



## Some Records of Mites on Medicinal Plants from South Bengal with their Economic Importance

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**ABSTRACT:** A total 75 species of mites (under 29 genera, 12 family and 3 orders) has been recorded from 38 medicinal plants grown in four districts of South Bengal, India. The results documented 35 species of phytophagous, 37 species of predatory and 3 species of fungal feeding mites. Of these, 2 species namely *B. amicus* and *B. recki*, are recorded for the first time from India and 8 species *Tetranychus sayedi*; *Tetranychus ludeni*; *Eutetranychus africanus*; *Eutetranychus orientalis*; *Brevipalpus melichrus*; *Bdellodes angustifolius*; *Euseius prasadi*; *Euseius pruni* shows new host records.

**Keywords:** Mite, medicinal plants, new records, South Bengal, India

### INTRODUCTION

The importance of medicinal plants is increasing globally because of the fact Medicinal plants are used not only in preparations of herbal medicines but also as phytopesticides, phytochemicals, food supplements, nutraceuticals, colouring agents, flavouring agents, etc. Since, the use of synthetic drugs have adverse effects in human health which cause more harm than good and as the facilities of modern medicine are almost unavailable in the rural communities, they are almost totally dependent on herbal medicines and collect those from surrounding areas. Due to all these, Government of India is providing encouragement and financial incentives to the growth of the medicinal plants and also generating awareness among the common people for using those for home remedial measures and for food supplements. These has resulting in the increasing cultivation of Medicinal plants throughout the country. As a result, the medicinal plants has invited pest problems causing substantial loss to the farmers. Among the pests which are doing quiet noticeable damage towards medicinal plants the mites are becoming more and more important and in some places they are turning out to be more important insect pest. In view of these it is felt necessary to conduct extensive survey on medicinal plants in the districts of West Bengal and the taxonomic study of those from the basis

of this paper which not only documents the mites species on different medicinal plants along with their host, habitat, economic importance, etc.

### MATERIAL AND METHODS

So far as mites are concerned the Medicinal plants were directly in the field with a 20x pocket lens and mites found if any, were collected with the help of brush moistened with 70% alcohol. In a number of cases the infested leaves were brought to the laboratory in a polythene bag by closing the mouth of the with a rubber band and then examining those with a Stereo research microscope and mites were collected in the same manners as mentioned before. Those were preserved in 70% alcohol and were mounted in modified Hoyer's medium. The specimens were then observed in Stereo research microscope for identification consulting the upgraded literatures. While collecting mites and predatory behavior in case of predatory mites were recorded in the field itself. The district which could be covered were South 24 parganas, North 24 parganas, Kolkata and East Midnapore. The survey was carried out from December, 2014 to December, 2015. All the slides of mites were submitted in the Entomological collection of Vidyasagar College, P.G. Department of Zoology, Kolkata 700091.

## RESULTS AND DISCUSSION

The mites which were collected and identified has been listed in Table 1. A perusal to Table 1 indicates that 75 species of mites were collected which belongs to 29 genera under 12 family, and 3 orders. Of these, there were 35 species belongs to 13 genera under 4 families and 1 order which were phytophagous and the corresponding for predatory species 37, 14, 6, 2 and fungal feeding mites the figures were 3, 2, 2,1. Among the phytophagous mites there were 6 species which were abundantly found during the entire study period and all those were important pest species. Those are *Tetranychus urticae* (Koch), *Petrobia harti* (Ewing), *Aponychus corpuseae* Rimando among Tetranychidae

group; *Brevipalpus mitrofavoni* (Pegazzano), *Brevipalpus karachinensis* Chaudhri among Tenuipalpidae and *Polyphagotarsonemus latus* Banks under Tarsonemidae. There were only 3 predatory mites like *Paraphytosieus multidentatus* (Swirski & Schchte) feeding on prey *Brevipalpus mitrofavoni*; *Euseius alstoniae* (Gupta) and *Euseius ovalis* (Evans) are one prey *Tetranychus ludeni* Zacher and on prey *Tetranychus urticae* respectively. The fungivorous mite included 2 species namely *Tyrophagus longior* (Gervais) and *Tyrophagus potrescentae* Schrank which were associated on plants like *Ocimum sanctum* and *Mikania micrantha*, respectively in association with fungus group on the concerned leaves.

**Table 1: Diversity of phytophagous, predatory and fungal feeding mites collected from different medicinal plants in different areas of South Bengal.**

Name of the Mite species	Trophic groups	Host Plants	Habitat status	Locality
<b>I. Order : Prostigmata</b>				
<b>i. Family: Tetranychidae</b>				
<b>Species:</b>				
1. <i>Schizotetranychus cajani</i>	Phytophagous	<i>Cajanus cajan</i>	A	Narendrapur
2. <i>Schizotetranychus tephrosiae</i> Gutierrez	Phytophagous	<i>Citrus aurantiifolia</i>	A/B	Narendrapur/Joynagar
3. <i>Schizotetranychus hindustanicus</i> (Hirst)	Phytophagous	<i>Citrus limonia</i>	B/B	Narendrapur/Babunghata
4. <i>Schizotetranychus baltazari</i> Rimando	Phytophagous	<i>Citrus</i> sp.	B	Narendrapur
5. <i>Tetranychus urticae</i> Koch	Phytophagous	<i>Ficus carica</i> .	B	Dhakuria
6. <i>Tetranychus hypogaeae</i> Gupta	Phytophagous	<i>Rauwolfia tetraphylla</i>	C	Narendrapur
7. <i>Tetranychus sayedi</i> Baker & Pritchard*	Phytophagous	<i>Cryptolepis buchanani</i>	B	Narendrapur
8. <i>Tetranychus ludeni</i> Zacher*	Phytophagous	<i>Cryptolepis buchanani</i>	B	Narendrapur
9. <i>Tetranychus macfarlaneae</i> Baker & Prichard	Phytophagous	<i>Murraya koenigii</i>	A	Kanta tala
10. <i>Tetranychus neocaledonicus</i> André	Phytophagous	<i>Ricinus communis</i>	C	Bantala
11. <i>Tetranychus pucheli</i> (Meyer)	Phytophagous	<i>Megathyrus maximus/ Datura metel</i>	C/B	Narendrapur/Tangra
12. <i>Petrobia harti</i> (Ewing) Pritchard & Baker	Phytophagous	<i>Oxalis corniculata</i>	A	Narendrapur
13. <i>Panonychus citri</i> (McGregor)	Phytophagous	<i>Carica papaya</i>	B	Minakhan/Moyna
14. <i>Oligonychus orizae</i> (Hirst)	Phytophagous	<i>Phleum pretense</i>	B	Narendrapur
15. <i>Oligonychus indicus</i> (Hirst)	Phytophagous	<i>Megathyrus maximus/ Carica papaya</i>	B/B	Mecheda/ Narendrapur
16. <i>Oligonychus martensis</i> Meyer	Phytophagous	<i>Ficus carica/ Aegle marmelos</i>	A/C	Mecheda/ Godkhali
17. <i>Aponychus bambusae</i> Gupta & Gupta	Phytophagous	<i>Bambusa arundinacea</i>	A	Gosaba
18. <i>Aponychus corpuseae</i> Rimando	Phytophagous	<i>Bambusa arundinacea</i>	A	Narendrapur
19. <i>Eutetranychus africanus</i> (Tucker) *	Phytophagous	<i>Passiflora caerulea</i>	C	Tangra
20. <i>Eutetranychus orientalis</i> (Klein) *	Phytophagous	<i>Rauwolfia tetraphylla</i>	C	Narendrapur
21. <i>Eotetranychus suginamensis</i> (Yokoyama)	Phytophagous	<i>Phyllanthus emblica</i>	B	Narendrapur
<b>ii. Family: Tenuipalpidae</b>				
<b>Species:</b>				
1. <i>Brevipalpus melichrus</i> Pritchard & Baker*	Phytophagous	<i>Phyllanthus emblica</i>	B/B	Narendrapur
2. <i>Brevipalpus phoenicis</i> (Geijskes)	Phytophagous	<i>Ficus carica/ Nyctanthes arbor-tristis</i>	B/C	Narendrapur/ Moyna
3. <i>Brevipalpus karachinensis</i> Chaudhri	Phytophagous	<i>Justicia adhatoda/ Aegle marmelos</i>	A/C	Narendrapur
4. <i>Brevipalpus mitrofavoni</i> (Pegazzano)	Phytophagous	<i>Datura metel/ Mentha arvensis</i>	C/B	Narendrapur/ Basanti
5. <i>Brevipalpus recki</i> Livschitz & Mitrofanov**	Phytophagous	<i>Solanum torvum</i>	B	Joynagar
6. <i>Brevipalpus dipholosi</i> De Leon	Phytophagous	<i>Ocimum gratissimum</i>	B	Mecheda
7. <i>Brevipalpus cucurbitae</i> Mohanasundaram	Phytophagous	<i>Punica granatum</i>	A	Ghusiara
8. <i>Brevipalpus amicus</i> Chaudhri**	Phytophagous	<i>Hibiscus</i> sp.	B	Gosaba
9. <i>Tenuipalpus</i> sp.	Phytophagous	<i>Hibiscus</i> sp.	C	Narendrapur
<b>iii. Family: Tarsonemidae</b>				
<b>Species:</b>				
1. <i>Tarsonemus</i> sp.	Phytophagous	<i>Acorus calamus</i>	C	Narendrapur
2. <i>Polyphagotarsonemus latus</i> Banks	Phytophagous	<i>Ocimum gratissimum/ Megathyrus maximus</i>	A/A	Narendrapur/Kanta tala

Name of the Mite species	Trophic groups	Host Plants	Habitat status	Locality
<b>iv. Family: Tydeidae</b>				
<b>Species:</b>				
1. <i>Pronematus flechneri</i> Baker	Predatory	<i>Ricinus communis</i> / <i>Mikania micrantha</i>	B/B	Chingrighata/Narendrapur
2. <i>Pronematus sextoni</i> Baker	Predatory	<i>Ocimum gratissimum</i>	B	Malancha
3. <i>Parapronematus cameliae</i> Gupta	Predatory	<i>Piper nigrum</i>	B	Narendrapur
4. <i>Parapronematus murshidabadensis</i> Gupta	Predatory	<i>Piper nigrum</i>	B	Narendrapur
5. <i>Tydeus wallachi</i> Gupta & Chatterjee	Predatory	<i>Ocimum sanctum</i>	B	Narendrapur
<b>v. Family: Cunaxidae</b>				
<b>Species:</b>				
1. <i>Cunaxa setirostris</i> (Hermann)	Predatory	<i>Coccinia grandis</i> / <i>Ricinus communis</i>	B	Beleghata/ Narendrapur
2. <i>Cunaxa mangiferae</i> Gupta	Predatory	<i>Hibiscus rosa-sinensis</i> / <i>Ocimum tenuifolium</i>	C/C	Narendrapur
3. <i>Cunaxa capreolus</i> (Berlese)	Predatory	<i>Justicia adhatoda</i>	B	Mathpukur
<b>vi. Family: Stigmaeidae</b>				
<b>Species:</b>				
1. <i>Agistemus</i> sp.	Predatory		A	Narendrapur
2. <i>Agistemus terminalis</i> (Quayle)	Predatory	<i>Ferula assafoetida</i>	B	Narendrapur
3. <i>Agistemus industani</i> Gonzalez-Rodriguez	Predatory	<i>Hibiscus rosa-sinensis</i>	B	Narendrapur
4. <i>Agistemus unguiparvus</i> Gonzalez-Rodriguez	Predatory	<i>Piper nigrum</i>	C	Salt lake
5. <i>Agistemus obscura</i> Gupta	Predatory	<i>Ficus carica</i> .	B	Tamgra
6. <i>Agistemus histrix</i>	Predatory	<i>Rosa</i> sp.	C	Salt lake
7. <i>Agistemus gamli</i> (Gupta)	Predatory	<i>Ficus carica</i>	B	Narendrapur
8. <i>Agistemus edulis</i> (Gupta)	Predatory	<i>Rauvolfia tetraphylla</i> <i>Ricinus communis</i>	B	Beliaghata
<b>vii. Family: Bdellidae</b>				
<b>Species:</b>				
1. <i>Bdellodes angustifolius</i> Gupta*	Predatory	<i>Morinda citrifolia</i>	C	Narendrapur
<b>viii. Family: Eriophyidae</b>				
<b>Species:</b>				
1. <i>Aceria cajani</i> Channabasavanna	Phytophagous		C	Narendrapur
2. <i>Aceria justiceae</i> (Keifer)	Phytophagous	<i>Cajanus cajan</i>	B	Beliaghata
3. <i>Aceria litchi</i> (Keifer)	Phytophagous	<i>Hibiscus rosa-sinensis</i> <i>Litchi chinensis</i>	A	Mecheda
<b>II. Order : Mesostigmata</b>				
<b>i. Family: Phytoseiidae</b>				
<b>Species:</b>				
1. <i>Amblysieus paraerialis</i> Muma	Predatory		B	Narendrapur
2. <i>Amblysieus largoensis</i> (Muma)	Predatory	<i>Shorea robusta</i>	A	Salt lake
3. <i>Amblysieus herbicolus</i> (Chant)	Predatory	<i>Ficus carica</i>	A	Ghatakpukur
4. <i>Amblysieus mcmurtryi</i> Muma	Predatory	<i>Passiflora caerulea</i>	B	Narendrapur
5. <i>Euseius alstoniae</i> (Gupta)	Predatory	<i>Nerium oleander</i>	A	Salt lake
6. <i>Euseius ovalis</i> (Evans)	Predatory	<i>Ricinus communis</i> <i>Moringa oleifera</i>	A	Bhojerhat
<b>II. Order : Mesostigmata</b>				
<b>i. Family: Phytoseiidae</b>				
<b>Species:</b>				
7. <i>Euseius eucalypti</i> Gupta*	Predatory	<i>Nyctanthes arbor-tristis</i> / <i>Ficus carica</i>	A/C	Bantala/ Narendrapur
8. <i>Euseius finlandicus</i> (Oudemans)	Predatory	<i>Nyctanthes arbor-tristis</i>	B	Bantala
9. <i>Euseius prasadi</i> Chant & Mc Murtry*	Predatory	<i>Nerium oleander</i>	B	Mecheda
10. <i>Euseius pruni</i> (Gupta, 1975) *	Predatory	<i>Polyanthia longifolia</i>	B	Minakhan
11. <i>Phytoseius wainsteini</i> Gupta	Predatory	<i>Mangifera indica</i>	C	Kanta tala
12. <i>Phytoseius minutes</i> Narayanan <i>et al.</i>	Predatory	<i>Nyctanthes arbor-tristis</i>	C	Joynagar
13. <i>Paraphytoseius multidentatus</i> (Swirski & Schchte)	Predatory	<i>Ocimum sanctum</i>	A	Joynagar
14. <i>Paraphytoseius scleroticus</i> (Gupta & Ray, 1981)	Predatory	<i>Ocimum gratissimum</i>	C	Narendrapur
15. <i>Paraphytoseius orientalis</i> (Narayanan <i>et al.</i> )	Predatory	<i>Ocimum gratissimum</i>	B	Gosaba
16. <i>Neoseiulus longispinosus</i> (Evans)	Predatory	<i>Hibiscus</i> sp.	A	Narendrapur
17. <i>Phytoscutella salebrosus</i> (Chant)	Predatory	<i>Ficus carica</i>	A	Narendrapur
18. <i>Typhlodromips syzygii</i> (Gupta)	Predatory	<i>Citrus limon</i>	B	Mathpukur
19. <i>Typhlodromips sukaensis</i> Gupta	Predatory	<i>Paederia foetida</i>	B	Narendrapur

ii. Family: Ascidae Species: 1. <i>Melichares</i> sp.	Predatory	<i>Ficus carica</i>	C	Narendrapur
III. Order : Astigmata i. Family: Acaridae Species: 1. <i>Tyrophagus potrescentee</i> Schrank 2. <i>Tyrophagus longior</i> (Gervais) ii. Family: Saprogliphidae Species: 1. <i>Suidasia nesbitti</i> Odenams	Predatory Predatory  Predatory	<i>Mikania micrantha</i> <i>Ocimum sanctum</i>  <i>Justicia adhatoda</i> / <i>Aegle marmelos</i>	C B  C/C	Bhojerhat Narendrapur  Tangra

Where, A= abundantly occurrence, B= occasional occurrence, C= casual occurrence, \*\*= New Report from India, \*=New host records

Of these, 2 species namely *B. amicus* and *B. recki*, are recorded for the first time from India and 8 species *Tetranychus sayedi*; *Tetranychus ludeni*; *Eutetranychus africanus*; *Eutetranychus orientalis*; *Brevipalpus melichrus*; *Bdellodes angustifolius*; *Euseius prasadi*; *Euseius pruni* shows new host records.

From India the important contribution made were Ghosh & Gupta, 2003; Gupta 2005, 2012; Gupta *et al.*, 2005, Lahiri *et al.*, 2004; Roy *et al.*, 2006, 2007, 2008, 2008a, 2009 and Roy & Saha, 2010. However many of the species have indicated earlier were not reported by them and many of the host plants on which the mites reported in the present communication were earlier unrecorded.

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