



Mites (Acari) on medicinal plants in South Bengal, India

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Abstract

The present paper reports the occurrence of 120 species of mites, including both phytophagous and predatory groups, under 44 genera and 15 families infesting 158 species of medicinal plants from South Bengal, India. This communication provides the collection data, host/habitat records, economic importance, if any, and keys to various taxonomic categories. This includes 9 species, all under Tenuipalpidae, 2 species under Phytoseiidae, 3 species under Cunaxidae and 1 genus under Tetranychidae which are being reported here for the first time from India. A host-mite catalogue is also appended.

Keywords: Medicinal plants, Mites, South Bengal, India, New reports

Introduction

The medicinal plants are receiving importance in India since over 5000 years because of being used as traditional medicines and those are even now the sole agents used in India to get cured from different ailments which the human beings are suffering from. Though in the present day, people in the developed countries mostly use conventional modern medicines but in the developing countries including India, as per WHO, 80%, population still depend upon traditional herbal medicines for their daily health care as those are easily accessible, cheap and are relatively free from side-effects. Apart from medicinal use, these medicinal plants are also used in the present day in preparation of nutraceuticals, food supplements, dyeing, coloring, flavoring agents, toiletries, cosmetics, phytopesticides, etc. All these have enhanced cultivation of medicinal plants in India and in many other developing countries. Unfortunately, this enhanced cultivation has invited more pest problems in which mites are important components. Though some work has been done in West Bengal and also in some other regions of India (Gupta, 1985, 2005, 2012, Gupta & Karmakar 2011) for exploring the mite diversity of medicinal plants but not intensively done from South Bengal and therefore in this study attempts have been made to undertake thorough exploration of mite fauna on medicinal plants from South Bengal and present a consolidated account of those along

with their collection records, economic importance, and keys to different taxonomic categories. This paper included 120 species under 44 genera, 15 families, 3 orders collected from 158 species of medicinal plants. The list of mites included 9 species all under Tenuipalpidae, 2 species under Phytoseiidae, 3 species under Cunaxidae and 1 genus under Tetranychidae which were hitherto unknown from India. A host-mite catalogue has also been appended. The entire collection was done by the authors as well as by Juin Mondal.

Material and Methods

Mite specimens were collected from different species of medicinal plants from eleven districts of South Bengal, viz. South 24 Parganas, North 24 Parganas, Howrah, Hooghly, Nadia, Bardhaman, East Medinipur, West Medinipur, Birbhum, Bankura and Purulia. In most of the cases, the leaves of the medicinal plants were examined in the field itself under a 20x lens and mites were collected directly with the help of a fine brush moistened with ethanol and preserved in ethanol kept in a vial. Hoyer's medium was used for permanent mounting. In many cases, the leaves were brought to the laboratory and were examined under stereo-binocular microscope and mites present therein were collected with a fine brush. For identification, current literature and updated keys of the respective families were consulted.

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Systematic Account

Phytophagous Mite

Suborder A. PROSTIGMATA

Family I. TETRANYCHIDAE Donnadieu

Key to the genera of Tetranychidae

1. Empodium with tenent hairs, female with 3 pairs of anal setae and male with 5 pairs of genitoanal setae.....Subfamily Bryobiinae, 2
 - Empodium without tenent hairs or empodium may be absent, female with 1 or 2 pairs of anal setae, males with 3-4 pairs of genitoanal setae.....Subfamily Tetranychinae, 3
2. True claws pad-like but rarely with a mid-ventral hook.....*
- * Humeral setae (c_1) contiguous with 1st pair of dorsolateral setae (c_2)..... Tribe Histrichonychini
 - Dorsal body setae on tubercles, mostly contiguous, dorsal integument without tuberculate pattern
.....*Porcupinychus*
 - True claws pad-like and empodium uncinat distally with mid ventral hook.....**
 - ** Dorsal body setae not on tubercles.....*Petrobia. Pharti*
3. Tarsus I dorsally with a single set of usually loosely associated duplex setae or duplex setae absentEurytetranychini, 4
 - Tarsus I dorsally usually with 2 sets of closely associated duplex setaeTetranychini, 5
4. Females with 2 pairs of anal setae, 4th pair of dorsocentral setae in normal position, opisthosoma with 10 pairs of dorsal setae*Eutetranychus*
 - Females with 1 pair of anal setae, 4th pair of dorsocentral setae marginal, opisthosoma with 9 pairs of dorsal setae... ..*Aponychus*
5. With 2 pairs of paraanal setae.....6
 - With 1 pair of paraanal setae.....10
6. Empodium claw-like, entire or split bilaterally into 2 claw-like structures7
 - Empodium ending into tuft of hairs, female with 2 pairs of anal setae, tarsus I with 3-5 tactile setae
.....*Eotetranychus*
7. Empodium without proximoventral hairs.....*
- * Opisthosoma with broad broken striae, prodorsum reticulate mediodorsally, dorsal body setae long, thick, finely setose, sometimes lanceolate
.....*Bakerina. B.aculus*
- Empodium with proximoventral hairs.....8
8. Empodium a single claw-like structure.....9

- Empodium splits bilaterally into 2 claw-like structure, usually with appendant hairs
.....*Schizotetranychus. S.cajani*
- 9. Empodial claw as long as or longer than proximoventral hairs, which are at right angle to claw*Panonychus. P.citri*
- Empodial claw shorter than proximoventral hairs, which are at less than a right angle to claw*Allonychus*
- 10. Tarsus I with duplex setae distal and approximate Empodial claws longer than proximoventral hairs*Oligonychus*
- Tarsus I with duplex setae well apart dividing segment more or less in 3 equal parts*Tetranychus*

Genus *Allonychus* Pritchard & Baker

1. *Allonychus* sp.

Collection data: 3♀, South 24 Parganas, Narendrapur, ex. *Hamelia patiens*, 21.04.2015.

Remarks: The absence of male specimen made it unable to reach up to species level. The occurrence of this genus in India was earlier unknown.

Genus *Bakerina* Chaudhri

2. *Bakerina aculus* Chaudhri

Bakerina aculus Chaudhri, 1971, *Pak. J. Zool.* 3: 197-199.

Bakerina aculus, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1) 52.

Collection data: 2♀, 1♂, Narendrapur, ex. *Mentha arvensis*, 10.10.2014.

Remarks: No economic importance is known.

Genus *Eotetranychus* Oudemans

Key to the species of *Eotrtranychus*

1. Dorsal idiosomal setae serrate and about 2 times as long as interval between their longitudinal bases.....
.....*E.fremonti*
- Dorsal idiosomal setae not serrate, and not 2 times as long as interval between their longitudinal bases
.....*E.hirsti*

3. *Eotetranychus fremonti* Tuttle & Baker

Eotetranychus fremonti Tuttle & Baker, 1964, *Univ. Arizona Tech. Bull.*, 158: 26.

Eotetranychus fremonti, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1)

Collection data: 1♂, South 24 Parganas, Basanti, ex. *Physalis minima*, 22.08.2015.

Remarks: The occurrence of this species on *Physalis minima* formed new host record.

4. *Eotetranychus hirsti* Pritchard & Baker

Tetranychus fici, Hirst, 1926, *Proc. Zool. Soc. Lond.* 838.

Eotetranychus hirsti, Pritchard & Baker, 1960, *Pacific Coast Ent. Soc. Mem. Ser.* 2: 200.

Eotetranychus hirsti, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1) 67-68.

Collection data: 8♀, West Medinipur, Garbeta, ex. *Syzygium javanicum*, 05.04.2015; 3♀, Bardhaman, Memari, ex. *Curcuma longa*, 11.11.2015.

Remarks: The occurrence of this species was casual and the plant species formed new host record.

5. *Eotetranychus* sp.

Collection data: 1♀ South 24 Parganas, Jagannathpur, ex. *Colocasia esculenta*, 08.10.2015.

Remarks: Since it was a female specimen the specific identity could not be ascertained.

Genus *Eutetranychus* Banks

Key to species of *Eutetranychus*

1. Striae forming 'v' pattern between 2nd and 3rd pairs of dorsocentral hysterosomal setae2
- Striae longitudinal between 2nd and 3rd pairs of dorsocentral hysterosomal setae*
- * Dorsal setae set on strong tubercles, dorsal body setae slender, serrate and tapering.....*E.africanus*
- * Propodosomal mediodorsal striae with less developed lobes, 3rd pair of dorsocentral setae tapering, 3rd and 4th dorsocentral hysterosomal setae forming a rectangle...
.....*E.phaseoli*
- Propodosomal mediodorsal striae with well developed lobes, 3rd pair of dorsolateral setae similar to other lateral setae, 3rd and 4th dorsocentral hysterosomal setae forming a square*E.orientalis*

6. *Eutetranychus africanus* (Tucker)

Anychus africanus Tucker, 1926, *Union S. Afr. Dept. Agr. Div. Ent. Mem.*, 5: 15.

Eutetranychus africanus, Moutia, 1958, *Bull. Ent. Res.*, 49: 60.

Eutetranychus africanus, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1): 28-30.

Collection data: 5♀, 1♂, Narendrapur, ex. *Ocimum sanctum*, 11.05.2015; 2♀, East Medinipur, Contai, ex.

Datura metel, 17.09.2015.

Remarks: This mite occurred on upper surface of leaves but produced no damage symptoms due to its feeding. The record of the species on *Ocimum sanctum* was earlier unknown.

7. *Eutetranychus maximae* Nassar & Ghai

Eutetranychus maximae Nassar & Ghai, 1981, *Oriental Ins.*, 15: 339.

Eutetranychus maximae, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1): 33-34.

Collection data: 4♀, Bardhaman, Asansol, ex. *Calotropis gigantea*, 05.06.2016.

Remarks: No damage was caused on the host due to feeding of this mite.

8. *Eutetranychus orientalis* (Klein)

Anychus orientalis Klein, 1936, *Bull. Agr. Res. Stn. Rehovot.*, 21: 3.

Eutetranychus orientalis, Baker & Pritchard, 1960, *Hilgardia*, 29: 464.

Eutetranychus orientalis, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1): 35-37.

Collection data: Several ♀ and ♂, West Medinipur, Jhargram, ex. *Citrus medica*, 12.12.2014; several ♀ and ♂, Narendrapur, ex. *Hibiscus rosa-cinensis* and *Rauvolfia tetraphylla*, 12.05.2015, 07.09.2015, 03.06.2015; 2♀, North 24 Parganas, Baduria, ex. *Holarrhena pubescens*, *Impatiens balsamina*, 17.03.2015; several ♀ and ♂, East Medinipur, Mahishadal, ex. *Citrus medica*, 10.10.2015; several ♀ and ♂, Purulia, ex. *Nyctanthes arbor-tristis*, *Ficus hispida*, *Plumbago zeylanica*, 12.03.2016.

Remarks: This mite occurred on upper surface of leaves and colonies were covered with thin webs where dust particles accumulated. The feeding caused browning of leaves. The attack was more on *Citrus medica* while on other hosts the occurrence was casual. The majority of the plants formed new host records.

9. *Eutetranychus phaseoli* Nassar & Ghai

Eutetranychus phaseoli Nassar & Ghai, 1981, *Oriental Ins.*, 15: 341-343.

Eutetranychus phaseoli, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1): 37-38.

Collection data: Several ♀ and ♂, South 24 Parganas, Canning, ex. *Momordica cochinchinensis*, 15.07.2014; several ♀ and ♂, Kakdwip, ex. *Impatiens balsamina*, 08.02.2015.

Remarks: No economic importance was known. Earlier, no report on occurrence of this mite on this host was known.

Genus *Oligonychus* Berlese

Key to species of *Oligonychus*

1. Aedeagus bent ventrad, tarsus I with not more than single tactile seta on venter just distered of duplex setae.....2
 - Aedeagus bent dorsad, although the distal end may be directed ventrad, tarsus I with 2 tactile setae on venter just distered of duplex setae.....3
2. Bent portion of aedeagus forming an acute angle to shaft.....*O. mangiferus*
 - Bent portion of aedeagus with tip directed venter.....
.....*O. punicae*
3. Aedeagus with distal end enlarged*O. indicus*
 - Aedeagus with distal end not enlarged.....*O. oryzae*

10. *Oligonychus indicus* (Hirst)

Paratetranychus indicus Hirst, 1923, *Proc. Zool. Soc. London*, Part-4, 990.

Oligonychus indicus, Pritchard & Baker, 1955, *Pacific Coast Ent. Soc. Mem. Ser.*, 2: 354-355.

Oligonychus indicus, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1): 104.

Collection data: 10♀, 3♂, Narendrapur, ex. *Cyperus rotundus*, 16.01.2015; 5♀, Bankura, Bishnupur, ex. *Zea mays*, 17.01.2015; 5♀, 5♂, Narendrapur, ex. *Cymbopogon martini* and *Pentapetes phoenicea*, 22.04.2015, 17.11.2015; 3♀, North 24 Parganas, Taki, ex. *Saccharum officinarum*, 04.10.2015; 12♀, 1♂, Birbhum, Sainthia, ex. *Cymbopogon palmarosa* and *Litsea salicifolia*, 22.03.2016, 08.08.2016.

Remarks: Often this mite infested seriously on under surface of leaves producing white stipplings on lemon grass. Even sometimes the occurrence of 100 mites/ leaf may not be unusual. Despite the white stipplings the healthy nature of leaves more or less remained unaffected.

11. *Oligonychus mangiferus* (Rahman and Sapra)

Paratetranychus mangiferus Rahman and Sapra, 1940, *Proc. Indian Acad. Sci.*, 11B: 192.

Oligonychus mangiferus, Pritchard & Baker, 1955, *Pacific Coast Ent. Soc. Mem. Ser.*, 2: 330.

Oligonychus mangiferus, Gupta & Gupta, 1994, *Mem. zool. Surv. India*, 18(1): 108-110.

Collection data: Several ♀, South 24 Parganas, Namkhana, ex. *Syzygium jambos*, 24.09.2014; 10♀, Narendrapur, ex. *Michelia champaca*, 22.10.2014; several ♀, North 24 Parganas, Sandeshkhali, ex. *Michelia champaca*, 10.04.2015; several ♀, Nadia, Kalyani, ex. *Mangifera indica*, 22.09.2015; 3♀, Bardhaman, ex. *Syzygium cumini*, 07.10.2016.

Remarks: This mite infested upper surface of leaves turning those to yellowish brown when heavily infested. A predatory mite, *Amblyseius largoensis* was often associated with this mite but whether it was feeding on it or not was not observed.

12. *Oligonychus oryzae* (Hirst)

Paratetranychus oryzae Hirst, 1926, *Proc. Zool. Soc. London* Part-4, 337.

Oligonychus oryzae, Pritchard & Baker, 1955, *Pacific Coast Ent. Soc. Mem. Ser.*, 2: 337.

Oligonychus oryzae, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1): 110-112.

Collection data: Several ♀ and ♂, Gosaba, ex. *Cymbopogon winterianus*, 25.09.2015; several ♀ and ♂, Hooghly ex. *Cynodon dactylon*, 11.03.2016; 4♀, Narendrapur, ex. *Oryza sativa*, 09.09.2015.

Remarks: The feeding of this mite produced whitish patches on undersurface of infested leaves where they made colonies covered with webs where dust particles adhered providing better shelter and could hide themselves from natural enemies.

13. *Oligonychus punicae* (Hirst)

Paratetranychus punicae Hirst, 1926, *Proc. Zool. Soc. London* Part-4, 830.

Oligonychus punicae, Pritchard & Baker, 1955, *Pacific Coast Ent. Soc. Mem. Ser.*, 2: 335-336.

Oligonychus punicae, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1): 112-113.

Collection data: Several ♀ and ♂, South 24 Parganas, Narendrapur, ex. *Bixa orellana*, 03.04.2015; 3♀, Narendrapur, ex. *Cedrus deodara*, 05.05.2016.

Remarks: Heavy infestation of this mite was seen on the upper surface of leaves of *Bixa orellana* and its infestation produced light brownish patches. *Bixa orellana* formed new host record.

14. *Oligonychus* sp. nr. *martensis*

Collection data: 2♀, South 24 Parganas, Baruipur, ex. *Pterospermum accrifolium*, 09.10.2016.

Remarks: This species was close to *martensis* but the dorsal striation pattern, a relative length of setae on dorsal surface and aedeagus differed from *martensis*.

Genus *Panonychus* Yokoyoma

15. *Panonychus citri* (McGregor)

Tetranychus citri McGregor, 1916, *Ann. Ent. Soc. Am.*, **9**: 284.

Panonychus citri, Ehara, 1956, *J. Fac. Sci. Hokkaido Univ.* (6) (Zool.) **12**: 500.

Panonychus citri, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, **18**(1): 53-54.

Collection data: Several ♀ and ♂, Narendrapur, ex. *Carica papaya*, 12.06.2015, 13.05.2016; several ♀ and ♂, Narendrapur, ex. *Achras sapota* throughout the year; 4♀, Bankura, Patrasayar, ex. *Carica papaya*, 03.08.2015; 6♀, Birbhum, Rampurhat, ex. *Carica papaya*, 05.09.2015; 8♀, Birbhum, Bolpur, ex. *Carica papaya*, 12.09.2015; 5♀, 5♂, North 24 Parganas, Hasnabad, ex. *Justicia adhatoda*, 10.01.2016; 5♀, 1♂, East Medinipur, Tumluk, ex. *Carica papaya*, 12.06.2016.

Remarks: A heavy infestation was noticed on Papaya on both the surfaces of leaves and the infested leaves turned first yellowish and then brownish. Later, such leaves withered and became unhealthy. The infestation was more on lower surface and when the population became very heavy they migrated on the upper surface. This mite was seen throughout the year but more during the summer months.

Genus *Petrobia* Murray

16. *Petrobia harti* (Ewing)

Neopetrobia harti Ewing, 1909, *Ann. Ent. Soc. Am.*, **6**: 405.

Petrobia harti, Pritchard & Baker, 1955, *Pacific Coast Ent. Soc. Mem. Ser.*, **2**: 45-47.

Tetranychina harti, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, **18**(1): 26-27.

Collection data: Several ♀ and ♂, Narendrapur, ex. *Oxalis corniculata* and *Azadirachta indica*, 10.03.2015; 9♀ and 1♂, Howrah, ex. *Oxalis corniculata*, 15.06.2015, 6♀ and 1♂, West Medinipur, Salboni, ex. *Oxalis corniculata*, 24.11.2015; 5♀, North 24 Parganas, Habra, ex. *Oxalis corniculata*, 05.01.2016; 13♀, Howrah, Uluberia, ex. *Oxalis corniculata*, 07.04.2016; 9♂, Hooghly, Pandua, ex. *Oxalis corniculata*, 03.09.2016.

Remarks: This mite was found abundantly infesting upper surface of *Oxalis corniculata* causing severe chlorosis. At later stage such infested leaves withered but on neem such chlorosis was not observed.

Genus *Porcupinychus* Anwarullah

17. *Porcupinychus abutiloni* Anwarullah

Porcupinychus abutiloni Anwarullah, 1966, *Can. Ent.*, **98**(1): 71.

Porcupinychus abutiloni, Prasad, 1975, *Internet J. Acarol.*, **1**(2): 24.

Porcupinychus abutiloni, Gupta, 1985, p.55.

Porcupinychus abutiloni, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, **18**(1): 16-18.

Collection data: 3♀ and 1♂, South 24 Parganas, Narendrapur, ex. *Abutilon indicum*, 08.09.2014; 3♀, Hooghly, Tarakeswar, ex. *Sida cordifolia*, 03.03.2016.

Remarks: The occurrence of this mite on the respective hosts was casual in nature and no damage symptoms were produced due to its infestation. The plants on which it was recorded formed new host records.

Genus *Schizotetranychus* Tragardh

18. *Schizotetranychus baltazari* Rimando

Schizotetranychus baltazari Rimando, 1962, *Tech. Bull. Coll. Agric. Univ.*, **11**: 534-535.

Schizotetranychus baltazari, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, **18**(1): 89-90.

Collection data: 5♀, Narendrapur, ex. *Citrus medica*, 03.09.2014; 4♀, South 24 Parganas, Kakdwip, ex. *Citrus medica*, 04.02.2015; 1♀, West Medinipur, Datan, ex. *Citrus limon*, 03.05.2016.

Remarks: The attack of this mite on Citrus produced white stipplings spread throughout leaf lamina.

19. *Schizotetranychus cajani* Gupta

Schizotetranychus cajani Gupta, 1976, *Oriental Ins.*, **10**: 336-337.

Schizotetranychus cajani, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, **18**(1): 90-92.

Collection data: Several ♀ and ♂, Narendrapur, ex. *Cajanus cajan* almost throughout the year; 4♀ and 1♂, Nadia, Kalyani, ex. *Cajanus cajan*, 19.05.2016.

Remarks: The infestation of this mite was seen all through the year causing yellowing of leaves.

20. *Schizotetranychus* sp.

Collection data: 5♀, Birbhum, Dubrajpur, ex. *Desmodium gangeticum*, *Hamelia patiens*, 16.10.2016

Remarks: The occurrence of this mite was casual and no damage symptom was produced on the host.

Genus *Tetranychus* Dufour

Key to Species of *Tetranychus*

1. Female with proximal pair of duplex setae distal to proximal tactile setae.....2
 - Female with proximal pair of duplex setae more or less in line with most of the proximal tactile setae.....5
2. Aedeagal knob with 1 or both projections acute.....3
 - Aedeagal knob with anterior and posterior projection rounded, dorsum of knob indented medially.....4
3. Aedeagal knob with anterior projection rounded, posterior projection acute*T. lombardinii*
 - Aedeagal knob with both projections acute.....*T. urticae*
4. Female with lobes on striae predominantly rounded, bearing basal spots, male with empodial spur on tarsus I about 1/4th length of proximal spur.....*T. neocaledonicus*
 - Female with lobes narrow, triangular and separated by space at bases, with basal spots, male with empodial spur on tarsus I about 1/3rd length of proximoventral spur.....*T. puschellii*
5. Female with small but obvious spur.....*
- * Aedeagal knob with relatively small, acute projections anteriorly and posteriorly, male empodium 2 with proximoventral tridigitated spurs.....*T. macfarlanei*
 - Female with empodial claw minute or absent*
 - * Axis of aedeagal knob parallel to shaft axis, aedeagal knob with no posterior projection, dorsal striae of female with lobes triangular sharply pointed and mostly taller than broad, female with lobes on venter*T. ludeni*

21. *Tetranychus hypogaeae* Gupta

Tetranychus hypogaeae Gupta, 1976, *Oriental Ins.*, **10**: 347-348.

Tetranychus hypogaeae, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, **18**(1): 123-124.

Collection data: 5♀, West Medinipur, Keshpur, ex. *Mimosa pudica*, 28.10.2014; 7♀, Narendrapur, ex. *Plumbago zeylanica*, 26.12.2015; 3♀, Narendrapur, ex. *Cassia sophera*, 09.09.2015.

Remarks: No noticeable damage was caused due to

infestation of this mite and the occurrence on this host was earlier unreported.

22. *Tetranychus ludeni* Zacher

Tetranychus ludeni Zacher, 1913, *Untersuchungen uber Spinnmilben*. Berlin Mitt. biol. Anst. H., **14**: 40.

Tetranychus ludeni, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, **18**(1): 127-129.

Collection data: 5♀, 1♂, East Medinipur, Kolaghat, ex. *Butea superba*, 23.03.2014; 5♀, South 24 Parganas, Narendrapur Medicinal Plant Garden, ex. *Rauvolfia serpentina*, 10.12.2014; 2♀, 1♂, ex. *Hemigraphis hirta*, Narendrapur, 08.02.2015; 5♀, 1♂, ex. *Datura metel*, Hooghly, Chuchura, 25.02.2015; 6♀, 1♂, South 24 Parganas, Gosaba ex. *Piper longum*, 04.03.2015; 10♀, Howrah, Rupnarayanpur ex. *Piper betle*, 16.03.2015; 6♀ ex. *Acorus calamus* and 5♀ ex. *Wissadula periplocifolia*, Birbhum, Rampurhat, 29.01.2016; 10♀, 3♂, Nadia, ex. *Rosa centifolia*, 05.06.2015; 7♀, Narendrapur, ex. *Withania somnifera*, 10.01.2016; 4♀, Narendrapur, ex. *Abrus precatorius*, 05.09.2015.

Remarks: This mite colonized on undersurface of leaves causing chlorosis, withering and defoliation leading to stunting of growth and vigour. The medicinal plants on which this mite was recorded formed new host records. The infestation of this mite was more on *Wissadula periplocifolia* and *Rauvolfia serpentina* on which the infestation was seen all through the year.

23. *Tetranychus macfarlanei* Baker and Pritchard

Tetranychus macfarlanei Baker and Pritchard, 1960, *Hilgartia*, **29**: 537.

Tetranychus macfarlanei, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, **18**(1): 129-131.

Collection data: 6♀, 2♂, East Medinipur, Tumluk, ex. *Phonex sylvestris*, 02.05.2015; 3♀, Purulia, Joypur, ex. *Azadirachta indica*, 15.05.2015; 4♀, 1♂, North 24 Parganas, Taki, ex. *Mentha piperita*, 13.11.2015; 5♀, 1♂, Bardhaman, Kalna, ex. *Dolichos lablab*, 25.11.2015; 10♀, 1♂, Narendrapur, ex. *Pavonia odorata*, 14.07.2016; 4♀, 1♂, Narendrapur, ex. *Santalum album*, 28.07.2016; 5♀, Purulia, Balarampur, ex. *Ocimum grattisimum* and *Justicia adhatoda*, 02.08.2016.

Remarks: The leaves of the infested hosts turned yellow and later defoliated. The infestation was more serious on *Dolichos lablab* and to some extent on *Justicia adhatoda* but on the other hosts the occurrence was casual.

24. *Tetranychus neocaledonicus* Andre

Tetranychus neocaledonicus Andre, 1933, *Bull. Mus. Natn. Hist. nat. Paris*, 5: 302.

Tetranychus neocaledonicus Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1): 131-133.

Collection data: 5♀, Narendrapur, ex. *Abelmoschus moschatus*, *Cryptolepis buchanani*, 16.12.2014; 5♀, Narendrapur, ex. *Pterocarpus santalinus*, 24.01.2015; 10♀, 1♂, North 24 Parganas, Hasnabad, ex. *Musa acuminata* and *Aegle marmelos*, 14.11.2015; 2♀, South 24 Parganas, Baruipur, ex. *Tagetes erecta*, 12.12.2015; 4♀, Kakdwip, ex. *Azadirachta indica*, 10.02.2016.

Remarks: The infestation on *Abelmoschus moschatus* was very serious not only on leaves but on fruits as well having over 100 mites/leaf/fruit. The infested leaves or fruits dried up and sometimes the fruits became deformed. All these caused substantial economic loss.

25. *Tetranychus puschelii* (Meyer)

Tetranychus puschelii Meyer, 1974, *Rep. S. Afr. Dept. Agr. Tech. Serv. Ser., Ent. Mem.*, 36: 239.

Tetranychus puschelii, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1): 135.

Collection data: 10♀, Dist. East Medinipur, Jibantala, ex. *Wissadula periplocifolia*, 27.05.2015.

Remarks: This mite caused no damage. No record of this mite on this host was earlier known.

26. *Tetranychus urticae* Koch

Tetranychus urticae Koch, 1836, *Deutsche Crustacea, Myriapoda, Fasc.*, 1: 10.

Tetranychus urticae, Gupta & Gupta, 1994, *Mem. Zool. Surv. India*, 18(1): 139-142.

Collection data: 9♀, 1♂, Narendrapur, ex. *Randia dometorum*, 20.02.2015; 4♀, 1♂, Hooghly, Haripal, ex. *Cyperus rotundus*, 20.03.2015; 5♀, Narendrapur, ex. *Desmodium gangeticum*, 13.04.2015; 6♀, 2♂, Hooghly, Jangipur, ex. *Justicia adhatoda*, 26.04.2015; 3♀, Jagannathpur ex. *Michaelia champaca*, 26.04.2015; 6♀, Bankura, Simlipal, ex. *Citrus limon* 20.06.2015. 2♀, Howrah, Amta, ex. *Gossypium arboreum*.

Remarks: This is a major pest of a number of medicinal plants causing yellowing, withering, browning and defoliation of leaves. The attack of this mite was more serious on *Justicia adhatoda* but on other hosts the occurrence was more or less casual. The plants on which this mite has been recorded here formed new host records.

27. *Tetranychus* sp.

Collection data: 3♀, Narendrapur, ex. *Artocarpus integrifolia*, 05.04.2016; 3♀, Narendrapur, ex. *Cassia sophera*, 14.10.2015.

Remarks: The occurrence of no male specimen was the reason why it could not be identified up to species level.

Family II TENUIPALPIDAE Berlese**Key to the genera of Tenuipalpidae**

1. Dorsosublateral hysterosomal setae absent or not more than 1 pair2
- Dorsosublateral hysterosomal setae 2-4 pairs
.....*Raoiella*, *R. indica*
2. Penultimate pair of Dorsolateral hysterosomal setae flagelliform*Tenuipalpus*, *T. leptadeniae*
- Penultimate pair of Dorsolateral hysterosomal setae not flagelli form..... *Brevipalpus*

Genus *Brevipalpus* Donnadieu**Key to the species of *Brevipalpus***

1. Hysterosoma without dorsosublateral setae.....2
- Hysterosoma with dorsosublateral setae.....*B. pictilis*
2. Solenidion on tarsus I and II shorter than width of segments on which they occur.....3
- Solenidion on tarsus I and II longer or about as long as width of segments on which they occur ...*B. mitrofanovi* group
3. Hysterosoma with 5pairs of dorsolateral.....4
- Hysterosom with 6pairs of dorsolateral.....12
4. Tarsus II with a single solenidion distally.....5
- Tarsus II with 2 solenidia distally.....*B. phoenicis* group
5. Dorsum or part of dorsum reticulate or tuberculate.....6
- Dorsum with striae.....8
6. Dorsum tuberculate, posterior pair of medioventral absent.....*B. absens*
- Dorsum mostly reticulate, posterior pair of medioventral present..7
7. Propodosoma with rather even reticulations mediolaterally, consisting of 4-6 polygonal cells.....
.....*B. obovatus*
- Propodosoma with few reticulations mediolaterally, consisting of not more than 4 rows of polygonal cells.....*B. amicus*
8. Dorsum nearly smooth.....*B. edwinae*
- Dorsum completely covered with striae.....9
9. Dorsal body setae setiform.....*B. melichrus*
- Dorsal body setae lanceolate.....10

10. Propodosoma with irregular striae, a few incomplete reticulate material occur mediolaterally*B. creber*
- Propodosoma completely or partly covered with reticulate elements.....11
11. Propodosoma without areolate reticulum of polygonal cells mediodorsally.....*
- * Propodosoma with loose faint oval areolar mediodorsally, hysterosoma with 3-4 longitudinal rows of polygonal cells mediolaterally, dorsolateral setae of uniform length*B. phoenicis*
- Propodosoma evenly reticulate mediodorsally.....*
- * All marginal body setae of equal length, dorso-central setae much shorter than dorsolateral setae, propodosomal pores present.....*B. araucanus*
12. Tarsus II with a single solenidion distally.....13
- Tarsus II with 2 solenidia distally.....*B. californicus*
13. Palpus with 3 setae, which may consist of 2 setae and a solenidion distally.....14
- Palpus with less than 3 setae distally.....15
14. Rostrum extends to distal end or past distal end of femur I.....*B. essigi*
- Rostrum extends to middle of femur I.....*B. lewisi*
15. Propodosoma with striae mediodorsally.....
.....*B. turrialbensis*
- Propodosoma with scattered pits of depressions mediodorsally.....*B. mitrofanovi*

28. *Brevipalpus absens* De leon

Brevipalpus absens De leon, 1965, *Proc. Ent. Soc. Wash.*, **67**: 193-196.

Brevipalpus absens, Smith-Meyer, 1979, *Ent. Mem. Dept. Agr. Tech. Serv. No.*, **50**: 75.

Collection data: 2♀, Narendrapur, ex. *Michelia champaca*, 11.07.2015.

Remarks: Casual occurrence, no damage symptoms were produced due to feeding. The record of this species formed new report from India.

29. *Brevipalpus amicus* Chaudhri

Brevipalpus amicus Chaudhri, 1972, *Pak. J. Zool.*, **4**(1): 65-67.

Brevipalpus amicus, Ghai & Shenhmar, 1984, *Oriental Ins.*, **18**: 126.

Collection data: 4♀, Narendrapur, ex. *Luffa acutangula*, 04.04.2015; 2♀, Howrah, Bagnan, ex. *Lawsonia inermis*, 10.05.2015; 1♀, Laketown, ex. *Polyalthia longifolia*, 02.08.2016.

Remarks: Casual occurrence and the plants formed new host records. This species was earlier unreported from India.

30. *Brevipalpus araucanus* Smith-Meyer

Brevipalpus araucanus Smith-Meyer, 1979, *Ent. Mem. Dept. Agr. Tech. Serv. No.*, **50**: 76.

Collection data: 4♀, Narendrapur, ex. *Hibiscus rosasinensis*, 31.03.2015.

Remarks: Casual occurrence, no damage symptoms observed. The occurrence of this species from India was earlier unknown.

31. *Brevipalpus californicus* (Banks)

Tenuipalpus californicus Banks, 1904, *J. NY. Ent. Soc.*, **12**: 55.

Brevipalpus californicus, Smith-Meyer, 1979, *Ent. Mem. Dept. Agr. Tech. Serv. No.*, **50**: 81-90.

Brevipalpus californicus, Ghai & Shenhmar, 1984, *Oriental Ins.*, **18**: 128.

Brevipalpus californicus, Gupta & Mandal, 2015, *Mem. Zool. Surv. India*, **22**(2): 15-16.

Collection data: Several ♀, Hooghly, Balagarh, ex. *Ficus hispida*, 02.09.2014; 4♀, Bankura, Vishnupur, ex. *Piper longum*, 05.02.2015; 9♀, Bardhaman, Durgapur, ex. *Ocimum tenuiflorum*, 03.05.2015; 2♀ and 1♂, Narendrapur, ex. *Pterocarpus santalinus*, 04.05.2015; 4♀, Howrah, Udaynarayanpur, ex. *Barleria cristata*, *Ocimum tenuiflorum*, *Mentha arvensis* 05.05.2015; several ♀ and ♂, South 24 Parganas, Narendrapur, ex. *Artemisia nilagirica*, *Justicia adhatoda*, 10.10.2015; 2♀, Nadia, Kalyani, ex. *Citrus reticulata*, 02.11.2015.

Remarks: On *Artemisia nilagirica*, the feeding produced brownish patches on leaves. But on the other hosts yellowish spots appeared at the points of feeding.

32. *Brevipalpus creber* Chaudhri

Brevipalpus creber Chaudhri, 1985, *Univ. Agr. Loyalpur*, p. 45.

Collection data: 4♀, Narendrapur, ex. *Cleome viscosa*, 04.03.2016.

Remarks: The occurrence of this species from India was hitherto unknown.

33. *Brevipalpus deleoni* Pritchard and Baker

Brevipalpus deleoni Pritchard and Baker, 1958, *Univ. Calif. Pub. Ent.*, **14**(3): 234-235.

Brevipalpus deleoni, Ghai & Shenhmar, 1984, *Oriental Ins.*, **18**: 130.

Brevipalpus deleoni, Gupta & Mandal, 2015, *Mem. Zool. Surv. India*, **22**(2): 17-18.

Collection data: Several ♀, East Medinipur, ex. *Michelia champaca*, 04.02.2016.

Remarks: It produced no noticeable damage symptoms.

34. *Brevipalpus edwinae* Baker

Brevipalpus edwinae Baker, 1949, *Amer. Midland Nat.*, **42**(2): 350-402.

Collection data: 2♀, Narendrapur, ex. *Ocimum grattissimum*, 27.03.2014.

Remarks: This species was reported from India for the first time.

35. *Brevipalpus essigi* Baker

Brevipalpus essigi Baker, 1949, *Amer. Midl. Nat.*, **42**(2): 367.

Brevipalpus essigi, Ghai & Shenhmar, 1984, *Oriental Ins.*, **18**: 131.

Brevipalpus essigi, Gupta & Mandal, 2015, *Mem. Zool. Surv. India*, **22**(2): 18-19.

Collection data: 10♀, South 24 Parganas, Narendrapur, ex. *Coffea arabica*, 30.08.2014; several ♀, West Medinipur, Jhargram ex. *Aegle marmelos*, 05.03.2015; several ♀, South 24 Parganas, Sagar island, ex. *Justicia adhatoda*, 31.07.2015; 6♀, Narendrapur, ex. *Ocimum sanctum*, 07.08.2016.

Remarks: This mite colonized on the under surface of leaves producing brownish patches.

36. *Brevipalpus lewisi* McGregor

Brevipalpus lewisi McGregor, 1949, *Mem. South Calif. Acad. Sci.*, **3**(2) 17.

Brevipalpus lewisi, Ghai & Shenhmar, 1984, *Oriental Ins.*, **18**: 134.

Brevipalpus lewisi, Gupta & Mandal, 2015, *Mem. Zool. Surv. India*, **22**(2): 22.

Collection data: 5♀, Narendrapur, ex. *Costus speciosus*, 20.04.2015; 4♀, Bardhaman, Durgapur, ex. *Aegle marmelos*, 03.09.2015; 2♀, Howrah, Domjur, ex. *Croton roxburghii* and *Setaria paniculifera*, 04.09.2015.

Remarks: It produced characteristic brownish patches on the infested leaves.

37. *Brevipalpus melichrus* Smith-Meyer

Brevipalpus melichrus Smith-Meyer, 1979, *Ent. Mem. Dept. Agr. Tech. Serv. No.*, **50**: 76.

Collection data: 3♀, Narendrapur, ex. *Piper nigrum*, 25.07.2016.

Remarks: Casual occurrence, no damage symptoms were produced. Earlier, the occurrence of this mite from India was unknown.

38. *Brevipalpus mitrofanovi* Smith-Meyer

Brevipalpus mitrofanovi Smith-Meyer, 1979, *Ent. Mem. Dept. Agr.*

Tech. Serv. No., **50**: 83.

Collection data: 5♀, South 24 Parganas, Narendrapur, ex. *Nyctanthes arbor-tristis*, 18.02.2015; 10♀, Narendrapur, ex. *Punica granatum*, 05.05.2016.

Remarks: Casual occurrence and no damage symptoms were produced on the host. This mite was earlier unknown from India.

39. *Brevipalpus obovatus* Donnadieu

Brevipalpus obovatus Donnadieu, 1875, *Ann. Soc. Linn. Lyon* (N. Ser.), **22**(1876): 116.

Brevipalpus obovatus, Ghai & Shenhmar, 1984, *Oriental Ins.*, **18**: 136.

Brevipalpus obovatus, Gupta & Mandal, 2015, *Mem. Zool. Surv. India*, **22**(2): 23-24.

Collection data: 4♀, Narendrapur, ex. *Gloriosa superba*, *Euraria picta*, *Cryptolepis buchmanii*, 25.03.2016, 17.10.2016.

Remarks: Casual occurrence, no damage symptoms were noticed on the host.

40. *Brevipalpus phoenicis* (Geijskes)

Tenuipalpus phoenicis Geijskes, 1939, *Arten. Meded. Land-Hoogesch Wageningen*, 230.

Brevipalpus phoenicis, Smith-Meyer, 1979, *Ent. Mem. Dept. Agr. Tech. Serv. No.*, **50**: 76.

Brevipalpus phoenicis, Ghai & Shenhmar, 1984, *Oriental Ins.*, **18**: 138.

Brevipalpus phoenicis, Gupta & Mandal, 2015, *Mem. Zool. Surv. India*, **22**(2): 34-35.

Collection data: Several ♀, South 24 Parganas, Narendrapur, ex. *Mentha piperita*, 21.09.2014; 3♀, Bankura, Kotolpur, ex. *Coccinia grandis*, 03.03.2015 several ♀, Gosaba, ex. *Justicia adhatoda*, 15.06.2015; 4♀, North 24 Parganas, Minakhan, ex. *Azadirachta indica*, 04.03.2016.

Remarks: The occurrence of this species on *Justicia adhatoda* was so serious that in one leaf more than 50 mites could be seen. In case of severe infestation the entire leaf turned brown, dried up and later defoliated.

41. *Brevipalpus pictilis* Chaudhri

Brevipalpus pictilis Chaudhri, 1971, *Pak. J. Zool.*, **3**(1): 71-77.

Brevipalpus pictilis, Smith-Meyer, 1979, *Ent. Mem. Dept. Agr. Tech. Serv. No.*, **50**: 84.

Brevipalpus pictilis, Ghai & Shenhmar, 1984, *Oriental Ins.*, **18**: 138.

Collection data: 2♀, South 24 Parganas, Sagar island, ex. *Syzygium jambos*, 03.04.2015; 5♀, Bankura, Bishnupur, ex. *Artocarpus integrifolia*, 03.02.2016.

Remarks: No damage symptoms were produced. The occurrence of this mite from India was earlier unknown. The species has been spelled as *pictilis* by Smith-Meyer (1979) while Ghai & Shenhmar (1984) spelled it as *pictilis*.

42. *Brevipalpus rica* Chaudhri

Brevipalpus rica Chaudhri, 1972, *Pak. J. Zool.*, 4(1): 56-58.

Brevipalpus rica, Ghai & Shenhmar, 1984, *Oriental Ins.*, 18: 141.

Brevipalpus rica, Gupta & Mandal, 2015, *Mem. Zool. Surv. India*, 22(2): 27.

Collection data: 2♀, Purulia, Joypur, ex. *Bauhinia variegata*, 21.01.2015.

Remarks: Csual occurrence.

43. *Brevipalpus rugulosus* Chaudhri, Akbar & Rasool

Brevipalpus rugulosus Chaudhri, Akbar & Rasool, 1974, *Univ. Agr. Lyallpur* 45-48.

Brevipalpus rugulosus, Ghai & Shenhmar, 1984, *Oriental Ins.*, 18: 141.

Brevipalpus rugulosus, Gupta & Mandal, 2015, *Mem. Zool. Surv. India*, 22(2): 27-28.

Collection data: 4♀, Narendrapur, ex. *Abelmoschus moschatus*, 29.07.2015; 2♀, West Medinipur, Ghatal, ex. *Ambroma augusta*, 11.08.2015.

Remarks: Casual occurrence.

44. *Brevipalpus turrialbensis* Manson

Brevipalpus turrialbensis Manson, 1963, *Acarologia* 5(2): 213-224.

Brevipalpus turrialbensis, Smith-Meyer, 1979, *Ent. Mem. Dept. Agr. Tech. Serv. No.*, 50: 83.

Collection data: 2♀, South 24 Parganas, Kakdwip, ex. *Momordica cochinchinensis*, 12.09.2016.

Remarks: This mite was earlier unknown from India. No damage symptoms were produced as its population was poor.

45. *Brevipalpus* spp.

Collection data: 2♀, Narendrapur, ex. *Curculigo orchioides*, 03.09.2015; 2♀, Narendrapur, ex. *Datura metel*, 05.11.2015; 1♀, Narendrapur, ex. *Justicia adhatoda*, 21.08.2016; 1♀, Narendrapur, ex. *Thespesia lampus*, 02.09.2016; 1♀, Narendrapur, ex. *Cajanus cajan*, 02.12.2016.

Remarks: Some species of *Brevipalpus* were collected

from different plants, the identities of those are still not ascertained.

Genus *Raoiella* Hirst

46. *Raoiella indica* Hirst

Raoiella indica Hirst, 1924, *Ann. Mag. Nat. Hist.* (9)14: 522.

Raoiella indica, Gupta, 1985, p. 137.

Raoiella indica, Gupta & Mandal, 2015, *Mem. Zool. Surv. India* 22(2): 41-42

Collection data: Several ♀, Narendrapur, ex. *Cocos nucifera*, 14.06.2015; several ♀, Sargachi, ex. *Areca catechu*, 03.02.2016.

Remarks: This mite was seen colonizing on undersurface of leaves and the feeding caused reddish patches on leaf lamina. They covered their colony with a thin web.

Genus *Tenuipalpus* Donnadieu

47. *Tenuipalpus leptadeniae* Mohanasundaram

Tenuipalpus leptadeniae Mohanasundaram, 1995, *J. Acarol.* 13(1&2): 5-6.

Tenuipalpus leptadeniae, Gupta & Mandal, 2015, *Mem. Zool. Surv. India*, 22(2): 63.

Collection data: Several ♀, Barasat, ex. *Lagestroemia speciosa*, 03.10.2016.

Remarks: This species was earlier unknown from West Bengal. The infestation was quite heavy, each leaf had more than 15-20 mites and their feeding caused the appearance of brownish patches at the points of feeding.

Family III TARSONEMIDAE Kramer

Genus *Fungitarsonemus* Cromroy

48. *Fungitarsonemus* sp.

Collection data: 2♀, Narendrapur, ex. *Cynodon dactylon*, 13.07.2016.

Remarks: Due to non-availability of male the specific identity could not be ascertained.

Genus *Polyphagotarsonemus* Beer & Lucifura

49. *Polyphagotarsonemus latus* (Banks)

Polyphagotarsonemus latus Beer & Lucifura, 1965, *Bull. Zool. Bachic* (2) 7: 19-43.

Polyphagotarsonemus latus, Gupta, 1985, *Handbook Plant Mites of India*, *Zool. Surv. India* 292-294.

Collection data: 5♀, South 24 Parganas, Narendrapur, ex. *Datura metel*, 03.03.2014; 3♀, Nadia, Ranaghat, ex. *Mentha piperata*, 17.03.2015; 2♀, Bardhaman,

Katwa, ex. *Phoenix sylvestris*, 27.04.2015; 4♀, Hooghly, Chuchura, ex. *Capsicum annuum*, 12.04.2016; 4♀, Nadia, Payradanga, ex. *Datura metel*, 16.04.2016.

Remarks: These light creamish coloured fast moving mites occurred abundantly on young apical leaves especially on *Datura metel* and *Ocimum gratissimum*. The affected leaves became crinkled and crumpled.

Genus *Steneotarsonemus* Beer

50. *Steneotarsonemus* sp.

Collection data: 1♀, Nadia, on *Citrus limon*, 13.07.2016.

Remarks: The occurrence of *Steneotarsonemus* on *Citrus limon* is being made for the first time.

Genus *Tarsonemus* Canestrini & Fanzago

51. *Tarsonemus confusus* Ewing

Tarsonemus confusus Ewing,

Tarsonemus confusus, Zhang, Bejakovich & Martin 2000, Final Report to MAF Science Policy for Project FMA 102, Aucland, p. 31.

Collection data: 3♀, Birbhum, Sainthia, *Azadirachta indica*, 05.09.2016.

Remarks: The plant on which it was recorded formed new host record.

52. *Tarsonemus* sp.

Collection data: South 24 Parganas, Gobindapur, on *Ficus religiosa*; Diamond harbor, on *Artocarpus heterophyllus*, *Artocarpus lakoocha*, 09.09.2015, 23.10.2016.

Remarks: Casual occurrence.

Family IV ERIOPHYIDAE Nalepa

Genus *Aceria* Keifer

Key to the species of *Aceria*

1. Feather claw 6 rayed.....*A.cajani*
- Feather claw less than 6 rayed.....2
2. Feather claw 5 rayed.....*A.mori*
- Feather claw 4 rayed*A.nerii*

53. *Aceria cajani* ChannaBasavanna

Aceria cajani ChannaBasavanna, 1966, *Univ. Agric. Sci. Bull.* 62-63.

Aceria cajani, Gupta, 1985, *Handbook Plant Mites of India* 191-192.

Collection data: Several ♀ and ♂, Nadia, Kalyani, ex. *Cajanus cajan*, 05.09.2015; several ♀ and ♂, Narendrapur, ex. *Cajanus cajan*, 16.09.2015.

Remarks: This mite could be seen throughout the year and due to its feeding the leaves turned yellowish and later at the points of feeding small brownish spots also appeared.

This mite is notorious in the sense that it causes pigeon pea sterility mosaic virus disease but such symptoms were never seen during the entire period of observation.

54. *Aceria mori* (Keifer)

Eriophyes mori Keifer, 1939, *Bull. Calif. Dept. Agr.* 28: 485.

Aceria mori, ChannaBasavanna, 1966, *Univ. Agric. Sci. Bull.* 71.

Aceria mori, Gupta, 1985, *Handbook Plant Mites of India*, 200.

Collection data: 5♀, Birbhum, Bolpur, ex. *Morus alba*, 19.07.2016.

Remarks: This mite was seen as vagrants on undersurface of leaves.

55. *Aceria nerii* ChannaBasavanna

Aceria nerii ChannaBasavanna, 1966, *Univ. Agric. Sci. Bull.* 78-79.

Aceria nerii, Gupta, 1985, *Handbook Plant Mites of India* 201.

Collection data: 4♀, Nadia, Kalyani, ex. *Nerium indicum*, 30.04.2015.

Remarks: Casual occurrence on undersurface of leaves.

56. *Aceria* sp.

Collection data: 5♀, Narendrapur, ex. *Santalum album*, 18.03.2015.

Remarks: These mites were seen as vagrants on undersurface of sandal wood leaves causing no damage symptoms.

Predatory Mite

Suborder A: PROSTIGMATA (contd.)

Family V ANYSTIDAE Oudemans

Key to the genera of Anystidae

1. Prodorsal shield present, 2 pairs of setae present posterolateral to the genital opening, each on small platelet.....*Anystis*, *A. baccarum*
- Prodorsal shield absent.....*Walzia*, *W. indiana*

Genus *Anystis* von Heyden

57. *Anystis baccarum* Linnaeus

Anystis baccarum Linnaeus, 1758, *System Naturae*, 10th Ed. 106.

Anystis baccarum, Tragardh, *Acariden Aus. Agypten und dem Sudan* Part III:63.

Anystis baccarum, Gupta, 2002, *Mem. Zool. Surv. India*, 19(2): 23-24.

Collection data: 5♀, South 24 Parganas, Narendrapur, ex. *Nyctanthes arbor-tristis*, 23.03.2015; 3♀, Canning, ex. *Clerodendrum inerme*, 24.03.2015; 4♀, Narendrapur, ex.

Justicia adhatoda, 19.05.2015; 1♀, North 24 Parganas, Barrackpore, ex. *Hibiscus rosa-sinensis*, 24.05.2015; 2♀, Bardhaman, ex. *Justicia adhatoda*, 10.08.2015.

Remarks: This was found to be quite common species making very swift whirling movement and as soon as disturbed it dropped down on the ground and escaped.

Genus *Walzia* Oudemans

58. *Walzia indiana* Smith-Meyer

Walzia indiana Smith-Meyer, *Ueckermann, Ent. Mem. Dept. Agric. Wat. Suppl. Repub. S. Africa* **68**: 14-16.

Walzia indiana, Gupta, 2002, *Mem. Zool. Surv. India*, **19**(2): 23-24.

Collection data: 1♀, Nadia, Kalyani, ex. *Phyllanthus emblica*, 15.04.2016.

Remarks: The plants formed new habitat records.

59. *Walzia* sp.

Collection data: 1♀, Hooghly, Chandannagar, on *Justicia adhatoda*, 21.08.2015.

Remarks: This is close to *Walzia indiana* but differed mainly in relative length of dorsal setae. The species is still under study for confirming identity/novelty.

Family VI **BDELLIDAE** Duges

Genus *Octobdellodes* Atyeo

60. *Octobdellodes guajavae* Chatterjee & Gupta

Octobdellodes guajavae Chatterjee & Gupta, 2002, *Mem. Zool. Surv. India*, **19**(2): 24-25.

Collection data: 2♀, North 24 Parganas, Barrackpur, *Melia azadirach*, 02.12.2015; 1♀, Nadia, Taherpur, ex. *Phyllanthus emblica*, 05.05.2016.

Remarks: Casual occurrence. The plants formed new habitat records.

Family VII **CHEYLETIDAE** Leach

Key to the genera of *Cheyletidae*

1. All tarsi with paired claws.....*Hemicheyletia*, *H. bakeri*
- 1 or more tarsi without paired claws... ..*Cheletogenes*, *C. ornatus*

Genus *Cheletogenes* Oudemans

61. *Cheletogenes ornatus* (Canestrini & Fanzago)

Cheletus ornatus Canestrini & Fanzago, *Atti. Soc. Vent. Trentena* p.106.

Cheletogenes ornatus, McGregor, *Calif. Cetograph* **30**(2): 53.

Cheletogenes ornatus, Gupta, 2002, *Mem. Zool. Surv. India*, **19**(2):

44-45.

Collection data: 2♀, North 24 Parganas, Hasnabad, ex. *Mangifera indica* 13.01.2016; 1♀, Narendrapur, ex. *Mangifera indica*, 03.02.2016.

Remarks: This mite was found on leaf buds.

Genus *Hemicheyletia* Volgin

62. *Hemicheyletia bakeri* (Ehara)

Paracheyletia bakeri Ehara, *Annot. Zool. Jap.*, **35**(2): 109-111.

Hemicheyletia bakeri, Summers & Price, *Univ. Calif. Pub. Ent.*, **61**: 12.

Hemicheyletia bakeri, Gupta, 2002, *Mem. Zool. Surv. India*, **19**(2): 54-56.

Collection data: 2♀, South 24 Parganas, Kulpi, ex. *Momordica cochinchinensis*; 2♀, North 24 Parganas, Hasnabad, ex. *Vitex negundo* 19.07.2015.

Remarks: This is known to be a good predator but such predatory habit was not observed.

Family VIII **CUNAXIDAE** Thor

Key to the subfamilies and genera of *Cunaxidae*

1. Palp with fewer than 5 segments.....*Cunaxoidinae*, 2
- Palp with 5 segments.....*Cunaxiinae*, 3
2. Palp genu without elongated apophysis apically, tarsi I to IV long, slender, gradually tapering distally, without conspicuous lateral bilobed flanges*Cunaxa*
- Palp genu apically with or without elongated apophysis, tarsi I to IV stout, terminating in conspicuous lateral bilobed flanges*Dactyloscirus*
3. Dorsum with a single shield extending to the region of metapodosoma, seta L4 present or absent*Neocunaxoides*
- Dorsum without shield.....*Cunaxoides*

Genus *Cunaxa* von Heyden

Key to the species of *Cunaxa*

1. Propodosomal and hysterosomal shields present.....2
- Propodosomal shield only present.....3
2. Palp telofemur inner surface with a finger-like apophysis.....*C. womersneyi*
- Palp telofemur inner surface with an uncinuate or truncate apophysis.....*C. capreolus*
3. Propodosomal shield smooth, telofemur inner surface with strong spine.....*C. setirostris*
- Propodosomal shield reticulate or striate, palp

tibiotarsus with spine-like seta, short and stout
*C. bambusae*

63. *Cunaxa bambusae* Gupta

Cunaxa bambusae Gupta & Ghosh, *Rec. Zool. Surv. India*, 77: 198-199.

Cunaxa bambusae, Gupta, 2002, *Mem. Zool. Surv. India*, 19(2): 60-61.

Collection data: 2♀, Narendrapur, ex. *Bambusa vulgaris*, 16.07.2015; 1♀, Hooghly, Chuchura, Agricultural Farm, ex. *Cynodon dactylon*, 12.06.2016.

Remarks: This is a new habitat record.

64. *Cunaxa capreolus* (Berlese)

Scirus capreolus Berlese, *Redia* 14:63, *Fasc.*, 7(20): 66.

Cunaxa capreolus, Vitzthum, 1929, *Fie Tierwelt Mitteleuropa* 3(3): 60.

Cunaxa capreolus, Gupta, 2002, *Mem. Zool. Surv. India*, 19(2): 61.

Collection data: 1♀, Narendrapur, ex. *Stevia rebaudiana*, 30.04.2014; 1♀, Narendrapur, ex. *Eucalyptus globulus*, 05.05.2015; 1♀, Bardhaman, ex. *Erythrina variegata*, 01.07.2015; 1♀, Nadia, Kalyani, ex. *Moringa oleifera*, 12.11.2015.

Remarks: All these plants formed new habitat records.

65. *Cunaxa johnstoni* Smiley

Cunaxa johnstoni Smiley, 1992, *Cunaxidae (Acari of the World)*, Michigan 235-236.

Collection data: 1♀, South 24 Parganas, Basanti, ex. *Justicia adhatoda*, 18.02.2016.

Remarks: The record of this species has been made here for the first time from India. It was of casual occurrence.

66. *Cunaxa* sp.

Collection data: 3♀, South 24 Parganas, ex. *Glycosmis pentaphylla*, 15.04.2015; 2♀, Nadia, Kalyani, ex. *Saraca asoca*; 20.03.2016; 2♀, Nadia, Kalyani, ex. *Barleria cristata*, 19.08.2016.

Remarks: These species under *Cunaxa* appeared to be interesting as those could not be placed on any of the known species and may turn out to be new. Further investigation for final determination of species is under process.

67. *Cunaxa setirostris* (Hermann)

Scirus setirostris Hermann, 1804, *Apterologie* 60-62.

Cunaxa setirostris, Von. Heyden, in *ISIS of Oken* 18(6): 608.

Cunaxa setirostris, Gupta, 2002, *Mem.zool. Surv. India*, 19(2): 67-68.

Collection data: 1♀, East Medinipur, Kolaghat, ex *Ocimum tenuiflorum*, 04.02.2015; 1♀, Narendrapur, ex *Psoralea corylifolia*, 25.05.2015; 3♀, South 24 Parganas, Lakshmikantapur, ex. *Andrographis paniculata*, 25.03.2016; 1♀, South 24 Parganas, Raidighi, ex. *Solanum nigrum*, 05.05.2016; 2♀, West Medinipur, Jhargram, ex. *Ambroma augusta*, 02.07.2016.

Remarks: This appeared to be quite dominant species and a good predator of spider mites. The plants recorded here formed new habitat records.

68. *Cunaxa womersleyi* Baker & Hoffmann

Cunaxa womersleyi Baker & Hoffmann, 1948, *An. Esc. Nac. Cienc. Biol. Mexico* 6: 234-235.

Cunaxa womersleyi, Gupta, 2002, *Mem. Zool. Surv. India*, 19(2): 68.

Collection data: 1♀, Howrah, Sankrail, ex. *Tagetes patula*, 17.01.2016.

Remarks: Casual occurrence. The plants recorded here formed new habitat records.

Genus *Cunaxoides* Baker & Hoffmann

69. *Cunaxoides croceus* (Koch)

Eupalus croceus Koch, 1838, *Deust. Crust. Myryopoden und Arach.*, *Fasc.* 20: 20-21.

Cunaxoides croceus, Baker & Hoffmann, 1948, *An. Esc. Nac. Cienc. Biol. Mexico* 5(3-4): 241.

Cunaxoides croceus, Gupta, 2003, In: *State Fauna ser. 9 Fauna of Sikkim (Part II)*, p. 24.

Cunaxoides croceus, Gupta, 2002, *Mem. Zool. Surv. India*, 19(2): 72.

Collection data: 1♀, Narendrapur, ex. *Vitex negundo*, 04.09.2016.

Remarks: Casual occurrence. The plant recorded here formed new habitat record.

Genus *Dactyloscirus* Berlese

Key to the species of *Dactyloscirus*

- Dorsal hysterosomal setae serrate, seta P1 half of P2...
*D. fuscus*
- Dorsal hysterosomal setae not serrate, P1 and P2 minute, both of same length.....*D. bengalensis*

70. *Dactyloscirus bengalensis* Gupta

Dactyloscirus bengalensis Gupta, In: *State Fauna Ser.3, Fauna of West Bengal Part 3*, 142-143.

Dactyloscirus bengalensis, Gupta, 2002, *Mem. Zool. Surv. India*, 19(2): 69.

Collection data: 2♀, Birbhum, Labpur, ex. *Tabernaemontana divaricata*, 16.03.2015.

Remarks: Casual occurrence.

71. *Dactyloscirus fuscus* Chaudhri

Dactyloscirus fuscus Chaudhri, 1977, *Pak. J. Agric. Sci.* 14:49.

Dactyloscirus fuscus, Smiley, 1992, *Cunaxidae (Acari of the World)*, p. 239-240.

Collection data: 2♀, South 24 Parganas, Narendrapur, ex. *Ficus hispida*, *Abelmoschus moschatus*, 02.09.2016.

Remarks: No record of this species from India was known earlier.

Genus *Neocunaxoides* Smiley

Key to the species of *Neocunaxoides*

1. Ventral gnathosoma without a band of transverse striae adjacent to seta hg 4.....2
- Ventral gnathosoma with a band of transverse striae adjacent to seta hg 4.....*N. zuluensis*
2. With a single platelet or shield adjacent to genital plate.....*N. andrei*
- Without a platelet or shield adjacent to genital plate...
.....*N. sp. nr. krama*

72. *Neocunaxoides andrei* (Baker & Hoffmann)

Cunaxoides andrei Baker & Hoffmann, 1948, *An. Esc. Nac. Cienc. Biol. Mexico* 5: 249-250.

Neocunaxoides andrei, Smiley, 1975, *Ann. Ent. Soc. Am.* 68(2): 237.

Neocunaxoides andrei, Gupta & Chattopadhyay, 1978, *Indian J. Acar.* 3: 83.

Neocunaxoides andrei, Gupta, 2002, *Mem. Zool. Surv. India*, 19(2): 74-75.

Collection data: 1♀, Narendrapur, ex. *Urena lobata*, 03.03.2016.

Remarks: Casual occurrence. The plant formed new habitat record.

73. *Neocunaxoides zuluensis* Den Heyer

Neocunaxoides zuluensis Den Heyer, 1980, *Phytophylactica* 12: 142.

Neocunaxoides zuluensis, Smiley, 1992, *Cunaxidae (Acari of the World)*, p. 298.

Collection data: 1♀ and 1♂, Narendrapur, ex. *Ocimum gratissimum*, 25.03.2015.

Remarks: Earlier this species was unknown from India.

74. *Neocunaxoides sp. nr. krama* Chaudhri

Collection data: 1♀, Narendrapur, ex. *Withania somnifera*,

03.08.2015.

Remarks: This species appeared to be undescribed and further investigation is being carried out to determine the identity/novelty.

Family IX ERYTHRAEIDAE Robineau-Desvoidy

Genus *Leptus* Latreille

75. *Leptus giganticus* Khot

Leptus giganticus Khot, 1965, *Acarologia* 6: 682.

Leptus giganticus, Gupta, 1985, p.325.

Collection data: 1♀, South 24 Parganas, Narendrapur, ex. *Mussaenda roxburghii*, 11.07.2015; 2♀, Hooghly, Bandel, ex. *Nerium indicum*, 21.09.2016.

Remarks: Casual occurrence.

Family X STIGMAEIDAE Oudemans

Genus *Agistemus* Summers

Key to the species of *Agistemus*

1. Propodosomal plate reticulate.....2
- Propodosomal plate not reticulate.....4
2. Ratio of setae ae/ae-ae more than 2.....3
- Ratio of setae ae/ae-ae less than 2*A. heterophylla*
3. Ratio of setae ae/ae-ae more than 3.....*A. gamblei*
- Ratio of setae ae/ae-ae less than 3.....*A. fleschneri*
4. Seta la and a almost equal....*A. terminalis*
- Seta la considerably longer than a.....*A. edulis*

76. *Agistemus edulis* Gupta

Agistemus edulis Gupta, 1991, *Rec. Zool. Surv. India*, 88: 218.

Agistemus edulis, Gupta, 2002, *Mem. Zool. Surv. India*, 19(2): 99.

Collection data: 1♀, South 24 Parganas, Gosaba, ex. *Morus alba*, 02.09.2016.

Remarks: The occurrence of this species appeared to be casual.

77. *Agistemus fleschneri* Summers

Agistemus fleschneri Summers, 1960, *Proc. Ent. Soc. Wash.* 62: 237-240.

Agistemus fleschneri, Gupta, 2002, *Mem. Zool. Surv. India*, 19(2): 101-102.

Collection data: 1♀, Birbhum, Siuri, ex. *Piper nigrum* 21.05.2016.

Remarks: The plant on which it was reported here formed new habitat record.

78. *Agistemus gamblei* Gupta

Agistemus gamblei Gupta, *Rec. Zool. Surv. India*, **88**: 218-219.

Agistemus gamblei, Gupta, 1991, *Mem. Zool. Surv. India*, **19**(2): 102.

Collection data: 4♀, South 24 Parganas, Narendrapur, ex. *Rauvolfia tetraphylla*, 05.05.2016.

Remarks: The reported plant formed new habitat record.

79. *Agistemus heterophylla* Gupta

Agistemus heterophylla Gupta, 1991, *Rec. Zool. Surv. India*, **88**: 211-214.

Agistemus heterophylla, Gupta, 2002, *Mem. Zool. Surv. India*, **19**(2): 104.

Collection data: 2♀, Howrah, Uluberia, ex. *Argemon mexicana*, 02.02.2016; 1♂, Narendrapur, ex. *Rauvolfia serpentina*, 21.09.2016.

Remarks: The plant on which it has been reported her formed new habitat record.

80. *Agistemus* sp. nr. *hystrix*

Collection data: 2♀, Narendrapur, ex. *Moringa oleifera*, 02.04.2016.

Remarks: The condition of specimen was bad and therefore the specific identity could not be ascertained.

81. *Agistemus* spn.

Collection data: 2♀, Narendrapur, ex. *Santalum album*, 05.08.2016.

Remarks: This species appeared to be new to science and is under further investigation to confirm its novelty.

82. *Agistemus terminalis* (Quale)

Calogonus terminalis Quale, 1912, *Univ. Calif. Agr. Exp. Stn. Bull.* No., **234**: 499.

Mediolata terminalis, Nesbitt, 1946, *Can. Ent.* **78**: 15.

Agistemus terminalis, Gonzalez- Rodriguez, *Univ. Calif. Pub. Ent.* **41**: 29.

Agistemus terminalis, Gupta, 2002, *Mem. Zool. Surv. India*, **19**(2): 108.

Collection data: 4♀, Bankura, Patrasayar, ex. *Aegle marmelos*, 03.03.2015; 2♀, South 24 Parganas, Narendrapur, ex. *Barleria cristata*, 27.09.2015; 2♀, North 24 Parganas, Naihati, ex. *Ocimum sanctum*, 10.05.2016; 1♀, Bardhaman, Kalna, ex. *Ambroma augusta*, 27.03.2016.

Remarks: This species appeared to be a common stigmatid mite occurring on a good number of plants and found feeding on eggs of spider mites.

Family XI TYDEIDAE Kramer**Key to the genera of Tydeidae**

1. Hysterosomal seta L2 in normal lateral position, striation longitudinal between 2nd pair of hysterosomal dorsocentral setae2
- Hysterosomal seta L2 shifted to lie in the line of D series, striation pattern of varying types.3
2. Dorsal striation not forming reticulate pattern.....
.....*Tydeus*, *T.gosabaensis*
- Dorsal striation forming reticulate pattern.....
.....*Lorryia*, *L.stricta*
3. Without anal setae, femur III and IV each with a prominent forked seta *Parapronematus*, *Pacaciae*
- With a single pair of anal setae, setae normal on femora III and IV.....*Pronematus*

Genus *Pronematus* Canestrini**Key to the species of *Pronematus***

1. Tarsus I as long as or longer than tibia I.....2
- Tarsus I shorter than tibia I*mcgregori*
2. Solenidion on tarsus I medial.....*fleschneri*
- Solenidion on tarsus I distal.....3
3. Ventral body setae half as long as distance between bases.....*ubiquitus*
- Ventral body setae short not 1/3rd as long as distance between bases.....*sextoni*

83. *Pronematus fleschneri* Baker

Pronematus fleschneri Baker, 1968, *Ann. ent. Soc. Am.* **61**(5): 1092-1093.

Pronematus fleschneri, Gupta, 2002, *Mem. Zool. Surv. India*, **19**(2): 126.

Collection data: 1♀, South 24 Parganas, Narendrapur, ex. *Michelia champaca*, 11.11.2015; 2♀, North 24 Parganas, Gobardanga, ex. *Nyctanthes arbor-tristis*, 05.05.2015; 1♀, Habra, ex. *Phyllanthus emblica*, 15.07.2016.

Remarks: This is a common species often encountered in the field. Its predatory behavior was not observed.

84. *Pronematus mcgregori* Baker

Pronematus mcgregori Baker, 1968, *Ann. Ent. Soc. Am.* **61**: 1095.

Pronematus mcgregori, Gupta, 2002, *Mem. Zool. Surv. India*, **19**(2): 126-127.

Collection data: 1♀, Laketown, ex. *Psidium guajava*,

30.07.2016; 6♀, Laketown, ex. *Anthocephalus cadamba*, 30.07.2016.

Remarks: Casual occurrence. The plant form new habitat record.

85. *Pronematus sextoni* Baker

Pronematus sextoni Baker, 1968, *Ann. Ent. Soc. Am.* **61**: 1092-1093.
Pronematus sextoni, Gupta, 2002, *Mem. zool. Surv. India*, **19**(2): 127.

Collection data: 1♀, Howrah, Uluberia, ex. *Rosa centifolia*, 15.02.2015; 2♀, Nadia, Bethuadohori forest, ex. *Ixora coccinae*, 30.03.2016.

Remarks: Casual occurrence. The plant formed new habitat record.

86. *Pronematus ubiquitous* (McGregor)

Tydeus ubiquitous McGregor, 1932, *Proc. Ent. Soc. Wash.* **34**: 62.
Pronematus ubiquitous, Gupta, 2002, *Mem. Zool. Surv. India*, **19**(2): 127-129.

Collection data: 1♀, Narendrapur, ex. *Sida cordifolia*, 11.03.2014.

Remarks: The host formed new habitat record.

87. *Parapronematus acaciae* Baker

Parapronematus acaciae Baker, 1965, *Advances in Acarology*, **2**: 116-117.

Parapronematus acaciae, Gupta & Ghosh, 1980, *Rec.zool. Surv. India*, **77**: 203.

Parapronematus acaciae, Gupta, 2002, *Mem. Zool. Surv. India*, **19**(2): 121.

Collection data: 1♀, Hooghly, Haripal, ex. *Hibiscus rosa-sinensis*, 30.07.2015; 1♀, Narendrapur, ex. *Nyctanthes arbor-tristis*, 09.09.2015.

Remarks: The plant formed new habitat record.

88. *Lorryia stricta* Gupta

Lorryia stricta Gupta, 1991, *Rec. Zool. Surv. India*, **88**: 231-234.

Lorryia stricta, Gupta, 2002, *Mem. Zool. Surv. India*, **19**(2): 118.

Collection data: 1♀, South 24 Parganas, Canning, ex. *Cocos nucifera*, 29.02.2016.

Remarks: The host formed new habitat record.

89. *Lorryia* sp.

Collection data: 5♀, East Medinipur, Tamluk, ex. *Boerhavia diffusa*, *Cocos nucifera*, 09.09.2014; 1♀, Sonarpur, ex. *Terminalia arjuna*, 01.05.2016; 1♀, Kamalgazi, ex.

Coccinia indica, 09.06.2016; 1♀, Narendrapur, *Ixora coccineae*, 05.05.2015.

Remarks: This appeared to be an undescribed species, will be published after re-conformation of novelty.

90. *Tydeus gosabaensis* Gupta

Tydeus gosabaensis Gupta, 1992, *In: State Fauna Ser. 3, Fauna of West Bengal Part-III*, p. 131.

Tydeus gosabaensis, Gupta, *Mem. Zool. Surv. India*, **19**(2): 130.

Collection data: 2♀, Gosaba, ex. *Clerodendrum indicum*, 04.02.2016.

Remarks: This is of rare occurrence.

Order B. MESOSTIGMATA

Family XII PHYTOSEIIDAE Berlese

Key to the subfamilies and tribes of *Phytoseiidae*

1. Setae z3 and s6 absent.....subfam. Amblyseiinae, 2
- Setae z3 and s6 present.....*
- * Setae Z1, S2, S4, S5 absent.....subfam. Phytoseiinae, Genus *Phytoseius*
2. Peritrematal shield not fused anteriorly with adult dorsal shield.....tribe Indoseiulini, Genus *Gynaeseius*
- Peritrematal shield fused anteriorly with adult dorsal shield.....3
3. Sternal shield with median posterior projection, some forward migration of preanal setae, JV 2 and ZV 2, preanal setae on male usually arranged in tangential row rather than in a triangular pattern.....tribe Euseiini, Genus *Euseius*
- Sternal shield without posterior projection, without forward migration of preanal setae JV 2 and ZV 2, preanal setae on male usually arranged in triangular pattern rather than in tangential row.....4
4. Seta s4 absent.....tribe Kampimodromoni, Genus *Paraphytoseius*
- Seta s4 present.....5
5. Ratio seta s4 : Z1 < 3.0 : 1.0, setae s4, Z4 and Z5 not greatly longer than other dorsal setae, usually lightly sclerotized, seta J2 always present.....6
- Ratio seta s4 : Z1 > 3.1 : 1.0, heavily sclerotized setae s4, Z5, Z4 markedly longer than other dorsal setae, J2 present/ absent.....tribe Amblyseiini, Genus *Amblyseius*
6. Genu II without and genu III rarely with a macrosetae, fixed digit of chelicera usually with fewer than 6 teeth,

rarely multidented, never with these two characters states together.....tribe Neoseiulini, Genus *Neoseiulus*

- Genu II and genu III rarely without macrosetae, fixed digit of chelicerae usually with more than 6 teeth, most species with both of these 2 character states.....tribe Typhlodromipsini, 7
- 7. Dorsal shield with waist at level of seta R1 never on dorsal shield, Z4 variable in length, never minute.....Genus *Typhlodromips*
- Dorsal shield with no prominent waist at level of R1, usually with distinct longitudinal striation along anterolateral margin of dorsal shield, rarely with patchy reticulation, Z4 variable in length, j3, z2, z4, Z1, S2, S4, S5 minute, R1 on dorsal shield.....Genus *Scapulaseius*

Genus *Amblyseius* Berlese

Key to the species of *Amblyseius*

1. Spermatheca with short, thickened saccular, looped cervix, undifferentiated atrium.....*paraaerialis*
 - Not like above.....2
2. Leg IV macrosetae graded in length, longest to shortest from tibia to tarsus.....*multiseius* group,3
 - Leg IV macrosetae partly graded in length, seta on genu always longer than seta on tibia, but longer / shorter than seta on tarsus.....6
3. Cervix short/ long, tubular, flared internally and a nodular atrium.....*aerialis* group, *A.aerialis*
 - Cervix long, narrow, tubular, flared internally and a nodular atrium.....*sundi* group, *A.sundi*
 - Cervix long, slender, tubular or fundibular with nodular, triangular or waferoid atrium.....*largoensis* group, 4
4. Spermatheca with tubular cervix.....*A.largoensis*
 - Spermatheca with fundibular cervix.....5
5. Z5 < 250 microns, s4-100 microns, macroseta on basitarsus IV 75 microns.....*A.herbicolus*
 - s4 longer than 100 microns, Z4 longer than 100 microns.....*A.adhatodae*
6. Cervix tubular, flared with undifferentiated atrium with various modifications.....*A.cinctus*
 - Cervix not tubular, fundibuliform at both ends with undifferentiated atrium.....*A.coffeae*

91. *Amblyseius adhatodae* Muma

Amblyseius adhatodae Muma, 1967, *Fla. Ent.* **50**: 268-270.

Amblyseius (Amblyseius) adhatodae, Gupta, 1986, *Fauna of India*

Phytoseiidae: p. 37.

Amblyseius adhatodae, Gupta, 2003, *Mem. Zool. Surv. India*, **20**(1): 7.

Amblyseius adhatodae, Chant & McMurtry, 2007, p. 74.

Collection data: 1♂ Narendrapur, medicinal plant garden, ex. *Coccinia indica*, 17.05.2015; 1♂, South 24 Parganas, Namkhana, ex. *Aegle marmelos*, 05.05.2016.

Remarks: Casual occurrence. The plant formed new habitat record.

92. *Amblyseius aerialis* (Muma)

Amblyseius aerialis Muma, 1955, *Ann. Ent. Soc. Am.* **48**: 264-266.

Amblyseius (Amblyseius) aerialis, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 39.

Amblyseius aerialis, Gupta, 2003, *Mem. Zool. Surv. India*, **20**(1): 15.

Amblyseius aerialis, Chant & McMurtry, 2007, p. 75.

Collection data: 2♀, Narendrapur, ex. *Catharanthus roseus*, 18.05.2015.

Remarks: This was collected from a colony of Tetranychid mite.

93. *Amblyseius coffeae* De Leon

Amblyseius coffeae De Leon, 1961, *Florida Ent.* **44**(2): 89.

Amblyseius coffeae, Chant & McMurtry, 2007, p. 78.

Collection data: 1♀, South 24 Parganas, Narendrapur, ex. *Euphorbia hirta*, 27.05.2015.

Remarks: This species was earlier unknown from India.

94. *Amblyseius herbicolus* (Chant)

Typhlodromus (Amblyseius) herbicolus Chant, 1959, *Can. Ent.* **91**: 84-85.

Amblyseius (Amblyseius) largoensis, Muma, *Bull. Fla. St. Mus.* **5**(7): 287 (not *largoensis* Muma 1959).

Amblyseius (Amblyseius) herbicolus, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 45-47.

Amblyseius herbicolus, Gupta, 2003, *Mem. Zool. Surv. India*, **20**(1): 18-20.

Amblyseius herbicolus, Chant & McMurtry, 2007, p. 78

Collection data: 1♀, Narendrapur, ex. *Michelia champaca*, 02.04.2014, 05.05.2015, 19.06.2016; 5♀, Kalyani, ex. *Nyctanthes arbor-tristis*, 03.03.2015; 2♀, Nadia, Chakdah, ex. *Clerodendrum inerme*, 15.09.2015.

Remarks: This was one of the most common Phytoseid mites encountered on a large number of plants and appeared to be a good predator of Tetranychid mites.

95. *Amblyseius largoensis* (Muma)

Amblyseius largoensis Muma, 1955, *Ann. Ent. Soc. Am.* **48**: 266.
Amblyseius (Amblyseius) largoensis, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 51-55.

Amblyseius largoensis, Gupta, 2003, *Mem. Zool. Surv. India*, **20**(1): 22-23.

Amblyseius largoensis, Chant & McMurtry, 2007, p.78.

Collection data: 2♀, Kakdwip, ex. *Syzygium cumini*, 15.03.2015; 2♀, Narendrapur, ex. *Ficus hispida*, 04.04.2015; 1♀, Gosaba, ex. *Bauhinia acuminata*, 05.05.2015; 2♀, Narendrapur, ex. *Rauvolfia tetraphylla*, 06.06.2015; 2♀, Narendrapur, ex. *Bacopa monnieri* and *Alangium salvifolium*, 21.07.2015; 2♀, Narendrapur, ex. *Santalum album*, 04.09.2015; 1♀, Bardhaman, ex. *Cedrus deodara*, 09.09.2015; 3♀, 2♂ Narendrapur, ex. *Ocimum grattissimum*, 12.09.2015; 1♀, Bankura, Jaipur, ex. *Nyctanthes arbor-tristis*, 16.09.2015; 4♂, Howrah, Amta, ex. *Momordica charantia*, 02.10.2015; 2♀, Sajnakhali, ex. *Michelia champaca*, 11.11.2015; 3♀, Canning, ex. *Abelmoschus moschatus*, 09.12.2015; 5♀, Baruiipur, ex. *Michelia champaca*, 18.12.2015; 2♀, Kulpi, ex. *Citrus limon*, *Citrus medica*, 17.01.2016; 2♀, Sonarpur, *Piper nigrum*, 03.02.2016; 2♀, Chuchura, ex. *Colocasia esculenta*, 03.03.2016; 2♀, Narendrapur, ex. *Impatiens balsamina*, *Hemidesmus indicus*, 01.05.2016; 2♀, Narendrapur, ex. *Mangifera indica*, 05.05.2016; 3♀, Bethuadohori, ex. *Momordica cochinchinensis*, 09.08.2016; 5♀, East Medinipur, Ghatal, ex. *Aegle marmelos*, *Mangifera indica*, 30.08.2016; 1♀, Narendrapur, ex. *Pterocarpus santalinus*, *Mangifera indica*, 05.09.2016; 1♀, Narendrapur, ex. *Piper nigrum*, 05.10.2016; 2♀, Birbhumi, Siuri, *Citrus medica*, 11.10.2016; 12♀, Narendrapur, ex. *Bixa orellana*, *Kalanchoe pinnata*, 14.11.2016.

Remarks: This was one of the most common phytoseiid predators collected from a large number of plants in different locations and was found feeding on tetranychid mites effectively. Some of the females turned reddish due to reddish pigments of the tetranychid mites.

96. *Amblyseius mcmurtryi* Muma

Amblyseius mcmurtryi Muma, 1967, *Fla. Ent.* **50**: 270.

Amblyseius (Amblyseius) mcmurtryi, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 55.

Amblyseius mcmurtryi, Gupta, 2003, *Mem. Zool. Surv. India*, **20**(1): 23-25.

Amblyseius mcmurtryi, Chant & McMurtry, 2007, p. 80.

Collection data: 1♀, North 24 Parganas, Barrackpur, ex.

Mangifera indica, 17.12.2014; 1♀, Bardhaman, ex. *Shorea robusta*, 05.03.2015; 2♀, Narendrapur, ex. *Santalum album*, 07.09.2016.

Remarks: This was not a very common species and encountered only occasionally.

97. *Amblyseius paraaerialis* Muma

Amblyseius paraaerialis Muma, 1967, *Fla. Ent.* **50**: 270-271.

Amblyseius (Amblyseius) paraaerialis, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 63.

Amblyseius paraaerialis, Gupta, 2003, *Mem. Zool. Surv. India*, **20**(1): 27.

Amblyseius paraaerialis, Chant & McMurtry, 2007, p.80.

Collection data: 2♀, South 24 Parganas, Diamond Harbor, ex. *Azadirachta indica*, 09.08.2016.

Remarks: This was not a very common species and encountered only occasionally.

98. *Amblyseius sundi* Pritchard & Baker

Amblyseius sundi Pritchard & Baker, 1962, *Hilgardia* **33**(7): 244.

Amblyseius sundi, Chant & McMurtry, 2007, p. 81.

Collection data: 1♀, South 24 Parganas, Narendrapur, ex. *Dioscorea alata*, 24.07.2015.

Remarks: This species was earlier unknown from India.

Genus *Euseius* Wainstein

Key to the species of *Euseius*

1. All setae on dorsal shield minute except j1 and Z5.....*E.ovalis*
- Besides j1 and Z5 some other setae also long.....2
2. j1, j3 either equal or j3 longer than j1.....*E. alstoniae*
- j1 longer than j33
3. Leg chaetotactic formula genu III 1 $\frac{1}{1}$ 2 1, tibia III 1 $\frac{2}{1}$ 1
- 1.....*E.finlandicus*
- Leg chaetotactic formula genu III 1 $\frac{2}{0}$ 2 1, tibia III 1 $\frac{2}{1}$ 1
- 1.....*E.prasadi*

99. *Euseius alstoniae* Gupta

Amblyseius alstoniae Gupta, *Internat. J. Acarol.* **1**(2): 31-32.

Amblyseius (Euseius) alstoniae, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 74-76.

Amblyseius (Euseius) alstoniae, Gupta, 2003, *Mem. Zool. Surv. India*, **20**(1): 32-34.

Euseius alstoniae, Chant & McMurtry, 2007, p. 120.

Collection data: Several ♀ and ♂, Narendrapur, ex. *Michelia champaca*, 04.03.2015; 4♀, Barasat, ex. *Syzygium*

jambos, 09.10.2016; 1♀ and 1♂, Hooghly, Jangipara, ex. *Lawsonia inermis*, 16.01.2016.

Remarks: This was also a commonly occurring species. The plants from where it was collected formed new habitat records.

100. *Euseius finlandicus* (Oudemans)

Seiulus finlandicus Oudemans, *Ent. Ber.*, 4: 183.

Amblyseius (Euseius) finlandicus, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 86-88.

Amblyseius (Euseius) finlandicus, Gupta, 2003, *Mem. Zool. Surv. India*, 20(1): 39-40.

Euseius finlandicus, Chant & McMurtry, 2007, p. 121.

Collection data: 2♀, Nadia, Krishnanagar, ex. *Alstonia scholaris*, 09.09.2015.

Remarks: The occurrence of the species was rare.

101. *Euseius ovalis* (Evans)

Typhlodromus ovalis Evans, *Ann. Mag. Nat. Hist.*, 6: 458-461.

Amblyseius (Euseius) ovalis, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 92-94.

Amblyseius (Euseius) ovalis, Gupta, 2003, *Mem. Zool. Surv. India*, 20(1): 42-43.

Euseius ovalis, Chant & McMurtry, 2007, p. 121.

Collection data: 3♀, South 24 Parganas, Narendrapur, ex. *Pterocarpus santalinus*, 21.09.2015; 4♀, Gosaba, ex. *Syzygium javanicum*, 02.09.2016.

Remarks: Although it is known to be a very good predator but such behavior was un-noticed in the present study and nor was it a very commonly occurring species.

102. *Euseius prasadi* Chant & McMurtry

Amblyseius pruni Gupta, 1970, *Internat. J. Acrol.* 1(2): 40-42.

Amblyseius (Euseius) pruni, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 94-96.

Amblyseius (Euseius) pruni, Gupta, 2003, *Mem. Zool. Surv. India*, 20(1): 43-44.

Euseius prasadi, Chant & McMurtry, 2007, p.123.

Collection data: 3♀ and 1♂, East Medinipur, Contai, ex. *Luffa cylindrica*, 17.10.2015; 4♂, Nadia, Bethuadahori, ex. *Saccharum spontaneum*, 02.12.2015.

Remarks: This was found in association with tetranychid colony on *Luffa cylindrica* but predation was not observed. The species *Euseius pruni* Gupta, 1975 was re-named as *Euseius prasadi* by Chant & McMurtry, 2007 because *pruni* was a pre-occupied name.

103. *Gynaesius ricini* (Ghai & Menon)

Indoseius ricini Ghai & Menon, 1969, *Oriental Ins.*, 3: 348.

Indoseiulus ricini, Denmark & Kolodochka, 1983, 19(3): 253.

Indoseiulus ricini, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 195-196.

Indoseiulus ricini, Gupta, 2003, *Mem. Zool. Surv. India*, 20(1): 86.

Gynaesius ricini, Chant & McMurtry, 2007, p.107.

Collection data: 2♀, North 24 Parganas, Barasat, ex. *Nerium indicum*, 04.11.2015.

Remarks: Casual occurrence.

Genus *Neoseiulus* Hughes

Key to the species of *Neoseiulus*

- All setae on dorsal shield very long, touch almost bases of following setae except S5 which is minute.....
.....*N.longispinosus*
- Setae on dorsal shield of variable length.....2
Ventrional shield much longer than wide*N. indicus*
- Ventrional shield almost as long as wide....*N.cynodonae*

104. *Neoseiulus cynodonae* (Gupta)

Amblyseius cynodonae Gupta, *Oriental Ins.*, 11: 626-627.

Amblyseius (Neoseiulus) cynodonae, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 107-108.

Amblyseius (Neoseiulus) cynodonae, Gupta, 2003, *Mem. Zool. Surv. India*, 20(1): 36.

Neoseiulus cynodonae, Chant & McMurtry, 2007, p.29.

Collection data: 4♀ and 2♂, Narendrapur, ex. *Abelmoschus moschatus*, 29.07.2015.

Remarks: Casual occurrence and the plant formed new habitat record.

105. *Neoseiulus indicus* (Nrayanan & Kaur)

Typhlodromus (Amblyseius) indicus Nrayanan & Kaur, *Proc. Indian Acad. Sci.*, 51(B): 2-5.

Amblyseius (Neoseiulus) indicus, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 112-114.

Amblyseius (Neoseiulus) indicus, Gupta, 2003, *Mem. Zool. Surv. India*, 20(1): 38-39.

Neoseiulus indicus, Chant & McMurtry, 2007, p. 29.

Collection data: 1♀ and 1♂, Narendrapur, ex. *Cynodon dactylon*, 06.06.2016.

Remarks: Casual occurrence and the plant formed new habitat record.

106. *Neoseiulus longispinosus* (Evans)

Typhlodromus longispinosus Evans, *Ann. Mag. Nat. Hist.* (12)5: 413-416.

Amblyseius (Neoseiulus) longispinosus, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 116-117.

Amblyseius (Neoseiulus) longispinosus, Gupta, 2003, *Mem. Zool. Surv. India*, **20**(1): 37-40.

Neoseiulus longispinosus, Chant & McMurtry, 2007, p.29.

Collection data: 4♀, Narendrapur, ex. *Averrhoa carambola*, 21.09.2015; 7♀, Hooghly, Chuchura, *Syzygium cumini*, 15.12.2015.

Remarks: Though it is an important predatory species in India and more common on vegetables but its occurrence in the present study was casual may be they do not like the medicinal plants.

Genus ***Paraphytoseius*** Swirski & Shechter

Key to the species of *Paraphytoseius*

1. Setae z2, z4 serrate.....*P.scleroticus*
- Setae z2 and z4 smooth.....2
2. Macrosetae on leg IV distinctly well spatulate.....
.....*P.bhadrakaliensis*
- Macrosetae on leg IV rod-like.....
.....*P.orientalis*

107. *Paraphytoseius bhadrakaliensis* (Gupta)

Amblyseius bhadrakaliensis Gupta, 1969, *Bull. Ent.* **10**(2): 127-128.

Paraphytoseius bhadrakaliensis, Chant & McMurtry, 2007, p. 53.

Collection data: 5♀, Narendrapur, ex. *Ureria picta*, 03.09.2015; 2♀, Howrah, Domjur, ex. *Abelmoschus moschatus*, 11.11.2015; 5♀, Narendrapur, ex. *Solanum viarum*, 27.04.2016.

Remarks: This was a very common species specially on *Solanum viarum* and almost every time the species was encountered on that plant.

108. *Paraphytoseius orientalis* (Narayanan, Kaur & Ghai)

Paraphytoseius orientalis Narayanan, Kaur & Ghai, 1960, *Proc. Nat. Inst. Sci.* **226** B: 394.

Amblyseius (Paraphytoseius) multidentatus, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 123-126.

Amblyseius (Paraphytoseius) multidentatus, Gupta, *Mem. Zool. Surv. India*, **20**(1): 59-60.

Paraphytoseius orientalis, Chant & McMurtry, 2007, p.53.

Collection data: 4♀, Narendrapur, ex. *Bixa orellana*, 09.09.2015; 5♀, Narendrapur, ex. *Ocimum gratissimum*, 17.10.2015; 1♀, East Medinipur, Tamluk, ex. *Bauhinia acuminata*, 20.02.2015; 2♀, Tamluk, ex. *Colocasia esculenta*, 07.07.2016; 1♀, Gosaba, ex. *Ocimum sanctum*, 15.02.2016; 3♀, Narendrapur, ex. *Ocimum tenuiflorum*, 07.03.2016; 2♀, Sargachi, ex. *Hibiscus rosa-cinensis*, 05.09.2016.

Remarks: The occurrence of this species on *Ocimum* plants was very common and could be collected from there almost throughout the year.

109. *Paraphytoseius scleroticus* Gupta & Ray

Amblyseius (Paraphytoseius) scleroticus Gupta & Ray, *Bull. Zool. Surv. India*, **4**: 42-43.

Amblyseius (Paraphytoseius) scleroticus, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 126-127.

Amblyseius (Paraphytoseius) scleroticus, Gupta, *Mem. Zool. Surv. India*, **20**(1): 60.

Paraphytoseius scleroticus, Chant & McMurtry, 2007, p.53.

Collection data: 2♀, Narendrapur, ex. *Rauvolfia tetraphylla*, 11.01.2016; 2♀, Nadia, Krishnanagar, ex. *Melia azadirach*, 12.11.2016.

Remarks: The occurrence of this species was interesting in the sense that it was described and known only from North East India and therefore West Bengal formed new distributional record and the plant on which it was recorded formed new habitat record.

Genus ***Scapulaseius***

Key to the species of *Scapulaseius*

1. Z4 quite long, atleast 3 times of s4.....*suknaensis*
- Z4 never so long.....*polyantheae*

110. *Scapulaseius polyantheae* (Gupta)

Amblyseius polyantheae Gupta, 1975, *Internat. J. Acarol.* **1**(2): 42.

Amblyseius (Typhlodromips) polyantheae, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 178-179.

Amblyseius (Typhlodromips) polyantheae, Gupta, 2003, *Mem. Zool. Surv. India*, **20**(1): 79.

Scapulaseius polyantheae, Chant & McMurtry, 2007, p.201.

Collection data: 1♀, Narendrapur, ex. *Citrus limon*, 15.07.2016.

Remarks: Casual occurrence. The plant formed new habitat record.

111. *Scapulaseius suknaensis* (Gupta)

Amblyseius suknaensis Gupta, 1970, *Oriental Ins.* 4: 185-186.

Amblyseius (Typhlodromips) suknaensis, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 185-188.

Amblyseius (Typhlodromips) suknaensis, Gupta, 2003, *Mem. Zool. Surv. India*, 20(1): 81-82.

Scapulaseius suknaensis, Chant & McMurtry, 2007, p.68.

Collection data: 5♀, South 24 Parganas, Jharkhali, ex. *Butea monosperma*, 05.05.2015; 4♀, Narendrapur, ex. *Uraria picta*, 16.04.2016; 2♀, Narendrapur, ex. *Abelmoschus moschatus*, 30.05.2016; 1♀, Narendrapur, ex. *Theobroma cacao*, 02.09.2015; 2♀, Narendrapur, ex. *Ambroma augusta*, 01.07.2016.

Remarks: The occurrence of the species was found to be common as it could be collected throughout the year. The plants formed new habitat records.

112. *Typhlodromips syzygii* Gupta

Amblyseius syzygii Gupta, 1975, *Internat. J. Acarol.* 1(2): 44-45.

Amblyseius (Typhlodromips) syzygii, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 188-190.

Amblyseius (Typhlodromips) syzygii, Gupta, 2003, *Mem. Zool. Surv. India*, 20(1): 82-83.

Typhlodromips syzygii, Chant & McMurtry, 2007, p.63.

Collection data: 4♀, South 24 Parganas, Baruipur, ex. *Solanum surattense*; 3♀, Bankura, Jaipur, ex. *Shorea robusta*, 09.08.2015.

Remarks: This was also commonly occurring species and could be collected from all round the year. The plants formed new habitat records.

Genus *Phytoseius* Ribaga

Key to the species of *Phytoseius*

1. Seta R1 present.....4
- Seta R1 absent.....2
2. Setae s4 and Z4 flat and devoided.....*crinitus*
- Setae s4 and Z4 not flat and devoided3
3. Genu IV without macroseta.....*macrosetosus*
- Genu IV with macroseta.....*swirskii*
4. Dorsal shield notched at the level of r3.....*kapuri*
- Dorsal shield not notched at the level of r3*minutus*

113. *Phytoseius crinitus* Swirski & Shechter

Phytoseius (Dubininellus) crinitus Swirski & Shechter, 1961, *Israel J. agric. Res.*, 11(2): 102-104.

Phytoseius (Phytoseius) crinitus, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 232-234.

Phytoseius (Phytoseius) crinitus, Gupta, 2003, *Mem. Zool. Surv. India*, 20(1): 103.

Phytoseius crinitus, Chant & McMurtry, 2007, p.129.

Collection data: 1♀ Narendrapur, ex. *Datura metel*, 05.09.2016.

Remarks: Casual occurrence. The plant formed new habitat record.

114. *Phytoseius kapuri* Gupta

Phytoseius (Phytoseius) kapuri, Gupta, *Israel J. agric. Res.*, 19(3): 116-117.

Phytoseius (Pennaseius) kapuri, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 221-223.

Phytoseius (Pennaseius) kapuri, Gupta, 2003, *Mem. Zool. Surv. India*, 20(1): 97-98.

Phytoseius kapuri, Chant & McMurtry, 2007, p.129.

Collection data: 5♀, Barasat, ex. *Saraca asoca*, 09.08.2016; 5♀, Narendrapur, ex. *Ficus hispida*, 05.09.2016; 2♀, Bardhaman, ex. *Heliotropium indicum*, *Setaria paniculifera*, 16.06.2015.

Remarks: This was a very common species especially on *Saraca asoca* and *Ficus hispida*.

115. *Phytoseius macrosetosus* Gupta

Phytoseius (Dubininellus) macrosetosus Gupta, 1977, *Indian J. Acarol.* 1: 16.

Phytoseius (Phytoseius) macrosetosus, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 242.

Phytoseius macrosetosus, Chant & McMurtry, 2007, p.129.

Collection data: 1♂ Narendrapur, ex. *Ichnocarpus frutescens*, 14.03.2016.

Remarks: Casual occurrence. The plant formed new habitat record.

116. *Phytoseius minutus* Narayanan, Kaur & Ghai

Phytoseius minutus Narayanan, Kaur & Ghai, 1960, *Proc. Nat. Inst. Sci.* 26B(6): 391-392.

Phytoseius (Pennaseius) minutus, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 223-225.

Phytoseius (Pennaseius) minutus, Gupta, 2003, *Mem. Zool. Surv. India*, 20(1): 98-99.

Phytoseius minutus, Chant & McMurtry, 2007, p.129.

Collection data: 3♀, Howrah, Sankrail, ex. *Azadirachta indica*, 02.11.2015.

Remarks: This is quite uncommon species, only occasionally recorded. The plant formed new habitat record.

117. *Phytoseius swirskii* Gupta

Phytoseius (Dubininellus) swirskii Gupta, 1980, *Ent. mon. Mag.* **115**: 210-212.

Phytoseius (Phytoseius) swirskii, Gupta, 1986, *Fauna of India Phytoseiidae*: p. 259-260.

Phytoseius (Phytoseius) swirskii, Gupta, 2003, *Mem. Zool. Surv. India*, **20**(1): 114-115.

Phytoseius swirskii, Chant & McMurtry, 2007, p.131.

Collection data: 1♂ Narendrapur, ex. *Psidium guajava*, 15.03.2016; 1♀, Birbhum, Bolpur, ex. *Psidium guajava*, 25.04.2016.

Remarks: Casual occurrence.

Family XIII AMEROSEIIDAE Evans

Genus *Klemania* Oudemans

118. *Klemania plumigera* Oudemans

Klemania plumigera, Hughes, 1976, p. 336-338.

Collection data: 4♀, Narendrapur, ex. *Withania somnifera*, 05.11.2014.

Remarks: Casual occurrence. The plant formed new habitat record.

Order C. ASTIGMATA

Family XIV GLYCYPHAGIDAE Berlese

Genus *Glycyphagus* Hering

119. *Glycyphagus domesticus* (De Geer)

Acarus domesticus De Geer, 1778.

Glycyphagus domesticus, Hughes, 1976, p. 140-144.

Collection data: 2♀, South 24 Parganas, Narendrapur, ex. *Solanum xanthocarpum*, 12.08.2015.

Remarks: Casual occurrence, may be fungal feeder.

Family XV ACARIDAE Ewing & Nesbitt

Genus *Suidasia* Oudemans

120. *Suidasia nesbitti* Hughes

Suidasia nesbitti Hughes, 1948,

Suidasia nesbitti, Hughes, 1976, *The Mites of Stored food and Houses, Min. Agr. Fish. Food London Tech. Bull.* **9**: 57-58.

Collection data: 2♀, Narendrapur, ex. *Leucas cephalotes*, 03.03.2015; 4♀, West Medinipur, Daspur, ex. *Abelmoschus moschatus*, 27.03.2016.

Remarks: Casual occurrence, may be fungal feeder.

Order D: CRYPTOSTIGMATA

A good number of Oribatid mites could be collected from different medicinal plants but those could not be identified and included in the present paper.

Discussion**I. Diversity Aspect**

Table 1. District-wise distribution of Mite species on Medicinal Plants in South Bengal

| Districts | Species | Genus | Family |
|-------------------|---------|-------|--------|
| Bankura | 9 | 7 | 4 |
| Bardhaman | 13 | 11 | 7 |
| Birbhum | 11 | 11 | 7 |
| East Medinipur | 12 | 9 | 5 |
| Hooghly | 13 | 12 | 8 |
| Howrah | 12 | 9 | 6 |
| Nadia | 18 | 14 | 10 |
| North 24 Parganas | 18 | 15 | 8 |
| Purulia | 3 | 3 | 2 |
| South 24 Parganas | 97 | 36 | 14 |
| West Medinipur | 8 | 7 | 3 |

A reference to Table 1 indicated that regarding district-wise species distribution, it was highest in South 24 Parganas district which was represented by 97 species and the minimum was in Purulia district which was represented only by 3 species. The reason may be that the South 24 Parganas district was more intensively surveyed as compared to other districts. The number of species reported from different districts of South Bengal may be arranged in following descending order:- South 24 Parganas > Nadia = North 24 Parganas > Bardhaman = Hooghly > Howrah = East Medinipur > Birbhum > Bankura > West Medinipur > Purulia.

As regards generic diversity, the maximum diversity was seen in South 24 Parganas followed by North 24 Parganas and minimum was in Purulia as was seen in case of species diversity also. The generic diversity in 11 districts of South Bengal may be arranged in following descending order:- South 24 Parganas > North 24 Parganas > Nadia > Hooghly > Bardhaman = Birbhum > East Medinipur = Howrah > Bankura = West Medinipur > Purulia.

Regarding diversity at family level, as was seen in previous two cases, the highest diversity was seen in South 24 Parganas followed by Nadia and the minimum was in Purulia. This diversity can be arranged in the following descending order:- South 24 Parganas > Nadia > Hooghly = North 24 Parganas > Bardhaman = Birbhum > Howrah > East Medinipur > Bankura > West Medinipur > Purulia.

From the above result it appeared that the diversity at species, generic and family levels was high in South 24

Parganas districts while Purulia was the poorest among all. No doubt, Soth 24 Parganas district is very rich with medicinal plant species especially at Narendrapur campus having over 380 species. It was more intensively surveyed and that may be one of the reasons for getting high level of diversity at species, generic and family levels. On the contrary, Purulia and Bankura districts of South Bengal are also very rich with diversity of medicinal plants but surveys could not be conducted in those districts during the present study as it could be done in the other districts. This might be the reason for getting poor mite faunal diversity in these two districts despite having rich medicinal plant diversity. However, the present result is not conclusive and by undertaking more intensive surveys in less surveyed districts, might yield a different result. Currently studies in that direction are being carried out.

II. Pest Status Aspect

The study so far conducted revealed that among the members of the family Tetranychidae, the species which were found to be most notorious pests were *Tetranychus urticae*, *T. macfarlanei*, *T. ludeni* on medicinal plants like *Rauvolfia serpentina*, *Wissadula periplocifolia*, *Withania somnifera*, *Datura metel*, *Pavonia odorata*, *Dolichos lablab*, *Justicia adhatoda*, etc. and all these mites were doing considerable damage to these plants not only by producing the typical damage symptoms as mentioned earlier but in some cases it caused death of the plants. Among other tetranychid mites causing damage to medicinal plants, the mention may be made of *Panonychus citri* on *Carica papaya*, *Oligonychus indicus* on *Cymbopogon* spp., *Petrobia hirti* on *Oxalis corniculata* and *Schizotetranychus cajani* on *Cajanus cajan*. Among tenuipalpid mites the most notorious pest was *Brevipalpus phoenicis* on *Justicia adhatoda* damaging the entire leaf and *Polyphgotarsonemus latus* of Tarsonemidae damaging *Datura metel*, *Mentha arvensis* and *Ocimum* spp. causing

crinkling and withering of apical leaves.

So far as eriophyid mites are concerned, none of the species was found to be of much economic importance and the damage caused by them was not of significant nature. They were mostly seen as vagrants on undersurface of leaf lamina.

III. Predatory Species Aspect

Although quite a good number of predatory mites was recorded on medicinal plants but barring a few, none of the other species was found to be of any potential importance as biocontrol agent. The important predatory species were *Amblyseius largoensis*, *A. herbicolus*, *Scapulaseius suknaensis*, *Paraphytoseius bhadrakaliensis*, *P. orientalis*, all under Phytoseiidae, were of some potential importance. Those often were found feeding on tetranychid mites of different stages. Among the other predatory mites, the species which were of importance were *Anystis baccharum* preying upon *Brevipalpus phoenicis* infesting *Justicia adhatoda*, *Cunaxa setirostris* on tarsonemid mites infesting *Datura metel* and *Agistemus terminalis* also on tarsonemids.

The overall conclusion which can be drawn from the present study is that the medicinal plants are attacked by a good number of mite species, the knowledge of which is still at its infancy and more intensive and extensive surveys need to be conducted which will reveal many more species and some of which will be important pests/ predators and some of which may be hitherto undescribed or unreported from India. Therefore, the study in this regard is urgently needed because of the fact that the medicinal plants are gaining increasing economic importance globally because of their multifarious uses also for control of the economically important pest species with potential predatory species in eco-friendly manner utilizing predatory mites as one of the components.

Table 2. Medicinal Plant-Mite Catalogue Reported from South Bengal during October 2014-December 2016

| Medicinal plants | Mite species |
|--|--|
| A | |
| <i>Abelmoschus moschatus</i> Medic Fam. Malvaceae | <i>Tetranychus neocaledonicus</i> , <i>Brevipalpus rugulosus</i> , <i>Dactyloscirus</i> sp., <i>Scapulaseius suknaensis</i> , <i>Amblyseius largoensis</i> , <i>Paraphytoseius bhadrakaliensis</i> , <i>Neoseiulus cynodona</i> , <i>Suidasia nesbitti</i> |
| <i>Abrus precatorius</i> Linn. Fam. Fabaceae | <i>Tetranychus ludeni</i> , |
| <i>Abutilon indicum</i> (Linn.) Sweet Fam. Malvaceae | <i>Porcupinychus abutiloni</i> |
| <i>Achras sapota</i> Linn. Fam. Sapotaceae | <i>P. citri</i> |
| <i>Acorus calamus</i> Linn. Fam. Araceae | <i>Teteranychus ludeni</i> |

| | |
|--|--|
| <i>Aegle marmelos</i> (Linn.) Corr. Fam. Rutaceae | <i>Tetranychus neocaledonicus</i> , <i>Brevipalpus</i> , <i>essigi</i> , <i>B. lewisi</i> , <i>Anystis baccarum</i> , <i>Agistemus terminalis</i> , <i>Dactyloscirus bengalensis</i> , <i>Amblyseius largoensis</i> , <i>A. adha-todae</i> |
| <i>Alangium salvifolium</i> (Linn. f.) Wang Fam. Alangiaceae | <i>Amblyseius largoensis</i> |
| <i>Alstonia scholaris</i> Linn. R. Br. Fam. Apocynaceae | <i>Euseius finlandicus</i> |
| <i>Ambroma augusta</i> (Linn.) L.f. Fam. Sterculaceae | <i>Brevipalpus rugulosus</i> , <i>Cunaxa setirostris</i> , <i>Agistemus terminalis</i> , <i>Paraphytoseius orientalis</i> , <i>Scapulaseius suknaensis</i> |
| <i>Andrographis paniculata</i> (Burm. f.) Wall. Fam. Acanthaceae | <i>Cunaxa setirostris</i> |
| <i>Anthocephalus chinensis</i> (Lam.) Rich. ex Walp Fam. Rubiaceae | <i>Pronematus mcgregori</i> |
| <i>Areca catechu</i> Linn. Fam. Mersileaceae | <i>Raoiella indica</i> |
| <i>Argemon mexicana</i> Linn. Fam. Papavaraceae | <i>Agistemus heterophylla</i> |
| <i>Artemisia nilagirica</i> (C.B.- Clarke) Pamp. Fam. Asteraceae | <i>Brevipalpus californicus</i> |
| <i>Artocarpus heterophyllus</i> Lam. Fam. Moraceae | <i>Tarsonemus</i> sp. |
| <i>Artocarpus integrifolia</i> Linn. Fam. Moraceae | <i>Tetranychus</i> sp., <i>Porcupinychus</i> sp., <i>Brevipalpus pictilis</i> |
| <i>Artocarpus lakoocha</i> Roxb. Fam. Moraceae | <i>Tarsonemus</i> sp., <i>Cunaxa setirostris</i> |
| <i>Averrhoa carambola</i> Linn. Fam. Oxalidaceae | <i>Neoseiulus longispinosus</i> |
| <i>Azadirachta indica</i> A. Juss. Fam. Maliceae | <i>Tetranychus macfarlanei</i> , <i>Schizotetranychus baltazari</i> , <i>Petrobia harti</i> , <i>Tetranychus neocaledonicus</i> , <i>Brevipalpus phoenicis</i> , <i>Tarsonemus confuses</i> , <i>Amblyseius paraaerialis</i> , <i>Phytoseius minutus</i> |
| B | |
| <i>Bacopa monnieri</i> (Linn.) Pennell Fam. Scrophulariaceae | <i>Amblyseius largoensis</i> |
| <i>Bambusa vulgaris</i> Schrad ex Wendl. non Nees Fam. Acanthaceae | <i>Leptus giganticus</i> , <i>Cunaxa bambusae</i> |
| <i>Barleria cristata</i> Linn. Fam. Acanthaceae | <i>Brevipalpus californicus</i> , <i>Agistemus terminalis</i> , <i>Cunaxa</i> sp. |
| <i>Bauhinia acuminata</i> / <i>B. variegata</i> Linn. Fam. Caesalpiniaceae | <i>Brevipalpus rica</i> , <i>Amblyseius largoensis</i> , <i>Paraphytoseius orientalis</i> |
| <i>Bixa orellana</i> Linn. Fam. Bixaceae | <i>Tetranychus ludeni</i> , <i>Oligonychus punicae</i> , <i>Amblyseius largoensis</i> , <i>Paraphytoseius orientalis</i> |
| <i>Boerhavia diffusa</i> Linn. Fam. Nyctaginaceae | <i>Lorryia</i> sp. |
| <i>Bombax ceiba</i> Linn. Fam. Bombacaceae | <i>Brevipalpus lewisi</i> |
| <i>Butea monosperma</i> (Lamk.) Taub. Fam. Fabaceae | <i>Scapulaseius suknaensis</i> |
| <i>Butea superba</i> Roxb. Fam. Fabaceae | <i>Tetranychus ludeni</i> |
| C | |
| <i>Cajanus cajan</i> (Linn.) Millsp Fam. Fabaceae | <i>Schizotetranychus cajani</i> , <i>Brevipalpus</i> spn., <i>Aceria cajani</i> |
| <i>Calotropis gigantea</i> (Linn.) R. Br. ex Ait Fam. Asclepiadaceae | <i>Eutetranychus maximae</i> |
| <i>Capsicum annuum</i> Linn. Fam. Solanaceae | <i>Polyphagotarsonemua latus</i> |
| <i>Carica papaya</i> Linn. Fam. Caricaceae | <i>Panonychus citri</i> |
| <i>Cassia sophera</i> Linn. Fam. Caesalpiniaceae | <i>Tetranychus</i> sp. |
| <i>Catharanthus roseus</i> (Linn.) G. Dong. Fam. Apocynaceae | <i>Amblyseius aeralis</i> |
| <i>Cedrus deodara</i> (Roxb.) Loud. Fam. Piniaceae | <i>Oligonychus punicae</i> , <i>A. largoensis</i> |
| <i>Cinnamomum camphora</i> (Nees & Eberm) Fam. Lauraceae | <i>Tetranychus urticae</i> |
| <i>Cinnamomum zeylanicum</i> Nees Fam. Lauraceae | <i>Paraphytoseius orientalis</i> |
| <i>Citrus limon</i> (Linn.) Burm. f. Fam. Rutaceae | <i>Tetranychus urticae</i> , <i>Eutetranychus orientalis</i> , <i>Schizotetranychus baltazari</i> , <i>Stenotarsonemus</i> sp., <i>A. largoensis</i> , <i>Typhlodromips syzygii</i> , <i>Scapulaseius polyantheae</i> , <i>S. suknaensis</i> |
| <i>Citrus medica</i> Linn. Fam. Rutaceae | <i>Eutetranychus orientalis</i> , <i>Schizotetranychus baltazari</i> , <i>A.largoensis</i> |

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| <i>Citrus reticulata</i> Blanco Fam. Rutaceae | <i>Eu.orientalis</i> , <i>B. californicus</i> |
| <i>Cleome viscosa</i> Linn. Fam. Capparideaceae | <i>Brevipalpus creber</i> |
| <i>Clerodendrum indicum</i> (Linn.) O Kutze Fam. Verbenaceae | <i>Tetranychus</i> sp., <i>Tydeus gosabaensis</i> |
| <i>Clerodendrum inerme</i> (Linn.) Gaertn. Fam. Verbenaceae | <i>Anystis baccarum</i> , <i>Tydeus gosabaensis</i> , <i>Amblyseius herbicolus</i> |
| <i>Coccinia indica</i> Naud Fam. Cucurbitaceae | <i>Lorryia</i> sp., <i>Amblyseius adhatodae</i> |
| <i>Coccinia grandis</i> (Linn.) Voight Fam. Cucurbitaceae | <i>Brevipalpus phoenicis</i> |
| <i>Cocos nucifera</i> Linn. Fam. Arecaceae | <i>Lorryia</i> sp., <i>Lorryia stricta</i> , <i>Tydeus</i> sp., <i>Raoiella indica</i> |
| <i>Coffea arabica</i> Linn. Fam. Rubiaceae | <i>Brevipalpus essigi</i> |
| <i>Colocassia esculenta</i> (Linn.) Schott Fam. Araceae | <i>Eotetranychus</i> sp., <i>Paraphytoseius orientalis</i> , <i>A. largoensis</i> |
| <i>Costus speciosus</i> (Koenig ex Ratz.) J.E. Smith Fam. Zingiberaceae | <i>Brevipalpus lewisi</i> |
| <i>Croton roxburghii</i> Balak Fam. Euphorbiaceae | <i>Brevipalpus lewisi</i> |
| <i>Cryptolepis buchanani</i> R.Br. ex Roem & Schutt Fam. Periplocaceae | <i>Tetranychus neocaledonicus</i> , <i>Brevipalpus obovatus</i> |
| <i>Curculigo orchioides</i> Gaertn. Fam. Hypoxidaceae | <i>Brevipalpus</i> spp. |
| <i>Curcuma longa</i> Linn. Fam. Zingiberaceae | <i>Eotetranychus hirsti</i> |
| <i>Cymbopogon martini</i> (Roxb.) Wats. Fam. Poaceae | <i>Oligonychus indicus</i> , <i>Panonychus citri</i> |
| <i>Cymbopogon palmarosa</i> Fam. Poaceae | <i>Oligonychus indicus</i> |
| <i>Cymbopogon winterianus</i> Zawitt Fam. Poaceae | <i>Oligonychus oryzae</i> |
| <i>Cynodon dactylon</i> (Linn.) Pers. Fam. Poaceae | <i>Oligonychus oryzae</i> , <i>Fungitarsonemus</i> sp., <i>Octobdellodes guajavae</i> , <i>Paraphytoseius orientalis</i> , <i>Cunaxa bambusae</i> , <i>Neoseiulus indicus</i> |
| <i>Cyperus rotundus</i> (Linn.) Fam. Cyperaceae | <i>Oligonychus indicus</i> , <i>Tetranychus urticae</i> |
| D | |
| <i>Datura metel</i> Linn. Fam. Solanaceae | <i>Tetranychus ludeni</i> , <i>Brevipalpus</i> spp., <i>Polyphagotarsonemus latus</i> , <i>Eutetranychus africanus</i> , <i>Phytoseius crinitus</i> |
| <i>Desmodium gangeticum</i> (Linn.) DC Fam. Fabaceae | <i>Tetranychus urticae</i> , <i>Schizotetranychus</i> sp. |
| <i>Dioscorea alata</i> Linn. Fam. Dioscoreaceae | <i>Amblyseius sundi</i> |
| <i>Dolichos lablab</i> Linn. Fam. Fabaceae | <i>Tetranychus macfarlanei</i> |
| E | |
| <i>Erythrina variegata</i> (Linn.) Merr. Fam. Fabaceae | <i>Cunaxa capreolus</i> |
| <i>Eucalyptus globulus</i> Labill. Fam. Myrtaceae | <i>Cunaxa capreolus</i> |
| <i>Euphorbia hirta</i> Linn. Fam. Euphorbiaceae | <i>Amblyseius coffeae</i> |
| F | |
| <i>Ficus hispida</i> Linn. f. Fam. Moraceae | <i>Eutetranychus orientalis</i> , <i>Brevipalpus californicus</i> , <i>Dactyloscirus fuscus</i> , <i>Amblyseius largoensis</i> , <i>Phytoseius kapuri</i> |
| <i>Ficus</i> sp. | <i>Tarsonemus</i> sp. |
| G | |
| <i>Glycosmis pentaphylla</i> (Retz.) A.DC Fam. Rutaceae | <i>Cunaxa</i> spp. |
| <i>Gloriosa superba</i> Linn. Fam. Liliaceae | <i>Brevipalpus obovatus</i> |
| <i>Gossypium arboreum</i> Linn. Fam. Malvaceae | <i>Tetranychus urticae</i> |
| H | |
| <i>Hamelia patiens</i> | <i>Schizotetranychus</i> sp., <i>Allonychus</i> sp. |
| <i>Heliotropium indicum</i> Linn. Fam. Boraginaceae | <i>Phytoseius kapuri</i> |
| <i>Hemidesmus indicus</i> R. Br. Fam. Periplocaceae | <i>Amblyseius largoensis</i> |
| <i>Hemigraphis hirta</i> (Vahl) T. Anders Fam. Acanthaceae | <i>Tetranychus ludeni</i> |
| <i>Hibiscus arboretum</i> Linn. Fam. Malvaceae | <i>Tetranychus urticae</i> |
| <i>Hibiscus rosa-sinensis</i> Linn. Fam. Malvaceae | <i>Brevipalpus araucanus</i> , <i>Eutetranychus orientalis</i> , <i>Amblyseius largoensis</i> , <i>Amblyseius</i> sp., <i>Typhlodromips syzygii</i> , <i>Anystis baccarum</i> , <i>Pronematus acaciae</i> , <i>Paraphytoseius orientalis</i> |

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| <i>Holarrhena pubescens</i> (Buch- Ham) Wall. ex G. Don. Fam. Apocynaceae | <i>Eutetranychus orientalis</i> |
| I | |
| <i>Ichnocarpus frutescens</i> R.Br. Fam. Apocynaceae | <i>Phytoseius macrosetosus</i> |
| <i>Impatiens balsamina</i> Linn. Fam. Balsaminaceae | <i>Eutetranychus phaseoli</i> , <i>Amblyseius largoensis</i> , <i>Eutetranychus orientalis</i> |
| <i>Ixora coccinea</i> Linn. Fam. Rubiaceae | <i>Dactyloscirus fuscus</i> , <i>Lorryia</i> sp., <i>Pronematus sextoni</i> |
| J | |
| <i>Justicia adhatoda</i> Linn. Nees Fam. Acanthaceae | <i>Tetranychus macfarlanei</i> , <i>Tetranychus urticae</i> , <i>Panonychus citri</i> , <i>Porcupinychus abutiloni</i> , <i>Brevipalpus californicus</i> , <i>Brevipalpus essigi</i> , <i>Brevipalpus phoenicis</i> , <i>Brevipalpus</i> spp., <i>Brevipalpus euphorbiae</i> , <i>Anystis baccarum</i> , <i>Walzia</i> sp., <i>Cunaxa capreolus</i> , <i>Amblyseius paraaerialis</i> , <i>Cunaxa johnstoni</i> |
| K | |
| <i>Kalanchoe pinnata</i> (Lamk.)Pers. Fam. Crassulaceae | <i>Amblyseius largoensis</i> |
| L | |
| <i>Lagestroemia speciosa</i> (Linn.) Spers Fam. Lythraceae | <i>Tenuipalpus leptadeniae</i> |
| <i>Lawsonia inermis</i> Linn. Fam. Lythraceae | <i>Brevipalpus amicus</i> , <i>Eutetranychus alstoniae</i> |
| <i>Leucas cephalotes</i> (Roth) Spreng Fam. Lamiaceae | <i>Suidasia nesbitti</i> |
| <i>Litsea salicifolia</i> Hook.f. Fam. Lauraceae | <i>Oligonychus indicus</i> |
| <i>Luffa acutangula</i> (Linn.) Roxb. Fam. Cucurbitaceae | <i>Brevipalpus amicus</i> |
| <i>Luffa cylindrica</i> (Linn.) M. Roem Fam. Cucurbitaceae | <i>Euseius prasadi</i> |
| M | |
| <i>Mangifera indica</i> Linn. Fam. Anacardiaceae | <i>Brevipalpus euphorbiae</i> , <i>Amblyseius largoensis</i> , <i>Amblyseius mcmurtryi</i> , <i>Oligonychus mangiferus</i> , <i>Cheletogenes ornatus</i> |
| <i>Melia azadirach</i> Linn. Fam. Meliaceae | <i>Octobdellodes guajavae</i> , <i>Paraphytoseius scleroticus</i> |
| <i>Mentha arvensis</i> Linn. Fam. Lamiaceae | <i>Bakerina aculus</i> , <i>Brevipalpus californicus</i> , <i>Brevipalpus phoenicis</i> |
| <i>Mentha piperita</i> Linn. Fam. Lamiaceae | <i>Tetranychus macfarlanei</i> , <i>Polyphagotarsonemus latus</i> , <i>Brevipalpus phoenicis</i> |
| <i>Michaelia champaca</i> Linn. Fam. Magnoliaceae | <i>Tetranychus urticae</i> , <i>Oligonychus mangiferus</i> , <i>Eutetranychus africanus</i> , <i>Brevipalpus absens</i> , <i>Brevipalpus deleoni</i> , <i>Pronematus ubiquitus</i> , <i>Cunaxa bambusae</i> , <i>Pronematus fleschneri</i> , <i>Amblyseius herbicolus</i> , <i>Amblyseius largoensis</i> , <i>Euseius alstoniae</i> , <i>Neoseiulus longispinosus</i> |
| <i>Mimosa pudica</i> Linn. Fam. Mimosaceae | <i>Tetranychus hypogaeae</i> |
| <i>Momordica cochinchinensis</i> (Lour.) Fam. Cucurbitaceae | <i>Eutetranychus phaseoli</i> , <i>Brevipalpus turrialbensis</i> , <i>Hemicheyletia bakeri</i> , <i>Paraphytoseius orientalis</i> , <i>Amblyseius largoensis</i> |
| <i>Moringa oleifera</i> Lamk. Fam. Moringaceae | <i>Cunaxa capreolus</i> , <i>Agistemus hystrix</i> |
| <i>Morus alba</i> Linn. fam. Moraceae | <i>Aceria mori</i> , <i>Agistemus edulis</i> |
| <i>Murraya koenigii</i> (Linn.) Spring Fam. Rutaceae | <i>Eutetranychus africanus</i> |
| <i>Musa acuminata</i> Linn. Fam. Musaceae | <i>Tetranychus neocaledonicus</i> |
| <i>Musa paradisisca</i> Linn. Fam. Musaceae | <i>Tetranychus</i> sp. |
| <i>Mussaenda roxburghii</i> Hook. f. Fam. Rubiaceae | <i>Leptus giganticus</i> |
| N | |
| <i>Nerium indicum</i> Mill. Fam. Apocynaceae | <i>Aceria nerii</i> , <i>Gynaeseius ricini</i> , <i>Leptus giganticus</i> |
| <i>Nyctanthes arbor-tristis</i> Linn. Fam. Oleaceae | <i>Eotetranychus hirsti</i> , <i>Eutetranychus orientalis</i> , <i>Panonychus citri</i> , <i>Brevipalpus pictilis</i> , <i>Brevipalpus mitrofanovi</i> , <i>Anystis baccarum</i> , <i>Cunaxa capreolus</i> , <i>Pronematus fleschneri</i> , <i>Pronematus acaciae</i> , <i>Dactyloscirus bengalensis</i> , <i>Cunaxa</i> sp., <i>Amblyseius herbicolus</i> , <i>Amblyseius largoensis</i> |
| O | |
| <i>Ocimum basilicum</i> Linn. Fam Lamiaceae | <i>Paraphytoseius orientalis</i> |
| <i>Ocimum grattissimum</i> Linn. Fam. Lamiaceae | <i>Tetranychus macfarlanei</i> , <i>Polyphagotarsonemus latus</i> , <i>Pronematus sextoni</i> , <i>Amblyseius largoensis</i> , <i>Brevipalpus deleoni</i> , <i>Brevipalpus edwinae</i> , <i>Neocunaxoides zuluensis</i> |

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| <i>Ocimum sanctum</i> Linn. Fam. Lamiaceae | <i>Tetranychus macfarlanei</i> , <i>Eutetranychus africanus</i> , <i>Brevipalpus essigi</i> , <i>Paraphytoseius orientalis</i> , <i>Eutetranychus coccineae</i> , <i>Agistemus terminalis</i> |
| <i>Ocimum tenuiflorum</i> Linn. Fam. Lamiaceae | <i>Brevipalpus californicus</i> , <i>Brevipalpus melichrus</i> , <i>Cunaxa setirostris</i> , <i>Paraphytoseius orientalis</i> |
| <i>Oryza sativa</i> Linn. Fam. Poaceae | <i>Oligonychus oryzae</i> |
| <i>Oxalis corniculata</i> Linn. Fam. Oxalidaceae | <i>Petrobia harti</i> |
| P | |
| <i>Pavonia odorata</i> Willd. Fam. Malvaceae | <i>Tetranychus macfarlanei</i> |
| <i>Pentapetes phoenicea</i> Linn. Fam. Sterculiaceae | <i>Oligonychus indicus</i> , |
| <i>Phoenix sylvestris</i> (Linn.) Roxb. Fam. Aracaceae | <i>Tetranychus macfarlanei</i> , <i>Polyphagotarsonemus latus</i> |
| <i>Phyllanthus emblica</i> Linn. Fam. Euphorbiaceae | <i>Walzia indiana</i> , <i>Octobdellodes guajavae</i> , <i>Pronematus fleschneri</i> |
| <i>Physalis minima</i> Linn. Fam. Solanaceae | <i>Eotetranychus fremonti</i> |
| <i>Piper betle</i> Linn. Fam. Piperaceae | <i>Tetranychus ludeni</i> |
| <i>Piper longum</i> Linn. Fam. Piperaceae | <i>Tetranychus ludeni</i> , <i>Brevipalpus californicus</i> |
| <i>Piper nigrum</i> Linn. Fam. Piperaceae | <i>Brevipalpus melichrus</i> , <i>Amblyseius largoensis</i> , <i>Agistemus fleschneri</i> |
| <i>Plumbago zeylanica</i> Linn. Fam. Plumbaginaceae | <i>Tetranychus hypogaeae</i> , <i>Eutetranychus orientalis</i> |
| <i>Polyalthia longifolia</i> (Sonn.) Thwaites Fam. Annonaceae | <i>Brevipalpus amicus</i> |
| <i>Psidium guajava</i> Linn. Fam. Myrtaceae | <i>Tetranychus</i> sp., <i>Pronematus mcgregori</i> , <i>Phytoseius swirskii</i> |
| <i>Psoralea corylifolia</i> Linn. Fam. Fabaceae | <i>Cunaxa setirostris</i> |
| <i>Pterocarpus santalinus</i> Linn. f. Fam. Fabaceae | <i>Tetranychus neocaledonicus</i> , <i>Brevipalpus californicus</i> , <i>Amblyseius largoensis</i> , <i>Euseius ovalis</i> |
| <i>Pterospermum acerifolium</i> Willd. Fam. Sterculiaceae | <i>Oligonychus</i> sp. nr. <i>martensis</i> |
| <i>Punica granatum</i> Linn. Fam. Punicaceae | <i>Brevipalpus mitrofanovi</i> |
| R | |
| <i>Randia dometerum</i> Lamk. Fam. Rubiaceae | <i>Tetranychus urticae</i> |
| <i>Rauvolfia serpentina</i> Benth ex Kurz. Fam. Apocynaceae | <i>Tetranychus ludeni</i> , <i>Brevipalpus</i> spn., <i>Amblyseius largoensis</i> , <i>Agistemus heterophylla</i> |
| <i>Rauvolfia tetraphylla</i> Linn. Fam. Apocynaceae | <i>Eutetranychus orientalis</i> , <i>Agistemus gamblei</i> , <i>Paraphytoseius scleroticus</i> , <i>Amblyseius largoensis</i> |
| <i>Rosa centifolia</i> Linn. Rosaceae | <i>Tetranychus ludeni</i> , <i>Tetranychus urticae</i> , <i>Pronematus sextoni</i> |
| <i>Rosa</i> spp. Fam. Rosaceae | <i>Gynaeseius ricini</i> |
| S | |
| <i>Saccharum officinarum</i> Linn. Fam. Poaceae | <i>Oligonychus indicus</i> |
| <i>Saccharum spontaneum</i> Linn. Fam. Poaceae | <i>Euseius prasadi</i> |
| <i>Santalum album</i> linn. Fam. Santalaceae | <i>T.macfarlanei</i> , <i>A. largoensis</i> , <i>A.mcmurtryi</i> |
| <i>Saraca asoca</i> (Roxb.) de Wild. Fam. Caesalpin- iaceae | <i>Cunaxa</i> sp., <i>Phytoseius kapuri</i> |
| <i>Setaria paniculifera</i> (Linn.) Fam. Poaceae | <i>B.lewisi</i> , <i>P.kapuri</i> |
| <i>Shorea robusta</i> Gaertn. f. Fam. Dipterocarpaceae | <i>A.mcmurtryi</i> , <i>Typhlodromips syzygii</i> |
| <i>Sida cordifolia</i> Linn. Fam. Malvaceae | <i>Porcupinychus abutiloni</i> , <i>Pronematus ubiquietus</i> |
| <i>Solanum nigrum</i> Linn. Fam. Solanaceae | <i>Cunaxa setirostris</i> |
| <i>Solanum surattense</i> Burm.f. Fam. Solanaceae | <i>Typhlodromips syzygii</i> |
| <i>Solanum viarum</i> Dunal Fam. Solanaceae | <i>Paraphytoseius bhadrakaliensis</i> |
| <i>Solanum torvum</i> SW Fam. Solanaceae | <i>Glycyphagus domesticus</i> |
| <i>Stevia rebaudiana</i> Bert. Fam. Rosaceae | <i>Cunaxa capreolus</i> |
| <i>Syzygium cumini</i> (Linn.) Skeel Fam. Myrtaceae | <i>O.mangiferus</i> , <i>A.largoensis</i> , <i>N.longispinosus</i> |
| <i>Syzygium jambolanum</i> (Linn.) Fam. Myrtaceae | <i>B.pictilis</i> , <i>Euseius alstoniae</i> |
| <i>Syzygium jambos</i> (Linn.) Alston Fam. Myrtaceae | <i>O.mangiferus</i> , <i>B.pictilis</i> , <i>Eu.alstoniae</i> |
| <i>Syzygium javanicum</i> (Linn.) Fam. Myrtaceae | <i>Eo.hirsti</i> , <i>Eu.ovalis</i> |
| T | |
| <i>Tabernaemontana divaricata</i> (Linn.) R. Br. Fam. Apocynaceae | <i>Dactyloscirus bengalensis</i> |
| <i>Tagetes erecta</i> Linn. Fam. Asteraceae | <i>T.neocaledonicus</i> , <i>P.latus</i> |

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| <i>Tagetes patula</i> Linn. Fam. Asteraceae | <i>Cunaxa womersleyi</i> |
| <i>Terminalia arjuna</i> (Roxb. ex DC) Wt. & Arn. Fam. Combretaceae | <i>Lorryia</i> sp. |
| <i>Theobroma cacao</i> Linn. Fam. Sterculiaceae | <i>Scapulaseius suknaensis</i> |
| <i>Thespesia lampus</i> (Cav.) Dalz. ex Dalz. et. Gibs Fam. Malvaceae | <i>Brevipalpus</i> spp. |
| <i>Triumfetta shombaidea</i> | <i>Pronematus fleschneri</i> , <i>S.suknaensis</i> |
| U | |
| <i>Urena lobata</i> Linn. Fam. Malvaceae | <i>Neocunaxoides andrei</i> |
| <i>Uraria picta</i> Jacq. Desv. ex DC Fam. Fabaceae | <i>B.deleoni</i> , <i>Scapulaseius suknaensis</i> , <i>P. bhadrakaliensis</i> |
| V | |
| <i>Vitex negundo</i> Linn. Fam. Verbenaceae | <i>Hemicheyletia bakeri</i> , <i>Cunaxoides croceus</i> |
| W | |
| <i>Wissadula periplocifolia</i> Presl. ex Thor Fam. Malvaceae | <i>T.ludeni</i> , <i>T.urticae</i> , <i>T.puscheli</i> |
| <i>Withania somnifera</i> (Linn.) Dunal Fam. Solana- ceae | <i>T.ludeni</i> , <i>Neocunaxoides</i> sp. nr. <i>krama</i> , <i>Klemania plumigera</i> |
| Z | |
| <i>Zea mays</i> Linn. Fam. Poaceae | <i>O.indicus</i> |

Summary

This paper deals with 120 species of mites belonging to both phytophagous and predatory groups collected from 158 species of medicinal plants representing 11 districts of South Bengal (India), giving their collection data, economic importance, selected references and a host-mite catalogue. This includes 9 species under Tenuipalpidae, 2 under Phytoseiidae, 3 under Cunaxidae and 1 genus under Tetranychidae which are being reported here for the first time from India. This also includes many host plants, the occurrence of mites on those was not known earlier. Finally, a discussion has been made regarding diversity of mites at species, genus and family levels in different districts of South Bengal as well as highlights the

important pests and predatory mites.

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References

- Chant, D.A and McMurtry, J. A. 2007 *illustrated keys and diagnosis for the genera and sub genera of the Phytoseiidae of the world (Acari Mesostigmata)*. Indira Publishing House, Michigan, U.S.A. 220 pp.
- Gupta, S.K. 1985, *Handbook. Plant Mites of India*. Zoological Survey of India Calcutta, 520pp.
- Gupta, S.K. 1986, *Fauna of India (Acari: Mesostigmata) Family Phytoseiidae*. Zoological Survey of India Calcutta, 350pp.
- Gupta, S.K. 2005, *Insects and Mites infesting medicinal plants in India*, Ramakrishna Mission Ashrama, Narendrapur, 214 pp.
- Gupta S.K. 2012 *Handbook Injurious & Beneficial Mites Infesting Agri- Horticultural Crops in India and Their Management*. Nature Books India, New Delhi 362 pp.
- Gupta, S.K. and Karmakar, K. 2011, *Diversity of mites (Acari) on medicinal and aromatic plants in India*. Acarology XIII Proceedings of the International Congress (Zoosymposia 6, 504 pp.).
- Hughes, A.M. 1976, *The Mites of Stored Food & Houses*. Ministry Agriculture Fisheries, Food, London, Tech. Bull. 9, 400pp.