

ABSTRACT

Investigation into the potential of local plants as sources of bioactive agents

Celeste Marie-Ange Chariandy

The natural mixture of secondary metabolites found in plants constitutes a resident chemical cornucopia that enables a variety of interactions with other organisms in the natural environment. Tapping into this resource, plant extractives are studied for their usefulness in biological control strategies. In this thesis, the bioactive potential of selected species of the local flora was investigated by conducting a series of experiments which tested crude extracts of some plants against various organisms.

Plants, and their respective tissues were selected on the basis of alleged bioactivities alluded to in the literature, via folkloric references or chemical profiles, as well as their local availability. Crude test fractions were prepared of the petroleum ether and ethyl acetate soluble components, from the total extracts of the selected plant tissues in a 50% solution of dichloromethane in ethanol.

Preliminary screening was done to acquire mortality data of the 24-hour nauplii of the brine shrimp, *Artemia salina*, using 128 test fractions. Thirty-five percent of the tested

fractions showed outstanding results gauged from at least 75-100% mortality of the nauplii within 48 hours exposure to the test fractions.

Further testing of these fractions for anti-bacterial activity provided information on their growth inhibitory potentials versus a battery of bacterial species, such as: *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus epidermis*, *Streptococcus faecalis* and *Salmonella typhimurium*. Twenty-six percent of the tested fractions yielded some inhibitory effect with two test fractions showing 100% inhibition of *P. fluorescens* and *S. aureus*.

The effects of some of the plant extracts on the development and survival of IV-stage larvae of the *Aedes aegypti* mosquito also were observed. The outstanding categories of results were larvicidal activity and growth retarding effects; the latter including prolonged larval periods, reduced pupation and reduced eclosion.

The investigation yielded data on the versatility of the plant extracts, notably, the ethyl acetate fractions of leaf tissue of *Catharanthus roseus*, leaf tissue of *Manihot utillissima*, and aerial tissues of *Justicia pectoralis*, and the petroleum ether fractions of leaf tissue of *Catharanthus roseus* and leaf tissue of *Neurolaena lobata*. This work also contributed to baseline information on the variety of bioactive potentials of the selected representatives of our local flora.