



ISSN 0974-7907 (Online)
ISSN 0974-7893 (Print)

Journal of Threatened Taxa | www.threatenedtaxa.org | 26 April 2015 | 7(5): 7164–7167

DESCRIPTION OF A NEW SPECIES OF PREDATORY MITE (ACARI: PHYTOSEIIDAE: MESOSTIGMATA) FROM KERALA, INDIA

P.K. Sajna Haneef¹ & Mary Anithalatha Sadanandan²

^{1,2} PG & Research Department of Zoology, Malabar Christian College, Kozhikode, Kerala 673001, India
¹sajnahaneef@gmail.com (corresponding author), ²manithals@yahoo.co.in

OPEN ACCESS

Abstract: A study was conducted on the biodiversity of predatory acarines of several districts of northern Kerala. The study revealed the occurrence of a new species of predatory mite under the family Phytoseiidae from Palakkad District. The new species of predatory mite *Phytoseius alathurensis* is described with appropriate illustrations.

Keywords: India, Kerala, new species, Phytoseiidae, *Phytoseius*, taxonomy.

Abbreviations: Cf - Chelicera of female; DF - Dorsal view of female; L IV - Leg IV; Sp - Spermatheca; VF - Ventral view of female.

Mites belonging to the family Phytoseiidae have gained the attention of scientists being the potential predators of other harmful mites, small soft-bodied insects and their eggs (Evans 1992; Nomikou et al. 2001). The mites of the genus *Phytoseius* were found feeding on spider mites (Smith & Summers 1961) and exclusively on arachnids (Muma et al. 1961). Ribaga in 1904 erected the genus *Phytoseius* with *Gamasus plumifer* as its type

species (Canestrini & Fanzago 1876). The species under the genus *Phytoseius* are characterised by the retention of both setae z3 and s6, absence of setae Z1,S2,S4,S5 and Genu II with 7 setae (Chant & Murty 2007). Chant & Murty (1994) also recognized three species groups based on the presence or absence of setae J2 and R1; the *horridus* species group Denmark (1966) with setae J2 and R1 absent; the *plumifer* species group Chant & Yoshida-Shaul (1992a) with setae J2 and setae R1 present and the *purseglovei* species group Chant & Yoshida-Shaul (1992a) with setae J2 absent and setae R1 present.

The genus *Phytoseius* is distributed worldwide on all continents except Antarctica and from tropical to temperate zones. Normally, this genus does not occur above the tree-line in subarctic areas (Chant & Murty 2007). Major contribution in the taxonomy of this genus includes the research work of Muma & Denmark (1968,1970), Gupta (1977), Murty & Moraes (1991),



DATA DEFICIENT	LEAST CONCERN	NEAR THREATENED	VULNERABLE	ENDANGERED	CRITICALLY ENDANGERED	EXTINCT IN THE WILD	EXTINCT
DD	LC	NT	VU	EN	CR	EW	EX

Phytoseius alathurensis sp. nov.



DOI: <http://dx.doi.org/10.11609/JoTT.o3957.7164-7> | **ZooBank:** urn:lsid:zoobank.org:pub:82F332BA-AE40-404C-B938-C665128ED5D5

Editor: Matheus dos Santos Rocha, Universidade do Vale do Rio dos Sinos - UNISINOS, Brasil.

Date of publication: 26 April 2015 (online & print)

Manuscript details: Ms # o3957 | Received 05 March 2014 | Final received 01 April 2015 | Finally accepted 05 April 2015

Citation: Haneef, P.K.S. & M.A. Sadanandan (2015). Description of a new species of predatory mite (Acari: Phytoseiidae: Mesostigmata) from Kerala, India. *Journal of Threatened Taxa* 7(5): 7164–7167; <http://dx.doi.org/10.11609/JoTT.o3957.7164-7>

Copyright: © Haneef & Sadanandan 2015. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use of this article in any medium, reproduction and distribution by providing adequate credit to the authors and the source of publication.

Funding: Maulana Azad National Fellowship for Minority Students granted by UGC, Selection id-F1 - 17.1/2010/MANF-KER- 6532/ (SA –III/WEBSITE)

Competing Interest: The authors declare no competing interests.

Acknowledgements: The authors are grateful to the Principal and Management, Malabar Christian College, Calicut, for facilities provided. Thanks are also due to the invaluable support in confirming the species identification extended by Dr. S.K. Gupta, Emeritus Scientist (MOEF), Colleges under Calcutta University, West Bengal. The first author is thankful to UGC for the financial assistance provided in the form of Maulana Azad National Fellowship.



Walter (1992), Chant & Murty (1994), Yoshida-Shaul & Chant (1995), Chinniah & Mohanasundaram (2001), Furtado et al. (2005), Silva et al. (2013) and Demite et al. (2015) worldwide. From India, 31 species of *Phytoseius* were recorded. However, the reports on occurrence of new species are scanty from peninsular India. In continuation with our pioneering taxonomic studies on the family Phytoseiidae of Kerala a new species, *Phytoseius alathurensis* sp. nov. is hereby described and illustrated.

MATERIALS AND METHODS

The specimens under study were collected from infested parts of economically important plants by beating or shaking methods. Specimens were cleared in lactic acid and permanent slides were prepared using Hoyer's medium (Walter & Krantz 2009). Detailed structural studies and illustrations were made using Wild Leitz GMBH microscope. All measurements are given in microns. The classification system used is that of Chant & Murty (2007). The setal nomenclature is of Rowell et al. (1978) and Chant & Yoshida-Shaul (1992a) for the dorsal and ventral surfaces of the idiosoma, respectively. All measurements are given in microns (μm) and measurements of the holotype are shown in bold type followed by the mean and range in parenthesis.

All the type specimens are kept in the Department of Zoology, Malabar Christian College but eventually will be transferred to the National Zoological Collection of the

Zoological Survey of India, Kozhikode, Kerala.

Phytoseius alathurensis sp. nov. (Figs. 1–5)

urn:lsid:zoobank.org:act:909CDAC0-6D70-480C-B67A-9A56415C2BA3

Material examined

Holotype: No. P 50/3, 20.i.2012, female marked on slide along with other four females, Alathur, Palakkad District, Kerala, India, 108°38'32.9"N & 76°32'41.91"E, ex. *Dioscorea alata* L, 1753, coll. Sajna.

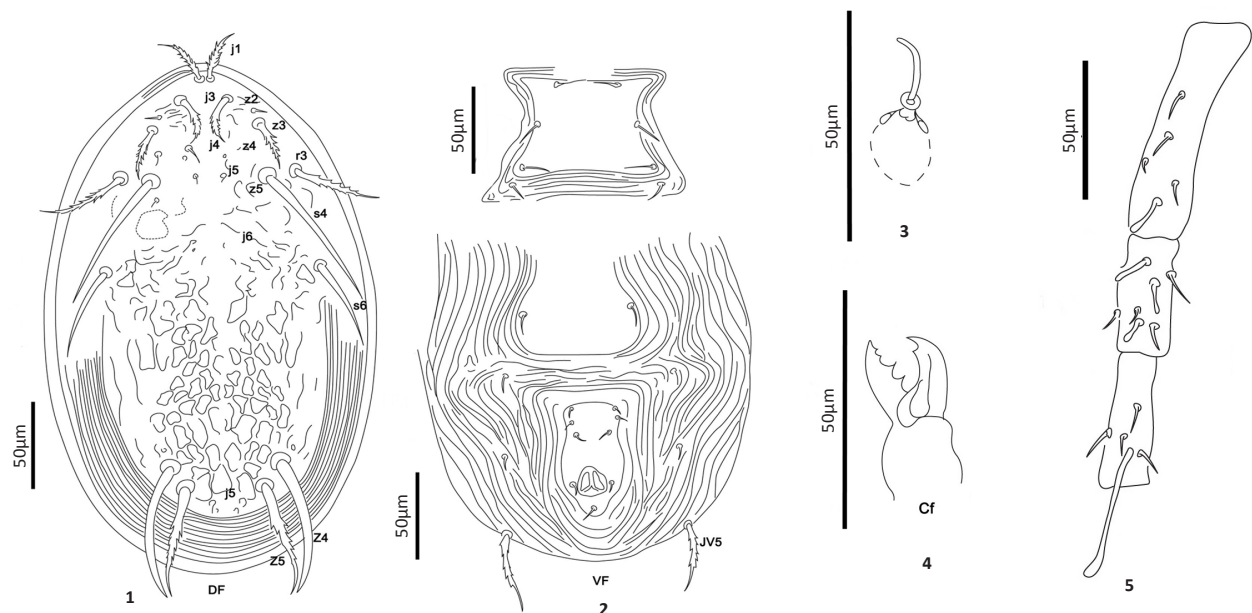
Paratype: Three paratype slides with 14 females, collection details same as holotype (No.P 50/2, 50/1, and P50/4).

DIAGNOSIS

Female

Dorsum: Dorsal shield rugose antero-laterally and medially, reticulated, with three pairs of lyrifissures. Shield 318 319 (317-319) long and 175 177 (175-177) wide. Setae **j1** 33 (30-33), **j3** 26 (24-28), **j4** 9 (9-11), **j5** 10(9-11), **j6** 10 (8-11), **J5** 10 (9-11), **z2** 10 (9-11), **z3** 31(31-33), **z4** 9 (9-11), **z5** 10 (9-10), **Z4** 82 (81-83), **Z5** 71 (70-73), **s4** 100 102 (100-103), **s6** 62 (60-63), **r3** 58 (56-58), Setae **j1**, **j3**, **z3** and **r3** thick and barbed. Setae **s4**, **s6**, **Z4** very thick, **Z5** thick and barbed.

Venter: Sternal shield indistinct measuring 55 54 (53-55) long and 65 63 (63-66) wide with three pairs of



Figures 1–5. *Phytoseius alathurensis* sp. nov. (female)
1 - Dorsal view; 2 - Ventral view; 3 - Spermatheca; 4 - Chelicera; 5 - Leg IV.

sternal setae (ST1, ST2 and ST3). Length of setae ST118 17 (17–18), ST218 18 (16–19), ST318 17 (16–18), ST513 14 (13–15). Distance between ST1-ST350 49 (50–53), ST2-ST251 50 (52–54). Genital shield smooth 70 70 (70–73) wide, distance between ST5-ST552 50 (50–53). Ventrianal shield pitcher-shaped 70 73 (70–73) long, 38 37 (36–39) broad, with three pairs of preanal setae (JV1, ZV2 and JV2). Length of JV1 10 9 (9–10), ZV2 10 8 (8–11), JV2 10 9 (8–11). Three pairs of opisthogastric setae on unsclerotised cuticle (JV5, ZVI and ZV3). Ventrianal setae smooth except JV5 48 46 (45–47), thick and barbed. Metapodal plate not visible.

Peritreme: Almost reaching level of j1 and curved inwards.

Spermatheca: Calyx pocular, 8 7(6–9) long, atrium small and nodulated.

Chelicera: Fixed digit on chelicerae 15 long with two sharp and two small teeth, movable digit 20 long with one sharp tooth, pilus dentilis not visible.

Legs: Macroseta present on leg IV, Setal lengths: SgeIV 15 16 (14–17), StiIV 55 56 52–58, StIV 28 28 (26–30). Lengths of legs: leg I 300, leg II 250, leg III 250, leg IV 433.

Leg chaetotactic formula: genu II: 2-2/0-2/0-1; tibia II: 1-1/1-2/1-1, genu III: 1-2/1-2/0-1; tibia III : 1-1/1-2/0-1.

Etymology: The nomenclature of this new species is based on the place Alathur of Palakkad district from where the specimen was collected.

Male

Unknown.

Habitat

Dioscorea alata L. (1753), Dioscoreaceae.

Remarks

This new species belongs to horridus group Denmark by the absence of setae J2 and r1, with dorsal setal patterns 12A: 3A and ventral pattern JV-3, 4: ZV (Chant & Murty 1994).

This species resembles *Phytoseius mixtus* Chaudhri (1973) but can be clearly differentiated by the following characters:

1. *P. alathurensis* sp. nov. differs from *P. mixtus* by having dorsal seta s4 and s6 smaller (s4 100µm versus 150µm; s6 60µm versus 90µm).

2. Fixed digit with 2 sharp and 2 small teeth in this new species whereas in *P. mixtus* 2–3 teeth on fixed digit

3. SgeIV 15µm long Leg IV genu with setae 15µm long whereas no macrosetae on genu IV in *P. mixtus*.

4. Structure of spermatheca differs in both the species.

5. This new species has three pairs of dorsal pores whereas it is absent in *P. mixtus*.

This new species is also seen related to *Phytoseius roseus* Gupta (1969) but differs distinctly in following characters:

1. *P. alathurensis* sp. nov. differs from *P. roseus* in having Z4 longer and thicker than Z5, in *P. roseus* both Z4 and Z5 are more or less of same length and thickness.

2. *Pilus dentilis* on fixed cheliceral digits absent, but it is present in *P. roseus*.

3. SgeIV present whereas absent in *P. roseus*.

4. The structure of spermatheca differ in both species.

5. Three pairs of dorsal pores is present whereas it is absent in *P. roseus*.

REFERENCES

- Canestrini, C. & F. Fanzago (1876). Nuovi acari Italiani, (Seconda Serie). *Atti Societa Veneto-Trentina di Scienza. Naturiai* 5: 130–142.
- Chant, D.A. & J.A.M. Murty (1994). A review of the subfamilies Phytoseiinae and Typhlodrominae (Acari: Phytoseiidae). *International Journal of Acarology* 20: 223–310; <http://dx.doi.org/10.1080/01647959408684022>
- Chant, D.A. & J.A.M. Murty (2007). *Illustrated Keys and Diagnoses for the Genera and Subgenera of the Phytoseiidae of the World* (Acari: Mesostigmata). Indira Publishing House, West Bloomfield, 220pp.
- Chant, D.A. & Yoshida-Shaul (1992a). A revision of the tribe Phytoseiini Berlese, with a world review of the *purseglovei* species group in the genus *Phytoseius* Ribaga (Acari: Phytoseiidae). *International Journal of Acarology* 18(1): 5–23; <http://dx.doi.org/10.1080/01647959208683924>
- Chaudhri, W.M. (1973). Description of 5 new species of the genus *Phytoseius* Ribaga from Pakistan (Acarina: Phytoseiidae). *Pakistan Journal of Zoology* 5(1): 79–86.
- Chinniah, C. & M. Mohanasundaram (2001). New species of acarine fauna (Acarina: Mesostigmata) from Shevroy Range of Eastern Ghats of Tamilnadu, India. *Zoos Print Journal* 16: 523–531; <http://dx.doi.org/10.11609/JoTT.ZPJ.16.7.523-31>
- Demite, P.R., P.R. Moraes, G.J. de Mc Murty, H.A. Denmark & R.C.Castillo (2015). Phytoseiidae Database. Available from : www.lea.esalq.usp.br/Phytoseiidae.
- Denmark, H.A (1966). Revision of the genus *Phytoseius* Ribaga, 1904 (Acarina: Phytoseiidae). *Florida Department of Agriculture & Consumer Services* 6: 1–65.
- Evans, G.O. (1992). *Principles of Acarology*. C.A.B. International, University Press, Cambridge, U.K., 563pp.
- Furtado, I.P., S. Kreiter., G.J. De Moraes., M.S. Tixier, C.H.W. Flechtmann & M. Knapp (2005). Plant mites (Acari) from Northeastern Brazil, with description of 2 new species of the family Phytoseiidae (Mesostigmata). *Acarologia* 45: 131–143.
- Gupta, S.K. (1969). Three new species of the genus *Phytoseius* (Acarina: Phytoseiidae) from India. *Israel Journal of Agricultural Research* 19 (3): 115–120.
- Gupta, S.K. (1977). New species and records of *Typhlodromus* and *Phytoseius* from Eastern India (Acarina: Phytoseiidae). *Indian Journal of Acarology* 2: 1–11.
- Murty, J.A & G.J. Moraes (1991). Two new Phytoseiidae (Acari: Mesostigmata) from Zimbabwe with new records of other species. *International Journal of Acarology* 17(1): 21–27; <http://dx.doi.org/10.1080/01647959108683924>

- [org/10.1080/01647959108683882](https://doi.org/10.1080/01647959108683882)
- Muma, M.H., A.G. Selhime and H.A. Denmark (1961).** An annotated list of predators and parasites associated with insects and mites of Florida citrus. *Florida Agricultural Experiment Station Bulletin* 634:1-39;
- Muma, M.H. & H.A. Denmark (1968).** Some generic description and new changes in the family Phytoseiidae (Acari: Mesostigmata). *Florida Entomologist* 51: 229–240.
- Muma, M.H. & H.A. Denmark (1970).** Arthropods of Florida and neighbouring land areas, Phytoseiidae of Florida. *Bureau of Entomological Contribution* 148: 1–5150.
- Nomikou, M., A. Janssen, R. Schraag & M.W. Sabelis (2001).** Phytoseiid predators as potential biocontrol agents for *Bemisia tabaci*. *Experimental and Applied Acarology* 25(4): 271–291; <http://dx.doi.org/10.1023/A:1017976725685>
- Ribaga, C. (1904).** Gamasidi Planticoli. *Rivista di Patologia Vegetale* 10: 175–178.
- Rowel, H.J., D.A. Chantand & R.I.C. Hansell (1978).** The determination of setal homologies and setal patterns on the dorsal shield in the family Phytoseiidae (Acarina: Mesostigmata). *Canadian Entomologist* 110: 859-876; <http://dx.doi.org/10.4039/Ent110859-8>
- Silva, G.L., M.S. Rocha & N.J Ferla (2013).** First new species of the *Phytoseius horridus* group (Acari: Phytoseiidae) described from Brazil, with a key to the Brazilian species of *Phytoseius*. *Zootaxa* 3681: 593.
- Smith, L.M. & F.M. Summers (1961).** The structure and biology of red spider predatory, *Hypoaspis macropilis* (banks). *Proceedings of the Entomological Society of Washington* 51: 209–218;
- Walter, D.E. (1992).** Leaf surface structure and the distribution of *Phytoseius* mites (Acari: Phytoseiidae) in South Eastern Australian forests. *Australian Journal of Zoology* 40(6): 593–603; <http://dx.doi.org/10.1071/ZO9920593>
- Walter, D.E. & G.W. Krantz (2009).** Collecting, rearing and preparing specimens, pp. 83–96. In: Krantz, G.W. & D.E. Walter (eds.). *A Manual of Acarology - 3rd Edition*. Texas Tech University Press.
- Yoshida-Shaul, E. & D.A. Chant (1995).** The Identity of *Phytoseius macropilis* (banks) (Acari: Phytoseiidae), with a note on its distribution. *Canadian Journal of Zoology* 73(7): 1199–1206; <http://dx.doi.org/10.1139/z95-143>

