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SCIENTIFIC NOTE

Preliminary Data on Settlement and Adaptation of the Predator, *Cryptolaemus montrouzieri* Mulsant (Coleoptera: Coccinellidae) in Colonies of Mealy Bugs on Citrus Trees in the Syrian Coast

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Cryptolaemus montrouzieri Mulsant (Coleoptera: Coccinellidae) is an efficient predatory species against the mealy bugs of Pseudococcidae and one of the most successful and common predators used, since 1892 when Koppel imported it from Australia and introduced it to California in the United States for controlling mealy bugs on citrus. It is believed that the original habitat of this predator is the Australian region, where the distinct coastal climate is moderate and fulfills its environmental requirements such as weak tolerance to cold and its need to high humidity associated with a warm moderate weather (Ahmad, 1961).

C. montrouzieri was used successfully in Florida and California in the USA, Japan, Finland, New Zealand, South and North Africa in Kenya and Tanzania, Morocco, Egypt, and in Europe; Spain, Italy, France and former Soviet Union. (Rether *et al,* 1989). Countries that are characterized by a harsh winter usually propagate the predator under laboratory conditions due to its low tolerance for cold and low humidity, as well the presence of ants associated with the mealy bugs that feed on their honeydews and other sugary secretions, that significantly reduce the activity and effectiveness of the predator, especially in areas where the predator could not adapt itself to them. For example, Flanders (1954) in Italy, reported that presence of certain species of ants among the colonies of the mealy bugs led to reduce the activity and efficacy of the predator. As well, the predator could not adapt itself to the environment of the Soviet Republic of Azerbaijan due to the low relative humidity and very cold weather in October and November, which consequently led to death of large numbers of the predator. Remaining individuals failed to produce tolerant strains to the cold and the low humidity, with an exception of one case in the Black Sea region on the coast of the Caucasus, where it was able to overcome this obstacle and be able to develop through the winter. Therefore, urgent needs arose for mass rearing of *C. montrouzieri* and releasing it periodically in the new habitats (Slivestri, 1939 and Aslan, 1990).

C. montrouzieri was introduced to Syria from Turkey in June 1995 and was reared at Lattakia Center for Rearing and Applications of Natural Enemies, Agricultural Department of Lattakia, Syria, as it is located at a semi-wet region. Rearing program of the predator in Syria aims to mass rear the predator and release it periodically during the season (Al-Khateeb and Rai, 2001; Al-Khateeb and Aslaan 2007).

Monitoring and following-up the colonies of mealy bugs deployed on citrus orchards, open fields and gardens in the city of Lattakia on the Syrian coast during the period 2006-09 led to detect the presence of the introduced *C. montrouzieri* in places away from the releases' sites. As well, over-wintered adults of the predator were recorded in four sites within the colonies of the mealy bugs on citrus trees, in the city of Lattakia and in sites received no releases of the predator. This indicates that it was able to deploy and move to new places and sites, particularly those characterized by intensive infestation of the pests, thus seeking its settlement and survivorship over winter seasons. Number of the predator's larvae reached 5-6 larvae and/or 6-7 pupae per a single leaf (Figs. 1-3), in the sites that had not received any releases of the predator. Such data confirm its settlement, adaptation and dispersal which indicate that the adults could feed, mate and lay eggs, giving 2-3 generations, without need for further releases.

Research team is currently pursuing the investigation, monitoring and recording the continuity of the predator's adaptation and settlement in the Syrian coast.

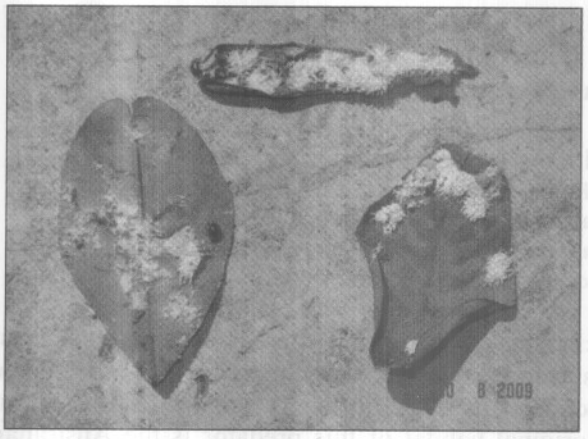

Fig (1): *C. montrouzieri* larvae and pupae on citrus leaves in a site had not received any releases

Fig (2): Pupation of *C. montrouzieri* beneath tree's barks in a site had not received any releases

Fig (3): Pupation of *C. montrouzieri* beneath tree's barks in a site had not received any releases

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SCIENTIFIC NOTE

Dendrothrips eremicola Priesner, (Thysanoptera: Dendrothripidae), a New Pest Outbreak on Olive trees and its Control in the Newly Reclaimed Lands at Ismailia, Egypt

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Interference of man in the desert ecosystem through land reclamation for gaining new agro-ecosystems with monoculture characteristic has led to occurrence of new economic insect pests (El-Husseini *et al.* 1996, 2001, and 2004). The thrips species, *Dendrothrips eremicola* Priesner (1965) (Thysanoptera: Terebratntia: Dendrothripidae) was recorded recently, as a new insect pest outbreak on olive trees in some locations in Egypt. Pest's population was under natural balance on its original wild host plants in the desert ecosystem, *e.g., Ligustrum* spp. and *Syringa* spp. (Fam.: Oleaceae) by both biotic (natural enemies and limited host plants) and abiotic (water/dryness) factors.

Some of the ecological factors that might contributed to the recent pest's outbreak in some olive groves are; removing wild plants and growing conventional olive variety (*Olea europeae*) which has offered an unlimited alternative food supply for the thrips, irrigation system by watering the trees all the year around has led to formation of juicy leaves suitable for thrips feeding and egg insertion, and moreover, nitrogen fertilization which increases softness of plant tissues, favorite for thrips feeding and reproduction. The most important additional factor is intensive use of chemical insecticides for controlling insect pests in olive groves. Such chemical control was not effective against this pest due to its hidden sites on the plant and to its feeding habit using its characteristic mouth parts and on the other hand, it suppressed existing natural enemies of the thrips. Accordingly, population of the *D. eremicola* has gradually increased and has become an economic insect pest on olive, especially at Ismailia, Alexandria and Behira governorates, as a unique case found only in Egypt.

Suppressing populations of *D. eremicola* in the olive groves can be reached through a crop management policy including an IPM program focusing on the use of biological control agents (El-Husseini *et al.*, 1996). At the present time, the searches for effective and environmentally safe pesticides became an urgent need for a rapid population suppression of this thrips in olive groves, especially those under organic farming. Therefore, the bio-pesticides Romectin 1.8 % EC (Abamectin) and Tracer 44% SC (Spinosad) comparing with traditional chemical pesticides, usually applied by olive growers in the newly reclaimed lands at Ismailia governorate were tested (Table 1). Results obtained 2 days post treatment showed that the two bio-insecticides gave a 100% mortality of the thrips on treated trees, as well was the two chemical insecticides; Challenger 36% SC (Chlorfenapyr) and Admire 20% SC (Imidacloprid). Meanwhile, decreasing

Table (1): Effect of bio-insecticides and traditional chemical insecticides for controlling the thrips, *Dendrothrips eremicola* Priesner on olive trees at newly reclaimed lands in Ismailia governorate.

Trade Name	Active Ingredient	Applied Concentration	No. of Treated Trees	Control Efficacy 2 Days post Treatment	Observation after Treatment
Romectin 1.8 % EC	Abamectin	30 cm^3/100 lit	50	High	• No alive thrips. • Dead insects on leaves.
Tracer 44% SC	Spinosad	35 cm^3/100 lit	50		
Challenger 36% SC	Chlorfenapyr	40 cm^3/100 lit	40		
Admire 20% SC	Imidacloprid	100 cm^3/100 lit	40		
Admire 20% SC	Imidacloprid	50 cm^3/100 lit	50	Medium	• Few alive active thrips.
Ortus 5% SC	Fenpyroximate	50 cm^3/100 lit	50	Low	• Alive active thrips. • Only few dead insects.
Baicao No.1 036% W/V	Matrine (Plant Extract)	100 cm^3/100 lit	40	Very Low	• Alive active thrips. • No dead insects.
Maccomite 10% WP	Hexythiazox	20 gm/100 lit	25	Very Low	
Sanmite 20% WP	Pyridaben	50 gm/100 lit	10	Very Low	

the applied dose of Admire by 50% resulted in a less efficacy against the thrips. The other tested chemical pesticides showed also low to very low efficacies against this pest. Further studies, particularly that searching for natural enemies of *D. eremicola* on its original natural host plants (*Ligustrum* spp. and *Syringa* spp.) at its virgin desert habitats are needed.

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