



A small collection of terrestrial true bugs (Heteroptera: Insecta) from Chilapata forest of Dooas, with a new record to West Bengal, India

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Abstract

Chilapata forest represents 11 species of true bugs distributed within 7 families of 2 infra-orders. The systematic accounts along with distributional patterns of recognized taxa are given. Furthermore, the new recorded taxon for West Bengal, *Bolaca unicolor* Walker, 1867, a species belonging to the family Pentatomidae is detailed with taxonomic notes, morphological features, body parts' measurements, drawings, and image of dorsal habitus.

Keywords: chilapata forest, dooas, new record, West Bengal

1. Introduction

The true bugs (Heteroptera) are differentiated from other allies by having with sucking mouthparts (rostrum), hemelytron (fore wing basally sclerotized and apically membranous), gula, metathoracic scent apparatus, abdominal dorsal scent glands (functional in nymphs) and reduced tentorium (Schuh & Slater, 1995) [41]. These insects are economically much important, as they feed on fungi or vegetables or crops or other arthropods or vertebrates' blood and some also can transmit pathogens among humans (Schaefer & Panizzi, 2000) [39]. The concise knowledge of current systematics on heteroptera has been developed from the following literatures as China & Miller (1959) [14], Schuh (1986) [40], Dolling (1991) [18], Wheeler *et al.* (1993) [45], Henry (1997) [28], Schaefer (1998) [38], Forero (2008) [19], Grazia *et al.* (2008) [26], Weirauch & Schuh (2011) [44]. The world fauna comprised of more than 40,000 known species spread over 91 recognised families including aquatic and semiaquatic bugs (Henry, 2017) [29]. Over 2000 species belonging to 31 families from India (Ghosh, 1998) [22], whereas only 344 species including aquatic and semiaquatic bugs were recorded from the state of West Bengal (see Ghosh, 1994 and Basu *et al.*, 2016) [21, 8].

From Indian subcontinent, probably, Atkinson (1885-1890) [2, 3] was the pioneer worker on heteropteran taxonomy. After that, the contributions of Distant (1902-1918) [17] were of immense value. Lefroy (1909) [31] worked out the Rhynchota (heteroptera) from Tirhat. Apart from West Bengal, in India some notable taxonomic works on terrestrial true bugs for last 2-3 decades are of Hedge (1995) [27], Ghosh *et al.* (2005) [23], Ambrose (2006) [1], Ghosh *et al.* (2006) [24], Chandra (2009) [13], Prabakar (2013) [34], Biswas *et al.* (2014) [9], Tembe *et al.* (2014) [43], Salini & Viraktamath (2015) [37], Saha *et al.* (2016) [35], Saha *et al.* (2017) [36].

Terrestrial heteropterans from West Bengal have been worked out by few taxonomists, but their works confined to family and /or superfamily level, as Mukhopadhyay (1988) [32] and Chakraborty & Ghosh (1994) [11] on Lygaeidae, Basu

& Mitra (1994) [7] on Alydidae and Coreidae, Biswas *et al.*, (1994) [10] on Reduviidae, Chakraborty *et al.* (1994) [12] and Ghosh *et al.*, (1994) [25] on Pentatomoidea and Sen *et al.*, (1994) [42] on Pyrrhocoridae.

2. Materials and methods

2.1. Study area

The Chilapata, a small dense, dry and mixed deciduous forest is assumed as a corridor between Jaldapara Wildlife Sanctuary and Buxa Tiger Reserve and finally Bhutan for the Wildlife, especially elephant movements. It is having with approximately 19.75 square kilometres, stretched in between Malangi River at east and Hasimara River at south (Jana *et al.*, 2010) [30] and is located in Alipurduar, a recently formed district of West Bengal.

2.2. Collection & Preservation

A survey was conducted on and from 6th to 11th march, 2020 in the Chilapata forest for sample collection. By applying the methods as net sweeping, bush beating, hand picking and using of UV light trap at night the bugs were collected and preserved in 75% alcohol in the field. After getting back to laboratory of Durgapur Government College, Durgapur – 713214, West Bengal, India, the collected bugs were dried, stretched and pinned in insect cabinet accordingly for further study.

2.3. Identification

The species were identified from the monographic works of Distant (1902-1918) [17]. Classification and nomenclature suggested by Schuh & Slater (1995) [41], Aukema & Rieger (1999, 2006) [4, 5], Aukema *et al.*, (2013) [6], Henry (2017) [29] and GBIF (2020) [20] have been imitated.

2.4. Technical support

During sample collection, GPS has been used to locate the geographical co-ordinates (latitude & longitude) for spots of occurrences. Stereo zoom binocular microscope (Zeiss Stemi SV 6) attached with Sony cyber shot camera and

drawing tube has been used during study. All measurements were taken in millimetre (mm).

3. Results & Discussion

1. Infra-order: Cimicomorpha

1. Family: REDUVIIDAE Latreille, 1807

Subfamily: Harpactorinae Amyot & Serville, 1843

Genus: *Coranus* Curtis, 1833

1. *Coranus siva* Kirkaldy, 1891

1904. *Coranus obscurus* (Kirby) Distant, Fauna Brit. India, Rhynch. 2: 381

2006. *Coranus siva* (Kirkaldy) Ambrose, Zoos' Print J. 21(9): 2397

Material examined: 1♀, 26°37'40.3"N 89°21'59.4"E, 08.iii.2020, coll. N. Ray; 1♀, 26°37'40.1"N 89°21'59.3"E, 10.iii.2020, coll. N. Ray.

Distribution: India: Assam, Kerala, Meghalaya, Nagaland, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal; Israel, Myanmar, Nepal, Sri Lanka (Distant, 1904; Biswas *et al.*, 1994; Ambrose, 2006, GBIF, 2020) [17, 10, 1, 20].

Subfamily: Salyavatinae Amyot & Serville, 1843

Genus: *Valentia* Stål, 1865

2. *Valentia apetalata* (de Vuillefroy, 1864)

1864. *Petalochirus apetalata* de Vuillefroy, Ann. Soc. Ent. Fr. P. 142, Pl. I, f: 10

1903. *Valentia apetalata* (de Vuillefroy) Distant, Fauna Brit. India, Rhynch. 2: 240

Material examined: 1♀, 26°37'39.8"N 89°21'59.3"E, 11.iii.2020, coll. S. Dhali.

Distribution: India: Manipur, West Bengal; Bangladesh, Indonesia, Malaysia, Myanmar, Singapore (Distant, 1903; Ambrose, 2006; Dhali *et al.*, 2014; GBIF, 2020) [17, 1, 16, 20].

1. Infra-order: Pentatomorpha

2. Family: ALYDIDAE Amyot & Serville, 1843

Subfamily: Alydinae Amyot & Serville, 1843

Tribe: Alydini Amyot & Serville, 1843

Genus: *Riptortus* Stål 1860

3. *Riptortus linearis* (Fabricius, 1775)

1775. *Lygaeus linearis* Fabricius, Syst. Ent.: 710

1902. *Riptortus linearis* (Fabricius), Distant, Fauna Brit. India, Rhynch, 1: 415

Material examined: 2♀, 26°37'39.8"N 89°21'59.5"E, 07.iii.2020, coll. S.Dhali; 1♂, 26°37'39.7"N 89°21'59.6"E, 08.iii.2020, coll. S. Dhali; 1♀, 26°37'39.8"N 89°21'59.6"E, 11.iii.2020, coll. N. Ray.

Distribution: India: Andaman Islands, Chhattisgarh, Delhi, Karnataka, Maharashtra, Manipur, Meghalaya, Sikkim, Tamilnadu, West Bengal; Australia, China, Indonesia, Japan, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Taiwan (Distant, 1902; Basu & Mitra, 1994; Chandra, 2009; Biswas *et al.*, 2014; GBIF, 2020) [17, 7, 13, 9, 20].

Subfamily: Micrellytrinae Stål, 1868

Tribe: Leptocorisini Stål, 1872

Genus: *Leptocorisa* Latreille, 1829

4. *Leptocorisa acuta* (Thunberg, 1783)

1783. *Cimex acuta* Thunberg, Nov. Ins. Sp. 2: 34

1902. *Leptocorisa acuta* (Thunberg) Distant, Fauna Brit. India, Rhynch. 1: 410

Material examined: 1♀, 26°37'39.7"N 89°21'59.7"E,

07.iii.2020, coll. S.Dhali; 1♀, 26°37'40.1"N 89°21'59.5"E, 08.iii.2020, coll. N. Ray; 1♂, 26°37'40.4"N 89°21'59.9"E, 10.iii.2020, coll. N. Ray; 2♀, 26°37'39.7"N 89°21'59.8"E, 11.iii.2020, coll. S.Dhali.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Karnataka, Kerarala, Maharashtra, Manipur, Meghalaya, Sikkim, Tamilnadu, West Bengal; Australia, Bhutan, China, England, Hong Kong, Indonesia, Japan, Korea, Malaysia, Myanmar, New Caledonia, Papua New Guinea, Pakistan, Philippines, Sri Lanka, Thailand, Taiwan, Vietnam (Distant, 1902; Basu & Mitra, 1994; Ghosh *et al.*, 2006; Biswas *et al.*, 2014; GBIF, 2020) [17, 7, 24, 9, 20].

3. Family: COREIDAE Leach, 1815

Subfamily: Coreinae Leach, 1815

Tribe: Daladerini Stål, 1873

Genus: *Dalader* Amyot & Serville, 1843

5. *Dalader acuticosta* Amyot & Serville, 1843

1843. *Dalader acuticosta* Amyot & Serville, Hist. Nat. des Insec. Hémiptères 31: 188

Material examined: 1♀, 26°37'40.3"N 89°21'59.9"E, 09.iii.2020, coll. S. Dhali; 1♀, 26°37'40.4"N 89°21'59.9"E, 10.iii.2020, coll. S. Dhali.

Distribution: India: Assam, Meghalaya, Sikkim, West Bengal; Bangladesh, Borneo, Malaysia, Myanmar, Nepal, Pakistan, Sri Lanka, Sumatra, Thailand (Distant, 1902; Basu & Mitra, 1994; Prabakar, 2013; GBIF, 2020) [17, 7, 34, 20].

4. Family: LARGIDAE Amyot & Serville, 1843

Subfamily: Physopeltinae Hussey, 1929

Tribe: Lohitini Ahmad & Abbas, 1987

Genus: *Macroceroea* Spinola, 1840

6. *Macroceroea grandis* (Gray, 1832)

1832. *Lygaeus grandis* Gray, In Griff. An. King. 15, Ins. 2: 242, pl. 92, f.3

1913. *Macroceroea grandis* (Gray) Bergroth, Mem. Soc. Ent. Belg. 22: 166

Material examined: 2♀, 1♂, 26°37'39.8"N 89°21'59.8"E, 07.iii.2020, coll. S.Dhali; 2♂, 26°37'40.5"N 89°21'59.5"E, 08.iii.2020, coll. N. Ray; 1♀, 26°37'40.4"N 89°21'59.8"E, 10.iii.2020, coll. N. Ray.

Distribution: India: Assam, Meghalaya, Uttar Pradesh, West Bengal; Belgium, Germany, Indonesia, Philippines, United Kingdom, Vietnam (Distant, 1904; Sen *et al.*, 1994; Saha *et al.*, 2017; Dhali & Ray, 2020; GBIF, 2020) [17, 42, 36, 15, 20].

Tribe: Physopeltini Hussey, 1929

Genus: *Iphita* Stål, 1870

7. *Iphita limbata* Stål, 1870

1870. *Iphita limbata* Stål, En. Hém. 1: 99

Material examined: 2♀, 26°37'40.1"N 89°22'00.1"E, 10.iii.2020, coll. N. Ray.

Distribution: Assam, Kerala, Maharashtra, Meghalaya, West Bengal; Australia, Bangladesh, China, Indonesia, Kenya, Mexico, Myanmar, Nepal, Sri Lanka, Thailand (Distant, 1904; Sen *et al.*, 1994; Saha *et al.*, 2017; Dhali & Ray, 2020; GBIF, 2020) [17, 42, 36, 15, 20].

5. Family: LYGAEIDAE Shilling, 1829

Subfamily: Lygaeinae Stål, 1862

Genus: *Graptostethus* Stål, 1868

8. *Graptostethus servus* (Fabricius, 1787)

1787. *Cimex servus* Fabricius, Mant. Ins. 2: 300

1879. *Graptostethus servus* (Fabricius) Distant, Trans. R. Entomol. Soc.: 50

Material examined: 1♀, 1♂, 26°37'40.1"N 89°21'59.4"E, 08.iii.2020, coll. N. Ray; 1♀, 26°37'40.1"N 89°21'59.5"E, 08.iii.2020, coll. S. Dhali.

Distribution: India: Chhattisgarh, Maharashtra, Meghalaya, Karnataka, Kerala, Uttarakhand, West Bengal; Australia, Cameroon, China, France, Gambia, Indonesia, Japan, Malaysia, Mozambique, Myanmar, Namibia, Philippines, South Africa, Spain, Sri Lanka, Thailand, Vietnam (Distant, 1904; Mukhopadhyay, 1988; Chakraborty & Ghosh, 1994; Saha *et al.*, 2016; GBIF, 2020) [17, 32, 11, 35, 20].

6. Family: PENTATOMIDAE Leach, 1815

Subfamily: Asopinae Amyot & Serville, 1843

Genus: Eocanthecona Bergroth, 1915

9. *Eocanthecona furcellata* (Wolff, 1801)

1801. *Cimex furcellata* Wolff, Icones. Cim. Des. Illus. 2: 176

1851. *Canthecona furcellata* Dallas, List. Hém. 1: 91

1902. *Canthecona furcellata* (Wolff) Distant, Fauna Brit. India, Rhynch, 1: 248

1915. *Eocanthecona furcellata* (Wolff) Bergroth, Ann. Mag. Nat. Hist. 8(15): 484

Material examined: 1♀, 26°37'40.4"N 89°21'59.5"E, 06.iii.2020, coll. S. Dhali; 1♀, 26°37'39.7"N 89°21'59.7"E, 08.iii.2020, coll. S. Dhali.

Distribution: India: Assam, Bihar, Madhya Pradesh, Maharashtra, Nagaland, Orissa, Punjab, Tamil Nadu, Uttarakhand, West Bengal, Throughout the plains of South India; Bangladesh, Caroline Island (Palau), China, Guam, Hong Kong, Indonesia, Japan, Lao People's Democratic Republic, Molucca Island, Myanmar, Pakistan, Philippines, Sri Lanka, Thailand (Distant, 1902; Ghosh *et al.*, 1994; Chandra, 2009; Salini & Viraktamath, 2015; GBIF, 2020) [17, 25, 13, 37, 20].

Subfamily: Pentatominae Amyot & Serville, 1843

Tribe: Amyntorini Distant, 1902

Genus: Bolaca Walker, 1867

1867. *Bolaca* Walker, Cat. Het. 2: 251

Bolaca Walker, 1867a: 251. Type species by monotypy: *Bolaca unicolor* Walker, 1867. Amyntor Stål, 1868b: 519 (syn. Disant, 1900d: 425). Type species by original designation: *Halys obscura* Dallas, 1849 (= *Bolaca unicolor* Walker, 1867). *Oestopis* Distant, 1879a: 48 (syn. Lethierry & Severin, 1893: 183). Type species by monotypy: *Oestopis terra* Distant, 1879 (= *Bolaca unicolor* Walker, 1867). Ref. Rider, In: Aukema & Reiger (Eds.), 2006, 5: 254.

Diagnosis: Body ovate and depressed; head triangular, about as long as broad, jugae longer than tylus and meeting beyond it, but with their apices strongly cleft; basal antennal segment not reaching apex of head; rostrum reaching the hind coxae; lateral pronotal margins denticulated and lateral angles rounded at base, deflexed towards head; scutellum longer than broad at base, gradually narrowed for 2/3 rd its length and then nearly straight to apex, which is angularly rounded; membrane with longitudinal veins; mesosternum centrally carinate; abdomen moderately dilated; connexivum extending beyond corium.

10. *Bolaca unicolor* Walker, 1867

1867. *Bolaca unicolor* Walker, Cat. Het. 2: 251

1902. *Amyntor obscurus* (Dallas) Distant, Fauna Brit. India,

Rhynch, 1: 144

2006. *Bolaca unicolor* (Walker) Rider, In: Aukema & Reiger (Eds.), 5: 254

Measurements (mm): ♀ : Total length=16.21; Head length=3.33; Head width across eye=3.11; Antennal total length=8.71, antennal segmental length: 1st=0.57, 2nd=1.50, 3rd=1.93 and 4th=2.21; Inter ocular distance=1.67; Inter ocellar distance=0.78; Pronotal length=3.28; Pronotal width across humeral angles=6.21; Scutellar length=5.21; Scutellar width at base=3.86; Forewing length=11.27; Wing width across membrane=3.27; Abdominal length=7.64.

Description: Body (Fig. 1) somewhat ovate, brownish ochraceous and with thick and dark punctures. Head: Head (Fig. 2a) triangular, slightly longer than broad across eyes, juga much longer than tylus, centrally longitudinally raised; antennae (Fig. 2b) 5 segmented, basal segment not reaching apex of head, ochraceous, 4th and 5th antennal segment dark fuscous with luteous base; rostrum dark castaneous, extending up to the hind coxae; eyes castaneous, globose and sessile; ocelli reddish, much closer to eyes. Thorax: Pronotum (Fig. 2c) about 2 times broader than long, lateral pronotal margin serrated, humeral angle prominent but almost rounded; scutellum (Fig. 2d) longer than broad, coarsely punctate, somewhat rugulose, darker near base; forewing (Fig. 2e) – corium dark brown with purplish tint, membrane pale fuscous with longitudinal veins; sterna brownish ochraceous, meso sternum centrally carinate, metathoracic scent gland opening (Fig. 2f) curved; legs (Fig. 2g) of moderate size, ochraceous with black punctures, femora with black speckled, tarsi 3 segmented, basal segment longest but smaller than 2 apical segments together taken. Abdomen: Both dorsum and venter (Fig. 2h) piceous with segmental lateral black spots near sutures, medially dilated, connexivum distinct; female terminal genital plates as Fig. 2i.

Material examined: 1♀, 26°37'40.4"N 89°21'59.9"E, 09.iii.2020, coll. S. Dhali.

Distribution: India: Assam, Meghalaya, Nagaland, newly recorded for West Bengal; Bhutan, China, Pakistan, Vietnam (Distant, 1902; Aukema & Reiger, 2006; Nizamani *et al.*, 2019) [17, 5, 33].



Fig 1: *Bolaca unicolor* Walker, dorsal habitus

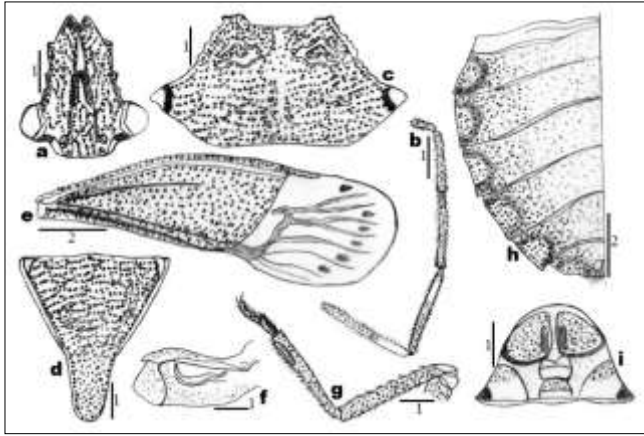


Fig 2(a-i): *Bolaca unicolor* Walker: a. Head, dorsal view; b. Antenna; c. Pronotum; d. Scutellum; e. Forewing; f. Scent gland opening; g. Anterior leg; h. Addomen, ventral view; i. Female terminal genitalia, ventral view.

7. Family: Pyrrhocoridae Amyot & Serville, 1843

Genus: *Antilochus* Stål 1863

11. *Antilochus coqueberti* (Fabricius, 1803)

1803. *Lygaeus coqueberti* Fabricius, Syst. Rhynch.: 222

1904. *Antilochus coqueberti* (Fabricius) Distant, Fauna Brit. India, Rhynch. 2: 101

Material examined: 2♀, 26°37'39.8"N 89°21'59.9"E, 07.iii.2020, coll. N.Ray.

Distribution: Andaman Island, Andhra Pradesh, Delhi, Kashmir, Kerala, Madhya Pradesh, Meghalaya, Nagaland, West Bengal; Bhutan, China, Indonesia, Malaysia, Myanmar, Singapore, Sri Lanka, Taiwan, Thailand, Vietnam (Distant, 1904; Sen *et al.*, 1994; Chandra, 2009; Saha *et al.*, 2017; Dhali & Ray, 2020; GBIF, 2020) ^[17, 42, 13, 36, 15, 20]

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