



SOIL SURFACE DWELLING INSECTS AND SPIDERS IN KATARNIRICE NURSERY AT SABOUR, BIHAR

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BAU Communication No. 599/2019

ABSTRACT

Soil surface dwelling arthropods play a vital role in rice ecosystem and there is a need to explore these in the rice nursery. This study attempts this from Bihar, and observes 13 species viz., *Abacetus* sp., *Clivina* sp., *Elaphropus* sp., *Scarites* sp., *Tachys* sp., *Paederus fuscipes* Curt., Anthicidae (unidentified species), *Camponotus compressus* (F.), Dermaptera (unidentified species), *Wadicosa fidelis* (O. Pickard-Cambridge), *Pardosasp.*, *Castianeirazetes* Simon and *Bianor* sp. from Katarnirice nursery. Familywise and specieswise abundance along with quantitative estimation of diversity indices are discussed.

Key words: Rice nursery, Katarani rice, soil surface, insects, spiders, Coleoptera, Hymenoptera, Dermaptera, abundance, diversity

Katarni rice is an indigenous rice variety known for its unique taste and aroma and is grown in some specific blocks of Bhagalpur, Banka and Munger districts of Bihar. The word 'Katarni', meansawl with a hook for sewing, the name is there because the shape of apex of its' grains is similar to the awl (Rana et al., 2018). Katarni rice has achieved the GI (Geographical Indication) tag on 28th March, 2018. Soil is known as living tissue and several biological activities are performed in soil by the micro and macrofauna and there is a need to explore their diversity along with their effects (Verhoeff and Brussaard, 1990; Tripathi et al., 2003) etc. In addition to these, the soil fauna maintain a control over plant damaging species. Therefore, the importance of soil fauna at this juncture can never be ignored because they act as indicator of soil conditions and can be used for soil diagnosis (Ghilarov, 1965). The fauna of Indian soil had been studied by earlier workers including Choudhuri and Roy (1970), Singh and Pillai (1976), Singh et al. (1978) and Tripathi et al. (2003). Soil surface dwelling insects and spiders in rice nursery has never been attempted at least from Bihar, and the present study attempts this.

MATERIALS AND METHODS

The indigenous rice variety Katarni rice was seeded on three nursery beds (each having area of 2 × 25m²) at Bihar Agricultural University, Sabour research farm (GPS location: 25° 13' 33.6612" N, 87° 2' 56.184" E) on 23rd of July, 2018. All the standard agronomic

package and practices were followed to raise the nursery except any plant protection practices. From the nursery bed, observation on the soil surface dwelling insect and spiders was made starting from one day after sowing (i.e. 24.07.2018) till one day before transplanting (i.e. 13.08.18) at five days interval. From the nursery beds, observation as well as collection of soil surface insects and spiders was done from four quadrates randomly by visual searching method (Latif et al., 2009).

The specimen were collected and preserved in 70% alcohol, and brought to the laboratory and identified. Specimens on each dates were classified at family and genus level and specimens were coded before analysis. Photographs of the specimens were taken code wise and got identified by Zoological Survey of India (HQ, Kolkata). The specimens were preserved in the Department of Entomology. After identification, the population data of species was analysed using MS Excel (2010). Indices to study the diversity and abundance, viz., Shannon-Wiener index (H^1), Simpson index (λ), Margalef Richness index (R) and Evenness index (E) were computed with the standard formula.

RESULTS AND DISCUSSION

A total of 13 species of soil surface dwelling insects and spiders were observed from 24th July to 13th August, 2018 (Table 1) and family wise abundance given in Fig. 1; Carabidae, Staphylinidae, Anthicidae, Formicidae, Lycosidae, Salticidae, and Corinnidae were the families encountered. Class Arachnida dominated

Table 1. Insects and spiders observed on soil surface (Katarnirice nursery, 2018)

Class	Order	Family	Species	
Insecta	Coleoptera	Carabidae	<i>Abacetus</i> sp.	
			<i>Clivina</i> sp.	
			<i>Elaphropus</i> sp.	
			<i>Scarites</i> sp.	
			<i>Tachys</i> sp.	
		Staphylinidae	<i>Paederus fuscipes</i> Curt.	
			Anthicidae	Unknown sp.
			Hymenoptera	Formicidae
		Dermaptera		Unknown
		Arachnida	Araneae	Lycosidae
<i>Pardosa</i> sp.				
Salticidae	<i>Bianor</i> sp.			
Corinnidae	<i>Castianeirazetes</i> Simon			

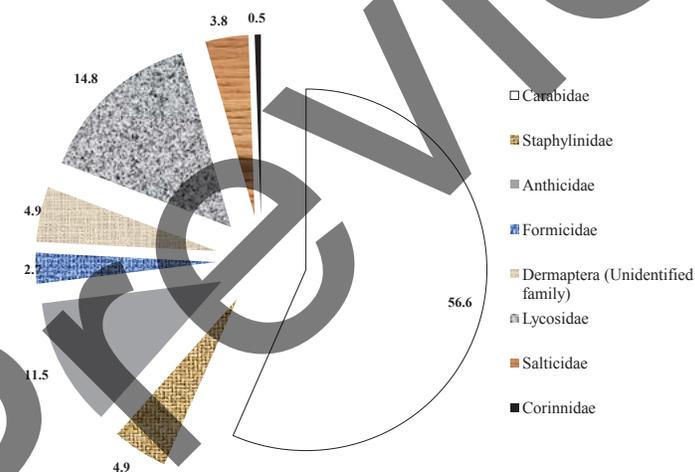


Fig. 1. Abundance of soil surface dwelling insects and spiders in paddy nursery (family wise)

these. Of insects, the Carabidae was the most dominant (56.6%) followed by Lycosidae (14.8), Anthicidae (11.5), Staphylinidae (4.9), unidentified family under Dermaptera (4.9), Salticidae (3.8), Formicidae (2.7) and Corinnidae (0.5). Species wise observations are given in Fig. 2. *Tachys* sp. was the maximum (20.3%) followed by *Elaphropus* sp. (18.7%), *Pardosa* sp. (12.1%), unidentified Anthicidae (11.5%), and others. Data in Table 1 reveal that only on the last date of observation all 13 species were there which was the reason behind the maximum value (7.84) of Margalef richness index

®. However, as the total number of individuals on that particular date was lesser (34), leading to the least value (0.09) of Simpson index (λ). The Shannon-Wiener Index and Evenness index were maximum (3.19 and 0.91, respectively) on 24th July, probably due to the presence of most of the species (11) along with quite good number of total individuals (32).

The species observed now viz., *Clivina* sp., *Tachys* sp., *Paederus fuscipes*, *Camponotus compressus*, unidentified Dermaptera, *Wadicosa fidelis*, *Pardosa* sp.,

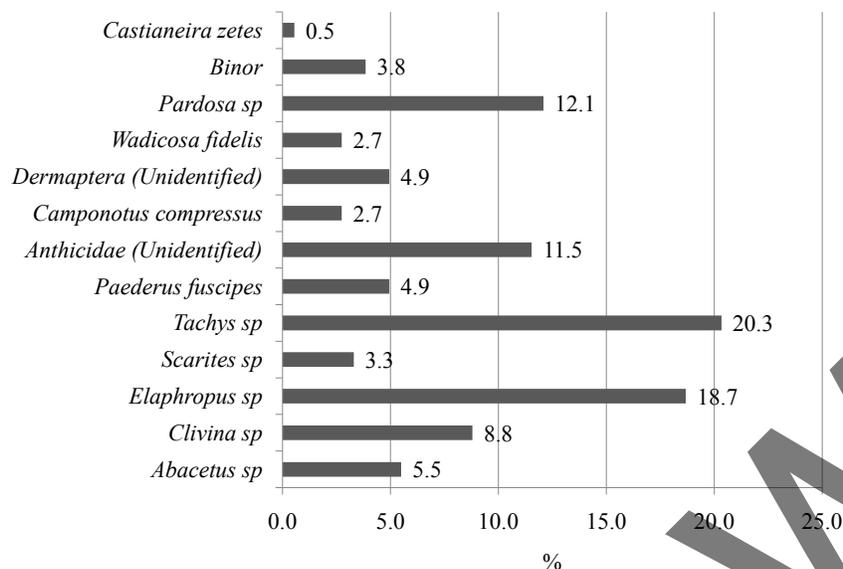


Fig. 2. Abundance of soil surface dwelling insect and spider (Katarni paddy nursery)

Table 2. Diversity indices -insects and spiders (Katarni paddy nursery)

Diversity indices	Dates of observation				
	24-07-18	29-07-18	03-08-2018	08-08-18	13-08-2018
No. of individuals	32	27	70	19	34
No. of species	11	9	10	9	13
Shannon-Wiener Index (H')	3.19	1.97	1.50	1.59	1.84
Evenness Index(E)	0.91	0.91	0.65	0.73	0.72
Margalef richness index (R)	6.64	5.59	4.88	6.26	7.84
Simpson index (λ)	0.11	0.13	0.30	0.10	0.09

and *Bianorsp.*, had been recorded previously by Annamalai (2018) from soil surface of post transplanted paddy from the present location. The remaining species like *Abacetussp.*, *Elaphropussp.*, *Scaritessp.* and *Casteinerazetes* are being reported for the first time as soil surface dwelling insects and spiders of Katarni paddy nursery from Bihar. Annamalai (2018) although recorded the species which were found to be common, difference exists only in terms of the stage of the crop i.e. the present investigation only focused on the nursery stage.

ACKNOWLEDGEMENTS

The study is part of the M.Sc. (Ag.) program of

Miss SamanAffrin, and all members of her advisory committee along with the Chairman of Department of Entomology, BAU, Sabour are hereby acknowledged. Support of the Zoological Survey of India is duly acknowledged.

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(Manuscript Received: June, 2019; Revised: October, 2019;
Accepted: November, 2019; Online Published: November, 2019)

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