# Comprehensive Evaluation of the Anticancer, Wound-Healing, Bioelectricity, Larvicidal, and Biofilm Inhibition Properties of Six Native Plant Species: Innovations for Novel Drug Discovery

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Plant-based natural products are utilized as active ingredients in herbal medicines, and studying their bioactivities is necessary for evaluating their medicinal value. The present study aims to evaluate five bioactivities of Pseudophoenix sargentii, Byrsonima lucida, Glandularia maritima, Illicium parviflorum, Pinus elliottii, and Ulmus alata, preceded by a phytochemical analysis and other bioactivity screenings during my past study. Leaves were shade dried and powdered; extracts were prepared by sonication. Utilizing varied concentrations of leaf extracts, anticancer activity (MTT assay), wound-healing activity, bioelectricity generation (plant microbial fuel cell), larvicidal activity and biofilm inhibition (XTT assay) were analyzed. P. ellioti extracts induced a time-dependent decrease in glioblastoma cell survival, with 24% decrease observed at 24 hrs and 65% at 72 hours. B. lucida extracts produced a cytotoxic effect in cultured human astrocytes. U. alata extract inhibited astrocyte migration in a wound-healing assay. Microscopic analysis of astrocyte morphology indicated that treatment with P. ellioti extracts induced apoptotic activity. B. lucida induced the highest levels of bioelectricity generation across all three anodic configurations and two different soil types. B lucida extracts also demonstrated the greatest biofilm inhibition properties against C. glabrata. The synergistic treatment of U. alata and P. ellioti demonstrated the highest larvae mortality rate for Aedes aegypti and Aedes albocitus. GC-MS analysis demonstrated the presence of chemicals, including butylamine, aziridines, and alanine. Out of six tested native plant species, B. lucida demonstrates the highest potential for development of novel pharmaceutical drugs for noncommunicable diseases.

**Awards Won:**