Title Laboratory evaluation of two diatomaceous earth formulations against *Blattisocius keegani*fox (Mesostigmata, Ascidae) and *Cheyletus malaccensis* oudemans (Prostigmata, Cheyletidae)

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Abstract

Diatomaceous earths (DEs) are very promising natural-origin pesticides against stored-product pests, but there is still inadequate information about the effect of DEs against stored-product mites. For this purpose, laboratory bioassays were conducted to assess the effects of DEs against the predatory mites *Blattisocius keegani*Fox (Mesostigmata, Ascidae) and *Cheyletus malaccensis* Oudemans (Prostigmata, Cheyletidae). Two DEs were used: SilicoSec, which contains 92% SiO_2, and PyriSec which contains 95.7% SilicoSec, 1.2% natural pyrethrum and 3.1% piperonyl butoxide. As prey, eggs of *Ephestia kuehniella* Zeller (Lepidoptera: Pyralidae) were used. The tests were conducted at three temperatures, 20, 25 and 30 °C, on wheat treated with DEs at two dose rates, 500 and 1000 ppm and mortality of mite individuals was measured after 7 days of exposure. For *B. keegani*, protonymphs were proved significantly less susceptible in comparison with adults, in most temperature/DE combinations examined. Also, for both DEs, significantly more *B. keegani* adults were dead at 30 °C than at the other two temperatures. *C. malaccensis* protonymphs were less susceptible than adults, for both DEs tested, with the exception of PyriSec at 30 °C. In the case of adults, in SilicoSec-treated wheat, significantly fewer individuals were dead at 30 °C in comparison with the other two temperatures, but this was reversed for PyriSec. The results of the present work indicate that both species are susceptible to the two DEs tested, but this susceptibility is highly determined by several factors such as formulation, dose rate and temperature.