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Fumigant Insecticidal Efficacy of Ozone Gas (O_3) Towards Tribolium castaneum and Cryptolestes ferrugineus

Authors : S. Saleem, L. J. Mason, M. Hasan, M. Sagheer, Q. Ali, S. Akhtar, C. M. S. Hanif

Abstract : Ozone has been documented as a potential fumigant against major insect pests of stored commodities due to its highly oxidative properties. Present studies were conducted in the Smith Hall (Department of Entomology), Purdue University, USA, to examine the fumigant toxicities of ozone gas (O_3) against stored grain insect pests. Adults of Tribolium castaneum and Cryptolestes ferrugineus were exposed to different concentrations (100, 200, 480, 700, and 800 ppm) of ozone gas. Test insects were fumigated by keeping a constant temperature of 27 ± 2 °C and 75 ± 5% relative humidity, while dead insects were recorded after 6, 12, 18, 24, 30, and 36 hr of treatment. C. ferrugineus was found susceptible, with mean mortality of 90.99% as compared to T. castaneum (53.22%). Fumigation, even with lower concentrations (100 ppm) of ozone gas for 36 hr, exhibited 100% mortality against C. ferrugineus. Mortality increased with the increase in concentration and exposure time. 100% mortality was achieved with 800 ppm concentration after 18hr of treatment against T. castaneum and with 700 ppm after 6 hr of treatment against C. ferrugineus.

Keywords : ozone gas, toxicity, O_3, Tribolium castaneum, Cryptolestes ferrugineus, stored grain insect pests
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