

ASSESSING VARIATION OF BIOACTIVITY OF *Dendrophthoe falcata* ON THE HOST *Limonia acidissima* IN DIFFERENT ENVIRONMENTAL REGIONS OF SRI LANKA

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Dendrophthoe falcata (L.f) Ettingsh, locally known as “Pilila” (Family Loranthaceae) is a hemiparasitic plant grown on a variety of hosts with many medicinal applications. The bioactivity of the hemiparasite has proven to be heavily dependant on the host on which it grows. It shows high antioxidant activity coupled with high toxicity when it grows on the host, *Limonia acidissima* (L.) (Woodapple, Family Rutaceae). The aim of the present study was to investigate the impact of environmental conditions on the bioactivity of the hemiparasite grown on host *Limonia acidissima*, as the environmental conditions may play a role in determining the secondary metabolites produced in a plant. The hemiparasite grown in Hambantota (Hamb-Arid zone), Kurunegala (Kuru-Intermediate zone) and Ambalantota (Amba-Arid zone) were selected for the study. Sequential extracts of hexane (Hamb-HE, Kuru-HE, Amba-HE), ethyl acetate (Hamb-EAE, Kuru-EAE, Amba-EAE) and methanol (Hamb-ME, Kuru-ME, Amba-ME) were studied to compare the antioxidant activity, toxicity, polyphenolic content and alkaloid content. Antioxidant activity, determined by 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay was 13% higher for Hamb-EAE compared to Kuru-EAE. Brine shrimp lethality assay was used to determine the toxicity and it revealed that *Dendrophthoe falcata* collected from Hambantota showed the highest toxicity for the three extracts. The toxicity was 38% higher for Hamb-HE than Kuru-HE. Out of the ethyl acetate extracts Hamb-EAE is almost 50% more toxic than Kuru-EAE. A significant three-fold difference was observed in total polyphenolic content of Hamb-ME compared to the other two locations which were investigated by Folin-Ciocalteu method. Hamb-ME showed the highest alkaloid percentage which was 21.9%. On average among the three locations, extracts of Ambalantota showed intermediate bioactivities, and the least bioactivities were observed for extracts of Kurunegala, which experience intermediate and least stressed environmental conditions, respectively. Extracts of plants collected from Hambantota, the location having the most stressed environmental conditions, showed the highest bioactivity compared to the other two locations. Hence, it is clear that environmental conditions have an impact in governing the production of secondary metabolites produced, which in turn affects the bioactivity exhibited by *Dendrophthoe falcata*.

Keywords: Antioxidant activity, *Dendrophthoe falcate*, Environmental impact, Secondary metabolite production, Toxicity