



## Effects of parasitism by *Pyemotes zhonghuajia* on reproduction of potato tuber moth\*

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*Pyemotes zhonghuajia* is an ectoparasitoid natural enemy of a wide range of pests such as Lepidoptera, Coleoptera and Hymenoptera. *Phthorimaea operculella* (Zeller) (PTM) is a worldwide potato pest with serious damage of potato production. Our study showed that one *P. zhonghuajia* female could kill 1<sup>st</sup> to 4<sup>th</sup> instar larvae of PTM, and the lethal time of one *P. zhonghuajia* female on first to fourth PTM instar larvae were 5.48, 11.33, 23.47 and 2076 min, respectively. The parasitism of 1, 3, 5, 10, and 20 *P. zhonghuajia* mites could significantly affect the mortality rate of PTM 4<sup>th</sup> instar larvae and pupae. The parasitism durations (30 and 60 mins) of one *P. zhonghuajia* female on one PTM fourth instar larva could influence the life history of PTM parental generation but did not influence the life table of PTM offspring generation. Releasing 60, 80, and 100 mites or opisthosoma with mites could reduce the occurrence and consumption of PTM on potatoes the weight loss of the potato tuber. The number of insect dung piles in one potato tuber was significantly decreased by releasing 60, 80, and 100 *P. zhonghuajia* mites, and releasing 100 mites resulted in the lowest number of insect dung piles. Our results indicate that *P. zhonghuajia* can significantly affect the population growth of PTM. Future studies should explore the lethal mechanism of *P. zhonghuajia* and its performance in practical application in the warehouse and field condition.

**Keywords:** *Pyemotes zhonghuajia*, *Phthorimaea operculella*, parasitism, development, potato