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Acanthaleyrodes elevatus sp. n. (Hemiptera: Aleyrodidae) from India, with key to species and discussion of tuberculate setae

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Abstract

The genus *Acanthaleyrodes* Takahashi is reported for the first time from India. *Acanthaleyrodes elevatus* sp. n. is described from *Bridelia retusa* in Kerala, India, with a key to puparia of *Acanthaleyrodes* species. The new species differs in its exceptionally elevated eighth abdominal tergite, circular vasiform orifice and eight pairs of subdorsal setae. The generic characteristics of *Acanthaleyrodes* are redefined and distinguished from those of *Tuberaleyrodes* Takahashi. *A. styraci* Takahashi is re-described in detail with illustrations of puparia and immatures from Hong Kong. A lectotype puparium is designated for *A. callicarpae* Takahashi. The development of tuberculate setae is discussed, in whitefly puparia and earlier nymphal instars, and considered to be subject to environmental modification.

Key words: *Acanthaleyrodes*, *callicarpae*, *styraci*, new species, India, Hong Kong

Introduction

Until now, the genus *Acanthaleyrodes* has comprised two species, *A. callicarpae* and *A. styraci*, both described from the eastern Palearctic Region by Takahashi (1931, 1942 respectively). Since then, the genus has not been studied in any depth. Puparia of an undescribed species of this genus were collected from the Adivaran forests of Calicut (India: Kerala), this being the first record of the genus from India. Further examination of slide mounted puparia and scanning electron microscope study has led us to redefine the generic diagnosis. The new species described here differs from both of the *Acanthaleyrodes* species already described in the very elongate tubular elevation of the dorsal cuticle of the eighth abdominal segment on which the vasiform orifice opens (Figs 1, 7, 8, 11, 23, 24).

Takahashi (1931) described *A. callicarpae* from *Callicarpa formosana* and *Mallotus* sp. from Taiwan, and Young (1944) recorded the same species from *Rubus* sp. in Szechwan (China). The puparia from Szechwan had 16 pairs of long spines and 9 median tubercles (2 cephalothoracic + 7 abdominal). Young noted that the number of long dorsal spines is reduced from 16 pairs in third instars to 12 pairs in fourth nymphal instars. This included a pair of small setae on the cephalothorax and first abdominal segment, and 10 pairs of long setae along the lateral margin. Our observation of the third (Fig. 19) and second instar (Fig. 42) nymphs indicates that the development of tuberculate setae on the cephalus and eighth abdominal segment begin in second instar with a slight elevation of dorsal cuticle. During this same stage, the sockets are formed in which dorsal setae are fixed and continue to develop in third instars. In the fourth instar (puparium), the cuticular elevation extends dorsally to produce the tuberculate setae. The subdorsal setae are arranged in a row and are simple and smaller in the third instar.

Studies on *A. elevatus* sp. n. confirm that: the dorsal setae are much smaller in the third instar than in the 4th instar; none of the pupal cases or third instars had as many as 32 setae (the count for *A. callicarpae*) and the large median tubercles were absent in all the developing instars. The puparia Young determined as *A. callicarpae* possibly represent an undescribed species which differs from *A. callicarpae* in the following characters: cephalic, first abdominal and eighth abdominal setae short and not placed on elevated tubercles; median tubercles absent on

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