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Evaluation of the insecticidal efficacy of the formulations based on inert dust and botanicals against rice weevil *Sitophilus oryzae* L.

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SUMMARY

Concerning the growing evidence of negative effects of pesticide usage in stored products protection, there is increasing demand for alternative methods without harmful effect on health and environment.

We developed (Croatian Science Foundation project IP-11-2013-5570) new formulations based on inert dusts and botanicals. In the preliminary testing their efficacy against the rice weevil *Sitophilus oryzae* (L.) was evaluated.

Five doses of each formulation were mixed separately with 100 g of wheat grain and the efficacy was estimated through adult mortality, after 7, 14 and 21 days and through the F1 progeny production, after 49 days. All treatments were set in three repetitions with 25 adult weevils, 7-21 days old in each repetition.

Formulation F1P caused 100% mortality of adults *S. oryzae* at 300 ppm after 7 days and at 200 ppm after 21 days of exposition. Formulation F3P reached maximum mortality at the highest dose (400 ppm after 21 days). After 21 days, LD₅₀ and LD₉₀ were 80.2 ppm and 126.3 ppm, respectively for F1P and 107.6 ppm and 270.7 ppm, respectively for F3P. Both formulation significantly reduced progeny production; with percentage of inhibition ranged from 82.0 to 99.6% for F1P, and from 81.7 to 96.5% for F3P, depending on dose.

Further testing should be done in order to evaluate their efficacy against other stored product insects under different conditions of grain moisture and temperature and also to test influence on bulk density reduction after mixing formulations with wheat grain.

Key words: botanicals, inert dust, stored products, efficacy, *Sitophilus oryzae*