SHORT COMMUNICATION

Incidence of Rhinoceros Beetle (*Oryctes rhinoceros*) and Eriophyid Mite (*Aceria guerreronis*) on a Coconut Plantation In Pollachi Area

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Abstract

A survey was carried out to identify the major insect pests in the coconut farm of the Pollachi area. There were two major pests *viz*., rhinoceros beetle, O*ryctes rhinoceros* (L.) (Coleoptera: Scarabaeidae), eriophyid mite, *Aceria guerreronis* Keifer (Acari: Eriophyidae) were predominant during the period of observation. Natural enemies *viz*., *Chelisochus mori,* and *Campsomeriella collaris* were identified, and the level of population was meagre. The incidence of rhinoceros beetle ranged from 36.26 to 41.97 % of which the highest incidence was recorded in B and E block, respectively. The incidence of eriophyid mite ranged from 4.52 to 16.45 %, against a minimum of 4.52 % noticed in D block. The incidence of rhinoceros beetle was maximum (43.50%) during April, followed by March month as compared to the lowest in January (34.7%). Similarly, the incidence of eriophyid mite was maximum (12.92%) during April followed by March (9.78%) as against the lowest incidence during January (7.40%). The peak occurrence of eriophyid mite was recorded during March and April might be due to the influence of either temperature or relative humidity.

Keywords: *Aceria guerreronis*, Coconut, Eriophyid mite, Rhinoceros beetle.

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Introduction

Coconut (*Cocos nucifera* Linn.), known as 'Kalpavriksha', is a major plantation crop provides livelihood securities to millions of small and marginal farmers in India (Rethinam and Singh, 2007). Coconut palm provides food security and livelihood to a large size of population in the world, particularly in Asia Pacific Countries. Coconut is also interlinked with the socio-economic life of many small and marginal farmers in peninsular India. The incidence and infestation by the insect pests damage are in general varied from one region to another region, one field to another field due to various factors like varietal distribution, environmental conditions like temperature, relative humidity, sun radiation, level of wind current, spacing adopted in planting besides the difference in package of practices being adopted by the coconut growers.

Oryctes rhinoceros (L.), the coconut rhinoceros beetle, is a pest species occurring throughout many tropical regions of the world. Adults can cause extensive damage to economically important wild and plantation palms. Even though, *the rhinoceros* beetle is found in various locations of the world, its shape, size, and color are generally consistent. In the case of *Oryctes rhinoceros*, damage to plants is caused by adults (especially young adults) and not larvae, which feed on already rotting material. With this background, the present study was undertaken to know the level of incidence, estimation of damage, population dynamics, and prevalence of natural enemies of coconut pests from time to time in the coconut ecosystem in Pollachi taluk Coimbatore district. The damage symptoms include the occurrence of small holes on crown and stem along with protruding chewed fibrous material, drying up of the young leaves and splitting of the petioles near the area of attack, presence of fermented odor from the trunk or topping off the crown (Kaahkeh *et al*., 2001)

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Materials and Methods

An extensive survey was carried out to identify the major insect pests in the coconut farm. The area was divided into five blocks (A, B, C, D, E) with 100 to 150 coconut trees in each block and observed closely about the incidence of major insect pests and to be quantified accordingly (Jacob and Bhumannavar, 1991).

The incidence of the identified insect pests was quantified based on the symptoms and their damage intensity and thereby computed through standard grading (0,1,3,5,7,9) and percentage of damage (0 to 90 %). The natural enemies of the major insect pests in coconut were monitored periodically and found out their potentiality (parasitization, predatory potential, pathogenicity, *etc*.) accordingly. The data collected were summarized and estimated their damage on the occurrence of individual insect pests.

Results

The results revealed that there were three major insect pests *viz*., rhinoceros beetle, O. *rhinoceros* (L.) (Coleoptera: Scarabaeidae), eriophyid mite, *Aceria guerreronis* Keifer (Acari: Eriophyidae)

prevalent in the coconut garden during the period of observation. The two natural enemies, *viz*., *Chelisochus mori* and *Campsomeriella collaris* were identified, and the population level was in a trace. The incidence of rhinoceros beetle ranged from 36.26 to 41.97% of which the highest incidence was recorded in the B and E block, respectively. This variation might be due to differences in planting space, irrigation pattern, and age of trees in the farm. The incidence of eriophyid mite was recorded and ranged from 4.52 to 16.45%, against a minimum of 4.52% noticed in D block (Fig. 1).

The population dynamics studies revealed that the incidence of rhinoceros beetle was maximum (43.50%) recorded during April followed by March month as compared to lowest in January (34.7%) (Table 1). Similarly, the incidence of eriophyid mite was maximum (12.92%) during April followed by March (9.78%) as against the lowest incidence recorded in January (7.40%) (Table 2). The peak occurrence of eriophyid mite was recorded during March and April might be due to the influence of either temperature or relative humidity or due to monsoon rain (Fig. 2).

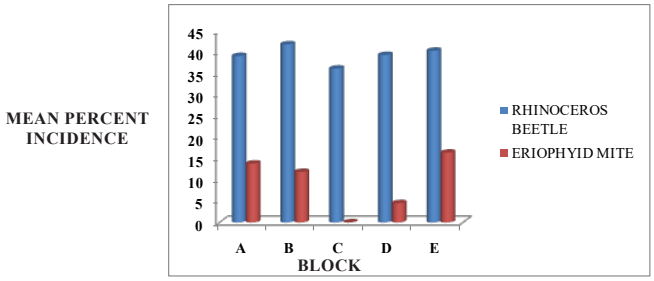

Fig. 1: Blockwise major coconut insect pest incidence

Table 1: Incidence of rhinoceros beetle, *O. rhinoceros* (L.) on coconut during 2016

	Mean percent incidence					
Month	*A*	*B*	*C*	*D*	*E*	*Mean (Month wise)*
Jan – I	9.73	8.73		3.73	13.73	
Jan – II	11.32	8.88	Flowering stage	3.75	14.32	
Mean	10.50	8.80		3.70	14.00	7.40
Feb – I	11.32	8.88		4.89	14.73	
Feb – II	13.47	11.53		4.97	15.89	
Mean	12.30	10.20	Flowering stage	4.90	15.30	8.54
Mar – I	13.69	12.37		5.00	17.00	
Mar – II	14.57	12.38		5.43	17.69	
Mean	14.10	12.30		5.20	17.30	9.78
Apr – I	17.89	15.37		5.97	18.73	
Apr – II	18.90	16.99	Flowering stage	6.32	19.55	
Mean	18.30	16.10		6.10	24.10	12.92
Mean (Block wise)	13.86	11.89		4.52	16.45	

Table 2: Incidence of eriophyid mite, *A. guerreronis* Keifer on coconut during 2016

	Mean percent incidence					
Month	*A*	*B*	*C*	*D*	*E*	*Mean (Month wise)*
Jan – I	33.37	37.81	29.40	32.90	37.50	
Jan – II	33.38	37.81	30.50	36.30	38.70	
Mean	33.37	37.80	29.90	34.60	38.10	34.70
Feb - I	37.85	37.53	33.33	36.60	38.73	
Feb – II	38.89	40.73	33.33	36.60	39.00	
Mean	38.30	40.10	33.30	36.60	38.80	37.40
Mar – I	43.17	40.73	39.79	42.30	42.30	
Mar – II	44.43	45.17	39.86	43.50	42.48	
Mean	43.80	42.90	39.80	42.90	42.30	42.80
Apr – I	39.43	47.00	41.90	43.50	43.00	
Apr – II	43.32	47.00	41.97	44.00	43.40	
Mean	41.30	47.00	41.90	43.70	43.91	43.50
Mean (Block wise)	39.23	41.97	36.26	39.46	40.70	

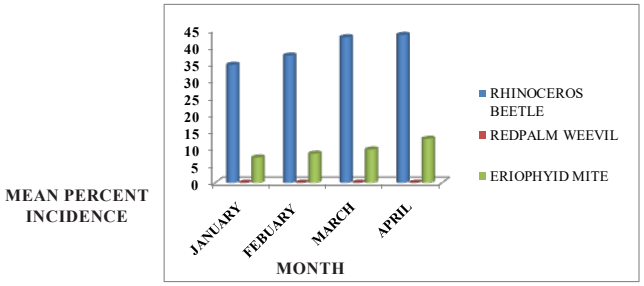

Fig. 2: Month wise major coconut insect pests incidence

Discussion

Otterbein (1988) reported that in Costa Rica the greatest nut damage was associated with frequent heavy rainfall and high humidity. Howard *et al*. (1990) found that the coconut mite populations increased immediately after periods of high rainfall in Puerto Rico and Florida but noted that coconut mite population fluctuations were not associated with dry and wet seasons or with mean daily temperatures. This is in support of the present findings that peak occurrence of mite was recorded during March and April that might be due to the prevalence of temperature and monsoon rain. It has spread to almost all coconut growing tracts of the country, including Andhra Pradesh, Karnataka and later to Maharashtra, and the level of infestation varied from 10 to 90%. The mites feed on the meristematic tissue found under the perianth of growing nuts and also adhere to the inner surface of sepals (Ramaraju *et al.,* 2000). Similar observations were recorded in the Andaman and Nicobar Islands due to the major climatic and non-climatic factors that contribute to the high-level incidence of the beetles and the palm damage (Jacob and Bhumannavar, 1991). Climatic factors, particularly relative humidity favors pest build-up (Sathiamma *et al*., 1972).

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