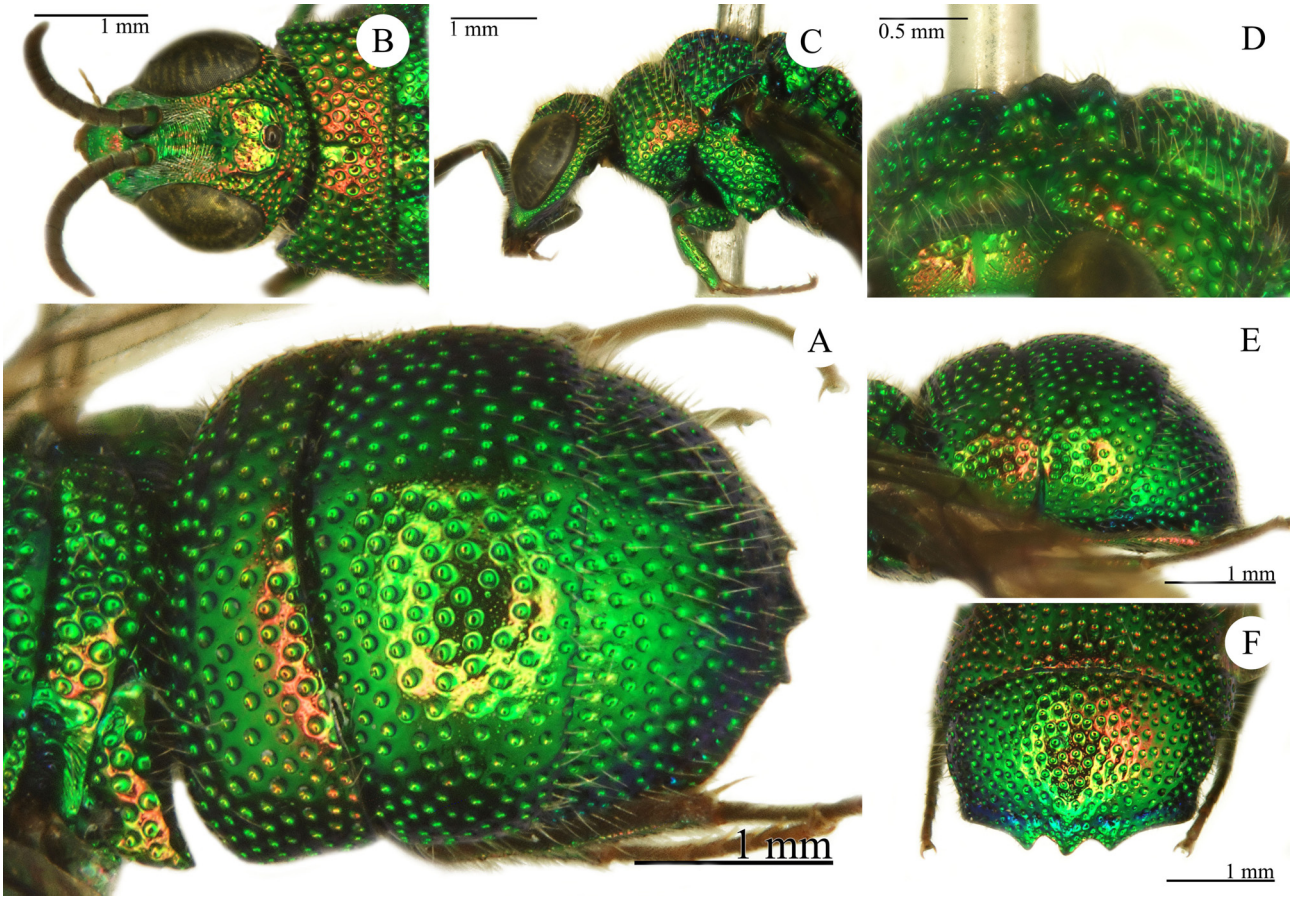

FIGURE 6. *Odontochrydium bicristatum* **sp. nov.**, holotype male. **A.** Metasoma, dorso-lateral view; **B.** Head, frontal view; **C.** Mesosoma, lateral view; **D.** Mesosoma, detail; **E.** Metasoma, lateral view; **F.** Metasomal tergite 3, posterior view.

Head. Frons with weakly raised TFC, with branches encircling mid-ocellar area with roughly kidney-shaped carinate area, irregularly and shallowly punctate (Fig. 8D); vertex and frons with deep, close punctures (Fig. 8D); scapal basin deep, with fine sculpture and without silvery (Fig. 8B); clypeus elongate with subantennal distance 2 × MOD, irregularly to finely punctate, with tiny dots mixed with small punctures, its apical margin weakly concave; antennal sockets close, 0.5 × MOD apart; malar spaces finely micropunctate; genal carina strong and complete (Fig. 8C); mid-ocellus and posterior ocelli lidded. Mandible subapically toothed.

Mesosoma. Pronotal punctures large (up to 0.7 × MOD), separated by 0.1–0.5 × PD, with polished interspaces; antero-median groove smooth, not differently punctate medially, reaching 2/3 of pronotal length; lateral margin of pronotum almost straight and anterior corners not distinctly convergent in apical third. Mesoscutum coarsely reticulate-punctate (Fig. 8D) with some small punctures; median mesoscutal area without longitudinal edges; lateral lobes of mesoscutum enlarged over tegula; notauli complete, with deep and round foveae, not elongate and convergent or fused; parapsidal furrow raised and developed only medially; mesoscutellum with reticulate-punctate sculpture; metascutellum rounded with similar sculpture; posterior propodeal projection large; lower mesopleuron armed with three strong teeth; upper teeth dissimilar, with anterior tooth distinctly smaller than posterior one; lower mesopleuron between teeth nearly smooth. Wing venation as in other species, with radial cell not distinctly open, and terminal part of Rs ill-defined but not completely obsolete.

Metasoma. Evenly punctate to subreticulate-punctate with tiny punctures on interspaces (Figs 8A, 8E, 8F); metasomal tergite 2 and metasomal tergite 3 with slight longitudinal medial ridge; metasomal tergite 3 profile (in lateral view) convex, with areas anterior and posterior to pit row in lateral view forming a distinct concave angle (Figs 8F, 9F), and pits of pit row deep, enlarged, partly confluent (Figs 8E, 8F, 9E, 9F); apical margin with three median teeth, lateral teeth short and triangular, median tooth larger and apically rounded (Fig. 8F); metasomal tergite 3 with erect and short (1 × MOD) whitish setae (in *O. irregulare* with longer, 1.5 × MOD, and mostly decumbent setae).

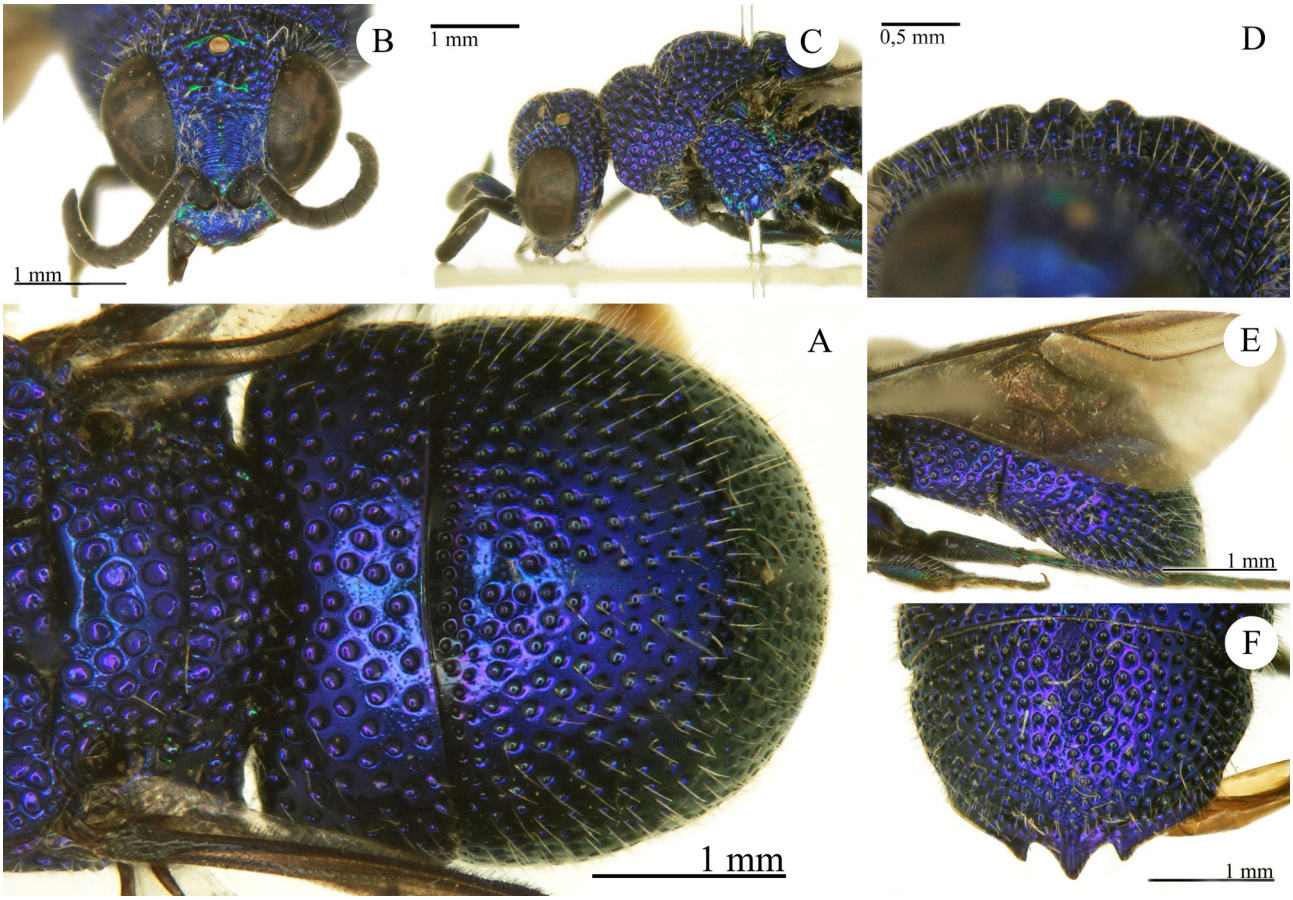

FIGURE 7.*Odontochrydium bicristatum* **sp. nov.**, female. **A.** Metasoma, dorso-lateral view; **B.** Head, frontal view; **C.** Mesosoma, lateral view; **D.** Mesosoma, detail; **E.** Metasoma, lateral view; **F.** Metasomal tergite 3, posterior view.

Male. Similar to female, except for larger punctures on metasoma and apical teeth shorter.

Coloration. Body overall metallic green, bluish on pit row and sternites; legs metallic green, including first tarsomere; wings dark brown; tegula metallic green. Male darker bluish on median area of mesoscutum, anteriorly on metasomal tergite 1 and metasomal tergite 2 and posteriorly on metasomal tergite 3, with brownish tarsomeres.

Remarks. *Odontochrydium xui* **sp. nov.** is the first species of this genus recorded from the Oriental region. It shows a different apical margin of metasomal tergite 3, compared with the other two known species, for the different shape of the anterior and posterior areas to pit row. The different shape of this area could be related to the ovipositional behavior. In fact, Yamada (1991) remarked that *Praestochrysis shanghaiensis* (Smith, 1874), a parasitoid of moths (Lepidoptera, Limacodidae), uses the teeth on the apex of the metasoma to make the oviposition hole in the host cocoon. Thus the apical teeth may play an important role during oviposition, and its shape might be related to the shape of the host cocoon.

Distribution. India (Tamil Nadu).

Etymology. The specific epithet *xui* (masculine in genitive case) is dedicated to the late Prof. Zai-fu Xu. He deeply influenced the author's studies and contributed to the knowledge of the Oriental Chrysididae.

Discussion

Odontochrydium is closely related to *Praestochrysis* Linsenmaier, 1959 by having the same general habitus, except for the lateral teeth of the metasomal tergite 3 which are obsolete in *Odontochrydium* (3 teeth), more or less distinct in *Praestochrysis* (5, rarely 7 teeth), and the same wing venation. Yet it strongly differs by having elongate clypeus, with subantennal space 1.8–2.0 × MOD (vs. very short and transverse in *Praestochrysis*, with subantennal space

usually about 1 × MOD); head roughly quadrate in frontal view (vs. broader than long); scapal basin transversely microridged (vs. punctulate without ridges); lower edge of mesopleuron tridentate (vs. at most bidentate), a fourth tooth on mesopleuron very close to the metapleuron, is seemingly unique among Chrysidinae; black spots on metasomal sternite 2 largely separate (more than 2 × MOD) (vs. medially close, less than 1.3 × MOD).

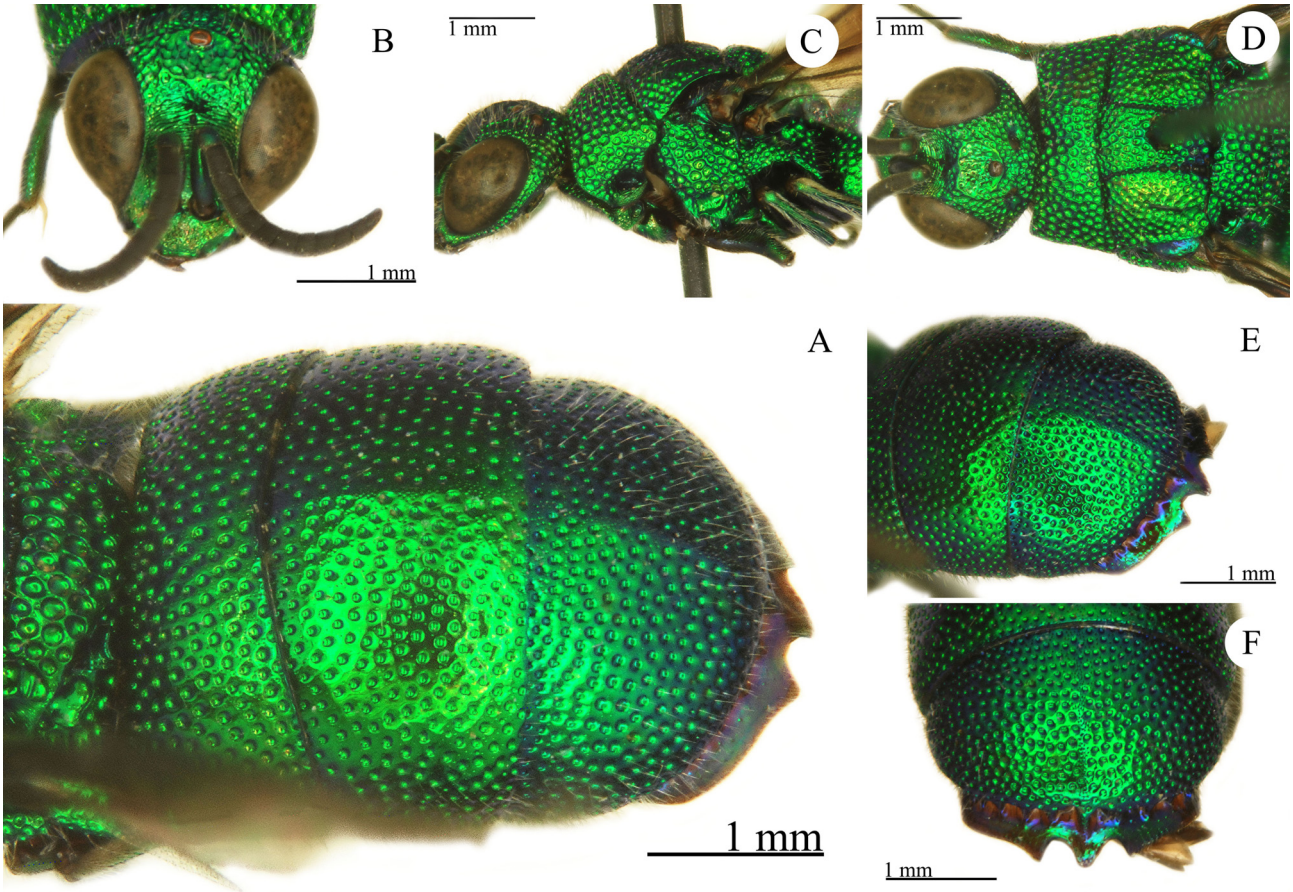

FIGURE 8. *Odontochrydium xui* **sp. nov.**, holotype female. **A.** Metasoma, dorso-lateral view. **B.** Head, frontal view; **C.** Mesosoma, lateral view; **D.** Mesosoma, dorsal view; **E.** Metasoma, postero-lateral view; **F.** Metasomal tergite 3, posterior view.

The female-male association has been a challenge in Chrysidoidea and other Aculeata with little knowledge on their life style, and morphology-based sex association may sometimes be unrealistic without observation of copulation, breeding or molecular work (Azevedo *et al.* 2016). For this reason, one female of *Odontochrydium* from Saudi Arabia, kindly provided by Franco Strumia, has been here tentatively identified as *O. bicristatum* **sp. nov.**. This Saudi Arabian female shares the most important diagnostic features with Kenyan males: the modified median lobe of the mesoscutum (Fig. 3B) and the metasomal punctation with large and scattered punctures (Fig. 7A). Yet, the punctures on the head and mesosoma are distinctly larger (Figs 1D, 7C); the apical median tooth on the metasomal tergite 3 is considerably longer than the lateral teeth (Fig. 7F), and the coloration is quite different (Fig. 1D) being bluish to violet. I consider these features as sexually dimorphic characters ascribable to different populations found in Africa and Saudi Arabia; in fact, chromatic variations from green to violet have been also recorded for *O. irregulare* (Kimsey & Bohart 1991), as well as variations in the shape and length of the median tooth of metasomal tergite 3 (Fig. 2F, 4F). Anyway, the examination of male specimens from Saudi Arabia is needed for a comparison with Kenyan males and the unambiguous confirmation of the specific attribution.

Brauns (1928) reported that one specimen of *Odontochrydium irregulare* has probably been raised from an *Anthidium* nest. He also stated that there is a second specimen pinned with a cocoon of a Limacodid moth. *Praestochrysis* is hitherto the only chrysidid genus known to parasitize Limacodidae, and the only genus in Chrysidinae parasitizing other than Hymenoptera Aculeata (Rosa *et al*. 2016b). Thus *Praestochrysis* and *Odontochrydium* also could share similar behaviour in addition to similar morphology.

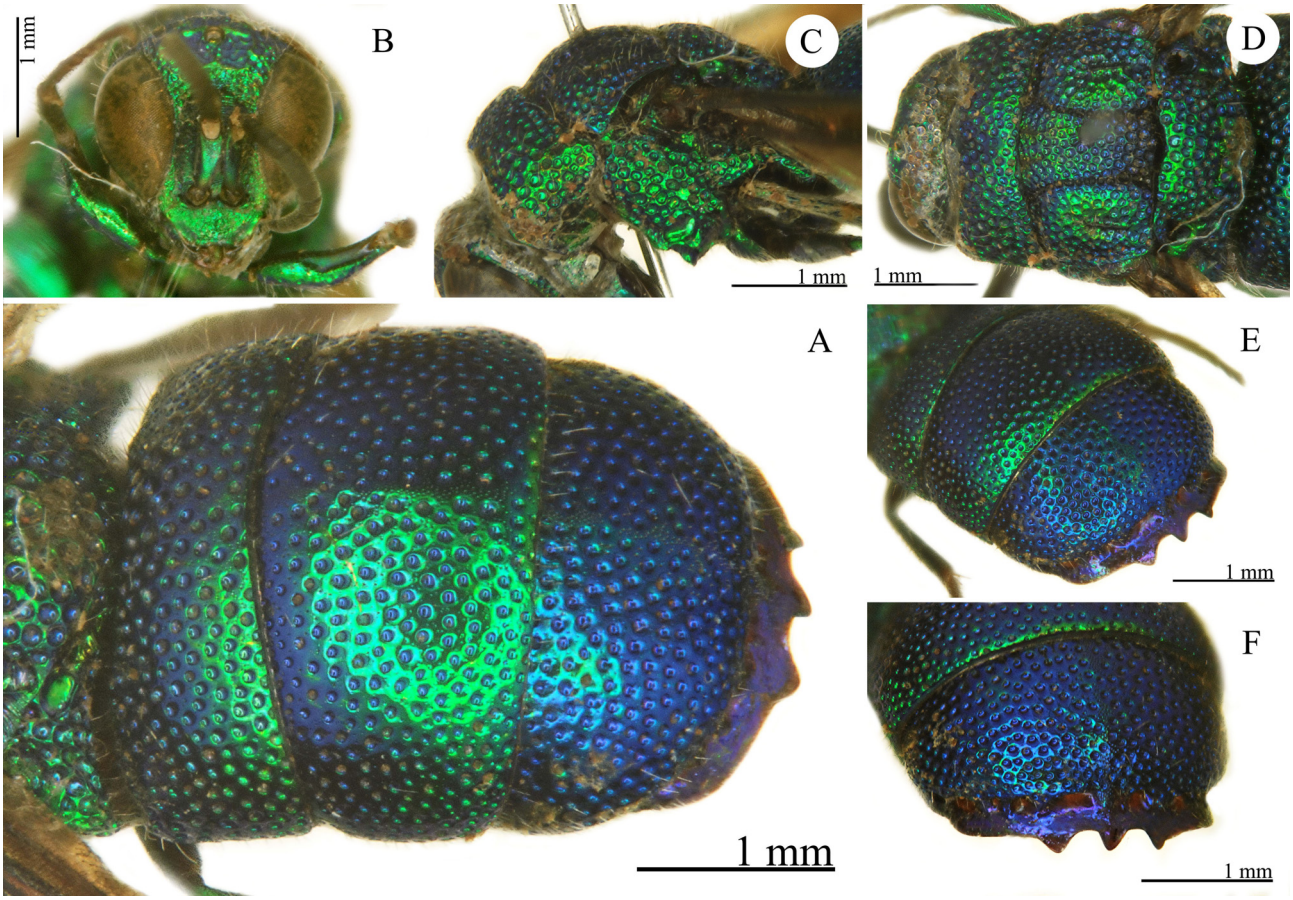

FIGURE 9. *Odontochrydium xui* **sp. nov.**, paratype male. **A.** Metasoma, dorso-lateral view; **B.** Head, frontal view; **C.** Mesosoma, lateral view; **D.** Mesosoma, dorsal view; **E.** Metasoma, postero-lateral view; **F.** Metasomal tergite 3, posterior view.

Only scarce distributional data are known for this genus, whose members have only been occasionally collected (Rosa *et al*. 2016a, 2017), probably because of very scarce distributional data from Eastern Africa and Oriental Region (Madl & Rosa 2012; Rosa *et al*. 2016a).

The recent findings of *Odontochrydium* broaden the known geographic range of this genus, which is now extended to the southern Palaearctic Region (Saudi Arabia) and the Oriental Region. The occurrence of *Odontochrydium* in these new regions is still underestimated, because the behavior and autecology is poorly understood. Based on data acquired by F. Koch in Namibia and South Africa, during the BIOTA Project (Koch *et al*. 1995, 2015), *Odontochrydium irregulare* prefers moist habitats with the rich vegetation typical of the Woodland Savanna Biome and the Thornbush Savanna Biome, where the humidity is at an optimum, as at Waterberg (Namibia) (Fig. 10). These conditions favour lush riverine vegetation rich in trees (at Popa Falls along the Okavango river), and of ruderal vegetation on the shores along the Zambezi river, East Caprivi. Also *O. xui* **sp. nov.** inhabits humid and forested areas (Nilgiri Hills), whereas *O. bicristatum* **sp. nov.** apparently prefers dry habitats such as dry Savanna and semi-deserts (Voi and Archers Post in Kenya and Jizan Province in Saudi Arabia).

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FIGURE 10. Namibia, Waterberg, collecting site of *Odontochrydium irregulare* (Mocsáry). Photo by courtesy of Frank Koch (MfN).

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