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DESCRIPTION OF *CHIRONOMUS BIFIDUS* SP. N. AND FIRST RECORD OF *CH. CRASSIFORCEPS* (KIEFFER, 1916) FROM INDIA (DIPTERA: CHIRONOMIDAE: CHIRONOMINAE)

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Summary. *Chironomus* (*Lobochironomus*) *bifidus* Pal et Hazra, **sp. n.** is described on the basis of adult male and pupa from the West Bengal in India. In addition, *Chironomus* (*Chironomus*) *crassiforceps* (Kieffer, 1916) is recorded for the first time from India.

Key words: Chironomidae, *Chironomus*, new species, new record, Oriental Region.

Г. Пал, Н. Хазра. Описание *Chironomus bifidus* sp. n. и первое указание *Ch. crassiforceps* из Индии (Diptera: Chironomidae: Chironominae) // Дальневосточный энтомолог. 2017. N 338. С. 10-15.

Резюме. Из Западной Бенгалии (Индия) по имаго самцам и куколке описан новый для науки вид *Chironomus* (*Lobochironomus*) *bifidus* Pal et Hazra, **sp. n.** Впервые для Индии указывается *Chironomus* (*Chironomus*) *crassiforceps* (Kieffer, 1916).

INTRODUCTION

The genus *Chironomus* Meigen (1803) is one of the most perplexed genera at the species level. Numerous species earlier included in the genus are now transferred not only to different genera but also to different subfamilies. The descriptions of species made previously appear meager and insufficient which may delimit a good number of the species. Moreover, types of most of earlier known species are found either lost, damaged, misplaced or are not housed in the museums. Owing to these problems, more *nomina dubia* of the species in the genus may be expected than the valid ones. The cosmopolitan genus comprises quite a good number of worldwide species distributed occurring in all continents from the high Arctic to the tropics except Antarctica (Epler *et al*., 2013). The larvae occur in highly variable environments preferring lentic water while a few rarely in lotic water. Some species are either halophilous or halobiontic while others are acidophilic. It includes numerous groups of cryptic species which may be differentiated through cytogenitcal and molecular analyses. So far 70 species from the Oriental Region and 41 from India are recorded under the genus (Hazra *et al*., 2016).

The genus *Chironomus* is divided into four subgenera, namely *Chironomus* s. str., *Chaetolabis* Townes, 1945, *Lobochironomus* Ryser, Wülker et Scholl, 1985 and *Austrochironomus* Yamamoto, 2002 (Townes, 1945; Ryser *et al*., 1985; Yamamoto, 2002). The male

imago of the subgenus *Lobochironomus* can be separated from other subgenera by the following combination of characters: superior volsella large, broad, setose and microtrichiose lobe tapered apically into bare, elongate, digitiform apex. The subgeneric diagnostic characters well fit the new species described below into the subgenus *Lobochironomus*. The present paper describes adult and pupa of *Chironomus bifidus* sp. n. with diagnostic characters of *Chironomus* (*Chironomus*) *crassiforceps* (Kieffer, 1916) first time recorded from India.

MATERIAL AND METHODS

The live larvae taken out of soft mud of different lotic systems had been subjected to rearing following Epler (1995). The individual larvae were reared in separate glass vials containing water and small amount substrates of fine clay and sand. The specimens have been microslide–mounted after phenol–balsam technique of Wirth & Marston (1968). However, the larval exuviae of the new species got damaged due to improper mounting and is not suitable for study. The general terminology mostly follows Sæther (1980) and Epler *et al*. (2013). Measurements of parts of adult and pupa are expressed in micrometer (μm) and the total length, length and breadth of wing of the adults, wing sheath of pupal exuviae in millimeter (mm) with ranges suffixed by "n" denoting the number of specimens measured in parentheses.

All material examined are now retained with the collection of insects in the Entomology Division, Department of Zoology, The University of Burdwan, West Bengal, India and will be deposited to the National Zoological Collections (NZC), Kolkata.

The abbreviations in the text are as follows: Ac – Acrostichals; Ap – Antepronotum; AR – Antenna ratio; BR – "Bristle ratio"; BV – "Beinverhältnisse"; CA – Head–Antennal ratio; CP – Head–Palp ratio; CR – Costal ratio; Cu – Cubitus; Dc – Dorsocentrals; FS – Frontals; fe – Femur; HR – Hypopygium ratio; HV – Hypopygium value; IV – Inner Verticals; LR – Leg ratio; LS – Lateral seta; M – Media; MCu – Crossvein between Media and Cubitus; OV – Outer Verticals, Pa – Prealars, Po – Post orbitals; R – Radius; RM – Crossvein between Radius and Media, Scts – Scutellers; SV – "Schenkel – Schiene–Ver–hältnis"; ta – tarsomere; ti – tibia; VR – Venarum ratio.

TAXONOMY

Chironomus (*Lobochironomus*) *bifidus* Pal et Hazra, sp. n.

Figs 1–9

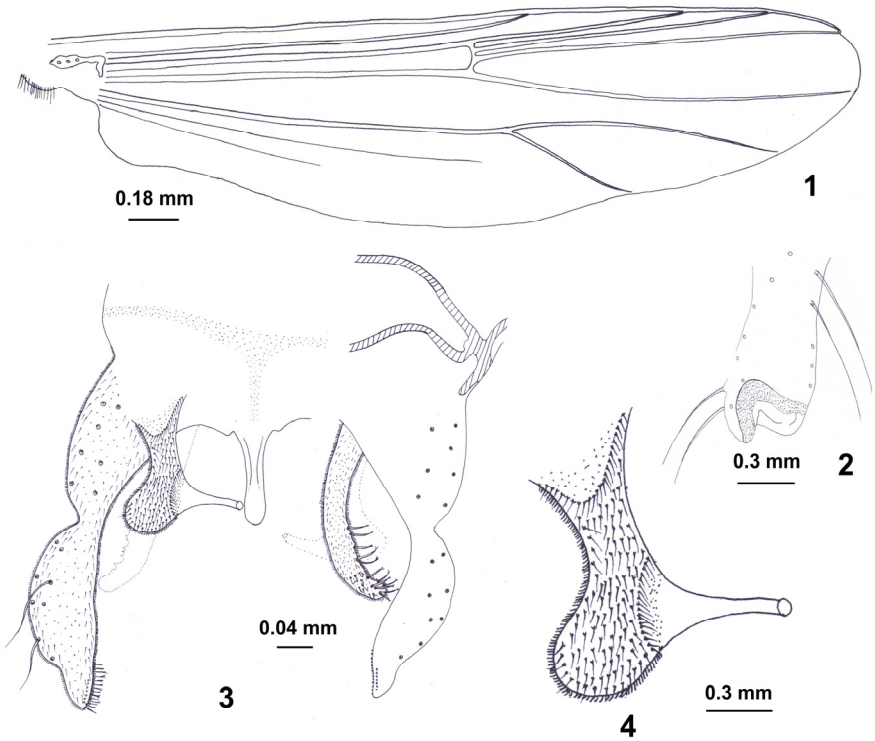
TYPE MATERIAL. Holotype: male with pupal exuviae [reared] **India**: West Bengal: Malda, Gour [24°90´N, 88°11´E], 04.I 2016, leg. G. Pal (Type no. B. U. Ent. 293). Paratypes: 5 males, the same data as holotype.

DESCRIPTION. MALE (n = 6) (Figs 1–4). Total length 4.38–5.69 mm; wing length 2.68–2.9 mm; total length/wing length 1.66–2.12; wing length/length of profemur 2.22–2.28.

Coloration. Thorax brown. Abdomen brown with few setae. Wing transparent.

Head. Eyes bare with 65–73 μm long dorsomedian parallel sided extension. Temporal setae 11–14 (IV 2–4, OV 2–3, Po 3–4). Frontal tubercle present. Clypeus with 11–16 setae on each side. Tentorium 100–166 μm long and 33–42 μm wide at sieve plate. AR 3.75–4.5; ultimate flagellomere 1056–1220 μm long; total antennal length 1300–1545 μm. Length ratio of palpomeres (I–V) (μm): 81–130, 81–114, 81–114, 97–114, 49–81. CA 0.51–O.55, CP 1.61–2.04.

Thorax. Acrostichals 10–12; antepronotals 6–10. dorsocentrals 5–6 setae; prealars 4–7; scutellum 8–10 setae.



Figs. 1–4. *Chironomus bifidus* sp. n., adult male. 1 – wing; 2 – fore tibial scale; 3 – hypopygium; 4 – superior volsella.

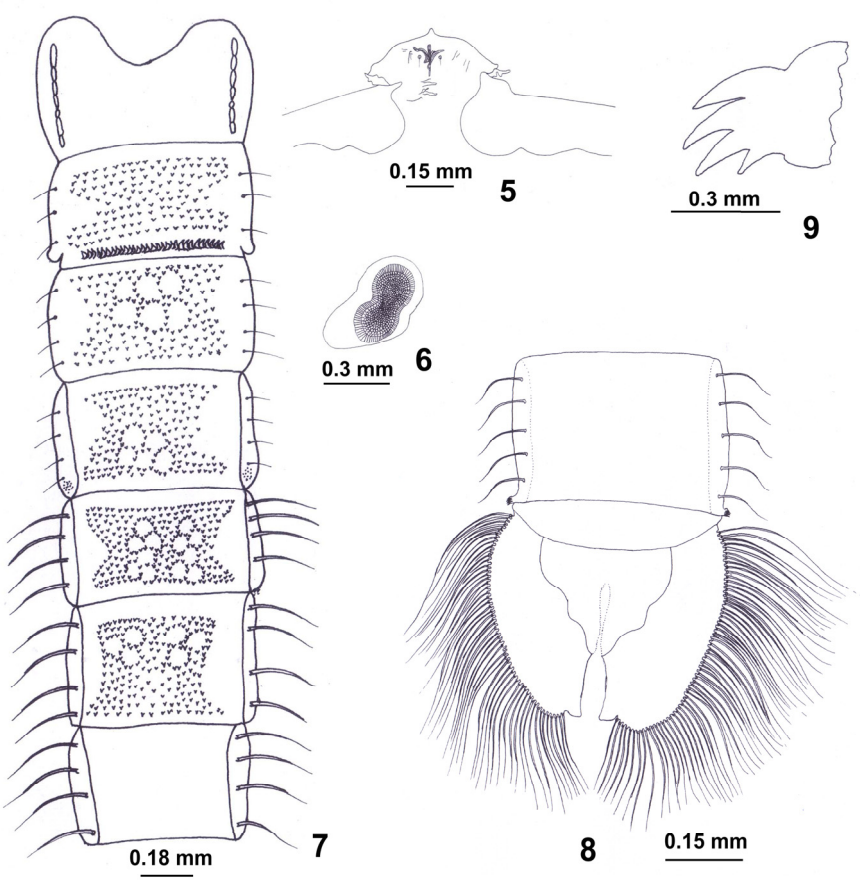
Wing (Fig. 1). Wing transparent without any markings. Anal lobe indistinct. Squama with 15–17 setae. Brachiolum with 2 setae. R_{2+3} well separated from R_1. Number of setae at R 23–26, R_1 16–20, M_1 1–2, M_{3+4} 1–2. CR 1.11–1.15, VR 1.06–1.16.

Legs. Fore tibial scale (Fig. 2) rounded with 140–146 µm long and 8–9 µm wide with 2 setae. Midtibia with 17–19 µm long and 96–98 µm wide closely approximated combs with two equal sized spurs, 47–49 µm long and 15–16 µm wide each. Hindtibia with 47–49 µm long and 578–580 µm wide closely approximated combs with two equal sized spurs, 64–65 µm long and 15–16 µm wide each. Fore, mid and hind leg with 63–65 µm, 48–49 µm and 62–65 µm long sickle shaped claws respectively. Length of pulvilli at fore, mid and hind leg 54–56 µm, 40–41 µm, 50–52 µm respectively with sub equal to the length of claw. Width at apex of fore, mid and hind tibia 62–65 µm, 47–49 µm and 47–49 µm respectively. Length (µm) and proportions of legs segments are as follows:

	Fe	**Ti**	**ta_1**	**ta_2**	**ta_3**	**ta_4**	**ta_5**	**LR**	**BV**	**SV**	**BR**
P1	1220–1462	927–1056	1100–1350	688–815	625–780	469–586	244–260	1.18–1.27	1.58–1.6	1.86–1. 95	1.71–6.2
P2	813–1056	813–976	488–770	325–374	277–327	163–165	130–152	0.6–0.78	2.36–2.67	2.63–3.33	2.5–3.8
P3	1302–1381	975–1041	688–815	425–571	344–408	179–246	130–165	0.7–0.78	2.3–2.75	2.97–3.3	1.75–1.8

Hypopygium (Fig. 3). Base of anal point broad, apex moderately swollen, 85–97 µm long and 33–35 µm wide. Anal tergite band T–shaped. Lateral sternapodeme 81–114 µm long, transverse sternapodeme 163–295 µm long. Gonocoxite 123–244 µm long bearing 6–8 setae at outer side. Gonostylus 144–195 µm long with 18–20 inner subapical setae arranged in two parallel rows, few of which apically split. Superior volsella (Fig. 4) 123–195 µm long, moderately projected posteriorly, swollen apically without any seta, microtrichiose; beaklike apicomedian projection 56–88 µm long, 1.5–2 times as long as the average width of basal portion. Inferior volsella 185–195 µm long, parallel–sided with 10–12 dorsal split setae. HR 0.85–1.25, HV 2.9–3.1.

FEMALE. Unknown.



Figs. 5–9. *Chironomus bifidus* sp. n., pupa. 5 – frontal apotome; 6 – basal ring; 7 – tergites I–VII; 8 – tergite VIII with anal lobe and male genital sac; 9 – caudolateral comb.

PUPA (n = 1) (Figs 5–9). Total length of exuviae 6.8 mm. Colouration. Light brown. Dark brown margin at wing sheath, origin of antenna and margin of tergites.

Cephalothorax. Frontal apotome (Fig. 5) 405 µm long and 324 µm wide. Cephalic tubercle not prominent with 8 µm long one apical seta. Frontal wart absent. Thoracic horn plumose arising from kidney shaped basal ring (Fig. 6), 113 µm long and 82 µm wide. Antennal sheath 1.78 mm long. Wing sheath 1.77 mm long.

Abdomen (Fig. 7). Tergites I, VII and VIII bare. T II–VI with uniform shagreen. Conjunctive III/IV with L setae. T II with 3 pairs of L setae at 0.2, 0.4 and 0.6 of segment length. T II with hookrow consisting of ca 54–56 hooklets occupying 0.75 of segment width. Pedes spurii A and B present. T III with 4 pairs of L setae at 0.2, 0.4, 0.6 and 0.8 of segment length. T IV with 4 pairs of L setae at 0.2, 0.4, 0.6 and 0.8 of segment length. T V with 4 pairs of LS setae at 0.1, 0.2, 0.3 and 0.7 of segment length. T VI with 4 pairs of LS setae at 0.2, 0.3, 0.6 and 0.8 of segment length. T VII with 4 pairs of LS setae at 0.2, 0.43, 0.6 and 0.8 of segment length. TVIII (Fig. 8) with 5 LS setae placed 0.2, 0.3, 0.4, 0.6, and 0.8 of segment length. Caudolateral comb (Fig. 9) deep brown with 3–4 stronger spines, none dominant. Approximately 80 taeniae on anal lobe (Fig. 8) and dorsal seta absent.

DIAGNOSTIC CHARACTERS. The new species can be distinguished by the following characteristics: Male. i) Anal point with broad base tapering to moderately swollen apex, ii) gonostylus with inner subapical setae arranged in two parallel rows, few of which apically split, iii) superior volsella with microtrichia moderately projected posteriorly, swollen apically, iv) beaklike apicomedian projection of superior volsella without any seta and v) inferior volsella parallel sided with dorsal split setae; Pupa. i) Cephalic tubercle not prominent with one apical seta and ii) caudolateral comb with 3–4 stronger spines, none dominant.

ETYMOLOGY. The name "*bifidus*" refers to Latinized version of dorsal split setae of inferior volsella.

DISTRIBUTION. Known only from India.

REMARKS. The new species bears similarity with *Chironomus* (*Lobochironomus*) *dorsalis* Meigen (1818) in the shape of anal point and inferior volsella, but differs in the shape of gonostylus and superior volsella in adult male. It also shows similarity with *C*. (*Lobochironomus*) *austini* Beck and Beck (1970) in the shape of anal point and inferior volsella, but differs in the shape of gonostylus and superior volsella of adult male; the shape of caudolateral comb of pupa also differs.

NEW RECORD

Chironomus (*Chironomus*) *crassiforceps* (Kieffer, 1916)

MATERIAL EXAMINED. **India**: West Bengal: Berhampur, 24°14′N, 88°26′E, 03.II 2003, 1 ♂ with larval and pupal exuviae, leg. U. K. Mandal; Old Malda, 25°05′N, 88°13′E, 23.XI 2013, 2 ♂ with larval and pupal exuviae, leg. G. Pal.

REMARKS. This species was described first by Kieffer (1916) as *Tendipes crassiforceps* and all the life stages were described by Tokunaga (1964). After that several authors described this species under different names from Saipan, Guam, Japan, and Caroline Island. The species conforms to the same of Kieffer (1916) with minor differences in morphometric variations like body length, AR and LR. The key features of the species are: Male. i) Squama with 7–9 setae, ii) anal tergite band weakly developed, iii) anal point lancet–like, iv) superior volsella slightly curved and uniformly wide and vii) inferior volsella extended up to the tip of gonostylus with one long and 15–20 short incurved apical setae; Pupa. i) Cone shaped cephalic tubercle with sub–apical frontal setae, and ii) caudolateral spur consisting of brush–like apex with closely apposed 2 spines; Larva. i) Mentum with apparently trifid median and 6 pairs of lateral teeth, and ii) pecten epipharyngis with row of 12–14 teeth.

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