Laboratory rearing of *Ceratitis capitata* Wiedemann (Diptera, Tephritidae): larval and pupal development

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Introduction:

The Mediterranean fruit fly *Ceratitis capitata* is among the most destructive agricultural pests (Fig. 1). It attacks fruits of more than 350 different species; larvae feed and develop inside fruits, converting the flesh into an inedible mass (Fig. 2). It originated in the tropical region of the western Africa, although as a cosmopolitian pest invaded all tropical and subtropical regions of the world, and even some temperature regions.

Ceratitis capitata has been considered as an established pest in Montenegro seacoast since the early 2000s. All cultivated citrus species (mandarin, orange, lemon, grapefruit), as well fig, persimmon, peach, apples and ziziphus are registered as host plants. In an economic sense, the most important host plant is mandarin (cult. Unshiu). *Ceratitis capitata* is present along whole Montenegrin seacoast, although with differences in population density depending on localities and year.

Fig. 1. *C. capitata* – adult on orange fruit

Fig. 2. Infested peach fruits

Material and methods:

Duration of larval and pupal development were tested in laboratory, in thermostat at 25˚C (Fig. 3). As material for the study, the first instar larvae (L1) were used. Larvae hatched from eggs that were collected every day from the laboratory stock colony (Fig. 4). Eggs were placed in Petri dish on moistened filter paper until hatched (Fig. 5). Total of 84 L1 were transferred in four consecutive days with tiny, soft brush to the rearing medium made of tomato puree (71.8%), corn grits (28.0%) and sodium benzoate (0.20%) (Fig. 6). Rearing medium was placed in large Petri in thermostat.

Fig. 3. Larval and pupal development in thermostat

Fig. 6. Rearing medium

Fig. 7. Full grown larvae ready to pupate

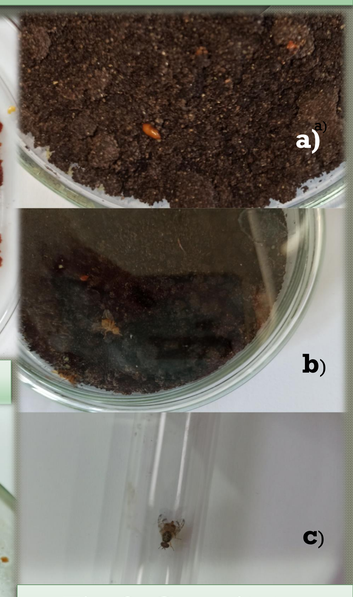

Fig. 9 *C. capitata* - pupa (a); emerged adult (b, c)

Fig. 8. Full grown larvae transfered in soil to pupate (a) and entering in the soil (b)

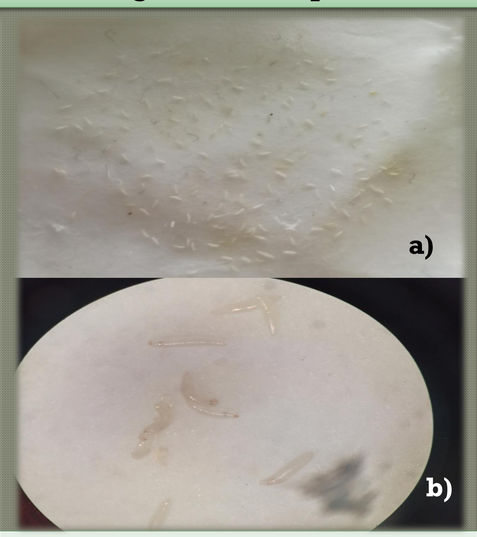

Fig. 5. Eggs on moistened filter paper (a) and hatched L1 (b)

Results:

Results showed that larval development lasted eight to eleven days when 71 fully grown larvae (or 84,5%) ready to pupate were transferred for hrisalidation into a petri dish filled with soil, also placed in thermostat (Fig. 7 , 8).

On the same temperature pupal stage lasted 11-12 days when 67 adults (or 94,3%) emerged (Fig. 9).

Conclusions:

Our results indicate that in favorable conditions (temperature and food) larval and pupal stage can be completed for around 20 days. This is important for prediction of population development speed in natural conditions.

Fig. 4. Laboratory stock colony (rearing cage)

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