

Mass Rearing and Effects of Gamma Irradiation on the Pupal Mortality and Reproduction of Citrus Leaf Miner *Phyllocnistis citrella* Stainton (Lepidoptera: Gracillariidae)

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Abstract : Citrus leaf miner (*Phyllocnistis citrella* Stainton) is native to Asia and one of the most serious pests of Iran's citrus nursery stocks. In the present study, the possibility of insect mass rearing on four various citrus hosts and the effects of gamma irradiation on the pupal mortality and reproduction of this pest were studied. Trifoliolate orange and grapefruit showed less infection, while the number of pupae in Valencia oranges and sweet lemons cages was so high. There was not any significant difference between weight of male and female pupae among different citrus hosts, but generally the weight of male pupae was less than females. Use of Valencia orange or sweet lemons seedlings in especial dark emergence and oviposition cages could be recommended for mass rearing of this pest. In this study, the effects of gamma radiation at doses 100 to 450 Gy on biological and reproductive parameters of the pest has been determined. The results show that mean percent of pupal mortality increased with increasing doses and reached to 28.67% at 450 Gy for male pupae and 38.367% for female pupae. Also, the mean values of this parameter were higher for irradiated female, which indicated the higher sensitivity of this sex. The gamma ray irradiation from 200 and 300 Gy caused decrease in male and female adult moth longevity, respectively. The eggs were laid by emerged females, and their hatchability was decreased by increasing gamma doses. The fecundity of females in both combinations of crosses (irradiated male × normal female and irradiated female × normal male) did not differ, but fertility of laid eggs by irradiated female × normal male affected seriously and the mean values of this parameter reached to zero at 300 Gy. The hatchability percentage of produced eggs by normal female × irradiated male at 300 Gy was 23.29% and reached to less than 2 % at 450 Gy as the highest tested dose. The results of this test show that females have more radio-sensitivity in comparison to males.

Keywords : citrus leaf miner, *Phyllocnistis citrella*, citrus hosts, mass rearing, Sterile Insect Technique (SIT)

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