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New report of *Choroedocus robustus* (Serville, 1838) from eastern Uttar-Pradesh, India

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Abstract

Grasshoppers are one of the largest groups of insect. They are more abundant in natural and uncultivated ecosystems. The present investigation is based on the specimens collected of the subfamily Catantopinae during the course of a survey of the district Ghazipur, Uttar-Pradesh in the month of August 13-14, 2017. The grasshoppers were collected from the barren land on the bank of the river *Karmanasha* by sweeping the sweeping net. Two female and one male grasshopper fauna have recorded and identified as *Choroedocus robustus* (Serville, 1838). The fauna have firstly reported from this district and probably the first time from eastern Uttar-Pradesh also. The descriptions of the species have made based on the morphological and genitalic characters. The identifying features of species were fastidium rounded in front, frontal ridge narrowest between antennae; the tegmin without brownish spots; hind femora larger than abdomen, hind tibia and tarsi red, tibia having 12 inner and 14 outer sides yellow base spines with the black tip; supra anal plate large, tongue shaped, subgenital plate gradually tapering apically, upward, hairy and circus wide, thick and leaf like obtused.

Keywords: Catantopinae, *Choroedocus robustus*, Ghazipur, Grasshopper, *Karmanasha*, Uttar-Pradesh

1. Introduction

Short horned grasshoppers belong to the suborder Caelifera of the order Orthoptera which are the very diverse group of insect. There are almost 20,000 species of Orthoptera known worldwide and about 1,750 species are recorded from India^[1]. Acridoidea is the notable superfamily of the suborder Caelifera having 518 species worldwide and 285 known species from the country^[2]. The major contribution on Acridid grasshoppers was made by Kirby in 1914^[3]. More recently, other contributions of this group have done by Tandon and Hazra^[1], Shishodia *et al.*^[2], Srinivasan and Prabhakar^[4], Hirdesh and Usmani^[5], Tandon^[6], Bhowmik and Haldar^[7], Yadav and Singh^[8] and Yadav *et al.*^[9]. The genus *Choroedocus* Bolivar, 1914 is also an important member of the family Acrididae (Catantopinae). The members of the subfamily Catantopinae are commonly called as spur throated grasshoppers and the subfamily consisting of about 17 tribes and more than 382 genera distributed throughout the old world^[10] whereas, over 65 species of 35 genera are recorded from India^[11]. The Fauna of this group are the noticeable pest of the most of the agricultural crops^[12]. Cigliano *et al.*^[10] have listed six species namely, *Choroedocus capensis* (Thunberg, 1815), *Choroedocus illustris* (Walker, 1870), *Choroedocus pallens* Uvarov, 1933, *Choroedocus robustus* (Serville, 1838), *Choroedocus sparsus* (Serville, 1838) and *Choroedocus violaceipes* Miller, 1934 of the genus *Choroedocus* Bolivar, 1914 worldwide. Out of this only three species, *Choroedocus capensis* (Thunberg), *Choroedocus illustris* (Walker, 1870) and *Choroedocus robustus* (Serville, 1838) are present in India under this genus^[2]. The species *Choroedocus robustus* (Serville, 1838) is distributed in eastern India endemically^[13]. More recently, Srinivasan and Prabhakar^[4] reported from western Himalayas and shown its distribution in different states of India with lacking in the Uttar-Pradesh. Shishodia *et al.*^[2] have also not produced its distribution in Uttar-Pradesh. Therefore, the present investigation was carried out from Ghazipur district of the Uttar-Pradesh, India.

2. Materials and Methods

(i) Study sites and collection: The district Ghazipur is a known district of the eastern Uttar-Pradesh. The district share its border with the state of Bihar to the east, Azamgarh (district of Uttar-Pradesh) to the west, Maunath Bhanjan and Ballia (district of Uttar-Pradesh) to the north and Chandauli and Varanasi (district of Uttar-Pradesh) to the South. The survey site situated

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between 25.415961° N latitudes and 83.559818° E longitudes in the Ghazipur district. The Collection place is situated very nearer to the bank of the river *Karmanasha*. The site is moderately rich in floral diversity. The Edaphic system of locality is sandy loam soil having different grasses, pearl millet, *Bambusa* and forest trees. The specimens were collected by sweeping net in the month of the August 13-14, 2017 and collected specimens were killed into jars containing ethyl acetate soaked cotton and they were prepared, stretched and pinned for study.

(ii) Species identification: The adult specimens of the species were carefully studied for all details of morphological characters under high magnification hand lense and microscope. The species was separated from others with the help of available literatures and keys [3, 4, 13]. The specimens were also confirmed to follow the Cigliano *et al.* [10]. The photographs were taken of the major parts of the identified species.

3. Results

In the present study *Choroedocus robustus* (Serville, 1838) has recorded the first time from district Ghazipur, Uttar-Pradesh and probably firstly from eastern Uttar-Pradesh. The details of the species are discussed below-

(i) Systematic Account

Order: Orthoptera

Suborder: Caelifera

Infraorder: Acridoidea

Family: Acrididae Mac Leay, 1821

Subfamily: Catantopinae Brunner Von Wattenwyl, 1893

Genus: *Choroedocus* Bolivar, 1914

(ii) *Choroedocus robustus* (Serville, 1838)

1839. *Acridium robustum*, Serville, *Orthopteres*, 647.

1870. *Heteracris ducalis*, Walker, *Cat. Derm. Salt. Brit. Mus.*, iv p663.

1914. *Heteracris robusta*, Kirby, *Fauna of British India, Orthoptera*, 262.

1976. *Choroedocus robustus* (Serville), Tandon, *Rec. Zool. Surv. India, Occ. Pap.* No. 3: 12.

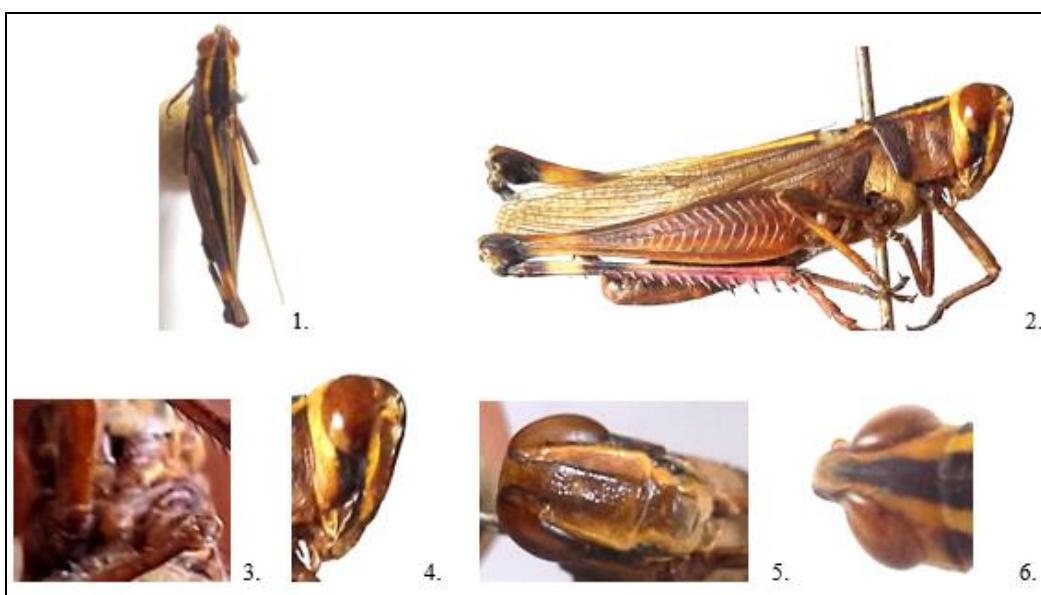
2006. *Choroedocus robustus* (Serville), Li, HongChang, Kai-

Ling Xia and *et al.*, *Fauna Sinica, Insecta*, 43: 602.

2013. *Choroedocus robustus* (Serville), Srinivasan and Prabhakar, *Zoological Survey of India*, 17.

(iii) Materials examined: INDIA, Uttar-Pradesh, Udharpur (Ghazipur), 1♂ and 1♀, 13.VIII.2017, on wild grasses, Coll. RS Yadav; 3♀, 14.VIII.2017, on grasses and papaya, Coll. RS Yadav.

(iv) Diagnosis and description: Male (1-12): Moderately large, very light greenish cum yellowish brown with yellow stripes; antennae (broken); head short, slightly obtuse, a broad brown band running down beneath the eyes, bordered in front with yellow stripes, occiput short; fastidium short, as long as wide, slightly concave, obtusely rounded in front, with a median carinula reaching up to occiput and sloping down in frontal ridge; frontal ridge flat, surface with punctuation, narrowest between antennae, and gradually widening towards clypeus; facial carina strong and straight; inter ocular space slightly wider at base of fastidium; vertex dark brown, bordered with yellow on sides; eyes prominent, laterally elongated. Prosternal processes gradually tapering apically, cylindrical, weakly incurved and pubescent, greenish yellow; mesosternal interspace about one third width of mesosternal lobe, metasternal furcal suture distinct; Pronotum dark brown, upper part with brown yellow bordered band of vertex continued to the extremity, side with obscure greenish spot, pronotum with prominent median carina intersected by all three transverse sulci and with less prominent and slightly divergent lateral carinae; prozona slightly less than twice as long as metazona. Tegmina without spots, extending beyond posterior knees, tegmina yellowish sub hyaline, veins are yellow; wings hyaline with a bluish iridescence toward the base; ventral abdomen greenish-yellowish brown, with some yellow spots towards extremity; supra anal plate large, tongue shaped, apex broadly rounded; sub genital plate gradually tapering apically, up curved, hairy; circus wide, thick, compressed, incurved, leaf like obtuse; hind tibia slightly shorter than hind femur; hind femur longer than abdomen, not serrated; hind tibia and tarsi coral red, tibia with extreme base blackish, shining and with 12 inner and 14 outer sides yellow base with black tipped spines.



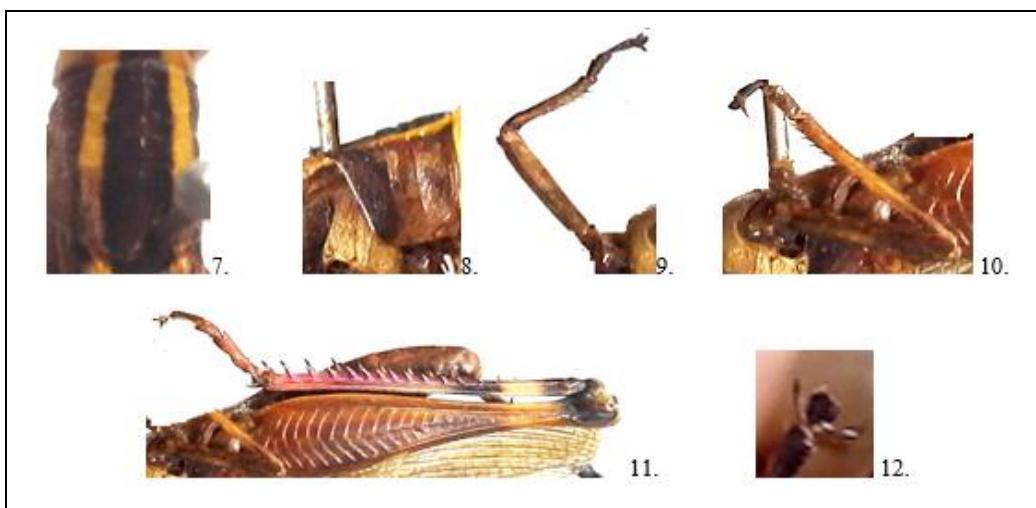


Fig 1-12: *Choroedocus robustus* (Serville, 1838). Male: 1. Dorsal view of specimen, 2. Lateral view of specimen showing wing and hind leg, 3. Prosternal processes, 4. Lateral view of head, 5. Face, 6. Dorsal view of head, 7. Dorsal view of pronotum, 8. Lateral view of pronotum, 9. Fore leg, 10. Middle leg, 11. Hind leg with tibia and tarsus 12. Middle leg's arolium

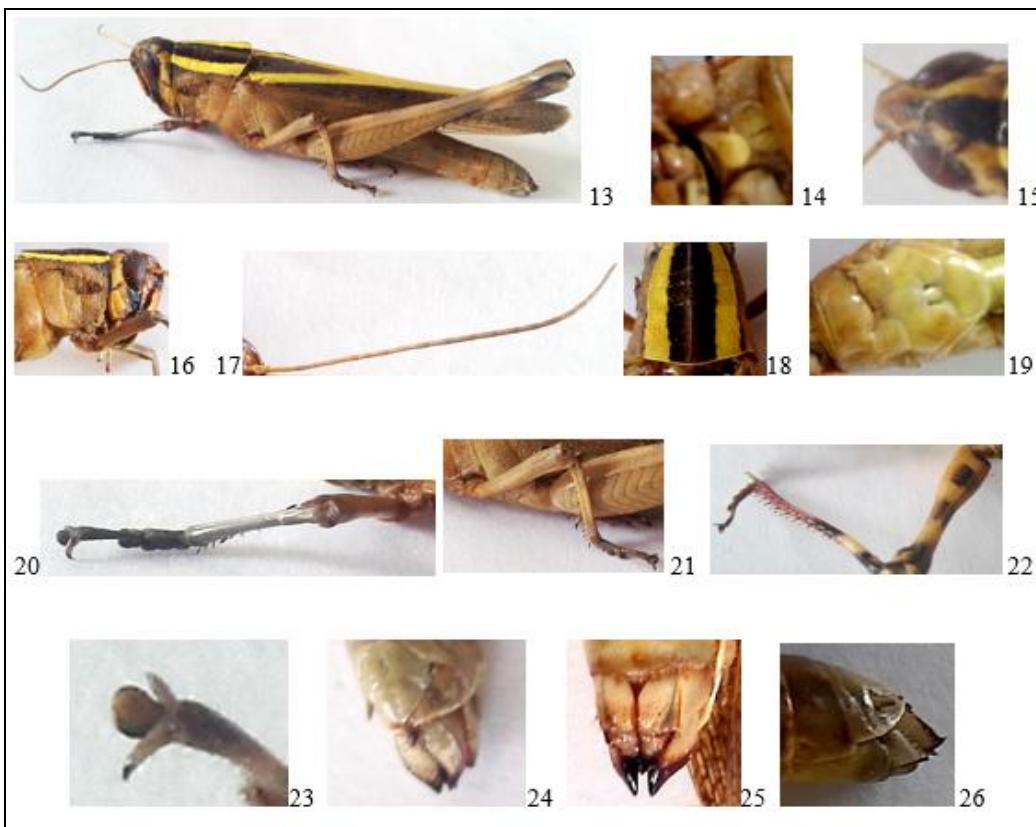


Fig 13-26: *Choroedocus robustus* (Serville, 1838). Female: 13. Dorso-lateral view of specimen, 14. Prosternal processes, 15. Dorsal view of head, 16. Lateral view of head and pronotum, 17. Antennae, 18. Dorsal view of pronotum, 19. Mesosternal lobe and metasternal furca, 20. Fore leg, 21. Middle leg, 22. Hind leg with tibia and tarsus 23. Hind leg's arolium. 24. Dorsal view of genitalia, 25. Ventral view of genitalia, 26. Lateral view of genitalia

Female (Fig. 13-26): Very alike to the male but somewhat different in their robust size and genital parts. Antennae

yellowish; supra anal plate broadly rounded apex; circus very short, broader at base and tapering at apex.

Table 1: Measurements of body of *Choroedocus robustus* (Serville, 1938) (all measurements in mm)

S. No.	Body parts	Male (♂)	Female (♀)
1.	Length of Body	42.30	63.20
2.	Length of Pronotum	6.70	10.00
3.	Length of Antennae	Broken	17.45
4.	Length of tegmina	37.20	48.50
5.	Length of expanded tegmina	86.30	113.60
6.	Length of hind femur	28.70	36.45
7.	Length of hind tibia	25.85	34.20

(iv) Distribution: Andhra Pradesh, Arunachal Pradesh, Assam, Himachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, Tripura, West Bengal (Shishodia *et al.* [2], Srinivasan and Prabhakar [4]) and Uttar-Pradesh.

4. Discussion

Bolivar [14] has described the genus *Choroedocus* Bolivar, 1914. The genus has six species namely, *C. capensis* (Thunberg, 1815), *C. illustris* (Walker, 1870), *C. pallens* Uvarov, 1933, *C. robustus* (Serville, 1838), *C. sparsus* (Serville, 1838) and *C. violaceipes* Miller, 1934 are known globally [10] and there are only three species present in India as *C. capensis* (Thunberg, 1815), *C. illustris* (Walker, 1870), and *C. robustus* (Serville, 1838) [2, 6, 13]. Bhowmik [13] stated by his research experience that *C. robustus* (Serville, 1838) is endemically distributed in the eastern India. This species was initially described as *Acridium robustum* (Serville, 1838) by Serville [15] and Walker [16] as *Heteracris ducalis* Walker, 1870. The species *Heteracris ducalis* Walker, 1870 later became junior synonymy. Kirby [3] described the same species as *Heteracris robusta*, Kirby, 1914 from Sylhet (Assam). The species was previously reported from country by Shishodia *et al.* [2], Tandon [6] and Bhowmik [13]. More recently, Srinivasan and Prabhakar [4] recorded *Choroedocus robustus* (Serville, 1838) from western Himalayas. The literatures reveal that the species from eastern Uttar-Pradesh is not very confidently known. In the present study three specimens (one male and two females) recorded from natural pasture on the bank of the river Karmanasa of district Ghazipur, Uttar-Pradesh and fauna identified as *Choroedocus robustus* (Serville, 1838). This is the first record from the district and probably from eastern Uttar-Pradesh. The morphological descriptions and measurements of the relevant body parts are provided.

5. Conclusion

The aim of the present study is to provide information regarding subfamily Catantopinae from the district Ghazipur, Uttar-Pradesh. The *Choroedocus robustus* (Serville, 1838) is representing the first record from the district as well as from eastern Uttar-Pradesh. However, several survey works have been made for Orthoptera from eastern Uttar-Pradesh, nevertheless, this species was lacking so far from this region.

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