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ABSTRACT

Susceptibility of the different stages of *Oryzaephilus surinamensis, Stegobium paniceum and Ephestia cautella* to CO_2 was differed from one stage to another. Larval stage was the most susceptible while pupal stage was the most tolerant. Mortality of insects was decreased gradually as the concentration of CO_2 in the mixtures decreased. Mortality of insects was higher at 30°C than at 20°C for all stages of the insects. Reduction of CO_2 gas in the mixtures showed an obvious decrease in insect mortality percentages at both temperatures and LT_{50} and LT_{90} values were clearly prolonged. *E.cautella* was more susceptibe to CO_2 gas than the other two insect species. As mentioned before in case of the other two insect species' mortality of insects was gradually decreased as the concentration of CO_2 decreased, so the exposure period was prolonged. Nitrogen gas was generally less effective against this insect than CO_2 gas. The sensitivity of insect stages to N_2 was approximately the same as showed before in case of CO_2 gas. After exposure period of 6 days to N_2 no complete mortality was attained for any insect stage at both temperature, while in case of CO_2 this result was attained after 3 days only. Nitrogen gas was less effective against *S.paniceum* than *O.surinamernsis, E.cautella* was the most susceptible insect to N_2 among the three tested insect species. N_2 gas was less effective against the most stages of the three tested insects species. Exposure of insect stages of the three tested insect species (*O. surinamensis, S.paniceum* and *E.cautella*) to N_2 gas for a period of ten days may be sufficient to kill all insects. Effect of pressurized

atmospheric gases (CO_2, N_2 and air) were more effective against the tested insects than the normal gases. Pressurized CO_2 was more effective than N_2 and air.The results showed generally that *O.surinamensis* was the most sensitive to ozone followed in descending order by *T.confusum*, *S.paniceum* and *E.cautella.* Mortality of insect increased as the exposure period to gas was increased and also as the period post treatment prolonged and the concentration of ozone increased. Larval stage was the most susceptible stage while the egg stage was the least susceptible comparing with the other stages.