

Title Biological activity and persistence of four essential oils towards the main pest of stored cowpeas, *Callosobruchus maculatus* (F.) (Coleoptera: Bruchidae)

Author Z. Ilboudo, L.C.B. Dabiré, R.C.H. Nébié, I.O. Dicko, S. Dugravot, A.M. Cortesero and A. Sanon

Citation Journal of Stored Products Research, Volume 46, Issue 2, April 2010, Pages 124-128

Keywords Cowpea storage pest; Essential oils; Persistence; *Ocimum americanum*; Chemical stability; Temperature cycles

Abstract

The use of essential oils extracted from native aromatic plants is perceived as a promising alternative to protect stored cowpeas in West Africa. However the optimal conditions for their efficiency remain to be determined. A study was therefore carried out to compare the biological activity and temperature-related persistence of four selected essential oils towards *Callosobruchus maculatus*, the main pest of stored cowpeas. Essential oil extracted from *Ocimum americanum* proved to be very toxic towards *C. maculatus* adults ($LC_{50} = 0.23 \mu\text{l/l}$) while the oils from *Hyptis suaveolens*, *Hyptis spicigera* and *Lippia multiflora* exhibited higher LC_{50} values ($1.30 \mu\text{l/l}$; $5.53 \mu\text{l/l}$ and $6.44 \mu\text{l/l}$ respectively). The persistence of the biological activity of the four oils was variable and that from *O. americanum* was most persistent. Fourteen days post-application, this oil was still as active on *C. maculatus* adults as it was immediately after its application. Exposure of this oil to a high temperature, close to temperatures occurring during storage in Burkina Faso in the dry season, however, resulted in a rapid decrease in its efficacy. Our results emphasize the need to take into account environmental factors such as temperature to optimize the use of promising essential oils for controlling stored-product pests in West Africa.