

2-20. Biological Characteristics of Greenhouse Whitefly, *Trialeurodes vaporariorum* (Westwood) and its Parasitoid, *Encarsia formosa* Gahan in the Mass-rearing System

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Mass-rearing system for natural enemies is the cornerstone to the development of a successful biological control program against insect pests and mites. With this regard, the mass-rearing system of whitefly parasitoid, *Encarsia formosa* has been established and some basic biological characteristics were observed to set up methods for the standardization and quality control of rearing system as following:

1. The sex ratio of GWF adults rearing on tobacco was ranged from 0.59 to 0.79, so population of GWF in this rearing system consisted with more females.
2. Affect of GWF larval density on the parasitization of *Encarsia formosa* was conducted at the 6 treatments: number of parasitoid *E. formosa* /number of GWF nymphs) as following: 1:50, 1:100, 1:150, 1:200, 1:250, and 1:300. Percentage of emergence GWF adult was 7.4; 47.2; 67.4; 64.6; 53.4; and 68.7 respectively. Percentage of black mummies of this parasitoid was 9.9; 26.2; 22.9; 25.2; 23.2; and 18.8 respectively.
3. Adults of *E. formosa* emerged to 83.1% on average from mummies at the black stage without detaching from the tobacco leaves. Adults of *E. formosa* emerged to 99.9% after 13 days from the day of *E. formosa* oviposition. Adults of *E. formosa* started to emerge on 16th to 22th day after oviposition. Peak of emergence was 18th day after oviposition (at the mass-rearing room condition temperature was set up at 25°C and controlled by air-conditioner)

4. Collected mummies at the black stage by spinning brush machine in the water from 3 to 10 minutes and collected mummies at the black stage by hand were not differed significantly from each other in dynamic of emergence and in flight activity of adult parasitoid, *E. formosa* (One hundred mummies in Petri dish were put the top of flask 100ml (h=10cm). This flask with mummies was put in the container (24x25x40 cm) with water at 2cm deep on the bottom. A yellow sticky card (4.0x4.0cm, sticky on one side) was hung up in the middle of the container at 20cm high. But mummies collected by this machine showed lower emergence rate (from 69.8-75.0%) than that of mummies collected by hand (86.1%)