

Effect of Host and Temperature on Population Increase and Parasitism of *Opius caricivora* (Hymenoptera: Braconidae)¹

Ching-Chin Chien^{2,3} and Shu-Chen Chang²

Abstract

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The objective of this study was to determine effect of host and temperature on population increase and parasitism of the wasp, *Opius caricivora* Fischer, using two species of hosts, *Liriomyza huidobrensis* (Blanchard) and *Liriomyza sativae* Blanchard, and six temperatures (10, 15, 20, 25, 30 and 35°C). The time required for the development of the wasp at different stages varied with host species. Using *L. huidobrensis* as host, the development period of wasps from egg to pupal stage was 82.6 days at 10°C and 15.5 days at 25°C and the survival rate was 62.6% at 10°C, 79.2–91.2% at 15°C to 25°C and 0% at 30°C. Using *L. sativae* as host, the development period of wasps from egg to pupal stage was 81.0 days at 10°C and 11.4 days at 30°C and the survival rate was 52.5% at 10°C, 85.8–89.0% at 15°C to 25°C and 67.4% at 30°C. The low temperature threshold for development of the wasp was 7.03 and 7.61°C from egg to pupal stage on the hosts *L. huidobrensis* and *L. sativae*, respectively. The accumulated heat units required for development of the wasp was 40, 88, 36, 125 and 286 degree-days for egg, larval, prepupal, pupal and egg to pupal stage, respectively, on the host *L. huidobrensis*, whereas the accumulated heat units required for development of the wasp was 36, 83, 31, 112 and 263 degree-days for egg, larval, prepupal, pupal and egg to pupal stage, respectively, on the host *L. sativae*. The lifetime fertility of the wasp was 10, 156, 146 and 259 wasps at 10, 15, 20 and 25°C, respectively, on *L. huidobrensis* and was 18, 171, 257, 277 and 216 wasps at 10, 15, 20, 25 and 30°C, respectively, on *L. sativae*. Depending on *L. huidobrensis* and *L. sativae*, the intrinsic rate of increase (r_m) of female wasps was 0.1874 and 0.2223/day, net reproductive rate (R_0) was 116.413 and 152.113 female wasps/female, and mean generation time (T) was 25.38 and 22.60 days at 25°C, respectively. When adult wasps were provided with honey only without host from 10°C to 35°C, the maximum longevity of the female and male wasps was 108.4 and 66.2 days at 10°C, respectively. For wasps provided daily with both hosts (*L. sativae*) and honey, the maximum longevity of female wasps was 34.3 days at 20°C, and male wasps was 53.6 days at 10°C. This study indicates that *O. caricivora* was an effective parasitoid of *L. huidobrensis* and *L. sativae* when the temperature was at 15–25°C and 15–30°C, respectively.

Key words: *Opius caricivora*, *Liriomyza huidobrensis*, *Liriomyza sativae*, Temperature, Population increase.

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 2. Respectively, Former Senior Entomologist and Assistant Entomologist, Applied Zoology Division, TARI, Taichung, Taiwan, ROC.
 3. Corresponding author, e-mail: chien@tari.gov.tw; Fax: (04)23317600.