

# ON SOME NEW RHYNCHOTA OF THE FAMILY ALEYRODIDAE FROM BURMA.

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(Plates VIII—XI.)

## INTRODUCTION.

The only references to the Aleyrodidae of Burma of which I am aware amount to the records of four species, two *Aleurocanthus dissimilis* Quaintance and Baker and *Aleurocanthus longispinus* Q. and B. (1917) collected by R. S. Woglum (1914); the third, an extinct species, *Aleurodicus burmiticus* Cockerell, recorded by Prof. Cockerell (1919); and fourth a well-known species *Aleurolobus barodensis* Mask, noted as a pest of sugar-cane in some localities. As pointed out by Imms (1924), most of the tropical species are yet unrecorded, and when intensively studied, the family will probably be found as extensive as the Joccidae and the Aphididae. The following study is based on material collected in leisure hours from the suburbs of Rangoon and from Kalaw. It embodies a record of thirteen species, of which ten are new. In view of the growing importance of these tiny insects as potential pests of some important crops, and as transmitters of fungoid diseases, it is hoped that the present contribution will be found not without its use. Thanks are due to Dr. H. S. Pruthi of the Indian Museum, Calcutta, for going through the manuscript.

Genus **Dialeurodes**, Cockerell (1914).

**Dialeurodes hexpuncta**, sp. nov.

(Plate VIII, figs. 1-6.)

*Locality.* Kalaw (5,000 ft.).

*Host.* An undetermined shrub.

*Pupa case* (Pl. VIII, fig. 1). On leaf the puparia are light brownish, usually with a dark patch on the first abdominal segment, behind the thoraco-abdominal suture; without fluff, except for a short curly filament from each of the tracheal pores; cleared cases translucent, roundly elliptical. Margin (Pl. VIII, fig. 5) entire, with well developed wax tubes, and with two pairs of fine setae, one cephalad and the other caudaterad; two pairs of setae on cephalic submargin, and a single pair on the caudal submargin, laterad of the anal tracheal fold. Dorsum with segmentation distinct, derm with wavy markings (Pl. VIII, fig. 6) and furnished with clear dot-like spots sparsely spread all over, and about nine pairs of sub-lateral, usually capitate, delicate setae (Pl. VIII, fig. 4); an additional pair of setae laterad of the mouth-parts and a pair cephalaterad of the vasiform orifice. Tracheal folds distinct, terminating on the submargin in paired pores (Pl. VIII, fig. 2), one semielliptical and the other sub-circular, with a distinct rim.

Vasiform orifice (Pl. VIII, fig. 3) semicircular, with the cephalic margin straight, the other crenulated; operculum practically similarly shaped, with a slight concavity at the caudal end, entirely covering the orifice; lingula setose, cylindrical, about the length of orifice, protruding beyond its caudal end.

Length of case, 2.48 mm.; breadth, 2.09 mm.; length of vasiform orifice, 0.038 mm.; breadth, 0.053 mm.

Adults unknown.

Puparia found on both the dorsal and ventral surfaces of leaves; not abundant. Numerous specimens on leaves and slides in my collection. Collected in December, 1929. Type in the Indian Museum (No.  $\frac{3475}{H 7}$ ).

### **Dialeurodes dorsidemarcata, sp. nov.**

(Plate VIII, figs. 7-10.)

*Locality.* Kalaw (5,000 ft.).

*Host.* An unidentified plant.

*Pupa case* (Pl. VIII, fig. 9). Light yellowish, medially greyish, without fluff, found on the under side of leaves; roundly elliptical; margin entire, with two pairs of setae, one cephalad and the other caudad. Dorsal disk with segmentation distinct, separated from the submarginal area by a line or groove running all round it; derm of the dorsum and submargin with reticular markings and minute clear dots, some of these with minute setae. Thoracic tracheal folds not distinct, terminating on the margin in circular pores (Pl. VIII, fig. 7); anal tracheal fold covered with polygonal markings, terminating on the margin in a circular pore (Pl. VIII, fig. 10).

Vasiform orifice (Pl. VIII, fig. 10) subcordate, with a pair of setae cephalad; operculum similarly shaped, almost filling the orifice and obscuring the lingula. Length of case, 0.78 mm.; breadth, 0.68 mm. Length of Vasiform orifice, 0.038 mm.; breadth, 0.042 mm.

Adults unknown.

This species differs from all other species of the genus in its dorsum being distinctly separated from the submarginal area. Numerous specimens on leaves and slides in my collection. Some puparia overgrown by a fungus. Collected in December, 1929. Not very abundant. Type in the Indian Museum (No.  $\frac{3476}{H 7}$ ).

### **Dialeurodes oweni, sp. nov.**

(Plate IX, figs. 1-5.)

*Locality.* Maubin.

*Host.* *Eugenia jambos*.

*Pupa case* (Pl. IX, fig. 1). Elongate, elliptical, light yellowish, usually sticking laterad of the veins on the under side of leaves without any fluff. Margin (Pl. IX, fig. 3) crenulate, with two pairs of setae, one cephalad and the other caudo-laterad; submargin with suture-like lines running a short distance mesad. Dorsum distinctly segmented, with a pair of setae laterad of mouth-parts, a similar pair on first abdominal segment

and a pair laterad of the vasiform orifice. Tracheal folds (Pl. IX, fig. 2) distinct, reticulately sculptured on one side, dotted on the other, terminating on the submargin in a sub-circular pore.

Vasiform orifice (Pl. IX, fig. 5) subcordate; operculum subelliptical, covering about half of the orifice, leaving the setose lingula exposed; inner caudal membrane of the orifice dotted or tubercled. Antennae rather long; legs ordinary. Length of case, 1.75 mm.; breadth, 0.663 mm.; length of vasiform orifice 0.064 mm.; breadth, 0.076 mm.; length of antenna 0.171 mm.

Adults unknown.

This species in superficial appearance closely resembles *Dialeurodes elongata* Dozier (1928), but differs from the latter in the sculpture of the tracheal folds, absence of papillae on the submargin, shape of the vasiform orifice, and other characters. Collected in December, 1929; rare, two pupa cases on slides. Type in the Indian Museum (No.  $\frac{3477}{H7}$ ). Named after Mr. M. Owen as a token of esteem.

### ***Dialeurodes cephalidistinctus*, sp. nov.**

(Plate IX, figs. 7-10.)

*Locality.* Maubin.

*Host.* *Eugenia jambos*.

*Pupa case* (Pl. IX, fig. 9). Sub-circular, pale white, found on under side of leaves, without waxy fluff. Margin (Pl. IX, fig. 10) crenulate, with the usual two pairs of setae, one cephalad and the other caudo-laterad; cephalo-thoracic part of the dorsum distinctly segmented and demarcated from the rest of the case; tracheal folds visible, dotted, terminating on the submargin in minute circular pores (Pl. IX, fig. 7), the anal one bearing polygonal markings close to the orifice, distally the markings being linear.

Vasiform orifice (Pl. IX, fig. 8) roundly subcordate, with a thickly chitinized rim; operculum similarly shaped, setose caudally, nearly filling the orifice, leaving the tip of the lingula exposed caudally; inner caudal membrane of the orifice tubercled or dotted. Length of orifice, 0.057 mm.; breadth, 0.074 mm.; length of case, 1.53 mm.; breadth, 1.32 mm.

Adults unknown.

This species differs from all other species of the genus in having the cephalo-thoracic part of the dorsum distinctly demarcated from the rest of the case. Some cases overgrown by a fungus. Collected by the author in December, 1929; a rare species; 4 cases on slides in my collection. Type in the Indian Museum (No.  $\frac{3478}{H7}$ ).

### ***Dialeurodes papulae*, sp. nov.**

(Plate IX, figs. 11-15.)

*Locality.* Royal lakes, Rangoon.

*Host.* An unknown tree.

*Pupa case* (Pl. IX, fig. 11) roundly elliptical, empty cases translucent, without any fluff, found on the under side of leaves. Margin (Pl. IX, fig. 15)

of closely-set wax tubes, with two pairs of setae, one cephalad and the other caudad; submargin with suture-like lines running mesad for a short distance. Dorsum segmented, sparsely covered with circular clear spots and furnished with about 9 pairs of minute sublateral setae and about 12 pairs of papillae arranged in more or less two submedial rows (Pl. IX, fig. 14). Thoracic tracheal folds indistinct, terminating on the submargin in circular pores with a thick rim (Pl. IX, fig. 12); anal fold as a distinct furrow from the orifice to the caudal tracheal pore, dotted proximally.

Vasiform orifice (Pl. IX, fig. 13) subcordate, with a thickly chitinized rim, provided with minute setae; operculum similarly shaped entirely covering the orifice and hiding the lingula. Inner caudal membrane of the orifice tuberculate or dotted. Length of case, 1.61 mm.; breadth, 1.21 mm.; length of vasiform orifice, 0.038 mm.; breadth, 0.049 mm.

Adults unknown.

This species differs from other species of this genus in possessing papillae on the dorsum. About a dozen specimens on leaves and slides in my collection. Collected by the author in December, 1929; not abundant. Type in the Indian Museum (No.  $\frac{3479}{H7}$ ).

### ***Dialeurodes nitidus*, sp. nov.**

(Plate IX, figs. 16-19.)

*Locality.* Horticultural Gardens, Rangoon.

*Host.* Unknown.

*Pupa case* (Pl. IX, fig. 17). Light yellowish, without any fluff; found on the under side of leaves. Cleared cases translucent, sub-elliptical, broadest across the middle; margin (Pl. IX, fig. 19) practically entire, with a pair of stout setae, on tubercles, in the posterior region, laterad of the caudal tracheal pore. Dorsum segmented, separated from the submargin by a thickly chitinized wavy line running all round it, furnished with two pairs of spine-like setae, one in the anterior region and other on the first abdominal segment; medially tuberculate, the first cephalo-thoracic transverse suture also tuberculate. About 12 pairs of setae on the submargin, usually on the chitinized line separating the dorsum from the submargin. Thoracic tracheal folds indistinct, terminating on the submargin in small sub-circular pores (Pl. IX, fig. 16); anal fold broad, densely covered all over with minute dots.

Vasiform orifice (Pl. IX, fig. 18) subcordate, with a thickly chitinized rim and a pair of setae cephalad; operculum similarly shaped, entirely covering the orifice and the lingula. Length of case, 0.59 mm.; breadth, 0.42 mm.; length of vasiform orifice, 0.03 mm.; breadth, 0.042 mm.

Adults unknown.

This species resembles *Dialeurodes dorsidemarcata* in having the dorsum separated from the submargin, but it differs from the latter in all other details. Collected by the author in December, 1929. Fairly abundant. Numerous specimens on leaves and slides. Type in the Indian Museum (No.  $\frac{3480}{H7}$ ).

***Dialeurodes cumiugum*, sp. nov.**

(Plate X, figs. 1-4.)

*Locality.* Kalaw.*Host.* An undetermined herb.

*Pupa case* (Pl. X, fig. 1). Puparia with a column of wax on the dorsum, elliptical, translucent white, medially lightly brownish. Margin (Pl. X, fig. 4) of closely-set wax tubes, with two pairs of setae, one cephalad and the other caudad; submargin with five pairs of circular pores and suture-like lines running for a short distance mesad. Dorsum with a medial segmented trachea-like ridge and sparsely covered with minute, clear, circular pores; tracheal folds faintly indicated, terminating on the margin in small pores, the rims of which are slightly serrated (Pl. X, fig. 2).

Vasiform orifice (Pl. X, fig. 3) subcordate, with the cephalic margin straight and the edges thickly chitinized; operculum similarly shaped, entirely covering the orifice and the lingula; a pair of setae cephalad of the orifice. Length of case, 0.98 mm.; breadth, 0.63 mm.; length of vasiform orifice, 0.038 mm.; breadth, 0.045 mm.; length of antenna, 0.153 mm.

Adults unknown.

This species resembles *Dialeurodes decempuncta* Q. and B. in possessing five pairs of pores on the submargin, but it differs from the latter in having a distinct rachis on the dorsum, in possessing smaller pores and in some other details. Collected by the author in December, 1929, rare; two cases on slides. Type in the Indian Museum (No.  $\frac{3481}{H7}$ ).

***Dialeurodes rangooni*, sp. nov.**

(Plate X, figs. 5-8.)

*Locality.* Horticultural Gardens, Rangoon.*Host.* *Eugenia jambos*.

*Pupa case* (Pl. X, fig. 6). Light yellowish, dorso-medially brownish. Margin (Pl. X, fig. 7) entire with a pair of caudal setae, broken occasionally by oblique and irregular channels running a short distance on the submargin. Dorsum with a conspicuous medial segmented ridge, bearing a pair of minute setae on each of the abdominal segments and also sparsely covered with minute circular pores situated usually on a papilla. Tracheal folds distinct, terminating on the submargin in large pores, having thickly chitinized and slightly serrated rims (Pl. X, fig. 5).

Vasiform orifice (Pl. X, fig. 8) roundly subcordate, with a pair of setae cephalad; the edge thickened, notched caudally; operculum narrower, filling about  $\frac{2}{3}$  of the orifice, leaving the setose end of the lingula exposed; inner caudal membrane of the orifice tuberculate or setose. Length of case, 1.7 mm.; breadth, 1.19 mm.; length of vasiform orifice 0.045 mm.; breadth, 0.064 mm.; length of antenna, 0.153 mm.

Adults unknown.

This species resembles *Dialeurodes fijiensis* Kotinsky in the appearance of the tracheal pores, but differs in all other details. Collected by the author in October, 1929; rare. Type in the Indian Museum (No.  $\frac{3482}{H7}$ ).

Genus **Trialeurodes** Cockerell (1914).**Trialeurodes megapapillae**, sp. nov.

(Plate XI, figs. 1-3.)

*Locality.* Syriam.*Host.* *Butea* sp.

*Pupa case* (Pl. XI, fig. 1). Elongate, elliptical, having a yellowish brown dorsum demarcated from the colourless submargin, which bears a broad white fringe about 0.43 mm. broad, made up of closely-set gelatinous filaments, unaffected by heat, alcohol and xylol. Margin of closely-set wax tubes; submargin distinctly demarcated, owing to the absence of colouration, sculptured peripherally and bearing a row of about thirty conspicuous hemispherical papillae (Pl. XI, fig. 2) and a pair of spines caudad. Dorsum with the usual segmentation and some linear sculpturing, furnished with four pairs of sublateral spines, three on the cephalothorax, and one on the first abdominal segment; tracheal folds invisible.

Vasiform orifice (Pl. XI, fig. 3) roundly subcordate, with a thick rim and a pair of setae cephalad, the inner margin of the rim with a few serrations; operculum similarly shaped, filling about  $\frac{3}{4}$ th of the orifice and covering the setose lingula. Length of case, 1.02 mm.; breadth, 0.51 mm.; length of vasiform orifice, 0.072 mm.; breadth, 0.076 mm.

Adults unknown.

Puparia sticking to the sides of veins on the underside of leaves. This species in superficial appearance looks more like a Coccid than an Aleyrodid; the conspicuous hemispherical papillae and the sculptured submargin differentiate this species from all other species of the genus. Collected by the author in October, 1929; rare. Type in the Indian Museum (No.  $\frac{8483}{H 7}$ ).

Genus **Aleurotrachelus** Quaintance and Baker (1914).**Aleurotrachelus multipapillus**, sp. nov.

(Plate XI, figs. 4-7.)

*Locality.* Syriam.*Host.* *Bambusa nana*.

*Pupa case* (Pl. XI, fig. 6). Light translucent yellow, without any fluff, found on the under side of leaves. Margin of closely-set rounded teeth (Pl. XI, fig. 5), about 14 in 0.1 mm., and with two pairs of setae, one cephalad and the other caudad. Dorsum with a medial rachis and the usual folds characteristic of the genus; minute papillae (Pl. XI, fig. 4) disposed in specified areas as shown in figure, caudad of the transverse abdominal folds and extad of the thoracic longitudinal folds; five pairs of submedial spines, the first pair longest, laterad of the mouth-parts, the next two pairs shorter, on the thorax, a pair cephalad of the vasiform orifice, and a short pair on the caudal submargin; tracheal folds not indicated.

Vasiform orifice (Pl. XI, fig. 7) almost subcordate, with a thick rim ; the caudal membrane and edge setose or tuberculate ; operculum more or less similarly shaped, narrower, with the caudal edge setose, filling about  $\frac{2}{3}$  of the orifice, leaving the swollen and setose end of the lingula exposed caudad. Length of case, 1.15 mm.; breadth, 0.82 mm.; length of vasiform orifice, 0.079 mm.; breadth, 0.076 mm.

Adults unknown.

This species differs from other species of the genus in the characteristic arrangement of the papillae ; case overgrown by a fungus ; Collected by the author in October, 1929 ; rare. Type in the Indian Museum (No.  $\frac{3484}{H 7}$ ).

Genus **Aleurocanthus** Quaintance and Baker (1914).

**Aleurocanthus dissimilis** Quaintance and Baker (1917).

*Locality.* Maubin.

*Host.* Palm. *Cocos nucifera*.

**Aleurocanthus longispinus** Quaintance and Baker (1917).

*Locality.* Horticultural Gardens, Rangoon. Kalaw.

*Host.* Bamboo—*Bambusa nana*.

**Aleurocanthus cocois** Corbett (1927).

(Plate IX, fig. 6.)

*Locality.* Maubin.

*Host.* *Eugenia jambos*.

*Egg.* Eggs laid on the under side of leaves in the form of a flat spiral, a single cluster having about 68 eggs ; translucent yellowish when freshly laid, taking up a golden tinge afterwards ; subreniform, about 0.18 by 0.12 mm., glued upright by a short stalk. I have little to add to the description of the pupa case given by Mr. Corbett, except the remark that they are surrounded by a white marginal fringe.

*Adult female.* About 1.4 mm. long, with bright red body and opaque white legs and antennae. Antenna setose, of 7 segments ; 2nd segment subpyriform, 0.049 mm.; 3rd sub-cylindrical, 0.161 mm. long, with two circular fringed sensoria and a spine near the distal end ; 4th similar, 0.034 mm.; 5th similar, 0.064 mm., with a circular fringed sensorium at its distal end ; 6th 0.057 mm., 7th subfusiform, 0.072 mm. with a spine and a sensorium about its middle and a seta at the tip.

Forewing (Pl. IX, fig. 6) about 1.46 mm. by 0.75 mm., with the usual veins, black with white patches as shown in the figure. Hindwing about 1.15 mm. by 0.56 mm., light cinereous, with the usual vein.

Vasiform orifice subcircular, operculum covering about  $\frac{3}{4}$  of the orifice, leaving the tip of the lingula exposed. Hind tibia 0.374 mm.; proximal tarsus 0.119 mm.; distal 0.085 mm., claws and paronychium ordinary.

Several females were noticed ovipositing about the middle of December, when the specimens were collected.

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