Zoosymposia 22: 241–241 (2022)
https://www.mapress.com/j/zs

Abstract

ISSN 1178-9905 (print edition)
ZOOSYMPOSIA
ISSN 1178-9913 (online edition)

https://doi.org/10.11646/zoosymposia.22.1.143
http://zoobank.org/urn:lsid:zoobank.org:pub:98731054-5A8B-4D4D-8F21-DCBBCFD6FE15

Exploring the diversity and host association of tarsonemid mites in West Bengal, a highly biodiverse state of Eastern India*

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**In*: Zhang, Z.-Q., Fan, Q.-H., Heath, A.C.G. & Minor, M.A. (Eds) (2022) *Acarological Frontiers: Proceedings of the XVI International Congress of Acarology (1–5 Dec. 2022, Auckland, New Zealand)*. Magnolia Press, Auckland, 328 pp.

The family Tarsonemidae is an extremely diverse assemblage of heterostigmatid mites which include phytophagous, fungivorous, detriphagous, algivorous and insect parasitic species living in various terrestrial, arboreal, subcortical or nidicolous habitats. Many of these mites pose a serious threat to global agriculture due to their direct feeding on crop plants or indirect transmission of disease-causing bacterial or fungal spores to healthy plants. For instance, *Polyphagotarsonemus latus* may reproduce year-round in all tropical and subtropical habitats and feed on more than 60 different plant families. *Steneotarsonemus* species, such as *S. spinki* and *S. subfurcatus*, attack rice and can significantly reduce the harvest, *S. ananas* attacks pineapple, and *S. laticeps* targets lilies. In temperate forests of the Northern Hemisphere, several *Tarsonemus* species phoretic on curculionid beetles transfer lethal fungal spores on healthy pine trees, while some other species pose a real hazard to cultivated mushrooms and stored products.

The study of tarsonemid mites in India has intensified in the latter half of this decade, and the description of various new species and their host associations has led to a realistic overview of the diversity of tarsonemids in India as well as their potential to disrupt Indian agriculture and forests. The majority of the recent discoveries were made in the state of West Bengal, which is a biodiverse corridor between central and eastern India with six distinct agroclimatic zones, ranging from temperate hills to humid coastal habitats. A total of 32 species of tarsonemid mite species are reported from India of which 20 are recorded from West Bengal accounting for 62.5% of Indian tarsonemid mites. The Northern Hill Zone of West Bengal situated amidst the Eastern Himalayan mountain range contains a high diversity of *Steneotarsonemus*, *Fungitarsonemus*, *Daidalotarsonemus* and *Floridotarsonemus* species. Recent discoveries from the same region of West Bengal include the addition of the new genus *Bongotarsonemus*, and first discovery of *Ceratotarsonemus bengalicus* from the Asian continent. Studies on host plant association established the presence of *S. subfurcatus* and *S. spinki* in the rice sheath in various West Bengal habitats, but *S. furcatus* was only found to infest weed hosts, but not rice, in contrast to the reports from the new world. Additionally, the ratio of *S. subfurcatus* and *S. spinki* was found varying based on climate and soil conditions. In West Bengal and other regions of Eastern India, research is still being performed to learn more about the diversity and host relationships of tarsonemid mites.

Keywords: Taxonomy, Diversity, Tarsonemidae, Eastern India, Heterostigmata

Submitted: 17 Oct. 2022; Accepted by Zhi-Qiang Zhang: 21 Oct. 2022; published: 30 Nov. 2022