

Ecological study on the abundance of micro fauna (Protozoa and Nematodes) in the crop land of Siwan district, Bihar

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Article Chronicle :

Received :
26.03.2020;
Revised :
10.05.2020;
Accepted :
28.05.2020

ABSTRACT : The present paper deals with the ecological numerical abundance of some microfauna particularly protozoa and nematode in the upland and lowland of wheat cultivated agricultural areas of Siwan Bihar. For this, four sampling site have been selected. The samples were collected on fortnightly basis in polythene bags. The protozoan population was more abundant at site 3 of upland crop areas of Pachrukhi block, while the minimal number of abundance was at site I of the same crop areas. The nematode population was totally absent in the low land areas. The maximum and minimum number of nematodes/g of soil was 150.00 nematodes/g of soil and 15.00 nematodes/g of soil, respectively.

HOW TO CITE THIS ARTICLE : Singh, Ravindra Kumar and Srivastava, Anurag (2020). Ecological study on the abundance of micro fauna (Protozoa and Nematodes) in the crop land of Siwan district, Bihar. *Asian J. Environ. Sci.*, 15(1): 19-20, DOI: 10.15740/HAS/AJES/15.1/19-20. Copyright@ 2020: Hind Agri-Horticultural Society.

Key Words :

Ecological study
Protoza,
Nematodes low
land areas, Upland
abundance

Agricultural practices are very common in the rural areas of the districts of north Bihar. But, unfortunately the regular flooding there is the disturbance in the abundance of micro fauna. The flooding event reduces the cropping pattern loading to the erosion of soil sub surface. If plantation or cropping is to be ensuring in this region then the preservation of erosion and depletion of essential mineral nutrients can be established. It also changes the characteristics and properties of the soils. The growth of the crop plant and fall of the plant parts influence the micro-climate at the ground level and determine the type and distribution of flora favoring the formation of fauna. The decomposition of the ground litter begins with the invasion of decomposes succeeded by detritivores thus aiding the function of humus.

Some of the beneficial site effects noted for fast growing species is associated with

the heavy litter fall. There species promoting nutrient cycling between the deep layers and the surface, improvement in soil and texture, water holding capacity bulk density and filtration. The organic substrate of the crops stimuli microbial activity so, keeping thus view in mind a study on soil micro fauna was started to know the pattern of protozoa and nematodes abundance in tropical crop lands.

EXPERIMENTAL METHODOLOGY

Several thousand hectares of land in Pachrukhi block, Siwan Bihar have been cropped with variety of wheat plants. There areas receives 250-300 mm of average rainfall. The averages temperature various between 25^oC and 42^oC throughout the year. The sampling was done during Pre monsoon and post monsoon periods of the two year *i.e.* 2018 to 2019. The soil was collected by

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core sampling techniques. From each of the cropping in each range, from samples were extracted and pooled to make a single composite sample for the convenience of transportation. As the cropping reaches to maturity one such sample was collected at random from each cropping and brought to the laboratory in cotton cloth bags.

Ecological analysis of biological community:

The soil Protozoa were assessed by culturing the protozoa on 17 saline again plate dilution technique which were incubated with 100 mg of soil for three days at room temperature. The protozoa were washed with known quantities of water sample of 0.1 ml were taken in cavity slides and seen under student microscope using low power.

Objectives:

Soil nematodes were outskated using Bearman's funnel. The sample collected was examined under stereoscopic, binocular microscope. The animals were counted and identified upto order level faunal diversity abundance and composition was assessed and recorded.

EXPERIMENTAL FINDINGS AND DISCUSSION

In all the natural ecosystems the development and maintenance of heterotrophic organisms depends entirely on the formation of energy rich organic substrate. The tropical crop field's soils are rich in humic material and hold diverse fauna in contrast to the other soil component (Lavelle, 1979) the area ratio and persist in soil for long period. Component of mass, it has facilitated the high abundance of bacteria and fungi. The total abundance of protozoa and fungi for the period of study indicated their establishment during the first year of cropping and there were found to be low in the pre monsoon period. The nematode population were practically absent in pre

Table 1 : Total abundance of microfauna in the soil crops field (Protozoa 10³/g of soil)

	Pre monsoon		Post monsoon	
	Lowland	Upland	Lowland	Upland
S ₁	14.24	6.74	5.74	22.89
S ₂	11.01	6.49	14.19	22.44
S ₃	8.49	12.49	24.97	16.22
S ₄	9.33	6.49	16.08	26.13

Table 2 : Total abundance of micro fauna in the soil of crop field (Nematodes/g of soil)

	Pre monsoon		Post Monsoon	
	Low land	Upland	Low land	Upland
S ₁	-	-	14.00	59.00
S ₂	-	-	14.00	110.00
S ₃	-	-	30.0	156.00
S ₄	-	-	149.00	100.00

Table 3 : Chemical properties of the soil crop field of Rural Siwan district

	Pre monsoon		Post Monsoon	
	pH	OM	pH	OM
S ₁	5.48	0.31	4.95	4.69
S ₂	5.47	0.33	4.67	4.28
S ₃	5.48	0.48	4.68	4.92
S ₄	5.46	0.33	4.94	4.28

monsoon period and hence no records of their population were made. However their densities were found to be low in the post monsoon period because of the low moisture content of the soil. The pH of the soils did not vary with time and remained acidic in the entire site for both season. The total organic matter was found to be higher in all sites during post monsoon. The micro faunal abundance suggests that the organism's energy establish themselves with the genesis of crop. With the increase of moisture level of the crop floor, increase in the number of protozoa and nematodes were recorded (Wall work, 1974) but in the present study their density, especially of the nematodes are low. Perhaps the low growth of these organisms.

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