EFFICIENCY OF CERTAIN ORGANOPHOSPHORUS INSECTICIDES ON SCALE INSECTS, THEIR NATURAL ENEMIES AND THE SIDE EFFECTS ON ORANGE FRUITS IN EGYPT.

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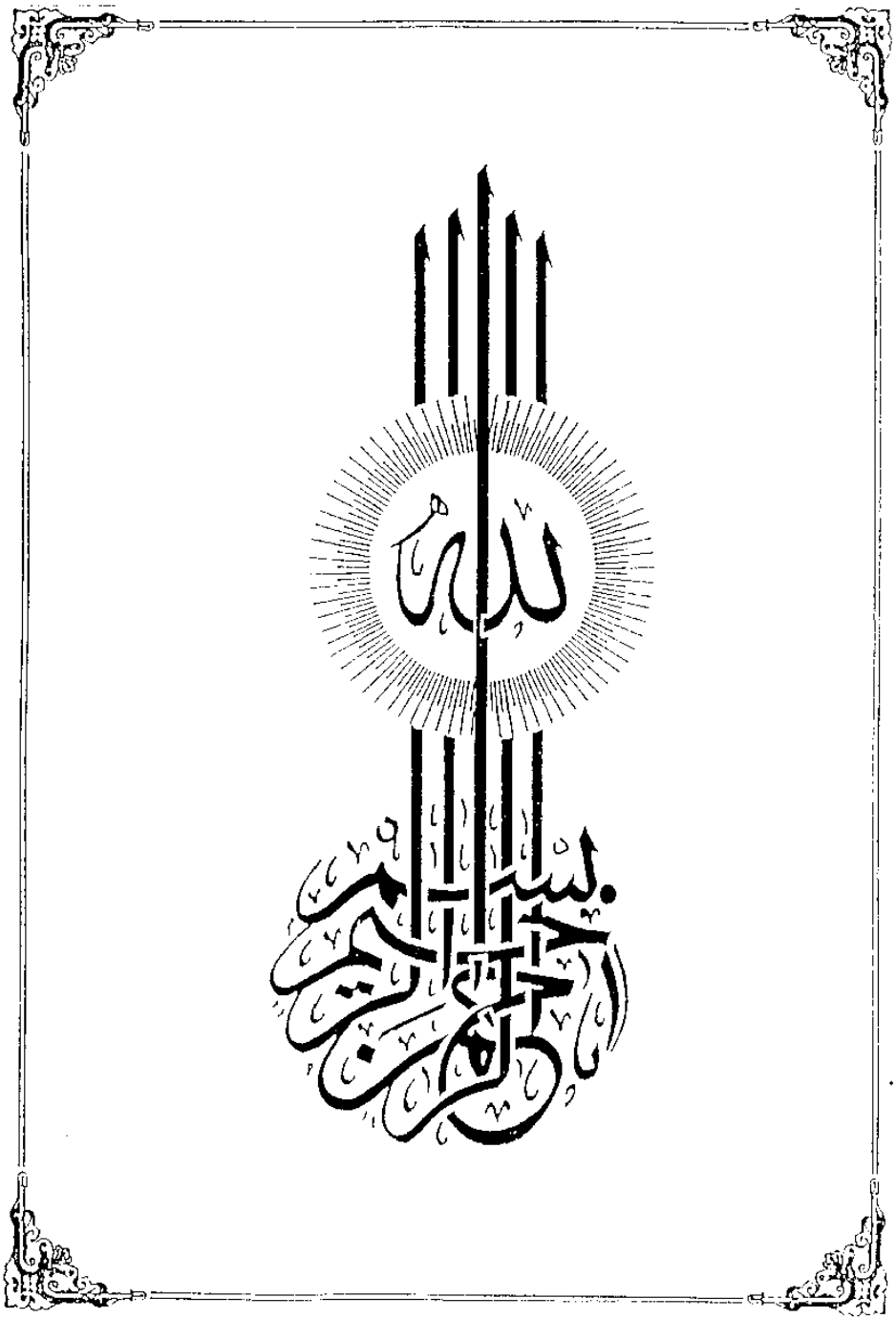

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CONTENTS

I- INTRODUCTION

The purple scale insect Lepidosaphes beckii (Newman), is one of the most serious citrus pests, vies in importance with California red scale, Aonidiella aurantii, Maskell. For while it is generally somewhat more easily controlled by existing artificial control measures than the red scale. It is the more widely distributed among the important citrus scale insects. It appears to thrive under a greater diversity of climatic conditions than do many other species, but reaches its greatest development in the more humid areas.

Unlike some of the other citrus - infesting scale insects, the purple scale confines its attacks largely to citrus and is not found on many other host plants in A.R.E.

Nowadays other pests have been taking place on citrus. The most serious damage due to insects on orange trees is attributed to three other scale insects, i.e. Aonidiella aurantii Maskell, Parlatoria Ziziphus (Lucas), family Diaspididae and Ceroplastes floridensis Comstok, family Coccidae. All belong to the superfamily Coccidea, order Homoptera.

Inspite of the widespread application of insecticides in controlling these insects in Egypt, yet they still cause considerable damage to citrus, other fruit and ornamental trees. To obtain satisfactory control, other means have

to be integrated with the chemical method.

Some basic informations on the population dynamic of the insect have to be known before such goal can be attained. Because of the fluctuation occurrence in the population density of scale insects, the indentity of their natural enemies and their role in regulation of their abundance must be considered in any control programme.

The present work was initiated with the aim of contributing some of the necessary informations to achieve emplimenting successfull pest control management in our country. The scope of the study included the following:

1- The seasonal variations of purple and red scales infesting orange trees in relation to biotic and abiotic factors in untreated orchard fields were investigated at two different localities.

The role of Aphytis lepidosaphes Compere in reducing the infestation by the purple scale to subeconomic level was studied in order to determine the appropriate time of chemical application against both scales without deleterious effects on natural enemies.

2- The bio residual efficacy of certain scalicides namely Actellic (50), Dimethoate (40), Sumithion (50),

Supracide (40), Oleo Supracide 100, Trithion (45.8), 6 EL Oil (1), Sumi Oil (6), Trithion Oil (7). Against Lepidosaphes beckii (Newman) and its natural enemy Aphytis lepidosaphes Compere was also studied.

3- Estimation of Actellic (50), Sumithion (50) and Supracide (40) EC. insecticidal residues in orange fruits after different intervals from application was also investigated in order to determine the safe time for harvesting and human consumption.

4- The susceptibility of L. beckii (Newm.) nymphal stage to Actellic (50), Dimethoate (Rogar 40 %) and Sumithion (50) was studied under laboratory conditions. The L.d.p. lines were also established and the LC_{50} was determined.

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II- REVIEW OF LITERATURE

a- The Seasonal Abundance of The Purple Scale Insect Lepidosaphes beckii (Newman).

Quayle (1912 a) reported that the purple scale insect Lepidosaphes beckii (Newman) was found to pass through its life history in three months or less during the warmer periods of the year in California. Two generations develop from May to October fellowing an other generation to get fairly well started before the coldest weather of Winter. In the coldest Winter, the individuals of this generation will not deposit eggs until Spring. He added that Mild Winters sometimes permit the development of a fourth generation. In (1938) the same author found that the purple scale does not occure in interior districts but in the coastal districts it is an important pest on Citrus trees and is not found on many other host plants. He also reported that L. beckii had three to four generations annually.

English and Turnipseed (1940) found that the average number of days from birth to laying the 1st. egg was 62 days and for the complete development of the purple scale female was 77.3 days with a minimum of 42 and a maximum of 198 day after birth at Alabama. Ebling (1959) stated

that L. beckii male emerges from under the scale covering as an adult about fifty days after birth and than takes place in accordance with the usual diaspine pattern for males. Simanton (1960) stated that the purple scale reached its peak of seasonal abundance at Florida in early Summer and its lowest population in September. Salama (1962) reported 3-4 generations for this scale; where the highest peak of population occurred in October while the lowest occurred in July. Cermeli (1966) showed that the population density of L. beckii in Caracas began to increase from December and reached a peak in May and June. Rawhy (1966) recorded three overlapping broads for L. beckii the first in spring (February-June) and overlapping with the second broad in Summer which started in (June) while the third one occurred in Autumn. Amin (1970) stated that the purple scale insect had four generations on May, August, November and February with six annual peaks of abundance on April, June, August, October, December 1967 and in February 1968 at Qualubia Governorate. Habib et al (1971) observed four annual generations for the purple scale, on May, August, November and February at Qualubia, Egypt. Helmy (1975) recorded four annual peaks of L. beckii infestations which occurred during September, November 1971, March and May 1972, with four annual generations relatively