

## A *Chaetogramma* Doult (Hymenoptera: Chalcidoidea) from India

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### Abstract

The male *Chaetogramma hisarensis* Yousuf & Shafee (1993) is recorded and diagnoses of the three known Indian species are given. A key to the three Indian species of *Chaetogramma* is also provided.

**Keywords:** *Chaetogramma*, India, records, key.

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### Introduction

*Chaetogramma* Doult, is represented by 6 species worldwide of which 3 species are recorded from India. Two species were described by Hayat, *C. borealis* Hayat (2008) and *C. maculata* Hayat (1981) and one species by Yousuf & Shafee, *C. hisarensis* Yousuf & Shafee (1993). In this paper a detailed description of the newly recorded male of *C. hisarensis* is provided along with diagnostic characters of the three known Indian species. A key to the three Indian species of *Chaetogramma* is also given.

### Materials and Methods

Only body lengths are given in millimeters; all other measurements are relative, taken from the divisions of a linear scale of a micrometer placed in the eye piece of a stereo zoom binocular microscope (Olympus SZX16) at 10× Zoom 8 for card-mounted specimens and placed in the eye piece of a compound microscope (Nikon Eclipse 80i) at 400× magnification. Body colours were noted from card-mounted specimens prior to mounting these on slides. The photographs of card-mounted specimens were taken by stacking microscope (Nikon SMZ25) with digital camera (DS-Fi2) and of the slide-mounted specimens were taken by digital camera (Leica, DFC295) fitted over the compound microscope (Leica, DM2500). The specimens, not listed as 'on slide' are card mounted.

The following abbreviations used.

F1, F2= Funicle segments 1, 2.

TI, TII, TIII etc.= Tergites 1, 2, 3, etc. of gaster.

The following acronyms are used for the depositories.

ZDAMU = Insect Collections, Department of Zoology, Aligarh Muslim University, Aligarh, India.

NPC= National Pusa Collection, Division of Entomology, IARI, New Delhi, India.

BMNH= The Natural History Museum, London, England.

### Genus *Chaetogramma* Doult

*Chaetogramma* Doult, 1975: 238. Type species *Chaetogramma occidentalis* Doult, by original designation.

*Chaetogrammina* Hayat, 1981: 73. Type species *Chaetogramma (Chaetogrammina) maculata* Hayat, by monotypy and original designation. (as subgenus of *Chaetogramma*).

*Brachistagrapha* De Santis, 1997: 9. Type species *Brachistagrapha candata* De Santis, by original designation. Synonymy by Pinto & Viggiani, 2004: 269–294.

### Diagnosis

*Female*. Head with lower torular margin placed at or slightly above the level of lower eye margin; Mandible tridentate; antennal formula, 1, 1, (2), 1–2, 1; funicle either one or two segmented (F1 and F2), if two segmented,

segments either sub-equal or F1 distinctly shorter than F2, each with placoid and basiconic peg sensilla; clava unsegmented, possess both placoid and basiconic peg sensilla; mid lobe of mesoscutum and scutellum each with 2 pairs of (2+2) setae; fore wing densely setose, few setae arranged in rows basally, but become obsolescent apically, marginal fringe short; RS1 absent; stigmal vein short, not distinctly attached to marginal vein; marginal vein normal or gradually widened at apex, with few setae along the margin; propodeum as long as or longer than metanotum; ovipositor short, either slightly or not extending beyond apex of gaster.

**Male:** Head with frontovertex yellow, eyes and ocelli red, toruli placed above level of lower eye margin, maxillary palp unsegmented, with two apical setae, a long [longer than maxillary palp] and a short setae. Mandible brown, three segmented. Antenna yellow except clava pale brown; Antennal formula 1, 1, (2), 1–2, 1, funicle and claval segments as in female. Fore wing hyaline, with slight infumation basally, distinctly infuscated below stigmal vein. Hind wing hyaline. Legs yellow. Gaster longer than mesosoma. Male genitalia with apodeme either absent or poorly developed; anterodorsal aperture oval, short, broad medially and open dorsally; parameres absent; aedeagus short.

**Comments:** Hayat (1981) divided the genus *Chaetogramma* into two subgenera such as *Chaetogramma* sens. str. and *Chaetogrammina* erected as new subgenus for *C. maculata*, based on completely divided funicle segments, well developed costal cell, broader fore wing and more distinct vein tracks, however the nominate genus have, funicle either one or two segmented; the two segmented funicle is partially divided and cannot easily be discernable as separate segments.

The male genitalia of *Chaetogrammina* have poorly developed apodemes, while the nominate genus *Chaetogramma*, has apodemes either developed or absent (If present, it can easily be seen “reaching to anterior apex of phallus” but in *Chaetogrammina* apodemes are short, not reaching the anterior apex of phallus, but can be seen slightly above the base of anterodorsal aperture).

#### ***Chaetogramma hisarensis* Yousuf & Shafee**

(Figures, 1–11)

*Chaetogramma hisarensis* Yousuf & Shafee, 1993: 49–50. female. Holotype, female, Haryana, Hisar (ZDAMU examined).

*Chaetogramma hisarensis* Yousuf & Shafee: Hayat, 2008a: 4–5.

#### **Diagnosis**

**Female:** Length, 0.46 mm. Head largely yellowish; gena with two brown patches below lower eye margin and above mouth margin; eyes and ocelli red. Mandible brown. Antenna yellowish brown. Mesosoma, anterior pronotum dark brown, most part of mid lobe of mesoscutum orange, rest of scutum, scutellum, metanotum and propodeum yellow. Fore wing hyaline with slight infumation basally and a distinct infuscated patch below stigmal vein. Hind wing hyaline. Legs pale except hind coxa, two-thirds femur and hind tibia brown. Gaster largely yellowish, tergite TII to TV and TVII alternate with yellow and dark brown bands.

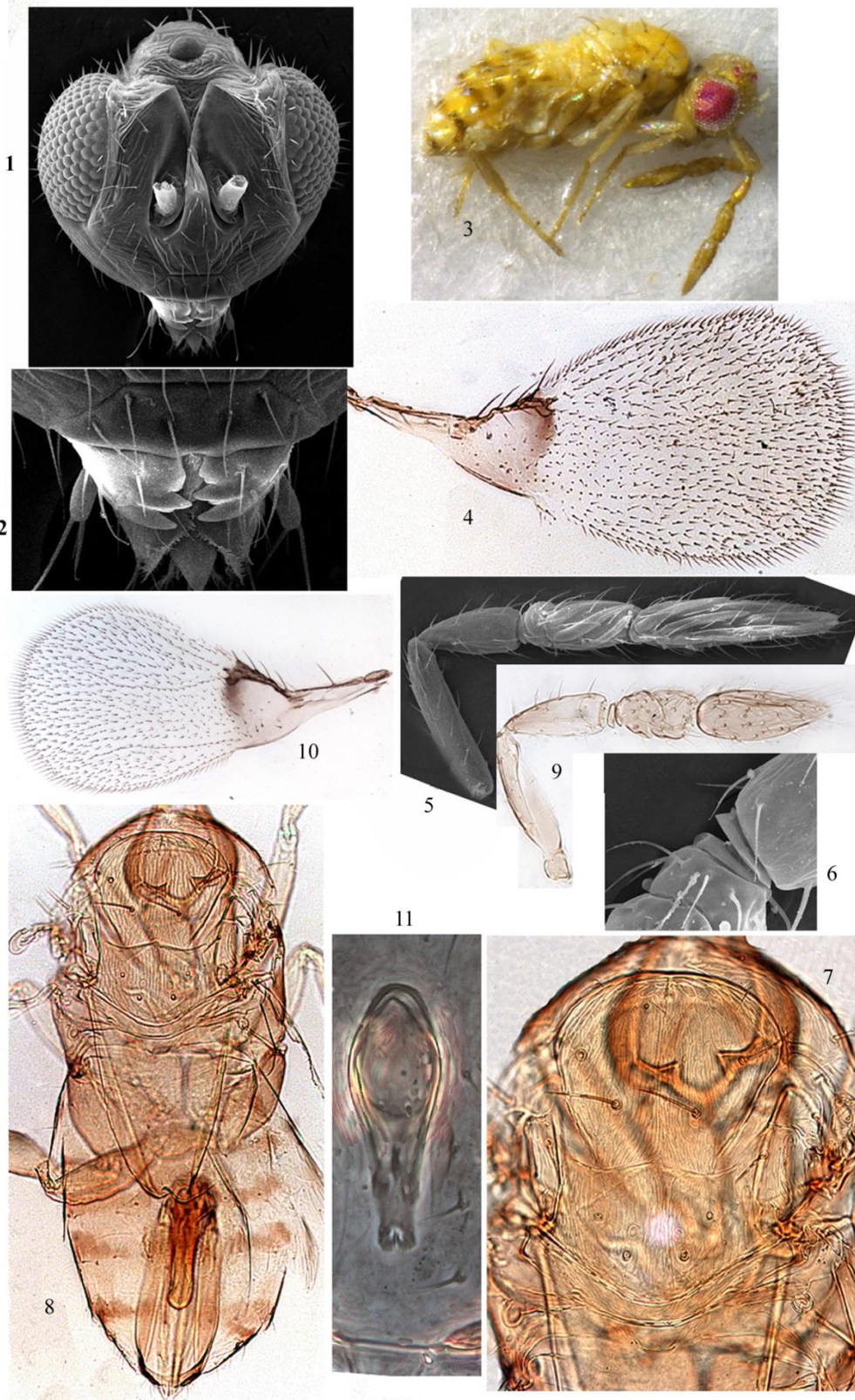
**Head** (Fig. 1) in frontal view slightly broader than high (12:10). Mandible (Fig. 2) tridentate. Antennae (Fig. 5) with scape cylindrical, 4.1× as long as broad; pedicel long, conical, 2× as long as broad; 2 anelli (Fig. 6) present; funicle two segmented (F1 and F2), 1.84× as long as broad, second funicular segment more than thrice as long as first funicular segment; clava one segmented, 2.93× as long as broad.

**Mesosoma** (Fig. 7): pronotal collar with three pairs of setae, one at anterolateral corner longer. Fore wing (Fig. 4), 2× as long as broad, discal setae densely setose, few setae arranged in rows; marginal vein longer than premarginal or stigmal veins; marginal fringe short, 10.4× of wing width.

**Metasoma** (Fig. 8): Gaster longer than mesosoma, (119:81); ovipositor moderately long, extending from tergite TIII of gaster, hardly exerted; ovipositor, 1.30× hind tibial length.

**Male:** Length, 0.49 mm. Head yellowish; eyes and ocelli red. Mandible brown. Antennae yellowish except clava pale brown. Mesosoma with pronotum, mesoscutum, scutellum, metanotum and propodeum yellow. Fore wing hyaline with slight infumation basally and infuscated below stigmal vein. Hind wing

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**FIGURES (1-11).** *Chaetogramma hisarensis*, **female:** 1, head; 2, mandible; 3, habitus; 4, fore wing; 5, antenna; 6, anelli; 7, mesosoma; 8, body. **male:** 9, antenna; 10, fore wing; 11, phallus.

hyaline. Legs yellow. Gaster largely yellowish, tergite from TI–TVI with alternate yellow and dark brown bands.

**Head** in frontal view as broad as high (13:13). Maxillary palp one segment with two apical setae, a long [longer than maxillary palp] and a short seta. Mandible tridentate. Antenna (Fig. 9) with scape broad medially, 2.58–3.1× as long as broad; pedicel long, conical, broad at apex, 2–2.3× as long as broad; 2 anelli present; funicle two segmented (F1 and F2), 1.58–2.1× as long as broad, clava one segmented, with 3 placoid sensilla, 2.46–2.53× as long as broad.

**Mesosoma:** Sculpture on mesosoma same as female; propodeum as long as metanotum. Fore wing (Fig. 10), 1.89–2.07× as long as broad, discal setae densely setose, marginal vein longer than combined lengths of premarginal and stigmal veins; marginal fringes short, 11.55–14× of wing width.

**Metasoma:** Gaster longer than mesosoma, (145:104); phallus (Fig. 11) short, arise from posterior tergite TV of gaster; anterodorsal aperture oval shaped, open dorsally; parameres without spines; aedeagal apodemes absent; 0.42–0.49× hind tibia length.

**Relative measurements:** length of scape, 31; width of scape, 10; length of pedicel, 23; width of pedicel, 10; length of funicle 19; width of funicle 12; length of clava, 32; width of clava, 13; fore wing length; 212; fore wing width, 112; submarginal vein length, 40; marginal vein length, 25; premarginal vein length, 17; stigmal vein length, 7; length of marginal fringe of fore wing, 10; length of hind tibia, 62; length of phallus, 26.

**Type material examined:** Holotype: female, (on one slide), labelled, “M.Y.R.A707 *Chaetogramma hisarensis* sp.n. M.Yousuf near Mini Secretariat, Hisar, 26.iii.1991” and a ticket with ‘Holotype’ written in black ink, Det. by M. Hayat 2007 (ZDAMU, HYM/CH 419).

**Additional material examined:** INDIA: ANDHRA PRADESH: East Godawari, Sarpavaram, 1 female, 2 females (on slides), 5.ii.2014, coll. MT Khan; East Godawari, VK Rayapuram, 2 females (on slides), 5.ii.2014, coll. SK Ahmad; Guntur, Kolanukonda, 1 female (on slide), 11.ii.2014, coll. SK Ahmad;

Krishna, Chepalakundi, 1 female, 12.ii.2014, coll. SK Ahmad. UTTAR PRADESH: Aligarh, Dept. of Zoology, 1 male, 2 males + 1 female (on slides), 26.viii.2014, coll. MT Khan.

**Host:** Unknown

**Distribution:** India: Earlier recorded from Haryana and presently from Andhra Pradesh, Uttar Pradesh.

**Comments:** The original description of this species is based on single female; I have collected a female and three males from the same locality and rest of the specimens collected from different locations. The male is similar to female based on sculpture of mesoscutum and scutellum, number of funicular segments and habitus but differs in antennal structure, where funicle segments F1 and F2 subequal in length; clava shorter and with a few placoid sensilla.

#### ***Chaetogramma borealis* Hayat**

*Chaetogramma borealis* Hayat, 2008b: 118–119. female. Holotype, female, Uttar Pradesh, Pilibhit, Rooppur Kirpa (NPC not examined). (Paratype in ZDAMU examined).

*Chaetogramma borealis* Hayat, 2009: 202. female. Uttar Pradesh record.

#### **Diagnosis**

**Female:** Length, 0.71 mm. Head with frontovertex yellowish; face pale brown; gena below lower eye margin with a triangular dark brown spot, rest pale brown to yellowish; occiput from the foramen downward brown. Mandible brown. Antenna brown except apical half of pedicel pale. Mesosoma with pronotum dark brown anteriorly, rest pale brown to colourless; mid lobe of mesoscutum largely orange with two brown vertical bands laterally, rest of scutum yellowish; scutellum yellowish with two brown spots mediolaterally, axillae yellow; metanotum medially pale yellow rest brown; propodeum pale yellow; most part of mesopleura colourless to pale yellow except a brown band medially. Fore wing hyaline with slight infuscation below venation and a distinct infuscated patch below stigmal vein. Hind wing hyaline. Legs pale brown except basal three–fourth of hind femur brown. Gaster dark brown

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except posterior tergite TVI and TVII pale yellow. Head in frontal view slightly broader than high. Mandible tridentate. Antenna with scape, 3.7× as long as broad; pedicel conical, 1.83× as long as broad; 2 anelli present; funicle one segmented, 1.28× as long as broad; clava one segmented, 2.05× as long as broad. Fore wing, 2.14× as long as broad, discal setae densely setose, not arranged in rows; marginal vein broadened distad, longer than combined lengths of premarginal and stigmal veins; marginal fringe short, 5.82× of wing width. Gaster longer than mesosoma, (155:99); ovipositor moderately long, extending from tergite TIII of gaster, and hardly exerted; ovipositor, 1.72× hind tibia length.

*Male*. Unknown.

**Type material examined:** Holotype: female (on one slide). INDIA: Uttar Pradesh: Pilibhit; Roop Pur Kirpa, 24.ix.2006, coll. SMA Badruddin and FR Khan.

Paratype: 1female (on one slide under three small cover slips), Uttar Pradesh: Bahraich; Tikona Mod, 1.x.2006, coll. FR Khan (ZDAMU, HYM/CH 556, examined).

**Additional material examined:** INDIA: ANDHRA PRADESH: Krishna, Chepalakundi, 1female, 1 female (on slide), 12.ii.2014, coll. SK Ahmad; Krishna, Chepalakundi, 2 females, 1 female (on slide), 12.ii.2014, coll. MT Khan; Guntur, Rajamandi, 2 females, 10.ii.2014, coll. MT Khan; East Godawari, Sarpavaram, 1 female, 5.ii.2014, coll. MT Khan. KARNATAKA: Mandya, Narayan, Gowda, 1 female, 2.i.2014, coll. FR Khan.

**Host:** Unknown.

**Distribution:** India: Earlier recorded from Uttar Pradesh and presently from Andhra Pradesh and Karnataka.

### *Chaetogramma maculata* Hayat

*Chaetogramma (Chaetogrammina) maculata* Hayat, 1981: 74–75. female. Holotype, female. Uttar Pradesh, Aligarh (BMNH, not examined). [Paratypes, ZDAMU examined].

*Chaetogramma maculata* Hayat: Hayat & Viggiani, 1984: 26, catalogue.

*Brachygrammatella singularis* Yousuf & Shafee, 1985: 305. female. Holotype, female, Uttar Pradesh, Aligarh (ZDAMU, examined). Synonym by Hayat, 2008a: 5.

*Chaetogramma maculata* Hayat: Hayat & Subba Rao, 1986: 194, catalogue. Yousuf & Shafee, 1988: 123, figures, key. Hayat, 2008a: 5, taxonomy.

*Chaetogramma singularis* (Yousuf & Shafee): Yousuf & Shafee, 1988: 123, 125, figures, key.

### Diagnosis

*Female:* Length, 0.71 mm. Head with frontovertex, face and gena brown; eyes and ocelli red. Mandible brown. Antenna dark brown. Thorax dark brown. Fore wing hyaline, infusate basally. Hind wing hyaline. Legs pale brown. Gaster pale brown with small patches laterally. Head, mandible tridentate. Antenna with scape long, 3.45× as long as broad; pedicel long, conical, 2.7× as long as broad; 2 anelli present; funicle two segmented, segments divided completely, slightly twisted, 1.61× as long as broad; clava one segmented, 3× as long as broad. Mesosoma, pronotal collar with two pairs of setae; propodeum as long as metanotum. Fore wing, 2.19× as long as broad, discal setae densely setose, vein tracks discernable basally, but become obsolescent apically; costal broad; marginal vein broad, longer than premarginal; stigmal vein short, distinctly attached to marginal vein; marginal fringe short, 13.87× of wing width. Metasoma, ovipositor 1.91× hind tibia length.

*Male:* Similar to female except antenna, with first funicle distinctly longer than second segment and genitalia with phalobase spindle shaped, apodeme poorly developed, aedeagus short, digiti without spines.

**Type material examined:** Holotype, female, INDIA: Uttar Pradesh: Aligarh, January, 1980, coll. M. Hayat. (BMNH, not examined).

Paratypes. 1female, 1male, (on two slides, each under a large circular), India: Uttar Pradesh: Aligarh, December, 1979, coll. M. Hayat (ZDAMU, HYM/CH 185).

**Material examined:** Holotype, female (on two slides), labelled, “342 *Chaetogramma singularis* sp.n. M.Akbar, Aligarh, 26.iii.1985” and a ticket



with 'Holotype' written in red ink (ZDAMU, HYM/CH 275).

**Host:** Unknown.

**Distribution:** India: Uttar Pradesh.

**Key to Indian species (female, male)**

1. Antenna with funicle two segmented.....2
- Antenna with funicle one segmented.....  
.....*C. borealis* Hayat
2. Female, first funicle segment short, F2, 3.8× F1; scape at least 4× as long as broad and ovipositor not more than 1.5× as long as hind tibia; male, phallus oval shaped, apodemes absent, parameres without spines.....*C. hisarensis* Yousuf & Shafee
- Female, first funicle segment slightly shorter than F2, 1.3× F1; scape 3.45× as long as broad and ovipositor 1.91× as long as hind tibia; male, phallus spindle shaped, apodemes poorly developed.....  
....*C. (Chaetogrammina) maculata* Hayat

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