

INTRODUCTION

Scale insects are noxious pests, feeding on the plant sap through leaves, branches and fruits of many fruit and nut trees, ornamental shade trees, shrubs and ground covers and forest trees (Miller and Kosztarab, 1979).

The armored and soft scale insects are the largest and most specialized groups of scale insects (Coccoidea). Those include some of the most injurious pests of orchard crops, as well as ornamental bushes.

The armored scale insects belong to Family Diaspididae comprise the largest and most specialized family of scale insects (Coccoidea), and constitute one of the most important groups of pests in agriculture, especially in subtropical and tropical regions.

The California red scale *Aonidiella aurantii* (Mask.), a highly polyphagous species of Oriental origin, is the most important pest of citrus in California, Australia, South Africa, and north western Mexico. It is a major pest of citrus in the eastern Mediterranean Basin, North Africa, and parts of South America (Quayle, 1938 and Ebling, 1959).

The Florida red scale, *Chrysomphalus aonidum* L. (= *C. ficus* Ashm.) a polyphagous pest of Oriental origin, occurs in many tropical and subtropical regions in North, Central, and South America, North and South Africa, the Mediterranean Basin, the far East, the Pacific Islands, and Australia. It has been recorded as a serious pest of citrus in Florida, Texas, Brazil, Mexico, Lebanon, Egypt, and Israel (Quayle, 1938; Bodenheimer, 1951 and Ebling, 1959).

The Oriental Yellow scale, *Aonidiella orientalis* (Newstead) became troublesome insect pest in Egypt since it attacks several fruit trees such as citrus, mango, guava, olives, banana and *Ficus nitida* Thumb. trees. It causes defoliation, drying up of young twigs, poor blossoming, premature dropping of heavily

infested fruits and small size of fruits together with lack of juice in case of heavy infestation.

Since the fluctuations of population density of the Oriental yellow scale and the role of natural enemies in regulating its abundance have not been studied up till now in Egypt, the present work was initiated with the aim of contributing some of the needed information in this respect.

The presented study was conducted throughout 3 successive years from mid-April 1995 up to the beginning of April 1998. The scope of the study included the following aspects:

- 1-Survey of the natural enemies, parasitoids and predators of certain scale insects under study.
- 2-The seasonal changes in the population dynamics of *Aonidiella aurantii* (Mask.), *Aonidiella orientalis* (Newst.) and *Chrysomphalus aonidum* L. in Beni-Suef Governorate.
- 3-Evaluation of the rate of natural mortality of the three above mentioned scale insects that caused by parasitoids.
- 4-Biological studies for two hymenopterous parasitoids which were recorded and reared from the Oriental yellow scale insect for the first time in Egypt viz., *Aspidiotiphagus citrinus* (Craw.) and *Habrolepis pascuorum* Mercet.