Susceptibility of Certain Citrus Varieties to Infestation with the False Spider Mite, *Brevipalpus obovatus* (Donnadieu)

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ABSTRACT

The three tested citrus varieties marked variation in their susceptibility to *Brevipalpus obovatus* infestation. Susceptibility indices calculated for each variety showed that the mean number of mite populations of the three tested citrus varieties recorded few individual during the first period of observation; while later reduction in mite population was recorded on all varieties from December to April during the two successive seasons, 2013-2014 and 2014-2015. Thereafter, a significant higher mite populations was recorded reached a peak during August for the three citrus varieties with a total number of 261 and 298.33 mites/sq. inch on common Balady orange**,** 219.67 and 259 mites/sq. inch on Washington navel orange and 185 & 239 mites/sq. inch on common Mandarin orange during 2013-2014 and 2014-2015 seasons, respectively. Accordingly, common Balady orange variety was the most susceptible for mite infestation with an average number of 83.16 and 89.02 mites/sq. inch; while, least infested variety was common Mandarin orange with rates 42 and 59.5 adults/25 leaves, during the two studied seasons, respectively.

Key words: Susceptibility; Citrus; *Brevipalpus obovatus*; *Tenuipalpidae*.

INTRODUCTION

The genus *Brevipalpus* is considered one of the most economically important tenuipalpid species on citrus in different parts of the world. *Brevipalpus californicus, B. obovatus* and *B. phoenicis* have all been identified from citrus in Brazil, Costa Rica, South Africa, Egypt and United States (Muma 1975, Smith Meyer 1981, Ochoa *et al*., 1994). The most significant threat posed by these mites is as vectors of a potentially invasive viral disease called citrus leprosis (Childers *et al*., 2001, Childers *et al*., 2003 a&b and Sánchez-Velázquez *et al*., 2015). Citrus leprosis is a serious virus disease that can ultimately kill citrus trees (Rodrigues, 2000 and Sánchez-Velázquez *et al*., 2015).

Many *Brevipalpus* species reproduce by theletokous parthenogenesis; while other species reproduce by male fertilization of female eggs. Previous researchers have determined that *Brevipalpus obovatus* Donnadieu, females were haploid. Development rates are strongly influenced by temperature, relative humidity and host plant (Goyal *et al*., 1985, Childers *et al*., 2001and Mata *et al*., 2010).

To characterize the dynamics of the probability and the rate of *B. obovatus* infestation in response to host plant, considerable research is needed. Therefore, this study was conducted to identify the susceptibility of certain citrus varieties to infestation with false spider mite, *B. obovatus* under field conditions.

MATERIALS AND METHODS

The field experiments were carried out in sweet orange orchards at Qalubia Governorate, during the two successive seasons 2013 -2014 and 2014-2015. The study dealt with clearing susceptibility of certain citrus varieties to *B. obovatus* infestation. These varieties were common Mandarin orange, Washington navel orange and common Balady orange.

The experiment was conducted in complete randomized distributed orchards; we sampled 3 orchards that were located at different locations at Qalubia governorate. Samples of 25 leaves were taken from each of five trees within the orchard and returned to the laboratory. The trees were selected based on their position in the orchard, one from each of the four corners and one from the center. Samples of the plants were picked up from each variety randomly at weekly intervals to assess the numbers of mites.

In the laboratory, the total number of mites was counted and collecting using a fine brush for identification and analysis using a binocular stereomicroscope. Normal agricultural practices were carried out without any application of insecticides.

RESULTS AND DISCUSSION

In This study we investigated the susceptibility of certain citrus varieties to infestation with the Tenuipalpid mite, *B. obovatus* under field conditions. Obtained results showed that the mean number of mite populations on 25 leaves of the three tested citrus varieties showed few individual during the first period of observation; while later on, a reduction in mite population occurred on all varieties from December to April during two successive seasons

2013-2014 and 2014-2015. Thereafter, data recorded a significant higher mite populations reached its peak during August for the three citrus varieties with a total average of 261 and 298.33 mites/sq. inch on common Balady orange**,** 219.67 and 259 mites/sq. inch on Washington navel orange and 185 & 239 mites/sq. inch on common Mandarin orange, respectively (Table1).

Accordingly, common Balady orange variety was the most susceptible for mite infestation, recorded an average number of 83.16 and 89.02 mites/sq. inch during the two seasons, respectively; while, the less infested variety was common Mandarin orange with a corresponding rate of 42 and 59.5 mites/sq. inch, during the two successive seasons 2013-2014 and 2014-2015, respectively (Table 2).

Generally, the most susceptible variety to the infestation was common Balady orange followed by, Washington navel orange and common Mandarin orange during the two successive years.

This variance in infestation rate of the tenuipalpid mite to citrus varieties may be due to the preference of host selection or the tendency of varieties to tolerant (Ekvised *et al.*, 2006). Therefore, numerous factors appear to contribute in this tendency including, physical and chemical characters of the plants (Goyal *et al*., 1985 and Childers *et al*., 2001&2005), environmental effects and genetic resistance (Laranjeira, *et al*., 2015 and Sánchez-Velázquez *et al*., 2015).

Similarly, tolerance of citrus cultivars to insect infestation has been studied by several investigators (Goyal *et al*., 1985, Ahmed and Zeidan, 2001, Childers *et al*., 2003a, Childers *et al*., 2005, Mata *et al*., 2010 and Sánchez-Velázquez *et al*., 2015).

Generally, it can be concluded that different citrus genotype varieties tolerant to insect and mite infestation could play an important role contributing to IPM strategies in integrated crop management programs.

Table (1): Mean number of *B. obovatus* per square inch on 25 leaves of three tested orange varieties at Qalubia Governorate during the two successive seasons 2013-2014 and 2014-2015.

Sampling date	**Season 2013-2014**			**Season 2014-2015**		
	Common Balady orange	Washington navel orange	Common Mandarin orange	Common Balady orange	Washington navel orange	Common Mandarin orange
October	42.00	34.00	27.00	51.67	42.00	33.00
November	18.00	10.00	7.00	23.33	15.00	11.00
December	1.00	0.00	3.00	1.67	0.00	4.00
January	0.00	0.00	0.00	0.00	0.00	0.00
February	0.00	0.00	0.00	0.00	0.00	0.00
March	4.00	6.00	1.00	7.00	7.00	1.00
April	9.00	9.00	6.00	16.33	13.00	8.00
May	58.00	45.00	34.00	71.67	62.00	49.00
June	122.00	95.33	53.00	157.33	145.67	82.00
July	213.00	134.00	85.00	241.33	231.00	128.00
August	261.00	219.67	185.00	298.33	259.00	239.00
September	270.00	138.00	103.00	199.67	173.00	159.00
Total	998	691	504	1068.33	947.667	714
Mean	83.16	57.5	42	89.02	78.9	59.5

Table (2): Mean number of *B. obovatus* per square inch on 25 leaves of three tested orange varieties under field conditions at Qalubia Governorate during two seasons 2013-2014 and 2014-2015.

		Common Balady orange	Washington navel orange	Common Mandarin orange	Mean	F	P	LSD
2013/2014	Oct.-Des.	20.33	14.67	12.33	15.78	137.58	0.0002	1.38
	Mar.-May	23.67	20.00	13.67	19.11	128.75	0.0002	1.75
	Jun.-Sep.	216.50	146.75	106.50	156.58	1467.25	0.0000	5.71
	Mean	83.16	57.5	42	60.89	1630.38	0.0000	2.02
2014/2015	Oct.-Des.	25.56	19.00	16.00	17.00	23.7699	0.006	3.934
	Mar.-May	31.67	27.33	19.33	22.00	93.1548	0.0004	2.546
	Jun.-Sep.	224.17	202.17	152.00	168.72	812.968	0	5.05
	Mean	89.02	78.9	59.5	75.81	14897.45	0	0.481

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