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## NEW RECORD OF THE GENUS *COCHLISCHNOGASTER* DONG AND OTSUKA (HYMENOPTERA: VESPIDAE: STENOGASTRINAE) FROM THE INDIAN SUBCONTINENT

P. GIRISH KUMAR, J.M. CARPENTER<sup>1</sup> AND P.M. SURESHAN<sup>2</sup>

Zoological Survey of India, M- Block, New Alipore, Kolkata, West Bengal- 700 053, India.

E- mail: kpgiris@gmail.com

<sup>1</sup>Division of Invertebrate Zoology, American Museum of Natural History, Central Park West at 79<sup>th</sup> Street,  
New York, NY 10024, U.S.A.

<sup>2</sup>Western Ghats Regional Centre, Zoological Survey of India, Eranhpalam, Kozhikode,  
Kerala- 673 006, India

### INTRODUCTION

The hover wasps, Stenogastrinae, are a group of primitively eusocial wasps endemic to the Oriental region. They occupy an intermediate position between the solitary Eumeninae and the social Polistinae and Vespinae (Pickett and Carpenter, 2010). Members of this group exhibit considerable diversity in social behaviour and nest architecture. They usually inhabit shady parts of tropical forests and generally construct their delicate nests near water streams. The adult wasps do not fold their wings when at rest.

The subfamily Stenogastrinae consists of seven genera, viz. *Liostenogaster* van der Vecht, *Stenogaster* Guerin-Meneville, *Eustenogaster* van der Vecht, *Anischnogaster* van der Vecht, *Metischnogaster* van der Vecht, *Parischnogaster* von Schulthess and *Cochlischnogaster* Dong and Otsuka (Carpenter and Kojima, 1996; Carpenter and Starr, 2000; Carpenter, 1988, 2001). The taxonomy of Stenogastrinae has not been well studied in the Indian subcontinent. There are three genera, namely *Liostenogaster*, *Eustenogaster* and *Parischnogaster*, so far reported from Indian subcontinent (Das and Gupta, 1989; Carpenter and Kojima, 1996). In this paper, we are reporting the genus *Cochlischnogaster* Dong and Otsuka for the first time from Indian subcontinent, recording the species *C. dadugangensis* Dong and Otsuka.

The genus *Cochlischnogaster* was erected by Dong and Otsuka in 1997 with *C. dadugangensis* Dong and Otsuka as its type species. This genus is distinguished by the remarkable spoon-shaped filament on the apex of the male antenna. Dong and Otsuka (1997) described two species, namely *C. dadugangensis* and *C. menglunensis*, both from Yunnan (China). *Cochlischnogaster menglunensis* is known only from the female, and the characters used by Dong and Otsuka (aside from the male antenna) to distinguish the genus do not actually do so. Hence Carpenter (2001) considered *C. menglunensis* as of uncertain placement. Carpenter and Starr (2000) described another species, namely *Chalogaster spatulata*, in the new genus *Chalogaster* from Vietnam and Thailand. Later, Carpenter (2001) synonymised the genus *Chalogaster* Carpenter and Starr under *Cochlischnogaster* Dong and Otsuka.

### MATERIAL AND METHODS

The specimen was collected by using a triangular sweep net at the sides of a water stream of the dense forest of Namdhapa National Park, Arunachal Pradesh, India. The specimen was studied and photographed by using a Leica Stereo microscope with LAS software version 3.6.0., and drawing was made by using the drawing tube of the same microscope.

The identified specimen was properly registered and deposited at the 'National Zoological Collections' of the Hymenoptera Section of Zoological Survey of India, Kolkata.

*Abbreviations used for the terms:* F1-F2 = Flagellar segments 1 and 2; H = Head; M = Mesosoma; OOL = Ocellular length; POL = Postocellar length; T1-T2 = Metasomal terga 1 and 2.

## RESULTS

### *Cochlischnogaster dadugangensis* Dong and Otsuka (Fig. 1; Images 1-14)

1994. *Cochlischnogaster dadugangensis* Dong and Otsuka, 451. *Nomen nudum*.

1997. *Cochlischnogaster dadugangensis* Dong and Otsuka, 205, 210, figs. 10-24, ♀, ♂, nest. Yunnan: Xishuanbanna, Dadugang, Holotype ♀ (Institute of Zoology, Academia Sinica, Kunming).

1997. *Cochlischnogaster dadugangetsis* Dong and Otsuka, 210. Incorrect original spelling.

*Redescription: Male:* Body length (H+M+T1+T2) 11.4 mm; forewing length 9 mm. Head black, mesosoma black to blackish brown and metasoma brown with yellow and white maculations. Yellow maculations as follows: two broad vertical lines at the sides and a minute spot at the middle of clypeus, broad spots below antennal sockets extending up to clypeus, a minute faint spot on scape ventrally, hind margin of pronotum, short lines anteriorly along the notauli, anterior half of tegulae, two small spots laterally on scutellum, most of metanotum, small mesepisternal spot dorsally, a faint spot above propodeal spiracle, a small spot posteriorly and a line ventrally on forecoxa, all femora ventrally and dorsally at apex, foretibiae and midtibiae mostly and hindtibiae ventrally, foretarsi and midtarsi largely. Sides of terga II-VII and sterna II-VII brownish yellow. White maculations as follows: pale white at the spatulate process of apical antennal segment, yellowish white at propleura, a faint transverse band at the posterior apex of tegum II, Terga III-VII each with a broad white basal band. Vestiture pale short hairs on clypeus and frons, denser on genae, longer hairs on mandible, longer and more scattered hairs on vertex, dorsum of mesosoma, propodeum and legs, denser on coxae and femora; midtibiae and hind tibiae and tarsi

with numerous very long, fine, erect hairs; very dense, short hairs on mesepisterna dorsally and posteriorly, metapleurum and propodeum anteriorly; metasoma with fine scattered short hairs on terga and a few longer hairs on sterna.

*Head:* 1.16x wider than long (Image 3); clypeus with shallow punctures, coarser on frons; clypeus with apex convex, roundly angled; frontoclypeal suture distinct, strong; occipital carina fused with hypostomal carina; maxillary palpi with the length of segment 2 approximately equal to that of segment 3; labial palpi with first segment subequal in length to combined lengths of segment 2-4; eyes exceptionally large and occupying almost all of side view of head (Image 5), only very narrowly separated from clypeus; antennal sockets far apart from each other and separated from clypeus by long supraclypeal area; antennae (Fig. 1; Image 6) with scape and pedicel roundly flattened, flagellomeres rounded; scape 0.9x F1, F1 1.67x F2, terminal antennal flagellomere spatulate (Image 7); Ocelli (Image 4) large, ratio of width to distance from eye about 0.7x for anterior ocellus and 1.03x for either posterior ocellus; POL 0.48x OOL (Image 4).

### *Cochlischnogaster dadugangensis* Dong and Otsuka Male.

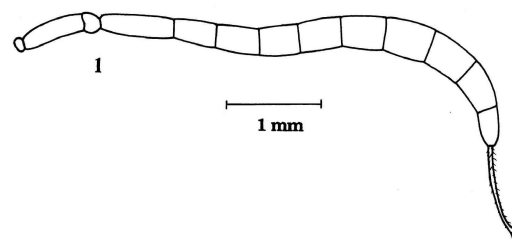


Fig. 1. Antenna.

*Mesosoma:* Ventral angle of pronotum, notauli, dorsal groove of mesepisterna, median groove of propodeum crenulate, pronotum with striae anteriorly above, weak striae dorsally on metapleuron and propodeum, dense striae anterodorsally on mesepisterna. Pronotum without dorsal carina and pretegular carinae; mesoscutum with notauli strongly impressed (Image 8); parapsidal and admedian lines deeply impressed; scutellum (image 9) without median carina; length of metanotum along midline about equal to that of scutellum (25:28); propodeum smooth, with valvulae reduced posteriorly, without raised

lamellae above orifice; forewing (Image 11) with second sub-marginal cell rectangular, third sub-marginal cell elongate, nearly attaining wing apex. Hindwing (Image 12) with two closed cells, without pigmented area posterobasally, posterior fringe of hairs very short. Forefemora in dorsal view curving anteriorly; foretibiae lacking spatulate setae; foretarsomeres not ventrally produced into spines; midtibiae with single spur; apical midtarsomeres flattened and expanded (Image 13), distitarsi rounded.

*Metasoma* : Metasomal segment I about 1.62x the length of the mesosoma, apical bulb of segment I about three times as broad as main part of petiole, scarcely narrowed behind; metasomal segment II not petiolate basally; sternum VII flattened. Genitalia as in Image 14; parameral spines not dilated, with rounded median inner process, bent in towards each other near the base, then arching out apart; digitus with small, sharply recurved point apically; cuspis plus lamina volsellaris broad medially; aedeagus apically strongly compressed, apex dilated in lateral view with pair of small projections located laterobasally.

*Material examined* : 1 Male, India: Arunachal Pradesh, Changlang district, Namdhapa National Park, Firmbase, 11.xi.2009, coll. J.K. De & Party, NZSI Regd. No. 12718/H3.

*Distribution* : India (new record): Arunachal Pradesh. *Elsewhere*: China (Yunnan).

*Discussion* : Even though the males of *Cochlischnogaster dadugangensis* Dong and Otsuka and *C. spatulata* (Carpenter and Starr) are very similar, they can be readily distinguished by the colour of the clypeus. In *C. dadugangensis* the clypeus is mostly black, with two broad vertical yellow lines

at the sides (cf. Image 3, and Dong and Otsuka, 1997: fig. 17), while in *C. spatulata* the clypeus is mostly yellow (Carpenter and Starr, 2000). From what can be seen in the figures of the male genitalia in Dong and Otsuka (1997: figs. 21-22), the median process on the parameral spine is smoothly rounded in *C. dadugangensis* (cf. Image 14, and Dong and Otsuka, 1997: fig. 22) while it is truncate in *C. spatulata* (Carpenter and Starr, 2000: fig. 7B). The digitus of *C. dadugangensis* and *C. spatulata* are quite differently shaped (cf. Image 14 and Carpenter and Starr, 2000: fig. 7C).

*Remarks* : New record of the genus *Cochlischnogaster* Dong and Otsuka from Indian subcontinent; the species *C. dadugangensis* Dong and Otsuka.

#### SUMMARY

The hover wasp genus *Cochlischnogaster* Dong and Otsuka is newly recorded from India, with the species *C. dadugangensis* Dong and Otsuka reported. The redescription of male with illustrations was also provided.

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PLATE - I

*Cochlischnogaster dadugangensis* Dong and Otsuka Male.



Image 1. Body dorsal view;



Image 2. Body lateral view;



Image 3. Head frontal view;



Image 4. Head dorsal view;



Image 5. Head lateral view;



Image 6. Antenna;



PLATE - II

*Cochlischnogaster dadugangensis* Dong and Otsuka Male.



Image 7. Apical antennal articles;



Image 8. Mesoscutum in oblique dorsal view;



Image 9. Mesosoma dorsal view;



Image 10. Mesosoma lateral view;

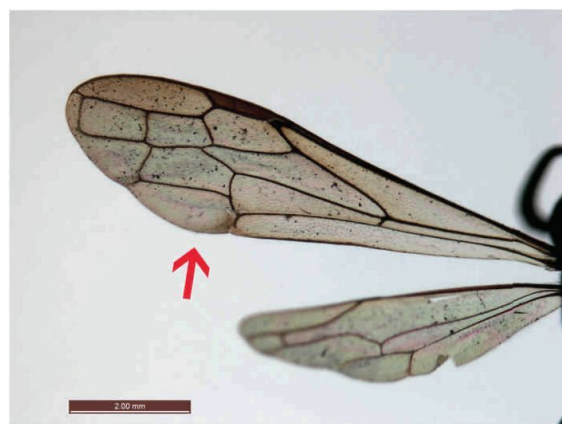


Image 11. Forewing;

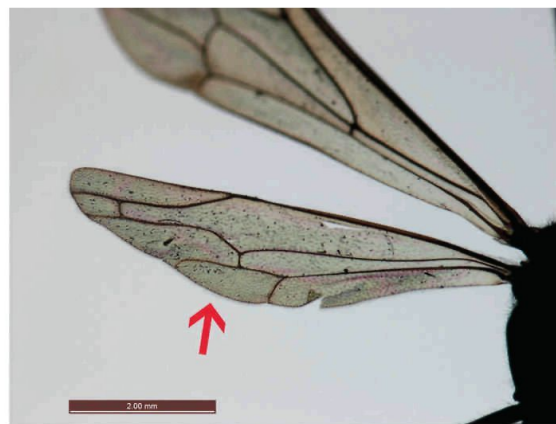


Image 12. Hindwing;

**PLATE - III**

*Cochlischnogaster dadugangensis* Dong and Otsuka Male.



**Image 13.** Midtarsus;



**Image 14.** Genitalia.