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FIRST REPORT OF COLLEMBOLA (HEXAPODA) FROM BUXA TIGER RESERVE, NORTH BENGAL WITH NOTES ON THEIR ECOLOGY.

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Abstract : The present communication is a part of collection of collembolan fauna from Buxa Tiger Reserve, North Bengal during the year 2014-2015. This is the first report of collembolan fauna from the Reserve, with 11 species under 9 genera belonging to 5 families.

Keywords : Collembola, Buxa Tiger Reserve, Ecology.

Introduction : The collembolans are soil inhabiting, most primitive, wingless hexapods with the presence of terminal cerci found in moist places such as soil, forest leaf litter, humus, under stones, book shelves, caves, in ant and termite nests etc. The present communication is based on surveys made by authors to Buxa Tiger Reserve during 2014-15. This is the first report of Collembolan fauna from Buxa Tiger Reserve, West Bengal with 11 species under 9 genera belonging to 5 families.

Literature Review: Literature reveals that study of collembolan fauna from West Bengal, was first initiated by Imms (1912) from Indian Botanical Garden and Indian Museum Campus, Calcutta. Thereafter, Choudhuri and Roy (1965), Hazra and Choudhuri (1981), Hazra *et al.* (2007), Mandal and Hazra (2009), Mitra (1966, 1974), Mitra *et al.* (1977) studied collembola from different ecosystems of West Bengal. Mandal (2011a) recorded 16 species of collembola from Bibhuti Bhushan Wildlife Sanctuary, Parmadan, West Bengal. Mandal and Suman (2013) recorded 9 species of collembolans under 8 genera belonging to 5 families from Sajnekhali Wildife Sanctuary, West Bengal. Mandal (2016) published collembola from Kolkata Metropolitan region. Recently, Roy and Mandal (2017) recorded 25 species under 20 genera belonging to 13 families of collembola from different habitats of Indian Botanical Garden. There

is no earlier record of collembolan fauna from Buxa Tiger Reserve, West Bengal. A total of 75 species under 43 genera belonging to 13 families of collembola have been recorded from different districts of West Bengal (Mandal *et al.* 2018). Mandal (2018a) published an updated checklist of Indian collembola represented by 342 species belonging to 113 genera under 20 families.

Materials and Methods : A good number of specimens were collected through mouth operated aspirator and beating the forest litter. Another good number of specimens were collected from soil by extracting the soil surface with the help of shovel and the soil was carefully deposited in polythene packets. In the laboratory the specimens from this soil were extracted by the Tullgren funnel's extracting procedure. The specimens were preserved in 70% ethyl alcohol and were mounted under a cover slip in Hoyer's solution, studied under a Leica Digital Module (DM 2500) microscope and identified using keys and illustrations after Christiansen and Bellinger. Photographs were taken under a Leica Digital Module R (DMR) microscope using a mounted Leica DFC 295 digital camera, and were enhanced with Photoshop CS4 (Adobe Inc.). All specimens and permanent slides have been deposited in the Apterygota section, Zoological Survey of India (ZSI), Kolkata.

Locality : Buxa Tiger Reserve is located in Alipurduar district of northern West Bengal, India, covering an area of 760 km2 (290 sq mi). In altitude, it ranges from 60 m (200 ft) in the Gangetic Plains to 1,750 m (5,740 ft) bordering the Himalayas in the north. It is the easternmost extension of extreme bio-diverse North-East India and represents highly endemic Indo-Malayan region. The fragile "Terai Eco-System" constitutes a part of this reserve. Apart from a rich faunal collection of chordates, Buxa Tiger Reserve also exhibits a rich variety of nonchordates. Several endangered species have also been reported from this reserve. The soil contains a rich variety of micro arthropods. The rainfall recorded for the months September-October varies from 235mm-440mm. The average temperature varies from 5°C in winter season to 35°C in summer season. The collembolan specimen collection localities have been given in Table – 1 & Fig. 1.

Results : The present study consists of 11 species under 09 genera belonging to 5 families. Among the 11 species reported here only 2 species namely *Yosiia dehradunia* Mitra, 1967

(Paronellidae) and *Lobella maxillaris* Yosii, 1966 (Neanuridae) are dominating while the other 9 species have relatively lesser density.

List of Taxa: Systematic Account:

Class Collembola Lubbock, 1870
Order Poduromorpha Borner, 1913, sensu D'Haese, 2002
Superfamily Neanuroidea Massoud, 1967
Family Neanuridae Borner, 1901 sensu Yosii, 1956
Subfamily Neanurinae Borner, 1901, Sensu Cassagnau, 1989
Tribe Lobellini Cassagnau, 1983
Genus *Lobella* Borner, C., 1906
Subgenus *Lobella* Cassagnau, 1983

1. *Lobella (L.) maxillaris* Yosii, 1966

Superfamily Hypogastruroidea Salmon, 1964
Family Hypogastruridae Borner, 1906
Genus *Xenylla* Tullberg, 1869

2. *Xenylla obscura* Imms, 1912

Order Entomobryomorpha Borner, 1913, sensu Soto-Adames et al., 2008
Superfamily Isotomoidea Szeptycki, 1979
Family Isotomidae Schaffer, 1896
Subfamily Isotominae Schaffer, 1896
Genus *Isotomurus* Börner, 1903

3. *Isotomurus jharkhandensis* Mandal, Suman and Bhattacharya, 2017

Family Entomobryidae Schaffer, 1896
Subfamily Lepidocyrtinae Wahlgren, 1906 Sensu Stach, 1955
Genus *Lepidocyrtus* Bourlet, 1839
Subgenus *Acrocyrtus* Yosii, 1959

4. *Lepidocyrtus (A.) heterolepis* Yosii, 1959
5. *Lepidocyrtus (A.) malayanus* Yosii, 1959

Family Paronellidae Borner, 1913

Subfamily Cyphoderinae Borner, 1913, Sensu Soto –Adams, 2008

Genus *Cyphoderus* Nicolet, 1842

6. *Cyphoderus javanus* Borner, 1906

Subfamily Paronellinae Borner, 1913 sensu Soto Adams et al., 2008

Tribe Callyntrurini Mitra, 1993

Genus *Callyntrura* Borner, 1906

7. *Callyntrura lineata* (Parona, 1892) Yosii, 1961

Genus *Dicranocentroides* Imms, 1912

8. *Dicranocentroides flavescens* Yosii, 1966
9. *Dicranocentroides gisini* Mitra, 1975

Tribe Cremastocephalini Handschin, 1926

Genus *Salina* MacGillivray, 1894

10. *Salina bengalensis* Mitra, 1973

Genus *Yosiia* Mitra, 1967

11. *Yosiia dehradunia* Mitra, 1967

Discussion : The species, *Lobella maxillaris* Yosii, 1966 and *Yosiia dehradunia* Mitra, 1967 has a significant presence in an altitude of 700 metres above sea level. These insects enhance the quality of the soil by maintaining the health and functions of the soil. These insects play an important role in the rehabilitation of damaged ecosystem where the vegetation of top soil has been lost. The decomposer soil group helps in the breakdown and relaying the nutrient throughout natural cosystem. The soil type is coarse loamy, occurring on piedmont plain with loamy surface associated with very deep poorly drained or fine loamy surface and moderate erosion. In some places the soil is mountainous with loamy surface and moderate erosion. Alluvial soil can also be seen on river banks. The soil is acidic in nature and the p^H value varies from 6.5 to 5.5. The diverse activities of man on the land and resultant adverse impacts are disturbing the upper mineral soil horizons and affect the diversity, numbers, and activities of microbes and micro-fauna that are important for maintenance of soil fertility. These disturbances can affect structure and function of soil ecology. The goal of environmentally sound

management to sustain the soil ecosystem as a living resource requires a comprehensive management approach that safeguards invaluable land.

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PLATE- 1

***Lobella maxillaris* Yosii, 1966**

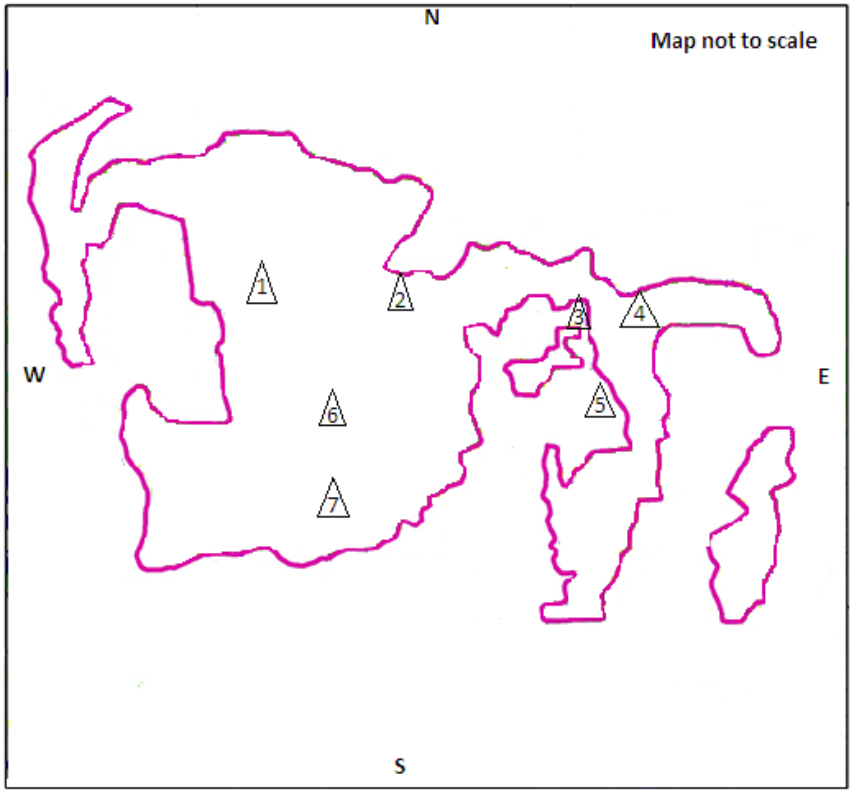
***Isotomurus jharkhandensis* Mandal, Suman and Bhattacharya, 2017**

***Cyphoderus javanus* (Borner, 1906)**

***Dicranocentroides flavescens* Yosii, 1966**

***Salina bengalensis* Mitra, 1973**

***Lepidocyrtus (Acrocyrtus) malayanus* Yosii, 1959**



Collection Localities

1- Hamiltonganj
2- Buxa Hill FRH
3- New Lands Tea Garden
4- New Lands Beat
5- Kumargram
6- Rajabhat Khawa
7- Damanpur Range

Fig. 1. Location Map of Buxa Tiger Reserve