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Effect of temperature on the development and on other biological parameters of pnigalio pectinicornis (linnaeus) (hymenoptera: eulophidae) parasitoid of phyllocnistis citrella stainton (lepidoptera: gramillariidae).

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P. pectinicornis is one of the most abundant indigenous parasitoids of the citrus leafminer Phyllocnistis citrella Stainton found in Greece. The effect of temperature on the development and mortality was studied under controlled conditions when the parasitoid fed on leaves of Washington navel and Clementine. Mean total development time of immature stages was estimated at 15, 20, 25, 30, and 32.5°C. Within the limits 15–30°C development time shortened as the temperature increased. The shortest total development time of the immature stages was recorded at 30°C and on the two host plants. Development time of females was longer than males. The highest mortality rate was found at 15°C and the lowest at 25°C. Between the different stages the larva was the most sensitive stage at all the temperatures and the pupa stage the less sensitive. Lower development threshold and thermal constant estimated to 2.10°C and 233 DD respectively for the total development period. Intrinsic rate of natural increase was highest at 20 °C and lowest at 30 °C. The intrinsic rate of natural increase almost tripled from 25 to 20°C and doubled from 30 to 25°C. It is concluded that development of P. pectinicornis could continue all the year under Greece climatic conditions and is an effective biological control agent for P. citrella early in the season under our climatic conditions.

Index terms: Pnigalio pectinicornis, Phyllocnistis citrella, temperature, development, biological control.

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Effect of three apple varieties on biological parameters of immature and adult Mediterranean fruit flies

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We studied in the laboratory (26 °C ± 2, 60 ± 5% R.H.) the developmental duration and survival of immature Mediterranean fruit fly, Ceratitis capitata (Wiedemann) (Diptera: Tephritidae) in apples of the varieties Golden Delicious, Granny Smith and Red Delicious. We also studied the biology of adults retrieved from immature development in these varieties. Total immature developmental period (larvae hatch to adult emergence) was longer in Granny Smith and Red Delicious, than in Golden Delicious. Survival rates, estimated as the percentage of newly hatched larvae that reached adulthood were higher in Golden Delicious in relation to other varieties. When females were ovipositing on fruits of the same variety in which they had been developed as larvae adult longevity did not differ among the three varieties. However, fecundity was 2.3 times higher in females obtained from and ovipositing on Golden Delicious (≈385 eggs per female) than in those obtained from and ovipositing on Granny Smith and Red Delicious (≈165 eggs per female in both varieties). When females, obtained from Golden Delicious and Granny Smith apples, were ovipositing on artificial oviposition substrate (5-cm red, hollow plastic hemisphere, bearing 15 artificial holes) there were no differences between adults neither in longevity nor in fecundity. Based on analyses of the physical and chemical characteristics of the different varieties we conclude that fruit firmness, which was higher in apples of Granny Smith and Red Delicious compared with those of Golden Delicious, seems to be the most important factor accounting for the differences among the three varieties. In general the variety on which larvae developed did not affect adult biology in terms of longevity and fecundity. However, the variety on which females oviposition took place had a significant influence on female fecundity.

Index terms: Ceratitis capitata, Tephritidae, development on apples, adult biology.