Table 1. Physico-chemical parameters of sea water collected from seaweeds cultivated site at Ervadi

Month	pH	Salinity (ppt)	Dissolved oxygen (ml/l)	Phosphate (µg/l)	Nitrate (µg/l)	Nitrite (µg/l)	Temperature (°C) Air	Water
October 2005	8.03	32	1.48	1.54	0.16	0.21	24	27
November 2005	8.01	32	1.48	1.81	0.21	0.37	25	24
December 2005	8.10	27	2.28	0.81	0.04	0.23	27	28
January 2006	7.80	29	1.03	1.30	0.10	0.38	33	29
February 2006	7.92	27	3.84	–0.24	1.82	0.17	33	32
March 2006	8.10	28	1.00	1.27	1.50	0.13	31	28
April 2006	7.90	28	1.02	1.48	0.90	0.2	32	28

followed by a complete decay, indicating its short life span. Temporary loss of *G. acerosa* or *K. alvarezii* crops could be either because of their competitive interaction with *S. pumila* for space, light and nutrients and/or due to some chemical exudates from *S. pumila*. Future study needs greater focus on the chemical, functional and behavioural aspects of the seaweeds and sponges that infect them.

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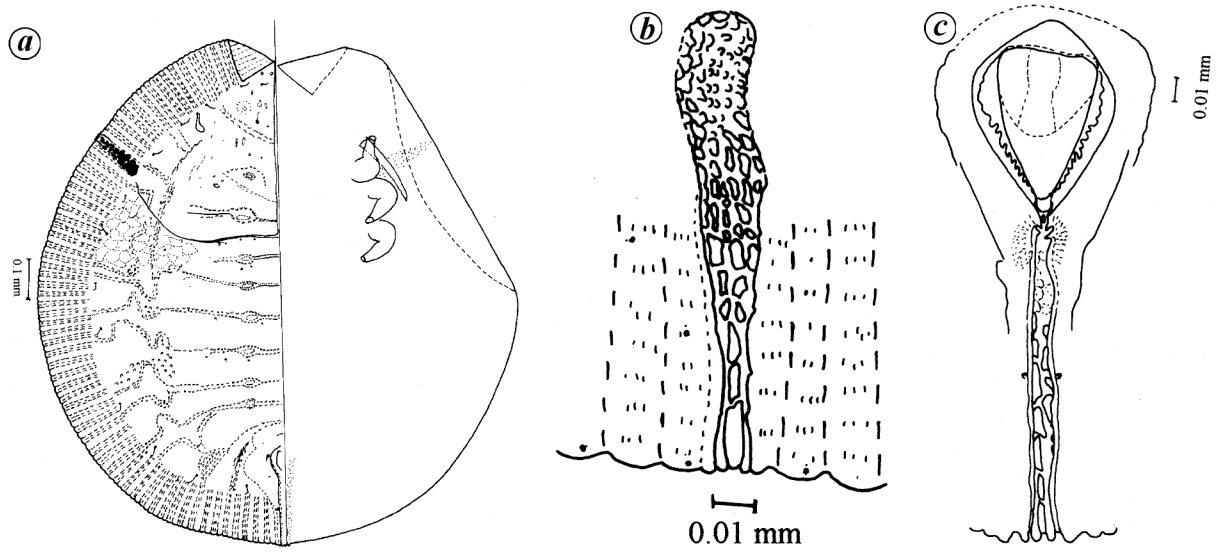
Rutaleyrodes atalantiae, a new genus and species (Hemiptera: Aleyrodidae) from India

The family Aleyrodidae (whiteflies) includes small inconspicuous phytophagous bugs often overlooked on the lower surface of leaves. They rank among the least studied group despite their importance as pests of agricultural, horticultural and forestry crop plants and their potential to transmit plant disease-causing viruses. The whitefly taxonomy is exclusively based on the fourth nymphal instar (so-called 'pupal case'), and use of puparia rather than adults for identification is well discussed by Martin[1]. The whitefly subfamily Aleyrodinae is represented in India by 57 genera, with majority of them from the Western Ghats. While studying the whiteflies of these ghats, *Rutaleyrodes* gen. nov. is described to accommodate a new species that differs from *Aleurolobus* Quaintance & Baker in the absence of a submarginal furrow, deeply invaginated thoracic tracheal combs giving it a pouch-like appearance and in the presence of tubercles on it; open type of vasiform orifice, and merging place of vasiform orifice and caudal furrow with inwardly directed lateral projections.

Rutaleyrodes Dubey and Ko gen. nov.

Type species: *Rutaleyrodes atalantiae* Dubey and Ko, sp. nov.

Diagnosis: Puparia black with waxy secretion. Margin crenulate; submarginal area not separated from dorsum by suture. Eye-spots present. Thoracic and caudal tracheal combs present. Thoracic tracheal furrows tuberculate, pouch-like. Cephalic, first abdominal, eighth abdominal and caudal setae present. A row of submarginal setae present. Longitudinal molting suture reaching margin; transverse molting suture reaching near thoracic tracheal furrows on submarginal area. Tubercles present throughout dorsum, rhachises in continuation of segment sutures. Vasiform orifice trilobed, open-type, posterior end with inwardly directed lateral projections; operculum subtriangular, lingula concealed. Tracheal folds not indicated. Stipples present.



Figures 1 *a–c*. *Rutaleyrodes atalantiae* sp. nov., Dubey and Ko, fourth instar. ***a***, Dorsal and ventral view; ***b***, Tracheal pore area; ***c***, Vasiform orifice.

Etymology: Named after host plant family, Rutaceae.

Remarks: The new genus differs from *Aleurolobus* Quaintance & Baker in (1) the absence of a submarginal furrow, (2) presence of tubercles in the thoracic tracheal furrows, (3) inwardly directed lateral projections near the base of the vasiform orifice, (4) vasiform orifice is open-type, having an open channel with a caudal furrow. It also differs from *Tetraleurodes* Cockerell in the following characters: (1) presence of thoracic tracheal combs with teeth, (2) absence of distinct submarginal furrow, (3) vasiform orifice not elevated, (4) open-type of vasiform orifice, (5) trilobed eighth abdominal segment; from *Aleuroduplidens* Martin in the following characters: (1) marginal tooth not notched in glandular openings, (2) extended thoracic tracheal furrow with tubercles in it, (3) open type of vasiform orifice, (4) thoracic tracheal folds not arising from large circular glands, (5) presence of stipples in tracheal folds; from *Psudaleuroplatus* Martin in the following characters: (1) thoracic and caudal tracheal combs indicated as comb of three teeth, (2) first abdominal setae not placed close to median area, (3) subcordate vasiform orifice, (4) open channel at posterior end of vasiform orifice with lateral ridges, (5) dorsal tubercular gland absent at base of each tooth, (6) presence of caudal furrow.

Rutaleyrodes atalantiae Dubey and Ko, sp. nov. (Figures 1 *a*–3 *d*).

Puparium: Black, with colourless wax secretion, found singly on the lower as well as upper surface of leaves, widest across the second and third abdominal segments; 1.35 to 1.44 mm long, 1.21 to 1.35 mm wide. Margin crenulate, 6 to 8 crenulations in 0.1 mm. Thoracic and caudal tracheal pores differentiated from margin with a comb of three distinct teeth. Anterior and posterior marginal setae absent.

Dorsum: Submargin not separated from dorsal disc by furrow. Submargin with broken lines made up of granules. Submedian pockets with depressions present on all segmental sutures. Minute tubercles on subdorsum forming rhachises. Median length of abdominal segment VII shorter than VIII. Thoracic tracheal furrows tuberculate, pouch-like; caudal tracheal furrow not pouch-like, with polygonal markings. Dorsum with scattered pores and porettes. Eye-spots reniform. Vasiform orifice subcordate, 74 to 102 μm long, 82 to 118 μm wide; operculum subcordate, 60 to 76 μm long, 60 to 76 μm wide. Lingula concealed. Inner wall of vasiform orifice with ridges.

Chaetotaxy: Four pairs of hook-like setae each with distinct bases; cephalic and first abdominal setae 18 μm long, eighth abdominal setae 12 μm long; caudal setae arising laterad of caudal furrow on submarginal area. Submargin with a row of 13 pairs of setae, each 26 μm long.

Venter: Paired ventral abdominal setae 2 μm long, 60 μm apart. Thoracic and caudal tracheal folds not indicated. Stipples present. Antennae reaching more than half length of mesothoracic legs and outside.

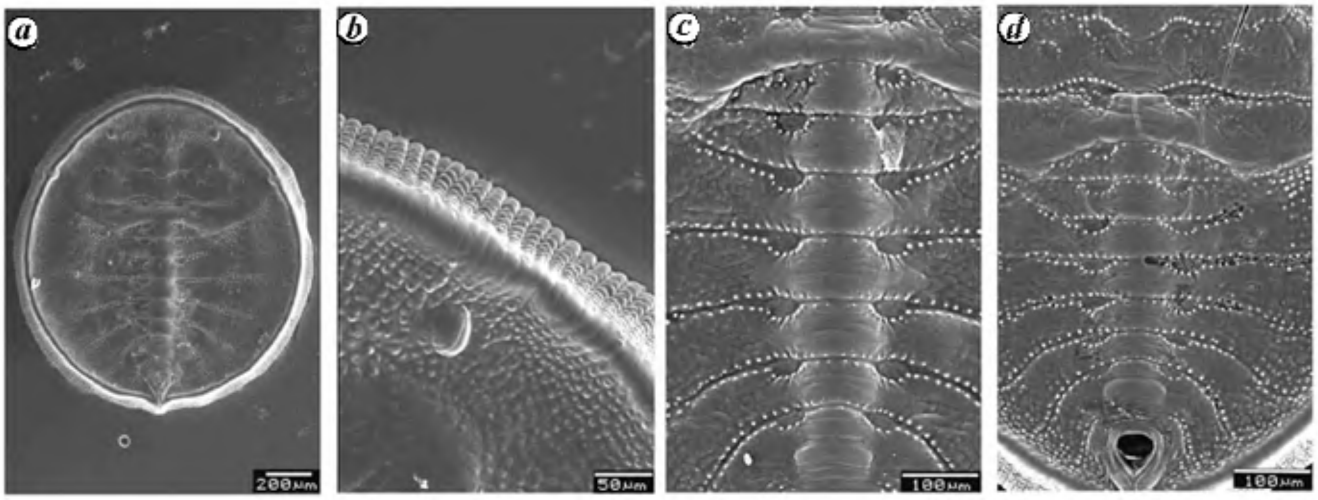
Material examined: Holotype puparium, India: Tamil Nadu: Chennai (13.04°N, 80.17°E), on *Atalantia racemosa*, 16-v-2004, A. K. Dubey, deposited in the collections of National Taiwan University, Department of Entomology, Taiwan. Paratypes, 28 puparia, data same as for holotype. Paratypes, 77 puparia, India: Tamil Nadu: Amaravathi (10.25°N, 76.52°E), on *Atalantia racemosa,* 28-v-2005, A. K. Dubey. (One paratype each deposited in the collections of the Australian National Insect Collection, CSIRO Entomology, Canberra, ACT, Australia; The Natural History Museum, London, UK; California Department of Food and Agriculture, Sacramento, USA; Indian Agricultural Research Institute, New Delhi, India; National Museum of Natural History, Tel Aviv University, Israel; National Taiwan University (NTU), Taipei, Taiwan; Staatliches Museum für Tierkunde, Dresden, Germany; the US Department of Agriculture, Beltsville, Maryland, USA (Sternorrhyncha collections of the United States National Museum of Natural History, Washington DC); Zoological Museum, Universitetsparken, Department of Zoology, Copenhagen, Denmark and Zoological Survey of India, Kolkata.

Etymology: Named after the host plant genus, *Atalantia*.

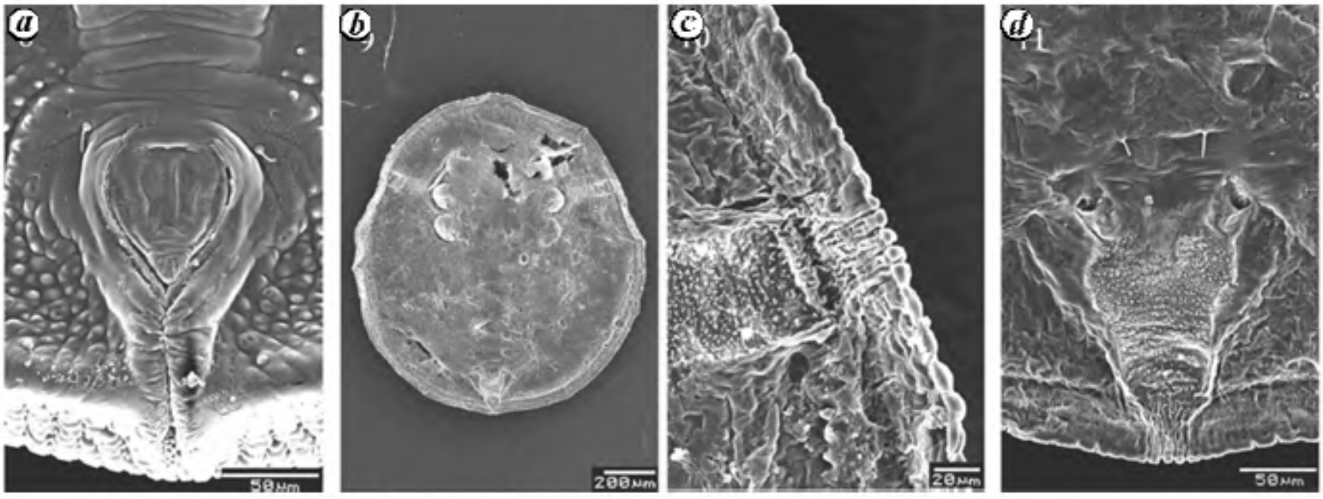
Host plant: *Atalantia racemosa* (Rutaceae).

Distribution: India: Tamil Nadu.

Comments: The host plant family (Rutaceae) is known to be infested by 25 whitefly species in India and description



Figures 2*a–d*. *R. atalantiae* sp. nov., Dubey and Ko, fourth instar: ***a***, Dorsal view; ***b***, Submarginal area; ***c***, Subdorsal area; and ***d***, Vasiform orifice.



Figures 3*a–d*. *R. atalantiae* sp. nov., Dubey and Ko, fourth instar: ***a***, Ventral view; ***b***, Antenna and foreleg; ***c***, Thoracic tracheal fold, and ***d***. Caudal tracheal fold.

of the new genus *Rutaleyrodes* forming a new record for this host plant family. We believe this genus may be a close relative of *Aleurolobus* Quaintance & Baker. Sexual dimorphism is observed in this species, i.e. the antennae of male puparia are longer (229 μm) than female (176 μm); however, the male puparia were smaller in size than female puparia. This species shows affinities with two *Aleurolobus* species, viz. *A. subrotundus* Silvestri and *A. olivinus* (Silvestri) in having wider submargin. *A. subrotundus* has distinct longer submarginal setae protruding beyond the margin of the puparium. In *A. olivinus*, submargin is clearly separated from the dorsum and thoracic tracheal pores lacking tubercles. The new species differs from the preceding species in having tubercles in tracheal pores, open-type of vasiform orifice and submargin not separated from the dorsum.

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