



## Description of a new species of genus *Fippataleyrodes* Sundararaj & David, 1992 (Hemiptera: Aleyrodidae) from Karnataka, India with key to known species

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**ABSTRACT:** The whitefly genus *Fippataleyrodes* Sundararaj & David, 1992, is represented so far by seven species from India. One new species *Fippataleyrodes divyae* sp. nov. breeding on an unidentified plant from Karnataka state of India is described and illustrated in this paper. A key to the species of the genus *Fippataleyrodes* is given.

**Keywords:** *Fippataleyrodes divyae*, *bituberculata*, *indicus*, *litseae*, Hemiptera, Aleyrodidae

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### INTRODUCTION

The whitefly genus *Fippataleyrodes* was erected by Sundararaj & David (1992) with description of two species namely, *F. indica* Sundararaj and David *F. litseae* Sundararaj and David. Dubey and Sundararaj (2005) described three species namely, *F. cinnamomi* Dubey and Sundararaj, *F. multipori* Dubey and Sundararaj and *F. yellapurensis* Dubey and Sundararaj. Pushpa and Sundararaj (2008) added two new species namely, *F. bituberculata*, *F. rajmohani*. So far this genus is reported only from India and seven species are reported. In this paper, a new species is described and illustrated and accordingly, the total number of species has increased to 8 under this genus. A key to the species of the genus is given.

### Genus *Fippataleyrodes* Sundararaj & David, 1992

**Type species:** *Fippataleyrodes indica* Sundararaj & David 1992 *Reichenbachia*, **29(40)**: 15-20, by original designation.

**Diagnosis:** Pupal case elliptical; white, without wax secretion; margin irregularly crenulate; submargin not separated from dorsal disc and with a row of setae; submedian area with a row of papillae; thoracic tracheal pore, furrow, and fold absent; caudal pore end, furrow and some times fold indicated; longitudinal moulting suture reaching margin and transverse moulting suture reaching subdorsum. Vasiform orifice cordate; operculum similarly shaped, filling the orifice; lingula concealed.

### MATERIAL AND METHODS

Surveys were conducted to collect and identify the whiteflies breeding in different habitats of south India during the period 2010-2014. The whitefly infested leaves were collected from the host plants and they were kept in whitefly collection envelopes bearing all collection details. To study the detailed characters of the whitefly, permanent mounts of the puparia were prepared by following the method adopted by David and Subramaniam (1976). The best mounts were obtained from puparia from which adults have emerged and parasitised specimens were avoided. Observations, micro-measurements and camera lucida drawings were made by using Nikon Optiphot T-2 EFD (Japan) microscope. The types and other collections available in the Institute of Wood Science & Technology, Bangalore and the type specimens loaned from the different national depositories were consulted in determining the identity of the species. The holotype of the new species was deposited in National Forest Insect Collection, (NFIC-FRI 21943), Dehra Dun, India and the paratype was deposited in National Bureau of Agricultural Insect Resources (ICAR/NBAIR/ALD 4), Bangalore.

### 1. *Fippataleyrodes bituberculata* Pushpa and Sundararaj, 2008

*Fippataleyrodes rajmohani* Pushpa and Sundararaj 2008. *Hexapoda* 15(2): 83-87.

**Material examined:** Holotype: puparium on *Actinodaphne malabarica*, 24.x.06, Kerala: Thrissur, Coll. R. Sundararaj.

**Host Plant:** *Actinodaphne malabarica* (Pushpa and Sundararaj, 2008).

**Distribution:** India- Kerala: Thrissur (Pushpa and Sundararaj, 2008).

## 2. *Fippataleyrodes cinnamomi* Dubey and Sundararaj, 2005

*Fippataleyrodes cinnamomi* Dubey and Sundararaj, 2005. *Journal of Bombay Natural History Society*, 102(2): 204-207.

**Material examined:** Holotype: puparium on *Cinnamomum malabratrum*, 10.ix.2001, Karnataka, Coll. A.K. Dubey.

**Host Plant:** *Cinnamomum malabratrum* (Dubey and Sundararaj, 2005).

**Distribution:** India: Karnataka (Dubey & Sundararaj, 2005).

## 3. *Fippataleyrodes divyae* Revathi and Sundararaj sp. nov. (Figs. 1-7)

**Material examined.** Holotype puparium, INDIA: Karnataka: Jarakbandae, on Unidentified plant, 15.vi.2012, K.P. Divya (NFIC-FRI- 21943). Paratype, 1 puparia, data as for holotype (ICAR/NBAIR/ALD- 4).

**Etymology.** Named after its collector, Ms. K.P. Divya.

**Puparium:** White, without secretion of wax; oval, broadest at prothoracic region, 1.06 – 1.1 mm long, 0.7 - 0.74 mm wide; found singly on the under surface of leaves. Margin irregularly crenulate with fine projectons; thoracic tracheal pore areas not differentiated from margin while caudal tracheal pore region indicated by emargination. Anterior and posterior marginal setae 38  $\mu$ m and 40  $\mu$ m long respectively.

**Dorsum.** Dorsum completely tuberculated with of different sizes, fine tuberculation in between the large tubercles and along the segment sutures, median tubercles on abdominal segments I-VII distinct. Longitudinal moulting suture reaching margin and transverse moulting suture reaching subdorsum. Submedian pockets and depressions absent. Thoracic tracheal furrows indistinct, caudal tracheal furrow distinct with irregular marking, 130  $\mu$ m long and 8  $\mu$ m wide.

**Chaetotaxy:** Cephalic setae laciniate, 8–12  $\mu$ m long, pointed first abdominal setae, 8  $\mu$ m long, eighth abdominal setae 30 - 38  $\mu$ m long and caudal setae 42  $\mu$ m long. A pair of small stout setae on the submarginal area laterad of metathoracic segment, 12  $\mu$ m long distinct.

**Vasiform orifice:** Cordate, longer than wide, 62  $\mu$ m long, 60  $\mu$ m wide; operculum similarly shaped, 48–50  $\mu$ m long, 48–52  $\mu$ m wide, lingula concealed.

**Venter:** Paired ventral abdominal setae 26  $\mu$ m long and 42  $\mu$ m apart. Thoracic tracheal folds not indicated, caudal tracheal folds indicated without stipples. Antennae discernible. Spiracles visible at the base of legs.

**Host Plant:** Unidentified.

**Distribution.** India: Karnataka.

**Remarks:** This species is typical from all other known species of *Fippataleyrodes* Sundararaj & David by the absence of submarginal row of setae and by the presence of a pair of small stout setae on the submarginal area laterad of metathoracic segment.

## 4. *Fippataleyrodes indicus* Sundararaj and David, 1992

*Fippataleyrodes indicus* Sundararaj and David, 1992. *Reichenbachia*, 29 (40): 15-20.

**Material examined:** 6 puparia, on *Nothopegia* sp., 12.viii.2001, Kudremukh National Park, Coll. A.K. Dubey; 9 puparia, on *Litsea* sp., 9.viii.2001, Kulem, Coll. A.K. Dubey.

**Host Plants:** *Litsea* sp., *Nothopegia* sp. (Sundararaj & David, 1992).

**Distribution:** India: Tamil Nadu (Sundararaj & David, 1992); Goa, Karnataka (Dubey & Sundararaj, 2005).

## 5. *Fippataleyrodes litseae* Sundararaj and David, 1992

*Fippataleyrodes litseae* Sundararaj and David, 1992. *Reichenbachia*, 29 (40): 16 – 20.

**Material examined:** 10 puparia, on *Litsea* sp., 11.viii.2001, Kudremukh, Coll. A.K. Dubey.

**Host Plants:** *Litsea stocksii* (Sundararaj & David, 1992); *Ficus racemosa*, *Hydnocarpus alpina*, *Litsea glabrata*, *Rapanea wightiana* (Meganathan & David, 1994) *Litsea* sp. (Dubey & Sundararaj, 2005).

**Distribution:** India: Maharashtra (Sundararaj & David, 1992); Kerala (Meganathan & David, 1994); Karnataka (Dubey & Sundararaj, 2005).

## 6. *Fippataleyrodes multipori* Dubey and Sundararaj, 2005

*Fippataleyrodes multipori* Dubey and Sundararaj, 2005. *Journal of Bombay Natural History Society*, 102 (2): 204-207.

**Material examined:** Holotype puparium, on unidentified plant, 11.x.2002, Karnataka: Bandipur National Park, Coll. A.K. Dubey.

**Host Plant:** Unidentified (Dubey & Sundararaj, 2005).

**Distribution:** India: Karnataka: Bandipur National Park (Dubey & Sundararaj, 2005).

## 7. *Fippataleyrodes rajmohani* Pushpa and Sundararaj, 2008

*Fippataleyrodes rajmohani* Pushpa and Sundararaj 2008. *Hexapoda* 15(2): 83-87.

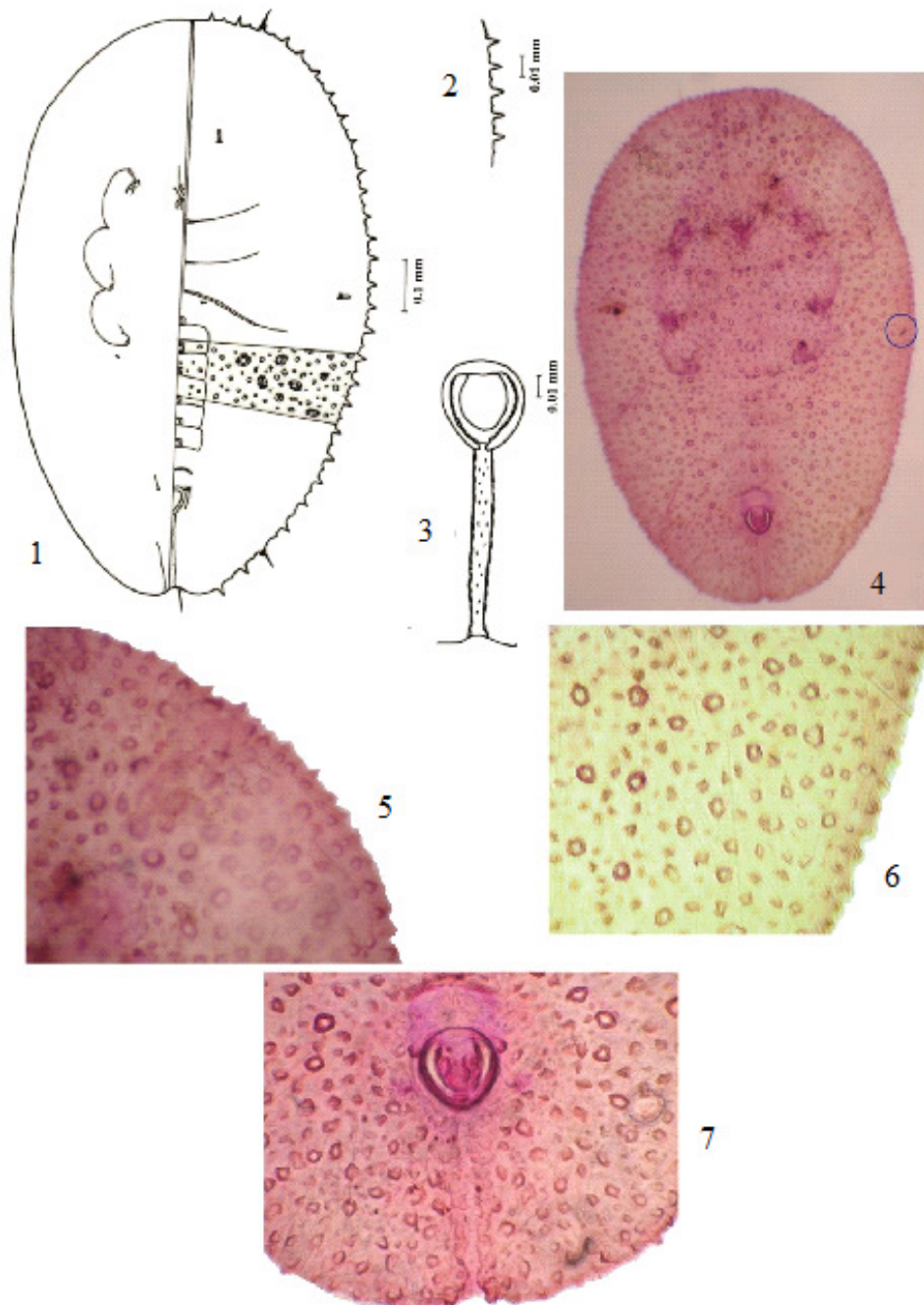
**Material examined:** Holotype: puparium on *Psidium guajava*, 06.xi.2006, Tamil Nadu, Coll. R.Pushpa.

**Host Plant:** *Psidium guajava* (Pushpa and Sundararaj, 2008).

**Distribution:** India: Tamil Nadu (Pushpa and Sundararaj, 2008).

## 8. *Fippataleyrodes yellapurensis* Dubey and Sundararaj, 2005

*Fippataleyrodes yellapurensis* Dubey and Sundararaj, 2005. *Journal of Bombay Natural History Society*, 102(2): 204-207.



**Fig. 1-7.** *Fippataleyrodes divyae* sp. nov. 1. puparium; 2. margin; 3. vasiform orifice; 4. puparium with small stout setae as marked; 5. margin with projections; 6. dorsum with different size tubercles; 7. vasiform orifice.

**Material examined:** Holotype: puparium on unidentified plant, 11.x.2001, Yellapur, Coll. A.K.Dubey.

**Host Plant:** Unidentified (Dubey & Sundararaj, 2005).  
**Distribution:** India- Karnataka: Yellapur (Dubey & Sundararaj, 2005).

**Key to the species of *Fippataleyrodes* Sundararaj & David**

1. Submargin without a row of tubercles, subdorsum without paired tubercles and caudal furrow without minute tubercles.....2  
 - Submargin with a row of tubercles, subdorsum with paired tubercles and caudal furrow with minute tubercles.....*bituberculata* Pushpa and Sundararaj
2. Submargin with a row of setae; a small stout setae on the submarginal area laterad of metathoracic segment present .....3  
 -Submargin without a row of setae; a small stout setae on the submarginal area laterad of metathoracic segment absent.....*divyae* sp. Nov
3. Abdominal segments without median tubercles; cephalic setae short 2-37.5 µm long.....4  
 -Abdominal segments with median tubercles; cephalic setae 98-304 µm long.....7
4. Submarginal setae pointed.....5  
 -Submarginal setae capitate.....6
5. A row of submedian papillae present; submargin with 12 pairs of setae; dorsum with distinct pores.....*multiporti* Dubey & Sundararaj  
 -A row of submedian papillae absent; submargin with 14 pairs of setae; dorsum without distinct pores.....*indica* Sundararaj & David
6. Submargin with 8 pairs of setae; caudal tracheal pore not indicated; vasiform orifice notched at caudal end; caudal furrow incomplete.....*cinnamomi* Dubey & Sundararaj  
 -Submargin with 13 pairs of setae; caudal tracheal pore indicated; vasiform orifice not notched at caudal end; caudal furrow complete.....*litseae* Sundararaj & David
7. Median tubercles on abdominal segments paired; submargin with papillae-like markings; submargin with

10 pairs of pointed setae, vasiform orifice not notched.....*rajmohani* Pushpa and Sundararaj  
 -Median tubercles on abdominal segments unpaired; submargin without papillae-like markings; subdorsum with 10 pairs of capitate setae, vasiform orifice notched.....*yellapurensis* Dubey & Sundararaj.

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