

Anti-feedant and Molluscicidal Activities of Selected Spices Against *Achatina fulica* (Gastropoda: Achatinidae)

ABSTRACT

The application of biopesticides is progressively encouraged for its advantages associated with environmental safety and high biodegradability. The objectives of this study were to compare the phytochemical constituents, anti-feedant, and molluscicidal activities of spices against the giant African land snail, *Achatina fulica*. The spices evaluated were clove (*Syzygium aromaticum*), cinnamon (*Cinnamomum verum*), black pepper (*Piper nigrum*), cumin (*Cuminum cyminum*) and coriander (*Coriandrum sativum*). Phytochemical constituents of spices were screened by qualitative standard protocols. Anti-feedant activity was investigated by the leaf disc no-choice bioassay method and molluscicidal activity was evaluated by a 72-h contact toxicity test. The phytochemical screening showed positive results for tannins, saponins, alkaloids, flavonoids, terpenoids, and phenols in clove, cinnamon, cumin and coriander ethanolic extracts whereas only tannins, alkaloids and terpenoids were found in the black pepper ethanolic extract. The leaf disc no-choice bioassay revealed that all spices demonstrated antifeedant activity ($p < 0.05$, compared to control). However, only clove ($85.33 \pm 3.09\%$), cinnamon ($72.35 \pm 3.41\%$) and coriander ($81.54 \pm 3.88\%$) ethanolic extracts showed high feeding inhibition activity, whereas black pepper ($68.85 \pm 3.22\%$) and cumin ($68.96 \pm 3.12\%$) had moderate antifeedant activity. In the contact toxicity test, clove ethanolic extract ($52.67 \pm 1.53\%$) showed moderate molluscicidal activity, meanwhile cinnamon ($19.34 \pm 2.08\%$), black pepper ($16.65 \pm 1.15\%$), cumin ($18.96 \pm 1.42\%$) and coriander ($22.67 \pm 1.37\%$) demonstrated low molluscicidal activity. In conclusion, all spices tested in this study showed the presence of important secondary metabolites that contribute to anti-feedant and molluscicidal activities at differencing levels.