

Seasonal incidence of coconut perianth mite, *Aceria guerreronis* Keifer around Dharwad*

The coconut palm, *Cocos nucifera* L., is reverently called 'Kalpavriksha' as it provides variety of useful products like food, fuel, fibre and timber. Coconut is grown in an area of 1.9 million hectares with a production of 12.8 billion nuts per annum in India. In recent years the coconut is facing severe problem particularly in south India due to the invasion of an eriophyid mite, *Aceria guerreronis* Keifer. Though this mite species was first described in 1965 from specimen of Guerrero State, Mexico (Keifer, 1965), since 1998 onwards it has attained a major pest status in the three peninsular states of India, viz., Kerala, Karnataka and Tamil Nadu and it has spread northwards menacingly (Sathiamma *et al.*, 1998). However, the information on the seasonal incidence in Karnataka is scarce. Hence, the present investigation was carried out to know the seasonal abundance of mite population which helps to know the peak periods of mite occurrence to take up management practices.

The experiment was conducted in three coconut gardens around Dharwad to record the eriophyid mite population and its damage during July 2003 to July 2004. The coconut gardens consisted of Arsikere tall variety of 15-20 years old. Five coconut trees were selected from each garden for collecting sample nuts. The bunch bearing newly fertilized nutlets was considered one month old bunch and each proceeding bunch was considered a month older than the previous one. Three nuts of four months old were plucked from selected trees in each garden. Nuts were brought to the laboratory for recording the active mite population and egg stages. First the perianths were removed and observations were made on three spots on surface of the nut covered by the perianth. Then, three spots on inner surface of the three inner most perianths were observed in an area of 28.28 mm² under stereo binocular microscope. In each garden, five matured bunches from selected five trees were observed to record the damaged nuts due to mite infestation. Percentage of damaged nuts was calculated based on total number of nuts and infested nuts.

The weather parameters such as maximum and minimum temperature, morning and evening relative humidities, rainfall and wind speed were obtained from meteorological observatory, Agricultural Research Station (ARS), Hebballi, Dharwad. Then the population fluctuations of active stages of mite and egg stages were correlated with weather parameters.

During the course of surveillance the mite population on the nut surface ranged from 50.01 to 105.73 mites per 28.28 mm² area. The mite population during the period from second fortnight of July to first fortnight of November ranged from

50.20 to 58.89 per 28.28 mm² area. A sudden increase in mite population was seen in second fortnight of December (68.92).

Then onwards it increased upto second fortnight of January (84.26). The mite population decreased during second fortnight of February (72.29). Then onwards, the mite population started increasing and reached another peak during second fortnight of May (105.73). From then onwards the population of the mite decreased (Table 1).

The mite population on perianth fluctuated from the lowest of 18.28 mites (second fortnight of June) to the highest of 58.52 (second fortnight of May). During remaining months mite population on perianth was more or less constant. On an average the mite population on nut surface was more (69.80 mites) compared to perianth (30.41).

The egg population on the nut surface ranged from 38.81 mites per 28.28 mm² area (first fortnight of July 2004) to 88.68 mites per 28.28 mm² area (second fortnight of May 2004). The first peak occurrence of eggs of eriophyid mite was seen during first fortnight of September (75.61) and the second peak was seen during second fortnight of May (88.68). However the egg population was low during second fortnight of July (38.81) followed by first fortnight of December (42.24).

Relatively less number of eggs was recorded on coconut perianth (31.61) compared to nut surface (57.48). On the inner surface of the perianth minimum egg load was recorded in second fortnight of August (18.67) followed by second fortnight of November (19.68). However, more number of eggs was recorded in the first fortnight of the May (49.05).

The per cent damaged nuts were relatively higher throughout the year with little variation which ranged from 85.67 to 98.81 per cent with an average of 92.51 per cent (Table 1).

The data presented in table 2 indicated that maximum temperature had positive and significant ($r=0.498$) effect on the mite population and rainfall had significant negative ($r=-0.352$) association with mite population including eggs on perianth. However, relationship of mites recorded on nut surface with evening relative humidity ($r=-0.370$) and eggs observed on nut surface with wind speed ($r=-0.260$) were significant and negative whereas remaining weather parameters had no significant influence either on the mite or on egg population.

Fluctuations in the mite population may be due to the variation in weather parameters like temperature, relative humidity, rainfall and wind speed during the period of investigations. The mite population was more on nut surface

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Table 1. Surveillance of coconut mite during 2003-04 in Dharwad region

Month / fortnight	No. of active mites/28.28 mm ² area of		No. of eggs/28.28 mm ² area of		Damaged nuts (%)
	Nut surface	Perianth	Nut surface	Perianth	
2003					
July – II	50.01	22.33	59.62	21.96	90.80
August – I	50.20	23.54	60.75	22.34	91.10
August – II	54.52	24.62	60.88	18.67	85.69
September – I	52.34	25.24	75.61	36.47	92.61
September – II	53.09	25.38	64.09	36.85	90.46
October – I	56.28	22.36	60.82	38.64	93.32
October – II	54.31	26.41	59.43	36.80	94.06
November – I	58.89	39.42	52.90	20.64	90.81
November – II	60.90	36.27	44.31	19.68	91.74
December – I	62.24	31.65	42.24	31.50	96.53
December – II	68.92	32.54	50.09	39.42	95.50
2004					
January – I	78.12	29.90	52.81	39.01	95.61
January – II	84.26	35.68	49.88	39.64	92.34
February – I	82.32	32.64	44.81	24.28	89.90
February – II	72.29	24.38	46.92	20.00	87.85
March – I	72.80	38.34	55.54	30.38	90.91
March – II	76.25	36.54	58.49	32.56	93.78
April – I	89.91	34.60	70.21	41.15	95.21
April – II	88.54	32.60	66.82	42.35	97.82
May – I	94.58	38.52	78.16	49.05	98.81
May – II	105.73	58.52	88.68	47.09	96.90
June – I	70.62	20.39	50.08	25.82	89.42
June – II	68.64	18.28	47.59	24.31	85.69
July – I	56.92	19.64	38.81	20.09	88.89
Average	69.80	30.41	57.48	31.61	92.51

Table 2. Correlation between eriophyid mite incidence and weather parameters

Sl. No.	Weather parameters	Correlation coefficient (r)			
		No. of mites/nut		No. of eggs/nut	
		Nut surface	Perianth	Nut surface	Perianth
1.	Maximum temperature (°C)	0.498**	0.121	0.120	0.116
2.	Minimum temperature (°C)	0.031	0.120	0.108	0.126
3.	Morning relative humidity (%)	-0.088	0.072	-0.179	0.049
4.	Evening relative humidity (%)	-0.370**	0.015	0.046	-0.030
5.	Rainfall (mm)	-0.352	0.049	0.012	0.236*
6.	Wind speed (km/ha)	0.135	0.029	-0.260*	-0.070

'r' value is 0.203 at 5 per cent level; 0.263 at 1 per cent level

* Significant at 5 per cent level

** Significant at 1 per cent level

than on perianth which might be due to more succulence of the nut surface. The present findings are in confirm with Zuluaga and Sanchez (1971) and Griffith (1989) who observed the presence of mites throughout the year with severe infestation during relatively dry climates. Haq (1999) also reported that variation in the incidence of mite population may be due to

difference in the rainfall. Sujata and Chalapati Rao (2004) concluded that decreased population counts were observed during rainy and winter months where high relative humidity prevailed when compared to summer months. Kannaiyan *et al.* (2000) reported that maximum population was seen during May followed by April and March.

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