



A Report On Diversity Of Some Phytophagous And Predatory Mites (Acari) Encountered In Crop Fields Of South Bengal With Their Economic Importance.

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ABSTRACT

The present paper reports occurrence of 58 species belonging to 28 genera, 13 families under 3 orders which appears to include 9 undescribed species. Among these, 27 species are phytophagous, 29 are predatory and 2 are fungal feeders. All the species are listed along with their hosts/habitats, records, abundance status, nature of damages.

KEYWORDS : Diversity, Medicinal plants, Mite, Phytophagous, Predatory, Host, Crop Field, South Bengal.

INTRODUCTION:

During the recent years mites are increasingly becoming serious pests of horticultural crops including ornamental and medicinal plants because of using broad spectrum pesticides which cause elimination of natural enemies. Consequently, many of the mite species which were earlier innocuous are assuming the status of major pests. Since not much information is available regarding the phytophagous and predatory mites of crop fields in South Bengal, it was thought worthy to conduct surveys in some parts of South Bengal and inventorize those along with the nature of damages caused by those.

MATERIAL AND METHODS:

The survey of phytophagous and predatory mites infesting horticultural crops were conducted in different places of South Bengal like District: South 24 Parganas: Sonarpur, Narendrapur, Canning ; District North 24 Parganas: Barrackpur, Naihati; District Howrah: Uluberia, Rupnarayanpur; District Hoogly: Chuchura, Bandel; District Bardhaman: Simlagarh, Bardhaman Agricultural farm and District Nadia: Kalyani Agricultural Farm. The various types of horticultural crops which were seen there were examined in the field itself under a 20X hand lens and whatever mites could be seen were collected with the help of a fine brush moistened with ethyl alcohol and preserved in 70% alcohol. The mites were mounted in Hoyer's medium and examined under research microscope. The identification was done following the latest keys of Gupta (2002,2003) for predatory mites and Gupta & Gupta (1994) for Tetranychids, Gupta & Mandal (2015) for Tenuipalpid mites.

RESULTS AND DISCUSSION:

Tables-1 & 2 listed a total of 58 species belonging to 28 genera 13 families and 3 orders which include 27 phytophagous, 29 predatory and 2 fungal feeder mites. Among the total of 27 phytophagous mites, there appear to be 2 new species and among 29 predatory mites, there appear to be 7 new species (marked with *) and all those will be described elsewhere. In addition, there were 3 species of *Brevipalpus* and 1 species of *Dactyloscirus*, (marked with **) the records of which from India were unknown earlier. The new species are marked with asterisks. There were as many as 32 new host/habitat records (marked with #) for the listed mites. Among the phytophagous mites, there were 6 serious pests like *Tetranychus ludeni* on *Wissadula periplocifolia*, *Tetranychus urticae* on *Justicia adhatoda*, *Eutetranychus orientalis* on *Citrus reticulata*, *Panonychus citri* on *Carica papaya*, *Oligonychus indicus* on *Cymbopogon martinii* and *Petrobia harti* on *Oxalis corniculata*. There were a total of 5 effective predators (marked with ##) like *Amblyseius largoensis*, *Paraphytoseius orientalis*, *Euseius*

alstoniae, *Cunaxa setirostris*, *Anystis baccarum*, all on spider mites and occasionally on Tenuipalpid mites. Gupta (1985, 1991, 2002, 2003, 2012), reported several mites infesting various agricultural crops in Bengal but there were practically very few representations from the areas wherefrom the mites were reported in the present study.

Table- 1: Diversity of phytophagous, predatory and fungal feeding mites collected from crop fields in different areas of South Bengal.

Type (According to feeding habit)	Number of Total Species	Number of Total Family	Number of Total Genus	Number of New Species	Number of New Report from India
Phytophagous	27	4	11	2	3
Predatory	29	8	15	7	1
Fungal feeder	2	1	2	0	0
Total	58	13	28	9	4

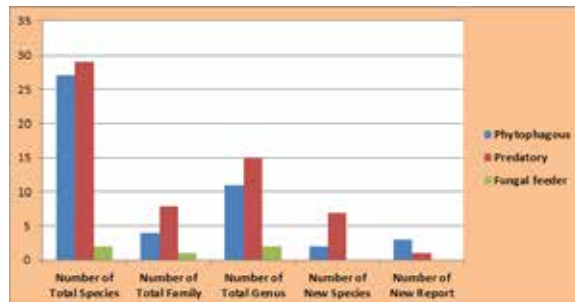


Fig. 1: Graphical representation of diversity of mites collected from crop fields in different areas of South Bengal.

Table- 2: List of phytophagous, predatory and fungal feeding mites Collected from crop fields in different areas of South Bengal along with hosts/habitats, localities, abundance status (1= Very Common, 2= Moderately Common, 3= Rare Occurrence) and Importance.

Group: Phytophagous				
Order: Prostigmata				
1. Family : Tetranychidae				
Species Name	Host	Locality	Abundance Status	Remarks
<i>Tetranychus hypogaeae</i> (Gupta)	<i>Plumbago zeylanica, Malavaviscus arboreus</i>	Narendrapur, Canning	3	Occasionally collected
<i>Tetranychus neocaledonicus</i> (Andre)	<i>Musa acuminata, # Aegle marmelos, Datura metel, Cryplepis buchanani</i>	Baruipur, Narendrapur, Kakdwip	2	Commonly seen on <i>Datura metel</i> as pest.
<i>Tetranychus macfarlanei</i> (Baker & Pritchard)	<i>Justicia adhatoda, Ocimum sanctum, # Phoenix sylvestris</i>	Bardhaman, Contai, East Medinipur,	2	Commonly seen on <i>Justicia adhatoda</i> doing moderate damage.
<i>Tetranychus puscheli</i> (Meyer)	<i># Wissadula periplocifolia, #Gelonium multiflorum</i>	Kalyani, Jibantala	3	Rare occurrence.
<i>Tetranychus urticae</i> (Koch)	<i>Justicia adhatoda, Michelia champaca</i>	Naihati, Bishnupur, Kharagpur	1	Most serious pest of <i>Justicia adhatoda</i> producing brownish patches.
<i>Tetranychus ludeni</i> (Zacher)	<i># Acorus calamus, Wissadula periplocifolia, Rauwolfia serpentina</i>	Rupnarayanpur, Sargachi	1	Most serious pest of <i>Wissadula periplocifolia</i> causing chlorosis.
<i>Eutetranychus orientalis</i> (Klein)	<i>Plumbago zeylanica, Nyctanthes arbor-tristis, Ficus hispida, Citrus reticulata</i>	Chuchura, Sargachi, Bandel	1	Serious pest of <i>Nyctanthes arbor-tristis</i> and <i>Citrus reticulata</i> causing brownish patches on leaves.
<i>Eutetranychus africanus</i> (Tucker)	<i>Ocimum Sanctum, Murraya koenigii</i>	Sonarpur, Narendapur	3	Rare occurrence.
<i>Eutetranychus phaseoli</i> (Nassar & Ghai)	<i># Momordica cochinchinensis, # Impatines balsamina</i>	Hotor, Hogla	3	Rare occurrence.
<i>Panonychus citri</i> (Mc. Gregor)	<i># Justicia adhatoda, Carica papaya</i>	Uluberia, Kalyani, Baruipur	1	Serious pest of <i>Carica papaya</i> causing yellowish then brownish and finally drying of leaves.
<i>Petrobia harti</i> (Ewing)	<i>Oxalis corniculata</i>	Canning, Gosaba, Narendrapur	1	Serious pest causing chlorosis followed by drying.
<i>Oligonychus indicus</i> (Berlese)	<i>Nyctanthes arbor-tristis, Pentapetes phoenicea, # Litsea sebifera, Cymbopogon martinii</i>	Hoogly, Narendrapur, Rajpur	2	Serious on <i>Cymbopogon martinii</i> producing whitish patches.
* <i>Oligonychus sp.</i> (near <i>martensis</i>)	<i># Pterospermum acerifolium</i>	Baruipur	3	Rare occurrence.
<i>Porcupinychus abutiloni</i> (Anwarrullah)	<i>Justicia adhatoda, Nerium indicum</i>	Harinavi, Subhasgram, Uluberia	3	Rare occurrence.
<i>Schizotetranychus sp.</i>	<i># Hamelia patiens</i>	Narendrapur	3	Rare occurrence.
<i>Allonychus sp.</i>	<i># Hamelia patiens</i>	Narendrapur	3	Rare occurrence.
Group: Phytophagous				
Order: Prostigmata				
2. Family : Tenuipalpidae				
Species Name	Host	Locality	Abundance Status	Remarks
<i>Brevipalpus lewisi</i> (Mc. Gregor)	<i># Aegle marmelos, Cryplepis buchanani, Bombax ceiba, Setaria paniculifera</i>	Jhargram, Debipur, Kulpi, Shantipur	2	Common on <i>Aegle marmelos</i> , causing yellowing of leaves.
<i>Brevipalpus californicus</i> (Banks)	<i>Ficus hispida, # Barleria cristata, Ocimum tenuiflorum</i>	Hotor, Diamond Harbour,	1	Common on <i>Barleria cristata</i> , producing yellowish patches at pteriolar attachment.
<i>Brevipalpus euphorbiae</i> (Mohanasundaram)	<i>Justicia adhatoda, Mangifera indica</i>	Gopal nagar, South Barasat	3	Rare occurrence.
<i>Brevipalpus essigi</i> (Baker)	<i>Justicia adhatoda, # Aegle marmelos</i>	Subhasgram, Kalikapur	2	Common on <i>Justicia adhatoda</i> , causing browning of leaves.
<i>Brevipalpus obovatus</i> (Donnadieu)	<i>Cryplepis buchanani, Uraria picta</i>	Ramchandrapur, Mathurapur	3	Rare occurrence no damage.
* <i>Brevipalpus sp.</i> (Near <i>phoenicis</i>)	<i>Cryplepis buchanani, Averrhoa carambola</i>	Shimultala, Sonarpur	3	Rare occurrence.
** <i>Brevipalpus turrialbensis</i> (Manson)	<i>Momordica cochinchinensis</i>	Narendrapur	3	Rare occurrence.
** <i>Brevipalpus pictilis</i> (Chaudhri)	<i># Justicia adhatoda, #Syzygium jambolanum</i>	Jaipur Forest (Bishnupur)	3	Rare occurrence.
** <i>Brevipalpus melichrus</i> (Baker & Pritchard)	<i>Nyctanthes arbor-tristis, Ocimum tenuiflorum</i>	Jairambati, Kamarpukur	3	Rare occurrence.

Group: Phytophagous Order: Prostigmata 3. Family : Tarsonemidae				
Species Name	Host	Locality	Abundance Status	Remarks
<i>Tarsonemus</i> sp.	<i>Artocarpus heterophyllus</i>	Harinavi	3	Rare occurrence.
Group: Phytophagous Order: Prostigmata 4. Family : Eriophyidae				
Species Name	Host	Locality	Abundance Status	Remarks
<i>Aceria justiceae</i> (Keifer)	<i>Justicia adhatoda</i> , <i>Hibiscus rosa sinensis</i>	Narendrapur, Rajpur	1	Common on <i>Justicia adhatoda</i> , producing small brownish patches.

Group: Predatory		5. Family : Phytoseiidae			Order: Mesostigmata
Species Name	Habitat	Locality	Abundance Status	Remarks	
## <i>Amblyseius largoensis</i> (Muma)	<i>Ficus hispida</i> , # <i>Bauhinia acuminata</i> , # <i>Colocasia antiquorum</i> , # <i>Impatiens balsamina</i> , <i>Malvaviscus arboreus</i> , # <i>Alangium lamarkii</i> , # <i>Michelia champaca</i> , # <i>Gelonium multiflorum</i>	Canning, Gosaba, Jainagar-Majilpur, Kulpi road, Jagaddol, Krishnamohan, Baruipur	1	Very common on all the plants, good predator of spider mites of all stages.	
* <i>Amblyseius</i> sp. (near <i>largoensis</i>)	# <i>Momordica cochinchinensis</i>	Diamond Harbour	3	Rare occurrence.	
* <i>Amblyseius</i> sp. (near <i>largoensis</i>)	<i>Hibiscus rosa sinensis</i> , <i>Mangifera indica</i> ,	kamarpukur, Jairambati	3	Rare occurrence.	
<i>Paraphytoseius scleroticus</i> (Gupta & Ray)	<i>Rauvolfia tetraphylla</i>	Krishnanagar	3	Rare occurrence.	
<i>Paraphytoseius orientalis</i> (Narayanan & Ghai)	<i>Cimmamomum zeylanicum</i> , <i>Rauvolfia tetraphylla</i> , <i>Colocasia antiquorum</i> , # <i>Cynodon dactylon</i> , # <i>Momordica cochinchinensis</i> , <i>Ocimum tenuiflorum</i>	Bonguon, Habra, Uluberia, Barasat, Barrakpur, Kalyani,	1	Very common on eggs of tetranychids/tenuipalps.	
## <i>Paraphytoseius bhadrakaliensis</i> (Gupta)	<i>Triumfetta shombaidea</i>	Howrah	2	Not very common, good predator of tetranychid's juvenile stages.	
## <i>Neoseiulus longispinosus</i> (Evans)	# <i>Averrhoa carambola</i>	Basirhat	1	Very common, good predator of all stages of spider mites.	
<i>Euseius ovalias</i> (Evans)	<i>Impatiens balsamina</i>	Saktigarh	3	Rare occurrence.	
<i>Euseius alstoniae</i> (Gupta)	# <i>Syzygium jambolanum</i>	Arambagh	1	Rare occurrence.	
<i>Phytoseius kapuri</i> (Evans)	<i>Setaria paniculifera</i>	Hoogly	3	Rare occurrence.	
Group: Predatory Order: Mesostigmata 6. Family : Cunaxidae					
Species Name	Habitat	Locality	Abundance Status	Remarks	
## <i>Cunaxa setirostris</i> (Hermann)	<i>Artocarpus lankoocha</i> , <i>Ocimum tenuiflorum</i>	Raidighi, Lakshmikantapur	1	Very common, effective predator of spider mites.	
<i>Cunaxa capreolus</i> (Berlese)	<i>Justicia adhatoda</i>	Narendrapur	3	Rare occurrence.	
* <i>Cunaxa</i> sp. (near <i>myabunderensis</i>)	<i>Saraca asoca</i>	Asansol	3	Rare occurrence.	
* <i>Cunaxa</i> sp. (near <i>evansi</i>)	# <i>Barleria cristata</i> , <i>Nyctanthes arbor-tristis</i> .	Chandmari, Sonarpur	3	Rare occurrence.	
<i>Dactyloscirus bengalensis</i> (Gupta)	<i>Aegle marmelos</i>	Purulia	3	Rare occurrence.	
** <i>Dactyloscirus fuscus</i> (Chaudhri)	<i>Ficus hispida</i>	Rajpur	3	Rare occurrence.	
* <i>Dactyloscirus</i> sp. (near <i>machairodus</i>)	<i>Ixora coccinea</i>	Debipur	3	Rare occurrence.	
Group: Predatory Order: Mesostigmata 7. Family : Ascidae					
Species Name	Habitat	Locality	Abundance Status	Remarks	
<i>Proctolaelaps pygmaeus</i> (Chant)	<i>Bauhinia acuminata</i>	Sargachi	3	Rare occurrence.	

Group: Predatory Order : Prostigmata 8. Family : Stigmaeidae				
Species Name	Habitat	Locality	Abundance Status	Remarks
<i>Agistemus gambli</i> (Gupta)	<i>Rauvolfia tetraphylla</i>	Kolkata	3	Rare occurrence.
<i>Agistemus edulis</i> (Gupta)	# <i>Morus alba</i>	Narendrapur	3	Rare occurrence.
<i>Agistemus terminalis</i> (Quayle)	<i>Barleria cristata</i>	Naihati	3	Rare occurrence.

Group: Predatory Order : Prostigmata 9. Family : Erythraeidae				
Species Name	Habitat	Locality	Abundance Status	Remarks
<i>Leptus gigantius</i> (Khot)	# <i>Bambusa vulgaris</i>	Bandel	3	Rare occurrence.
Group: Predatory Order : Prostigmata 10. Family : Anystidae				
Species Name	Habitat	Locality	Abundance Status	Remarks
## <i>Anystis baccarum</i> (Linn.)	<i>Justicia adhatoda</i> , <i>Nyctanthes arbor-tristis</i> .	Kanathi	1	Very common on <i>Justicia adhatoda</i> , good predator of spider mites.
<i>Walzia</i> sp.	<i>Justicia adhatoda</i>	Sreerampur	3	Rare occurrence.
Group: Predatory Order : Prostigmata 11. Family : Cheyletidae				
Species Name	Habitat	Locality	Abundance Status	Remarks
<i>Hemicheyletia bakeri</i> (Ehara)	# <i>Momordica cochinchinensis</i>	Kulpi	3	Rare occurrence.

Group: Predatory Order : Prostigmata 12. Family : Tydeidae				
Species Name	Habitat	Locality	Abundance Status	Remarks
* <i>Pronematus</i> sp.(near <i>sextoni</i>)	<i>Artocarpus lankoocha</i>	Narendrapur	3	Rare occurrence.
<i>Pronematus fleschneri</i> (Beker)	<i>Nyctanthes arbor-tristis</i> . <i>Triumfetta shombaidea</i>	Gobordanga, Habra	3	Rare occurrence.
* <i>Lorryia</i> sp. (near <i>stricta</i>)	<i>Ixora coccinea</i>	Kamalgazi	3	Rare occurrence.
<i>Tydeus</i> sp.	<i>Cocos nucifera</i>	Raidighi	3	Rare occurrence.
Group: Fungal feeder Order: Astigmata 13. Family : Acaridae				
Species Name	Habitat	Locality	Abundance Status	Remarks
<i>Suidasia nesbitti</i> (Hughes)	<i>Justicia adhatoda</i>	Lilua	2	Accidental occurrence.
<i>Tyrophagus longior</i> (Grevais)	<i>Justicia adhatoda</i> , <i>Nyctanthes arbor-tristis</i> .	Shimultala, Karbala	3	Rare occurrence.

* Likely new species

** New Report from India

New host records

Good Predators

Abundance status (1= Very Common, 2= Moderately Common, 3= Rare Occurrence).

Acknowledgement:

The authors are thankful to the Secretary and Assistant Secretary of Ramakrishna Mission Ashrama, Narendrapur for providing laboratory and infrastructure facilities as well as allowing to make the collection of Specimens from their Medicinal Plants Garden and crop fields.

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