

## Biodiversity of Springtail in Kanpur district of Uttar Pradesh

Deepmala Verma and Rajesh Yadav

Department of Environment Science, S.S.Jain Subodh PG College, Jaipur

Email: deepav762@gmail.com

### ABSTRACT

*In the present, examined population distribution of Collembola communities was studied in native natural site at Kanpur. Soil apterygotes were dominated by collembolans belonging to the families, Isotomidae and Entomobryoidae. During this work, Highest population observed of Isotomidae; while low population examined of Tomoceridae. Total 279 specimen and 28 species collected during this work. In this work, we carried out to study the population diversity of Soil Collembola in Kanpur Region.*

*Key Words: Collembola, Population density*

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### INTRODUCTION

Collembola is widely distributed and highly abundant group of entognathous wingless hexapods. The majority of Collembolan inhabits moist, terrestrial habitats such as damp leaf litter, yet a small percentage is considerable to be semi aquatic or riparian. Among soil arthropods fauna, soil mites and Collembolans are known to dominate the Indian soil (70-97%) and indicate the status of soil health and fertility [1]. Soil conditions and vegetation cover influence the activities of diverse soil organisms including Springtail [2]. Collembolan communities have been shown to vary in abundance and diversity negatively according to changes in vegetation, quality of litter materials, habitat structure and human induced disturbances related to land use practices [3]. Adequate knowledge of spatial pattern and seasonal population buildup of such fauna is considered desirable for understanding their ecology and role in decomposition process in major land use system of a region for understanding the sustainability issues [4].

Present investigation was carried out to study the population diversity of Soil Collembola in Kanpur Region.

### MATERIAL AND METHODS

Soil samples have been regularly collected during (May 2015 to November 2015) from different area of Kanpur region. On each sampling taken at random with stainless steel soil augur (2.5 cm diameter) at a depth of 10 cm. The extraction was done using Tullgren funnel type extractor under 25W electric bulb. The extracted microarthropods were collected in specimen tube containing 70% ethanol. After identification of major taxonomic unit all the specimens were preserved in 70% ethanol separately. Prior to identification of collembola, specimens were mounted in Hoyer's solution mounting media and identified by using face contrast microscope with an enlarged view of 10x X 100x. All soil microarthropods were identified up to the level of their order or, family using a range of taxonomic keys [5].

### RESULTS AND DISCUSSION

Nearly 279 specimens of 28 Collembolan species are collected from the study areas. The richest families were Isotomidae, Entomobryidae and then Hypogastruridae [Table 1].

Table 1 that the species distribution of collembolan in Kanpur regions. In the table, the highest species distribution of Isotomidae, while very numerous species belong to Tomoceridae family. Collembolans are represented numerous in soils of forest ecosystems. Agrocoenoses, can support similar or slightly lower densities of springtails than natural ecosystems situated on the same type of soil. Increasing intensity of

management, using of pest control chemicals, herbicides and large doses of mineral fertilizers drastically reduce Collembolan densities in the field soil [6,7].

Table 1: Identified species of Collembola from different study areas of Kanpur region

S.No	Species	Study Site				
		ASI	ASII	ASIII	ASIV	Total
<b>I</b>	<b>Family Hypogastruridae Börner, 1906</b>	<b>30</b>	<b>6</b>	<b>26</b>	<b>16</b>	<b>78</b>
1	<i>Hypogastrura denticulate</i> (Begnall, 1941)	6	1	8	3	
2	<i>Ceratophysella indovaria</i> (Salmon, 1970)	8	2	4	3	
3	<i>Hypogastrura vernalis</i> (Carl, 1901)	4	1	6	4	
4	<i>Xenylla maritime</i> Tullberg, 1869	6	2	3	4	
5	<i>Friesea mirabilis</i> (Tullberg, 1871)	4	-	3	1	
6	<i>Neanura conjuncta</i> (Stach, 1922)	2	-	2	1	
<b>II</b>	<b>Family Isotomidae Schäffer, 1896</b>	<b>19</b>	<b>11</b>	<b>22</b>	<b>36</b>	<b>88</b>
1	<i>Folsomia nana</i> (Gisin 1957)	6	1	4	7	
2	<i>Folsomia candida</i> (Willem 1902)	3	1	3	5	
3	<i>Isotomiella minor</i> (Schaffer 1896)	1	3	-	2	
4	<i>Isotomina bipunctata</i> Axelson	-	1	2	2	
5	<i>Proisotoma crassicauda</i> (Tullberg 1871)	4	3	4	9	
6	<i>Proisotoma minuta</i> (Tullberg 1871)	3	1	6	5	
7	<i>Isotoma notabilis</i> (Schaffer)	2	1	3	6	
<b>III</b>	<b>Family Tomoceridae Schäffer, 1896</b>	<b>5</b>	<b>-</b>	<b>4</b>	<b>2</b>	<b>11</b>
1	<i>Tomoceris vulgaris</i> (Tullberg 1871)	5	-	4	2	11
<b>IV</b>	<b>Family Entomobryidae, 1896</b>	<b>34</b>	<b>6</b>	<b>18</b>	<b>25</b>	<b>83</b>
1	<i>Entomobrya handschini</i> (Stach 1922)	4	1	1	3	
2	<i>Entomobrya lanuginose</i> (Nicolet)	9	1	1	3	
3	<i>Entomobrya marginata</i> (Tullberg)	3	-	1	1	
4	<i>Entomobrya multifasciata</i> (Tullberg)	4	-	1	4	
5	<i>Orchesella flavescens</i> (Bourlet)	2	1	2	1	
6	<i>Orchesella cincta</i> (Nicolet)	1	-	-	1	
7	<i>Pseudosinella wahlgreni</i> (Borner)	2	-	-	1	
8	<i>Heteromurus nitidus</i> (Templeton)	1	-	2	2	
9	<i>Lepidocyrtus lanuginosus</i> (Gmelin)	3	1	2	3	
10	<i>Lepidocyrtus cyaneus</i> Tullberg	3	-	5	1	
11	<i>Lepidocyrtus paradoxus</i> Uzel	2	2	3	2	
<b>V</b>	<b>Family Sminthuridae, Lubbock 1862</b>	<b>10</b>	<b>2</b>	<b>-</b>	<b>7</b>	<b>19</b>
3	<i>Sminthurides malmgreni</i> (tullberg)		1	-	2	
4	<i>Bourletiella insignis</i> (Reuter)	7	-	-	1	
5	<i>Sminthurus lubbocki</i> Tullberg	3	1	-	4	

AS = Agriculture Site; - Not present

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#### REFERENCES

- Gharamaninezhad S, Shayanmehr M, Yoosefi E. (2013). New record of Collembola from Kermanshah(Iran). Journal of Plant Protection 27, 136-138. (InPersian).
- Cox P. 1982. The collembola fauna of North and Western Iran. Entomologists' monthly magazine 118,39-43.
- Hazra, A. K. and Mandal, G. P. (2007). Pictorial Handbook on Indian Collembola (Part-1). Zool. Surv. India, Kolkata. 1-34.
- Hopkin, S. P. (1997). Biology of the Springtails (Insecta: Collembola).Oxford University Press, Oxford, 330p.
- O'Connor, F. B. (1957). An ecological study of the enchytraeid worm population in a coniferous forest soil. Oikos 8: 161-199.
- Deepmala Verma and A.K. Paliwal. (2010). Effects of springtails community on plant-growth. Biological Forum — An International Journal, 2(2): 70-72.
- Deepmala Verma and Rajesh Yadav (2014). Role of Collembola In Soil Fertility: A Brief Review. Journal Of Current Research In Science (ISSN 2322-5009). Vol. 2, No. 5, pp: 564-56