

SEASONAL ABUNDANCE OF THE WHITEFLY
***Trialeurodes ricini* (MISRA) (HOMOPTERA :ALEYRODIDAE)**
ON SOME WEEDS AND ON CASTOR PLANTS IN
QALYUBIA, EGYPT

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ABSTRACT

Seasonal abundance of the castor whitefly *Trialeurodes ricini* (Misra) was studied on castor plants in addition to 8 species of wild plants (six winter and two summer weeds) at Qalyubia Governorate in Egypt during 1993/1994 . The highest population on these host plants occurred between September and December. *Ricinus communis*, *Bidens bipinnata*, *Cichorium endivia* and *Sonchus oleraceus* appeared to be the major host plants .

Key words: *castor plants, Trialeurodes ricini, whitefly, wild plants.*

1.INTRODUCTION

The castor whitefly , *Trialeurodes ricini* (Misra) (Homoptera : Aleyrodidae) is a polyphagous insect , feeding on the leaves and fruits of a wide range of host species including castor, cowpea ,cotton , pumpkin and sweet potato (Bink –Moenen, 1983). It is found also in tropical regions of Asia and Africa (Mound and Halsey , 1978). Abd – Rabou (1990) for the first time in Egypt recorded this species as *Trialeurodes vaporariorum* (Westwood) .

The castor whitefly nymphs and adults suck the cell sap , mostly from the lower surface of the leaves and consequently produce sooty moulds and reduce the seed yield (Patel *et al.*, 1986; Shishehbor & Brennan , 1996).

More information about the occurrence and seasonal abundance of *T.ricini* on its host plants is very much needed . Thus , the present study deals with the abundance of this species on some weeds and castor plants in Qalyubia , Egypt .

2.MATERIAL AND METHODS

2.1. Identification of the whitefly *Trialeurodes ricini*

Samples of this species sent to Dr. Gina Banks (John Innes Center , UK) were analyzed by RAPD-PCR, and some samples were also sent to J.H. Martin of the Hemiptera section in the British Museum and they agreed that these samples were species *Trialeurodes ricini* (Misra).

2.2. Seasonal abundance of *Trialeurodes ricini* on wild plants

The seasonal abundance was carried out for the *Trialeurodes ricini* on the most prevalent wild plants in Qalyubia Governorate in Egypt from Dec.1993 to Dec.1994.

2.3. Sampling and counting of immature stages

For each wild plant species, the size of the sample was 10 leaves taken weekly from 10 wild plants chosen at random. The sample unit was one leaflet from each leaf in the case of the compound leaves. Sampling and counting were made according to the type of the plant, its density , degree of growth , nature of infestation and the distribution of insects on the different parts of the plants .

Square –inch method

In this method , one square-inch was marked on the under- side of each leaf , on which different stages of the whitefly were counted and recorded . This technique was employed in the following plant species : *Ricinus comunis*, *Ageratum conyzoides*, *Amaranthus cruentus*, *Cichorium endivia*, *Datura stramonium* , *Solanum nigrum* and *Sonchus oleraceus*.

Whole leaf area method

In this method the immature stages found on the whole area of each leaf were counted . This method was employed in the case of *Chenopodium album*.

2.4. Sampling and counting of adults

At the beginning of each sampling , adults were counted on the 10 leaves before their removal. This was essentially done at early morning in the presence of dew.

3.RESULTS

3.1. Seasonal abundance of whitefly on castor plants

On *Ricinus communis* (Fig. 1):

The total number of *Trialeurodes ricini* during December recorded an average of 2100.75 individuals/ inch², which declined during January/ February reaching 47.75 individuals / inch² in February . Another increase in the number of insects started during June and continued during August /December reaching an average of 2461 individuals/inch² in December. No insects were recorded in March/May despite the availability of the weed . The period from October\ to December represented the high abundance of the insect with a peak number in December. Larvae represented the highest stage recorded followed descendingly by eggs and adults, respectively ,this order was the same on all the inspected plant species.

3.2. Seasonal abundance of whitefly on some annual winter weeds

On *Ageratum conyzoides* (Fig. 2):

This weed is known to be a winter annual, however, it was observed all year round except for two months (May/June) . The number of *Trialeurodes ricini* on this weed recorded an average of 284/ inch² during December which declined during January reaching 104.4/inch². In the period February /April this insect was not recorded , despite the availability of the weed. Another increase in the number occurred during July /Septemer reaching an average of 351.25 /inch² in September. This increase was followed by a decrease during October onwards. The period August / October represented the high abundance of the insect with a peak in September.

On *Amarantus cruentus* (Fig.3):

This weed is known to be a winter annual, however, it was observed all year round except for two and half months; mid-February/April. *Trialeurodes ricini* recorded a general low density during January (5.4 individuals / inch²) No insects were recorded in May, despite the availability of the weed. The population increased during July/October reaching an average of 213.8/inch² in October. This increase was followed by a decrease during November. The period September/November represented the highest abundance of the insect with a peak in October.

On *Bidens bipinnata* (Fig.4):

This weed is known to be a winter annual, however, it was observed all year round except for one and half month (March/mid-April).

The number of *Trialeurodes ricini* recorded an average of 549.5/leaflet during December, then declined sharply during January reaching 53.6/ leaflet. No insects were recorded in the period from April to May despite the availability of the weed. Another increase in the number of insects started during July and continued during October /November reaching an average of 838.5/leaflet in November. Generally the period October/ December represented the highest abundance of the insect with a peak in November.

On *Chenopodium album* (Fig.5):

This weed was available during the period November / beginning of January. The lowest population of *Trialeurodes ricini* occurred during January with an average of 461/ whole leaf, while the highest population occurred in December (552/whole leaf).

On *Cichorium endivia* (Fig.6):

This weed was available during the period October / February, which represents its natural growing season. The population of *Trialeurodes ricini* recorded 325.25 individuals / inch² in December, then declined to reach 4/inch² in February. When the weed appeared again in October, *Trialeurodes ricini* recorded an average number of 520.25 / in inch². The population increased during November/ December reaching 833 / inch² in December. The period October

/December represented the highest abundance of the insect with a peak in December.

On *Sonchus oleraceus* (Fig.7):

This weed was available during the period October/mid-February, which represents its natural growing season. The number of *Trialeurodes ricini* recorded an average of 589.25 /inch² during December, then declined during January/February reaching 299.5/inch² in February. Another increase in the number of insects occurred during October /December reaching an average of 663/inch² in December . The period October / December represented the high abundance of the insect with a peak in December.

3.3.Seasonal abundance of whitefly on summer annual weeds

On *Datura stramonium* (Fig .8):

This weed was available during the period May/ October, which represents its natural growing season . *Trialeurodes ricini* recorded a general low density during may (0.8 individuals / inch²) and that increased during June / October reaching an average of 581.2 individuals/ inch² in October. The period August /October represented the highest abundance of the insect .

On *Solanum nigrum* (Fig.9):

Although this weed is known to be a summer annual, it was observed during the investigation all year round except for only one and half month (February/ mid March). *Trialeurodes ricini* recorded a general low density on this weed , during January (13.75 individuals / inch²). No insects were recorded in the period from March to April despite the availability of the weed . The population increased during August / December reaching its peak with an average of 227 individuals /inch² in December . The period October /December represented the highest abundance of the insect.

4.DISCUSSION

The present results revealed that *Trialeurodes ricini* has two main overlapping annual broods a year, on the prevalent host *R. communis* . The first brood of eggs was during May/ late November ,

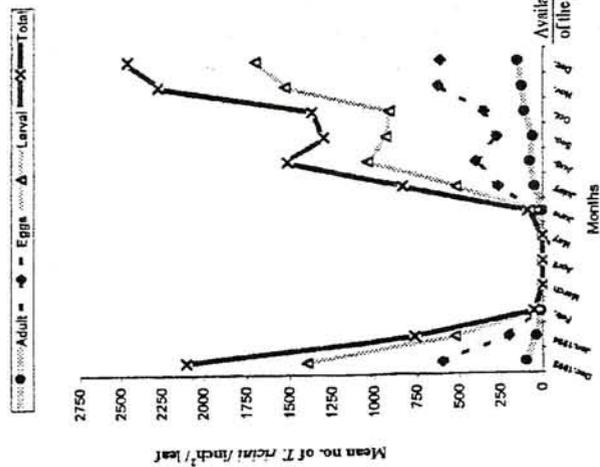


Fig. (1) : Monthly mean numbers of the whitefly, *T. ricini*/finch² on *Ricinus communis* in Qalyubiya during 1993/1994

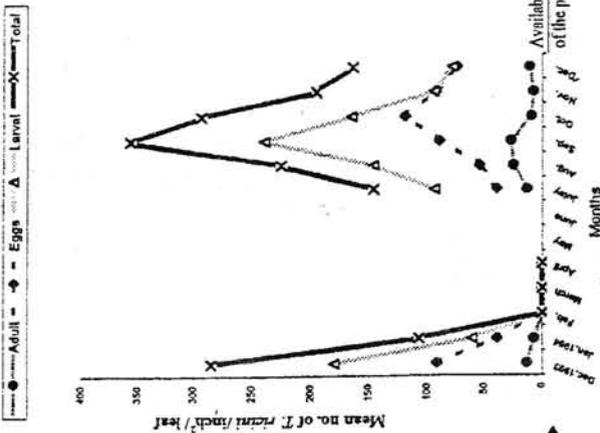


Fig. (2) : Monthly mean numbers of the whitefly, *T. ricini*/finch² on the wild plant *Ageratum conyzoides* in Qalyubiya during 1993/1994

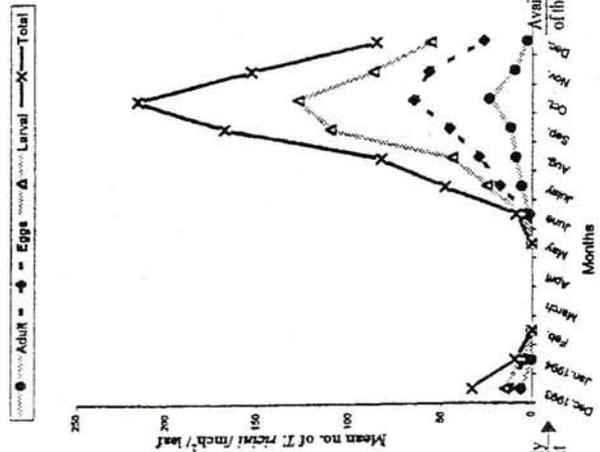


Fig. (3) : Monthly mean numbers of the whitefly, *T. ricini*/finch² on the wild plant *Ageratum cruentus* in Qalyubiya during 1993/1994

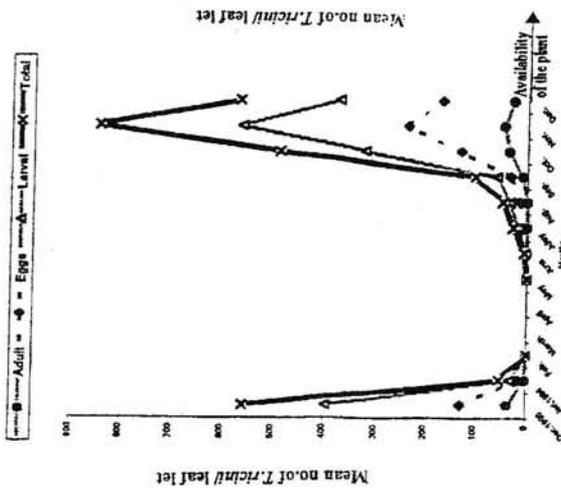


Fig. (4) : Monthly mean numbers of the whitefly, *T. ricini*/inch² on the wild plant *Bidens bipinnata* in Qalyubiya during 1993/1994

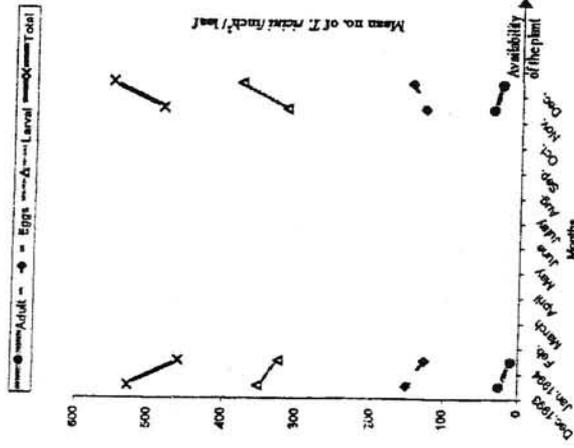


Fig. (5) : Monthly mean numbers of the whitefly, *T. ricini*/inch² on the wild plant *Chenopodium album* in Qalyubiya during 1993/1994

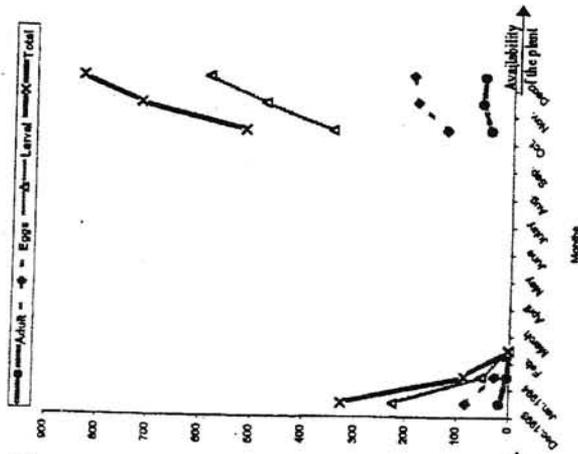


Fig. (6) : Monthly mean numbers of the whitefly, *T. ricini*/inch² on the wild plant *Cichorium endivia* in Qalyubiya during 1993/1994

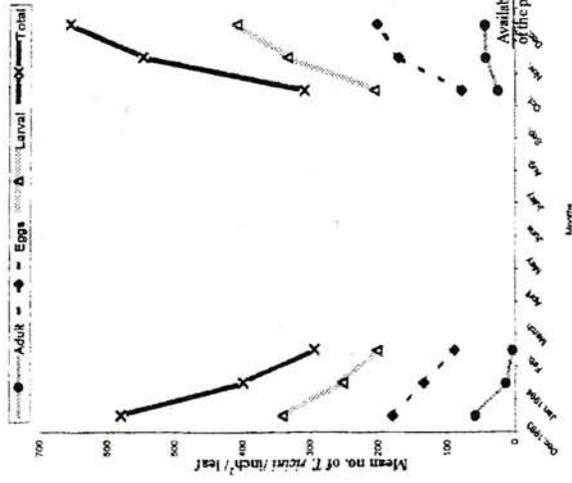


Fig. (7) : Monthly mean numbers of the whitefly, *T. ricini* /finch², on the wild plant *Sonchus oleraceus* in Qalyubiya during 1993/1994

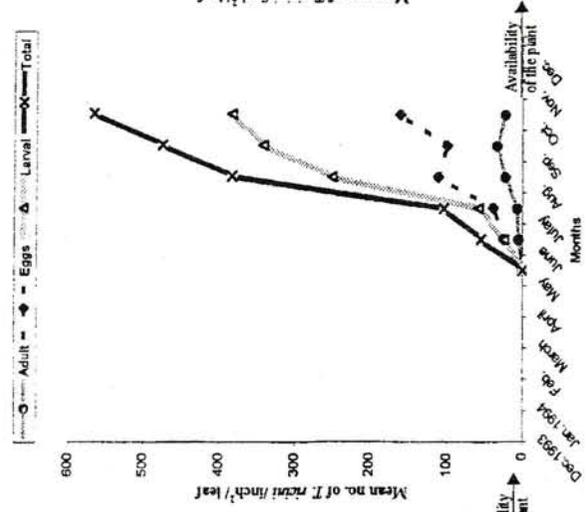


Fig. (8) : Monthly mean numbers of the whitefly, *T. ricini* /finch², on the wild plant *Datura stramonium* in Qalyubiya during 1993/1994

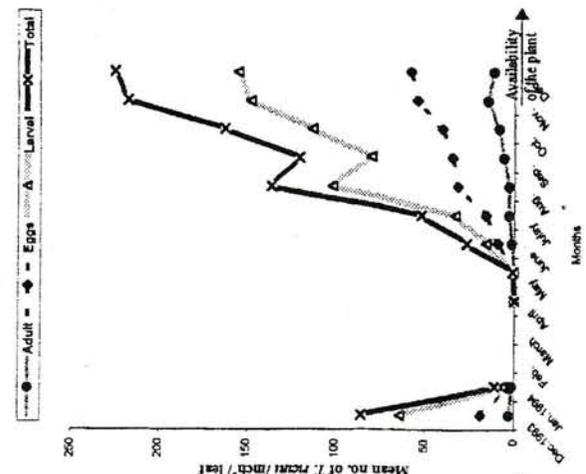


Fig. (9) : Monthly mean numbers of the whitefly, *T. ricini* /finch², on the wild plant *Solanum nigrum* in Qalyubiya during 1993/1994

with a duration of 27 weeks and the second occurred during late August / mid- January covering a period of 19 weeks duration . The larvae were observed mid –May / late November for the first brood, with duration of 25 weeks and during mid-July/ mid-February with duration of 28 weeks for the second brood. The adults of the first brood occurred June/early November (21 weeks duration) and again during August /February for a second brood with 28 weeks duration . In the present work six wild plants are recorded for this species for the first time in Egypt . The highest population on the 9 studied host plants occurred between September to December. *R.communis* , *B.bipinnata*, *C.endivia* and *S.oleracéus* appeared to be major hosts. Some other Homopterous insects appeared to have their highest abundance in the coldest months in Egypt (Sewify , and Herakly,1993), probably because these insects prefer the mildly cooler temperatures during these months in Egypt.

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الوفرة الموسمية لذبابة الخروج البيضاء على نبات الخروج
وبعض الحشائش البرية في مصر

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ملخص

تناول البحث دراسة الوفرة الموسمية لذبابة الخروج البيضاء المسجلة حديثا في مصر على نبات الخروج بالاضافة الى ثمانية حشائش برية (ستة حشائش شتوية وحشيشتان صيفيتان) منها ستة حشائش برية تسجل كعوامل لها لاول موة في مصر في محافظة القليوبية وقد رصد أعلى تعداد لهذه الحشرة في الفترة من شهر سبتمبر وحتى ديسمبر .

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