

## A REPORT ON MITES OCCURRING ON MEDICINAL PLANTS IN WEST BENGAL

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### INTRODUCTION

West Bengal is rich with agroclimatic variation and has high natural resources of medicinal plants. Of the 2500 plant species under about 1000 genera which are commercially used by different companies for pharmaceutical purpose and are widely used by medical practitioners under Indian System of Medicine (ISM), many of those are available in West Bengal. Because of the rich diversity of medicinal plants and for their large scale use for medicinal purpose, attention of Govt. of India has been focussed to promote the culture of many of those medicinal plants and extract the useful and beneficial alkaloids from those plants for human welfare.

Like many other plants, the medicinal plants are also prone to a large number of pests including mite pests which cause retardation of growth of the plants and that ultimately affect the yield. So far as mites occurring on medicinal plants are concerned, practically nothing has been done from West Bengal and barring Lal & Mukherji (1977) no efforts were made to explore the mite fauna on medicinal plants from India. Since many of the mites on medicinal plants have importance either as pests or as predators, it was thought desirable to explore the mite fauna on medicinal plants and find out their importance, if any, either as pests or as predators. The present paper is the first attempt in that direction and reports 54 species belonging to 27 genera under 14 families and 3 orders from West Bengal, of those, 23 species are phytophagous. 2 are fungivorous and the remaining 29 species are predatory in habit. This report is made partly basing on survey of literature and partly on the basis of collection made by the senior author.

The plants which have been considered here as medicinal plants are as per Chopra *et al.* (1956) and Satyavati *et al.* (1976, 1987).

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## SYSTEMATIC ACCOUNT

*Phytophagous mites*

## Family 1. TETRANYCHIDAE

1. *Aponychus corpuzae* Rimando

1966. *Aponychus corpuzae* Rimando, *Philip. Agric.*, **50** : 105.

*Medicinal plant* : *Feronia elephantum*.

*Distribution* : India : Assam, Meghalaya, West Bengal, Orissa, Andaman & Nicobar Island. Elsewhere : Philippines; Thailand; Japan.

2. *Eutetranychus orientalis* (Klein)

1936. *Aponychus orientalis* Klein, *Bull. Agric. Res. Stn., Rehovoth*, **21** : 3.

*Medicinal plants* : *Azadirachta indica*, *Cocos nuciferae*, *Datura alba*.

*Distribution* : India : Assam, West Bengal, Delhi, Uttar Pradesh, Punjab, Haryana, Jammu & Kashmir, Karnataka. Elsewhere : Pakistan; Taiwan; Israel; Turkey; Jordan; Iran; Afghanistan; Cyprus; South Africa; Sudan; Egypt.

*Remarks* : This species was found to cause severe damage specially to citrus and papaya plants. The infested leaves became fully enveloped by web formed by the mites where dust particles got adhered causing retardation of physiological activities of plants. This ultimately made the leaves brownish, unhealthy and ultimately such leaves fell off.

3. *Oligonychus indicus* (Hirst)

1923. *Paratetranychus indicus* Hirst, *Proc. Zool. Soc. London*. p. 990.

*Medicinal plant* : *Musa paradisiaca*.

*Distribution* : India : West Bengal, Orissa, Bihar, Delhi, Haryana, Punjab, Andhra Pradesh, Karnataka, Tamil Nadu. Elsewhere : Pakistan.

*Remarks* : The feeding of this mite caused the appearance of white stipplings on the under surface of leaves.

4. *Oligonychus mangiferus* (Rahman & Sapro)

1940. *Paratetranychus mangiferus* Rahman & Sapro, *Proc. Indian. Acad. Sci.*, **11B** : 102.

*Medicinal plants* : *Mangifera indica*, *Syzygium cumini*.

*Distribution* : India : West Bengal, Orissa, Bihar, Delhi, Haryana, Punjab, Himachal Pradesh, Karnataka, Kerala.

*Remarks* : It caused yellowing on upper surface of mango leaves.

### 5. *Oligonychus punicae* (Hirst)

1926. *Paratetranychus punicae* Hirst, *Proc. Zool. Soc. London*, p. 830.

*Medicinal plant* : *Cocos nucifera*.

*Distribution* : India : West Bengal, Tamil Nadu. Elsewhere : Central and South America.

### 6. *Oligonychus* sp.

*Medicinal plant* : Guava.

*Distribution* : India : West Bengal.

### 7. *Schizotetranychus baltazari* Rimando

1962. *Schizotetranychus baltazari* Rimando, *Philipp. Agric.*, **45** : 534-535.

*Medicinal plant* : *Azadirachta indica*.

*Distribution* : India : Assam, West Bengal, Karnataka. Elsewhere : Myanmar; Thailand; Taiwan; Hong Kong.

### 8. *Schizotetranychus hindustanicus* (Hirst)

1924. *Tetranychus (Schizotetranychus) hindustanicus* Hirst, *Ann. Mag. nat. Hist.* (9) **14** : 525.

*Medicinal plants* : *Azadirachta indica*, *Citrus* sp.

*Distribution* : India : Tamil Nadu, Kerala.

*Remarks* : On citrus and neem, this mite caused the appearance of yellowish stiplings on leaves. Recently, it has been seen attacking citrus in southern part of West Bengal.

### 9. *Panonychus citri* (McGregor)

1916. *Tetranychus citri* McGregor, *Ann. ent. Soc. Amer.*, **9** : 284.

*Medicinal plants* : *Melia azadirachta*, papaya, citrus.

*Distribution* : India : West Bengal, Assam, Meghalaya, Punjab, Jammu & Kashmir, Andaman & Nicobar Island. Elsewhere : Argentina; Bermuda; U.S.A.; China; Cuba; Japan; Mexico; New Zealand; South Africa; Thailand.

*Remarks* : This mite was seen as pest of citrus and papaya in West Bengal causing yellowing and later drying of leaves.

### 10. *Panonychus* sp.

*Medicinal plant* : Banana.

*Distribution* : India : West Bengal.

11. *Tetranychus urticae* Koch

1836. *Tetranychus urticae* Koch, *Deu. Crust. Hyr. Arach. Fasc.*, 1 : 10.

*Medicinal plants* : *Solanum melongena*, *Mangifera indica*, *Psidium guajava*, *Ricinus communis*.

*Distribution* : India : Meghalaya, West Bengal, Orissa, Bihar, Gujarat, Haryana, Punjab, Rajasthan, Karnataka, Kerala. Elsewhere : Cosmopolitan.

*Remarks* : It was seen severely infesting brinjal and castor in West Bengal enveloping the leaves with webs. The infested leaves became yellow which dried up and fell off.

12. *Tetranychus neocaledonicus* Andre

1933. *Tetranychus neocaledonicus* Andre, *Bull. Mus. Nat. Hist. nat. Paris*, (2) 5 : 302.

*Medicinal plant* : *Solanum melongena*.

*Distribution* : India : Assam, Meghalaya, West Bengal, Orissa, Bihar, Uttar Pradesh, Delhi, Punjab, Haryana, Rajasthan, Gujarat, Maharashtra, Karnataka, Kerala. Elsewhere : Africa; Fiji; Bahamas; Hawaii; Venezuela; Puerto Rico; U.S.A.

*Remarks* : The affected plants suffered defoliation.

## Family 2. TENUIPALPIDAE

13. *Brevipalpus obovatus* Donnadieu

1875. *Brevipalpus obovatus* Donnadieu, *Recherches pour Service Historie des Tetranyques* : 116.

*Medicinal plant* *Syzygium cumini*.

*Distribution* : India : West Bengal, Delhi, Himachal Pradesh, Punjab. Elsewhere : Pakistan; Sri Lanka; Egypt; Japan; Israel; France; Spain; Cyprus; Australia; Canada; U.S.A.; Venezuela; Argentina.

*Remarks* : The infested leaves became brittle.

14. *Brevipalpus phoenicis* (Geij.)

1939. *Brevipalpus phoenicis* Geij., *Meded. Landb. Hooges. Wageningen*, 42 : 230.

*Medicinal plant* : *Cocos nucifera*.

*Distribution* : India : Assam, Meghalaya, West Bengal, Orissa, Bihar, Delhi, Punjab, Himachal Pradesh, Maharashtra, Karnataka, Tamil Nadu. Elsewhere : Kenya; Tanganyika; Okinawa Isl.; Australia; Holland; Spain; Portugal; Syria; Sicily; Italy; U.S.A.; Trinidad; Argentina; Brazil; Venezuela.

*Remarks* : The infested leaves first developed yellowish patches. Such leaves dried up and the infested trees suffered defoliation.

15. *Brevipalpus rugulosus* Chaudhri, Akbar & Rasool

1974. *Brevipalpus rugulosus* Chaudhri, Akbar & Rasool, p. 45.

*Medicinal plants* : *Hibiscus rosa-sinensis*, *Adhatoda vasica*.

*Distribution* : India : West Bengal, Punjab. Elsewhere : Pakistan.

16. *Raoiella indica* Hirst

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

*Medicinal plant* : *Cocos nucifera*.

*Distribution* : India : West Bengal, Punjab, Karnataka, Tamil Nadu. Elsewhere : Mauritius.

*Remarks* : The infestation of this mite caused the appearance of reddish patches on leaves.

## Family 3. ERIOPHYIDAE

17. *Aceria lycopersici* (Wolff.)

1879. *Phytoptus lycopersici* Wolff., *Monatschr. Gartenb.*, 22 : 424.

*Medicinal plant* : Brinjal.

*Distribution* : India : West Bengal, Punjab, Delhi, Karnataka, Tamil Nadu. Elsewhere : Cosmopolitan.

*Remarks* : The infested leaves became greyish white.

18. *Aceria mangiferae* Sayed

1946. *Aceria mangiferae* Sayed, *Bull. Soc. Fouad Ber. Ent. Egypte*, 30 : 7-10.

*Medicinal plant* : *Mangifera indica*.

*Distribution* : India : West Bengal, Bihar, Punjab, Haryana, Delhi, Karnataka, Tamil Nadu. Elsewhere : Egypt; Southern Asia; Brazil.

*Remarks* : This mite has been incriminated to causing vegetative and floral mango malformation.

19. *Tegonotus jambolensis* Mondal, Ghosh & Chakraborti

1982. *Tegonotus jambolensis* Mondal, Ghosh & Chakraborti, *Oriental Ins.*, 16 : 310-312.

*Medicinal plant* : *Eugenia jambolana*.

*Distribution* : India : West Bengal.

*Remarks* : The infested leaves developed russeting symptoms.

20. *Tegonotus mangiferae* (Keifer)

1946. *Oxypleurites mangiferae* Keifer, *Bull. Calif. Dep. Agr.* **35** 43.

*Medicinal plant* : *Mangifera indica*.

*Distribution* : India : West Bengal. Elsewhere : Hawaii.

*Remarks* : The infested leaves developed rusty symptoms.

21. *Phyllopoptruta oleivora* (Ashmead)

1879. *Typhlodromus oleivora* Ashmead, *Can. Ent.*, **11** : 160.

*Medicinal plant* : Citrus.

*Distribution* : India : West Bengal, Tamil Nadu. Elsewhere : U.S.A.; South Africa; Israel; Mauritius.

*Remarks* : The infested leaves developed russetting symptoms. Infested fruits got shrivelled, dried up and fell off prematurely.

22. *Bakeriella ocimis* Chakrabarti & Mondal

1982. *Bakeriella ocimis* Chakrabarti & Mondal, *Oriental Ins.*, **16** : 521-522.

*Medicinal plant* : *Ocimum basilicum*.

*Distribution* : India : West Bengal.

Family 4. TARSONEMIDAE

23. *Polyphagotarsonemus latus* (Banks)

1904. *Tarsonemus latus* Banks, *Proc. U. S. Nat. Mus.*, **32** : (1553) : 615.

*Medicinal plants* : *Datura alba*, *Solanum melongena*, *Amaranthus* sp., Citrus.

*Distribution* : India : West Bengal, Bihar, Uttar Pradesh, Punjab, Maharashtra, Karnataka. Elsewhere : Cosmopolitan.

*Remarks* : It was seen causing crinkling and curling of leaves.

*Predatory mites*

Family 5. STIGMAEIDAE

24. *Agistemus simplex* Gonzalez-Rodriguez

1965. *Agistemus simplex* Gonzalez-Rodriguez, *Univ. Calif. Pub. Ent.*, **41** : 33-34.

*Medicinal plant* : *Azadirachta indica*.

*Distribution* : India : West Bengal.

25. *Zetzellia languida* Gonzalez-Rodriguez

1965. *Zetzellia languida* Gonzalez-Rodriguez. *Univ. Calif. Pub. Ent.*, **41** : 21.

*Medicinal plant* : *Mangifera indica*.

*Distribution* : India : West Bengal.

## Family 6. TYDEIDAE

26. *Tydeus cumini* Gupta

1992. *Tydeus cumini* Gupta, In : *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 134.

*Medicinal plant* : *Eugenia jambolana*.

*Distribution* : India : West Bengal.

## Family 7. RAPHIGNATHIDAE

27. *Raphignathus guajavae* (Gupta)

1992. *Acheles guajavae* Gupta, In : *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 134-135.

*Medicinal plant* : *Psidium guajava*.

*Distribution* : India : West Bengal.

*Remarks* : This appears to be an important predatory mite upon *Tetranychus urticae* infesting guava.

## Family 8. CUNAXIDAE

28. *Cunaxa mangiferae* Gupta

1992. *Cunaxa mangiferae* Gupta, In : *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 136-138.

*Medicinal plant* : *Mangifera indica*.

*Distribution* : India : West Bengal.

*Remarks* : This mite was noticed feeding upon *Oligonychus mangiferus* on mango.

29. *Cunaxa setirostris* (Hermann)

1804. *Scirus setirostris* Hermann, *Mem. Aptelologie*. **1** : 60-62.

*Medicinal plant* : *Mangifera indica*.

*Distribution* : India : West Bengal, Arunachal Pradesh, Meghalaya, Tripura, Sikkim, Uttar Pradesh, Punjab, Himachal Pradesh, Andaman & Nicobar Isls., Lakshadwip Isls. Elsewhere : Cosmopolitan.

## Family 9. ANYSTIDAE

30. *Tencateia kanthiensis* Gupta

1992. *Tencateia kanthiensis* Gupta, In : *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 146-148.

*Medicinal plant* : Betel vine.

*Distribution* : India : West Bengal.

## Family 10. CHEYLETIDAE

31. *Cheletogenes ornatus* (Canestrini & Fanzago)

1876. *Cheyletus ornatus* Canestrini & Fanzago, *Atti. Soc. Vent. Trentina*, 1 : 106.

*Medicinal plant* : *Magnifera indica*.

*Distribution* : India : West Bengal, Punjab, Rajasthan. Elsewhere : China; Italy; Australia; Hawaii; U.S.A.; Galapagos Isls.; West Indies.

*Remarks* : It was seen amidst *Aceria mangiferae* infesting axillary buds in mango.

## Family 11. PHYTOSEIIDAE

32. *Amblyseius (Amblyseius) channabasavannai* Gupta & Daniel

1978. *Amblyseius channabasavanni* Gupta & Daniel, *Oriental Ins.*, 12 : 328-329.

*Medicinal plant* *Mangifera indica*.

*Distribution* : India : West Bengal, Kerala, Tamil Nadu.

33. *Amblyseius (Amblyseius) herbicolus* (Chant)

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

*Medicinal plants* : Guava, papaya, wood apple, *Hibiscus rosa-sinensis*.

*Distribution* : India : Arunachal Pradesh, Tripura, West Bengal. Elsewhere : Philippines; Taiwan; Thailand; Japan; Madagascar; U.S.A.; South America; Mexico; Brazil; British West Indies.

*Remarks* : This is an effective predator of tetranychid mites and is abundantly available in the field.

34. *Amblyseius (Amblyseius) largoensis* (Muma)

1955. *Amblyseiopsis largoensis* Muma, *Ann. Ent. Soc. Amer.*, 48 : 266.

*Medicinal plants* : *Mangifera indica*, *Psidium guajava*, *Adhatoda vasica*, wood apple. *Hibiscus rosa-sinensis*.



*Distribution* : India : Assam, Arunachal Pradesh, Manipur, West Bengal, Bihar, Himachal Pradesh, Andhra Pradesh, Karnataka, Kerala, Andaman & Nicobar Isls., Gujarat. Elsewhere : Phillippines; Taiwan; Thailand; Hong Kong; Israel; Iran; Japan; New Zealand; South Africa; Brazil; U.S.A.

*Remarks* : Like *A. (A.) herbicolus*, it is also a good predator of a number of tetranychid mites and is abundantly available in nature.

### 35. *Amblyseius (Amblyseius) neorykei* Gupta

1977. *Amblyseius neorykei* Gupta, *Entomologists' mon. Mag.*, **112** : 56-57.

*Medicinal plant* : *Azadirachta indica*.

*Distribution* : India : West Bengal, Arunachal Pradesh.

### 36. *Amblyseius (Euseius) alstoniae* Gupta

1975. *Amblyseius alstoniae* Gupta, *Internat. J. Acarol.*, **1(2)** : 31-32.

*Medicinal plants* : *Psidium guajava*, bitter gourd.

*Distribution* : India : West Bengal, Orissa, Bihar, Uttar Pradesh, Punjab, Jammu & Kashmir, Rajasthan, Gujarat, Madhya Pradesh.

### 37. *Amblyseius (Euseius) coccineae* Gupta

1975. *Amblyseius coccineae* Gupta, *Internat. J. Acarol.*, **1(2)** : 33.

*Medicinal plants* : *Mangifera indica*, *Cocos nucifera*.

*Distribution* : India : Meghalaya, West Bengal, Bihar, Orissa, Uttar Pradesh, Jammu & Kashmir, Gujarat, Madhya Pradesh, Andhra Pradesh, Tamil Nadu.

### 38. *Amblyseius (Euseius) finlandicus* (Oudemans)

1915. *Seiulus finlandicus* Oudemans, *Ent. Ber.*, **4** : 183.

*Medicinal plants* : *Mangifera indica*, citrus.

*Distribution* : India : West Bengal, Bihar, Uttar Pradesh, Himachal Pradesh, Jammu & Kashmir, Karnataka. Elsewhere : Pakistan; Japan; Greece; Netherlands; Scandinavian countries; U.S.S.R.; Africa; Mexico; South America; North America.

### 39. *Amblyseius (Euseius) pruni* Gupta

1975. *Amblyseius pruni* Gupta, *Internat. J. Acarol.*, **1(2)** : 40-42.

*Medicinal plants* : *Psidium guajava*, *Glycosmis pentaphylla*.

*Distribution* : India : Assam, Meghalaya, Tripura, West Bengal, Himachal Pradesh, Jammu & Kashmir.

40. *Amblyseius (Neoseiulus) paspalivorus* (DeLeon)

1957. *Typhlodromus paspalivorus* DeLeon, *Fla. Ent.*, **40** : 143-144.

*Medicinal plant* : *Ocimum sanctum*.

*Distribution* : India : West Bengal, Rajasthan, Andhra Pradesh. Elsewhere : Jamaica; Philippines.

41. *Amblyseius (Paraphytoseius) multidentatus* (Swirski & Shechter)

1961. *Paraphytoseius multidentatus* Swirski & Shechter, *Israel J. agric. Res.*, **11** : 114-116.

*Medicinal plant* : *Solanum melongena*.

*Distribution* : India : Assam, Tripura, West Bengal, Bihar, Uttar Pradesh, Maharashtra, Andhra Pradesh, Karnataka, Andaman & Nicobar Isls. Elsewhere : Pakistan; Thailand; Philippines; Malaya; Nigeria; Madagascar; Hong Kong.

42. *Amblyseius (Typhlodromalus) kalimpongensis* Gupta

1969. *Amblyseius kalimpongensis* Gupta, *Bull. Ent. Ent. Soc. India*, **10** : 128-129.

*Medicinal plants* : *Mangifera indica*, *Datura alba*, *Eujenia jambolana*.

*Distribution* : India : Assam, West Bengal, Andaman & Nicobar Isls., Kerala.

43. *Amblyseius (Typhlodromips) suknaensis* Gupta

1978. *Amblyseius suknaensis* Gupta, *Oriental Ins.*, **4** : 185-186.

*Medicinal plants* : *Glycosmis pentaphylla*, citrus, *Azadirachta indica*.

*Distribution* : India : Assam, West Bengal, Andaman & Nicobar Isls., Kerala.

44. *Amblyseius (Typhlodromips) syzygii* Gupta

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

*Medicinal plants* : *Azadirachta indica*, *Tagetes erecta*.

*Distribution* : India : West Bengal. Elsewhere : Thailand.

45. *Amblyseius* sp.

*Medicinal plants* : *Musa paradisiaca*, *Solanum melongena*, *Ocimum sanctum*, *Tagetes erecta*.

*Distribution* : India : West Bengal.

46. *Iphiseius (Iphiseius) andamanicus* Gupta

1980. *Iphiseius andamanicus* Gupta, *Entomologists' mon. Mag.*, **115** : 213-214.

*Medicinal plant* : *Eujenia jambolana*.

*Distribution* : India : West Bengal, Karnataka, Andaman & Nicobar Isls.

**47. *Phytoseius (Pennaseius) kapuri* Gupta**

1969. *Phytoseius (Phytoseius) kapuri* Gupta, *Israel J. agric. Res.*, **19** : 115-117.

*Medicinal plants* : *Ocimum sanctum*, *Mangifera indica*, Citrus.

*Distribution* : India : West Bengal, Bihar, Uttar Pradesh, Punjab, Rajasthan, Gujarat, Madhya Pradesh, Jammu & Kashmir, Kerala, Tamil Nadu, Andaman & Nicobar Isls., Pondicherry.

**48. *Phytoseius (Phytoseius)* sp.**

*Medicinal plants* : *Ocimum sanctum*, *Solanum melongena*.

*Distribution* : India : West Bengal.

**49. *Typhlodromus (Amblydromella) darjeelingensis* Gupta**

1986. *Typhlodromus (Amblydromella) darjeelingensis* Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*. p. 270-272.

*Medicinal plants* : *Mangifera indica*, *Psidium guajava*.

*Distribution* : India : Tripura, West Bengal, Punjab, Uttar Pradesh, Karnataka, Tamil Nadu.

**50. *Typhlodromus (Orientiseius) hadii* Chaudhri**

1965. *Typhlodromus hadii* Chaudhri, *Acarologia*, **7** : 632-633.

*Medicinal plant* : Brinjal.

*Distribution* : India : West Bengal.

**51. *Typhlodromus (Typhlodromus) communis* Gupta**

1980. *Typhlodromus communis* Gupta, *Entomologists' mon. Mag.*, **115** : 209.

*Medicinal plant* : *Mangifera indica*.

*Distribution* : India : West Bengal, Arunachal Pradesh, Karnataka, Tamil Nadu.

Family 12. ASCIDAE

**52. *Lasioseius* sp.**

*Medicinal plants* : *Tagetes erecta*, *Musa paradisiaca*.

*Distribution* : India : West Bengal.

*Fungivorous mites*

## Family 13. EUPODIDAE

53. *Eupodes sigmoidensis* Strandtmann & Goff

1978. *Eupodes sigmoidensis* Strandtmann & Goff, *Pacific Insects*, 19 : 123-124.

*Medicinal plants* *Mangifera indica*, *Musa paradisiaca*.

*Distribution* : India : West Bengal, Mizoram, Lakshadwip Isls., Sikkim. Elsewhere : Hawaii; Ivory Coast; Africa.

## Family 14. ACARIDAE

54. *Acarus* sp.

*Medicinal plant* : *Tagetes erecta*.

*Distribution* : India : West Bengal.

**SUMMARY**

This paper lists for the first time from West Bengal a total of 54 species of mites belonging to 27 genera under 14 families and 3 Orders occurring on various medicinal plants along with giving the names of medicinal plants on which they occur, their distribution and importance, if any, either as pests or predators.

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