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## Quantitative analysis of collembola population in Aligarh regions

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### Abstract

We have selected two different sites for the investigation: Agricultural and A natural field. During this study, Total 78 Species have been collected from Aligarh regions and also done collembolan extraction done by Modified Tullgren's funnel apparatus. We have found that Collembolans found highly frequent in entire community of soil collembolan, comprising up to 67.78% absolute frequency in natural site whereas 65.7% in Agricultural site.

**Keywords:** Collembola, quantitative analysis, absolute frequency

### Introduction

Agricultural intensification leads to alteration of soil pH which disrupts niches of soil fauna. Previous studies on effect of soil disturbances on the abundance and diversity of mites and Collembola showed that soil disturbance negatively affects their diversity have showed that molding and burning of surface plant litter reduces populations Collembolan<sup>[1, 2]</sup>.

This study has baseline information against seasonal habitat disturbances in native soils because the dynamics of Collembola assemblages are extremely poor understood in Indian agricultural soils. Thus, under the progress of our research, a comparative study has been carried out from two sites of Aligarh region which are different in locations and nature of vegetation. in the present study was carried out to study the population diversity and distribution of Soil Collembola in Aligarh Region.

### Material and Methods

The present investigation was carried out for one year from 03 September 2014 to 02 September 2015 in a two regions of Aligarh. Soil samples were collected on monthly intervals using cylindrical core sampler of size 5.5 cm. in diameter and 10 cm in height having a surface area of 23.76 cm<sup>2</sup> based on the principle of O'Conor<sup>[4]</sup>.

Samples were taken every week regularly from the both site. Modified Tullgren's funnel apparatus was used for extraction of soil microarthropods. All microarthropods were collected inside a beaker which contained 70% alcohol with few drops of glycerol and they were mounted with DPX. All soil microarthropods were identified up to the level of their order or, family using a range of taxonomic keys<sup>[3]</sup>. A stereoscopic binocular microscope (Olympus Model CX 24B with digital camera) was used for identification of soil collembolan.

To study the diversity of soil microarthropods, the parameters considered were density, abundance, fractional population, relative density, and absolute frequency, Shannon Wiener diversity index (H) and Evenness (J) between the sites. Statistical analysis of the data was performed using the Statistical package<sup>[5]</sup>. Correlation coefficient analysis was done between population of collembola and soil parameters.

### Result and Discussion

Quantitative analysis of Collembola population against different parameters showed in table 1. The species richness of Collembola was very low while the individual population was high in most of the sampling cases specifically in spring and winter season in both sites. The average abundance and density of collembolans was recorded 19.19 (ind/sample) and 21.09 (ind/sample) respectively in natural site. During this study, we have collected total 126 species, which are belonging to five families [i.e. Family Hypogastruridae, Isotomidae, Tomoceridae, Entomobryidae and Sminthuridae] and showed in Table 2.

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Most abundant species found in Aligarh regions of Etomobryidae.

**Table 1:** Quantitative analysis of Collembola population against different parameters of Aligarh

Parameters	Site I	Site II
Mean Density	11.20	12.67
Abundance	19.19	21.09
Relative Density (%)	51.11	58.09
Absolute Frequency (%)	62.05	67.18
Diversity Index (H)	1.00	1.21
Evenness (E)	0.20	0.21

**Table 2:** Identified species of Collembola from different study areas of Aligarh region

S. No	Species	Study Site		
		SI	SII	Total
I	Family Hypogastruridae Börner, 1906			26
1	<i>Hypogastrura denticulate</i> (Begnall, 1941)	6	1	7
2	<i>Ceratophysella indovaria</i> (Salmon, 1970)	8	2	10
3	<i>Hypogastrura vernalis</i> (Carl, 1901)	4	1	5
4	<i>Neanura conjuncta</i> (Stach, 1922)	-	4	4
II	Family Isotomidae Schäffer, 1896			17
1	<i>Folsomia nana</i> (Gisin 1957)	1	1	2
2	<i>Folsomia candida</i> (Willem 1902)	2	4	6
3	<i>Isotomiella minor</i> (Schaffer 1896)	2	1	3
4	<i>Isotoma notabilis</i> (Schaffer)	4	2	6
III	Family Tomoceridae Schäffer, 1896			1
1	<i>Tomocerus vulgaris</i> (Tullberg 1871)	-	1	1
IV	Family Entomobryidae, 1896			28
1	<i>Entomobrya handschini</i> (Stach 1922)	6	4	10
2	<i>Entomobrya lanuginose</i> (Nicolet)	1	4	5
3	<i>Entomobrya marginata</i> (Tullberg)	3	-	3
4	<i>Entomobrya multifasciata</i> (Tullberg)	2	1	3
5	<i>Orchesella flavescens</i> (Bourlet)	2	1	3
6	<i>Lepidocyrtus lanuginosus</i> (Gmelin)	3	1	4
V	Family Sminthuridae, Lubbock 1862			6
1	<i>Sminthurides malmgreni</i> (tullberg)	2	-	2
2	<i>Bourletiella insignis</i> (Reuter)	1	2	3
3	<i>Sminthurus lubbocki</i> Tullberg	-	1	1

Site I= Khair , Site II= Iglas

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### References

1. Deepmala Verma, Rajesh K Yadav. Role of Collembola in Soil Fertility. Journal of Current Research in Science. 2014; 2(5):564-566.
2. Deepmala Verma, Rajesh K Yadav. Collembola Species in Grassland Area of Jhansi Region. Journal of Current Research in Science. 2013; 1(6):639-640.
3. O'Connell, Bolger T. The microarthropod fauna associated with fungal fruiting bodies in Woodland-a study of the role of spatial and temporal diversity in determining assemblage structure. Unpublished Ph. D thesis, National University of Ireland, Dublin, 1994.
4. O'Connor FB. An ecological study of the enchytracid worm population in a coniferous forest soil. Oikos. 1957; 8:161-199.
5. Statsoft. Data analyses software systems, version 8.02. StatSoft. Inc Tulsa, Oklahoma, USA, 2004.