

ABSTRACT

Chemical Investigation of

Desmodium tortuosum (Swartz) DC

Desmodium tortuosum (Swartz) DC (common name: beggarweed) is a member of the Leguminosae family and has been known as a prolific weed of the soya (*Glycine max*) and peanut (*Arachis hypogaea*) industries. The natural products isolated from this plant in this study were dillapiole (DT-4), *trans*-2,3-dihydroxy-2-methyl- γ -butyrolactone (DT-3) and spinosin – a C-glycosylated flavone (DT-1). The octa-acetylated spinosin (DT-2) was synthesised from spinosin (DT-1). The structures of these compounds were elucidated using a combination of the following experiments: UV-vis spectroscopy, mass spectrometry, ^1H , ^{13}C , ^1H - ^1H COSY, HMBC, HSQC, HMQC, T-ROESY and NOE NMR experiments.

Spinosin, the major component of the plant, exhibited retardation of lettuce seed germination. The butyrolactone, DT-3, is a known negative feedback inhibitor in the synthesis of valine in leguminous plants. Dillapiole is known to act synergistically with other insecticides. Antibacterial screening of the petroleum ether, dichloromethane, ethyl acetate and butan-1-ol extracts of *Desmodium tortuosum* revealed that the dichloromethane extract was most effective against *Bacillus subtilis* and *Staphylococcus aureus* at concentrations of 100 and 500 ppm, respectively.

Keywords: Karlene Carolyn Lewis, *Desmodium tortuosum*, spinosin, NMR, variable temperature NMR, molecular modelling, antibacterial testing, lettuce seed germination bioassay