

Evaluation of the efficacy of a diatomaceous earth (SilicoSec) against *Callosobruchus maculatus* F. (Coleoptera: Chrysomelidae) on three cowpea varieties

Tofel, H. K.², Wadar, E.¹, Nukenine, E. N.¹, Adler, C.²

¹ Department of Biological Sciences, University of Ngaoundere, PO Box 454, Ngaoundere, Cameroon

² Federal Research Centre for Cultivated Plants – Julius Kühn – Institute, Institute for Ecological Chemistry, Plant Analysis and Stored Product Protection, Königin-Luise-Str. 19, D-14195 Berlin
Email of corresponding author: Tofel@jki.bund.de

In search for alternative methods to residual synthetic pesticides in protection of cowpea seeds *Vigna unguiculata* (L.) Walp. in storage, the incidence of three varieties of cowpea (CRSP, LORI and TN5 - 78) on the insecticidal effectiveness of SilicoSec (diatomaceous earth) and on an insecticide of reference (Malagrain: Malathion 5%) was evaluated against *Callosobruchus maculatus* Fab. (Coleoptera: Bruchidae) under laboratory conditions of (t ≈ 21.5 - 26.5°C; r.h. ≈ 71.0 - 84.5 %). The grains of the three varieties of cowpea were mixed with the diatomaceous earth at four rates (0.5, 1, 1.5 and 2 g/kg) and with Malagrain® with the recommended amount of 0.5 g/kg. The susceptibility of the varieties of cowpea against the attack of *C. maculatus*, the mortality of the adults, the production of progeny of *C. maculatus* and the damage on the grains treated with diatomaceous earth were evaluated. The mortality of the adult beetles was recorded after 1, 2, 4 and 6 days post-exposure. Variety LORI with an index of susceptibility of 7.87 were weakly susceptible to *C. maculatus*. SilicoSec caused a significant and increasing mortality in

beetles according to the rates and periods of exposure. One day after exposure, Malagrain caused 100% of mortality in beetles. SilicoSec was most effective on the variety TN-78. The greatest rates of SilicoSec (2 g/kg) caused 100% of mortality for the three varieties after 4 days of exposure. The LC₅₀ values at 4 days were of 0.20 g/kg for varieties TN5-78 and LORI and 0.54 g/kg for variety CRSP. As in the case of Malagrain, SilicoSec reduced the emergence of the progeny on average, the percentage of grain damaged and the mass losses for the three varieties of cowpea by more than 80%. These results suggest that varietal resistance and the use of diatomaceous earth against the devastating insects in storage of cowpea could represent an alternative for the integrated management against *C. maculatus*. SilicoSec could profitably replace Malagrain for the protection of the grains of cowpea against cowpea weevil attacks.