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A new species of phytophagous Mite (*acari*: *eriophyidae*: *phyllocoptinae*) infesting timber yielding plant from sub himalayan region of India

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Abstract
During the general surveys for eriophyoid mites from the Sub Himalayan regions of India, a new species, *Tetra dalbergicola* n. sp. of the sub family Phyllocoptinae of the family Eriophyidae is found along the mid veins of the leaves of *Dalbergia sissoo* Roxb. (Papilionaceae). This new mite species is described and illustrated from the area of present study. A brief discussion on the genus *Tetra* is provided and a key to the Indian species of *Tetra* included. Relationships of new species with other eriophyoid species are also provided. This new mite species causes damage to this economically important timber yielding plant by its sap feeding habit and produces leaf rusting as a visible damage symptom. For proper control of the mite pest, the taxonomic study of this mite and their relation to the host plant is very much essential.

Keywords: Plant mite, new species, *tetra dalbergicola*, *eriophyidae*, taxonomy, leaf rusting, India

Introduction

The Acari comprising ticks and mites form one of the largest and biologically most diverse groups of Arachnida. Eriophyoids are highly specialized group of plant sucking mites (Shukla, 2021, Vervaet, 2021) [26, 27] and are considered as a serious pest throughout the world (Abdel-Khalek & Momen, 2022; Brown *et al.,* 2021) [1, 5]. They produce various damages to the plant parts and are responsible for transmission of viruses to the plant tissues during their feeding on them (Druciarek *et al*., 2019; Sarwar, 2020; Stephan *et al.*, 2008) [11, 24, 25]. A survey is conducted for these mites in two districts namely Malda and Dakshindinajpur of West Bengal, India during the months of October and November, 2024. A detailed study of the collection made on *Dalbergia sissoo* yields a new species of the genus *Tetra* Keifer, 1944 (See Keifer 1944) from the sub Himalayan region of India. *Dalbergia sissoo* is commonly known as shisham or sissoo is one of the most important timbers yielding plant species of India. It is a large deciduous tree widely distributed on riverine beds in sub-Himalayan tract from Indus to Assam and Himalayan valleys. It grows abundantly and forms a forest, either pure or mixed with other species on the new alluvium formed of deposits of sand, boulders etc., in the riverbeds of these regions.

In 1944, Keifer erected the genus *Tetra* to hold phyllocoptine rust and vagrant mites based on the type species *concava* Keifer, 1939. (See Keifer 1939; Keifer 1944). The species of this genus is characterized by having fusiform body; obliquely down gnathosoma; scapular tubercles on or near the rear shield margin with posteriorly projecting scapular setae; dorsal opisthosoma always with a wide middorsal longitudinal furrow and ventral opisthosoma with usual series of setae; coxal plates and legs with all setae present (Amrine *et al*., 2003) [3]. According to a working Catalog of the Eriophyoidea of the World, Version 1.0 - The Catalog of the *Eriophyidae* by Joel Hallan (biocat@ccms.net) as of 2024, 11 species of the genus *Tetra* are known to exist in India. However, based on morphological differences from other closely related species, a new species *Tetra dalbergicola* n. sp. has been discovered through analysis of specimens collected from the area of present study. As a result of this study, 12 species of *Tetra* have now been identified in India's Phyllocptine fauna.

Materials and Methods

Eriophyoid mites are examined with the help of hand-lens (30X) on infested plants parts. The infested shoots of plants are collected and placed in individual polythene bag. These bags are then brought to the laboratory. The collected plant parts are duly labeled and herbaria are also prepared for their identification. To prevent the damage caused by desiccation or fungal degradation mite-infested fresh plant samples are brought to the laboratory as soon as possible. They are not exposed to heat to avoid moisture accumulation within the bags and contained in plastic bags are stored in a cooler. In order to keep the material fresh, the sample are wrapped in damp (not wet) paper towel, then sealed in a plastic bag, preventing it from drying out, and stored in a refrigerator. Fine holes are punched in the plastic bag to reduce humidity whenever necessary. The plant samples are examined under stereomicroscope within a short time to confirm whether there is infestation of mites or not. With the aid of the stereomicroscope the mites are picked up from the infested leaves with the help of a needle and placed onto a grooved slide containing Kono's fluid (Jepppson *et al*., 1975). The slide is then kept on a hot plate having temperature of 40ºC and cooked enough to clear the mites. Upon being cleared enough, the mites are mounted in Hoyer's medium after a bath in the same medium. The ingredients of Kono's mixture are chloral hydrate 100 g, Glycerin 10 g, water 50ml, concentrated HCI 1 ml. The mites are studied under a Leitz Dialux 20 microscope with provision for phase illumination. Camera lucida drawings were prepared using a built-in draw tube type prism camera lucida attached to the microscope. The morphological terminologies and abbreviations used here were given by

Lindquist (1996) [19], and the generic classification system followed is that of Amrine *et al*. (2003) [3].
Measurements were taken at (10 x 100X) magnification and strictly under phase contrast using an ocular micrometer. Sixty nine specimens, including the holotype are measured. The following measurements are taken during this study: i) width of body of the mite : maximum width just behind rear prodorsal shield margin, ii) length of body: distance from the anterior tip of the prodorsal shield to the posterior end of the body, iii) length of shield: distance from the tip of anterior lobe to rear prodorsal shield margin, iv) width of prodorsal shield: maximum width along rear shield margin, v) length of gnathosoma: length from base of proximal segment to end point of terminal segment, vi) length of legs: distance from base of trochanter to the tip of tarsus, vii) length of epigynum: maximum width across mid transverse line, viii) length of seta: distance from the socket to its tip. All measurements are taken as de Lillo *et al.* (de Lillo *e.t al.* 2010) [10] recommended and are given in micrometres (µm) referring to the length unless specified otherwise. In the text, measurements of holotype are followed by the range of measurements of the paratypes in parentheses. Slides after being properly labeled with all relevant data are stored suitably. The slide bearing the type specimen has been deposited in the Entomology Research Unit (A Biosystematics Research Unit Maintained by Zoological Survey of India, a national depository), Serampore College of University of Calcutta, Serampore, 9, William Carey Road, West Bengal, India. Registration of this new species in Zoobank account (see urn:lsid:zoobank.org:pub:90861D6F-4973-4C6C-A423-299E0BD6B6B1.) is done properly and a Zoo Bank LSID has been generated.

Result
Based on morphometric studies descriptions of the new species are discussed here to erect the new species of the genus *Tetra* and relation to the host plant is also mentioned here. The etymology of the new name of the species is given following the Nomenclature Rules of International Code of Zoological Nomenclature.
Taxonomic description of new species*: Tetra dalbergicola* n. sp. on *Dalbergia sissoo*
ZOO Bank LSID: urn:lsid:zoobank.org:pub:90861D6F-4973-4C6C-A423-299E0BD6B6B1
Tetra bengalensis Sarkar, 2011 (See Sarkar S, 2011 [23], P.106) Invalid name, a thesis name.
Female (holotype and 68 specimens): Body 235.2 (177.3-266.0) long, 65.3 (63.4-65.3) wide, elongated wedge shaped, creamy white in colour.
Gnathosoma- 20.5 (20.5-21.2) long, curved down, seta *ep* 3.7 (2.8-3.7) dorsal pedipalp genual seta d absent, seta *v* 5.6 (5.1-5.6) long (Figs. 1A-LM, 1B- AD).
Prodorsal- shield- (Fig. 1B-AD) 37.3 (34.5-37.3) long, 49.4 (48.4-49.4) wide with a small shield lobe; prodorsal shield shows numerous broken curve lines and granular texture, postero lateral region of prodorsal shield shows thumb impression like sculpture of loop shaped, median line obscure, admedian line complete but broken at posterior end, submedian lines diagonal, broken and incomplete; dorsal tubecles 4.6 (3.8-4.6) long, placed on rear shield margin, pointing backward and outward and 21.4 (20.3-21.4) apart, scapular seta *sc* 10.2 (10.2- 11.2).
Opisthosoma (Fig.1A- LM)- with 64 (58-64) micro tuberculted dorsal annuli and 78 (73-78) microtuberculeted ventral annuli; micro tubercles rounded and located on annular line; micro tubercles on dorsal annuli are larger than that of ventral annuli; last 9 ventral annuli have micro striation, opisthosoma bears dorsal longitudinal trough flanked on either side by ridge, seta *c2* 53.2 (53.2-57.8) long on annulus 12 (12-14), seta *d* 68.1 (67.2-68.1) long on annulus 27 (27-29); seta *e* 53.2 (51.3-53.2)long on ventral annulus 28 (28-37) from posterior end; seta *f* 20.5 (20.5-21.2) long on ventral annulus 7 from posterior end ; seta *h1* (Fig. I- PV) 3.7 (3.7-4.6), seta *h2* 57.8 (57.8-59.7) long.
Leg I- (Fig. 1C) from base of trochanter 37.3 (36.5-37.3) long; femur12.1 (11.2-12.1) long, with basiventral femoral seta *bv* 9.3 (9.3-10.2); genu 3.7 (3.7-4.1) with antaxial genual seta *l*" 22.4 (22.4-28.0); tibia 3.7 (3.7-4.1) long, with paraxial tibial seta *l*' 6.5 (5.6-7.4); tarsus 6.5 (5.6-6.5) long; two identical tarsal setae-paraxial fastigial tarsal setae *ft*' and antaxial fastigial tarsal seta *ft*" 19.6 (18.6-19.6) long; paraxial unguinal tarsal seta *u*' 3.7 (2.8-3.7) long, tarsal solenidion ω slightly curved, non-knobbed and 4.6 (4.1-4.6) long, 7 rayed tarsal empodium *em* 5.6 (5.6-6.5) long (Fig. 1E); femur I has transverse striations (Fig. IC -L I).
Leg II- (Fig. 1D) from base of trochanter 33.6 (33.6-34.4) long; femur 12.1 (11.2-12.1) long, with basiventral femoral seta *bv* 11.2 (11.2-14.0);genu 4.6 (3.7-4.6) with antaxial genual seta *l*" 7.4 (6.5-7.4); tibia 2.8 (2.8-3.7) long, without paraxial tibial seta *l*'; tarsus 6.5 (5.6-6.5) long, paraxial fastigial tarsal seta *ft*' 18.6 (17.4-18.6), antaxial fastigial tarsal seta *ft*" 7.4 (6.5-7.4), paraxial unguinal tarsal seta *u*' 3.7 (2.8-3.7), tarsal solenidion ω almost straight, non-knobbed and 9.3 (8.4-9.3) long, 7 rayed tarsal empodium *em* (Fig. 1F) 9.3 (8.4-9.3); femur II have transverse striations (Fig. 1D-L II)
Coxal-genital Region- (Fig. 1G- CG) Coxae I- 12.1 (11.2-12.1) long and broadly jointed but no sternal line, at each bases of the coaxae I there are 4 wavy parallel dotted lines extended from 1a tubercles to 1b tubercles, seta 1b 4.6 (4.6-5.5) long and present on antero-lateral margin of coxae I, coxal surface ornamented with dotted lines; 1a tubercles with seta present a little ahead of line across the 2a tubercles with seta; seta 1a 10.2 (10.2-11.2) long; Coxae II- ornamented with many dotted lines embracing the coxal breadth and 10.2 (9.1-10.2) long, seta 2a 16.8 (15.8-16.8) long.
Epigynum- 14.0 (13.0-14.0) long, 21.4 (20.5-21.4) wide; assumes the shape of pearl oyster's shell with two lateral and one posterior notches, anterolateral region of the epigynum extends out into two fan like transverse processes which have 3 lateral scorings, epigynum has also 5 longitudinal scorings (Fig. 1G- CG) ; seta *3a* 26.1 (25.-26.1) long.
Internal genitalia of female (Fig. 1H-IG) - shows distinct gonopore and two rounded spermathecal pouch with a short spermathecal tube.
Male: Not observed
Type Locality: India: West Bengal: Malda, Englishbazar (25° 0' 39.0276" N and 88° 8' 27.9528" E.)

Material Examined
Holotype: Female (marked) on slide (no.1425/78/2024), India: West Bengal: Malda, Englishbazar, 14.x.2024 from *Dalbergia sissoo* Roxb. (Papilionaceae) Coll. S. Sarkar.

Paratypes: 16 females on slide bearing holotype and 52 females on 5 slides (nos1426-1430/78/2024); collection data same as in holotype.

Explanation of the Text Figure

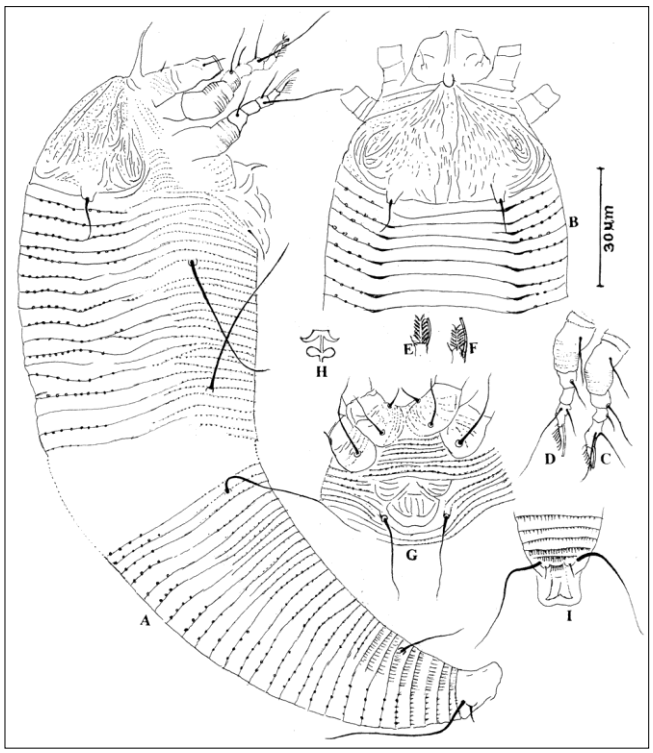

Fig 1: *Tetra dalbergicola* n. sp., holotype, 1425/78/2024, A- Lateral mite (LM); B- Antero-dorsal mite (AD); C- Leg I (L1); D- Leg II (L2); E- Tarsal empodium of LI (em); F- Tarsal empodium of LII (em); G- Coxal-genital region (CG); H- Internal genitalia, female. (IG); I- Postero- ventral mite (PV)

Discussion

Differential diagnosis: A working Catalog of the Eriophyoidea of the World. Version 1.0 - The Catalog of the *Eriophyidae* by Joel Hallan (biocat@ccms.net) reflects that, as of 2024, under the genus *Tetra* Keifer, 116 species, including 11 from India are known (Amrine & de Lillo, personal electronic data; Amrine *et. al*., 2003; Chakrabarti *et. al.* 1981; Chakrabarti & Roy 1980; Das and Chakrabarti 1994; Ghosh *et al*, 1984; Mohanasundaram 1984; Mohanasundaram 1983; Mohanasundaram 1988 [3, 6, 7, 9, 12, 20, 22]; Channabasavanna 1966).

In possessing weak lines in prodorsal shield, the new species is close to *T. cercocarpi* Keifer, 1948 (See Keifer 1948) [17], *T. puerariae* Barke and Davis, 1971(see Barke and Davis, 1971) [4], *T. magnolifoliae* Keifer, 1966 (See Keifer 1963) but differs from them by having 7 rayed tarsal empodium. In terms of the common host plant the new species comes close to *T. sissoae* Mohanasundaram, 1988 (See Mohanasundaram 1988) [22] by having similar broken lines on prodrsal shield, triangular shape of female genitalia, granular coxal surface and in location and direction of scapular seta. In both the species tarsal solenidion on leg II is almost double in length than that of Leg I. In spite of these similar features the new species can be differentiated from *T. sissoae* by having 7 rayed tarsal empodium, presence of prominent seta *h1*, microtuberculated dorsal annuli, transverse dotted lines on both coxae and by presence of transverse curved parallel lines on femur of both legs. The unique features of this new species are microtuberculated dorsal annuli, scorings on femur and 7 rayed tarsal empodium.

Relation to host: Mites are found along the mid vein of the leaf causing rusting of leaves.

Etymology: The specific epithet '*dalbergicola'* derived from '*Dalbergia*' genus of the host plant, '*cola'* from Latin '*Colus'* meaning dwelling in or inhabitant.

Key to the Indian species of Tetra Keifer (female)

1. Tarsal empodium with more than 7 rays……2
- Tarsal empodium with 7 or less than7 rays……...4
2. Dorsal tubercles with bases transverse, setae directed outwardly caudad, tarsal empodium 8-rayed; on *Bridellia stipularis* …… *brideliae* Das & Chakrabarti
- Dorsal tubercles with bases divergently caudad, setae directed caudad, tarsal empodium with less than 8-rayed……..3
3. Prodorsal shield with median line; epigynum with longitudinal scorings only; on *Bauhinia purpurea* …… *Bauhinae* Channabasavanna
- Prodorsal shield without median line; epigynum with two basal lines in addition to longitudinal scorings; on Tephrosia perpura…….*Tephrosiae* Mohanasundaram
4. Tarsal empodium with 4 rays; surface of epigynum smooth; on *Anisomelis* sp…….*anisomelae* Mohanasundaram.
- Tarsal empodium with more than 4 rays; surface of epigynum with scorings……..5
5. Tarsal empodium with 6 rays…….6
- Tarsal empodium with 5 rays ……7
6. Prodorshal shield wide; median line present; on *Casia fistula* ……..…… *Cassiae* Das & Chakrbarti
- Prodorshal shield narrow; median line absent; on Desmodium trifolium ……...*Triflorae* Das & Chakrbarti
7. Epigynum with transvers scorings and basal granulations; on Shorea robusta…… *Shoreacola* Das & Chakrbarti
- Epigynum with longitudinal scorings and without basal granulations……8
8. Prodorshal shield with median line absent; on *Lannea coromandelica*……. *Lanneansis* Chakrbarti *et al.*
- Prodorshal shield with median line present…… 9
9. Prodorshal shield with median line incomplete, absent anteriorly, coxal surface granulated;… ……10
- Prodorshal shield with complete median line dividing the prodorsal shield pattern in half; coxal surface smooth; on Aegle mermelose……*Aeglis* Ghosh *et al*
10. Eepigynum with 5 longitudinal scorings and tarsal empodium 5- rayed; on *limonia* sp…….*Limonis* Ghosh *et al*
- Eepigynum with 5 longitudinal scorings, tarsal empodium with more than 5 rays …….11
11. Seta h1 absent; dorsal annuli smooth; base of the femur smooth……*sissoo* Mohanasundaram
- Seta *h1*present; dorsal annuli microtuberculated; transverse curved parallel lines present on femur of both legs……...*dalbergicola* n. sp.

Conclusion

Through this study a new species of eriophyoid mite is added to the World Eriophyoid diversity. This species is important in terms of its pest status. *Dalbergia sissoo* is very important timber yielding plant in sub Himalayan region of India. This mite pest causes serious damage to the foliage and hampers growth and nutrition of young plants. This finding may be helpful to the forest entomologist to save the trees from the effect of phytophagous mite.

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References

1. Abdel-Khalek AA, Momen FM. Biology and life table parameters of *Proprioseiopsis lindquisti* on three eriophyid mites (Acari: Phytoseiidae: Eriophyidae). Persian Journal of Acarology,2022:11(1):59-69. https://doi.org/10.22073/pja.v11i1.68574
2. Amrine JW Jr, Stasny TA. Catalog of the Eriophyoidea (Acarina: Prostigmata) of the world. Indira Publishing Houses; Michigan, 1994, 798.
3. Amrine JW Jr, Stasny TA, Flechtmann CHW. Revised keys to world genera of Eriophyoidea (Acari: Prostigmata). Indira Publishing Houses; Michigan, 2003, 244.
4. Barke HE, Davis R, Hunter PE. Some Eriophyid mites occurring in Georgia with description of four new species. Jour. Georgia Entomol. Soc.,1971:6(3):157-169.
5. Brown MS, Blubaugh CK, Chong JH. Biology and management of eriophyid mites in turfgrass. Journal of Integrated Pest Management,2021:12(1):25. http://dx.doi.org/10.1093/jipm/pmab020.
6. Chakrabarti S, Roy A. A new genus and two species of eriophyid mites (Acarina : Eriophyoidea) from West Bengal. - Ind. Jour. Acarol.,1980:4(2):55-61.
7. Chakrabarti S, Ghosh B, Mondal S. New and little known eriophyid mites (Acarina : Eriophyoidea) from India. - Orient. Insects,1981:15(2):139-144.
8. Channabasvanna GP. A contribution to the knowledge of Indian eriophyid mites (Eriophyoidea: Trombidiformes: Acarina), University of Agricultural Sciences, Hebbal, Bangalore, 1966, 132.
9. Das B, Chakrabarti S. Four new species of phyllocoptine mites (Acari: Eriophyoidea) from northeast India with a discussion on Genus *Tetra* Keifer and Key to Indian Species. Acarologia,1994:35(4):335-344.
10. de Lillo E, Craemer C, Amrine JW Jr, Nuzzaci G. Recommended procedures and techniques for morphological studies of Eriophyoidea (Acari: Prostigmata). Experimental and Applied Acarology,2010:51(1–3):283–307.
11. Druciarek T, Lewandowski M, Tzanetakis. A new, sensitive and efficient method for taxonomic placement in the Eriophyoidea and virus detection in individual eriophyoids. Exp Appl Acarol,2019:78(2):247–61.
12. Ghosh B, Mondal S, Chakrabarti S. Four new species of eriophyid mites (Acarina : -344- Eriophyoidea) from West Bengal, India. - Entomon,1984:9(3):231-237.
13. Jeppson LR, Keifer HH, Baker EW. Mites Injurious to EconomicPlants. Univ. Calif. Ber. Los. Arg. London., 1975, 614pp.
14. Hallan J. A Working Catalogue of the Eriophyoidea of the World. Version 1.0. The Catalogue of the Eriophyidae. (last accessed 01.03.2025], 2024.
15. Keiffer HH. Eriphyid studies II. Bull. Calif. Dept. Agr.,1939:27:301-323.
16. Keiffer HH. Eriophyid Studies XIV. - Bull. Calif. Dept. Agri.,1944:33(1):18-38.
17. Keifer HH. Eriophyid Studies XIX. - Bull. Calif. Dept. Agri.,1948:41(2):65-74.
18. Keiffer HH. Eriophyid Studies B-21. - Bur. Ent., Calif. Dept. Agri., 1966, 1-24.
19. Lindquist EE. External anatomy and notation of structures. In: Lindquist E.E., Sabelis M.W. & Bruin J. (Eds.), Eriophyoid mites: their biology, natural enemies and control. World Crop Pests, Vol. 6, Elsevier Science Publishers, The Netherlands, 1996, 3–31.
20. Mohanasundaram M. India eriophyid studies IV. Record of phyllocoptine mites (Phyllocoptinae: Eriophyidae : Acarina) from South India. - Acarologia,1983:24(1):14-35.
21. Mohanasundaram M. New eriophyid mites from India (Acarina: Eriophyoidea). - Oriental Insects,1984:18:251-283.
22. Mohanasundaram M. The Eriophyid fauna of Varanasi with description of two new species of *Tetra* (P. 385-389). In: ChannaBasavanna G.P. and Viraktamath C.A. (eds.)., Progress in Acarology, Vol. 1, Oxford & IBH (Publ.), 1988, 523.
23. Sarkar S. Eriophyoid mites (Acari) of Malda and Dakshin Dinajpur of west Bengal, India, 2011, 106-108.
24. Sarwar M. Mite (Acari acarina) vectors involved in transmission of plant viruses. Applied Plant Virology Elsevier, 2020, 257-273. http://dx.doi.org/10.1016/B978-0-12-818654-1.00020-7
25. Stephan D, Moeller I, Skoracka A, Ehrig F, Maiss E. Eriophyid mite transmission and host range of a Brome streak mosaic virus isolate derived from a full-length cDNA clone. Archives of Virology,2008:153:181–185. https://doi.org/10.1007/s00705-007-1065-3
26. Shukla A. Mites. Polyphagous Pests of Crops, 2021, 409-455.
27. Vervaet L, De Vis R, De Clercq P, Van Leeuwen T. Is the emerging mite pest *Aculops lycopersici* controllable? Global and genome-based insights in its biology and management. Pest Management Science,2021:77(6):2635-2644. https://doi.org/10.1002/ps.6265.