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OBSERVATIONS ON SPIDERS (ORDER:ARANEAE) PREDACIOUS ON THE COCONUT LEAF EATING CATERPILLAR *OPISINA ARENOSELLA* WLK. (= *NEPHANTIS SERINOPA* MEYRICK) IN KERALA: OCCURRENCE AND SEASONAL ABUNDANCE*

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Twenty-six species of spiders belonging to twelve genera and six families were collected from the coconut palms infested with *Opisina arenosella*. The hunting spiders including species of *Cheiracanthium, Clubiona, Marpissa, Phidippus, Plexippus, Rhene* and *Sparassus* and the weaving spider *Tetragnatha* were widely distributed. *Cheiracanthium* constituted nearly 21% of the total spider fauna on the coconut palms. Four species were noted as important predators of *O. arenosella*. Spiders occurred in the field almost throughout the year with maximum population during July—August.

(Key words: coconut, *Opisina arenosella*, spiders)

INTRODUCTION

Opisina arenosella Wlk. is one of the key pests of the coconut palms in many parts of Kerala, Karnataka, Tamil Nadu, Andhra Pradesh, Orissa, Gujarat and Maharashtra. Several parasites and predators have been documented effecting the natural suppression of *Opisina* population. Spiders constitute the dominant group of predators which exert considerable check on this pest. NAIR & NAIR (1956), MENON & PANDALAI (1958) and DHARMARAJU (1962) also had made observation of some species of spiders predaceous on coconut leaves infested with *O. arenosella*. However, no systematic attempts have been made so far to identify and study in detail the exact role of the spiders as biocontrol agents of the pest.

Our surveys during 1981—1983 in coconut gardens infested with *O. arenosella* in the Alleppey and Quilon districs of Kerala have revealed the prevalence of a rich fauna of spiders. Some are voracious feeders consuming a large number of caterpillars of *Opisina*. There are many others whose economic importance is not fully known. The main objective of the present study was to identify the spiders associated with *Opisina* infested coconut palms and to study their seasonal occurrence in the field.

MATERIALS AND METHODS

Opisina- infested gardens comprising nearly 800 coconut palms of the age group 5 to 10 years were selected for the study. Twenty per cent of the palms were marked as sample for observation and in each palm two sample leaves of the lower whorl were observed. Data on the population of the spiders present were recorded every fortnight.

RESULTS AND DISCUSSION

Occurrence:

Among the spider fauna collected from *Opisina* infested coconut palms,

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twentysix species belonging to 12 genera and six families were identfied and listed in Table 1. The hunting spiders viz. *Cheiracanthium* sp., *Clubiona drassodes*, *Marpissa dhakuriensis*, *M. tigrina*, *Phidippus bengalensis*, *Phidippus* spp., *Plexippus paykulli*, *Rhene indicus*, *R. khandalensis*, *Sparassus* sp. and the weaving spider *Tetragnatha andamanensis* were widely distributed in all the areas combed during the study. Salticid spiders were more common than the other groups of spiders present on *Opisina* infested coconut palms.

In number, *Cheiracanthium* sp. topped the list (Table 2). Nearly 21% of the total population comprised this species. *Marpissa tigrina* constituted 7%, *Sparassus* sp. 6%and *Rhene indicus* 5% of the total population of the spiders. Other common species of spiders present on *Opisina*-infested coconut leaves were *Tetragnatha andamanensis*, *Phidippus bengalensis*, *Neoscona elliptica* and *Cheiracanthium melanostoma*. Besides these species, four species of *Marpissa*, three species of *Phidippus* and a number of other spiders co-existed with the population of *O. arenosella*.

TABLE 1. Spider fauna associated with *Opisina arenosella* – infested coconut palms.

Family	name of spider
Araneidae (= Argiopidae)	*Argiope catenulata* (Doleschall)
	Larinia jayasankari Biswas
	Neoscona bengalensis Tikader and Bal
	N. elliptica Tikader and Bal
Clubionidae	*Cheiracanthium melanostoma* Thorell
	Cheiracanthium sp.
	Clubiona drassodes Cambridge
Gnaphosidae	*Poecilochroa barmani* Tikader
Salticidae	*Marpissa anusuae* Tikader and Biswas
	M. dhakuriensis Tikader
	M. tigrina Tikader
	Marpissa sp. (Coll. No. 67)
	Marpissa sp. (Coll. No. 68)
	Phidippus bengalensis Tikader
	Phidippus sp. (Coll. No. 7)
	Phidippus sp. (Coll. No. 26)
	Phidippus sp. (Coll, No. 61)
	Plexippus paykulli (Aud.)
	Rhene danieli Tikader
	R. indicus Tikader
	R. khandalensis Tikader
Sparassidae	*Sparassus* sp.
Tetragnathidae	*Tetragnatha andamanensis* Tikader

TABLE 2. Seasonal abundance of spider population on *Opisina arenosella*–infested coconut palms.

Name of spider	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Argiope catenulata	0	0	0	0	0	0	0	1	0	0	0	0
Cheiracanthium melanostoma	0	1	0	13	8	8	7	14	0	2	0	10
Cheiracanthium sp.	22	16	39	16	22	23	89	61	28	39	14	29
Clubiona drassodes	0	0	0	1	1	1	7	0	3	3	0	0
Larinia jayasankari	0	0	0	0	0	0	1	1	1	0	0	0
Marpissa anusuae	0	0	0	0	0	1	8	0	0	0	0	0
M. dhakuriensis	0	0	1	1	0	0	7	0	0	4	1	0
M. tigrina	0	2	3	16	9	7	25	25	13	21	5	13
Marpissa spp.	0	0	0	0	0	0	1	0	1	1	2	0
Neoscona elliptica	0	0	0	0	0	0	4	1	0	0	0	0
Phidippus bengalensis	0	0	2	10	9	9	13	12	11	4	4	4
Phidippus spp.	0	1	7	4	12	13	6	18	6	9	4	6
Plexippus paykulli	0	0	0	0	0	0	1	6	2	1	0	0
Rhene danieli	0	0	0	0	0	0	0	0	0	0	0	1
R. indicus	0	0	2	6	7	3	18	23	16	19	1	0
R. khandalensis	0	0	0	0	0	0	0	2	2	0	0	0
Sparassus sp.	3	7	6	6	4	12	17	18	5	11	6	17
Tetragnatha andamanensis	14	3	3	0	7	5	20	19	14	26	12	23
Unidentified spiders	128	78	42	32	51	56	38	60	31	30	24	179

coconut palms. The economic importance of some of these species is yet to be ascertained. As regards the predacious habits on caterpillars of *O. arenosella*, *Cheiracanthium* sp., *Sparassus* sp., *Rhene indicus* and *Marpissa tigrina* are very important and they consumed the immature as well as adult stages of the pest.

Seasonal abundance:

Spiders were present on *Opisina*–infested coconut palms almost throughout the year (Table 2). Maximum spider population was observed during July–August and minimum during February to March. *Cheiracanthium* sp. occurred at its maximum level during July; *M. tigrina* during July and August; *Sparassus* sp. during July and December and *R. indicus* during August. It is interesting to observe that the population of *O. arenosella* was normally at a lower level during July–August period, when the populations of spider fauna, particularly the highly predacious ones, were abundant. Similarly during February–March period when the spider fauna was less abundant, build up of population or *Opisina* was observed.

This clearly brings out the significant role the spider community plays in the natural suppression of *Opisina* population in the field.

Spiders constitute one of the dominant groups of predators exerting natural suppression of many pest species. SPECHT & DONDALE (1960) described 34 species of spiders associated with apple orchards. Spiders were observed to have a definite seasonal succession checking the cotton insect pests from early growth state sill maturity of the crop (WHITCOMB *et al.*, 1963). They also play and important role in the control of insect pests of grain sorghum (BAILEY & CHADA, 1968). BARRISON & LITSINGER (1984) listed 217 species of rice field spiders from Asia and identified 51 species from the philippines, ten of which are dominant predators on rice pest. Observation on the spiders fauna of coconut gardens in association with *O. arenosella* and their impact on natural suppression revealed that the spiders play a vital role in the biological suppression of the pest. As such, conservation of these biocontrol agents has become quite imperative.

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REFERENCES

BAILEY, C. L. & H. L. CHADA (1968) Spider populations in grain sorghum. *Ann. ent. Soc. Amer.*, **61**, 567—571.

BARRISON, A. T. & J. A. LITSINGER (1984) The spider fauna of Philippine rice agro-ecosystems II. Wetland. *Philipp. Ent.*, **6**, 11—37.

DHARMARAJU, E. (1962) A check list of the parasites, the hyperparasites, predators and pathogens of the coconut caterpillar *A. serinopa* Meyrick, recorded in Ceylon and in India and their distribution in these countries. *Ceylon Cocon. Q.*, **13**, 102—111.

MENON, K. P. V. & K. M. PANDALAI (1958) *The Coconut Palm – A Monograph*. Indian Central Coconut Committee, Ernakulam, 384 pp.

NIRULA, K. K. (1956) Investigations on the pests of coconut palm. Part III. *Nephantis serinopa* Meyr. *Indian Cocon. J.*, **9**, 101—111.

SPECHT, H. B. & C. D. DONDALE (1960) Spider populations in New Jersey apple orchards. *J. econ. Ent.*, **53**, 810—814.

WHITCOMB, W. H., H. EXLINE & R. C. HUNTER (1963) Spiders of the Arkansas cotton field. *Ann. ent. Soc. Amer.*, **56**. 653—660.