



E-ISSN: 2708-0021
P-ISSN: 2708-0013
<https://www.actajournal.com>
AEZ 2023; 4(1): 10-14
Received: 03-10-2022
Accepted: 10-12-2022

Airin Sultana
Post Graduate, Department of
Zoology, Vidyasagar College,
Salt Lake Campus, CL Block,
Kolkata, West Bengal, India

Sagata Mondal
Post Graduate, Department of
Zoology, Vidyasagar College,
Salt Lake Campus, CL Block,
Kolkata, West Bengal, India

Salil K Gupta
Medicinal Plants Research
and Extension Centre,
Ramakrishna Mission,
Narendrapur, Kolkata,
West Bengal, India

Corresponding Author:
Sagata Mondal
Post Graduate, Department of
Zoology, Vidyasagar College,
Salt Lake Campus, CL Block,
Kolkata, West Bengal, India

On a collection of (Insects, Acari) some insects and mites from medicinal plants of Ramakrishna mission, Narendrapur (India: West Bengal, Dist south 24 Paraganas)

Airin Sultana, Sagata Mondal and Salil K Gupta

DOI: <https://doi.org/10.33545/27080013.2023.v4.i1a.90>

Abstract

A total 37 species of mites (under 22 genera, 9 family and 2 orders) and 17 species of insects (under 14 genera, 11 family and 3 orders) has been recorded from 99 medicinal plants grown in three medicinal plant gardens of Ramakrishna Mission Ashrama, Narendrapur, collected during November 2021 - July 2022. Out of 37 species of mites, 23 species belonged to phytophagous group and 13 species predatory groups respectively. Among the phytophagous and predatory mites, *Brevipalpus phoenicis*, *Petrobia harti*, *Steneotarsonemus spiniki* and *Aceria guerreronis* were found to be serious pests causing damage to their respective host plants, while *Gynaneseius eharai*, *Amblyseius largoensis* and *Euseius finlandicus* were found to be promising predatory mites feeding mostly upon Tetranychidae and Eriophyidae pest mites. In case of insects, 16 species was recorded as phytophagous and only 1 species (*Scolothrips sexmaculatus*) was predatory in nature. Among the phytophagous insects 3 species. *Aphis nerii*, *Aspidiotus destructor*, *Kola vesta* found to occur abundantly on the medicinal plants, causing serious damage symptoms to their respective host plants. The present study also recorded 25 mite species and 10 insect species shows new host records.

Keywords: Medicinal plants, insects, mites, diversity, new host records, West Bengal, India

Introduction

In recent times, mites and insects are posing serious threats to the cultivation of medicinal plants as some of those have turned out to be important pests feeding on those plants. Consequently, the growth, vigour and vitality of the infested plants are affected and that ultimately reduces the production of secondary metabolites (phytochemicals used in herbal drug preparation). Because of the therapeutic values of medicinal plants and having their significant market demands, many farmers have come forward towards cultivation of medicinal plants. However, with the increase in cultivation of medicinal plants, the pest problem has also increased. Some workers in India attempted to explore the diversity of mites and insects on medicinal plants and some such references are [1, 2, 14, 4, 5, 6, 7, 8, 9, 10, 11, 2, 13]. The Ramakrishna Mission Ashrama, Narendrapur has three medicinal plants gardens having a wide range of medicinal plants and many of those have not been explored properly for occurrence of insects and mites from there. In view of that, this work was taken up during November 2021-July 2022 and the present paper is based upon the results of that study. Incidentally, this paper reports many new host/habitat records as well as some mites not earlier known to occur on medicinal plants in India.

Materials and Method

The collection of insects and mites from three medicinal plant gardens of Ramakrishna Mission Ashrama, Narendrapur was done during November 2021 - July 2022. The plant samples (mostly infested leaves) were collected from the field, examined under stereo microscope in laboratory and the mites and insects were collected with a help of fine brush mostly on help alcohol. Many a time, the infested plants were examined directly in the field under a 20X hand lens and insect and mite occurring on those, if any were collected with a fine brush. The mite species were identified up to species level. While collecting insects and mites from the field, observations one makes regarding their biological importance have pests of predator and nature of damage etc.

Results and Discussion

All the species of insects and mites have been documented in table 1 and 2 and i.e. self-explanatory.

Table 1: List of insects collected on medicinal plants of Ramakrishna Misson, Narendrapur During November 2021 - July 2022.

Order/Family/Genus/Species	Host/Habitat Records	Date of collection	Remark	
Order - HEMIPTERA				
Family - Pseudococcidae				
1.	<i>Ferrisia virgata</i> (Cockerell)	<i>Areca catechu, Phyllanthus emblica</i>	29/08/21, 26/01/22	This appear to be a coomon species on <i>Phyllanthus emblica</i> where it was recorded on leaves and twigs and its occurrence on the other hosts was rare. The damage symptoms were not very important.
Family - Aleyrodidae				
2.	<i>Aleurocanthus citrifolli</i> Corbett	<i>Citrus auranthium, Eranthemum roseum</i>	7/08/21, 11/01/22	This white fly infested under surface of <i>Citrus</i> leaf and the infested leaves turned pale yellow. The host records a new for the species from India.
Family - Aphididae				
3.	<i>Aphis gossypii</i> Glover	<i>Argemon maxicana, Thespesia lampus, Luffaa egyptiaca</i>	9/10/22, 3/07/22	This aphid colonized undersurface of leaves in good number and infested leaves turned yellow and later withered.
4.	<i>Aphis craccivora</i> Koch	<i>Achyranthus aspera, Lablab sp., Solanum nigrum</i>	4/09/21, 16/06/22	This infestation was observed on both the host plants but produced no noticeable damage symptoms.
5.	<i>Aphis malvae</i> Koch	<i>Coccinea grandis, Ocimum sanctum</i>	3/05/22, 23/07/22	Poor population, no damage was done. <i>Ocimum sanctum</i> new host record from India.
6.	<i>Aphis nerii</i> (B.d.F.)	<i>Calotropis gigantea, Mentha arvensis, Mentha spicata</i>	07/08/21, 24/03/22	Very severe infestation of this yellow aphid was noticed during the summer time on <i>Calotropis gigantea</i> both on leaves and twigs. Infested plants became weak. The occurrence of the species on <i>Calotropis gigantea</i> was not known earlier from India.
Family - Coccidae				
7.	<i>Coccus hesperidum</i> L.	<i>Amaranthus viridis, Ccajanas cajan, Citus limon</i>	18/12/21, 26/02/22	Stray population was noticed, no damage done. <i>Citus limon</i> form new host record.
Family - Diaspidae				
8.	<i>Aspidiotus destructor</i> Signoret	<i>Cacica papaya, Ficus carica, Melia azedarach</i>	19/10/21, 26/01/22	This hard scale infestation was seen more on <i>Melia azedarach</i> than <i>Carica papaya</i> . The infested leaves became brownish. <i>Ficus carica</i> and <i>Melia azedarach</i> form new host record in India.
Family - Cicadellidae				
9.	<i>Kola vesta</i> (Distant)	<i>Ambroma augusta, Bacopa monnieri</i>	29/09/21, 12/03/22	The infestation of this insect was very high on leaves of <i>Ambroma augusta</i> . Where from all the stages of the insects sucked sap which made the leaves brownish and became curved like a boat.
10.	<i>Nephotettix sp.</i>	<i>Cymbopogon palmarosa, Barleria lipulina</i>	28/11/21, 19/03/22	All stages of the insect were seen on under surface of the leaf sucking sap and making those yellowish. <i>Barleria lipulina</i> from new host record from India.
Family - Membracidae				
11.	<i>Tricentrus bicolor</i> Distant	<i>Cynodon dactylon, Physalis minima</i>	15/08/21, 24/04/22	The population of the insect was low on the under surface of the leaves with which a black ant was found associated. The damage symptoms were yellowing of leaves. <i>Physalis minima</i> form new host record from India.
Family - Pentamoidae				
12.	<i>Nezara viridula</i> (L.)	<i>Catharanthus roseus, Dolichosbiflorus, Ricinuscommunis</i>	5/08/21, 26/03/22	This greenish bug were often see sucking plant sap. <i>Catharanthus roseus</i> form new host record.
Order - Thysoptera				
Family - Thripidae				
13.	<i>Thrips carthemi</i> Shumsher	<i>Carthamus tinctorious</i>	15/01/21, 22/05/22	Both adults and nymphs were observed on under surface of leaves.
14.	<i>Scolothrips sexmaculatus</i> Pergande	<i>Rosa indica, Ablemoschus moschatus</i>	27/02/22, 31/07/22	This was a predatory insect found on surface of Rose leaves in association with spider mite form new host from India.
Order - Lepidoptera				
Family - Noctuidae				
15.	<i>Helicoverpa armigera</i> Hb.	<i>Cedres deodera, Cinnamomum tamala, Coccinia grandis, Eupatorium triplimnerve</i>	11/09/21, 20/03/22	This borer were seen feeding on leaves and twigs of, <i>Coccinia grandis</i> . Consequently the plant lost vitality. All the four hosts are new for this species from India.
16.	<i>Sdoptera litura</i> (F.O)	<i>Cannabis sativa, Capsicum annum</i>	16/01/22, 19/05/22	The caterpillars fed on the leaves of the <i>Cannabis sativa</i> and <i>Capsicum annum</i> causing damage to the plant.
Family - Papillionidae				
17.	<i>Papilio polytes</i> Cr.	<i>Aegle marmelos</i>	8/5/22, 23/6/22	This butterfly were recorded on the host plant but no damage were done. It may be a pollinator.

Table 2: List Of Mites Collected On Medicinal Plants Of Ramakrishna Mission, Narendrapur, During November 2021 – July 2022.

Order/Family/Genus/Species	Host/Habitat Records	Date of collection	Remark	
Order - Trombidiformes				
Suborder - Prostigmata				
Family - Tetranychidae				
1.	<i>Oligonychus coffeae</i> Nietner	<i>Murraya paniculata, Coffea arabica</i>	05/09/21, 19/06/22	It is a rare occurrence on the concerned host plants doing no damage. Both hosts are new for this species.
2.	<i>Schizotetranychus undulates</i> Beer and Laing	<i>Acacia nilotica, Solanum surattense</i>	19/12/21, 19/06/22	Rare occurrence, no damage. <i>Solanum surattense</i> from new host record.
3.	<i>Schizotetranychus baltazari</i> Rimoando	<i>Citrus aurnticum, Murraya koenigii, Citrus limon</i>	30/01/22, 23/07/22	It occurrence was noticed under surface of leave and feeding by both adults and nymphs produced yellowish stipplings. <i>Citrus aurantium</i> from new host record.
4.	<i>Schizotetranychus industanicus</i> Hirst	<i>Murraya koenigii, Citrus limon</i>	13/11/21, 20/02/22	This mite produced similar type of damage symptoms as mentioned for <i>Schizotetranychus baltazari</i> . Both are new host record.
5.	<i>Schizotetranychus cajani</i> Gupta	<i>Cajanus cajan, ficus carica</i>	07/08/21, 06/03/22	The colony of this mite was seen on the under surface of the leaf and as many as 15-20 mites of all stages were seen making the infested leaves yellow which later defoliated.
6.	<i>Eutetranychus suginamensis</i> (Yokoyama)	<i>Morus alba</i>	04/09/21, 10/03/22	Occurrence of the mite on mulberry population was so poor that it caused no damage.
7.	<i>Eotetranychus histri</i> Prichard and Baker	<i>Ficus carica, Ficus hispida</i>	28/11/21, 24/04/22	Its infestation on fig plant on under surface but due to poor population no damage symptoms noticed.
8.	<i>Tetranychus lombardini</i> Baker and Pritchard	<i>Wedelia chinensis, Rauwolfia serpentina</i>	25/09/21, 26/02/22	On both the hosts, the occurrence of the mite was in poor number the typical spider mite damage symptoms were produced. New record on medicinal plant.
9.	<i>Aponychus bambusae</i> Gupta and Gupta	<i>Bambusa vulgaris, Bambusa aurandinacea</i>	29/08/21, 16/01/22	This interesting flat spider mite was observed on lower surface of leaf along mid rib causing yellowing of leaves. <i>Bambusa vulgaris</i> new host record.
10.	<i>Petrobia harti</i> (Ewing)	<i>Oxalis corniculata</i>	07/08/21, 10/04/22	Very severe infestation was noticed on both leaf surfaces on <i>Oxalis corniculata</i> was observed and its infested leaf became pail whitish specially in the petular apartment region. Subsequently all infected leave became brown and dried up.
Family - Tenupalpidae				
11.	<i>Brevipalpus phoenicis</i> (Geijks)	<i>Adhatoda vesica, Catharanthus roseus, Ocimum gratissimum, Gloriosa superba, vitex negundo</i>	19/10/21, 22/05/22	The infested leaf produced brownish at the point of feeding and those ultimately form brownish patches. <i>Adhatoda vesica, Ocimum gratissimum</i> forms new host record.
12.	<i>Brevipalpus obovatus</i> Donndieu	<i>Eranthemum roseum, Clerodendrum indicum, Calotropis Prosera, Desmodium gangeticum</i>	11/12/21, 09/06/22	Rare occurrence, no damage done. <i>Eranthemum roseum</i> form new host record.
Family - Tarsonemidae				
13.	<i>Tarsonemus narkole</i>	<i>Datura metel, Curculigo orchioides</i>	25/09/21, 11/06/22	Both the plants from new host record.
14.	<i>Tarsonemus sp.</i>	<i>Ocimum sanctum, Mentha arvens, Mentha piperata, Calendula officinalis</i>	01/05/22, 3/07/22	Occasional occurrence, no damage observed.
15.	<i>Steneotarsonemus spinki</i> Smiley	<i>Oryza sativa</i>	26/02/22, 10/07/22	This is a very important pest of paddy called paddy leaf sheath mite causing drying of plants.
Family - Eriophyidae				
16.	<i>Aceria ficus</i> (Cotte)	<i>Ficus erica, Ficus hispida</i>	29/08/21, 15/05/22	Though this mite is known to transmit fig mosaic virus disease but such same plants were not observed in the present study.
17.	<i>Aceria guerreronis</i> Keifer	<i>Cocus nucifera</i>	21/11/21, 18/06/22	This mite is very serious pest called coconut perianth mite and its quite common in South 24 Pargana district, being a coconut growing area. The attack of this mite causes brownish fibrous appearance on outer surface of coconut and premature nut fall.

18.	<i>Aceria pongamiamiae</i> Channa Basavanna	<i>Mellitia pinnata</i>	11/09/21, 11/06/22	This mite produced elongated pouch gall on pongamia leave.
19.	<i>Aceria justicae</i> ChannaBasavanna	<i>Achyranthes aspera, Justacia adhatora.</i>	07/08/21, 24/04/22	Attack of the mite was seen on under surface of jasmine leaf producing erineum. <i>Achyranthes aspera</i> form new host record.
20.	<i>Phyllocoptruta oleivoras</i> (Ashmead)	<i>Citrus aurantium, Citrus medica</i>	04/09/21, 01/05/22	It was recorded on fallen citrus fruits where it was found on outer skin of the fruit which became brownish and shrivelled.
21.	<i>Calacarus jasmine</i> Chakrabarti and Mondal	<i>Jasmina sambac</i>	23/01/22, 08/05/22	No damage was observed. It produces erineum not earlier reported from India.
22.	<i>Tegolophus calotropi</i> Chakrabarti and Mondal	<i>Calotropis procera, Calotropis gigantea</i>	18/09/21, 10/07/22	No damage. <i>Calotropis gigantea</i> new host record
Family - Cunaxidae				
23.	<i>Cunaxa bambusae</i> Gupta and Ghosh	<i>Cocos nucifera, Areca catechu</i>	14/08/21, 19/06/22	This is a deep reddish predatory mite occur on under surface of leaf. Not earlier recorded on medicinal plant from India.
24.	<i>Cunaxa capreolus</i> (Berlese)	<i>Mangifera indica, Clerodendrum viscosum</i>	31/10/21, 19/06/22	A predatory mite, importance not observed. The occurrence of the species on medicinal plant was not in India.
25.	<i>Cunaxa setirostris</i> (Hermann)	<i>Cocos nucifera, Citrus sp., Gymnema sylvestre, Indigofera tinctoria, lawsonia innermis</i>	30/01/22, 17/04/22	This is good and efficient predator of spider mite, often encounter on under surface of leaf. All plants form new host from India.
Family- Lolinidae				
26.	<i>Parapronemetus ferox</i> Gupta	<i>Nyctanthes arbor-tristis, Datura metel</i>	13/11/21, 01/05/22	A predatory mite, found feeding on egg of spider mite. New record on medicinal plant.
Family - Stigmaeidae				
27.	<i>Agistemus obscura</i>	<i>Urena sinuata, Bauhinia acuminata</i>	25/09/21, 17/07/22	A predatory mite but its predatory behaviour was not observed. New record of the mite species on the medicinal plant.
Family- Tydeidae				
28.	<i>Tydeus sp.</i>	<i>Aegle marmelos, Piper nigrum</i>	21/11/21, 19/06/22	A predatory mite but its predatory behaviour was not observed. New record of the mite species on the medicinal plant.
29.	<i>Tydeus gossabaensis</i> Gupta	<i>Theobroma cacao</i>	18/09/21, 23/07/22	A predatory mite but its predatory behaviour was not observed. New record of the mite species on the medicinal plant.
Order - Mesostigmata				
Family - Phytoseiidae				
30.	<i>Amblyseius largoensis</i> (Muma)	<i>Mangifera indica, Syzygium cumini, Eugenia jambolana, Abelmoschus moschatus</i>	29/08/21, 27/02/22	Most abundantly available predatory mite, its feeding was observed on all stages of spider mites. Excepted <i>Mangifera indica</i> , all other three plants from new host record.
31.	<i>Euseius coccineae</i> Gupta	<i>Eranthemum roseum, Withania somnifera, Citrus sp.</i>	13/11/21, 12/03/22	A predatory mite but such behaviour was not observed. Not earlier known on medicinal plant in India.
32.	<i>Euseius finlandicus</i> (Oudemans)	<i>Carica papaya, Citrus aurantium, Abutilon indica</i>	22/08/21, 24/04/22	A commonly occurrence phytoseiid mite, predation noticed on immature spider mite. Occurrence this mite on medicinal plant are unknown from India.
33.	<i>Paraphytoseius orientalis</i> (Narayanan <i>et al.</i>)	<i>Artemisia nilagirica, Achyranthes aspera, Urena lobata, Rauwolfia serpentina</i>	11/09/21, 11/06/22	It was seemed to be a tarsonemid mite predator. All host plants are new for this mite.
34.	<i>Euseius scutalis</i> Athias-Henriot	<i>Clerodendrum innermis, Cinnamomum zeylanicum, Cassia alata</i>	11/12/21, 08/05/22	A predatory mite of uncertain importance. new report of this mite on the recorded host plants.
35.	<i>Gynaneseius eharai</i> Gupta	<i>Nerium indicum</i>	11/12/21, 08/05/22	A group predator and voracious feeder of eriophyid mite.
36.	<i>Phytoseius minutes</i> Narayanan, Kaur and Ghai	<i>Piper betle, Urena sinuata</i>	11/12/21, 22/05/22	Importance unknown. Both from new host record.
37.	<i>Phytoseius kapuri</i> Gupta	<i>Ocimum gratissimum, Wissadula periplocifolia</i>	28/11/21, 23/07/22	As above. Both plants from new host record for this mite.

Acknowledgement

The authors are thankful to the Secretary, Ramakrishna Mission Ashrama, Narendrapur for allowing to explore the Medicinal Plant Gardens of Narendrapur campus which enable the senior author to collect insect and mite specimen reported in this paper.

and utilization overview. (Ed. SK Gupta); c2005. p. 245-251.

References

1. Ghosh S, Singh R. Aphids on medicinal plants in North East India (Insecta: Aphids on medicinal plants in North East India (Insecta: Hemiptera: Aphididae). Rec. Zool. Survey of India. 2004;102(1-2):169-186.
2. Ghosh S, Gupta SK. A report on mites occurring on medicinal plants in West Bengal Rec. Zool. Survey of India. 2003 Dec 1;101(3-4):287-298.
3. Wafaa Kamal Taia, Abdelbasit Musa Asker, Fatma M Alwashish, Salem Ahmed Mohamed. Research Title: Ethnobotanical survey of medicinal plant *Teucrium* L. (Lamiaceae) in eastern Libya. Int. J Agric. Extension. Social Dev. 2021;4(1):176-181.
4. Gupta SK, Mondal D. A conspectus of medical plants associated predatory mites of India and their potentially pest management programe and best. 1st It. Work shop of 10 BC-APR5- mites as Biological control agent working group; c2016. p. 22.
5. Gupta SK, Bose S. Mites (Acari) on medical plants in South Bengal. India. Records of the Zoological Survey of India. 2017 Sep 1;117(2):1-30.
6. Lal L, Mukherjee SP. A contribution to the knowledge of phytophagous mites infesting medicinal plants. Sci. and Cult. 1977;43:313-316.
7. Lahiri S, Poddar S, Saha GK, Gupta SK. Diversity of phytophagous and predatory occurring on medicinal plants in Kolkata Porc. Semina ISM and H; c2004. p. 62-65.
8. Mondal S, Gupta SK. Some Records of Mites on Medicinal Plants from South Bengal with their Economic Importance. Biological Forum – An International Journal. 2016;8(2):1-4.
9. Mondal A, Gupta SK. Mites on some medical plants occurring in Purulia and Bankura district of South Bengal with two new reports from India along with keys to different taxonomic categories, Bionotes. 2019;21(3):78-79.
10. Mondal S, Gupta S K. A note on predatory mites on medicinal plants in South Bengal with results on their predator-prey interaction. Journal of Entomology and Zoology Studies. 2021;9(4):292-296.
11. Roy I, Gupta SK, Saha GK. Two new species of prostigmatid mites infesting medicinal plants in West Bengal, India, Entomon. 2007;33(2):119-128.
12. Roy I, Gupta SK, Saha GK. New record of predatory mites (Acari: Prostigmata, Mesostigmata) from medicinal plants of Darjeeling district, West Bengal, India, with description of new species, Entomon. 2008;33(2):119-128.
13. Ghosal G, Mondal S. Gupta S.K. Some mites and insects occurring on medicinal plants from medicinal plant gardens located in and around Kalyani, West Bengal. South Asian Journal of Agricultural Sciences. 2022;2(2):36-40.
14. Gupta SK, Mukherjee A, Roy I, Saha GK. Insects and mites injurious to medicinal plants in India and their suggested management. In: Medicinal plants research