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CHEMICAL COMPOSITION OF *CITRUS NOBILIS* AND *CITRUS MEDICA* FRUIT PEELS AND THEIR REPELLENT ACTIVITY AGAINST *CALLOSOBRUCHUS MACULATUS* (F.) (COLEOPTERA; BRUCHIDAE)

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ABSTRACT

Cowpea, *Vigna unguiculata* (L.) is a popular food crop grown in Sri Lanka which is also considered as a rich source of protein. In storage, cowpea seeds are attacked by a number of insect pests and among them cowpea bruchid (*Callosobruchus maculatus* (Fab.)) is the most destructive pest. As several Citrus species have been documented as a source of botanical insecticides to control *C. maculatus*, the present study was carried out with the view of investigating the repellent activity and chemical composition of fruit peels of *Citrus nobilis* and *Citrus medica*. Repellent effect was assessed under laboratory conditions (28±2°C and 84±2% RH) by using a dual-choice olfactometer. Three doses of fruit peel (1, 4, 7g) were tested after 15, 30 and 60 mins of exposure to adult beetles. Volatile fraction of fruit peel of both species was separately extracted by HS-SPME (medium polar fiber) technique combined with GC-MS for the identification of chemical constituents. With both Citrus species, insect repellency increased with the increase of the dose and time of exposure. At the highest dose after 60 mins of exposure, *C. nobilis* elicited 95% repellent effect whereas *C. medica* showed only 65% effect. All three doses of the two Citrus species produced more than 50% insect repellency even after 30 minutes of exposure. A total of 37 and 26 volatile components were identified in *C. nobilis* and *C. medica* fruit peels respectively. D-Limonene was the major constituent of both *C. nobilis* (45.3%) and *C. medica* (68.3%). p-Mentha-4,8-diene (3.7%) and α-Terpinolene (3.0%) in *C. nobilis* and β-Myrcene (7.5%) and Linalool (4.7%) in *C. medica* fruit peel were also identified. The results suggest that both Citrus species, especially *C. nobilis* have potential to be developed as natural repellents to minimize damage caused by *Callosobruchus maculatus.*

Keywords: Citrus nobilis, Citrus medica, Callosobruchus maculatus, Repellency