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Research Article

Odontacolus markadicus sp. nov. (Hymenoptera: Platygastroidea: Platygastridae) – An addition to the platygastrid fauna of India

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ABSTRACT: *Odontacolus markadicus* sp. nov. is described from Karnataka, Southern India. Eight species of *Odontacolus* are known from the world. This is the first time that a species of *Odontacolus* is being described from the Indian subcontinent. A key to the species of *Odontacolus* is provided.

KEY WORDS: *Odontacolus markadicus* sp. nov., Indian subcontinent, Platygastridae, Hymenoptera.

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INTRODUCTION

The genus *Odontacolus* belongs to the subfamily Scelioninae. All species in this genus are egg parasitoids of spiders (Masner, 1976). The genus *Odontacolus* was erected by Kieffer in 1910, with *Odontacolus longiceps* Kieffer as the type species. So far eight species of *Odontacolus* are known from different parts of the world, *viz., O. amoenus* Kononova, (Russia), *O. flavissimus* Megyaszai (South America), *O. hackeri* (Dodd) (Australia), *O. longiceps* Kieffer (Seychelles, Africa), *O. longispinosus* Girault (Indonesia), *O. macroceps* Szabó (South America), *O. spinosus* (Dodd) (Australia) and *O. szaboi* Megyaszai (Trinidad) (Dodd, 1913, 1914; Girault, 1917; Kieffer, 1910; 1912; 1926; Szabo, 1966; Kononova, 1992; Megyaszai, 1995; Johnson, 1992; 2011). Of the eight species of *Odontacolus* known from the world, only two species, *viz.*, *O. longispinosus* and *O. szaboi* are known by both males and females while the remaining six species are known by only females. A new species is now being added to the genus *Odontacolus* after a span of 15 years. This is the first representative of a species in this genus from the Indian subcontinent (*sensu lato*).

MATERIAL AND METHODS

Eggs of spiders collected from different ecosystems were incubated for the emergence of parasitoids. In two cases adults of *Odontacolus* emerged. In addition, sweep net collections of these wasps were made in grassland ecosystems.

Digital images and measurements were made using Auto Montage version 3.6 Leica DFC 425 camera, Leica M205A stereomicroscope and 1X objective lens.

The holotype and nine paratypes are deposited at the National Bureau of Agriculturally Important Insects, Bangalore, India. One paratype is deposited at the National Pusa Collection, IARI, New Delhi.

Abbreviations and morphological terminology used in the text follow Masner (1979, 1980) and Mikó *et al.* (2007; 2010).

Abbreviations: Frontal cephalic index (FCI), Lateral cephalic index (LCI), Head width (HW), Interorbital space (IOS), Length of transscutal line (TSL), Distance between posterior end of notauli (DPN); Mesoscutellum length (SL), width (W), Length (L), Width (W), Ocular ocellar length (OOL), Post ocellar length (POL), Lateral ocellar length (LOL), Width of forewing (WW), Width of hind wing (HWW); Hind wing cilia (HWS); Length of marginal vein (m); Length of stigmal vein (st); T1–T7 – Metasomal tergites 1 to 7; S1–S2 – Metasomal sternites.

RESULTS AND DISCUSSION

Genus *Odontacolus* Kieffer

Odontacolus Kieffer, 1910: 294. Type species *Odontacolus longiceps* Kieffer, by monotypy and original designation.

For subsequent taxonomic literature see Johnson (1992; 2011).

***Odontacolus markadicus* Veenakumari sp. nov. (Plates 1 & 2)**

Holotype: Female, Length = 1.81 mm

Head, antennae honey brown with traces of black; mandibles brown, dark brown towards extremities; mesosoma honey brown with a variable dark brown patch medially and a lateral blackish brown patch on either side; legs, long (0.65 x body length), yellowish brown with coxae pale yellow; mesopleura and metapleura yellowish brown; metasoma black, except for T1 and anterior region of T2 being honey brown; horn on T1 black with brownish yellow base.

Head: Transverse when viewed dorsally, triangular with much prolonged buccal region; FCI = 1.18; LCI = 1.76; HW/IOS = 2.11; head almost as wide as high and about half as long as high; head about 2.11 times as wide as inter orbital space and 1.26 times wider than mesosoma (HW/TSL = 1.26); frons reticulate-rugulose with a smooth, shallow medial depression, central keel well developed reaching middle of frons and ventrally surrounds antennal foramen; eyes large, greenish, densely setose; ocelli in a triangle, lateral ocelli very close to inner orbits; occipital carina very close to eyes (0.02mm) resulting in short temples; POL > LOL > OOL in ratio of 19:13:0.6; orbital carina, antennal scrobe well developed; facial striae radiating from base of clypeus and extending above antennal scrobe; frons covered with well dispersed white setae; gena prolonged, malar sulcus well defined; sculpture of gena, malar region, vertex reticulate-rugulose; clypeus longer than wide (1:0.7), with protruding corners; mandibles tridentate, median tooth longer than other two; shallow depression above antennal insertion; antenna ten segmented, scape longest, club four segmented with three faint transverse sutures; entire antenna covered with short brownish setae; length and width of antennal segments 22:4, 8:4, 5:3, 3:3, 2:3, 3:3, 18:8.

Mesonotum: (L:W = 53:41) Mesonotum reticulate-rugulose, setose with short white setae; notauli short (0.05mm) but pronounced; DPN = 0.164mm; scutoscutellar sulcus distinct and foveolate laterally; epomial carina weakly defined; cervical pronotal area reticulate-rugulose and setose, lateral pronotal area smooth, pronotal cervical sulcus fovea large reaching base of netrion; pronotal suprahumeral sulcus foveolate; mesoscutal suprahumeral sulcus foveolate; netrion present, smooth; anterior margin of netrion foveolate, fovea large; mesopleura smooth and shining with small white setae restricted to antero-ventral region; femoral depression smooth, shiny; posterior mesepimeral area smooth and spindle shaped; prespecular sulcus fovea very wide; mesepimeral sulcus fovea small; metapleural pit distinct, paracoxal sulcus foveolate; metapleural epicoxal sulcus distinct; several transverse rugae on lower metapleura; mesoscutellum trapezoidal, scaly reticulate, setose (setae much longer than those on mesonotum); SW/SL = 3.3; posterior mesoscutellar sulcus foveate; metascutellum unarmed; propodeum excavated; lateral propodeal carina well developed, dorsad of which modified into yellowish brown blunt spine (0.078mm) covered with long setae; outer lateral propodeal area with 4-5 prominent rugae.

Metasoma: (L:W = 83:44) subpedunculate; T1 0.45 times as wide as T1 + T2 length (T1W/ T1 + T2L = 0.45); T3 longest and broadest of all tergites; T3 almost as wide as mesoscutum (T3W/TSL = 1.07); T1 expanded into laterally compressed horn flanked anteriorly by propodeal spines; horn completely striated; T1 costate with some costae extending onto basal portion of horn; T2 costate apically, medially striate, laterally scaly reticulate, basally smooth; T3 scaly reticulate and basally smooth; T4 scaly reticulate along upper margin and basally smooth; T1 with 4-5 lateral white setae; metasoma setose laterally including base of T3 and entire T4; T5 and T6 not visible; T7 triangular with rugose sculpture; S1 and S2 costate; all sternites sparsely setose; laterotergites narrow, setose, submarginal ridge well defined; length and width of tergites T1-T4 are 14:19, 26:37, 30:44, 7:32.

Wings hyaline, cilia well developed, submarginal vein just below wing margin, marginal vein short, a triangular brown spot present at juncture of postmarginalis and stigmalis; forewing almost as wide as mesoscutum (TSL/WW = 0.901); stigmal vein 5.4 times longer than marginal vein (st/m = 5.4); thick short hairs present along submarginal vein continuing onto postmarginal vein; width of hind wing 0.174mm; hind wing ten times as wide as marginal cilia length (HWW/HWS = 10.02); hind wing with well developed submarginal vein, apical end darkened with three frenal hooks; both wings covered uniformly with short brown setae.

Male : Length = 1.76mm. Same as female but for following characters. Yellow to yellowish brown. Antenna eight segmented, subclavate; apical segment biggest of all flagellar segments; length and width of antennal segments are 19:6, 9:4, 6:4, 4:4, 3:5, 4:5, 3:5,14:6.

Propodeum with two broad based spines, covered with long white setae.

T1 slightly raised; black sublateral lines running from T2 to end of abdomen; T1 and apical one fourth of T2 costate and rest of T2 weakly striate; T3 striate and laterally scaly reticulate; T4 scaly reticulate; T5 and T6

very narrow; T7 triangular with rugose sculpture; length and breadth of tergites (T1–T7) are 15:20, 29:39, 31:46, 11:38, 2:24, 1:19, 6:16.

Distribution: INDIA: Karnataka, Bengaluru.

Biology: Egg parasitoids of spiders (Saticidae). From one spider egg mass 48 adults of *Odontacolus* emerged (sex ratio Male: Female – 1:47), while from another egg mass five adults emerged with a sex ratio of 4:1 (Male: Female). It is probable that in the latter case some of the adults had emerged prior to the collection of the egg mass.

Material examined: Holotype Female, (Reg. No. ICAR/NBAII/P21) INDIA**:** Karnataka: Bengaluru: Gandhi Krishi Vigyan Kendra (GKVK), 29.xii.2009 at an elevation of 910m (N. 13° 2' 3' E. 77° 35' 18'); *Paratypes:* (Reg. No. ICAR/NBAII/P22 to P29) 8 Femals, data same as holotype; (Reg. No. ICAR/NBAII/30) Karnataka: Bengaluru: Adugodi (NDRI), 23.vi. 2011 1 Male (N. 12° 56' 49' E. 77° 36' 37'); (Reg. No. ICAR/NBAII/31 & 32) 2 Females & data same as P30. All parasitoids emerged from spider eggs.

Etymology: This species is named *'markadicus'* meaning spiders in Sanskrit, referring to the host of these wasps.

Key to species of *Odontacolus* Kieffer (based on females)

1. Abdomen long, ovate, pointed and not as wide as thorax; T4 longest of all abdominal segments ..... *longispinosus*

– Abdomen subpedunculate, anterior one-third narrow, posterior two-thirds widest, not pointed apically; T3 longest of all abdominal segments 2

2. Propodeum with two spines on each side flanking horn on T1 ..... *amoenus*

– Propodeum with a single spine on each side flanking horn on T1..... 3

3. Notauli absent 4

– Notauli present 5

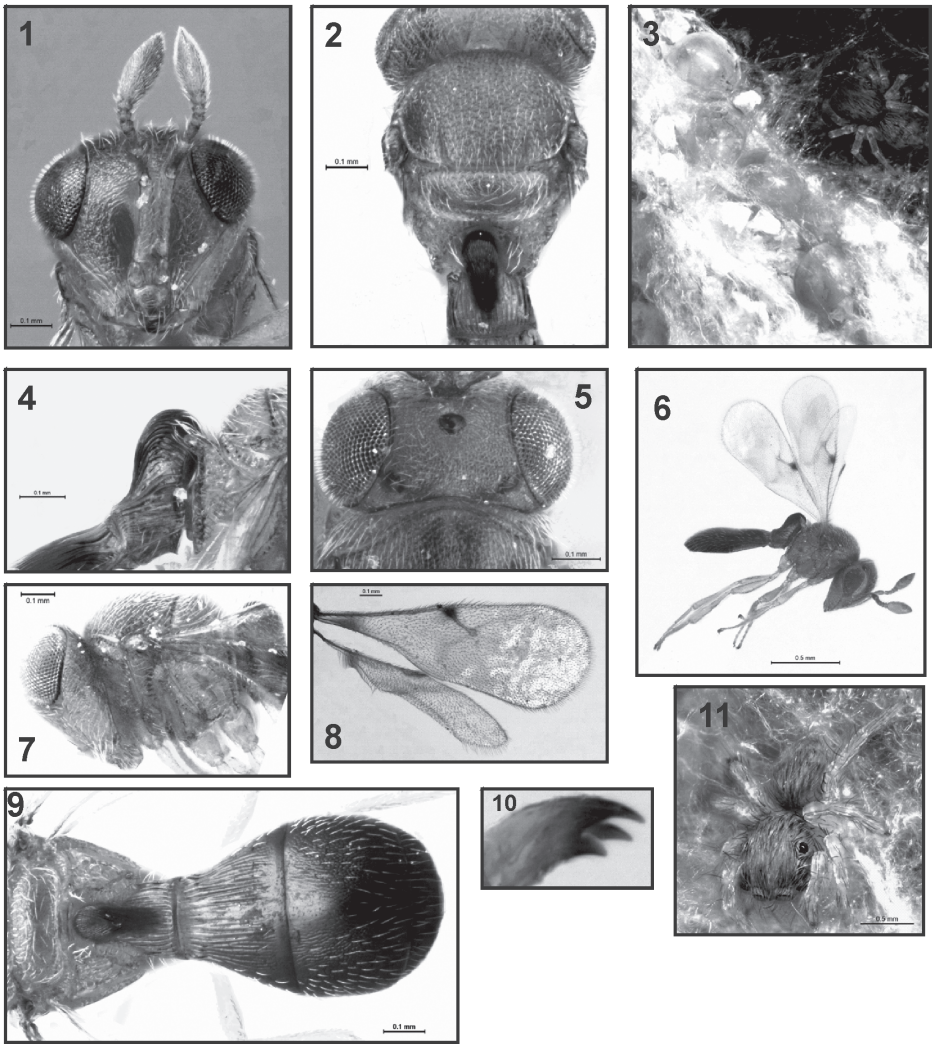

Plate 1: *Odontacolus markadicus* sp.nov. (female)

1. Face – front view
2. Mesonotum – dorsal view
3. Parasitized spider eggs
4. Horn on T1
5. Head – dorsal view
6. Habitus
7. Thoracic pleura
8. Wings
9. Abdomen
10. Mandible
11. Spider host (salticidae)

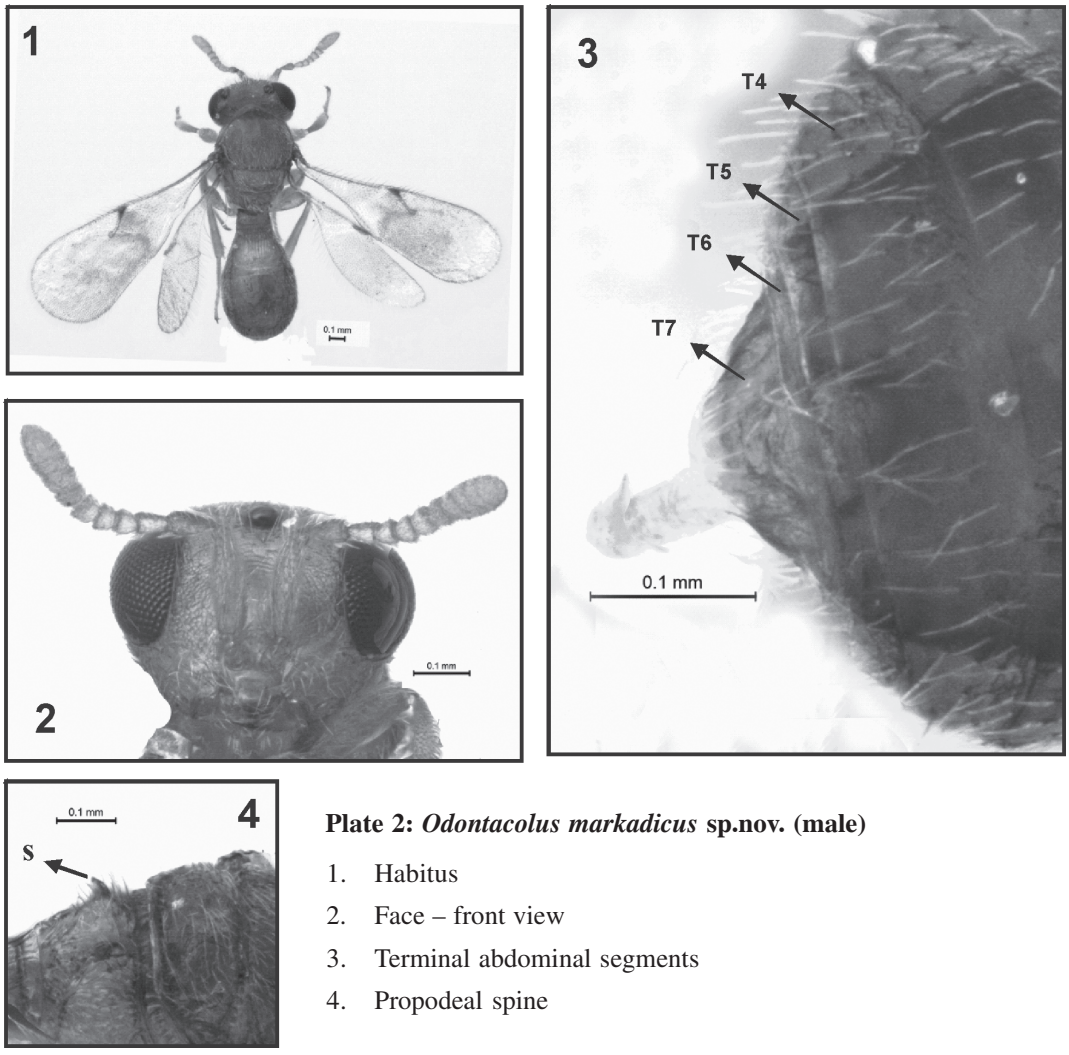

Plate 2: *Odontacolus markadicus* sp.nov. (male)

1. Habitus
2. Face – front view
3. Terminal abdominal segments
4. Propodeal spine

4. Reddish brown head; hind wing almost as wide as forewing ..... *hackeri*

– Head black; hind wing only half as wide as forewing .....*longiceps*

5. Forewing with a distinct brown band; body colour light yellow .....*flavissimus*

– Forewing without a distinct brown band, hyaline or fumate throughout, body colour other than light yellow 6

6. Wings fumate, body length 1mm ..... *macroceps*

– Wings hyaline; body length >1.5 mm 7

7. Sculpture on T3 finely densely granulate ..... *spinosus*

– Sculpture on T3 scaly reticulate/ reticulate cutaneous 8

8. Frons finely punctate, mesoscutum finely reticulate, meso scutellum anteriorly reticulate striate, body colour rust brown, coxae brown ..... *szaboi*

– Frons and mesonotum reticulate-rugulose; head, mesosoma, T1 and anterior region of T2 honey brown, rest of metasoma black..... ***markadicus* sp. nov.**

Diagonosis: Most closely resembling *Odontacolus szaboi*, differing by reticulate-rugulose sculpture on frons and mesonotum; pale yellow coxae; head, mesosoma, T1 and anterior region of T2 honey brown, rest of metasoma black.

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REFERENCES

Dodd, A. P. 1913. Some south Queensland Proctotrypoidea (sic.). *Memoirs of the Queensland Museum,* **2:** 335–339.

Dodd, A. P. 1914. Australian Hymenoptera Proctotrypoidea (sic.). No. 2. *Transactions of the Royal Society of South Australia,* **38:** 58–131.

Girault, A. A. 1917. *New Javanese Hymenoptera*. Privately published, Washington, D.C. 12 pp.

Johnson, N. F. 1992. Catalog of world Proctotrupoidea excluding Platygastridae. *Memoirs of the American Entomological Institute*, **51:** 1–825.

Johnson, N. F. 2011. http://osuc.biosci.ohio-state.edu/hymDB/eol_scelionidae.home accessed on 14.7.2011.

Kieffer, J. J. 1910. Diagnoses de nouveaux genres et de nouvelles espèces de Scélionides (Hym.) des iles Seychelles. *Bulletin de la Societe Entomologique de France* **1910:** 292–294.

Kieffer, J. J. 1912. Hymenoptera, Proctotrupoidea. *Transactions of the Linnean Society of London, Zoology*, **15**: 45–80.

Kieffer, J. J. 1926. *Scelionidae. Das Tierreich*. Vol. 48. Walter de Gruyter & Co., Berlin. 885 pp.

Kononova, S. V. 1992 [The additional record to the fauna of Scelionidae (Hymenoptera) from Chita Region] Pages 124–135 in Amirkhanov, A. M. *[Insects of Daura and contiguous territories].* Izdatelstvo Tsentralnoi Nauchno-issledovatelskoi Laboratorii Okhotnighego Khozyaistva i Zapovednikov, Moscow.

Masner, L. 1976. Revisionary notes and keys to world genera of Scelionidae (Hymenoptera: Proctotrupoidea). *Memoirs of Entomological Society of Canada*, **97:** 1–87.

Masner, L. 1979. Pleural morphology in scelionid wasps (Hymenoptera: Scelionidae) – An aid to higher classification. *Canadian Entomologist,* **111:** 1079–1087.

Masner, L. 1980. Key to genera of Scelionidae of the Holarctic region, with descriptions of new genera and species (Hymenoptera: Proctotrupoidea). *Memoirs of Entomological Society of Canada*, **113:** 1–54.

Megyaszai, T. 1995. Three new Scelioninae (Hymenoptera, Scelionidae) species from the Neoptrical Region. *Acta Zoologica Academiae Scientiarum Hungaricae*, **41:** 335–342.

Miko, I., Masner, L. and Deans, A. R. 2010. World revision of *Xenomerus* Walker (Hymenoptera: Platygastroidea, Platygastridae). *Zootaxa,* **2708:** 1–73.

Miko, I., Vilhelmsen, L., Johnson, N. F., Masner, L. and Penzes, Z. 2007. Skeletomusculature of Scelionidae (Hymenoptera: Platygastroidea): head and mesosoma. *Zootaxa,* **1571:** 1–78.

Szabo, J. B. 1966. New proctotrupid genera and species from Neogaea (Hymenoptera: Proctotrupoidea). First report on South American Scelionidae and Platygastridae. *Acta Zoologica Academiae Scientiarum Hungaricae,* **12:** 161–179.