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ABOU-ELKHAIR, S.
Plant Protection Institute, Agricultural Research Station, Elsababeia, Baccos, Alexandria, Egypt.

SCALE INSECTS (HEMIPTERA: COCCOIDEA) AND THEIR PARASITOIDS ON ORNAMENTAL PLANTS IN ALEXANDRIA, EGYPT.

ABSTRACT

SCALE INSECTS (HEMIPTERA: COCCOIDEA) AND THEIR PARASITOIDS ON ORNAMENTAL PLANTS IN ALEXANDRIA, EGYPT.

This paper discusses the scale insects (Coccoidea) and their parasitoids on ornamental plants in the Alexandria district of Egypt, between 1995 and 1998. Thirty-nine coccoid species belonging to eight families were noted: Asterolecaniidae, Coccidae, Diaspididae, Eriococcidae, Margarodidae, Ortheziidae, Phoenicococcidae and Pseudococcidae. Twelve genera of Hymenoptera belonging to five families were recorded as parasitoids: Aphelinidae (*Aphytis*, *Coccophagus* and *Encarsia*); Encyrtidae (*Anagyrus*, *Arrhenophagus*, *Gyranusoidea*, *Habrolepis*, *Metaphycus* and *Rhopus*); Eulophidae (*Aprostocetus*); Pteromalidae (*Scutellista*) and Signiphoridae (*Signiphora*). Four endoparasitoids were recorded from Egypt for the first time: *Arrhenophagus* sp. and *Gyranusoidea litura* Prinsloo (Encyrtidae), *Aprostocetus* sp. (Eulophidae) and *Signiphora fax* Girault (Signiphoridae).

Key words: urban environment, biological control, host plants.

INTRODUCTION

Ornamental herbaceous plants and trees are an important part of urban environments. Unfortunately, they are attacked by several species of scale insect which are important and destructive pests (Hammad & Moussa, 1973; Moursi *et al.*, 1991; Abou-Elkhair & Karam, 1994). The present survey of ornamental plants in the Alexandria area was conducted between 1995 and 1998 and included the scale insects parasitoids which might provide some biological control of these pests (Priesner & Hosny, 1940; Temerak, 1981; Hamed & Hassanein, 1991; Karam & Abou-Elkhair, 1996).

MATERIALS AND METHODS

Samples of 10-20 leaves or 10cm lengths of twig and/or roots were collected every 2-3 months from plants heavily infested with scale insects from (i) the International Garden, Elsababeia Research Station, Faculty of Agriculture, (ii) some private gardens at Mina Tourist Village (Northern Coast) and (iii) trees and shrubs along the streets and roads in Alexandria City. The scale insects were prepared for microscopical studies using McKenzie's

method (1956) and were identified using the keys of McKenzie (1956, 1967) and Hamon & Williams (1984).

In the laboratory, the plant samples were divided so that each consisted of a single scale insect species on a specific host plant. Each sample was then placed in a dark jar with a clear emergence tube to which any emerging parasitoids would fly. For the following two weeks, all emerging hymenopterous parasitoids were removed and placed in lactic acid for 24h, rinsed in distilled water and then mounted on a labelled glass slide in Hoyer's solution. These were kept in an oven at 35-40°C for a week after which they were identified by using the keys of Compere (1955), Quednau (1964), Prinsloo & Annecke (1979), Prinsloo (1980, 1983) and Viggiani (1987).

RESULTS

Coccoidea	Host plants	Parasitoids
Asterolecaniidae		
Russelaspis pustulans (Cockerell)	*Acacia* sp., *Bauhinia* sp. (Leguminosae); *Nerium oleander* (Apocynaceae)	
Coccidae		
Ceroplastes floridensis Comstock	*Ficus benghalensis*, *F. nitida* (Moraceae); *N. oleander*	
C. rusci (L.)	*Ficus* spp.; *Meryta sinclarii* (Araliaceae)	
Chloropulvinaria psidii (Maskell)	*Aralia longifolia* (Araliaceae); *Schinus terebinthifolius* (Anacardiaceae)	
Coccus hesperidum L.	*Sciadophyllum pulchrum*, *Schefflera actinophylla* (Araliaceae); *Ficus* spp.	*Coccophagus* sp. (Aphelinidae)
C. longulus (Douglas)	*Meryta sinclarii*; *Ficus* spp.; *Hibiscus rosa-sinensis* (Malvaceae)	*Metaphycus flavus* Howard (Encyrtidae)
Kilifia acuminata (Signoret)	*Meryta sinclarii*	
Pulvinaria chrysanthemi Hall	*Chrysanthemum morifolium* (Compositae)	
Saissetia oleae (Olivier)	*Nerium oleander*; *Hibiscus* spp.	*Scutellista cyanea* Motschulsky (Pteromalidae)
Diaspididae		
Abgrallaspis cyanophylli (Signoret)*	*Acacia saligna* (Leguminosae)	*Aphytis maculicornis* (Masi)
Aonidiella aurantii (Maskell)	*Ficus benghalensis*; *Hedera helix* (Araliaceae); *Jasminum* sp. (Oleaceae); *Rosa* sp. (Rosaceae)	*Aphytis melinus* DeBach (Aphelinidae)
A. citrina (Coquilett)*	*Ficus* spp.	
A. orientalis (Newstead)	*Ficus* spp.	
Aspidiotus nerii Bouché	*Nerium oleander*; *Ficus benghalensis*	*Aphytis fisheri* DeBach; *Encarsia lounsburyi* (Berlese & Paoli) (Aphelinidae)
Carulaspis minima (Targioni Tozzetti)	*Cupressus sempervirens*, *Thuja orientalis* (Pinaceae)	*Aphytis mytilaspidis* (Le Baron); *Encarsia citrina* (Craw)
Chrysomphalus aonidum (L.)	*Ficus nitida*; *Jasminum* sp.; *Nerium oleander*	

Diaspidiotus ancylus (Putman)*	*Populus candicans* (Salicaceae)	
Diaspis echinocacti (Bouché)*	*Cactus* sp. (Cactaceae)	*Aphytis maculicornis* (Masi)
Hemiberlesia lataniae (Signoret)	*Acacia saligna*; *Meryta sinclarii*; *Melia azadarach* (Meliaceae); *Ficus nitida.*	*Aphytis diaspidis* (Howard); *A. flavus* Quednau, *A. fisheri* DeBach, *A. mytilaspidis*, *Signiphora fax* Girault* (Signiphoridae), *Habrolepis rouxi* Compere (Encyrtidae)
H. rapax (Comstock)	*Ficus spp.*; *Nerium oleander*	
Lineaspis striata (Newstead)	*Cupressus sempervirens*; *Thuja orientalis*	*Encarsia citrina*
Mycetaspis personata (Comstock)	*Ficus nitida*; *Jasminum* sp.	
Oceanaspidiotus spinosus (Comstock)*	*Ficus* spp.; *Nerium oleander*	
Odonaspis ruthae Kotinsky	*Cynodon dactylon* (Gramineae)	
Pinnaspis aspidistrae (Signoret)	*Aspidistra* spp. (Liliaceae)	*Aphytis diaspidis, A. flavus*, *Arrhenophagus* sp.*† (Encyrtidae); *Encarsia citrina*
P. strachani (Cooley)*	*Soleirolia* spp. (Urticaceae)	*Aphytis* sp.
Pseudaulacaspis pentagona (Targioni Tozzetti)	*Myoporum pictum* (Myoperaceae); *Pelargonium* spp. (Geraniaceae)	*Aphytis* sp.; *Encarsia fasciata* (Malenotti)
Eriococcidae		
Eriococcus araucariae (Maskell)	*Araucaria* sp. (Araucariaceae)	
Margarodidae		
Icerya aegyptiaca (Douglas)	*Ficus benghalensis*; *Myoporum pictum*	
I. purchasi Maskell	*Ficus* spp.	
I. seychellarum (Westwood)	*Ficus* spp.; *Latania commersoni* (Palmaceae)	
Ortheziidae	*Coleus* sp. (Labiatae); *Lantana camara* (Verbanaceae)	
Orthezia insignis Douglas		
Phoenicococcidae		
Phoenicococcus marlatti Cockerell	*Phoenix dactylifera*, *Washingtonia filifera* (Palmaceae)	
Pseudococcidae		
Antonina graminis (Maskell)	*Cynodon dactylon*	*Anagyrus shahidi* Hayat; *Anagyrus* sp. nr. *impar* Noyes & Hayat (Encyrtidae)
Brevennia rehi (Lindinger)	*Cynodon dactylon*	*Rhopus nigriclavus* (Girault) (Encyrtidae)
Ferrisia virgata (Cockerell)	*Mesembryanthemum* sp. (Aizoaceae)	
Maconellicoccus hirsutus (Green)	*Hibiscus* spp., *Cupressus sempervirens*	*Anagyrus kamali* Moursi, *A. aegytiacus* Moursi, *Aprostocetus* sp.* (Eulophidae); *Signiphora* sp. (Signiphoridae)
Planococcus citri (Risso)	*Myoporum pictum*; *Nerium oleander*, *Pelargonium* spp.	
Pseudococcus longispinus (Targioni Tozzetti)	*Nerium oleander*	*Gyranusoidea litura* Prinsloo* (Encyrtidae)

where * = first record for Egypt; and † = endoparasite in male *Pinnaspis aspidistrae.*

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