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Species-richness in the Oriental fungus-feeding thrips of the genus *Azaleothrips* (Thysanoptera, Phlaeothripidae)

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Abstract

Azaleothrips, a phlaeothripine genus of fungus-feeding species, is presumably endemic to the Oriental Region between India and Japan. Although only 10 species have been known in this genus until now, a total of 35 species is recorded here, of which 26 are newly described: from Indonesia—*A. bali* sp.n., *A. bulelengi* sp.n., *A. dentatus* sp.n., *A. dorsalis* sp.n., *A. floresi* sp.n., *A. inflavus* sp.n., *A. simulans* sp.n., *A. sulawesicus* sp.n., from the Philippines—*A. apoensis* sp.n., *A. bifidius* sp.n., *A. luzonensis* sp.n., *A. mindanaoensis* sp.n., *A. philippinensis* sp.n., from Taiwan—*A. atayal* sp.n., *A. formosae* sp.n., *A. taiwanus* sp.n., from Thailand—*A. flavicollis* sp.n., *A. phuketanus* sp.n., *A. pulcher* sp.n., *A. toshifumii* sp.n., from Vietnam—*A. laocai* sp.n., *A. vietnamensis* sp.n., from W. Malaysia—*A. malaya* sp.n., *A. reticulatus* sp.n., *A. richardi* sp.n., *A. templeri* sp.n. In addition *A. magnus* Chen, described from Taiwan, is newly synonymized with *A. moundi*. *Azaleothrips laevigatus*, described from southern Japan, is newly recorded more widely in Southeast Asia. A key to 33 species is provided, but *A. bhattii* and *A. lineus* cannot be recognized because of the poor information in the original descriptions.

Key words: Fungus-feeding, Thysanoptera, Phlaeothripidae, *Phlaeothrips*-lineage, *Amphibolothrips* genus-group, *Azaleothrips*, new species

Introduction

The fungus-feeding phlaeothripine thrips fauna of tropical and subtropical Asia is probably very rich. Unfortunately, the Thysanoptera fauna of most of this region is still insufficiently investigated, though there have been extensive studies on it from some parts of India (Ananthkrishnan & Sen 1980), the Philippines (Reyes 1994) and Japan including the subtropical Ryukyu and Ogasawara Islands (Okajima 2006). In the early 20th century, before World War II, some European authors, such as Bagnall, Karny and Priesner, described many thrips taxa from some parts of this region, but most of those studies are now unreliable. As pointed out by Mound and his colleagues in their Australian phlaeothripid papers (Mound 2008; Mound *et al.* 2013), many taxa had also been described based on low quality, as well as a low quantity of specimens in the early studies on Asian thrips, and it is very difficult to observe detailed character states of such taxa. Description of taxa based on low quality specimens in low quantities can cause various problems. For example, observation of surface structure on unmacerated specimens is often impossible, and cover slip pressure can greatly change the proportions of the body and head of a thrips specimen. From a species described based on few or single specimens we cannot understand its intraspecific variation as well as its distribution. As a result, there have been many poorly defined genera and species, and these increase the difficulty of further studies. Moreover, the specimens described in the early studies were collected from limited areas, such as Java, Sumatra and Peninsular Malaysia. In recent years, the present authors and their colleagues have accumulated many specimens from Southeast Asia through repeated investigations. Amongst these collections are more than 1500 slide-mounted specimens representing the genus *Azaleothrips*.

The genus *Azaleothrips* is presumably endemic to Asia between India and Japan, and it may be a member of the *Phlaeothrips*-lineage (Dang *et al.* 2014). Until now, only 10 fungus-feeding species have been listed in this genus, of which four were described from India, two from Thailand, one from Japan and Taiwan, and one each from Indonesia, Japan and Taiwan. Species of this genus are commonly found living on dead branches, and sometimes on the prop roots of Banyan trees. Most of the species seem to have somewhat limited distributions, but one species described from northern Thailand, *lepidus*, was recorded recently from Australia (Mound *et al.* 2013). Moreover, another species described from southern Japan, *laevigatus*, is here newly recorded from a wide range of tropical and subtropical Southeast Asia. At present it is unknown why the difference in such a distribution patterns arises.

The objective of this paper is to demonstrate the species-richness of the genus *Azaleothrips*, and to provide an identification key to the 33 species including 26 newly described species based on a long series of recently collected specimens.

among reticles, tuberculate along reticles at posteromedian portion. Cheeks convex, distinctly narrowed at base. Compound eyes about 0.3 times as long as head. Postocular setae about half the length of eyes. Antennal segments VII and VIII closely fused; segment IV a little shorter than segment III; segment III with two (1 + 1), segment IV with four (2 + 2) sensoria. Pronotum (Fig. 158) distinctly sculptured with reticles, tuberculate along reticles at posteromedian portion; with 29 short setae in holotype. Basantra present, but very weak. Mesonotum (Fig. 159) with small dentate microtrichia or tubercles along transverse lines of sculpture, almost smooth among lines. Metanotum (Fig. 159) entirely with polygonal reticulations, with delicate wrinkles among reticles; anterior half with 9 short setae in holotype. Fore tarsus unarmed. Fore wing with 7/7 duplicated cilia in holotype. Pelta distinctly reticulate, almost smooth among reticles. Abdominal tergites entirely distinctly reticulate, but somewhat weak at middle (Figs 160–161); tergites III to VII with dentate microtrichia along striae; interdistance of posterior pair of wing-retaining setae on tergite IV about 110 microns in holotype; tergite IX with 8 short setae at middle; S1 setae on tergite IX longer than half the length of tube; S2 setae on tergite IX expanded at apex. Tube about two-thirds the length of head. Anal setae much longer than tube.

Measurements (holotype female in microns). Distended body length 1750. Head length 192, width across cheeks 188. Compound eye dorsal length 53. Pronotum length 138, width 236. Fore wing length 630. Tube length 123, width across base 59. Antenna length 335, segments III–VIII length (width) as follows: 50 (29), 47 (27), 45 (25), 43 (24), 35 (21), 25 (16). Postocular setae 25–27. S1 setae on tergite IX 65–70, S2 setae on tergite IX 75–78. Anal setae 166–170.

Male macroptera. Color and structure very similar to holotype female. Body somewhat paler; head about 1.1 times as long as wide; fore tarsus unarmed; fore wing with 6/7 duplicated cilia; pore plate on abdominal sternite VIII distinct, but narrow at middle; S2 setae on abdominal tergite IX expanded at apex.

Measurements (paratype male in microns). Distended body length 1470. Head length 167, width across cheeks 150. Compound eye dorsal length 52. Pronotum length 113, width 190. Fore wing length 530. Tube length 785, width across base 50. Antenna length about 300, segments III–VIII length (width) as follows: 47 (26), 42 (25), 42 (23), 40 (23), 31 (22), 20 (15). Postocular setae 25. S1 setae on tergite IX 33, S2 setae on tergite IX 52–54. Anal setae 135–140.

Specimens examined. Holotype female macroptera: **Vietnam**, Ninh Thuan Prov., Lam Son District, Root 27 (Pass 1), 23.viii.2007 (SO).

Paratype: **Vietnam**, 1 male, collected with holotype.

Non-paratypic specimen. Thailand: **Thailand**, Saraburi, on dead leaves and branches, 10.ix.1991 (TN & SO).

Remarks. This new species belongs to the *moundi* group. The entirely reticulate head and metanotum of this species is shared with *reticulatus*, described above from West Malaysia. However, it can be distinguished from *reticulatus* by the shorter head proportion, convex cheeks and longer median pair of setae (S1) on the abdominal tergite IX. Moreover, the distance between right and left wing-retaining setae is much wider in this species. A non-paratypic male collected from Thailand listed above cannot be distinguished satisfactorily from this species.

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