

**Population dynamics of false spider mite, *Brevipalpus phoenicis* (Giejskes) (Acari:Tenuipalpidae) on *Mikania micrantha* Kunth. in relation to weather parameters**

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**ABSTRACT**

*Mikania micrantha*, a widespread perennial creeper weed found to grow everywhere in the fencing of cultivated field, tea garden, poorly managed trees of homestead plantation and on forest plants also acts as a source of infestation of a destructive mite pest, *Brevipalpus phoenicis* G. infesting many economically important crops like-tea, citrus, guava, papaya, pointed gourd etc. Population dynamics of this mite has been studied for two years on this weed which revealed that the mite remained active through out the year on the weed. Mite population started increasing in February/March and attained maximum (14.42 mites/leaf) during moderately dryer and cooler period in the month of October as in other host plants. The mite population persisted till November and thereafter declined sharply with a very low population (0.27mites/leaf) during January. Significant positive correlations were observed between mite population and minimum temperature and minimum relative humidity, whereas, relation with other weather parameters were non-significant.

**Key words:** *Mikania micrantha*, *Brevipalpus phoenicis*, Population dynamics, Weather parameters

*Mikania micrantha* is a widespread perennial creeper weed found to grow everywhere in the fencing of cultivated fields, tea gardens, poorly managed trees of homestead plantations and on forest plants. It is regarded as a very destructive weed pest of tea gardens and fencing of vegetable field. It grows and spread very fast during rainy season and bears flowers during onset of winter. This plant not only act as a major weed pest but being a perennial weed it also act as a source of infestation of *Brevipalpus phoenicis* G., a destructive mite pest of many economically important crops like- tea, citrus, guava, papaya, pointed gourd etc. (Nageshachandra and ChannaBasavanna, 1976; Sandhu *et al.*, 1979; Patel and Karmakar, 2004). This mite is distributed worldwide (Jeppson *et al.*, 1975) and was reported on 49 host plants from Panjab (Gupta, 1985; Kumari and Sadana, 1990). Therefore, considering gravity of the mite species, present experiment was laid out to study the population dynamics of the mite species on this weed host, and relationship with different weather parameters to assess most congenial period for the mite. All these efforts were made with a view to develop better management strategy of the mite to increase crop productivity.

**MATERIALS AND METHODS**

The experiment was conducted at the experimental field of All India Network Project of Agricultural Acarology situated at District Seed Farm,

Bidhan Chandra Krishi Viswavidyalaya, Kalyani, Nadia, West Bengal, India where the fencing was covered with this creeper weed. Occurrence of the destructive mite species, *Brevipalpus phoenicis* on this weed was monitored by counting population at regular monthly interval commencing from March, 2002 till February, 2004. Only adult and immature stages of mite population were counted taking ten leaves from each of the three different sites of the eastern fence of the experimental field from which mean mite population per leaf was obtained. The correlation coefficients were worked out between mite population and the corresponding monthly mean weather parameters.

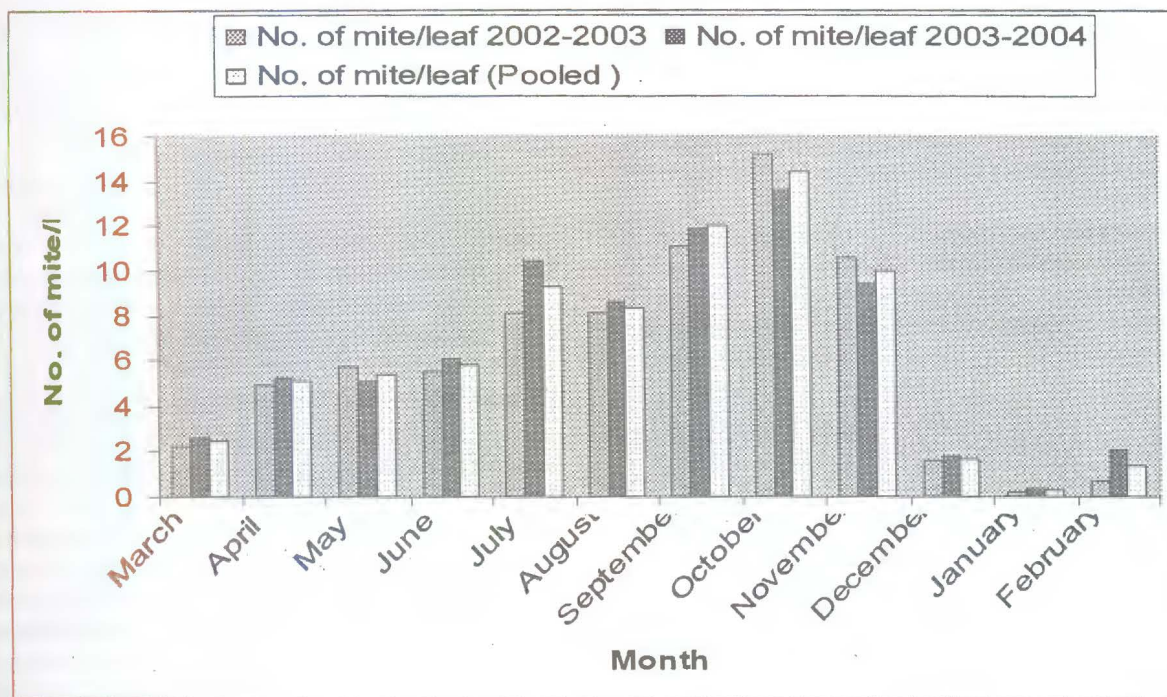
**RESULTS AND DISCUSSION**

*Brevipalpus phoenicis* was found to feed from the ventral surface of usually mature leaves causing characteristic brown to blackish spots which gradually turned yellowish and dried out. The mite found to be distributed well over the leaf lamina with a preferred site of leaf margins and at the base of the petiole. Like the spider mite they do not spin web on the plant surface. The population of the mite varied significantly on different months of the year on *Mikania micrantha*, however, being a perennial weed host they persist on it throughout the year (Fig-1). Their population increased with increasing temperature and relative humidity and attained peak during October in both the years (15.23



mites/leaf and 13.60 mites/leaf in 2002 and 2003, respectively) and thereafter, their population dwindled with a minimum level observed during January (0.20 and 0.33 mites/leaf). These observations were in parity with the earlier findings of Patel and Karmakar (2005) in case of pointed gourd, where maximum population of the mite attained during September, 2002. A significant and positive relationship has been observed between mite population and minimum temperature and minimum relative humidity whereas, relationships

with other meteorological parameters were found to be non significant (Table 1). A clear relationship has been established between mite and the weed, *Mikania micrantha* where the mite species persist throughout the year and act as a source of infestation to many other cultivated crop plants. Hence it is suggested that surrounding fields have to be cleaned in a community basis to check the spreading of the mites to increase crop productivity.



**Fig 1** Occurrence of false spider mite, *Brevipalpus phoenicis* on *Mikania micrantha* during 2002-2004 at District Seed Farm, BCKV, Kalyani, West Bengal, India

**Table-1** Correlation coefficient between mite population with different weather parameters in two consecutive years 2002-03 and 2003-04

	Value of 'r'	Value of 't'	Remarks
<b>2002-03</b>			
Population and Tmax.	0.44	1.56	NS
Population and Tmin.	0.57	2.21	Significant
Population and rainfall	0.41	1.43	NS
Population and RHmax.	- 0.10	0.32	NS
Population and RHmin	0.62	2.49	Significant
<b>2003-04</b>			
Population and Tmax.	0.45	1.59	NS
Population and Tmin.	0.68	2.94	Significant
Population and rainfall	0.52	1.95	NS
Population and RHmax.	0.27	0.89	NS
Population and RHmin.	0.76	3.80	Significant

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