

Title Integration of Calneem® oil and parasitoids to control *Cadra cautella* and *Corcyra cephalonica* in stored grain cereals

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Abstract

The compatibility and protectant potential of Calneem® oil derived from the neem tree *Azadirachta indica* and two parasitoids, *Habrobracon hebetor* and *Venturia canescens*, for the control of the rice moth *Corcyra cephalonica* (Stainton) (Lepidoptera: Pyralidae) and the tropical warehouse moth *Cadra cautella* Walker (Lepidoptera: Pyralidae) in stored rice and wheat, were evaluated in the laboratory. Calneem® oil (= neem oil) is a biopesticide produced, registered and marketed in Ghana by AQUA AGRIC Community Projects (AACP/Caldor Ghana Ltd., Tema). It contains 0.3% azadirachtin as its major active ingredient. The oil was emulsified with water using 0.07% soap. Fourth instar moth larvae were held in grain treated with neem oil only, grain treated with one of the parasitoids only, grain treated with a combination of neem and one of the parasitoids, and a control with untreated grain. Neem oil was applied at concentrations from 5,000 to 30,000 ppm. All samples were kept in growth cabinets maintained at 25°C and 65–70% r.h. Adult emergence was recorded after 4 weeks. Parasitoid or neem treatments alone reduced the emergence of *C. cephalonica* and *C. cautella*. In general, parasitoid releases were as effective as a combination of neem oil and parasitoids. At the lowest dose, 5,000 ppm, the combination of neem and parasitoid was more effective than the neem alone. The number of adults of *H. hebetor* and *V. canescens* that emerged in rice containing either parasitoids alone or in combination with neem oil was similar. This indicates minimal or no adverse effect of neem oil on the two parasitoids. It is thus possible to incorporate neem oil in a well-designed pest management program with parasitoids.

<http://www.springerlink.com/content/1465714727gk0840/fulltext.pdf>