

A NOTE ON *SAISSETIA OLEAE* AND ITS NATURAL ENEMIES IN IRAN

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A cursory survey made in the Rudbar area and on the Caspian coast in Iran revealed that two species of *Chalcidoidea*, five species of Coccinellids, one Nitidulid and one Neuropteran attacked *Saissetia oleae* (OL.). Of these *Pullus* sp. and *Scymnus* sp. (Coccinellidae) were common and appeared to be important biological control agents.

The Food and Agriculture Organization of the United Nations is assisting the Government of Greece in research on the control of the insect pests of the olive trees. It has sponsored investigations by the Commonwealth Institute of Biological Control on the natural enemies of these pests during 1973-74. *Saissetia oleae* (OL.), which is an important pest of olive-trees in many countries, has been recorded in Iran (Anon., 1973), but little was known concerning its natural enemies in this area. As a part of the FAO project, a survey for parasites and predators of this scale was conducted in the northern areas of Iran during August, 1973. In this paper, an account is given of the observations made in the Rudbar area (Lushan to Jamshidabad) and on the Caspian coast (Bandhar Pahlevi to Babolsar).

## INCIDENCE

A very light infestation was found on *Olea europaea* at Jazamkul (Rudbar). Some dead scales were, however, observed on this host-plant at Alizeh, Feesham, Imamzadeh Taher, Jamshidabad, Katleh and Qarye Kalurez (Rudbar). It also attacked *Gleditschia caspica* at Babolsar and *Nerium oleander* at Alamdeh, Babolsar, Chalus, Nowshar, Ramsar and Soldeh (Caspian coast), but incidence was usually low.

## PARASITES

*Microterys* sp. parasitised the scale at Babolsar, Chalus, Nowshar, Ramsar and Soldeh, and also *Coccophagus* sp. at Babolsar. The former species was also reared from *Chloropulvinaria aurantii* (CKLL.) and *Coccus hesperidum* L. and the latter from *Parthenolecanium* sp.

Incidence of *Microterys* sp. was up to 2% on *S. oleae* and 3-12% on *Chrysomphalus aurantii* at different localities. From the parasite emergence holes it appeared that first and second instar nymphs were attacked and that at most two individuals could develop in each scale. It was reared from *S. oleae* either from scales on trees also infested by *C. aurantii*, or from trees situated near to such closely infested trees. The higher incidence of *Microterys* sp. on *C. aurantii* and its absence from trees infested by *S. oleae* alone indicate that it is probably an incidental parasite of the latter scale.

*Coccophagus* sp. was reared from 2 % mature females of *S. oleae* and 16 % of *Parthenolecanium* sp. on plants with combined infestations. One or two emergence holes were present in parasitised *S. oleae* indicating that two individuals of this parasite can develop in each scale. Its low incidence on *S. oleae* and preference for *Parthenolecanium* sp. suggest that this is not an important parasite of the former scale.

#### PREDATORS

*Chilocorus bipustulatus* (L.), *Exochomus nigromaculatus* (GOEZE), *Pharoscymnus pharoides* MARS., *Propylea quatuordecimpunctata* (L.), *Pullus* sp., *Scymnus* sp. (Coccinellidae), *Cybocephalus* sp. (Nitidulidae) and a Neuropteron attacked the scale. *C. bipustulatus*, which is usually predaceous on Diaspidids, was found at most localities. Its eggs were seen under the scales of ovipositing females. The larvae, in the absence of Diaspidids, preyed on both eggs and nymphs of *Saissetia*. Because of its preference for Diaspidids, it does not seem to be of potential value as a control agent against *S. oleae*. *E. nigromaculatus*, *P. pharoides* and *P. quatuordecimpunctata* were rare and occurred only on the heavily infested plants at Babolsar.

*Pullus* sp. and *Scymnus* sp. preyed on eggs and nymphs of *S. oleae* and *C. aurantii* and occurred at most localities. Their larvae were found under 2-8 (average 6) % ovipositing females of *S. oleae* in fairly dense host populations on plants also infested with *C. aurantii* and under 2-4 (average 2.5) % female scales in lighter host populations on plants attacked only by *S. oleae*. The host eggs and nymphs are present for a longer period on trees having heavy mixed populations of both scales. The higher incidence of *Pullus* sp. and *Scymnus* sp. in heavy combined infestations suggests that these may be capable of maintaining their populations at higher levels in such situations. These were found in almost all the samples and appeared to destroy a considerable number of *S. oleae*.

Both *Cybocephalus* sp. and the Neuropteron preyed on eggs and nymphs of *S. oleae* at Soldeh and Chalus. They were found in small numbers on trees carrying fairly large populations of *S. oleae* and *C. aurantii*, and do not seem to be of importance as control agents.

#### PATHOGEN

The entomogenous fungus *Cephalosporium lecanii* ZIMM. has been recorded as heavily attacking *S. oleae* at Ramsar, Bandhar Pahlevi and Pir Ali Bagh (DAVATCHI, 1946). According to GUSTAFSSON (1971) this fungus has been used frequently for the biological control of Coccids and seems to have given good results in Brazil, Ceylon, Guam, India, Puerto Rico, the Seychelles, the U.S.S.R. and the West Indies. During the present studies it was found at Ramsar, Babolsar and Soldeh and seemed to have caused mortality of 1-4 %, scales. Its low incidence at the time of survey might be due to dry weather conditions.

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#### RÉSUMÉ

Note sur *Saissetia oleae* et ses ennemis naturels en Iran.

L'inventaire effectué dans la région de Rudbar et sur la côte de la Mer Caspienne a révélé que deux espèces de Chalcidoidea, cinq espèces de Coccinellides, un Nitidulide et un Neuroptère attaquent *Saissetia oleae*. Parmi elles les Coccinelles *Pullus* sp. et *Scymnus* sp. sont communes et constituent d'importants facteurs de limitation des populations de la Cochenille.

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