

Kessuda Puanmanee 2010: Bionomics of Guava Fruit Fly, *Bactrocera correcta* (Bezzi) (Diptera: Tephritidae) and Effect of Gamma Radiation. Master of Science (Entomology), Major Field: Entomology, Department of Entomology. Thesis Advisor: Professor Praparatt Hormchan, Ph.D. 72 pages.

Life cycle study of *Bactrocera correcta* (Bezzi) fed on papaya under laboratory conditions of 25-27 °C and 70-80 %RH was conducted. It revealed mating at the average female age of 11.85 ± 1.18 days. The egg was either laid singly or in mass, 4-5 eggs/mass, with 92.25 % hatching. The averages of egg, larval (3rd instar), pupal, female and male adults stages were 38.30 h, 6.77, 9.62, 82.30 and 70.12 days respectively. The analysis of partial life table of *B. correcta* using 100 eggs for the start showed the net reproductive rate (R_0) to be 197.2200, the capacity for increase (r_c) 0.0910, the cohort generation time (T_c) 58.1235 days and the finite rate of increase (λ) 1.0952. Partial life table in 3 diets namely mango, papaya and artificial diet of wheat-yeast formula were also studied. It was found that for the mortality and survival in the mango, the 3rd and 2nd instars larvae had the highest percentages of 48.98 and 97.45 respectively; in papaya, the pupal stage and 1st instar larva obtained the highest percentages of 31.36 and 97.17 respectively whereas in the artificial diet, those of 9.36 and 92.00 were found in the 2nd and 3rd larval instars respectively.

The investigation of gamma irradiation on the fruit fly pupae from ¹³⁷Cs source at the doses of 0, 5, 10, 15 and 30 Gy indicated percentages of adult emergence, adult abnormality and male age not to be significantly different from one another and the sterilities were 23.85, 21.78, 59.10, 72.57 and 98.34 respectively. The percent sterilities at 5 Gy was not significantly different from the control (0 Gy). Mating competitiveness of the males when irradiated at 30 Gy was almost equally competitive to the untreated males. The total competitiveness values of treated males were estimated to range from 1.45 to 2.09 at three different ratios from 1:1:1 to 3:1:1. The observation on melanization of the treated larvae after killing by freezing resulted in the larval color appearing from black to creamy white. The degree of melanization decreased with the increasing dose. The total haemocyte counts (THCs) of the irradiated 1st instar larvae and observed in the 3rd instar larvae were also found to be the averages of 3150, 2200, 700, 550 and 350 h/mm³ respectively. THCs at every dose were noticed to be significantly different from that of the control.

Student's signature

Thesis Advisor's signature