TAXONOMIC STUDIES OF WHITEFLIES OF EGYPT
(HOMOPTERA - ALEYRODIDAE)

THESIS

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By

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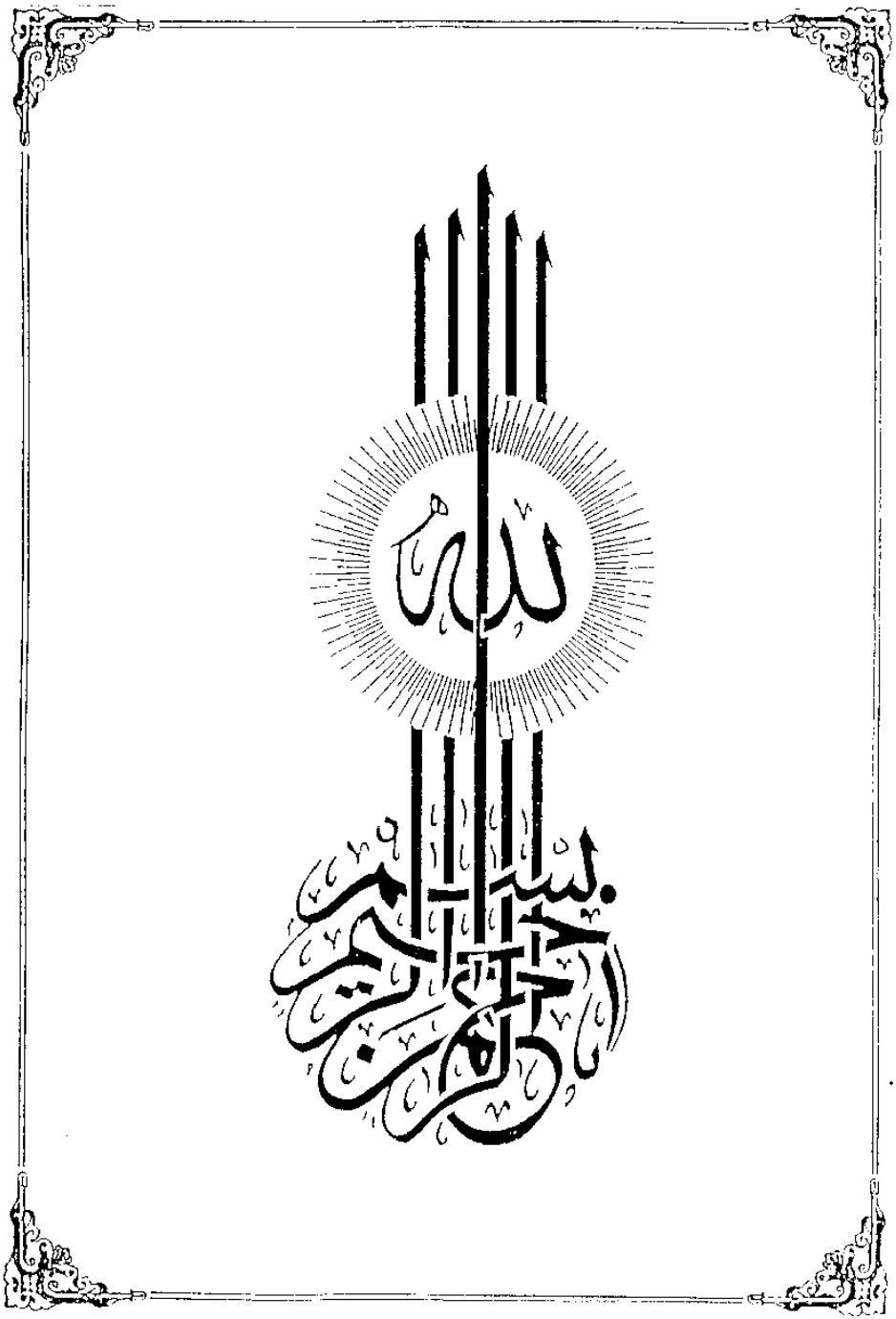

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I- INTRODUCTION

Recently, flies of the family Aleyrodidae (whiteflies) are of importance as pests of economic crops such as; vegetables, citrus, cucurbitaceous, cotton and ornamental plants.

Whiteflies damage to their different host plants includes the suction of sap by larvae and adult flies, curling and yellowing of young leaves, as well as collapse of the infested leaves due to the accumulation of honey dew on them. Later on, dust sticks to honey dew and fungus grows on the infested leaves which results in a dirty black appearance and causes indirect injury by transmission of certain virus diseases to a lot of plants of recognized economic importance.

Family Aleyrodidae is one of the most important families in the order Homoptera. It includes about 1156 species belonging to 126 genera all over the world (Mound & Halsey, 1978).

Whiteflies are widely distributed in many regions with diverse climatic conditions of temperature such as subtropical, tropical and palaearctic zones.

The generic and specific classification of subfamily Aleyrodinae of the family Aleyrodidae is based entirely on the study of the so-called pupal cases which are the exuviae of the fourth instar larvae.

The whiteflies are tiny insects, from one to three mm. long. The adults of both sexes have their two pairs of wings covered with a white, powdery wax which gives the insects their common name. The larvae are characterized by a fringe of conspicuous, white, waxy plates or rods extending out from the margin of the body.

The Aleyrodidae has attracted the attention of many workers all over the world. Among the names who handled this family in Egypt one may mention Willcocks (1922), Priesner and Hosny (1934), Habib and Farag (1970), Zahradnik (1970), El-Healaly *et al*. (1972) and Bink-Moenen (1983).

On account of the economic importance of this family, it was thought of value to study their taxonomy in Egypt together with their host plants, distribution and quantitative evaluation.

There are nineteen species known to exist in Egypt belonging to the subfamily Aleyrodinae. Twelve species of them belong to ten genera are studied here.

II- LITERATURE REVIEW

The literature of the Egyptian whiteflies will be presented in the following account, arranged in chronological order.

1. Taxonomy :

Linnaeus (1758) recorded a new species Aleyrodes proletella Linnaeus on Brassica sp. and described it.

Westwood (1856) recorded a new species Aleyrodes vaporariorum Westwood on Gonolobus sp.

Gennadius (1889) recorded also a new species, Bemisia tabaci Gennadius on tobacco from Greece.

Laing (1921) recorded Aleyrodes proletella Linnaeus (cabbage whitefly) abundant in southern England.

Misra and Lamba (1929) recorded Bemisia tabaci Gennadius in Punjab and described all its stages.

Takahashi (1931) gave brief notes on two species Bemicia gossypiperda Misra & Lamba on cotton (Gossypium sp.) and Dialeurodes citri Riley & Howard which is common on citrus and other plants, later on, the same author (1932) recorded Aleurotuberculatus as gen.n. in Formosa on Cinnamomum camphora.

Priesner and Hosny (1934) described the pupal cases of Dialeurodes kirkaldyi on various ornamental plants, Aleurocanthus zizyphi Priesner & Hosny on Zizyphus spinach-risti, Aleuroplatus cadabae Priesner & Hosny on Cadaba rotindifolia, Bemisia longispina Priesner & Hosny on guava, Aleurolobus niloticus Priesner & Hosny, Aleurotrachelus citri Priesner & Hosny on various host plant, Bemisia afer (Priesner & Hosny) on Lawsonia alba and Ficus sycomorus, Aleurotrachelus alhagii Priesner & Hosny on several leguminous plants, Dialeurodes elbaensis Priesner & Hosny on Ficus salicifolia and Siphoninus phillyreae (Haliday) recorded on pear, apple and pomegranate (Punica granatum).

Corbett (1935) recorded Aleuromarginatus tephrosiae Corbett on Tephrosia candida in Sierra and gave description of this genus.

Priesner and Hosny (1938) described Trialeurodes porosus as sp.n. on Zizyphus spinach-risti.

Frappa (1939) discussed the difference between the new species Bemisia manihotis Frappa and Bemisia longispina Priesner & Hosny.

Takahashi (1940) described pupal cases and few adults of Bemisia tabaci (Gennadius) on tobacco and reiterate, he stated that Bemisia gossypiperda

Misra & Lamba and Bemisia hibisci Takahashi are synonyms of this species.

Young (1942) described Dialeurodes citri Riley & Howard on citrus in England.

Russell (1948) recorded Trialeurodes mossopi Corbett, Trialeurodes natalensis Corbett and Trialeurodes souchi Kotinsky as synonyms of Trialeurodes vaporariorum (Westwood).

Mound (1965) differentiated between the pupal cases of Acaudaleyrodes citri (Priesner & Hosny) and Acaudaleyrodes alhagii Priesner & Hosny. The same author (1966) described Aleyrodes proletella Linnaeus, Bemisia tabaci (Gennadius), Siphoninus phillyreae (Haliday) and Trialeurodes vaporariorum (Westwood).

Hill (1969) demonstrated the morphological comparison between Trialeurodes vaporariorum (Westwood) and Bemisia tabaci (Gennadius) on tobacco in South Africa.

Azab et al. (1970) studied the morphology of Bemisia tabaci (Gennadius) in Egypt, indicated a relation between the shape of the pupa and number of dorsal spines.

Pollard (1971) described some features of aleyrodid mouth parts from an examination of the stylets of adults of Aleyrodes proletella (Linnaeus).

Habib and Farag (1970) described nine species of Aleyrodidae that are common in Egypt, with notes on their host plants and local distribution.

El-Healaly *et al*. (1972) described the immature stages and adults of *Aleyrodes proletella* (Linnaeus).

Herakly (1973) described different pupal cases of *Bemisia tabaci* (Gennadius), reared in Egypt on different host plants.

Iaccarino (1982) recorded a new species of Aleyrodidae (*Aleuroviggianus adrianae* Iaccarino, 1982) on Quercus ilex in Sorrento Portici, and subsequently, other parts of Italy.

Bink-Moenen (1983) stated that *Aleurocanthus hansfordi* Corbett is a synonym of *Aleurocanthus zizyphi* Priesner & Hosny and *Bemisia hancocki* Corbett is a synonym of *Bemisia afer* (Priesner & Hosny) and recorded 2 new species from Egypt *Aleuroplatus acaciae* Bink-Moenen and *Tetraleurodes leguminicola* Bink-Moenen.

Paulson and Kumashiro (1985) studied the morphology of *Bemisia tabaci* (Gennadius), *Dialeurodes kirkladyi* (Kotinsky), *Parabemisia myricae* (Kuwana) and *Trialeurodes vaporariorum* (Westwood).

David (1987) studied host-correlated variations in aleyrodid taxonomy , and variation in the pupal morphology

of Trialeurodes vaporariorum (Westwood) on various host species has been correlated with the structure of the host leaf and similar relationships have been demonstrated for several other species of Trialeurodes and Dialeurodes. Basic taxonomic studies on the large number of specimens associated with different host plants are needed.

2. Host plants and distribution :

Froggatt (1918) found the whiteflies feeding on the sap of plants and that there are several cosmopolitan species with a very wide range of host plants such as Trialeurodes vaporariorum (Westwood).

Kuwana (1927) found Bemisia myricae Kuwana in Japan infesting both sides of the leaves of Myrica rubra (mulberry), citrus and other plants.

Husain and Khan (1932) published a list of all host plants other than citrus for Dialeurodes citri Riley & Howard in Calcutta, for example pomegranate (Punica granatum), guava (Psidium guajava), pear (Pyrus communis) and other trees and the authors showed the whiteflies attacking Jasminum and also Hibtage is in reality Dialeurodes kirkaldyi (Kotinsky), moreover, specimens labelled Dialeurodes citri Riley & Howard on Jasminum