Title	Bioactivities of *Cocos nucifera* L. (Arecales: Arecaceae) and *Terminalia catappa* L. (Myrtales: Combretaceae) leaf extracts as post-harvest grain protectants against four major stored product pests
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Abstract

Compounds extracted from the leaves of coconut palm, *Cocos nucifera* L. (Arecales: Arecaceae) and the Indian almond, *Terminalia catappa* L. (Myrtales: Combretaceae) were assessed as potential grain protectants against four major pests of stored grains, *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae), *Rhyzopertha dominica* (F.) (Coleoptera: Bostrychidae), *Tribolium castaneum* (Herbst) (Coleoptera: Tenebrionidae), and *Callosobruchus chinensis* (L.) (Coleoptera: Bruchidae). The crude leaf extracts and their fractions were obtained by solvent elution and bioassayed in the laboratory, focusing on (a) the duration of protection and (b) their effects on progeny production. Results showed that adults of *C. chinensis*, *S. oryzae,* and *T. castaneum* were equally susceptible to the fumigant toxicity of *C. nucifera* and *T. catappa* crude extracts as well as their column eluted fractions. On the contrary, adults of *R. dominica* showed tolerance to all the extracts tested in both fumigation and contact mode bioassays. *Cocos nucifera* crude extracts were highly effective in offering long-term protection in residual toxicity trials and along with the crude extracts of *T. catappa* showed strong repellent properties against the tested species except for *R. dominica* in a Y-tube olfactometer. Generally, the chromatographic fractions of crude leaf extracts eluted with ethyl acetate were significantly more effective than methanol, chloroform or hexane-eluted fractions. Further, all the tested plant extracts demonstrated a negative impact on several biological parameters such as feeding activity and progeny production of the tested species. These results highlight the potential of *C. nucifera* and *T. catapa* extracts as potent insecticides, feeding deterrents and progeny production inhibitors and consequently are suitable for the control of pests in stored commodities.

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