Studies on some mite species infesting some fruit trees

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The present study aimed to throw light on the incidence of mites inhabiting Fig (Ficus carica L.) and Pear (Pyrus communis L) in some different localities of Egypt. In addition, the population dynamics of certain mites, occurring with Sultani fig variety and Lacont Pear variety under environmental conditions of the field at Sinhera district, Qalubia Governorate during two successive years beginning from January 1998 to the end of December 1999. Also, the effect of two pear varieties, (Lacont and Hood) and seven fig varieties, (Black michen, conadria, cadota, Adsi, Doritto, Sultani and Gizi) on the biology of Tetranychus urticae Koch was investigated under laboratory conditions. Moreover the effect of chemical content in leaves on the biology of T. urticae on different fig varieties was concerned.Results revealed the following: -1. Occurrence studies indicated that 33 mites species belonging to 25 genera and 13 families, were collected from different habitats laid into three categories as the following:a- Phytophgous mites included 13 species belonging to 10 genera and 4 families, namely, Tetranychus urticae Koch, T cucurhitacearum (Sayed), Eutetranychus orientalis (Klein), Panonychus ulmi (Koch) and Bryobia practiosa Koch (Tetranychidae); Cenopalpus pulcher (C.& F.), C. lanceolatisetae Attiah, Brevipalpus obovatus Donnadieu, B. phoenicis (Geijskes) (Tenuipalpidae); Eriophyes ficus Cotte, Epitrimerus pyri Nalepa (Eriophyidae); Rhyncaphytoptus/it iltiiht?• Iticilci mid)11)Illuitiolitis ji(riA(Rhyncaphytoptidae).b- Predaceous mites comprised 1 I species belonging to 9 genera and 5 families distinctly, Phytoseius finitimus Ribaga, Ainhlyseius swirskii (A.-H.), Euseius sculalis A.-H., Amblyseius ficus El-Halawany & Abdel Samad, A. cydnodactylon Shehata & Zaher and Typhlodromus pyri Scheuten (Phytoseiidae); Agistemus exsertus Gonzalez (Stigmaeidae); Cheyletogenes ornatus (C. & F.) (Chyletidae); Saniosulus nudus Summers and Eupalopsellus olearius Zaher & Gomaa (Eupalopsellidae) and Hemisarcoptes malus Shimer (Hem i sarcopti dae).c. Mites of miscellaneous feeding habits represented by 9 species belonging to 6 genera and 4 families namely, Tarsonemus setifer Ewing, T. smithi Ewing and T. fusari Cooreman (Tarsonemidae); Tydeus californicus Banks; T Kochi Oudemans and Pronematus ubiguitus McG. (Tydeidae); Siculobata sicula Grandjean and Zygoribatula sayedi El-Badry& Nasr (Oribatidae) and Tyrophagous putrescentiae (Schrank) (Acaridae).2.Population dynamics of mites occurring on fig trees showed that Eriophyes ficus Cotte was the main pest infesting Sultani fig variety trees and Tetranychus urticae Koch was the second in important phytophagous mite species. Individuals of the eriophyid bud mite E. ficus were observed in greater number on Lower surface of the young leaves than on the old leaves of Sultani fig variety trees. The individuals of T.147Summary and Conclusionurticue; were observed with high number on lower surface of Sultani fig variety leaves.. The eriophyid bud mite E. ficus has two peaks of seasonal abundance on young leaves of Sultani fig variety, one in June and the other in November, in the first year. However, in the second year, it has also two peaks in June, and in October. Individuals of E. ficus appeared in few numbers in March in the first year and in April in the second year, and gradually decreased in December in the first year and in November in the second year. On old leaves of Sultani fig variety, E. ficus has two peaks, which were recorded in July and November during the two successive years. The eriophyid bud mite appeared in little numbers on old leaves in April and increased graduall to July but it had to decrease in number from August to October, and entirely disappeared from January to march during the two successive years. Population density of E. ficus exhibited

significant positive correlation with temperature, while relative humidity was non-significantly, correlated with the mite population but in the first year it was negative and in the second year it was positive correlated on both young and old leaves of Sultani fig varieties.2. The two-spotted spider mite 7'. urticue has two annual peaks, one in June and the other in October in the first year on young and old leaves of Sultani fig variety. However, on young leaves it has two peaks in June and October and only one peak in June on old leaves in the second year. Mite individuals appeared in few numbers in spring, then increased, reaching maximum number in June and October, and disappeared148Summary and Conclusiongradually until march, then it was, entirely observed from January to March during the two successive years. Generally, population density of 7'. urticae was positively correlated with temperature during the two successive years, but in the first year it was highly significant while in the: second one it exhibited non-significant correlation. However, non-significant negative correlation between density of T. urticae and relative humidity on young and old leaves, during the two successive years.3.The predator mite, Phytoseius finitimus Ribaga has two annual peaks of seasonal abundance in June and October in the first year, and in June and November in the second year on young leaves. On old leaves, it has two peaks in July and October during two successive years of Sultani fig variety. Generally, the predator mite P. finitimus appeared on young and old leaves of Sultani fig variety in spring, then increased in number during summer months, but was not observed in winter months during the two successive years. Population of P. finitimus was positively high significant correlated with temperature, on young and old leaves, but non-significant between mite density and relative humidity.4.Ecological studies of mites occurring on Pear trees revealed that Tetranychus urticae Koch, was the main mite pest infesting pear varieties and Epitrimerus pyri Nalepa represented the second important phytophagous mites. Individuals of T. urticae were observed, in high numbers on lower surface of leaves. Also all stages of E. pyri were found on both lower and upper surfaces of leaves of pear trees.14iSummary and Conclusion5.The two-spotted spider mite T. urticae has two annual peaks of seasonal abundance in July and in October in the first and in June and November in the second year. The two-spotted spider mite was appeared on leaves in May in the first year and in April in the second year, then increased in number during the summer and autumn months. The mite species was disappeared from January to April in the first year and from January to March in the second year. Population density of 7'. urticae was highly significant positive correlated with temperature in the first year while in the second year it was only significant. Relative humidity, was non-significant, but negatively correlated in the first year and positively correlated in the second one.6.E. pyri has one annual peak of seasonal abundance in June in the first year and in July in the second year. The eriophyid mite, however was appeared on leaves in May, then increased in numbers and reach maximum number in June in the first year and in July in the second year, then the mite gradually decreased in number until December, during two successive years. The mite disappeared from January to April during the two successive years. Also, Population of E. pyri was positively affected with temperature, in the first year it was non-significant but in the second year it was positively high significant. Relative humidity, however showed, no any significance, with population of mite.7.The predator mite Ambylseius. swiriskii (A.-H.) was recorded with high number on Lacont pear variety, but it has one annual peak of seasonal abundance was recorded in JulySummary and Conclusion 150during . the two successive year. Phytoseiid mite appeared in May in the first year and in April in the second year. The predator mite than disappeared from January to April in the first year and from January to March in the second year. Population densityt of the Predator mite A. swiriskii it was positively high correlated with temperature, but non-significant correlation occurred between the density of mite population of the predator and the relative humidity, during the two successive years.8.Population density of the predator Phytoseius finitimus Ribaga had significant positive correlation with the density of population of both phytophagous mites, E. ficus and T. urticae on young and old leaves of Sultani fig variety, during the two successive years. The density population decreased in number in the first year of phytophagous mites 1998 than in the second year 1999. This may be due to increase the population density of predator mite P. finitimus. Therefore the predator mite P. finitimus main important role in suppressing the population density of phytophagous mites E. ficus and 7'. urticae on trees of Sultani Fig variety.9.The relationship between density of the population of the predator

mite A. swiriskii and that of T. urticae was significant during the two successive years. Also the relation ship between the predator mite population and that of E. pyri was positive affected during two successive year. The predator mite A. swiriskii played arole on suppressing density of the phytophagous mites population in the first year than in the second year on Lacont pear variety trees.Summary and Conclusion 15110.The shortest developmental time (6.67) days and the high fecundity of female (128.05 eggs/ female) were recorded at 30°C. Also the shortest generation period (7.77 days) and the highest intrinsic rate of increase (rm) (0.29) was obtained at 30°C when the two-spotted spider mite T. urticae fed on Black michen fig variety.11.Duration of different developmental stages of T. urticae, when was fed on Cadota fig variety at 30°C was 7.23 days. The longest longevity (26.45 and 20.3days) at 15 and 20°C, while the highest female fecundity occurred at 30 and 25°C, average numbers of deposited eggs per female were 117.7 and 111.66 eggs, respectively.12.The shortest developmental time; maximum sex ratio; shortest generation time; maximum intrinsic rate of increase (rm) and the highest net reproductive rate (Ro) was recorded at 30°C, while the contrary was obtained at 15°C when T. urticae was fed on Sultani fig variety.13.The maximum net reproductive rate (Ro) (15.02) at shortest generation (10.37days) was at 30°C, when the 7'. urticae fed on Doritto fig variety. The lowest intrinsic rate of increase (rm) was recorded at 15°C as (0.034). The highest total mean fecundity rate was found at 25°C as 115.5 eggs per female.14.The shortest developmental time of female and male of T. urticae when fed on Adsi fig variety was recorded at 30°C as (10.15& 9.29 days). While the longest longevity of female was obtained at 15°C as 20.6 days. The highest 50% mortality was 39.5 days at 15°C.Summary and conclusion 15215.The shortest incubation period of T. urticae when it was recorded on Conadria fig variety at 30°C was 3.55 and 3.29 days for female and male, respectively). The shortest period of oviposition at 30°C (8.55 days) while the highest total mean fecundity rate was at 25°C (94.18 eggs per female). Maximum intrinsic rate of increase (rn,) at 30°C was 0.20.16.The shortest developmental period of female and male of T. urticae were 10.85 and 9.28 days at 30°C, on Gizi fig variety. The longest longevity was observed at 15°C (22.04days). The maximum net reproductive rate (Ro) was recorded at 30°C as 21.35 at mean generation time (12.36days) and total egg deposited per female (99.53 eggs).17.The longest developmental time reached 30.78 and 29.93 days, for female and male at 15°C when the two-spotted spider mite T. urticae was Ted on Lacont pear variety. The highest total mean fecundity rate was recorded at 30°C (163.42 eggs/ female). The maximum intrinsic rate of increase (rm) was observed at 30°C (0.31) and net reproductive rate (Ro) (37.67) at mean generation time 7.23 days.18.The shortest periods of egg incubation period; larval stage and protonymphal period, were recorded at 30°C (2.82 & 2.8; 1.53& 1.3 and 1.62 and 1.38 days for female and male, respectively, when T. urticae was reared on Hood pear variety. The highest fecundity; shortest generation time and the maximum intrinsic rate of increased (r,,) were observed at 30°C. The longest period for generation doubling 16 days and highest 50% mortality at 15°C.Summary and Conclusion 15319.Tasting the effect of leaves chemical contents f seven fig varieties, on the biology of T. urticue it was found that significant Positive correlation between leaf contents of Nitrogen, Phosphorus, reducing-and total Sugars and the oviposition, longevity, fecundity and intrinsic rate of increases. On the other hand, negative correlation between leaf content of Nitrogen, phosphorus, reducing-and total sugars and incubation period, life cycle and generation. Negative correlation between leaf contents of potassium and oviposition, longevity, fecundity and intrinsic rate of increases, on the contrary, Positive correlation between leaf contents of potassium and Incubation period, life cycle and generation, was observed.20.Black michen fig variety prolonged Oviposition period, longevity and fecundity of T. urticue than Gizi fig variety, and this may be due to the such variety has high contents of Nitrogen, Phosphorus, reducing-, and total Sugars than in Gizi fig variety.from the previously mentioned results, the followingcould be concluded:-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 red spider mite and the Eriophyid mites and,S'utninary and Conclusion 154their relatives, were

chosen for such study, because of their serious and dangerous role in destroyed these fruit trees.2.Recognizing the time of the annual peaks of seasonal abundance for each phytophagous species, 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 plant leaf content of various elements and the growth of phytophagous mite population of the tested species, may help in managing pest population by changing, controlling or modifying the fertilization system in combination with irrigation one.