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Insect Diversity of Some Selected Species in Three Agricultural Lands in Tirunelveli District

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Abstract

Biodiversity is one of the most important issues worldwide nowadays. The present study deals with the insect diversity of three rice ecosystem of Tirunelveli district of Tamilnadu. A study was made in three rice field during December 2011 to February 2012. The sweep net collection yielded five orders namely Hemiptera, Lepidoptera, Hymeoptera, Odoata ad Orthoptera. The diversity idex (Simpson's index ad Shannon-Weiner) and Margalef and Mehinick richness index were calculated. From this study it was observed that the Hemiptera (54%) was the predominant order than the other orders. The Shanno-Weiner index value was varied for various months. Highest simpson's index was recorded during January at Kuthukkal (0.2). Highest Shannon-Weiner index was recorded during January at Vellaikovil (2.5). The preset study revealed that the most of the sweep net collected insect were pest of the agro ecosystem.

Keywords: Insect diversity, rich field, pest

Introduction

Biodiversity is one of the most important issues worldwide nowadays and each country has various policy measures to preserve it. As long as the conservation of biodiversity and ecosystems is closely linked to human life, the efforts to preserve and improve our eco systems assume importance in the field of agriculture.

Biodiversity of insects are important, whether viewed from ecological, economic, aesthetic or other perspectives (Wijesekra and Wijesinghe, 2003).

Paddy is considered to be important one in the conservation of wetland ecosystems. Rice cultivation is thought to be the oldest form of intensive agriculture by man. (Fernado, 1977). Rice is attacked by several pest and cause damage and loss (Datta and Khush, 2002).

Insect diversity accounts for the large proportion of all biodiversity on the planet, with over 1,032,000 insect described. The total number may be much higher, as much as 10 to 30 million in fact of those described species, insects comprise 751,000 species or 72.8% of all animals. Insects are an even larger proportion of the terrestrial animals of nearly 85%. It is estimated that there are 60,000 insects, many more un-identified species exist (Krishnan, 1993).

Insects are essential in the following roles within the ecosystem nutrient recycling, via leaf litter and wood degradation, dispersal of fungi, dispersal of carrion and dung (Vinod and Sabu, 2007) and soil turn over; plant propagation, including pollination and seed dispersal; maintenance of plant community composition and structure, via phytophagy, including seed feeding (Lowman, 2006). Their removal or loss can cause negative effects in the eco-systems stability and diversity (Krishnan, 1988).

This study was carried out with objective of accessing the insect diversity in three areas around Palayamkottai in Tirunelveli district.

Materials and Methods

Study site

This study was conducted during December 2011 to February 2012 at Tirunelveli. The total area of the Tirunelveli city is 108.65 km^2.

This paper originated from the *National Conference on* "Biodiversity Conservation and Sustainable Utilization" (11-12th October 2012).

Insects were collected from the rice field using Quadrant method, at three selected paddy field in Tirunelveli District. The locations are:

Site 1 : Kuthukkal
Site 2 : Vellakovil
Site 3 : Thimmarajapuram.

The Sampling of the insects was conducted over a 3 month period from December 2011-February 2012 encompassing the rice field.

Biodiversity indices such as Richness indices like Margalef index (R1) and the Mennhinick index (R2) and the Diversity indices like the Simpson's index (λ), Shannon's Weiner index (H'), Hill's diversity numbers and the Evenness index (E) used to estimate the diversity of insects in a given habitat (Maguran, 2004) were calculated.

Results and Discussion

A total number of insects belonging to these orders are Hemiptera, Odonata, Lepidoptera, Orthoptera and Hymenoptera were collected from December 2011 to February 2012 in three rice agro ecosystem at Kuthukkal, Vellakovil and Thimmarajapuram.

Totally 2611 insects belonging to different species under five orders were collected from the paddy ecosystem at these three areas. There were variations on the total number of individuals collected among the maximum number of insect was observed during January 2012. Hemiptera ranked first with the large population of individuals and percentage (1410 and 54%). The orders followed by Hemiptera were Odonata (701, 26.84%) Lepidoptera (250, 9.6%), Orthoptera (155, 5.93%), Hymenoptera (95, 3.63%).

The highest calculated Margalf index richness indices were observed in the month of December in Kuthukkal. The highest calculated Menhinick indices were observed in the month of December in Vellakovil. The maximum calculated Simpson's indices were observed in the month of December in Kuthukkal. The maximum calculated Shannon-Weiner index was observed in the month of January in Kuthukkal.

Conclusion

The sweep net collection yielded five orders namely, Hemiptetra, Odonata, Lepidoptera, Orthoptera and Hymenoptera. The Hemiptera (54%) was the predominant orer than the other orders. Hymenoptera (3.63%) was the least recorded order with less number of individuals. Highest simpson's index was recorded during December at Kuthukkal (0.21). Highest Shannon-Weiner index was recorded during January at Vellaikovil (2.5).

The Margalef and Menhinick richness indices calculated during the study period revealed that most species richness indices observed during December at Vellaikoil, with 3.46 and 1.41 respectively. The present study revealed that the most of the sweep net collected insects were pest of rice agro ecosystems.

References

Ananthakrishnan, T.N. 1988. Dynamics of litter ecosystems in natural and interfered forests. *International J. Eco. Envir. Sci,* 14:61-66.

Ananthakrishnan, T.N. 1993. Biological diversity concepts and conservation strategies *Hexapoda,* 5(2):5-8.

Anu, A. and Sabu, T.K. 2007. Biodiversity analysis of forest litter and assemblages in the way and Region of Western Ghats using taxanomic and conventional diversity measures. *J. ins. sci.* 7:6-18.

Datta, S.K. and Khush, G.S. 2002. Improving rice to meet food and nutrient needs: Biotechnological approaches. *J. Crop. prod.* 6:229-247.

Fernado, C.H. 1977. Investigation on the aquatic fauna of tropical rice fields with special reference to South-East-Asia.

Lowman, M. 2006. Seasonal variation in insect abudance among three Australian rain forests, particular reference to phytophagous types. *J. Aust. Ecol.* 7:353-365

Magurran, A.E. 2004. Ecological Diversity and its Measurment Australia: Croom Helm. pp. 179.

Vinod, K.V and Sabu, T.K. 2007. Species composition and community structure of dung Beetles attracted to dung of gaur and elephant in the moist forests of South Western Ghats. *J. Ins. Sci.* 7: 56-69.

Wijesekara, A. and Wijesinghe, D.P. 2003. History of insect collection and a review of insect diversity in Srilanka. *Bio. Sci.,* 31: 43-59.