

Effect of Soil Salinity on the Population Dynamics of Soil Arthropods Fauna at Nayachar Island of Midnapore District

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Abstract

The paper deals with the analysis of 144-soil samples collected during July 2003 to June 2004 in some selected areas of Nayachar Island. Collembola and mites are most dominant groups. In general the adverse effect of salinity on micro arthropods population was more severe in saline soil compared to less saline soil.

Key words : Salinity, Mangroves, Soil arthropods, Population dynamics.

Soil salinity is becoming a world wide problem causing significant losses of arable land. Investigations were made earlier on the physical and chemical changes brought about by excess salt in their soil (1, 2). A good amount of work has been done regarding soil fauna of West Bengal in general (3-9) but little is known regarding soil arthropods in relation to soil salinity in Nyachar Island. Vast number of diverse microarthropods inhabits the soil and their activities have profound influence on soil fertility and plant nutrient (10). Therefore the present study was made to investigate the population composition of micro arthropods in relation to soil salinity in the Island.

Study Site

The Nayachar Island is spindle shaped with total area of about 29.38 sq km. The Island lies on the river Hooghly opposite to the port of Haldia in West Bengal. The Island is flat with an average height of 3' to 5' (0.914-1.524 m) from the riverbed. The island formed out of sediment deposition during the past several decades, started accumulation from 1945. For this study the in Nayachar Island four sites were chosen: (a) Accacia site situated in the riverbed of the Island; (b) Hut site situated on the 0.5 km away from the riverbed; (c) MIC (Mangrove Interpretation Center) situated about 0.25 km away from the Hut site and 0.5 km away from the riverbed; and (d) Meen Dweep situated 2 km away from the MIC

and 0.5 km away from the riverbed.

Methods

A total of 144 soil samples were drawn from four sites of the Nayachar Island for a period of one year. From July 2003 to June 2004, samples were drawn randomly. The extraction of soil samples was carried out by the expedition faunal apparatus (modified). A 40 W bulb was used for heating and light source. Temperature was measured by soil thermometer. The soil samples were powdered and passed through a 2mm sieve and analyzed for electrical conductivity of saturation extract.

Results and Discussion

The soil arthropod groups which were obtained from different sites are presented in the Table 1. Altogether nine groups viz. Collembola, Acarina, Coleoptera, Diptera larvae, Orthoptera, Hymenoptera, Isopoda, Centiped and Milliped. Maximum number of soil arthropods were obtained from Hut site followed by MIC, Meen Dweep and minimum from Accacia site. It is to be noted that the maximum collembolan population varied from one site to other such as in February from Accacia site to August from Hut site and MIC site and in January to February at Meen Dweep. In acarina maximum population also varied from one site to another. In February from Accacia site, July to August in Hut site, MIC