

First record of a whitefly, *Asialeyrodes euphoriae* Takahashi 1942 (Hemiptera: Aleyrodidae) from India

Anil Kumar Dubey* and Lakshmi Kousalya

Zoological Survey of India, M-Block, New Alipore, Kolkata, India.

email: anil.2kd@gmail.com

Abstract

Asialeyrodes euphoriae Takahashi, found infesting an unidentified shrub in the South Andaman, is the first record to the Indian fauna of whitefly. Puparia of the *A. euphoriae* are broadly oval in shape, have complete submarginal furrow, and found on the both surface of the leaves.

Keywords: Aleyrodidae, *Asialeyrodes*, new species, Nicobar Island, *tuberculata*, India

Introduction

Whiteflies are phloem sap-sucking insects belonging to the insect order Hemiptera. A few of them are pest and vectors of viruses causing diseases to plants. There are 1707 species in 197 genera known from the world and 497 species from India. Of these, the whitefly genus *Asialeyrodes* Corbett, 1935 is represented from the Oriental and Australian regions. It was first reported from the Andaman Islands through description of *Asialeyrodes nicobarica* Dubey, 2019. Recently, *Asialeyrodes euphoriae* Takahashi, 1942 is discovered on an unidentified shrub in the South Andaman, Andaman and Nicobar Islands. The species was described by Takahashi from Thailand in 1942 and unknown from elsewhere till now. After resurrection of the genus *Icfrealeyrodes* Dubey and Sundararaj, 2006 and transfer of a few *Asialeyrodes* species to *Icfrealeyrodes*, only seven species (including the *A. euphoriae*) are now known under *Asialeyrodes* from India. A brief description with diagnostics of *A. euphoriae* is given here with microscopic photographs.

Materials and Methods

A survey was conducted in the Chidiyatapu, South Andaman, Andaman and Nicobar Islands for collection of whiteflies. An unidentified plant infested with puparia of *Asialeyrodes euphoriae* Takahashi was collected A4 size paper envelopes. The collection locality is marked on the map using Google Map (Figure 1). Puparia were detached from leaves and preserved in 95% ethyl alcohol for nearly one month, and then slide mounted following method of Dubey and David (2012). Puparial morphological terminology is as in Bink-Moenen (1983), Martin (1985) and Gill (1990). Measurements were taken for 10 puparia. Auto-montage images of habitus was taken using a Leica made microscope M205 A. A compound microscope Olympus BX 43 was used for measurements and imaging from the Hemiptera Section, Zoological Survey of India, New Alipore, Kolkata. The determined slides are deposited in the National Zoological Collection, Zoological Survey of India, Kolkata.

Taxonomy

Systematic classification

Phylum: Arthropoda von Siebold, 1848

Class: Insecta Linnaeus, 1758

Order: Hemiptera Linnaeus, 1758

Suborder: Sternorrhyncha Amyot & Serville, 1843

Infraorder: Aleyrodomorpha Chou, 1963

Family: Aleyrodidae Westwood, 1840

Subfamily: Aleyrodinae Westwood, 1840

Asialeyrodes euphoriae Takahashi, 1942

(Figs 2–5)

Puparium. Creamy white to brown, median area dark brown; with secretion of little wax on dorsal surface; oval (Figs 2, 3); broadest from metathorax to abdominal segment III; not constricted at thoracic tracheal pore opening areas, tracheal pores not indicated at the margin; male and female puparia differ in size; female 1967–2193 μm long, 1686–1844 μm wide; male 1444–1521 μm long, 1130–1260 μm wide; found singly on both surface of leaves, more in number on the lower surface, 1–9 puparia per leaf.

Margin: Crenulate (Fig 4), 6–7 crenulations in 0.1 mm; not invaginated at caudal and thoracic tracheal openings and not forming deep pore.

Dorsum: Tuberculate. Submargin broad, nearly equal to the half width of the dorsal disc; narrow submarginal area with irregular dorsal plates. Dorsal disc differentiated from the submargin by a prominent submarginal furrow intersecting the caudal furrow area. The median length of abdominal segment VII shorter than the segment VIII. Longitudinal and transverse moulting sutures reaching submarginal furrow. Intersegmental sutures reaching submedian area. Submedian pockets and depressions present. A longitudinal row of tubercles present on submedian area near termination of abdominal segment sutures. The distance between vasiform orifice and the caudal pore opening five times the length of the vasiform orifice. Thoracic tracheal furrows

absent; caudal tracheal furrow present. Pore/porettes pairs present, two rows on submedian area and many scattered on subdorsum and submargin. Pockets discontinuous.

Vasiform orifice: Triangular (Figure 5), posterior and lateral margins with transverse plates; female 87–97 μm long, 74–76 μm wide; male 71–80 μm long, 65–67 μm wide; operculum subcordate, covering half the length of the orifice, female 36–40 μm long, 56–57 μm wide; male 32–33 μm long, 45–46 μm wide; lingula exposed, triangular, female 17–20 μm long, male 13–14 μm long; a pair of setae placed subapically.

Venter: Thoracic and caudal tracheal folds present, filled with stipples. Paired ventral eighth abdominal setae present, 12–14 μm long, 64–78 μm apart. Antennae reaching base of mesothoracic legs in female, 411–141 μm long, reaching parallel to apex of metathoracic legs in the male. Adhesive pads and spiracles visible.

Chaetotaxy: Anterior marginal setae 22 μm long. Posterior marginal setae broken. Cephalic setae 11–14 μm long; eighth abdominal setae cephalolaterad to the vasiform orifice, 11–14 μm long; caudal setae present; the first abdominal and submarginal setae absent.

Material examined. India: Andaman and Nicobar Islands, South Andaman, Chidiyatapu, 27 puparia on 15 slides, 25-iii-2022, A. K. Dubey and L. Kousalya (Registration No. In ZSI, Kolkata 15361/H15 to 15366/H15; deposited in ZSI, Kolkata); 8 puparia on 5 slides, on an unidentified tree seedling, 7-10-2022, A. K. Dubey and L. Kousalya (deposited in ZSI, Kolkata).

Host plants: Unidentified tree seedling.

Distribution. INDIA: Thailand (Takahashi, 1942); Andaman and Nicobar Islands (new record).

Remarks: Puparia of this species doesn't fit well in the genus *Asialeyrodes* in lacking the first abdominal setae, thoracic tracheal pore openings and in the shape of vasiform orifice. Further study is required to evaluate placement of this species in *Asialeyrodes*. The male puparia are smaller than female and have longer antennae, reaching apex of metathoracic legs.



Figure 1. Map showing type locality of *A. euphoriae*



Figure 2. *A. euphoriae*, habitus on leaf.



Figure 3. *A. euphoriae*, puparium.



Figure 4. *A. euphoriae*, margin.

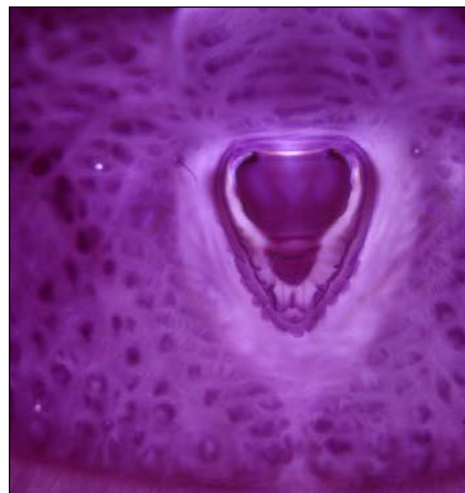


Figure 5. *A. euphoriae*, vasiform orifice.

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References

- Bink-Moenen, R.M. 1983. Revision of the African whiteflies (Aleyrodidae), mainly based on a collection from Tchad. *Monografieën Nederlandse Entomologische Vereniging*, **10**: 1–210.
- Corbett, G.H. 1935. Malayan Aleurodidae. *Journal of the Federated Malay States Museums*, **17**: 722–852.
- David, B.V. and Dubey, A.K. 2006. Whitefly (Hemiptera: Aleyrodidae) fauna of Andaman and Nicobar Islands, India with description of a new species. *Entomon*, **31**(3): 191–205.
- Dubey, A. K. 2019. *Asialeyrodes nicobarica* sp. nov. (Hemiptera: Aleyrodidae) from the Nicobar Island, located in the Indian part of the Sundaland hotspot, and two new synonymies. *Zootaxa* 4674 (4): 439–450.
- Dubey, A.K. and David, B.V. 2012. Collection, preservation and preparation of specimens for taxonomic study of whiteflies (Hemiptera: Aleyrodidae). In: David, B.V. (Ed.), *The whiteflies or mealywing bugs: biology, host specificity and management*. Lambert Academic Publishing, Germany, pp. 1–19.
- Dubey, A.K. and Sundararaj, R. 2006. *Icfrealeyrodes indica*, a new genus and species of whitefly (Hemiptera: Aleyrodidae) from India. *Entomon*, **31**: 125–128.
- Gill, R.J. 1990. The morphology of whiteflies. In: Gerling, D. (Ed.) *whiteflies: their bionomics, pest status and management*. Andover: Intercept, pp.13–46.
- Martin, J.H. 1985. The whitefly of New Guinea (Homoptera: Aleyrodidae). *Bulletin of the British Museum (Natural History) (Entomology)*, **50**: 303–351.
- Takahashi, R. 1942. Some foreign Aleyrodidae (Homoptera) VI. Species from Thailand and Indo-China. *Transactions of the Natural History Society of Formosa*, **32**: 204–216.