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DIVERSITY OF MITES AND INSECTS OCCURRING ON DYE-YIELDING AND AROMATIC PLANTS WITH TWO NEW RECORDS OF MITES FROM INDIA

Zoology

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ABSTRACT

The present paper reports the occurrence of 20 species of mites under 12 genera, 6 families and 3 orders and also 5 species of insects belonging to 4 genera, 3 families, 2 orders on dye yielding and aromatic plants from some areas of district South 24 parganas,West Bengal. Out of these, Oligonychus indicus and Tetranychus macfarlanei were found most injurious on Cymbopogon and Mentha, respectively. Eotetranychus populi (Koch) and Brevipalpus floridanus De Leon are being reported here for the first time from India. These apart, the localities, relative abundance, host / habitat records and economic importance if any, of each species have also been dealt with.

KEYWORDS

Mites, insects, diversity, dye yielding, aromatic plants, West Bengal.

INTRODUCTION:

In the recent time, there is a great demand of herbal dyes instead of chemical dyes as the latter has some adverse effects on human health causing skin allergies, respiratory problems, cancer, kidney and liver diseases, etc, and hence unacceptable in the global market. Some of the plants known to produce herbal dyes are *Bixa orellana, Nyctanthes arbor-tristis, Tagetes lucida*, *Syzgium cumini, Curcuma longa,* etc. Likewise, some plants synthesize aromatic compounds as secondary metabolites from where various aromatic compounds and essences are produced and those are used as fragrance, flavouring agents, cosmetics, etc. India earns US$ 3000 million per year out of these plants. Some of the aromatic plants are *Rosa indica*, *R.centifolia Hibiscus rosa-sinensis*, *Clitoria ternatea*, *Indigofera tinctorea*, *Jasminum sambac, Lawsonia innermes*, etc. Both these types of plant are attacked by a good number of mites and insects and they sometimes do reasonably good amount of damage causing economic loss. Since there are a number of dye- yielding and aromatic plants in the district of South Bengal, especially at Narendrapur campus it was decided to conduct a survey of mites and insects of those plants along with recording localities, host/habitat records, relative abundance and their economic importance, if any. Earlier to this, Gupta (2005) documented some mites and insects from these plants from India which included a few from district South 24 parganas also.

MATERIAL AND METHODS:

- Collection of sites: Different areas of South Bengal (Narendrapur, Baruipur, Canning, Gosaba, Namkhana)
- Period of collection: August 2017- June 2018
- Methods of collection: By examining the leaves under stereo binocular microscope in the laboratory and collecting mites/ insects with alcohol- moistened brush.
- Preservation: 70% ethyl alcohol
- Mounting: Hoyer's medium(for mite), kept dry(for insects)

RESULTS AND DISCUSSION:

Survey and Documentation-

Mites; - The identification of the collected mite specimens revealed the occurrence of 20 species under 12 genera, 7 families and 2 orders (Table-1). These included 14 species under 7 genera and 4 families which were phytophagous and 6 species under 4 genera and 2 families belonged to predatory group.

Interestingly, *Eotetranychus populi* and *Brevipalpus floridanus* were recorded for the first time from India. There also appears to be 1 species under *Tenuipalpus* which is likely to be a new species and that will be described later. Among the phytophagus mites, *Tetranychus macfarlanei* on Mentha, *Oligonychus indicus* on *Cymbopogon* and *Brevipalpus phoenicus* on *Elettaria cardamomum* were the most abundant species and also were important pests causing the appearance of typical mite damage symptoms like yellowing, browning, defoliation, stunting of growth, etc. Among the predatory mites, *Paraphytoseius orientalis* and *Amblyseius channabasavannai* were the most dominant. Among the 9 aromatic plants, viz. *Abelmoschus moschatus*, *Elettaria cardamomum*, *Pterocarpus santalinus*, *Mentha arvensis*, *Cymbopogon martinii*, *Cinnamomum camphora*, *Plumeria* sp., *Ocimum tenuiflorum* , *Rosa indica*. Mentha harboured 6 species of mites followed by 2 on Cardamom and the rest of the plants harboured only 1 species each. Among the 20 species of mites, there was not a single species which occurred on more than 1 plant i.e. no mite could be collected on more than one plant species.

Insects; - As per as insects are concerned, there were altogether 5 species under 4 genera, 3 families and 2 orders. Out of these, *Aphis gossypii* on *Abelmoschus moschatus, Pseudococcus* sp. on *Mentha arvensis* and *Thrips andersoni* on *Rosa indica* were most abundant. The former as well as *Thrips andersoni* were most damaging pests on the respective plants as mentioned earlier causing yellowing, drying and defoliation of leaves. Mentha represented 2 species of insects followed by 1 species each on *Abelmoschus moschatus*, *Pterocarpus santalinus* and *Rosa indica*. Interestingly, there were 7 plants viz.Cardamom, Cymbopogon, Camphor, Holy basil, Mehendi, Turmeric and Plumeria on which no insect could be collected during the entire period of study.

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Table-1: List of Mites and Insects collected on aromatic and dye-yielding plants from South 24 Parganas of West Bengal during August 2017- June 2018

No.	Order/Family	Name of species	Host/Habitat	Locality	Relative Abundance	Remarks
I.	PHYTOPHAGOUS				1= Most abundant 2= Moderately abundant 3= Least abundant	

	Order: Trombidiformes					
a.	Family: Tetranychidae					
1.		*Eotetranychus populi* (Koch)	*Abelmoschus moschatus*	Narendrapur	3	New report from India, no damage done.
2.		*Eotetranychus sexmaculatus* (Riley)	*Pterocarpus santalinus*	Baruipur	2	Poor population, no damage done.
3.		*Oligonychus indicus* (Hirst)	*Cymbopogon martinii*	Canning	1	White spots appeared all through leaf lamina.
4.		*Oligonychus mangiferus* (Rahman & Sapra)	*Cinnamonum camphora*	Namkhana	2	Moderate infestation on upper leaf surface appeared yellow spots, later brown.
5.		*Tetranychus macfarlanei* Baker & Pritchard	*Mentha arvensis*	Narendrapur	1	A good infestation on upper leaf surface, appeared yellow spots, later those turned brown.
6.		*Tetranychus* sp.	*Mentha arvensis*	Narendrapur	3	Occasional occurrence.
b.	Family: Tarsonemidae					
7.		*Polyphagotarsonemus latus* Banks	*Mentha arvensis*	Gosaba	1	Huge infestations on undersurface of leaves, the infested young leaves become crinkled.
8.		*Tarsonemus* sp.	*Mentha arvensis*	Canning	3	Poor population.
9.		*Tarsonemus randsi* (Ewing)	*Phyllanthus emblica*	Baruipur	3	Poor population
c.	Family: Tenuipalpidae					
10.		*Brevipalpus floridanus* De Leon	*Lawsonia innermes*	Narendrapur	2	Moderate infestation, brownish patches appeared.
11.		*Brevipalpus phoenicis* Geijskes	*Elettaria cardamomum*	Namkhana	1	Good infestation, the infested leaves developed brownish patches, then defoliated.
12.		*Brevipalpus obovatus* Donnadieu	*Elettaria cardamomum*	Narendrapur	3	Poor population, no damage done.
13.		*Brevipalpus essigi* Baker	*Curcuma longa*	Narendrapur	3	Poor population, no damage done
14.		*Tenuipalpus* sp.n	*Curcuma longa*	Baruipur	3	Poor population, no damage done.
II.	PREDATOR					
	Order: Mesostigmata					
d.	Family: Phytoseiidae					
15.		*Amblyseius channabasavannai* Gupta & Daniel	*Mentha arvensis*	Gosaba	1	Regularly encountered, but feeding on prey not observed.
16.		*Amblyseius neorykei* Gupta	*Lawsonia innermes*	Canning	3	Regularly encountered, but feeding on prey not observed.
17.		*Euseius sacchari* Ghai & Menon	*Rosa indica*	Narendrapur	2	Poor population, feeding on prey not observed.
18.		*Paraphytoseius orientalis* Narayanan et al.	*Occimum tenuiflorum*	Namkhana	1	Good population on undersurface of leaves, feeding on prey not observed.
e.	Family: Tydeidae					

19.		*Pronematus fleshneri* Baker	*Plumeria sp.*	Narendrapur	2	Moderately available on undersurface of leaves.
	Order: Sarcoptiformes					
f.	Family: Suidasiidae					
20.		*Suidasia nesbitti* Hughes	*Bixa orellana*	Canning	3	Accidental occurrence.
III.	INSECT					
	Order: Hemiptera					
g.	Family: Aphididae					
21.		*Aphis gossypii* Glover	*Abelmoschus moschatus*	Narendrapur	1	Huge infestations on undersurface of leaves, affected leaves become yellow.
h.	Family: Pseudoccidae					
22.		*Pseudococcus* sp.	*Mentha arvensis*	Baruipur	1	Large population on undersurface of leaves.
23.		*Planococcus* sp.	*Pterocarpus santalinus*	Gosaba	3	Sporadic infestation, no noticeable damage.
	Order: Thysanoptera					
i.	Family: Thripidae					
24.		*Thrips* sp.	*Mentha arvensis*	Narendrapur	3	Poor infestation.
25.		*Thrips andersoni* (Begnall)	*Rosa indica*	Namkhana	1	Huge infestations on undersurface of leaves, all stages seen feeding upon leaf lamina. Blackish brown patches appeared at the points of feeding.

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