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SURVEY OF PREDATORY MITES INHABITING VEGETABLE CROPS IN KOZHIKODE, KERALA

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The paper embodies the result of a survey conducted on predatory mite fauna associated with 18 species of vegetable crops belonging to 09 families and 16 genera. The result of the survey yielded 40 species of predatory mites belonging to 19 genera, 05 families of the suborders Mesostigmata, Prostigmata and Astigmata. Of these 04 species belonging to 02 genera are recognized as new to science.

Key words : Predatory mites, Phytoseiidae, Ascidae, Cunaxidae, Acaridae, Bdellidae, Kerala

INTRODUCTION

Predatory mites deserve special mention in an agricultural country like India, where agricultural is always under the threat of constant pest attack. Predatory mites are now valued with growers world wide as natural enemies that provide effective pest control on agricultural crops (Bjorson, 2008).

Consumers worldwide are now strongly demanding agricultural products grown with few or no chemicals. Many farmers are aware of the dangers of excessive use of chemicals and are now trying to replace chemicals with natural enemies or organic pesticides. The use of natural enemies prevents environmental risks associated with chemical pesticides, while sustainable protecting the crop, given that the biological control agents does not cause any harmful non target effects. Predatory mites are of economic importance because they efficiently control pest mites in many parts of the world (Sabelis & Dicke, 1985). Despite of the relevance of predatory mites, they have not acquired adequate recognition in many parts of the world, especially in Kerala. Considering the above lacuna the present survey has been undertaken to unravel the predatory mite fauna of vegetable crops from Kozhikode district, Kerala.

MATERIALS AND METHODS

Predatory mite fauna harbouring various species of vegetable crops were collected by making extensive surveys covering different localities in Kozhikode district of Kerala. A total of 18 species belonging to16 genera and 09 families of plants were surveyed. Predatory mites of comparatively larger size and fast moving nature were collected directly from the field with the help of hand lens and camel hair brush. They were preserved in 70% ethyl alcohol until permanent slides were prepared. Sample containing leaves, twigs, petioles and flowers were randomly collected in polyethylene bags and examined under Olympus Stereo-zoom Microscope. Quite often, plant parts were beaten over a dark colored resin sheet and the dislodged mites were picked up with a moistened camel hair brush and stored. Stored mites were upgraded in alcohol series and mounted in Hoyer's medium permanently. Specimens were thoroughly examined and identified with the help of relevant literature and also seeking opinion from experts.

RESULTS AND DISCUSSION

The result of the present survey revealed the occurrence of 40 species of predatory mites belonging to 19 genera and 05 families of the suborders Mesostigmata, Prostigmata and Astigmata. The suborder Mesostigmata was found represented by 02 families *viz.* Phytoseiidae and Ascidae, Prostigmata comprised of 0 2 families *viz.* Cunaxidae and Bdellidae, while Astigmata comprised of a single family Acaridae. However, the species diversity of Mesostigmata was remarkable, as the family Phytoseiidae constituted the largest family of predatory mites comprising 23 species of the total 40 species recovered during the study. Faunistic studies on Phytoseiidae of the country are fairly well progressed, 189 species have been reported from the country, compared to 2280+ species from the world (Mallik *et al.,* 2010). The Phytoseiid mites especially those belonging to genera like *Amblysieus, Euseius* and *Typhlodromips* have been considered as important predators of tetranychids, eriophyids, tarsonemids, thrips, white flies and so on (Mc Murtr & Rodrigues, 1989).

The suborder Prostigmata though was recognized to exhibit the maximum family diversity, its species diversity was comparatively very low than Mesostigmata. The prostigmatid families recovered were Cunaxidae and Bdellidae. Under Cunaxidae a total of 5 species were recovered. They belongs to three genera *viz. Cunaxa, Neocunaxoides* and *Dactyloscirus*. Family Bdellidae comprised of 3 species under the genera *Bdella* and *Cyta.*

Mites of the family Ascidae constitute an important group of predator under the sub oreder Mesostigmata. During the present study 6 species of Ascid mites were reported under the genera *Lasioseius* and *Gamasellodes.*

The single family recovered under the sub order Astigmata was Acaridae. They comprised of about 400 species, under 90 genera in the world. A total of 3 species under 3 genera *viz. Tyrophagus, Acarus* and *Suidasia* were recovered.

Table I : Distribution of predatory mites with respect to host plants in various localities

S. No.	Species Name	Host plant	Location
FAMILY: PHYTOSEIIDAE			
1	*Amblysieus channabasavanni* Gupta & Daniel, 1978	*Momordica charantia* L *Pisum sativum* L. *Benincasa hispida* (Thunb.)	Koottalida Farooke Ashokapuram
2	*A. paraaerialis* Muma, 1967	*Capsicum annum* L. *Amaranthus spinosus* L. *Momordica charantia*	Kadalundi Ramanattukara Kappad
3	*A. kulini* Gupta, 1978	*Solanum melongena* L.	Chaliyam
4	*A. herbicolus* Chant, 1959	*Pisum sativum* L. *Artocarpus heterophyllus*	Malaparamba Edakkad Kadalundi
5	*A. cucurbitae* Rather, 1985	*Capsicum Chinese* L.	Koyilandi Chaliyam
6	**A. sp.nov 1*	*Amaranthus tricolor*	Kavumvattam

7	**A. sp.nov 2*	*Manihot esculenta* Crantz	Kavumvattam
8	**A. sp.nov 3*	*Capsicum annum* L.	Kakkur
9	*Euseius coccineae,* Gupta, 1975	*Pisum sativum* L.	Mankav
10	*E. ovalis* Evans, 1953	*Amorphophallus paeoniifolius* (Dennst.) Nicolson	Kadalundi
11	*E. rhododendronis* Gupta, 1970	*Coccinia grandis* L.	Medical college
12	*E. alstoniae* Gupta, 1915	*Pisum sativum* L.	Kunduparamba
13	*E. bambusae* Ghai & Menon, 1967	*Pisum sativum* L.	Koorachund
14	*E. sacchari* Ghai & Menon, 1967	*Pisum sativum* L. *Amorphophallus paeoniifolius* (Dennst.) Nicolson	Koorachund Kadalundi
15	*Neoseiulus longispinosus* Evans, 1952	*Pisum sativum* L. *Carica papaya* L.	Edakkad Ramanattukara
16	*Paraphytoseius orientalis* Swirskii & Shechter, 1960	*Cucurbita pepo* L.	Thikkodi Kadalundi Asokapuram
17	*P. bhadrakaliensis* Gupta, 1969	*Benincasa hispida* (Thunb.)	Kavumvattam Ramanattukara
18	*Proprioseiopsis peltatus* Van der Merwe, 1968	*Phaseolus lunatus* L.	Malaparamba
19	*Typhlodromips syzygii* Gupta, 1975	*Amaranthus spinosus* L. *Pisum sativum* L. *Abelmoschus esculenta* (L.) Moench	Vengeri Vadakara Kakkur Kootalida
20	*T. meghalayensis* Gupta, 1978	*Pisum sativum* L.	Ramanattukara
21	*Phytoseius intermedius* Evans & Macfarlane, 1962	*Amaranthus spinosus* L.	MCC campus
22	*Scapulaseius sukaensis* Gupta, 1970	*Amaranthus spinosus* L.	Kadalundi
23	*Transeius tetranychivorus* Gupta, 1978	*Solanum melongena* L.	Vadakara
FAMILY: ASCIDAE			
24	*Lasioseius phytoseioides* Chant, 1963	*Cucumis sativus* L.	Ramanattukara
25	*L. matthyssei* Chant, 1963	*Momordica charantia* L	Vengalam
26	*L. ometes* Oudemans, 1903	*Momordica charantia* L	Kurumpoyil
27	*L. japonicas* Ehara, 1965	*Capsicum annum* L.	Koorachund
28	*L. meridionalis* Chant, 1963	*Solanum melongena* L.	Vengeri
29	*Gamasellodes adrianae* DE Walter, 1995	*Capsicum annum* L.	Kadalundi
FAMILY: CUNAXIDAE			

30	*Cunaxa womersleyi* Baker & Hoffmann, 1948	*Amaranthus spinosus* L.	Kakkur
31	*C. evansi* H. Martin, 1965	*Pisum sativum* L.	Mankav
32	*C. terrula* Den Heyer, 1978	*Manihot esculenta* Crantz	Kunduparamba
33	*Neocunaxoides andrei* Baker & Hoffman, 1975	*Phaseolus lunatus* L.	Pazhoor
34	*Dactyloscirus campbelli* E. E. Lindquist, 1969	*Xanthosoma sagittifolium* (L.) Schott	Kaavumvattam
FAMILY: BDELLIDAE			
35	*Bdella muscorum*	*Benincasa hispida* (Thunb.)	Kadalundi
36	*Bdella distincta*	*Abelmoschus esculentus* (L.) Moench	Pazhoor
37	**Cyta sp.nov 4*	*Amorphophallus paeoniifolius* (Dennst.) Nicolson	Koottalida
FAMILY: ACARIDAE			
38	*Tyrophagus putrescentia* Schrank, 1781	*Benincasa hispida* (Thunb.)	Ramanattukara
39	*Acarus gracilis* Hughes, 1957	*Amaranthus spinosus* L.	Mokavoor
40	*Suidasia nesbitti* Hughes, 1948	*Cucurbita pepo* L	Vengalam

* New species will be published soon.

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