World Academy of Science, Engineering and Technology
International Journal of Bioengineering and Life Sciences
Vol:9, No:12, 2015

Effect of Varied Climate, Landuse and Human Activities on the Termite (Isoptera: Insecta) Diversity in Three Different Habitats of Shivamogga District, Karnataka, India

Authors : C. M. Kalleshwaraswamy, G. S. Sathisha, A. S. Vidyashree, H. B. Pavithra

Abstract : Isoptera are an interesting group of social insects with different castes and division of labour. They are primarily wood-feeders, but also feed on a variety of other organic substrates, such as living trees, leaf litter, soil, lichens and animal faeces. The number of species and their biomass are especially large in tropics. In natural ecosystems, they perform a beneficial role in nutrient cycles by accelerating decomposition. The magnitude and dimension of ecological role played by termites is a function of their diversity, population density, and biomass. Termite assemblage composition has a strong response to habitat disturbance and may be indicative of quantitative changes in the decomposition process. Many previous studies in Western Ghat region of India suggest increased anthropogenic activities that adversely affect the soil macrofauna and diversity. Shivamogga district provides a good opportunity to study the effect of topography, cropping pattern, human disturbance on the termite fauna, thereby acquiring accurate baseline information for conservation decision making. The district has 3 distinct agro-ecological areas such as maidan area, semi-malnad and Western Ghat region. Thus, the district provides a unique opportunity to study the effect of varied climate and anthropogenic disturbance on the termite diversity. The standard protocol of belt transects method developed by Eggleton et al. (1997) was used for sampling termites. Sampling was done at monthly interval from September-2014 to August-2015 in Western Ghats, semi-malnad and maidan habitats. The transect was 100m long and 2m wide and divided into 20 contiguous sections, each 5 x 2m in each habitat. Within each section, all the probable microhabitats of termites were searched, which include dead logs, fallen tree, branch, sticks, leaf litter, vegetation etc.,. All the castes collected were labelled, preserved in 80% alcohol, counted and identified to species level. The number of encounters of a species in the transect was used as an indicator of relative abundance of species. The species diversity, species richness, density were compared in three different habitats such as Western Ghats, semi-malnad and maidan region. The study indicated differences in the species composition in the three different habitats. A total of 15 species were recorded which belonging to four sub family and five genera in three habitats. Eleven species viz., Odontotermes obesus, O. feae, O. anamallensis, O. bellahunisensis, O. adampurensis, O. boveni, Microcerotermes fletcheri, M. pakistanicus, Nasutitermes anamalaiensis, N. indicola, N. krishna were recorded in Western Ghat region. Similarly, 11 species viz., Odontotermes obesus, O. feae, O. anamallensis, O. bellahunisensis, O. hornii, O. bhagwathi, Microtermes obesi, Microcerotermes fletcheri, M. pakistanicus, Nasutitermes indicola and Pericapritermes sp. were recorded in semi-malnad habitat. However, only four species viz., O. obesus, O. feae, Microtemes obesi and Pericapritermes sp. species were recorded in maidan area. Shannon's wiener diversity index (H) showed that Western Ghats had more species dominance (1.56) followed by semi- malnad (1.36) and lowest in maidan (0.89) habitats. Highest value of simpson's index (D) was observed in Western Ghats habitat (0.70) with more diverse species followed by semi-malnad (0.58) and lowest in maidan (0.53). Similarly, evenness was highest (0.65) in Western Ghats followed by maidan (0.64) and least in semi-malnad habitat (0.54). Menhinick's index (Dmn) value was ranging from 0.03 to 0.06 in different habitats in the study area. Highest index was observed in Western Ghats (0.06) followed by semi-malnad (0.05) and lowest in maidan (0.03). The study conclusively demonstrated that Western Ghat had highest species diversity compared to semi-malnad and maidan habitat indicating these two habitats are continuously subjected to anthropogenic disturbances. Efforts are needed to conserve the uncommon species which otherwise may become extinct due to human activities.

Keywords : anthropogenic disturbance, isoptera, termite species diversity, Western ghats
Conference Title : ICE 2015 : International Conference on Entomology
Conference Location : Penang, Malaysia
Conference Dates : December 03-04, 2015