The efficacy of essential oil of *Plectranthus zeylanicus* plant against *Callosobruchus maculates* (F.)

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The bruchid, *Callosobruchus maculatus* (F.) causes major losses during the storage of cowpea seeds [*Vigna unguiculata* (L.)Walp.] in Sri Lanka. Essential oil isolated from *Plectranthus zeylanicus* plant was tested for potential insecticidal activity against *C. maculatus*. The major constituents of the essential oil of *P.zeylanicus,* p - cymene (3.55%), caryophyllene (0.24%), geranyl acetate (9.3%), and geraniol (7.2%) were identified by the retention time in gas chromatography studies. The adults of *C. maculatus* were susceptible to both fumigant and contact toxicity of *P. zeylanicus* plant oil. In the fumigant toxicity assay LC_{50} value of 0.927g/L was obtained. LC_{50} value of 0.010g/L was obtained for the contact toxicity of *P. zeylanicus* plant oil. Oviposition and F_1adult emergence were significantly inhibited by *P. zeylanicus* plant oil at concentration higher than 0.001g/L in both contact toxicity and fumigant toxicity. The analysis of olfactometer bioassay and choice chamber bioassay revealed the repellent effects of the oil of *P. zeylanicus* plant. Oil repelled adult *C. maculatus*, making more bruchids to found in the control bottles than oil treatments. The results obtained for control and ethanol in olfactometer bioassay were not significantly different from each other indicating that the use of ethanol has no effect on insect repellency.

Aspartic protease inhibitory activity of *Ancardium occidentale*

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Natural inhibitors of serine, cysteine and metalloproteinases have been isolated from plants, animals and bacteria and characterized. However, relatively few studies have been reported on natural inhibitors of aspartic proteinases. Aspartic proteinases participate in a variety of physiological processes and their activities are associated with onset of pathological conditions such as hypertension, inflammation and gastric ulcers. Recently aspartic proteinases have become enormously important since two aspartic proteinases, human immunodeficiency virus proteinase and malarial parasite proteinase are targeted as key therapeutic intervention points in the treatment of AIDS and malaria, respectively.

Ten grams of bark of *Ancardium occidentale* was chopped using a mortar and pestle and dissolved in 50 ml of distilled water. Inhibitory assay was carried out by incubating the enzyme with crude extract and determining the remaining activity. Porcine pepsin and denatured bovine hemoglobin were used as the aspartic proteinase and substrate, respectively. Thermal stability of the inhibitor in crude extract was studied by incubating the extract at different temperatures and determining the remaining activity. DEAE cellulose, CM cellulose and $(NH_4)_2SO_4$ precipitation were used to partially purify the inhibitor.

Significant inhibitory activity (60%) was detected in water extracts of the *A.occidentale* bark. The activity did not change significantly during incubation at 4℃ for 2 weeks. But the activity drastically reduced when incubated at room temperature and 37℃ for 2 weeks. More than 80% of the inhibitory activity of the crude extract was recovered after dialysis using membranes with a 12 kDa molecular weight cut off point. Considerable inhibitory activity was not obtained for eluted fractions for DEAE cellulose and CM cellulose columns. Ammonium sulfate at 10% -70% saturation resulted in precipitation of inhibitor/s. The stability of resultant inhibitor precipitated at 70% $(NH_4)_2SO_4$ saturation is comparable to that of crude extract.

This assay procedure provided the quantitative measurement of the inhibitory activity for the inhibitor/s present in the bark extract. More than 80% remaining inhibitory activity was retained after complete dialysis with the 12 kDa membrane. This implies that inhibitor/s present in the sample is/are macromolecule/s presumably a protein/s with a