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A Study of Diversity of Mites and Insects Associated With Medicinal Plants At Ramakrishna Mission Garden, Narendrapur As Well As Agri-Horticulture Garden, Alipore and Neighbouring Areas

Zoology

KEYWORDS : Medicinal plants, Pest mites, Predatory mites, West Bengal.

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ABSTRACT

*The present communication report the occurrence of 33 species of mites of 16 genera, under 8 families and 2order occurring on medicinal plants at Narendrapur campus of R.K Mission as well as from Agri-horticulture garden, Alipore. This includes 18 phytophagous and 15 predatory species, of these 4 species were important phytophagous pest mites(marked with**) doing considerable economic damage to the plants and 3 species (marked with #) were useful predators found feeding on pest mites in the field. It also includes 2 species of Brevipalpus sp. (marked with ✂) Which are being reported here for the first time in India.*

Introduction:-

Since the ancient time, medicinal plants are being used for treatment of various ailments of human beings as well as for their pets. According to WHO, 80% people of the developing world rely upon herbal medicines for indigenous healthcare. Medicinal plants are receiving increasing importance globally for their multifarious uses not only in preparation of herbal drugs in Ayurvedic Siddhai, Homeopathic systems of medicines but also as in nutraceuticals, cosmetics, flavouring agents, colouring agents, phytochemicals, phytopestisides etc. Recently Government of India is giving a lots of emphasis to generating awareness among the common people regarding importance and uses of medicinal plants. Like all other agriculture crops, medicinal plants are also attacked by a good number of mites and insects and couse moderate to serious damage. This leads to appearance of various damage symptoms like yellowing or browning of leaves, defoliation, reducing in size of flowers and fruits as well as reducing the quantity of active ingrediants which are used in preparing of drugs. The control of pest of medicinal plants by conventional pesticides leave behind residues which diminish the therapeutic value of medicinal plant.

In the present investigation, attempts have been made to collect mite species from some medicinal plants at Ramakrishna Mission Ashram, Narendrapur, as well as Agri-Horticulture socity and identify those and making an inventory giving status, abundance, locality and economic importants if any

So far as mites infesting plants are concerned, major contribution came from Ghosh and Gupta (2003), Lahiri et.al. (2004), Gupta et.al. (2005). Gupta 2005, Roy et.al. 2006a,2008,2009 and Gupta and Karmakar (2011).

Material and Methods:-

Survey and documentation of mites and Insects on medicinal plants:-

Regular surveys were conducted in the medicinal plant gardens of Narendrapur R.K Mission and Ari-Horticulture Alipore.Leaves were examined with the hand lens of 20X, and mite were collected with fine brush, moistened with 70% ethanol. Those were preserved in 70% ethanol and mounting was done in Hoyer's medium . Identification of mites was done by the junior author while insects were identified taken the help of ZSI scientists.

Result and Discussioon :-

During the survey conducted from October'2015 to March'2016 revealed the occurrence of total 33 species belonging to 16 genera under 8 families of 2 order. All those are listed in table 1 and 2 giving details of host/ habitats, localities, along with their importance. Among these 18 species under 6 genera and 3 families belongs to phytophagous group and 15 species under 10 genera and 5 families belongs to predatory group.(Table 1 and 2)

Among the phytophagous species, *Tetranychus urticae* on *Abelmoschus moschatus*, *Tetranychus ludeni* on *Rauvolfia sarpentina, schizotetranychus cajani* on *cajanus cajan, Aceria guerreronis* on coconut (*Cocos nucifera*) and *Brevipalpus californicus* on Mentha appear to be important damage causing mites causing yellowishing or browming of leaves following by dryig and defoliation.

Amblyseius largoensis is abundantly found on *Cymbogon flexuosu),* cocco (*Theobroma cacap)* and shiuli (*Nyctanthes arbortristris*) were acted as spider mites.The occurance of other phytophagous and predatory mites were casual and nothing could be observed as regard their predatory behavior.

Brevipalpus melichus and *Brevipalpus mitrofanovia* were newly reported from India.

Table 1: List of Phytophagous mite collected from differ-

ent medicinal plants in Ramakrishna Mission, Narendrapur, Kolkata and its neighbourhood:-
ORDER:-PROSTIGMATA
FAMILY 1:-TETRANYCHIDAE

Sl. No.	NAME OF MITES	HOST PLANT	LOCATION	STATUS	REMARK
1	****Tetranychus urticae** Koch	Lata kasturi Marigold Rose	Narendrapur	1	Serious infestation observed on Lata Kashturi & Marigold. Infested leaves become brown defoliated, growth stunned.
2	****Tetranychus ludeni** Zacker	Sarpagandha	Alipore	1	Serious infestation causing yellowishing of leaves.

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3	** *Tetranychus macfarlanei* Baker & Pritchard	Mentha	Narendrapur	3	Casual occurance no such damage observed.
4	*Tetranychus neocaledonicus* Andre	Citronella	Narendrapur	3	Casual occurance, no damage occurred
5	*Eotetranychus hirsti* Pritchard & Baker	*Ficus carica*, Marigold	Alipore	2	Yellowish stippling on undersurface of the leaves.
6	*Schizotetranychus cajani* Gupta	Arhar	Alipore	1	The infested leaves turn yellow, later brownish patch appeard.
7	*Oligonychus indicus* (Hirst)	Citronella	Narendrapur	2	Produced whitish patches on the undersurface of the leaves, later spread all along the leaf.
8	*Oligonychus biharensis* (Hirst)	Coco	Naredrapur	2	Casual occurance, no such damage occurred
FAMILY 2:- TENUPALPIDAE					
9	*Brevipalpus essigi* Baker	Menttha	Sonarpur	2	No characteristic damage symptoms produced
10	**Brevipalpus californicus* (Banks)	Mentha	Narendrapur	1	Casual occurance ,no such damage occurred
11	*Brevipalpus mitrofanovi* Pegazzano	Kanchan, sarpagandha	Saltlake	3	Casual occurrence.
12	*Brevipalppus ovovatus* Donnadieu	Tulsi	Alipore	1	Produced brownish spots at the site of feeding.
13	*Brevipalpus phoenicis* (Geji.)	Citrus	Alipore	2	Infested leaf became first yellowish then brownish in colour.
14	*Brevipalpus melichrus* Pritchard & Baker	Sarpagandha	Narendrapur	2	New recorded.
15	*Brevipalpus karachiensis* Chaudhri Akbar & Rasool	Tulsi	Narendrapur	1	Often serious infestation occur causing drying of leaves.
FAMILY 3:- ERIOPHYIDAE					
16	*Aceria* sp	Latkan	Narendrapur	2	Occational infestation of this mite was observed on underside of the leaves.
17	*Aceria guerreronis* Kifer	Coconut	Narendrapur	1	Some young nuts were found infested with this mite underneath the perianth producing white 'V' shaped patch

TABLE 2 : List of PREDATORY mite**s** collected from different medicinal plants:

FAMILY 4:- STIGMAEIDAE					
18	*Agistemus* sp	Tumeric, Kalmegh	Narendrapur	3	This mite casually occurred on Tumeric.
FAMILY 5:-BDELLIDAE					
19	*Bdella maldahensis* Gupta	Lemon	Alipore	3	Casually occurred, no serious damage symptoms noted.
FAMILY 6:-CHEYLETIDAE					
20	*Hemicheyletia bakeri* (Ehara)	Tulsi	Tollygunge	2	This mite was associated with Tenuipalpid mite, feeding upon those.
FAMILY 7:- TYDEIDAE					
21	*Tydeus* sp	Citronella	Narendrapur	1	Though these mites were found abundantly, but their importance were still unknown.

ORDER:- MESOSTIGMATA
FAMILY 1 :- PHYTOSEIIDAE

22	# *Amblyseius largoensis* (Muma)	Citrinella,coco,Siuli	Narendrapur	1	Abundantly available on the listed plant, good predator of all stage on *Oligonichys Indicus* Citronella.
23	*Amblyseius paraerialis* Muma	siuli	Narendrapur	2	Only once these mites are recorded on siuli, economic importance are unknown.
25	*Amblyseius mcmurtryi* Muma	Citronella	Narendrapur	2	Casual occurance, economic importance unknown.
26	*Amblyseius herbicolous* Chant	Kalmegh	narendrapur	3	Casual occurance
27	*Scapulaseius polyantheae* (Gupta)	Kanchan	Saltlake	2	Occationalt encountered, feeding habbit not observed.
28	*Neoseiulus suknaensis* (Gupta)	Siuli, citronella	Narendrapur	2	Frequently recorded in association with *Eotetranychus* sp. feeding not observed.
29	*Neoseiulus fallacis* (Garmen)	Tulsi	Narendrapur	3	Only once it was recorded on Tulsi.
30	*Typhlodromips syzygii* (Gupta)	Kalmegh	Narendrapur	3	Sometimes recorded on the mentioned host but economic importance unknown.

31	# *Paraphytoseius orientalis* (Ghai & Mrnon)	Tulsi	Sonarpur	1	This was vey abundantlu found on undersurface of leaf bt feeding habit is not observed.
32	*Euseius alstoninae* (Gupta)	Tulsi, Kanchan, sarpagandha	Narendrapur	2	Recorded very often with insect and mite but feeding was not observed.
33	# *Euseius ovalis* (Evans)	Nayantara, citronella	Saltlake	3	Though it is a good predator but in the predent observation such observation not observed.

TABLE 3 : List of various Insects associated with medicinal plants :-

There are about 9 species of insects under 9 families belonging to 2 orders were recorded during the entire survey from October 2015 to March 2016 at Narendrapur Ramakrishna Mission campus and Agri-Horticulture Garden,Alipore.

Among all, *Aphis gossypii* on *Ocimum sanctum, Kola vesta* on *Ambroma augusta*, and *Urentius senti* on *Abutilon i*ndicum were the major damage causing species.

ORDER:- HEMIPTERA

FAMILY	SPECIES	HOST	STATUS	NATURE OF ASSOCVIATION
Aphididae	*Aphis gossypii* Grover	*Ablemoschus moschatus* *Ocimum sanctum* *Rauvolfia serpentine* *Cymbogon flexusus*	Major pest	The infested leaf get crinkled and crumpled, later dry up when severely infested.
Ceropidae	*Poophilus costalis* Walker	*Ocimun sanctum*	Minor pest	Nymphs secrete asplit like secretion to cover it up. It cause no apparent damage to the host.
Cicadellidae	*Kolla vesta* (Distant)	*Ambroma augusta*	Major pest	Infested leaves curve downward to give a boat like appearance and the leaves turn deep brown, dry up and defoliate.
Coccidae	*Ceroplaster ceriferus* (Fab.)	*Azadirachta indica* *Cymbogon flexusus* *Rauvolfia serpentine*	Minor pest	Infested leaves and young twigs wither.
Pseudococcidae	*Ferrisia virgata* (Cock.)	*Achranthes aspera* *Saraca asoca*	Minor pest	No serious damage
Pyrochroidae	*Dysdercus koenigii*	*Withania somnifera* *Ocimum sanctum*	Major pest	Continious sucking of sap from leaves and tender shoot makes the plants weak showing stunted growth.
Tingidae	*Urentius sentis* (Dis.)	*Abutilon indicum* *Ocimum sanctum* L	Major pest	Infested leaves show yellowish appearance at petiole attachment.
ORDER:- COLEPTERA				
Crysmelidae	*Aspidomorpha indica* (Boh.)	*Ablemoschus moschatus* Medic	Minor pest	Feeding caused appearance of hole on leaf lamina.
Coccineillidae	*Henosepilachna vigintic-topunctata*	*Datura metel*	Major pest	Feed on chlorophyll from leaf lamina leaving network of veins.

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