STUDIES ON SOME NATURAL ENEMIES ATTACKING SCALE INSECTS AND MEALY BUGS IN QUALUBIA PROVINCE

BY

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B. Sc. (Agriculture, Entomology), 1986
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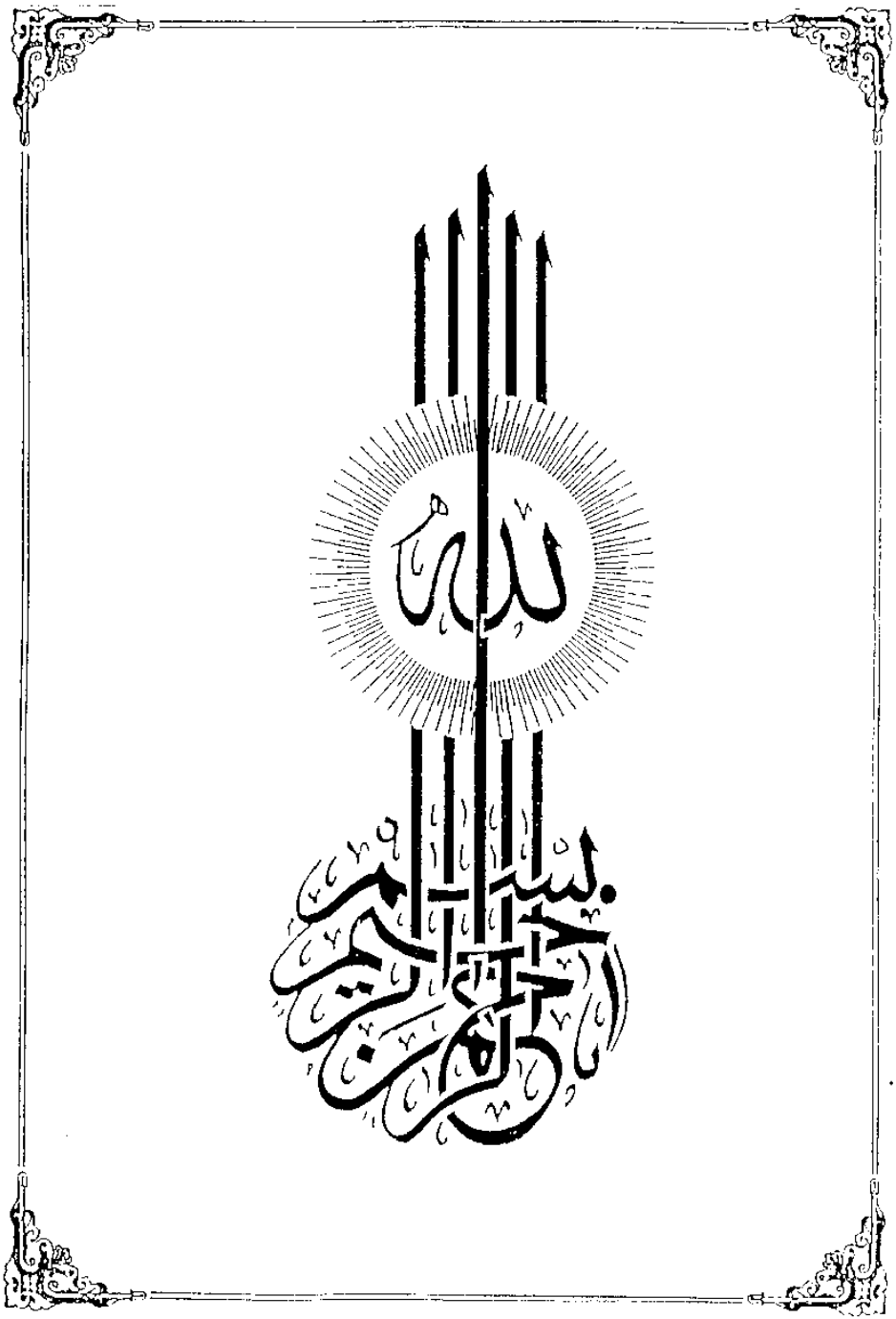

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ABSTRACT

The black scale insect, *Chrysomphalus ficus* Ashmead was considered as key pest on citrus orchards since the end of

nineteen century uptill the end of sixth decade of twentieth century. Afterwards, the population of this pest began to decrease gradually in the successive years. Nowadays, it is not easy to find an orchard infested with this scale insect. The factors responsible about this phenomenon are unrecognizable uptill these studies.

The ecological data about *C. ficus* and its natural enemies were obtained by half-monthly counts on navel orange leaves from a citrus orchard at El-Kanater El-Khiria, Qualubia Governorate from 1st February, 1989 to mid-January 1990. The seasonal fluctuation in the total population as well as the seasonal variations of the different developmental stages showed that this species had four annual periods of seasonal activities and four annual generations, viz. spring generation form 1st February to mid-May; summer generation from 1st June to 1st August; autumn generation from mid-August to mid-October; winter generation from 1st November to mid-January.

The natural enemies of *C. ficus* were recorded and carefully identified throughout the ecological studies. One species of ectoparasitoid, *Aphytis holoxanthus* DeBach which recorded for the first time in Egypt; three species of endoparasitoids, *Aspidiotiphagus citrinus* Craw.,; *A. lounsburyi* Berl. & Paoli and *Habrolepis pascuorum* Mercet and an entomogenous fungus, *Cladosporium cladosporioides* (Fresen.) were recorded. The seasonal activities for these natural enemies were represented by actual numbers as well as percentages of parasitism throughout the half-monthly counts. Statistical analysis of the data clarify that the combined effects of these bioagents (ecto- endo- parasitoids and entomogenous fungus) and main climatic factors (mean temperature and mean % R.H.) were responsible as a group on the seasonal activities of *C. ficus* specially during spring and winter generations; while the same factors had lesser effects during summer and autumn generations.

Therefore, the phenomenon of scarcity of the black scale insect probably due to the effects of the previously mentioned

these natural enemies while had the opportunity to parasitized on this insect pest especially *A. holoxanthus*.

Morphological and biological studies were carried out on the ectoparasitoid, *Aphytis holoxanthus* on *C. ficus* under laboratory conditions. The different developmental stages of the parasitoid were described and their measurements were estimated. The duration of the different stages were estimated. The type of diets provided to adults had highly significant effects on both sexes. The honey, seemed to be the most appropriate food for the adults of parasitoid. It gave the proloned oviposition periods and the longevity of both female and male. Moreover, it caused an increase in the rate of egg laying/female.

Four species of entomogenous fungi were isolated and identified from *C. ficus*, these species are: *Cladosporium cladosporioides*, *Alternaria* sp., *Ulocladium* sp. and *Diplodia* sp.. The pathogenicity tests of the four species showed that C. cladosporioides was the only dominant and effective species. The percentage of parasitism reached 15.5 after four weeks of application.

Key words: Biological control - Black scale insect - Bioagent - Natural enemies - Ectoparasitoid - Endoparasitoid - Entomogenous fungi - Ecology - Biology - Isolation - Phathogenicity test - *Chrysomphalus ficus* - *Aphytis holoxanthus* - *Aspidiotiphagus citrinus* - *A. lounsburyi* - *Habrolepis pascuorum* - *Cladosporium cladosporioides*.

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