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RECORDS OF SOME COLLEMBOLA FROM AGRICULTURAL FIELDS OF NORTH 24-PARGANAS, WEST BENGAL

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INTRODUCTION

Collembolans are the commonest soil insects. Being extremely soft bodied and sensitive to various measures adopted in agroecosystem, their population and diversities are depleted. Particularly mechanical abrasive action involved in ploughing, application of chemical fertilizers, pesticides, herbicidal chemicals, etc. impair their growth and development. The species of Collembola, particularly the hyperedaphic and hemiedaphic ones, that occur in agroecosystem from Barrackpore, North 24-Parganas, West Bengal, indicate their tolerance to such rigors of cultivation. In the present investigation, eleven species of Collembola of which three belonging to suborder Symphypleona and eight to Arthropleona were found to occur predominantly in the studied agroecosystem.

The most abundant and ubiquitous were *Isotomurus balteatus* (Reuter), *Cryptopygus thermophilus* (Axelson), *Lepidocyrtus* (*Lepidocyrtus*) sp., *Cyphoderus javanus* Borner and *Brachystomella* sp. occurring during cultivation of all the three crops while the rest were found to remain restricted to a specific type of crop.

METHODOLOGY

Soil samples, drawn from the field, were extracted through modified Tullgren funnels by using a 60-watt electric lamp for the purpose of dessication. The examples were collected in rectified alcohol and were subsequently mounted on slides for the purpose of identification.

Analysis was made of various species of Collembola, occurring in the agricultural fields of Barrackpore, with reference to their occurrence according to months and specific crop.

Choudhuri, *et al.* (1971a, b, 1972, 1975), Mitra, *et al.* (1977, 1981, 1983a, b, 1986, 1993) and Singh, *et al.* (1971) contributed to the knowledge of Collembola both from cultivated and uncultivated fields of West Bengal and Uttar Pradesh.

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QUALITATIVE ANALYSIS OF COLLEMBOLA WITH REFERENCE TO CROPS

Qualitative analysis of total Collembola, obtained from the experimental plots during cultivation of all the three crops, reveal the presence of eleven species of which six species were crop-specific while others were present during cultivation of all the three crops. Three species, viz., *Seira indica, Sminthurus* sp. and *Isotomodes* sp. occurred during cultivation of jute while *Sminthurides appendiculatus, Sphaeridia cornuta* and *Acherontiella* sp. were remain associated with paddy only.

An analysis of species, remaining associated with all the three crops, reveals that *Isotomurus balteatus* reached its population-maxima during wheat cultivation and its lowest population occurred during jute cultivation *Cryptopygus thermophilus* and *Lepidocyrtus* (*Lepidocyrtus*) sp. exhibited their peaks during paddy cultivation and minimum for the former was during wheat cultivation while for the later during jute cultivation and its minimum population occurred during jute cultivation. *Brachystomella* sp. reached its peak of population during wheat cultivation and its minimum population during paddy cultivation.

Qualitative composition of Collembola, obtained during cultivation of each crop, reveals that eight species of Collembola remain associated with both jute and paddy while five species with wheat. *I. balteatus, C. thermophilus, Lepidocyrtus* (*Lepidocyrtus*) sp., *C. javanus* and *Brachystomella* sp. occurred during wheat cultivation of which the bulk of the population was of *I. balteatus* and the least was that of *Brachystomella* sp.

During jute cultivation, *C. thermophilus* was most dominant followed by *C. javanus, I. balteatus, Sminthurus* sp., *S. indica, Brachystomella* sp., *Isotomodes* sp. and *Lepidocyrtus* (*Lepidocyrtus*) sp.

During paddy cultivation, *I. balteatus* was most predominant followed by *C. thermophilus, Lepidocyrtus* (*Lepidocyrtus*) sp., *S. appendiculatus, C. javanus, S. cornuta, Acherontiella* sp. and *Brachystomella* sp.

Occurrence of Collembolan species according to vegetation type

Species	Vegetation		
	Wheat	Jute	Paddy
Isotomurus balteatus	****	**	***
Cryptopygous thermophilus	**	**	**
Lepidocyrtus (*Lepidocyrtus*) sp.	*	*	**
Cyphaderus javanus	*	**	*
Seira indica	–	*	–
Sminthurides appendiculatus	–	–	*

Table *Cont'd.*

Species	Vegetation		
	Wheat	**Jute**	**Paddy**
Brachystomella sp.	*	*	*
Sminthurus sp.	–	*	–
Sphaeridia cornuta	–	–	*
Isotomodes sp.	–	*	–
Acherontiella sp.	–	–	*

**** Most predominant ** Frequent – Absent

*** Predominant * Infrequent

QUALITATIVE ANALYSIS OF COLLEMBOLA WITH REFERENCE TO MONTHS

Four species of Collembola viz. *I. balteatus, C. thermophilus, C. javanus* and *Brachystomella* sp. occurred during January with the highest population of *I. balteatus* followed by others as arranged above in graded sequence. During February, *I. balteatus* continued to dominate the population with four other species, viz. *C. thermophilus Lepidocyrtus* sp., *C. javanus, Brachystomella* sp. *I. balteatus* was absent during March and the entire population obtained during this month was represented by *C. thermophilus* only. During April, *I. balteatus* continued to remain absent and *C. thermophilus* constituted half of the population followed by *C. javanus* (5.56%), *Sminthurus* sp. (38.89%) and *Isotomodes* sp. (5.56%). *I. balteatus* was also absent during May with *C. thermophilus* representing the highest population (64.29%) followed by *C. javanus* (14.29%), *S. indica* (7.14%), *S. appendiculatus* (7.14%) and *Isotomodes* sp. (7.14%). *I. balteatus* reappeared during June with 15.79% of the population for this month. The population for this month was, however, dominated by *C. javanus* (42.11%) followed by *S. indica* (21.05%), *C. thermophilus* (15.79%) and *Sminthurus* sp. (5.26%). During July, *I. balteatus* dominated the population with 51.52% followed by *C. javanus* (36.36%), *Brachystomella* sp. (9.09%) and *Lepidocyrtus* sp. (3.03%). *C. thermophilus* was noticeably absent during this month. During August, *I. balteatus* continued to dominate the population with 41.67% followed by *C. javanus* (25%), *S. appendiculatus* (16.67%), *Lepidocyrtus* sp. and *S. cornuta* each with 8.33%. *C. thermophilus* remained unrepresented during this month. During September, *I. balteatus* dominated the population with 51.72% followed by *S. appendiculatus* (34.48%) and *Lepidicyrtus* sp. (6.9%). *C. thermophilus* reappeared in this month constituting 6.9% of the population. During October, *I. balteatus* continued to dominate the population with 44.26% of the population followed by *C. thermophilus* (36.07%), *Lepidocyrtus* sp. (14.75%), *C. javanus* (3.28%) and *Acherontiella* sp. (1.64%). During November, *C. thermophilus* dominated the population with 39.47% followed by *I. balteatus* (26.32%), *Lepidocyrtus* sp. (26.32%),

C. javanus (5.26%) and *Brachystomella* sp. (2.63%). During December, both *I. balteatus* and *C. thermophilus* was represented by the same population (33.33% each) followed by *C. javanus* (25%) and *Brachystomella* sp. (8.33%).

SUMMARY

In the studied fields, altogether eleven species of Collembola were found to occur. *Isotomurus balteatus* was found to be most predominant during cultivation of all the three crops followed by *Cryptopygus thermophilus* which was moderately predominant. Other species occur indifferently and the rarest being *Sminthurides appendiculatus, Sminthurus* sp., *Sphaeridia cornuta, Isotomodesi* sp., *Acherontiella* sp. and *Salina indica.*

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