



**SEVENTH INTERNATIONAL CONFERENCE
SUSTAINABLE POSTHARVEST AND
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EFFICACY OF DIATOMACEOUS EARTH IN CONTROLLING MAJOR STORE PRODUCT PESTS: *Plodia interpunctella*, *Tribolium confusum* and *Acanthosclides obtectus*

Sonja GVOZDENAC¹, Dejan PRVULOVIĆ², Milica VUČINIĆ VASIĆ³, Aleksandra ILIĆ¹,
Snežana TANASKOVIĆ⁴, Jelena OVUKA¹, Miloš KRSTIĆ¹

¹Institute of Field and Vegetable Crops, Maksima Gorkog 30, 21 000 Novi Sad, Serbia

²University of Novi Sad, Faculty of Agriculture, Trg Dositeja Obradovića 3, 21 000 Novi Sad, Serbia

³University of Novi Sad, Faculty of Technical Sciences, Department of Fundamentals Sciences, Trg Dostieja Obradovića 6, 21 000 Novi Sad, Serbia

⁴University of Kragujevac, Faculty of Agronomy, 32 000 Čačak, Serbia

E-mail: sonja.gvozdenac@ifvcns.ns.ac.rs

Diatomaceous earth (DE) is a dust formed from fossilized skeletal remains of single-celled algae – diatoms. Diatoms have a fine skeleton made of amorphous silicon dioxide (SiO₂), as a major constituent of DE, which additionally contains minor amounts of minerals (aluminium, iron oxide, calcium hydroxide, magnesium and sodium). Insecticidal activity of DE is a result of desiccation that occurs after the particles of DE absorb the waterproof lipids from the arthropod cuticle (destroy epicuticular lipid layers) leading to high rate of water loss. Efficacy of DE depends on chemical composition, particle size and geographic origin. This work aimed to assess the efficacy of DE originating from Kolubara open-pit mine, Serbia, in comparison to commercially available preparation SilicoSec®.

Efficacy was assessed in contact toxicity test, against indian meal moth (*Plodia interpunctella*) larvae and confused beetle (*Tribolium confusum*) and bean weevil (*Acanthosclides obtectus*) adults. DEs were applied at rates: 5, 10, 15 and 20 mg⁻² and mortality was recorded after 24, 48, 72 h and seven days.

Significant mortality of *P. interpunctella* larvae was recorded after seven days of exposure at higher rates (15 and 20 gm⁻²) of both SilicoSec® (48.0 and 54%, respectively) and DE from Kolubara (45.6 and 58.5%, respectively). Significant mortality of *T. confusum* was achieved also at higher rates (15 and 20 gm⁻²) after seven days in treatment with SilicoSec® (54.1 and 84.3%, respectively), and DE from Kolubara (49.2 and 78.2%, respectively). Significant mortality of *A. obtectus* adults was recorded after 48 h in treatment with the highest rate of DEs (20 gm⁻²). It was 61.5% in treatment with SilicoSec® and 58.0% in treatment with DE from Kolubara. After 72 h, strong insecticidal effect was recorded at two high rates (15 and 20 gm⁻²) for SilicoSec® (49.4 and 82.1%, respectively) as well as for DE from Kolubara (56.7 and 78.5%, respectively). The results indicate that insecticidal activity of DE from Kolubara was at the same level as the commercial preparation SilicoSec® at all applied rates and after all exposure periods. Given indicates that both preparations have good potential to be used as additional surface treatment in storages for prevention of infestation by *P. interpunctella*, *T. confusum* and *A. obtectus*.

Key words: alumina silicates, inert dusts, contact toxicity, storage pests