The Biological Control Optimization of Indian Meal Moth (*Plodia interpunctella*) Manipulating Its Parasitoid (*Bracon hebetor*) on Brown Rice

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Population suppression efficiency of indian meal moth (*Plodia interpunctella*) was studied with different densities of *Bracon behetor* and stored depth.

Ten pairs of moths were introduced with brown rice in a plastic cage(18×29×15cm). After 30 days and 84 days, one, two, four or eight pairs of parasitoids were introduced into the test cage. The population density of indian meal moth examined differed significantly among the different parasitoid density after 100 days. Population suppression efficiency of indian meal moth was the highest at the cage where two pairs of *B. behetor* was introduced. The population density of parasitoids also differed significantly(100 days: F=37.00; df=4, 10; p=0.0001, 120 days: F=13.22; df=4, 10; p=0.0005). Two pairs of parasitoids including 10 pairs of indian meal moth was introduced in the cage with various stored volume(0.6kg, 1.2kg, 2.4kg). Population density of indian meal moth examined differed significantly in proportion to a stored depth after 40 days. The population density of parasitoids also differed significantly.

The number of parasitoid introduced was an important factor in suppressing their hosts. Intraspecific competition and mutual interference in term of the rate of decline in searching efficiency might be induced as parasitoid increased over optimum. The stored depth was also an important factor of the population suppression. Hosts on the bottom of the grain are less likely to be attacked than hosts on the surface. We found that the deeper the stored depth was, the lesser become the searching and suppression efficiency of parasitoids.