Bioaktivnost 1,8-cineola na kukuljice kestenjastog brašnara *Tribolium castaneum* (Herbst)

Anita LIŠKA, Vlatka ROZMAN, Irma KALINOVIĆ, Andrijana EĐED, Bojana PERHOČ

Sveučilište Josipa Jurja Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku, Trg Sv. Trojstva 3, 31000 Osijek, Hrvatska, (e-mail: aliska@pfos.hr)

Sažetak

Kestenjasti brašnar *Tribolium castaneum* (Herbst), je značajan štetnik uskladištenih poljoprivrednih proizvoda. Izolat 1,8-cineol je sastavni dio esencijalnog ulja dobiven iz lišća biljke eukaliptusa. Cilj rada je ispitati fumigantnu učinkovitost 1,8-cineola na kukuljice *T. castaneum*. Fumigacija je obavljena u staklenim posudama volumena 350 ml, u 4 ponavljanja, odvojeno za svaki spol kukuljice, u dva tretmana. Izolat je testiran u 6 doza; 30, 60, i 120 µl 350 ml^{-1}vol. (tretman bez zrna) i 120, 300 i 600 µl 350 ml^{-1}vol. (tretman sa zrnom pšenice), s ekspozicijom od 48 sati. Mortalitet i aktivnost rasta insekta ocjenjena je prema skali koju je opisao Mandava. Kontrola je rađena na isti način, ali bez aplikacije ulja. Izolat 1,8-cineol je djelovao letalno na tretirane kukuljice kod oba spola i u oba tretmana. Smanjen je ukupni udio normalno razvijenih odraslih brašnara koji su se razvili iz preživjelih kukuljica. 1,8-cineol je djelovao i kao regulator rasta kukuljica, stvarajući adultoid i deformirane jedinke. Osjetljivost kukuljica je spolno uvjetovana; muški spol je osjetljiviji. Između tretmana uočena je značajna razlika u učinkovitosti 1,8-cineola. U tretmanu sa zrnom značajno je manje uginulih kukuljica i manje normalno razvijenih živih jedinki u stadiju 3 (muškog spola); te je opravdano manje deformiranih jedinki u stadiju 2 (ženskog spola). Može se zaključiti da je izolat 1,8-cineol višestruko učinkovit za suzbijanje *T. castaneum* u stadiju kukuljice.

Ključne riječi: 1,8-cineol, Tribolium castaneum, kukuljice, fumigacija

sa2011_a0513

Bioactivity of 1,8-cineole against red flour beetle *Tribolium castaneum* (Herbst) pupae

Anita LIŠKA, Vlatka ROZMAN, Irma KALINOVIĆ, Andrijana EĐED, Bojana PERHOČ

University of J.J. Strossmayer in Osijek, Faculty of Agriculture, Trg Sv. Trojstva 3, 31000 Osijek, Croatia,
(e-mail: aliska@pfos.hr)

Abstract

Red flour beetle *Tribolium castaneum* (Herbst) is a major pest of stored products. Compound 1,8-cineole is essential oil component extracted from leaves of plant eucalyptus. The aim of this study is to assess the potential fumigant effects of 1,8-cineole on the *T. castaneum* pupae. Fumigation was investigated in the glass bottles (350 ml volume), in 4 repetitions, for each sex in two treatments. Compound was tested in 6 doses; 30, 60, and 120 µl 350 ml^{-1}vol. (treatment without grain) and 120, 300 and 600 µl 350 ml^{-1}vol. (treatment with wheat grain), exposed for 48 h. Mortality and insect growth activity was evaluated following the scale of Mandava. Control was done by the same method but without oil application. Compound 1,8-cineole had lethal effect on the treated pupae at both sexes and in the both treatments. Total proportion of the normally developed beetles, which developed from the survived pupae, was decreased. 1,8-cineole had also a growth regulator effect, producing adultoid and deformed units. Pupae sensibility was sex depended; males were more susceptible. There has been a significant difference between treatments in the 1,8-cineole activity. In the treatment with the grain there were significant lower dead pupae and lower normally developed live units in the stage 3 (males); also there were significant lower deformed units in the stage 2 (females). In general, compound 1,8-cineole has multiple effect against *T. castaneum* in pupae stage.

Key words: 1,8-cineole, Tribolium castaneum, pupae, fumigation

sa2011_a0513