



EFFECT OF THE POPULATION DENSITY OF THE DATE PALM MITE OF THE ANCIENT WORLD *OLIGONYCHUS AFRASIATICUS* (MCGREGOR) ON SOME DATES PALM TREES IN THE ORCHARDS OF CENTRAL IRAQ

Ahmed M. Tarek

Technical Institute Alswera, Middle Technical Univ.,
Ministry of Higher Education and Scientific Research, Baghdad, Iraq

Abstract

The population density of the date palm of *Oligonychus afrasiaticus* (McGregor) was determined on several dates palm trees in the central orchards of Iraq during the 2016 season. Results indicated that the highest egg density of mite stage during the first week of July timing with fruits in Khalal stage and then started to decrease until the end of the generation at the middle of August, while the highest density of nymphs mite stage during last week of July timing with green and yellow of Khalal stage. Species were differ in regard with sensitivity to the mite pest whereas Barhee and Umrani were resistant to the mite, while highly susceptible in Brem and Zahdi species was noted. However, Maktum, Khadrawimandli, and Tabrzal species have a moderate resistance and the highest means of 338, 255, 197, 70, 0, and 0 egg/fruit were recorded in Bream, Zahdi, Maktoom, KhadrawyMandali, Tazzl, Berhi and Amrani respectively during the stage of green Khalal. The highest eggs density were: 338, 255, 197, 70, 0, 0 egg per fruit in Brem, Zahdi, Maktum, Khadrawimandli, and Tabrzal species respectively, during Al-khalal stage, while the highest density of nymphs were: 746, 452, 447, 309, 108, 0, 0 nymph per fruit respectively during fruits in green and yellow of khalal stage. These results will assist in application of programs management of the mite pest.

Key words: Population density, Mite, *Oligonychus afrasiaticus*, Date palm

Introduction

Date palms attack Phoenix dactylifera many dream types and cause severe damage, the date palm of the ancient world, *Oligonychus afrasiaticus*, is one of the major pests that attack date palm (Negm *et al.*, 2016; Gerson and Applebaum, 2017). The first to study the life of this type of mite is (Hussain, 1966), which showed that the shape of the egg round and color crystal at the first place and then turns into a yellow color waxy at maturity, Larvae are bright green at the beginning of hatching, and have several generations per year and the generation period depends on temperature. The damage of the mite and its danger from nourishing the nymphs on the skin layer of fruit and absorption of juice in the stages before maturity and during which the color of the fruit turns to white gray, which leads to damage to the crop and low quality and marketing value (Carpenter and Elmer, 1978; Ben Chaaban *et al.*, 2011; ALdwsary, 2009). The role of the larvae and the mobile nymphs are the harmful phases of this pest, and members of this type of mite characterized by the secretion of large amounts of tissue covering the fruits, which inhibits the phylogenetic processes of fruits, which cause delay in coloration and maturity of fruits (Al-Jboory, 2007). He showed (Pasquier, 1932) that the fruit is infected with creeping nymphs that are transmitted by the air in the bush, but the main injury occurs by air transport. Date palm varieties vary in degree to *Oligonychus afrasiaticus*, It was found (Hussain, 1974; Ali and

Aldosari, 2007) that the varieties of spikey and a variety of resistance to the mite, while Sucary and Rutan were high sensitivity to the injury of this mite either Khuthary variety is the average resistance. Bass'haih (1999) that the mite *Oligonychus afrasiaticus* attacked all varieties of date palm, but different varieties among them in the degree of resistance to him and were Hamra and Hajri least sensitive to this type of mite in the circumstances of WadiHadramout in Yemen, He also studied (Palevsky *et al.*, 2003) the density of the mite *Oligonychus afrasiaticus* on the cultivars of DugllaNour, Al-Burahi and Al-Jadul and found a difference between them and their sensitivity to infection. Previous studies have indicated that the dates of appearance, population density and spread of the mite *Oligonychus afrasiaticus* vary from country to country and from region to region according to temperature and relative humidity and according to palm varieties, When the temperature reaches above 39 Celsius, the mite begins and increases when the humidity is low (Perring *et al.*, 1984b; Pasquier, 1932). Under the conditions of Yemen, the Brehhi species is caught between the end of May and the beginning of July (Blumberg, 2008). In Saudi Arabia and Tunisia, *Oligonychus afrasiaticus* reaches its highest population density in mid-July and early August (Ben Chaaban *et al.*, 2012; Bass'haih, 1999; Aldosari, 2009). In Amman, he found that the varieties Halali, Jabri and Khaznani begin to hit in April .The rest of the items will end at the end of the season

(Elwan, 2000). He cited (Othman *et al.*, 2001; Al-Jboory, 2007) the registration of many natural enemies as biological agents this kind of mite, (ALrubaaai *et al.*, 2015). Several chemical pesticides of natural origin and different action methods were used in its control. The aim of this research is to determine the population density of the mite *Oligonychus afrasiaticus* and the sensitivity of some date palm varieties to be infected under the conditions of palm groves south of Baghdad.

Material and Methods

The experiments were carried out on trees of date palms: Prim, Zuhdi, Maktoum, Khadraoui Mandali, Tibrzal, Burhi and Omrani in one of the palm groves south of Baghdad during the 2016 season. Three fruit trees were selected from each species and with an average age and trees were identified for each species with colored ribbons. Watchdog 2000 was used to record temperature and humidity in the experimental orchard and air flow data were taken throughout the experiment. The population density of the mite was calculated when the symptoms of the infection were observed at the end of June (6/29) and at the rate of every ten days once and until 8/19. Each time, 15 fruits were randomly collected from each palm tree and from each direction and each palm (single) The number of fruits per class was 45 fruit, The fruits are placed in bags and transferred to the laboratory for the purpose of calculating the numbers of eggs and nymphs for each fruit by washing the fruit with alcohol 70% until the fall of all the mite people and filtering the washing solution using a paper filter and then calculating the preparation of the mite (eggs and nymphs) on the filter paper using a manual meter, The pressure of the thumb and under a simple microscope, The numbers of the mite were calculated on each fruit and each species according to the dates mentioned above. The results were statistically analyzed using the least significant difference of 5% using the statistical program Genstat in the implementation of statistical analysis.

Results and Discussion

The results of the research in Table (1) indicate that Brim and Zuhdi varieties are the most sensitive varieties of the mite *Oligonychus afrasiaticus* either Berhi and Amrani varieties were the most resistant to the mite, show Maktoum, Khadrawimandli, Tabrzal medium resistance, The results in table 1 show that the highest number of eggs was in the first week of July (7/8) and in all the studied varieties: 338.0, 255.2, 197.6, 135.6, 70.6, 0.0, 0.0 eggs /fruit, Brem, Zuhdi, Maktoum, Khadrawy Mandali, Tizzer, Burhi and Omrani, respectively, After that, the population density of the

eggs began to decline until it reached zero at the third week of August 8/19. The numerical density of nymphs and adults Table (2) reached their highest density during the third and final week of July (7/28, 7/18) and in all the varieties Table 2 where the average rate was 746.2, 452.8, 447.8, 309.2, 108.0, 0.0, nymphs and adults / fruit respectively Then the numbers went down to zero, except for the Primus, which was 5 nymphs, whole / fruit, during the third week of August 8/19. The results of the statistical analysis indicate significant differences in the population density of the mite among the dates palm cultivars examined. The population density of *Oligonychus afrasiaticus* may vary according to regions and the difference in climatic conditions of temperature and humidity, as indicated by (Perring *et al.*, 1984b; Pasquier, 1932). We recorded an average temperature and relative humidity of 40.2, 37.8, 40.0, 37.3, 36.9 and 34.7 Celsius during the population density calculation dates of 6/29, 7/8, 7/18, 7/28, 8/9, 8/19 respectively, And relative humidity: 19.5%, 24.5%, 18.5%, 27.3%, 22.5%, 27.0%, respectively. The results of the study agree with the findings of (Ali and Aldosari, 2007; Bass'haih, 1999; Hussain, 1974; Palevsky *et al.*, 2003) that there are differences between date palm varieties in the degree of resistance to the mite *Oligonychus afrasiaticus*. It was observed in the orchard of the experience that there was a great difference between the species in the degree of the mite where the cultivar Berhi is free of injury Compared with the Brem-sensitive group.



Fig. 1: Bunch of date palm infected *Oligonychus afrasiaticus*

Conclusion

Palm varieties differ among themselves in terms of sensitivity to *Oligonychus afrasiaticus*. It reaches the highest density of the egg stage during the second week of July according to climatic conditions. *Oligonychus afrasiaticus* mite reaches the highest population density of the stage of nymphs and adults during the last week of July and according to climatic conditions.

Table 1 : The Numerical density of mite palm (Egg stage) *Oligonychus afrasiaticus* on the fruits of some varieties of palms groves in central Iraq during the season 2016.

Number of mite eggs																	
History and maturity of fruits																	
Species	29/6/2016			8/7/2016			18/7/2016			28/7/2016			9/8/2016			19/8/2016	
	Total in 45 fruit	In one fruit	Maturity stage	Total in 45 fruit	In One Fruit	Maturity stage	Total in 45 fruit	In one fruit	Maturity stage	Total in 45 fruit	In one fruit	Maturity stage	Total in 45 fruit	In one fruit	Maturity stage	Total in 45 fruit	Maturity stage
Brem	13221	293.0	Green Khalal	15210	338.0	Green Khalal	7893	175.4	Green Khalal	7173	159.4	Pink Khalal	5490	122.0	Pink Khalal	0	Damply Khalal
Zahdi	10377	230.6	Green Khalal	11484	255.2	Green Khalal	5328	118.4	Green Khalal	3717	159.4	Yellow Khalal	3177	70.6	Yellow Damply	0	Yellow Khalal
Maktum	6975	155.0	Green Khalal	8892	197.6	Green Khalal	2907	64.6	Green Khalal	2808	62.4	Green Khalal	2664	59.2	Yellow Khalal	0	Yellow Khalal
Khadrawi mandli	4068	90.4	Green Khalal	6102	135.6	Green Khalal	2448	54.4	Green Khalal	1629	36.2	Green Khalal	1368	30.4	Green Khalal	0	Light Green
Tabrzal	2124	47.2	Green Khalal	3177	70.6	Green Khalal	2691	59.8	Green Khalal	3348	74.4	Green Khalal	2610	58.0	Yellow Khalal	0	Light Green
Barhee	0	0	Green Khalal	0	Yellow Khalal												
Umrani	0	0	Green Khalal	0	0	Green Khalal	0	0	Green Khalal	0	0	Damply Khalal	0	0	Damply Khalal	0	Damply Khalal
LSD 0.05		24.44			36.52			22.43			21.61			19.31			0.0

References

- ALrubaaai, H.; Fadil, M.Z.; Alzidawi, I.B. and Nahar, F.H. (2015). Efficacy of some pesticide to control Mite *Oligonychus afrasiaticus* Biotechnolgy: 14(12): 281-187.
- ALdwsary, N.H. (2009). Efficacy of some pesticides and sticky trap to protect date palm to infested with *Oligonychus afrasiaticus* Basrah J., 23(1): 162-184
- Aldosari, S.A. (2009). Occurrence of dust mite, *Oligonychus afrasiaticus* McG. on fruits, leaflets of some date palm trees and evaluation the efficiency of botanical compound, (biaco) as compared with some acaricides. Assiut University Bulletin Environmental Research, 12: 69-77.
- Ali, A.G. and Aldosari, S.A. (2007). Susceptibility of date palm fruit cultivars to the natural infestation by *Oligonychus afrasiaticus* McG. (Acari: Tetranychidae) in relation to their chemical composition. Assiut University Bulletin Environmental Research, 10: 1-7.
- Al-Jboory, I.J. (2007). Survey and identification of the biotic factors in the date palm environment and its application for designing IPM-program of date palm pests in Iraq. Aden Journal of Natural and Applied Sciences, 11: 1-28.
- Bass'haih, G. (1999). Studies on the occurrence of the date palm dust mite *Oligonychus afrasiaticus* (McGregor) (Acarina: Tetranychidae) and its natural enemies on different date palm varieties in WadiHadramout, M.Sc. thesis, University of Aden, Yemen, 55.
- Ben Chaaban, S.; Chermiti, B. and Kreiter, S. (2011). *Oligonychus afrasiaticus* and phytoseiidpredators' seasonal occurrence on date palm Phoenix dactylifera (Deglet Noor cultivar) in Tunisian oases. Bulletin of Insectology, 64: 15-21.
- Ben Chaaban, S.; Chermiti, B. and Kreiter, S. (2012). Effects of host plants on distribution, abundance, developmental time and life table parameters of *Oligonychus afrasiaticus* (McGregor) (Acari: Tetranychidae). PapéisAvulsos de Zoologia (São Paulo), 52: 121-132.
- Blumberg, D. (2008). Date palm arthropod pests and their management in Israel. Phytoparasitica, 36: 411-448.
- Carpenter, J.B. and Elmer, H.S. (1978). Pests and diseases of the date palm (U.S. Department of Agriculture Handbook 527, 42 pp). Washington, DC: Department of Agriculture, Science and Education Administration.
- Elwan, A.A. (2000). Survey of the insect and mite pests associated with date palm trees in Al-Dakhliya region, Sultanate of Oman. Egyptian Journal of Agricultural Research, 78: 653-664.
- Gerson, U. and Applebaum, S. (2017). *Oligonychus afrasiaticus* (McGregor) http://www.agri.hugi.ac.il/mepests/pest/Oligonychus_afrasiaticus. accessed 15 May 2018.
- Hussain, A.A. (1966). Biology of Paratetranychusafrasiaticus McG. infesting date palm in Iraq. Bulletin of the Entomological Society of Egypt, 33: 221-225.
- Hussain, A.A. (1974). Date palms and dates with their pests in Iraq (166 p). University of Baghdad, Ministry of Higher Education and Scientific Research, Iraq.
- Negm, M.; DeMoraes, G. and Perring, T. (2016). Mite pests of date palms. In Sustainable pest

- management in date palm: Current status and emerging challenges, Edts: Wakil, W., Faleiro, J. and Miller, T. Springer: 347-389.
- Othman, K.; Rhouma, A.; Belhadj, R.; Alimi, E.; Fallah, H.; Kreiter, P.; Lenfant, C. and Brun, J. (2001). Lutte biologique contre un acarien ravageur des dattes: essai d'utilisation de *Neoseiulus californicus* contre *Oligonychus afrasiaticus* dans les palmeraies du Djerid (Sudtunisien). *Phytoma*, 540: 30-31.
- Palevsky, E.; Ucko, O.; Peles, S.; Yablonski, S. and Gerson, U. (2003). Species of *Oligonychus* infesting date palm cultivars in the Southern Arava Valley of Israel. *Phytoparasitica*, 31: 144-153.
- Pasquier, R. (1932). *Undangereux ennemi du dattier: le oufaroua*. *Revue d'horticulture et d'agriculture de l'Afrique du Nord*, 36, 36-40.
- Perring, T.M.; Holtzer, T.O.; Toole, J.L.; Norman, J.N. and Myers, G.L. (1984b). Influences of temperature and humidity on pre-adult development of the Banks grass mite (Acari: Tetranychidae). *Environmental Entomology*, 13: 338-343.