



Assessment of the Nutritional Content of Cowpea Seed exposed to Plant-Derived (Azadirachtin, Myristicin and α -Humulene) Insecticides against *Callosobruchus maculatus*

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Abstract

The utilization of synthetic insecticides for safeguarding cowpea seed against *C. maculatus* infestation, while effective, faces substantial opposition due to safety apprehensions. The detrimental impact of *Callosobruchus maculatus* infiltration on cowpea seed quality serves as an indicator that could be utilized to assess the effectiveness and reliability of newly developed eco-friendly botanical insecticides. This study aimed to analyse the nutritional composition of cowpea seed treated with specific botanical insecticides namely, azadirachtin, myristicin, and α -humulene-based alternatives against *C. maculatus*. Concentrations (0.003 $\mu\text{g/mL}$, 0.006 $\mu\text{g/mL}$, and 0.013 $\mu\text{g/mL}$) of azadirachtin, myristicin, and α -humulene-based insecticides respectively exhibited sustained effectiveness against *C. maculatus*. Notably, the protein, ash, lipid, and fibre content of infested cowpea seed that remained untreated were significantly lower ($P < 0.05$) than those of the treated infested cowpea seed. Conversely, the carbohydrate and moisture content of the untreated infested cowpea seed were significantly higher ($P < 0.05$) than those found in the treated infested cowpea seed. When examining mineral content, cowpea seed treated with botanical insecticides displayed significantly higher ($P < 0.05$) mineral levels compared to untreated non-infested cowpea seed, yet significantly lower ($P < 0.05$) mineral levels in comparison to the untreated infested cowpea seed. The outcomes of this investigation suggest that the mentioned botanical insecticides hold promise as viable alternatives to synthetic options in post-harvest cowpea bruchid management.

Keywords: Botanical insecticides; *Callosobruchus maculatus*; Infestation; Mineral; Nutrients; Proximate; Synthetic insecticide