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POSSIBLE RESIDUAL EFFECT OF PESTICIDE ON *BACTROCERA OLEAE* ROSSİ (DİPTERA:TEPHRİTİDAE) ADULTS

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The olive fruit fly, *Bactrocera oleae* Rossi, is the main pest of olive orchards in the Mediterranean Basin (Economopoulos 2002). The larvae are monophagous (Weens & Nation 2003) and compelete their development in the mesocarp of the olive fruit. Females oviposit eggs inside the fruit and decreasing the value of table fruit. Olive fruit fly larvae cause important damage to table olives, and damage oil production by increasing acidity of olive oil. Small scale rearing on artificial diets was reviewed by Silva (1970), Hagen (1966), Hagen et al. (1963), Mittler & Tsitsipis (1973) and Genc (2008), and on host olive fruits by Tzanakakis (1971) and Genc & Nation (2008). Olive flies reared on an artificial diet differ from wild flies in certain aspects of their physiology, such as Allele frequencies (Economopolos 1980; Loukas et al. 1985; Cosmidis et al. 2002). The traditional control of this pest has been based on organophosphate insecticides for years in Turkey and many other countries. However intensive use of insecticides has lead to the development of acetylcholinesterase (AChE) enzyme resistance rsulting in 2 resistance mutations (I199V and G488S) (Vontas et al. 2002). Skavdis et al. (2009) found resistance-associated point mutations of organophosphate-insensitive acetylcholinesterase (AChE) in wild populations of olive fruit fly in Çanakkale, Turkey. The sterile insect technique (SIT) is the most promising approach for fruit fly integrated management (Enkerlin & Mumford 1997; Hendrichs et al. 2002). A primary requirement for successful olive fruit flie SIT is mass rearing flies on a larval diet of high efficient, and low cost larval diet. It is also necessary that the larvae should have similar characteristics as the wild populations with comparable variability, vigor and behavior. The primary aim of my work has been to obtain information on laboratory rearing and physiology of reared flies. In this paper, I report an observation of possible pesticide residual effect on olive fruit fly adults.

An olive fruit fly colony was established from naturally infested fruits. Flies have been reared on an artificial diet in the laboratory since 2006. The larval diet is based on soy hydrolysate, yeast and sugar (Tsitsipis & Kontos 1983). Adult flies were kept in fine mesh screen cages (30 × 30 × 30 cm) and provided with a liquid diet containing water, sugar and brewer's hydrolyzed yeast (Tzanakakis 1971) with access also to solid diet containing hydrolyzed brewer's yeast, sugar, dried egg yolk powder and streptomycin sulfate (Tsitsipis & Kontos 1983). Water was supplied by dental wicks in adult cages.

Green olive fruits, as a natural diet, were obtained from the local market. Adults (n = 200, 120♀:80♂) that had been laboratory reared were allowed to oviposit in 20-30 unripe locally grown 'Gemlik' variety table olives. After 4-5 h, some adults were observed lying motionless at the bottom of the cages. They were unable to fly or walk. Females especially appeared to be paralyzed. Flies had the third pair of legs extended posteriorly (Fig. 1). Flies were still alive but they could not move their legs or wings. A total of 129 flies (some male and some female) were picked up gently with soft forceps and placed in a petri dish. A camel hair brush was wetted with distilled H_20 and the body parts (head, thorax, legs, wings, and abdomen) were gently washed twice under an Olympus SZX9 streozoom microscope, and then the flies placed back in the cage. The cage was monitored after 24 h. I found that 70 adult males were able to recover from the residual effect of the pesticide on the surface of the olive fruit. The remaining 59 adults - all females - could not recover. They were dead on the following d. Typical

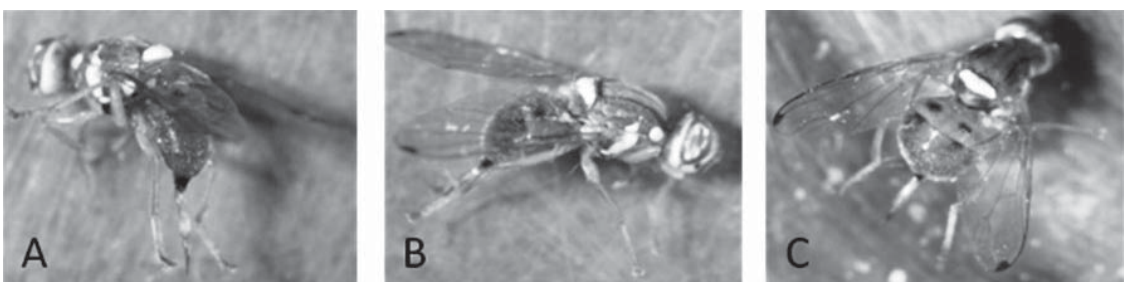

Fig. 1. The appearance of paralyzed olive fruit fly females (A, B and C).

behavior is that females usually walk on the fruit with the mouthparts tapping the fruit surface to select fruit in which to oviposit (Genc & Nation 2008). This behavior may cause females to accumulate more pesticide residue than males. Some of the adults originally placed in the cage (61♀:80♂) survived 18.3 ± 4.7 d in the laboratory. Parafin domes were placed in the cage as typically used in the laboratory adult colony for oviposition, but the females laid no eggs during their lifetimes.

It is important to recognize that the residue on the surface of the olive fruit dramatically affected the olive fruit fly adults. Further studies are needed to understand the residual effect of table olives and olive oils on the environment and on human health.

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Summary

Adult olive fruit flies appeared to be affected by residual insectide deposits on the surface of the olive fruit. Females initially knocked down did not recover, and all died, but knocked down males recovered by the next day after washing their bodies with water. In future experiments with olives of unknown history, the researcher is advised to wash the fruit thoroughly before offering then to flies.

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