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### Revision of Genus *Cibdela* KONOW from India

(Insecta, Hymenoptera, Symphyta: Argidae)

With 18 Figures

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**Abstract.** Genus *Cibdela* KONOW has been revised from India. To the previously recorded one species from India, four species are added a fresh. Described as new are *C. ramgarhensis*, *C. choptaensis*, *C. smithi* and *C. chakrataensis*. Along with illustration of external genitalia a workable dichotomous key for the examined species has been provided.

#### Introduction

The work that follows deals with the taxonomic revision of genus *Cibdela* KONOW from India. This genus is purely confined to the high altitude regions of India (1600–5000 m MSL) along the entire Himalayan chain. Bluish black medium-sized adults of this genus frequently visit low vegetation, flowers and broad leathery leaves of various plants to feed on nectar, pollen grains and leaf juices. This work is the first of its kind to update the Indian fauna of this genus. It covers detailed and systematic description of 5 Indian species (1 species described earlier, 4 species as new to science). KONOW (1905) enlisted 3 species under this genus from the Oriental region in *Genera Insectorum* and later on ROHWER (1921) provided a key to the species of *Cibdela* from the Oriental and adjacent parts of the Palaearctic region.

The literature based facts may be enumerated as follows. From the Oriental region, so far 5 species have been reported which are contributed as follows: 2 species by KONOW (1898, 1901) and one species each by KLUG (1834), ENDERLEIN (1919) and ROHWER (1921). From India only 1 species i. e. *C. janthiana* (KLUG, 1834) has been reported so far. None of the earlier workers have taken into account the male and female genitalia while erecting and describing different species. However, in the present study, account of genitalia have been taken and accordingly the criteria for distinguishing species is slightly modified. After studying the male and female genitalia, minor colour variation have been put under the heading of population variation. — A workable dichotomous key has been provided to facilitate identification of various Indian species of this genus infuture.

For the purpose of confirmation and comparison some rare and very old holotypes/paratypes/determined specimens have been precured from the following museums and the abbreviation of these institutes as used in the text are as follows: FRI = Forest Research Institute, Dehradun (U. P.), India; USNM = United States National Museum, Washington, U.S.A.

#### Material and methods

This study is based on about 65 adults specimens belonging to 5 species. Most of the collection has been made with the help of Malaise trap and sweeping nets during the months of April to September every year since 1985. As this group of insects is mainly confined to the high altitude regions (1600–5000 m MSL), so the various collection localities falling within this range in the states of Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh, Sikkim, West Bengal and Meghalaya have extensively been explored. After killing

with ethylacetate vapours, the specimens were pinned, stretched and kept in almost airtight wooden insect boxes, which were fumigated periodically. Labels have been attached to each specimen carrying information regarding date of collection, locality and name of collector. After proper identification and confirmation holotypes have been designated for the new species.

Slides of external genitalia have been prepared, following the technique of ROSS (1945). However, for species represented by single specimen, a newly designated technique with which the dry specimens do not break while taking out the genitalia, has been followed. In this technique each pinned specimen is attached to a cork sheet glued to the front wall of a specifically designed apparatus in such a way that only apex of its abdomen dips in distilled water taken in a plastic tube. The entire apparatus is put in a humidity chamber and the latter is placed in an oven set at 42°C for 10–12 hours. The genitalia is then gently taken out with the help of very fine forceps and specimen is restretched, dried and kept back in its original place.

Detailed description of species have been written following a uniform pattern suggested by Dr. D. R. SMITH of USNM, Washington. For this purpose the most typical specimen was selected in each case and population variations, if any, have been mentioned separately. Where both the sexes were available, the male has been described only in comparison to female in order to condense the text. To separate closely related species, genitalic characters have been extensively employed for the first time. Synonymy has been provided wherever required and the type material record is given under 'Holotype Depository'. Complete distributional data including date of collection, number of specimens examined, place with altitude have been provided employing a uniform method to facilitate comparison.

The terminology proposed by SNODGRASS (1935), ROSS (1937) and MALAISE (1945) has generally been adopted. Labelled diagrams of antennae, postero-dorsal and lateral view of abdominal tip, female and male genitalia have been provided. International Code of Zoological Nomenclature (1985) has been consulted wherever required. A workable dichotomous key has been provided for the identification of species under study.

Body length has been measured from the anterior tip of head to the abdominal apex (excluding antennae, female sawsheath or male genitalia). Relative lengths have been used in the text as actual ratio proportions. Measurements have been made with the aid of slidemicrometer and oculometer, whereas diagrams are drawn under stereoscopic microscope fitted with an ocular grid.

### Genus *Cibdela* KONOW

*Cibdela* KONOW (1899), Ent. Nachr. 25, p. 76.

Type species *Hylotoma janthiana* KLUG.

Adult Average length varies in female (9.5–10 mm) and males (7–7.5 mm). Body metallic blue to bluish-black; wings hyaline smoky, infumated or strongly infuscated; costa, stigma and venation dark brown to black.

Flagellum widened towards tip and more or less distinctly compressed; head not or scarcely widened behind the eyes; facial quadrangle with its width subequal or little more than the length of the eyes; posterior orbits much narrower than the cephalocaudal diameter of the eyes; ocelli are tangent to the eyes; molar space is narrower than the length of pedicel; postocellar area obsolete; lateral ocelli with their anterior margin on the supra-orbital line; compound eyes longer than the distance between them at the base; propodeum with a faint median furrow; hind tibiae neither compressed nor with supraapical spur; interval between the cubitus and discoidis shorter than the intercostal cross vein.

Distribution Oriental and adjacent parts of the Palaearctic region.

### Key to the species of genus *Cibdela*

- 1 Body bluish-green. *C. janthiana* (KLUG)
- Body bluish-black. 2
- 2 (1) Mesolegs with supraapical tibial spur; both pairs of wings uniformly dusky hyaline except a dilute infuscated spot below stigma. *C. ramgarhensis* sp. n.
- Mesolegs without supraapical tibial spur; wings different unless stated separately. 3

- 3 (2) Median ocellus on the level of supraorbital line; head distinctly widened behind the eyes; anterior wings pale brown infuscated towards base and becoming lighter towards the apex. **C. choptaensis sp. n.**
- Median ocellus below the level of supraorbital line; head parallel or narrowing behind eyes; anterior wings subhyaline with an infuscated spot below stigma. 4
- 4 (3) Head narrowing behind eyes; circum-, inter- and postocellar furrows absent, supraclypeal furrow in the form of depression; anterior wings with 3rd cubital cross vein complete. **C. smithi sp. n.**
- Head sides parallel to eyes; circum-, inter- and postocellar furrows present, supraclypeal furrow absent; anterior wing with only the lower half of the 3rd cubital cross vein. **C. chakrataensis sp. n.**

***Cibdela janthiana* (KLUG) (Figs. 3, 6, 9, 12, 15, 18)**

*Hylotoma janthiana* KLUG (1834), Jahrb. Ins. I, p. 223.

*Hylotoma maculipennis* CAMERON (1899), Mem. Proc. Manch. Lit. Phil. Soc. 43 (3) p. 9.

*Cibdela janthiana*: KONOW (1899), Ent. Nachr. 25, p. 76.

**Female**

Colour: Body bluish-green; anterior wings smoky hyaline with an infuscated spot below the stigma becoming paler towards the apex and covering the entire radial cells; hind wings clear; costa, stigma and venation dark brown to black.

Large structures: Average length 9.5 mm. Antenna (Fig. 3) 1.9x head width; scapus conical, pedicel shorter than scapus, flagellum towards tip somewhat compressed with its maximum thickness greater than the apical thickness of scapus; clypeus roundly emarginate upto  $\frac{1}{5}$  of its medial length; supraclypeal area roundly, evenly raised; supraclypeal and supraantennal pit deep, distinct; lower margin of eyes below the level of antennal socket; head not widened behind eyes; LID IDMO EL = 4.3 : 4 3.8; frontal area above the level of eyes; supraantennal tubercle moderately elevated and posteriorly continuous with slightly low frontal ridges; median fovea distinct, deep, open anteriorly; median ocellus below the level of suborbital line; circumocellar furrow present, inter- and postocellar furrows absent; postocellar area subconvex, broader than long in ratio 2:1; lateral furrows in the form of shallow depression; head without postgenal carina; OOL POL OCL = 1.1 1 1.3; mesoepisternum obtusely raised without carina or acute apex; tarsal claws simple without inner tooth; ICD ITD = 1 8.5; IATS MB OATS = 1 2.6 1.1.

Lancet (Fig. 12) with 19 serrulae. Posterodorsal view of abdominal tip (Fig. 6). Lateral view of abdominal tip (Fig. 9).

Sculptures: Body smooth and shining almost impunctate.

Pubescence: Body pubescent.

Male Average length 8 mm, otherwise similar to female. Male genitalia: Penis valve (Fig. 15), Gonoforceps (Fig. 18).

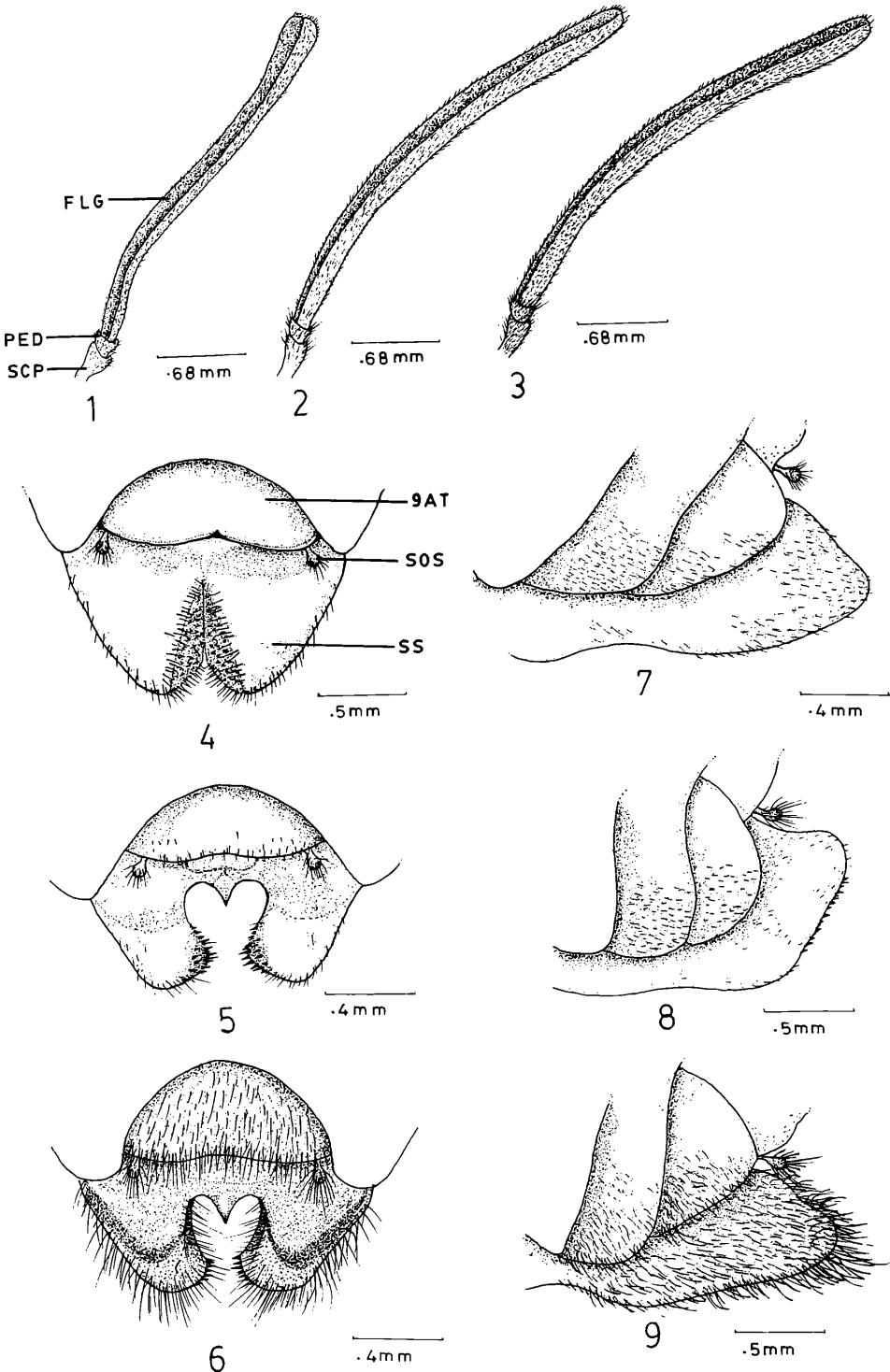
**Holotype depository** BMNH London.

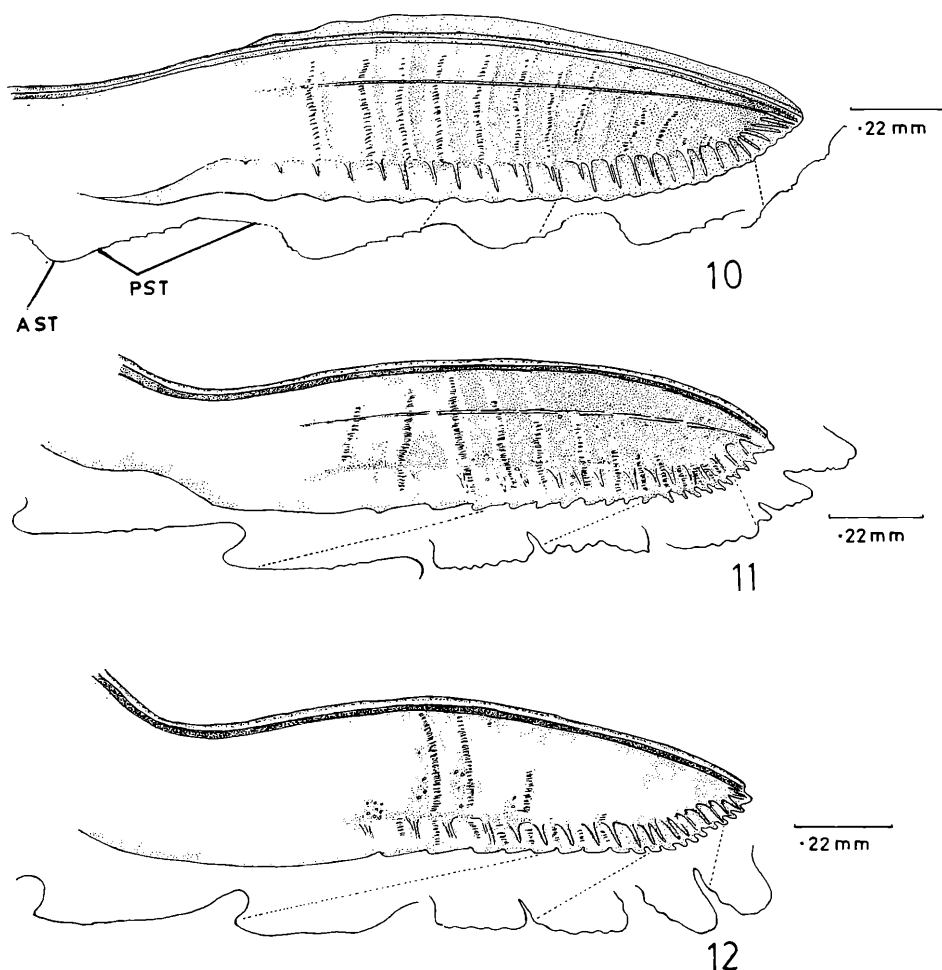
**Specimens examined** Himachal Pradesh: Kalatop, 2485 m (13 ♀♀, 5 ♂♂), 25. 5. 1981 to 30. 6. 1981; 4. 5. 1982; 20. 8. 1984; Mashobra (2 ♀♀, 1 ♂), 22. 5. 1984; Uttar Pradesh: Mandal, 2300 m (3 ♀♀), 16. 6. 1983; Chopta, 3000 m (1 ♀), 28. 6. 1987; Flowervalley, 3300 m (1 ♀), 12. 6. 1985; Ranikhet, 1700 m (1 ♀), 17. 6. 1987; New Forest, Dehradun (23 ♀♀, 7 ♂♂), 3. 10. 1933, 13. 11. 1941, 10. 8. 1950, 13. 10. 1951 to 16. 9. 1961 (borrowed from FRI, Dehradun).

**Population variation** Colour of abdomen may vary from bluish green to purple. Extent and limits of an infuscated spot below stigma also vary.

**Distribution** India: Himachal Pradesh; Uttar Pradesh.

**Diagnostic combination** The studied specimens comply well with the available description and are easily distinguishable from others by its bluish-green colour.





Figs. 10–12: Lancet. 10: *C. choptaensis* sp. n. — 11 *C. chakrataensis* sp. n. — 12: *C. janthiana* (KLUG).

***Cibdela ramgarhensis* sp. n. (Figs. 13, 16)**

**Male**

Colour: Body bluish-black; wings dusky hyaline; anterior ones with a very small infuscated spot just below the proximal half of the stigma; costa, stigma and venation dark brown to black.

Large structures: Average length 7.5 mm. Antenna 2.2x head width; scapus conical, pedicel shorter than scapus, flagellum of uniform thickness throughout and its maximum thickness is greater than the apical thickness of scapus; clypeus roundly emarginate upto  $\frac{1}{3}$  of its medial length; supraclypeal furrow just indicated; lower half of supraclypeal area roundly raised with blunt carina, whereas upper half with a supraclypeal fovea bounded by distinct ridges; supraclypeal and supraantennal pits deep; lower margin of eyes well below the antennal sockets; head slightly widened behind the eyes; LID IDMO

Figs. 1–3: Antennae. 1: *C. choptaensis* sp. n. — 2: *C. chakrataensis* sp. n. — 3: *C. janthiana* (KLUG). — Figs. 4–6: Postero-dorsal view of the abdominal tip. 4: *C. choptaensis* sp. n. — 5: *C. chakrataensis* sp. n. — 6: *C. janthiana* (KLUG). — Figs. 7–9: Lateral view of the abdominal tip. 7 *C. choptaensis* sp. n. — 8: *C. chakrataensis* sp. n. — 9: *C. janthiana* (KLUG).

EL = 4 4.5 3.1; frontal area above the level of eyes; supraantennal tubercle distinctly elevated, confluent with somewhat low frontal ridges; median fovea deep, pit-like, open anteriorly and continuous with the supraclypeal fovea; median ocellus above the level of supraorbital line; circum- and interocellar furrows present, postocellar one absent; postocellar area convex broader than long in ratio 2:1; lateral furrows indicated; head without postgenal carina; mesoscutellum flat with rounded posterior tip; mesotibia with a supra-apical spur; mesoepisternum obtusely raised without carina or acute apex; tarsal claws simple, ICD ITD = 1 9; IATS MB OATS = 1 2.2 0.7

Male genitalia: Penis valve (Fig. 13), Gonoforceps (Fig. 16).

Sculptures: Body shining; clypeal and supraclypeal area very minutely punctured, posterior orbit and rest of the body almost impunctate.

Pubescence: Body covered with silvery pubescence.

**Holotype** ♂, Uttar Pradesh: Ramgarh, 2170 m, 16. 6. 1987 **Paratype** 1 ♂, with same data as above. No other examined specimens.

**Population variation** No.

**Distribution** India: Uttar Pradesh.

**Diagnostic combination** This species resembles with *C. chakrataensis*, *C. choptaensis* and *C. smithi* on the basis of colour pattern but is easily distinguished from these by having supraapical tibial spur on mesoleg, wings dusky hyaline, anterior wing with a small infuscated spot just below the proximal half of the stigma.

**Etymology** The species is named after its collection spot, Ramgarh.

### ***Cibdela choptaensis* sp. n.** (Figs. 1, 4, 7, 10)

#### **Female**

**Colour:** Body bluish-black, abdomen with a slight greenish tinge; wings subhyaline, anterior wings pale brown with an infuscated spot below the stigma, without sharp limits; costa, stigma and venation dark brown to black.

**Large structures:** Average length 10 mm. Antenna (Fig. 1) 1.5x head width; scapus conical, pedicel shorter than scapus, flagellum clubbed with its maximum thickness 1.5x apical thickness of scapus; clypeus shallowly incised upto  $\frac{1}{4}$  of its medial length; supraclypeal furrow not indicated; supraclypeal area roundly raised without carina; supraclypeal and antennal pits deep and sunken; lower margin of eyes well below the antennal sockets; head distinctly widened behind eyes; LID IDMO EL = 4 4.5 2.7 frontal area above the level of eyes; supraantennal tubercle distinctly elevated, sloping posteriorly and continuous with slightly low frontal ridges; median fovea distinct, more so in between the antennal tubercle, open anteriorly and posteriorly reaches median ocellus; median ocellus at the level of supraorbital line; circum-, inter- and postocellar furrows present; postocellar area subconvex, broader than long in ratio 2:1; lateral furrow indicated; head without postgenal carina; OOL POL OCL = 2 1 1.5; mesoscutellum flat with blunt posterior tip; mesoepisternum obtusely raised without carina or acute apex; tarsal claws simple; ovipositor sheath shell-like; ICD ITD = 1 8.5, IATS MB OATS = 1 : 3 1.3. Lancet (Fig. 10) with 22 serrulae. Posterodorsal view of abdominal tip (Fig. 4). Lateral view of abdominal tip (Fig. 7).

**Sculptures:** Body smooth and shining almost impunctate.

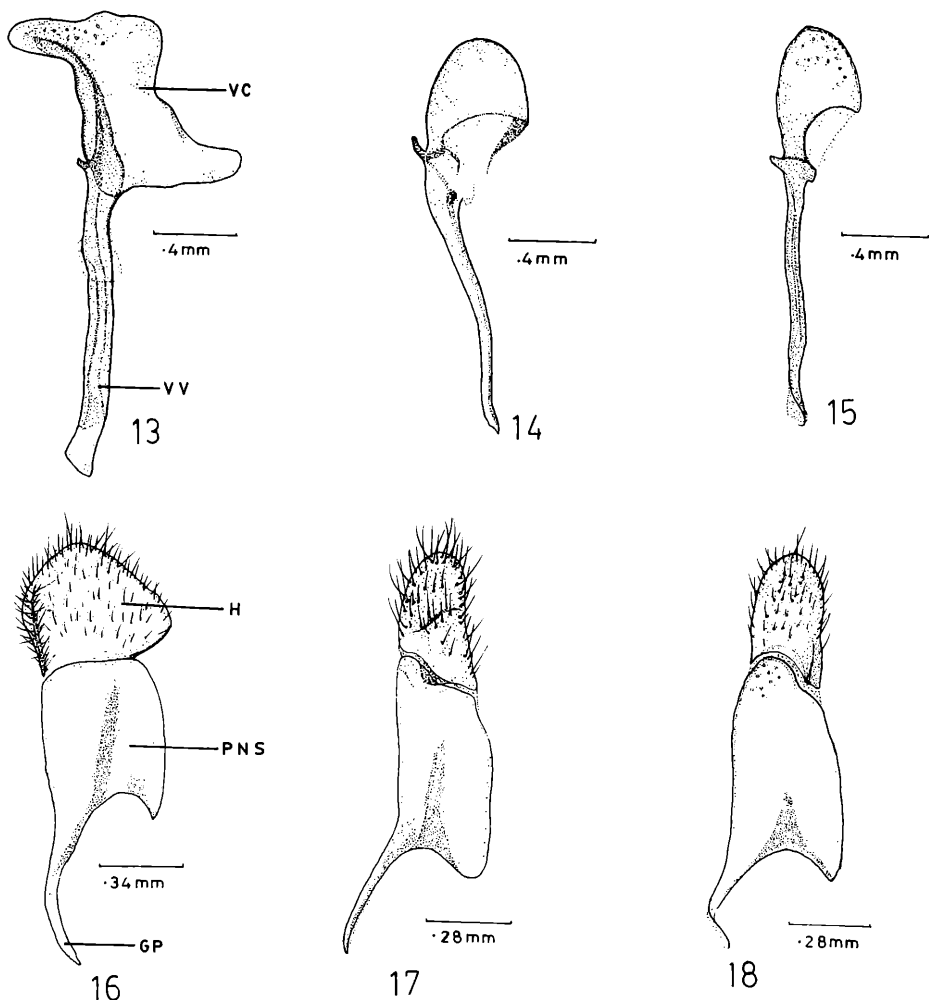
**Pubescence:** Body pubescent.

**Male** Not found.

**Holotype:** ♀, Uttar Pradesh: Chopta, 3000 m, 19. 6. 1987 **Paratype:** No. No other examined specimens.

**Population variation** Single specimen examined.

**Distribution** India: Uttar Pradesh.



Figs. 13–15: Penis valve. 13: *C. ramgarhensis* sp. n. — 14: *C. smithi* sp. n. — 15: *C. janthiana* (KLUG). — Figs. 16–18: Gonopod. 16: *C. ramgarhensis* sp. n. — 17: *C. smithi* sp. n. — 18: *C. janthiana* (KLUG).

**Diagnostic combination** This species resembles with *C. smithi* and *C. chakra-taensis* on the basis of colour, but can easily be distinguished from these by having median ocellus on the level of supraorbital line, head distinctly widened behind the eyes; anterior wings pale brown, infuscated towards base and becoming lighter towards the apex, whereas in the other 2 species, median ocellus is below the level of supraorbital line, head sides either parallel or narrowing behind eyes; anterior wings subhyaline with an infuscated spot below stigma.

**Etymology** Species name is taken from its type locality.

***Cibdela smithi* sp. n. (Figs. 14, 17)**

**Male**

**Colour:** Body bluish-black; anterior wings subhyaline with an infuscated spot below the stigma; posterior wings clear; costa and stigma light brown; venation dark brown to black. **Large structures:** Average length 7.5 mm. Antenna 2x head width; scapus conical, pedicel

shorter than scapus, flagellum of uniform thickness, pointed towards apex, its maximum thickness is greater than the apical thickness of scapus; clypeus roundly shallowly emarginated up to  $\frac{1}{6}$  of its medial length; supraclypeal furrow in the form of feeble depression; supraclypeal area roundly raised without carina; supraclypeal and supraantennal pits distinct; anterior margin of eyes well below the antennal sockets; head narrowing behind the eyes; LID IDMO EL = 4 4 4.5; frontal area above the level of eyes; supraantennal tubercle distinctly elevated, confluent with low frontal ridges; median fovea deep, open anteriorly and posteriorly continuous until it reaches median ocellus; median ocellus below the level of supraorbital line; circum-, inter- and postocellar furrows absent; postocellar area subconvex, broader than long in ratio 2:1; lateral furrows in the form of depressions; head without postgenal carina; OOL POL OCL = 1.7 1 1.1; mesoscutellum subconvex with blunt posterior tip; mesoepisternum obtusely raised without carina or acute apex; tarsal claws simple without inner tooth; ICD ITD = 1 7 IATS MB OATS = 1 2.8 0.7  
Male genitalia: Penis valve (Fig. 14), Gonoforceps (Fig. 17).

Sculptures: Body smooth and shining; clypeus and supraclypeal area with minute punctures, posterior orbit and rest of the body almost impunctate.

Pubescence: Body pubescent.

Female Not found.

Holotype ♂, Uttar Pradesh: Chopta, 3000 m, 19.6.1987 Paratype 1 ♂, Meghalaya: Shillong, 1600 m, 14.6.1976. No other examined specimens.

Population variation No.

Distribution India: Uttar Pradesh; Meghalaya.

Diagnostic combination This species resembles with *C. chakrataensis* but is easily distinguished by head narrowing behind the eyes; circum-, inter- and postocellar furrows absent; supraclypeal furrow in the form of feeble depression; anterior wing with complete 3rd cubital crossvein, whereas in *C. chakrataensis* head is not narrowing behind eyes; circum-, inter- and postocellar furrows present; supraclypeal furrow absent; anterior wing with only the posterior half of 3rd cubital cross-vein.

Etymology This species is named in honour of Dr. D. R. SMITH, a known sawfly taxonomist.

### ***Cibdela chakrataensis* sp. n. (Figs. 2, 5, 8, 11)**

Female

Colour: Body bluish-black; anterior wings subhyaline with an infuscated spot below the stigma covering half of the 1st, entire 2nd cubital and radial cell, in anterior wing only the posterior half of the 3rd cubital cross vein is indicated, posterior wing clear; costa and stigma dark brown; venation dark brown to black.

Large structures: Average length 7.5 mm. Antenna (Fig. 2) 1.75x head width, scapus conical, pedicel shorter than scapus, flagellum sickle shaped with its maximum thickness greater than the apical thickness of the scapus; clypeus roundly shallowly emarginate up to  $\frac{1}{10}$  of its medial length; supraclypeal furrow absent; supraclypeal area roundly raised without carina; lower margin of eyes well below the antennal socket; head neither narrowing nor widened behind eyes; LID IDMO EL = 4 3.5 3.8; frontal area above the level of eyes; supraantennal tubercle distinctly elevated, sloping posteriorly and confluent with low frontal ridges; median fovea deep in between the antennal tubercle, open anteriorly, posteriorly reaches the median ocellus shallowly; median ocellus below the level of supraorbital line; circum-, inter- and postocellar furrows just indicated; postocellar area subconvex broader than long in the ratio of 2:1; lateral furrows shallowly indicated; head without postgenal carina; OOL POL OCL = 1.4 1 1.9; mesoscutellum subpyramidally raised with anterior slope; mesoepisternum obtusely raised without carina or acute apex; tarsal claws simple without inner tooth; ICD ITD = 1 8; IATS MB OATS = 1 3 8.



Lancet (Fig. 11) with 20 serrulae. Postero-dorsal view of abdominal tip (Fig. 5). Lateral view of abdominal tip (Fig. 8).

Sculptures: Body smooth and shining almost impunctate.

Pubescence: Body pubescence.

Male Not found.

Holotype ♀, Uttar Pradesh: Chakrata, 2350 m (borrowed from FRI, Dehradun), 23. 6. 1924. Paratype: No. No other examined specimens.

Population variation Single specimen examined.

Distribution India: Uttar Pradesh.

Diagnostic combination This species resembles *C. choptaensis*, *C. ramgarhensis* and *C. smithi* on the basis of colour pattern but is easily distinguished from these by having only posterior half of the 3rd cubital crossvein in anterior wings.

Etymology The species name is taken from its type locality.

#### Acknowledgements

The authors are indebted to Dr. D. R. SMITH of USNM, Washington for lending some rare specimens of this genus from the museum collections under his charge.

#### Abbreviations

AST = anterior subbasal tooth, AT = abdominal tergum, EL = eye length, FLG = flagellum, GP = gonostipes, H = harpe, IATS = inner apical tibial spur, ICD = intercenchri distance, IDMO = interocular distance at level of median ocellus, ITD = intertegular distance, LTD = lower interocular distance, MB = metabasi tarsus, OATS = outer apical tibial spur, OCL = ocello-occipital line, OOL = oculo-ocellar line, PED = pedicel, PNS = parapenis, POL = postocellar line, PST = posterior subbasal tooth, SCP = scape, SOS = socii, SS = saw-sheath, VC = valviceps, VV = valvura.

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