V- SUMMARY

Grapevine, *Vitis vinifera* and fig, *Ficus carica* fruits are considerable important orchard crops for local consumption in Egypt and exportation.

The phytophagous mites are the most serious pests of grapevine and fig varieties in Egypt, causing heavy injuries to leaves, buds and fruits, resulting reduced of production and fruits quality. Also some mites transmitted some virus diseases which decreased the quality and quantity of yield in some countries of the world. In Egypt, this is considered the first evidence of transmission plant viruses by mites.

The present study was aimed to throw light on the following aspects:

1- Survey of mites inhabiting grapevine (*Vitis vinifera* l) and fig varieties (*Ficus carica*) in some localities of lower Egypt. Mites were collected from leaves; cuttings; buds; debris and soil. Survey studies indicated the occurrence of 33 species belonging to 12 families. These mites are classified according to their feeding habits into three categories as the following:

A- Phytophagous mites included 13 species belonging 10 genera and 4 families as the following: *Tetranychus urticae* Koch; *T. Cucurbitacearum* Sayed, *Eiotetranychus orientalis* (Klein); *Oligonichus vitis* Zaher & Shehata, *O. mangiferus* (Rahman & Sapra); *Bryobia paractiosa* Koch (Tetranychidae), *Tenuipalpus granati* Sayed; *Brevipalpus californicus* (Banks); *B. phoenicis* (Geijskes)

(Tenuipalpidae), *Colomerus vitis* (Pagenstecher); *Aceria ficus* cotté (Eriophidae), *Rhyncaphytoptus ficifoliae* keifer, *Diptilomiopus ficus* Attih (Rhyncaphytoptidae).

B- The predaceous mites included 11 species belonging 8 genera and 4 families as a following: *Amblyseius swirski* Athias-Henriot, *A. cyndoductylon* Shehata & Zaher, *A. ficus* El-Halawany & Abdel-Samad, *Euseius scutalis* A.H., *Typhlodromus pyri* (Schueten); *Phytoseius fintimus* Ribaga (phytoseiidae), *Agistimus exsertus* Gonzalez (Stigmaeidae), *Cheletogenes ornatus* (C. & F.); *Paracheyletia bakeri* (Ehara) (Cheyletidae), *Neophyllobius aegyptium* Soliman & Zaher, *N. citri* Soliman & Zaher (Comerobiidae).

C- Mites of uncertain feeding habits included 9 species belonging 6 genera and 4 families as following: *Tydeus californicus* (Banks), *T. kochi* oudeman, *T. schusteri* Andri & Nado, *Prenematus ubiquitus* (MCG) (Tydeidae), *Tarsonemus setufer* Ewing, *T. smithi* Ewing (Tarsonemidae), *Siculobata sicula* Grandjen, *Zygoribatus* sp. (oribatidae); *Tyrophagous putrescntia* (Schrank) (Acaridae).

2- Some ecological studies carried out on mites inhabiting three grapevine varieties at Qalubiya Governorate during two successive years indicated that the phytophagous mites *Tneuipalpus granati* Sayed; *Tetranychus urticae* Koch; *Oligonychus vitis*; Zaher & Shehata; *Colomerus vitis* pagenstecher and *Brevipalpus californicus* (Banks)

were appeared on leaves of grapevine varieties during the period from March 1999 to February 2001.

3- The flat mite *T. granati* was the major pest infesting leaves of grapevine followed by *C. vitis, O. vitis* and *T. urticae* while *B. californicus* appeared with few number at Qalubiya Governorate.

4- The population dynamics of *T. granati,* has one annual peak of seasonal abundance in August on leaves of three grapevine varieties (Romy Ahmer; Thompsonseedles and Bez El-anza). This species was moved from leaves to buds where it hibernated as adult females in cracks and under bark with peak in December in autumn during two successive years.

5- The population dynamics *T. urticae* has one annual peak of seasonal abundance in August on leaves of three grapevine varieties (Romy Ahmer; Thompsonseedles and Bez El-anza) and the individuals were concentrated around the buds with one peak in November during two successive years.

6- The population density of *O. vitis* has one annual peak of seasonal abundance in September on leaves during two successive years.

7- The population of the eriophyid mite *C. vitis* has one annual peak of seasonal abundance in July on leaves and the individuals tended to migrate from leaves to buds with one peak in December during two successive years.

8- The population dynamics of *B. californicus* has one peak of seasonal abundance in July on leaves, while the

individuals were concentrated with few number around the buds in autumn and winter during two successive years.

9- During this study the eriophyid mite *C. vitis* was a main pest in buds of grapevine varieties.

10- The population density of five phytophagous mites (*T. granati; T. urticae; C. vitis; O. vitis* and *B. californicus*) were positively correlated with the average temperature and non significant negatively correlated with average relative humidity during two successive years.

11- Grapevine varieties exhibited variability in their susceptibility to phytophagous mites as the following:

A- Romy Ahmer variety was the most susceptible to the infestation by phytophagous mites followed by Thompson seedless and then Bez El-anza variety during the two successive years.

12- The predatory mites *A. swirski; A. exsertus* and *C. ornatus* was recorded on grapevine varieties during two successive years as following:

A- The population dynamics of *A. swirski* has one peak of seasonal abundance in December on grapevine varieties during two successive years.

B- The population density of *A. exsertus* has one peak of seasonal abundance in November during two successive years.

C- The population density of *C. ornatus* has one peak of seasonal abundance in November during two successive years.

13- The population dynamics of three predator mites *A. swirski*; *A. exsertus* and *C. ornatus* on three grape varieties were positively correlated with average temperature while it were negatively correlated with the relative humidity during two successive years.

14- The population density of three predatory mites were positively correlated with the population density of five phytophagous mites during two successive years.

15- Population dynamics of fig bud mite, *Aceria ficus* cotte on two fig variety trees were carried out at Giza Governorate.

16- The population dynamics of *A. ficus* has two peak of seasonal abundance one in June and other in October on young leaves of Sultani and Adsi fig varieties during two successive years.

17- On old leaves of Sultani variety the eriophyid bud mite, *A. ficus* has two peaks of seasonal abundance one in July and other in November, while on the old leaves of Adsi variety it has two peaks in July and October. The individuals of *A. ficus* were appeared with little number in March and decreased in December. The eriophyid bud mite, *A. ficus* disappeared from January to March during two successive years.

18- The population density of *A. ficus* were significant positively correlated with average temperature while it

was negatively correlated with average relative humidity on young and old leaves of Sultani and Adsi fig varieties during two successive years.

19- Fig varieties exhibited considerable variability in their susceptibility to fig bud mite, *A. ficus* from which Sultani fig variety was the most susceptible to the infestation by fig bud mite, *A. ficus* than Adsi fig variety during two successive years.

20- Trees with mosaic symptoms, observed in almost all the fig growing areas in Egypt, which infested by mites were used to study:

I. Transmission of FMV by mites:

1- The fig bud mites (*A. ficus*) was succeeded to transmit the virus from diseased to healthy plants of Siltani and Adsi fig varieties. Results indicated that the percentage of transmission was higher in Sultani (60) than in Adsi plants (50).

2- The two spotted spider mite (*T. urticae*) was failed to transmit the virus.

3- The characteristic of FMV observed were light chlorotic spotting & mottling, mosaic & yellowing the leaves and malformation of the laminae.

II. Effect of number of viruliferous mites (*A. ficus*) per plant on virus transmission:

1- The number of infected plants were increased with the increase of the number of mites used.

2- Hundred percentage of Sultani and Adsi plant became infected when 20 viruliferous individuals of mites were used.

III. Development of mite population on healthy and virus-infected fig plants.

1- The numbers of mite, *A. ficus* were increased during the period from developed the first pair of infected leaves to complete the second one of Sultani and Adsi infected plants (5040 and 3884 individuals comparing with 4196 and 3506 individuals on healthy control plants, respectively) when 20 individuals were used.

2- The numbers of two-spotted spider mite were increased in healthy fig plants than in infected ones. On Sultani healthy leaves 6869 individuals were recorded, comparing with 7470 individuals on infected plants whereas on healthy Adsi plants 6181 individuals recorded comparing with 5386 individuals recorded on infected ones.

3- Transmission by grafting: the infectious nature of FMV was confirmed by graft-transmission test. Healthy and/or symptom less seedlings did not give any symptoms of mosaic when tested by bud-grafting.

21- Evaluation of some acaricide Challenger (chlorfenopyrol) 36% Sc at 40cc / 100 litres of water against the population of fig bud mite, *A. ficus* cotte under field condition at Giza Governorate revealed that the reduction in mite population after 28 days of spraying averaged 88.02%, while the percentage average was 81.05%,

78.46% and 69.21% for the recommended acaricides sumi mite (Ethoxazole) 10% FL; Tobas 10% EC (Penconazole) 10cc and sulphur 70% W.P. at concentration of 35cc; 10cc and 250 gr. 100 liter of water, respectively.

RECOMMENDATION

1- The final purpose of the present course of investigation is how to protect such fruit trees from the injurious attacks of the mite pests. For such purpose, detailed information about different pests must be any how, provided, which is, principally death with in the present work. Thus, we ought to start with the most dangerous and serious acarine pests, depending upon new concept about pest population management, instead of instantaneously killing of the pest individuals. The mites studied were chosen for such study, because of their serious and dangerous role in destroyed these fruit trees and their relation with virul diseases.

2- Recognizing the time of the annual peaks of seasonal abundance for each phytophagous spices, concerned in the time of starting the application of the suggested control program.

3- The recognized local predaceous mites, which is found in association with such phytophagous mite pests, are considered as the most successful natural enemies for these pests. Thus, it is recommended here to use them in control application programs.

4- The obtained data about the relationship between fig bud mite (*A. ficus*), two spotted spider mite (*T. urticae*) and FMV. So, several sources of resistance to mite and virus disease must be use.

5- Some acaricides and fungicides were used against *A. ficus* to determine the compound which more efficiency (Challenger 36% Sc).