

ON THE GENERA *ASIALEYRODES* CORBETT AND *COCKERELLIELLA* GEN. NOV. FROM INDIA¹

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(With six text-figures)

A new species of *Asialeyrodes*, viz. *A. indica* sp. nov. (from Tamil Nadu: Coimbatore, Kerala: Ambalamedu, Maharashtra: Bombay) is described and illustrated. This is the first report of the genus from India. Five new species of the new genus are described and illustrated. *Cockerelliella* gen. nov. (from India): *Cockerelliella dioscoreae* sp. nov. (from Tamil Nadu: Munchirai); *C. indica* sp. nov. (from Tamil Nadu: Munchirai and Kunnathoor); *C. meghalayensis* sp. nov. (from Meghalaya: Nongkhalaw); *C. quaintancei* sp. nov. (from Kerala: Ambalamedu); and *C. zingiberæ* sp. nov. (from Tamil Nadu: Manalodai). Seven Malayan species described by Corbett in 1935 under the genus *Dialeurodes*, viz. *D. adinandrae*, *D. curcumae*, *D. kamardini*, *D. lumpurensis*, *D. psidii*, *D. rhodamniae* and *D. sembilanensis*, have been assigned to the new genus proposing new combinations.

INTRODUCTION

Corbett (1935) erected the genus *Asialeyrodes* for *A. lumpurensis* and *A. selangorensis* Corbett from Malaya with the former being the type species. Takahashi (1942) added two new species under this genus, viz. *A. euphoriae* Takahashi and *A. multipori* Takahashi from Thailand and proposed a new combination *A. maesae* (Takahashi) for *Pseudaleurolobus maesae* from Taiwan. In 1949 he described one more new species *A. corbetti* Takahashi from Riouw Islands. In the present paper the characteristic features of the genus *Asialeyrodes* are defined with the description of one new species forming the first report from India, and a genus *Cockerelliella* gen. nov. is described with five new species; new combinations have been proposed for seven species of *Dialeurodes* Cockerell described by Corbett (1935) from Malaya.

Asialeyrodes Corbett, 1935

Type species: *Asialeyrodes lumpurensis* Corbett, 1935. *J. F.M.S. Mus.* 17: 841-842, by monotypy.

Pupal case almost flat, broadly elliptical; marginal band narrow; submarginal area wide, separated by a suture-like line around the case. Dorsum without conspicuous pores or papillae;

thoracic and caudal tracheal folds distinct. Vasiform orifice small, subcordate, not notched, without teeth; operculum similarly shaped and obscuring lingula. Orifice not surrounded by a trilobed area.

Asialeyrodes indica sp. nov. (Fig. 1)

Type area: South India: Coimbatore.

Type material: Holotype "one pupal case on slide, *Ervatomia coronaria*, south. India (Tamil Nadu) Coimbatore, B.V. David, 15 April 1968" In coll. B.V. David. Paratypes: 11 pupal cases on slides with same data as holotype, 5 slides, *Ervatomia coronaria*, south India (Kerala) Ambalamedu, R. Sundararaj, 28 July 1987, 9 slides, *Ervatomia coronaria*, Bombay (Maharashtra), R. Sundararaj, 18 March 1989.

Diagnosis: This species resembles *A. multipori* Takahashi in shape and size but it differs by capitate nature of cephalic and first abdominal setae and in the structural features of the tracheal pore.

DESCRIPTION

Pupal case: White with little wax on the dorsal surface; broadly elliptical, very slightly constricted across the thoracic tracheal pores, broadest at the first abdominal segment region; 0.81-1.08 mm long and 0.62-0.87 mm wide; found on the under surface of leaves in large numbers.

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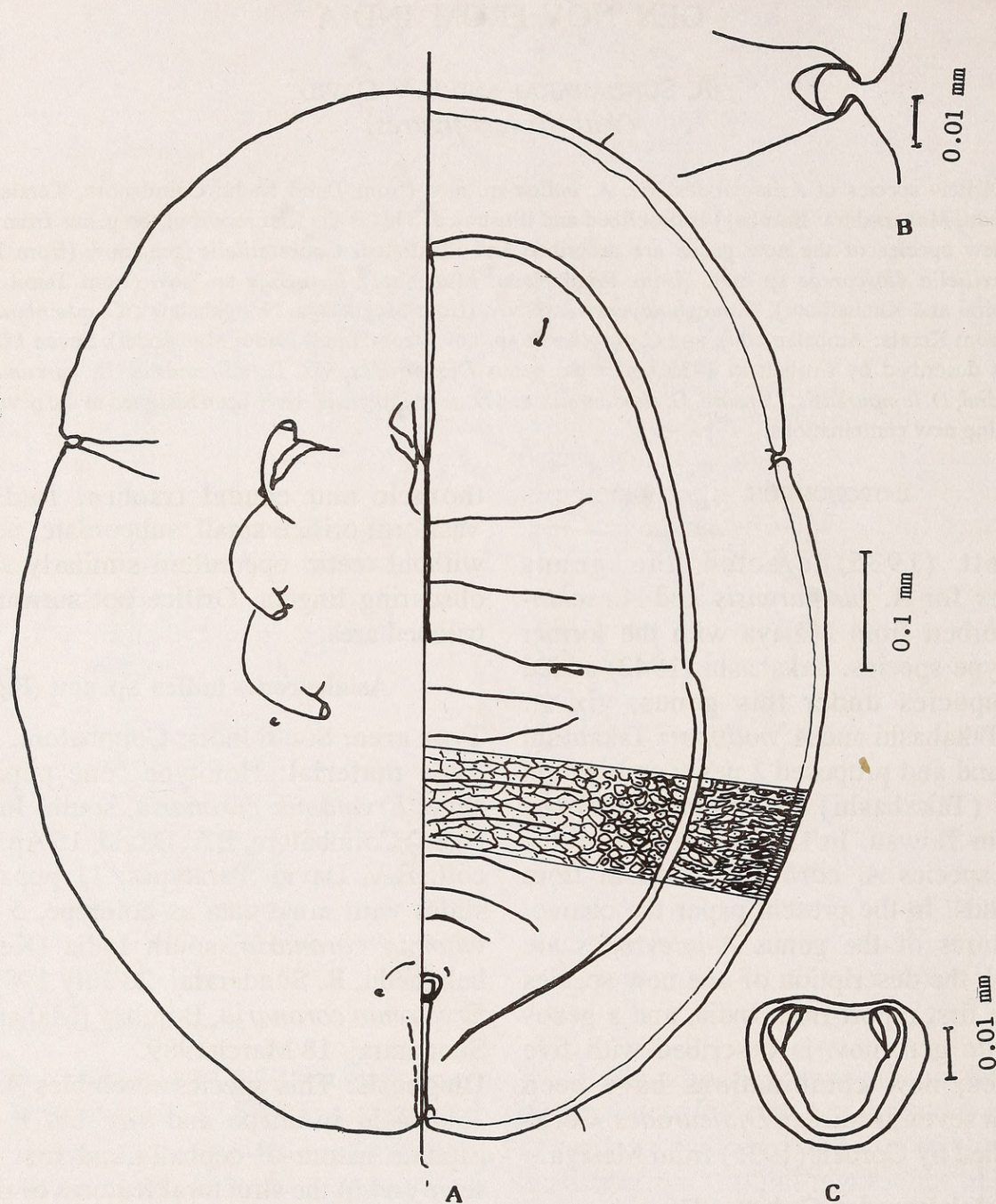


Fig. 1 *Asialeyrodes indica* sp. nov. A. Pupal case, B. Thoracic tracheal fold, C. Vasiform orifice.

Margin: Smooth with a narrow marginal band; anterior and posterior marginal setae respectively 22.5 and 20.0 μ long; thoracic and caudal tracheal pores distinct with chitinised rim.

Dorsal surface: Four pairs of setae – cephalic setae capitate 17.5 μ long, first abdominal setae capitate 22.5 μ long, eighth abdominal setae cephalolaterad of vasiform orifice pointed 5 μ long, and submarginal caudal setae 10 μ long. Dorsum with polygonal structures; submargin

demarcated from the dorsal disc by a suture-like line around the case, 100-130 μ wide.

Vasiform orifice small, subcordate, wider than long 25-30 μ long and 30.0-37.5 μ wide, filling the orifice, obscuring the lingula. Caudal tracheal furrow distinct with polygonal markings and thoracic tracheal furrows not discernible.

Ventral surface: Paired ventral abdominal setae 30 μ long and 27.5 μ apart; thoracic tracheal folds distinct; caudal tracheal fold faintly discernible.

Cockerelliella gen. nov.

Type species: *Cockerelliella indica* sp. nov., on *Calophyllum* sp., Munchirai, 2 Aug. 1987, Coll. R. Sundararaj.

Pupal case broadly elliptical; pores and folds distinct without stipples; caudal tracheal furrow distinct and thoracic tracheal furrow indistinct; submargin wide, separated from dorsal disc only on the cephalothorax by cephalothoracic fold or suture; submarginal setae present; dorsum with conspicuous pores and papillae; first abdominal setae wanting; longitudinal moulting suture reaching margin and transverse moulting suture reaching submargin. Vasiform orifice small, subcordate, notched at the caudal end; operculum similarly shaped filling the orifice and obscuring the lingula.

This new genus is close to *Asialeurodes* Corbett but differs in the separation of submargin from dorsal disc only on the cephalothorax, in having conspicuous pores and papillae on dorsum, and caudal end of vasiform orifice being notched.

From the whiteflies collected and examined five species have been found to be new to science and assignable to this new genus. Further the critical study of the description of *Dialeurodes* spp. described by Corbett (1935) from Malaya has shown that *D. adinandrae*, *D. curcumae*, *D. kamardini*, *D. lumpurensis*, *D. psidii*, *D. rhodamniae* and *D. sembilanensis* are assignable to this new genus resulting in proposing new combinations.

Cockerelliella dioscoreae sp. nov. (Fig 2)

Type area: South India: Munchirai

Type material: Holotype one pupal case on slide, *Dioscorea alata*, south India (Tamil Nadu) Munchirai, R. Sundararaj, 3 August 1987. In coll. B.V. David. Paratypes: 8 cases on slides with same data as holotype.

Diagnosis: This species resembles *Dialeurodes lumpurensis* Corbett in shape and by the differentiation of margin by a fold around the case but differs by the presence of distinct thoracic tracheal

fold and by the absence of distinct tubercles near the legs and cephalothorax.

DESCRIPTION

Pupal case: White without secretion of wax; broadly elliptical, slightly constricted at the thoracic tracheal pore region, slightly narrowed at the posterior region, widest across the region of first abdominal segment; 0.66-0.88 mm long and 0.55-0.73 mm wide; found singly on the under surface of leaves.

Margin: Regularly crenulate, 21-24 crenulations in 0.1 mm; thoracic and caudal tracheal pores distinct with chitinised rim, marginal area differentiated by a fold around the case; margin incised by sutures; anterior and posterior marginal setae each 25 μ long.

Dorsal surface: Three pairs of setae – cephalic setae 12.5 μ long, eighth abdominal setae 5 μ long, and submarginal caudal setae 5 μ long; first abdominal setae wanting. Dorsum tassellated

KEY TO INDIAN

SPECIES OF *Cockerelliella* GEN. NOV.

1. Submargin without papilla-like structures but with striations; thoracic tracheal pore region deeply invaginated with chitinised rim; caudal furrow not smooth 2
- Submargin with papilla-like structures but without striations; thoracic tracheal pore region indicated by slight invagination; caudal furrow smooth *quaintancei* nov. sp.
2. Prothorax, mesothorax and second abdominal segment without enlarged tubercles 3
- Prothorax, mesothorax and second abdominal segment each with a pair of enlarged tubercles *meghalayensis* sp. nov.
3. Pupal case 0.66-0.93 mm long and 0.55-0.78 mm wide; a submedian row of papilla-like structures on dorsum present 4
- Pupal case 0.94-1.19 mm long and 0.75-0.96 mm wide; a submedian row of papilla-like structures on dorsum absent *zingiberae* sp. nov.
4. Marginal area differentiated by a fold around the case; meso and metathoracic segments and first and eighth abdominal segments without brown patch *dioscoreae* sp. nov.
- Marginal area not differentiated by a fold around the case; meso and metathoracic segments and first and eighth abdominal segments with brown patch *indica* sp. nov.

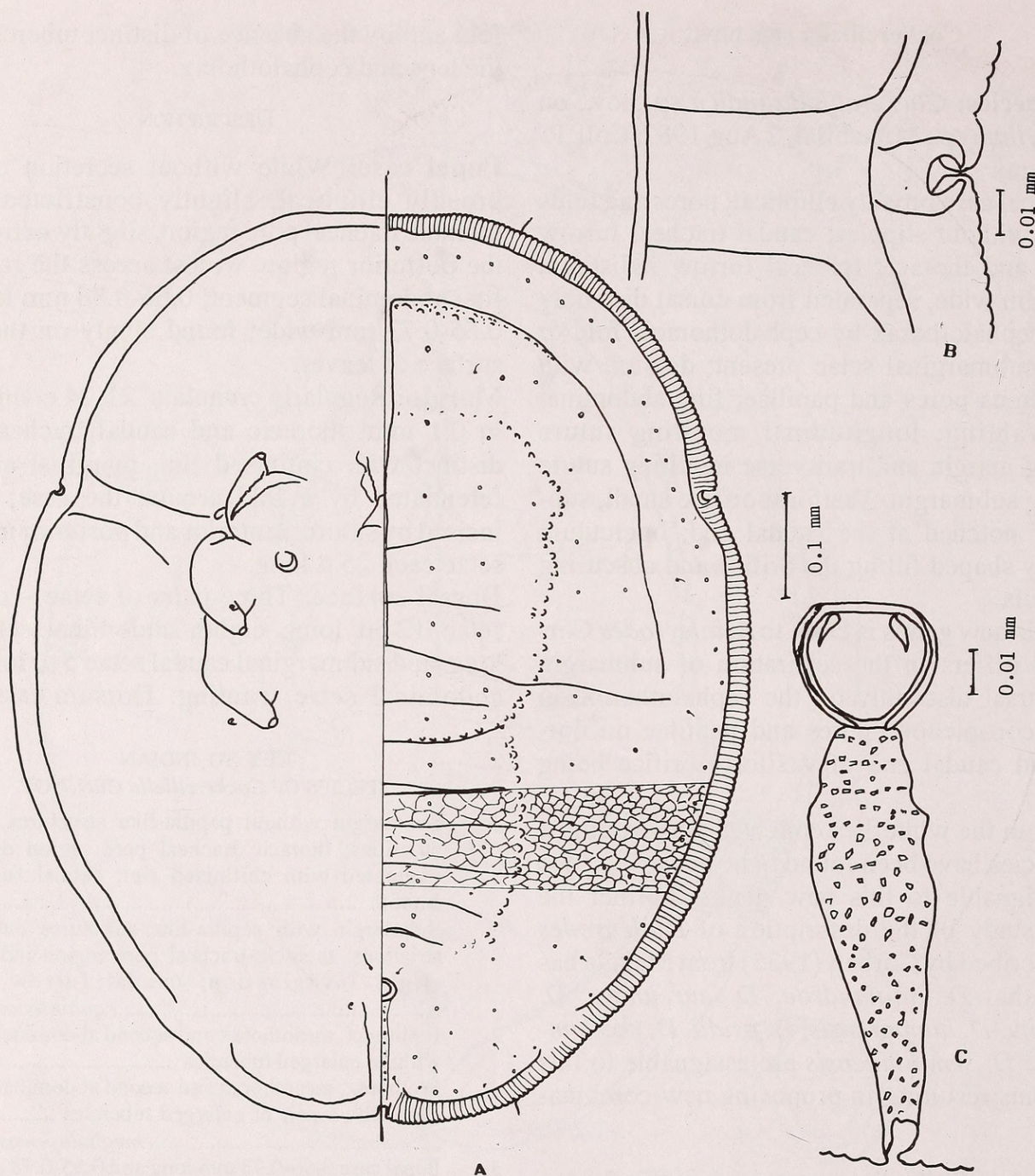


Fig. 2. *Cockerelliella dioscoreae* sp. nov. A. Pupal case, B. Margin and submargin, C. Vasiform orifice

with row of pores and porettes – a row on submargin, two rows on subdorsum, and two rows on submedian region of abdomen and three rows on submedian region of cephalothorax; a distinct row of crescent shaped papilla-like structures extending from laterad of vasiform orifice to the anterior end of cephalothorax, a few on the suture separating second and third abdominal segments; a row of seven setae on submargin, of which five are on abdomen and two on cephalothorax on each side.

Vasiform orifice subcordate, slightly notched at the caudal end, wider than long ($25 \times 30 \mu$); operculum similarly shaped, $17.5-20.0 \mu$ long and $20.0-25.0 \mu$ wide, filling the orifice and obscuring the lingula. Caudal tracheal furrow 92.5μ long with polygonal markings while thoracic tracheal furrow not indicated.

Ventral surface: Ventral abdominal setae cephalad of vasiform orifice 10μ long and 42.5μ apart. Thoracic and caudal folds distinct

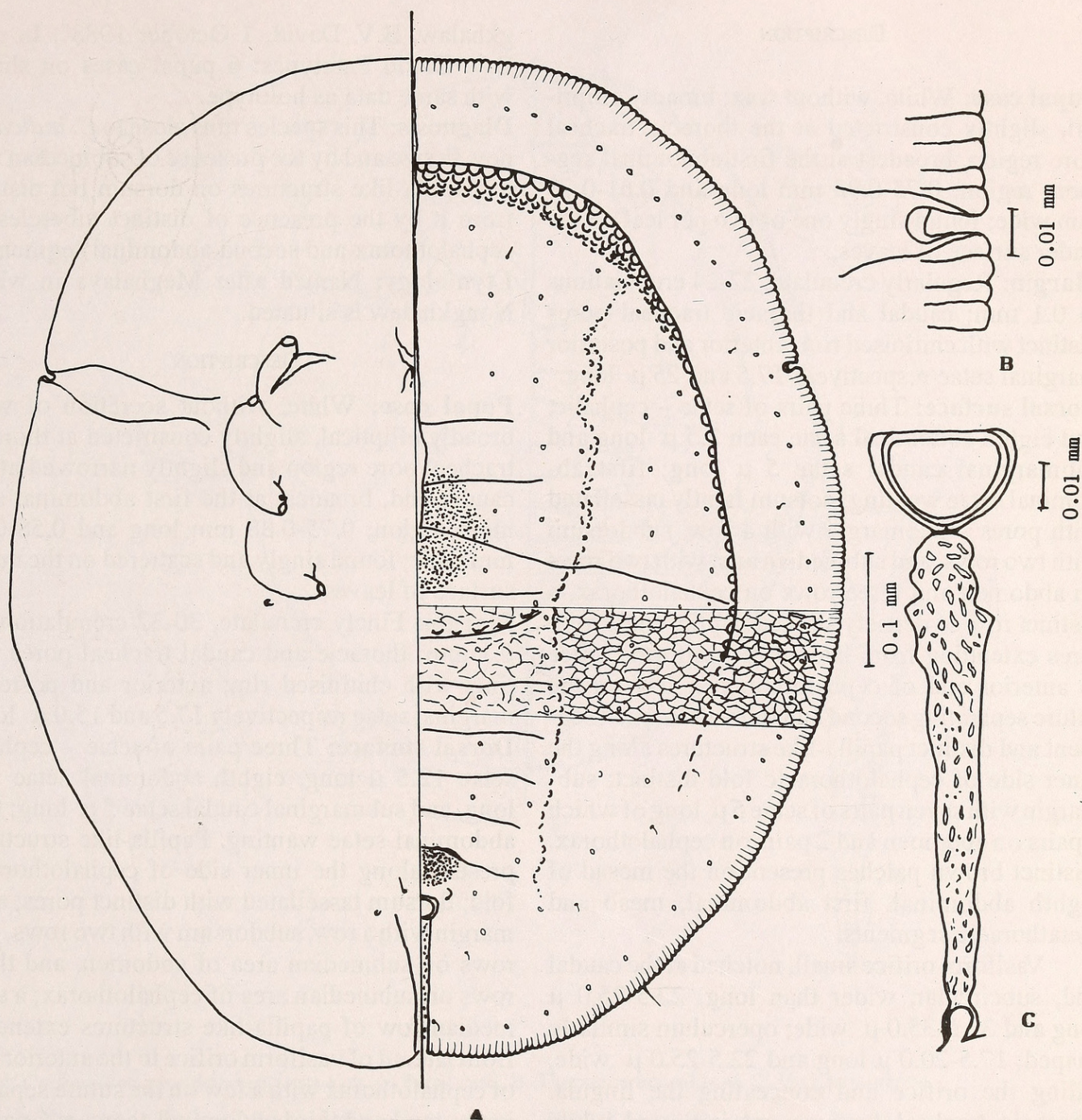


Fig. 3. *Cockerelliella indica* sp. nov. A. Pupal case, B. Thoracic tracheal fold, C. Vasiform orifice without stipples or sculpturing.

Cockerelliella indica sp. nov. (Figs. 3)

Type area: South India: Munchirai.

Type material: Holotype one pupal case on slide, *Calophyllum* sp., south India (Tamil Nadu) Munchirai, R. Sundararaj, 2 Aug.1987. In coll. B.V. David. Paratypes: 2 pupal cases on slides with same data as holotype; 3 cases on slides,

unidentified plant, Kunnathoor (Tamil Nadu), K. Regu, 25 Feb.1988.

Diagnosis: Resembles *Dialeurodes adinandrae* Corbett in shape and size but differs by the presence of median patches on eighth and first abdominal segment and pro- and mesothoracic segments, a distinct row of papilla-like structures on submedian area and by submargin with a row of setae.

DESCRIPTION

Pupal case: White, without wax; broadly elliptical, slightly constricted at the thoracic tracheal pore region, broadest at the first abdominal segment region; 0.75-0.93 mm long and 0.61-0.78 mm wide; found singly one or two per leaf on the under surface of leaves.

Margin: Regularly crenulate, 22-24 crenulations in 0.1 mm; caudal and thoracic tracheal pores distinct with chitinised rim; anterior and posterior marginal setae respectively 17.5 and 25 μ long.

Dorsal surface: Three pairs of setae – cephalic, and eighth abdominal setae each 2.5 μ long and submarginal caudal setae 5 μ long; first abdominal setae wanting; dorsum faintly tassellated with pores – submargin with a row, subdorsum with two rows, and submedian area with two rows on abdomen and three rows on cephalothorax, a distinct row of densely stained papilla-like structures extending from laterad of vasiform orifice to anterior end of cephalothorax; a few on the suture separating second and third abdominal segment and distinct papilla-like structures along the inner side of cephalothoracic fold distinct; submargin with seven pairs of setae 5 μ long of which 5 pairs on abdomen and 2 pairs on cephalothorax. Distinct brown patches present on the mesad of eighth abdominal, first abdominal, meso and metathoracic segments.

Vasiform orifice small, notched at the caudal end, subcircular, wider than long, 22.5-25.0 μ long and 32.5-35.0 μ wide; operculum similarly shaped, 17.5-20.0 μ long and 22.5-25.0 μ wide, filling the orifice and concealing the lingula. Thoracic tracheal furrows not indicated while caudal tracheal furrow indicated with polygonal markings, 105 μ long and 10 μ wide.

Ventral surface: Paired ventral abdominal setae 15 μ long and 32.5 μ apart; thoracic and caudal tracheal folds distinct.

Cockerelliella meghalayensis sp. nov. (Fig. 4)

Type area: India: Nongkhalaw.

Type material: Holotype "one pupal case on slide, unidentified plant, India, (Meghalaya) Non-

gkhalaw, B.V. David, 1 October 1988". In coll. B.V. David Paratypes: 6 pupal cases on slides, with same data as holotype.

Diagnosis: This species runs close to *C. indica* sp. nov. in size and by the presence of submedian row of papilla-like structures on dorsum but distinct from it by the presence of distinct tubercles on cephalothorax and second abdominal segment.

Etymology: Named after Meghalaya in which Nongkhalaw is situated.

DESCRIPTION

Pupal case: White, without secretion of wax; broadly elliptical, slightly constricted at thoracic tracheal pore region and slightly narrowed at the caudal end, broadest at the first abdominal segment region; 0.75-0.88 mm long and 0.58-0.73 mm wide; found singly and scattered on the under surface of leaves.

Margin: Finely crenulate, 30-32 crenulations in 0.1 mm; thoracic and caudal tracheal pores distinct with chitinised rim; anterior and posterior marginal setae respectively 17.5 and 15.0 μ long.

Dorsal surface: Three pairs of setae – cephalic setae 12.5 μ long, eighth abdominal setae 5 μ long, and submarginal caudal setae 5 μ long; first abdominal setae wanting. Papilla-like structures present along the inner side of cephalothoracic fold; dorsum tassellated with distinct pores; submargin with a row, subdorsum with two rows, two rows on submedian area of abdomen, and three rows on submedian area of cephalothorax; a submedian row of papilla-like structures extending from laterad of vasiform orifice to the anterior end of cephalothorax with a few on the suture separating second and third abdominal segments; paired tubercles on prothorax, mesothorax and second abdominal segment on submedian area distinct; submargin with a row of seven pairs of setae, 5 μ long – five pairs on abdomen and two pairs on cephalothorax distinct.

Vasiform orifice subcordate, notched at the caudal end, wider than long, 27.5-30.0 μ long and 37.5-40.0 μ wide; operculum similarly shaped, 20.0-22.5 μ long and 27.5-30.0 μ wide, filling orifice and obscuring the lingula. Caudal furrow

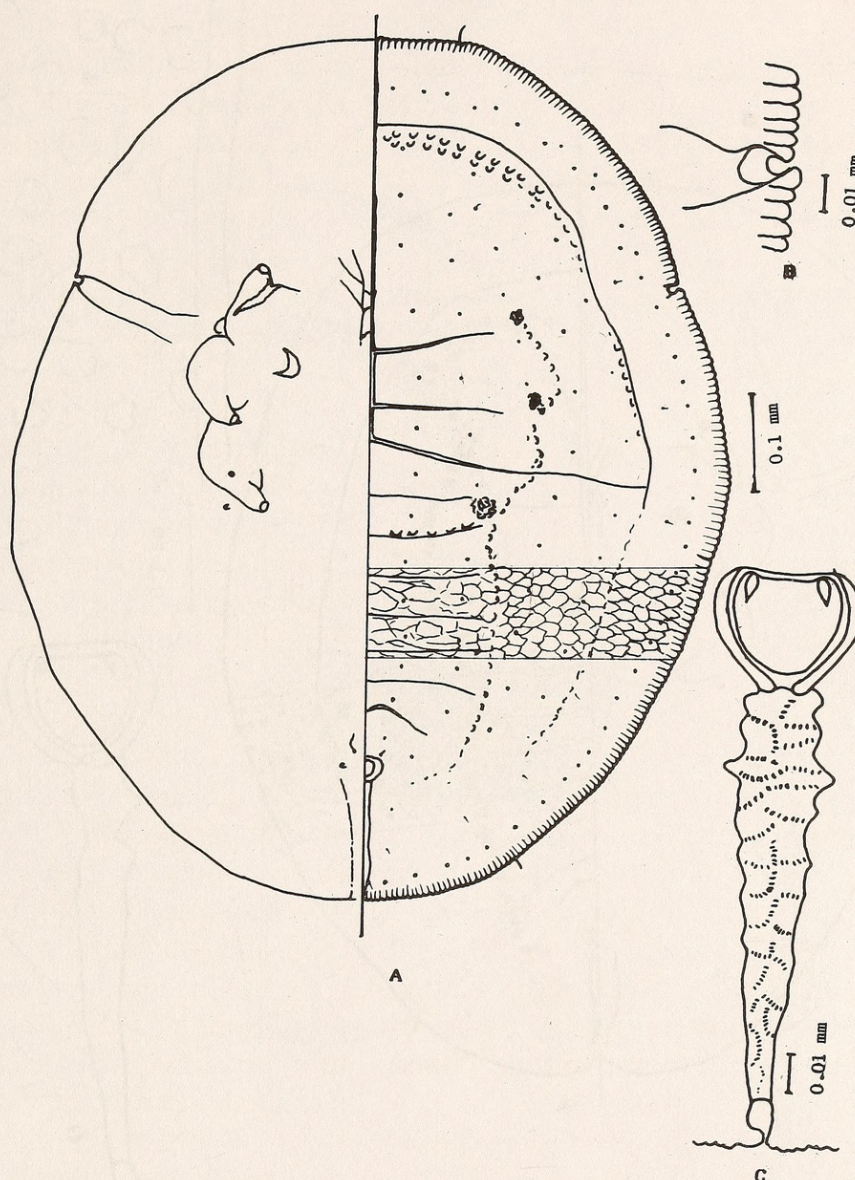


Fig. 4. *Cockerelliella meghalayensis* sp. nov. A. Pupal case, B. Thoracic tracheal fold, C. Vasiform orifice

prominent with dots, broader near the anterior end and narrowed towards the pore end.

Ventral surface: Ventral abdominal setae $12.5\ \mu$ long and $35\ \mu$ apart, thoracic tracheal folds distinct while caudal tracheal fold slightly indicated.

Cockerelliella quaintancei sp. nov. (Fig. 5)

Type area: South India: Ambalamedu

Type material: Holotype "one pupal case on slide, *Ailanthus* sp., south India (Kerala) Ambalamedu, R. Sundararaj, 30 July 1987". In coll.

B.V. David. Paratypes: 3 pupal cases on slides with same data as holotype; 1 pupal case on slide, *Cordia* sp., south India (Kerala), Ambalamedu, R. Sundararaj, 29 July 1987.

Diagnosis: This species resembles *Dialeurodes kamardini* Corbett by the presence of crescent markings on dorsum but differs in shape, size, short dorsal setae and absence of marginal sutures

Etymology: Named in honour of late A.L. Quaintance.

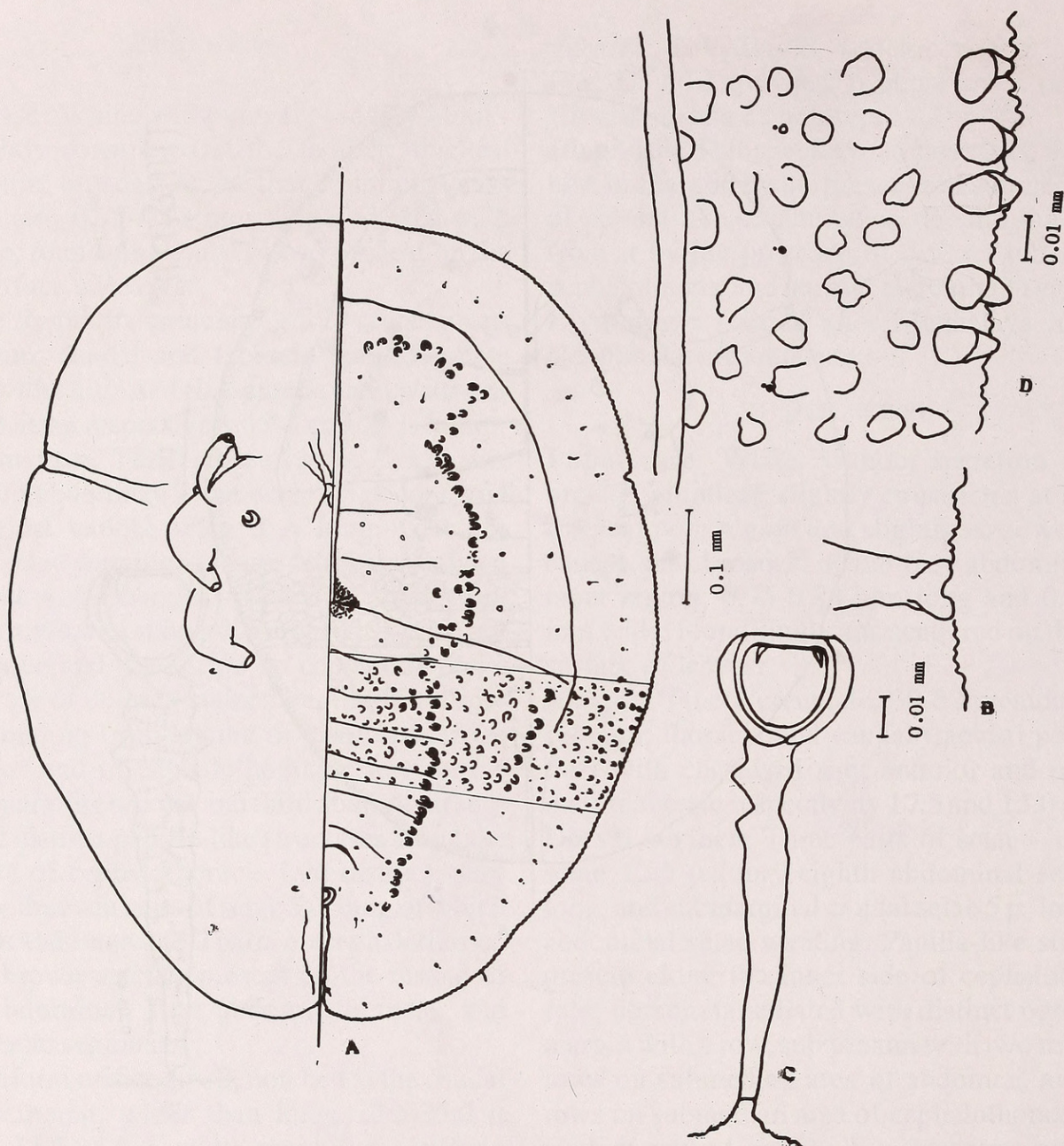


Fig. 5. *Cockerelliella quaintancei* sp. nov. A. Pupal case, B. Thoracic tracheal fold, C. Vasiform orifice, D. Margin and submargin.

DESCRIPTION

Pupal case: White, with wax secretion, broadly elliptical, slightly constricted at thoracic and tracheal pores, posterior part of abdomen slightly narrowed; 0.74-0.77 mm long and 0.59-0.63 mm wide; found singly on the under surface of leaflets.

Margin: Regularly crenulate, 28 crenulations in 0.1 mm; thoracic tracheal pore region slightly

indented in the margin and caudal tracheal pore distinct; anterior and posterior marginal setae each $20\ \mu$ long.

Dorsal surface: Three pairs of setae – cephalic setae 15.0 - $17.5\ \mu$ long, eighth abdominal setae $15\ \mu$ long and submarginal caudal setae $7.5\ \mu$ long; first abdominal setae wanting. Dorsum with numerous papilla-like structures, a distinct submedian row of papillae extending from laterad of vasiform orifice to the anterior end of

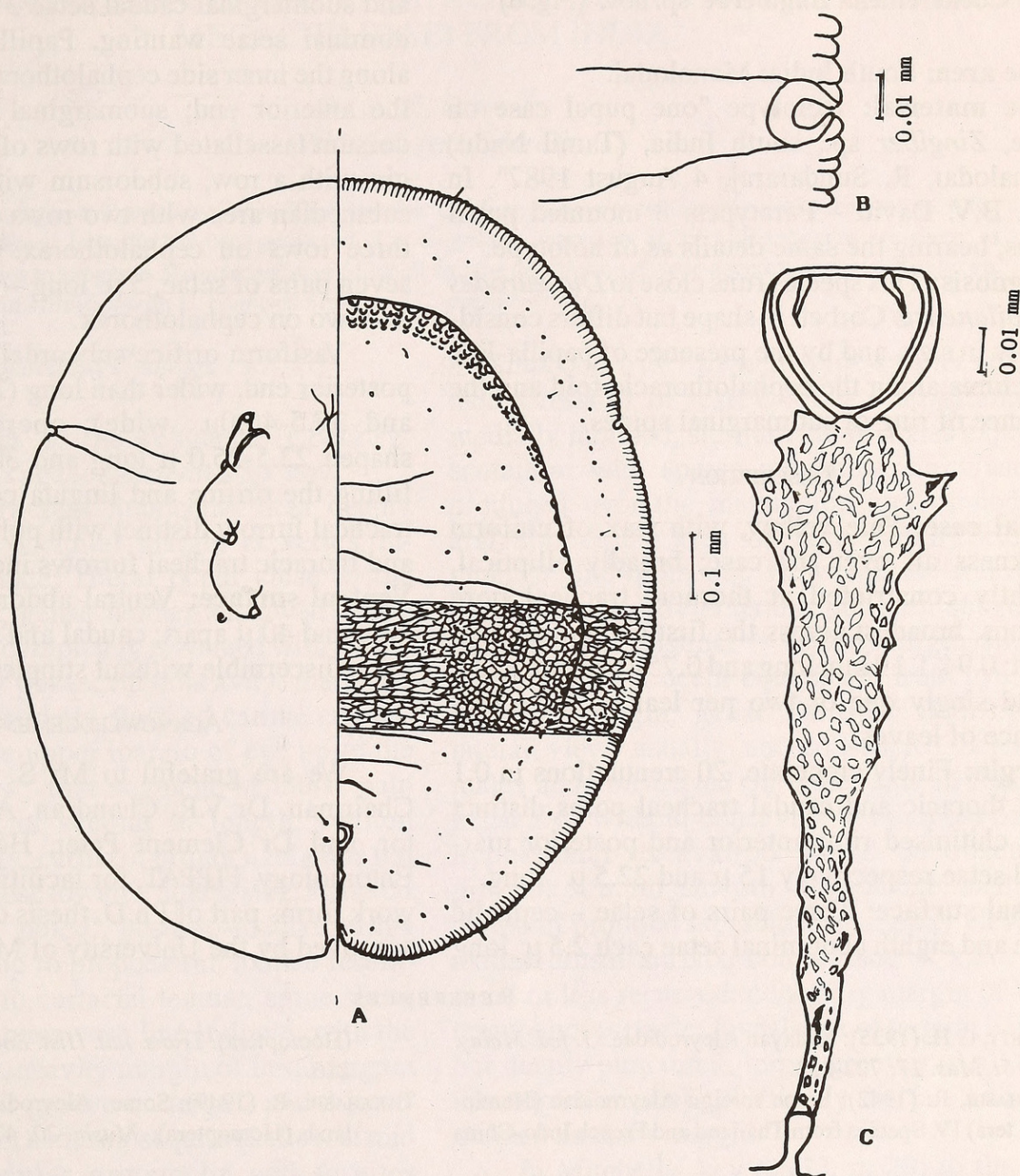


Fig. 6. *Cockerelliella zingiberæ* sp. nov. A. Pupal case, B. Thoracic tracheal fold, C. Vasiform orifice

cephalothorax and rows of pores - submedian area with two rows on abdomen and three rows on cephalothorax, subdorsum with two rows and submargin with a row of pores. Seven pairs of setae $5\ \mu$ long on submargin - five pairs on abdomen and two pairs on cephalothorax. A light brown patch evident on the mesad of first abdominal and prothoracic segments.

Vasiform orifice subcircular, notched at the caudal end, $27.5\text{--}30.0\ \mu$ long and $32.5\text{--}35.0\ \mu$

wide; operculum similarly shaped, $20.0\text{--}22.5\ \mu$ long and $22.5\text{--}25.0\ \mu$ wide, filling the orifice; lingua concealed; caudal tracheal furrow distinct, $85\ \mu$ long and $75\ \mu$ wide without dots or sculpturing μ and thoracic tracheal furrows not discernible.

Ventral surface: A pair of ventral abdominal setae $10\ \mu$ long and $30\ \mu$ apart. Thoracic and caudal tracheal folds distinct without stipples.

Cockerelliella zingiberæ sp. nov. (Fig. 6)

Type area: South India: Manalodai.

Type material: Holotype "one pupal case on slide, *Zingiber* sp., south India, (Tamil Nadu) Manalodai, R. Sundararaj, 4 August 1987". In coll. B.V. David – Paratypes: 8 mounted pupal cases, bearing the same details as of holotype.

Diagnosis: This species runs close to *Dialeurodes sembilanensis* Corbett in shape but differs considerably in size, and by the presence of papilla-like structures along the cephalothoracic fold and the absence of ring of submarginal spines.

DESCRIPTION

Pupal case: Pale yellow, with wax of uniform thickness all over the case; broadly elliptical, slightly constricted at thoracic tracheal pore regions, broadest across the first abdominal segment; 0.94-1.19 mm long and 0.75-0.96 mm wide, found singly one or two per leaf on the under surface of leaves.

Margin: Finely crenulate, 20 crenulations in 0.1 mm; thoracic and caudal tracheal pores distinct with chitinised rim; anterior and posterior marginal setae respectively 15 μ and 22.5 μ long.

Dorsal surface: Three pairs of setae – cephalic setae and eighth abdominal setae each 2.5 μ long

and submarginal caudal setae 3 μ long; first abdominal setae wanting. Papilla-like structures along the inner side cephalothoracic fold, more on the anterior end; submarginal sutures evident; dorsum tassellated with rows of pores – submargin with a row, subdorsum with two rows and submedian area with two rows on abdomen and three rows on cephalothorax. Submargin with seven pairs of setae, 5 μ long – five on abdomen and two on cephalothorax.

Vasiform orifice subcordate, notched at the posterior end, wider than long (27.5-30.0 μ long and 37.5-40.0 μ wide); operculum similarly shaped 22.5-25.0 μ long and 30.0-32.5 μ wide; filling the orifice and lingula concealed, caudal tracheal furrow distinct with polygonal markings and thoracic tracheal furrows indiscernible.

Ventral surface: Ventral abdominal setae 15 μ long and 40 μ apart; caudal and thoracic tracheal folds discernible without stippling.

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