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Community turn over of flood water arthropods in an irrigated rice ecosystem of Tamil Nadu, India

M.KANDIBANE
Department of Agricultural Entomology and Nematology, Pandit Jawaharlal Nehru College of Agriculture and Research Institute, KARAIKAL (PUDUCHERRY) INDIA

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An investigation on the community turn over of flood water arthropods in weeded and partially weeded rice ecosystems was carried out in a rice field trial conducted at the wetlands of Agricultural College and Research Institute, Madurai, Tamil Nadu during *kharif* 2000 on four ruling rice varieties. The study revealed that in the first week, the turn over rates of 40.00, 41.17, 33.33 and 47.05 per cent were recorded in weeded plots. But, in partially weeded plots the turn over rates were 42.10, 48.00, 42.85 and 50.00 per cent in MDU 5, ADT 36, ADT 39 and ADT 43, respectively. In the weeded plots there was a decline of community turn over of arthropods, where as the increased trend of turn over was recorded from the first to the last week in partially weeded plots. A total of 23 species of flood water arthropods containing 12, 2, 6 and 3 species of Odonata, Ephemeroptera, Hemiptera and Coleoptera were recorded, respectively, in both the ecosystems. A total of 18 weed species were recorded in partially weeded rice ecosystem. Among them, *Cyperus iria, C. rotundus, C. diformis, Ehinochloa colonum, E. crus-galli, Panicum repens, Brachiaria mutica* and *Eclipta alba* were dominant.

Key words : Flood water arthropods, Odonata, Ephemeroptera, Hemiptera,Coleoptera, Community turn over, Weed plants

INTRODUCTION

Numerous species of flood water arthropods are residing in rice aquatic ecosystem of Tamil Nadu. In the philippines, Barrion (1979) recorded the two species of giant water bug *viz*., *Diplonychus rusticus* (Fabricius) and *Lethocerus indicus* (Lepeletiller + Serville) (Hemiptera: Belostomatidae), the species of water measurer, *Hydrometra lineata* Eschsch (Hemiptera: Hydrometridae) and the two species of back swimmer, *Anisops kurawai* Matsumura and *Anisops* sp., (Hemiptera: Notonectidae) in wetland rice conditions. Sridharan *et al.* (2000) recorded Anisops sardea species of backswimmer and *H. vittata* species of water measurer in an irrigated rice ecosystem of Tamil Nadu, India. In Tamil Nadu, community turnover of flood water arthropods had not been studied earlier. Hence, the present investigation was taken up with a view to know the community turnover and species of aquatic arthropods between weeded and partially weeded rice ecosystems of Tamil Nadu.

MATERIALS AND METHODS

A field trial was conducted in an irrigated condition at the Wetlands of Agricultural College and Research Institute, Madurai, during *kharif* 2000 at an altitude of 147 m msl with temperature ranging between 24 and 38^0 C. The study area received water from the Vaigai dam and the annual rainfall was 928.00 mm in the year, mostly from the northeast monsoon between July and November. The size of the experimental plots was 5 x 5 m during the season. In this season four ruling rice varieties *viz*., MDU 5, ADT 36, ADT 39 and ADT 43 were grown and each variety was subdivided into weeded (all the weed plants removed) and partially weed plot (10 weed plants per square metre allowed with rice plants). A spacing of 30 cm was allowed between treatments. Twenty five sweeps were made diagonally across each plot with dip net and the collected materials were flushed into coded vials containing 70 % ethyl alcohol. The collection of aquatic arthropods was done at weekly intervals from 30 days after transplanting. The collected arthropods were recorded and the data were used for a statistical analysis.

On each date t after the first sample, to obtain estimates of succession rates in weeded and partially weeded ecosystems, a modification of Sorensen's index of similarity was used (Diamond, 1969).

$$\% \text{ To } (t) = 100. [(a+b) / (c+d-e)].$$

Where, a is the number of taxa in the 1^{st} sample but not in sample t

b is the number of taxa in sample t but not in the 1^{st} sample

c is the number of taxa present in the 1^{st} sample

d is the number of taxa present in sample t and

e is the number of joint taxa occuring in both samples