World Academy of Science, Engineering and Technology
International Journal of Agricultural and Biosystems Engineering
Vol:11, No:07, 2017

Effect of Different Temperatures and Cold Storage on Pupaes Apanteles gelechiidivoris Marsh (Hymenoptera: Braconidae) Parasitoid of Tuta absoluta Meyrick (Lepidoptera: Gelechiidae)

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Abstract : Tuta absoluta known as the tomato leaf miner, is one of the main pests in tomato crops in South America and the main pest in many European countries. Apanteles gelechiidivoris is a parasitoid of third instar Tuta absoluta larvae. Our studies have demonstrated that this parasitoid can cause up to 80% mortality of T. absoluta larvae in the field. We investigated cold storage of A. gelechiidivoris pupae as a method of mass production of this parasitoid. This storage method does not interfere with biological characteristics of the parasitoid. In this study, we evaluated the effect of different temperatures (4, 8 and 12°C) and different time duration (7, 14, 21 or 28 days) of cold storage on biological parameters of A. gelechiidivoris pupae and adults. The biological parameters of the parasitoid evaluated were: adult emergence time, lifespan, parasitism percentage and sex ratio. We found that the adult emergence time was delayed when the parasitoid pupae were stored at 4°C and 8°C. The shortest adult emergence was recorded when pupae were stored for seven days. The lowest adult emergence was found for pupae stored at 4°C and decreased significantly as the days of storage increased. We found high percentages of adult emergence when pupae were stored at 8°C and 12°C for seven days. Adult lifespan decreased with increasing days of cold storage. Adults emerging from pupae stored at 8°C during seven and 14 days showed the longest lifespan (nine days). The lowest parasitism rate was recorded at 4°C at every time point. The highest percentage of parasitism (80%) was found at 8°C during seven days of storage. The treatments had no effect on adults the sex ratio. The results suggest that A. gelechiidivoris pupae can be stored for up to 14 days at 8°C without affecting the efficacy of the parasitoid in the field.

Keywords : biological control, cold storage, massive rearing, quality control
Conference Title : ICABBBE 2017 : International Conference on Agricultural, Biotechnology, Biological and Biosystems Engineering
Conference Location : Rome, Italy
Conference Dates : July 17-18, 2017