

ABSTRACT

Biological activity of whole plant extracts of *Croton humilis* and *Chenopodium ambrosioides* on *Cylas formicarius elegantulus* (sweet potato weevil)

Kashena Powell-Bennett

Whole plant extracts of dried and green *Croton humilis* and *Chenopodium ambrosioides* were made using various solvents (ethanol, hexane and acetone). The crude ethanol extracts of dried *Croton humilis* and dried *Chenopodium ambrosioides* exhibited acute toxicity (LC_{50} – 0.260g/mL, LC_{95} – 0.530g/mL; LC_{50} – 0.168g/mL, LC_{95} – 0.243g/mL respectively). Both dried *Croton humilis* and dried *Chenopodium ambrosioides* were effective over different time periods depending on the concentration of crude extract used, (LT_{50} – 40.152 hrs, LT_{95} – 63.170 hrs; LT_{50} – 20.614 hrs, LT_{95} – 37.875 hrs respectively) using LC_{50} and (LT_{50} – 19.321, LT_{95} – 33.854; LT_{50} – 10.123, LT_{95} – 20.542 respectively) using LC_{95} .

Of the extracts made from the green plants, the ethanol extract resulted in the highest percentage mortality. When this was fractionated, the 25% acetone/hexane removed the most toxic compounds.

The crude extract of the dried and green plants were assessed for antifeedant properties. When alternative and no alternatives were provided, the significance of solvent, time and sex varied each day over the five day period. For

the entire 5 day period however, the plants, solvent and sex of insect had a significant impact on inhibition of feeding when alternatives were provided. The effect of plant, solvent and sex on the inhibition of feeding was significant over the five day period when no alternative was provided.

The extracts were also tested for semiochemical properties. Both plants and the solvents used had a significant impact on the semiochemical responses. The acetone extract (C.A. = -14.5), the ethanol extract (C.A. = -92.61) of green *Chenopodium ambrosioides* and the ethanol extract of dry *Chenopodium ambrosioides* (C.A. = 59.28) were repellents. Acetone extracts (C.A. = -36.47) and hexane extracts (C.A. = -18.89) of green *Croton humilis* were repellents. Ethanol extracts of green (C.A. = 28.05) and dry (C.A. = 58.83) *Croton humilis* were attractants.

Keywords: Kashena Powell-Bennett, insect mortality, antifeedant, semiochemical, olfactory, attractant, repellent, *Croton humilis*, *Chenopodium ambrosioides*