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Comparison of Faunal Wealth of a Selected Oil Palm Plantation and a Rubber Plantation in the Wet Zone of Sri Lanka

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Abstract

A rapid increase in oil palm plantations has been evident in the low country wet zone of Sri Lanka as it is an economically profitable crop. Nevertheless, oil palm receives an immense resistance by the public claiming diminution of the water table and biodiversity wealth. Rubber plantations, which are often replaced by oil palm are claimed to be more environmentally friendly than oil palm plantations. The current study was designed to reveal the faunal wealth of selected oil palm plantations (OPP) and rubber plantations (RP) with reference to microclimatic conditions. It was hypothesized that there is no difference in faunal wealth of OPP and RP as measured by species richness, abundance and diversity indices. Three OPP and two RP in Agalawatta (N 6^o 32' 50" E 80^o 14' 01"-N 6^o 32' 50" E 80^{o}13' 55") were selected for the study. Species richness and abundance of selected faunal groups were determined with reference to environmental factors (ambient temperature, relative humidity, soil moisture, litter depth, light intensity and canopy cover) from March to September 2018. Species richness and abundance of invertebrates (butterflies and dragonflies) and vertebrates (amphibians, reptiles, birds and mammals) were studied using line transects, circular plot counts, visual encounter survey technique, quadrate cleaning technique, live trapping and hair tube sampling. Shannon-Weiner Diversity Index (H) was determined for different faunal groups inhabiting OPP and RP. Soil moisture content in OPP was significantly higher than that of RP (t-test $p<0.05$) while litter depth was significantly higher in RP ($p<0.05$). Ambient temperature, relative humidity, light intensity and canopy cover did not differ significantly between the two plantations. Species richness of fauna of OPP and RP were 54 (Endemic 16) and 30 (Endemic 5) respectively. Vertebrate diversity did not differ significantly between OPP (H=2.68) and RP (H=2.53), however, invertebrate diversity of OPP (H=2.26) was significantly higher than that of RP (H=0.95) (t-test $p<0.05$). Diversity of birds and reptiles were higher in RP than OPP while diversity of amphibians and small mammals were higher in OPP. Rare point endemic bush frog *Polypedates ranwellai* was found in oil palm plantations, which is considered as a range extension. This preliminary study revealed that overall faunal wealth of oil palm plantations is slightly higher than that of rubber plantations and this could be attributed to the availability of microhabitats.

Keywords: Oil palm cultivations, Biological diversity, Microclimatic parameters, Herpetofauna