

Diversity of Collembola (Hexapoda: Collembola) of Phansad Wildlife Sanctuary, Raigad, Maharashtra: A preliminary report

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ABSTRACT

Collembolans commonly known as spring-tails are minute, soft bodied, wingless primitive insects. They live in micropores of the soil, leaf litter, dung, cave and shorelines. They feed largely on dead plant parts, animal tissues, fungal hyphae and plant residues. During past several years, several faunal groups have been studied from Phansad Wildlife Sanctuary, Raigad, Maharashtra but so far no detailed account in respect of diversity of soil collembola is reported. Therefore, this paper presents the first records of 12 species belonging to 10 genera and 7 families of Collembola from PWLS, Raigad district of Maharashtra State.

Keyword: Collembola, Diversity, Spring-tails, Phansad, Soil.

1. INTRODUCTION

Phansad Wildlife Sanctuary is situated in Murud and Roha Talukas of Raigad district with the coastal stretch of Arabian Sea in Konkan region of Maharashtra State, with a coverage area of 52.73sq.km. Geographically, the sanctuary is located between 18°24'31.56"N latitude and 72°58'15.36"E longitude. The Government has declared this area as a sanctuary dated 25.02.1986 (Pande, 2005). The forest of this sanctuary consists of mainly of moist teak forests, the southern part of the forest is mixed deciduous, western coast is semi-evergreen and south-western part of the sanctuary has mangrove vegetation. The topography of the region is characterized by rough lands and intermittent undulating areas of varied slope. The weather conditions of the sanctuary during monsoon season are typical with plenteous and regular rainfall. Average rainfall is

2500 to 2600 mm. Humidity is 90%. The soil of this sanctuary is rocky; brown to red is a leaching product of Lateritic Rocks which gives rise to dusty reddish brown color.

The collembolans commonly called spring-tails are primitive minute, wingless insects live in micropores of the soil and litter layers. They have very diverse distribution occurring in all Zoo-geographical regions of the world viz., tropical zone, desert, temperate zone, arctic region etc. and are also located at high altitudes on the mountains. There are about 7500 species described worldwide while Indian Collembolans fauna represented 314 species belonging to 104 genera under 18 families. They feed largely on dead plant parts, animal tissues, fungal hyphae and plant residues. They have a great influence in functioning of the decomposer as a result of their feeding activities and have a great potential as bio indicators of environmental conditions (Santos *et al.*, 1981). Prabhoo (1971 a & b) recorded 74 species in Western Ghats and Kerala. During past several years, several faunal groups have been studied from Phansad Wildlife Sanctuary, Raigad, Maharashtra but this group has attracted less attention. Therefore, the present paper is taken to enrich the knowledge on Indian spring-tails with intensive coverage of the study area described 12 species belonging to 10 genera and 7 families.

2. MATERIALS AND METHODS

Samples were collected from Phansad Wildlife Sanctuary from 2011-2013 and prepared a preliminary list of Collembolan species. Three surveys were conducted in the months of January, 2011, 2012 & 2013 in the following localities Savrat Talav, Phansadgan, Chikhalgan, Dharnachigan and Forest Rest House area. The soil corer was used to collect soil samples then each core was carefully sealed in a separate polythene bag and then taken to laboratory for processing. Soil samples were processed in modified Berlese-Tullgren funnels. All collected specimens were preserved in Absolute Alcohol. Preserved specimens were cleared in Marc Andre1 medium. Hoyer's mounting medium was used for slide mounting of the specimens. Identification of the specimens is done by using Carl Zeiss Phase contrast microscope following Prabhoo (1971). The identified specimens have been deposited in the National Zoological Collection of Zoological Survey of India, Western Regional Centre, Pune.

The collection tours resulted in the collection of 310 examples under 12 species belonging to 10 genera and 7 families. All the collected species have been reported for the first time from Phansad Wildlife Sanctuary, Raigad. The list of collected species as follows:

Kingdom: Animalia
Phylum: Arthropoda
Subphylum: Hexapoda
Class: Insecta
Order: Collembola
Suborder: Arthropleona
Family: Brachystomellidae

1. *Brachystomella terraefolia* Salmon, 1944

Family: Onychiuridae

2. *Onychiurus indicus* Choudhuri and Roy, 1965

Family: Isotomidae

3. *Folsomides purvulus* Stach, 1922

4. *Isotomodes dagamae* Prabhoo, 1971

5. *Isotomina interrupta* (Schott), 1926

6. *Isotomina thermophila* (Axelson), 1900

Family: Entomobryidae

7. *Lepidocyrtus (Ascocyrtus) medius* Schaeffer, 1898

8. *Lepidocyrtus exploratorius* Carpenter, 1924

9. *Pseudosinella petterseni* Borner, 1901

10. *Delamarerus immsi* Mitra, 1976

11. *Salina indica* (Imms), 1912

Suborder: Symphypleona
Family: Sminthuridae

12. *Sphaeridia biniserrata* (Salmon), 1951

3. RESULTS AND DISCUSSION

During the present study a total of 12 species belonging to 10 genera and 7 families were recorded. All the collected species have been reported for the first time from Phansad Wildlife Sanctuary, Raigad. Extensive taxonomic studies of collembolan have been published

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worldwide. First Indian species of collembola from Malabar hill region was described by Ritter (1910). Carpenter (1917) described a new genus and new species of family Poduridae and Entomobryidae from north-east region of India. Brown (1932) studied the *Proisotoma* sp. from North West Himalaya. Prabhoo (1970) recorded the first marine collembolan from India. Mitra (1976) described a new genus and species of *Delamarerus immsi* from Arunachal Pradesh. Prabhoo and Muralidharan (1980) described a new species *Tomocerus mitrai* from Himachal Pradesh. Reddy and Venkataiah, (1990) studied seasonal population abundance of soil micro arthropods in grassland and tree planted areas of a tropical semi-arid savanna in Andhra Pradesh. Hazra and Sanyal, (1996) reported collembolan population in a newly emerged alluvial island in the river Hooghly, West Bengal. Roy and Bano, (2008) studied the diversity and dynamics of soil meso-fauna associated with natural grasslands in Central India. Mandal and Hazra (2009) studied the diversity of soil collembolan fauna from East and North-East states of India.

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