2-19. Affect of temperature on the development time of greenhouse whitefly, *Trialeurodes vaporariorum* (Westwood) and parasitoid, *Encarsia formosa* Gahan

Tran Dinh Pha[1], Han Man-Wi, Kim Jeong-Hwan, Yoo Jai-Ki

Entomology Division, NIAST, RDA (Suwon, Korea)
[1]National Institute of Plant Protection (Hanoi, Vietnam)

To establish biological control program of greenhouse whitefly(GWF), *Trialeurodes vaporariorum*, basic biology of a parasitoid, *Encarsia formosa* was studied. Especially, the affect of constant temperature on the development time of the greenhouse whitefly and its parasitoid were examined and the results were as follows;

1. The duration of GWF egg(from egg to first instar larvae) was 14.54±1.57; 8.95±0.54; 5.79±0.71; 5.42±0.72 and 7.12±0.32 days at the constant temperatures of 15, 20, 25, 30 and at the room temperature (22.9±1.3℃, min.18.6, max.28.7). At 35℃, eggs of GWF could not survive to hatch.
2. The nymphal stage lasted 39.92±2.96, 22.29±1.21, 14.77±1.45, 17.90±1.83, and 17.16±1.22 at 15, 20, 25, 30℃, and at the room temperature (24.2±1.1℃, min.20.5, max.29.4), respectively. Significant delay or stop of development was observed at 30℃ in GWF nymphal stage.
3. Development time of parasitic wasp, *Encarsia formosa* from egg to the black stage was 28.9±4.5, 15.4±3.6, 11.3±3.6, 10.1±3.4, and 10.1±1.9 days at 15, 20, 25, 30, and 35℃ respectively.
4. Development time of parasitic wasp, *Encarsia formosa* from egg to adult emergence was 54.4±6.3, 29.6±3.7, 19.4±2.9, 15.7±3.5, and 17.4±1.8 days at 15, 20, 25, 30℃, and at the room temperature (22.8±0.9℃, min. 18.6, max. 28.7) respectively. At the 35℃, only 10 mummies successfully developed from egg to emerging mummies at the black stage. These mummies continuously conducted experiment but no parasitoid adult successfully emerged. It showed significant retardation of development at low temperature condition.

5. Temperature affected clearly on the parasitization of parasitoid, *E. formosa*. One parasitoid could give mummies at the black stage as follows: 8.7±5.8 at 35℃; 13.61±1.5 at 15℃; 19.0±5.8 at 20℃; 24.61±1.7 at 30℃ and 35.01± 7.5 at 25℃.