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KEY TO THE TRIBES AND GENERA OF ALEYRODIDAE OF JAPAN, WITH DESCRIPTIONS OF THREE NEW GENERA AND ONE NEW SPECIES.

(Homoptera)

By RYOICHI TAKAHASHI

The family Aleyrodidae is represented in Japan, by the subfamily Aleyrodinae alone. This subfamily contains about 80 genera in the world, while 17 genera are now known to occur in our country, of which three are here proposed as new. At present the classification of the family is still in its infancy and two new tribes, Aleurocantiini and Aleurolobini, are erected in the following key.

Key to tribes and genera in Japan.

Pupa case.

- (1) Tracheal pores or clefts usually present; if absent, vasiform orifice definitely notched at the hind end and caudal furrow distinctly defined, or lateral ridges (rhachis) developed on the abdomen and dorsum with many short spine-like setae, many of which are capitate. Lingula usually small, wanting long setae. Tracheal combs and eye spots lacking (Tribe *Dialeurodini*). (2)
- Tracheal pores or clefts absent, tracheal combs sometimes developed; vasiform orifice not notched at the hind end. Lingula sometimes large, exposed and with a pair of long setae. Eye spots present in some species..... (5)
- (2) Tracheal pores or clefts wanting, vasiform orifice definitely notched at the hind end, caudal furrow prominent, dorsum without large rounded low tubercles in pairs, ventral rim or pleura wide. *Taiwanaleyrodes* TAKAH.
- Tracheal pores or clefts present, if absent lateral ridges (rhachis) developed on the abdomen and dorsum with many short capitate setae. (3)

- (3) Submarginal area with many long narrow ridges, sometimes separated from the dorsal disk by a suture; the ridges not arising from each marginal tooth, but present at intervals of many marginal teeth; dorsum with large rounded low tubercles in pairs on the cephalothorax; vasiform orifice large, notched at the hind end; caudal furrow distinct. *Aleurotuberculatus* TAKAH.
- Submarginal area not separated from the dorsal disk, without such ridges; dorsum without large rounded low tubercles in pairs on the cephalothorax; vasiform orifice sometimes a little notched at the hind end; caudal furrow sometimes developed.... (4)
- (4) Lateral ridges (rhachis) developed on the abdomen, dorsum with many short stout setae, many of these setae capitate. *Rhachisphora* QUAINT. et BAKER.
- Lateral ridges (rhachis) not present on the abdomen, dorsum without many short, stout setae. *Dialeurodes* COCKERELL.
- (5) Seventh abdominal segment nearly as long as, or a little shorter than, the sixth; vasiform orifice rounded, not elongated, sometimes elevated; lingula concealed under the operculum; caudal furrow absent (Tribe Aleurocanthini n. tribe). ... (6)
- Seventh abdominal segment much shortened at the median area in many genera; vasiform orifice subcordate, triangular or truncated at the hind end, elongated in some species; lingula exposed, knobbed; caudal furrow sometimes developed. ... (8)
- (6) Dorsum with many spines. *Aleurocanthus* QUAINT. et BAKER.
- Dorsum without spines. (7)
- (7) Dorsum with a pair of longitudinal folds on the cephalothorax, these folds reaching the basal part of abdomen; submarginal area without long setae arranged in a row around the body; lateral ridges (rhachis) usually developed, eighth abdominal setae definitely anterior to the vasiform orifice. *Aleurotrachelus* QUAINT. et BAKER.
- Dorsum without longitudinal folds and lateral ridges, many long submarginal setae arranged in a row along the body margin. *Pentaleyrodes* TAKAH.
- (8) Knobbed part of lingula elongated, much longer than wide (Tribe Aleurolobini n. tribe). (9)
- Knobbed part of lingula globular, not distinctly longer than wide (Tribe Aleurodini). (13)
- (9) Submarginal area separated from the dorsal disk by a suture around the body except at the posterior small part; tracheal combs developed, sometimes replaced by blunt tubercles; vasiform orifice nearly triangular, longer than wide. *Aleurolohus* QUAINT. et BAKER.
- Submarginal area not separated from the dorsal disk, tracheal combs sometimes differentiated, vasiform orifice usually longer than wide. (10)
- (10) Dorsum with many short spine-like setae. *Acanthobemisia* TAKAH.
- Dorsum without spine-like setae. (11)
- (11) Dorsum without setae arranged in a row along the body margin, lingula without a lateral tubercle at the base of knobbed part. *Bemisia* QUAINT. et BAKER.
- Dorsum with a series of submarginal setae, lingula with a lateral tubercle at the base of knobbed part. (12)
- (12) Lingula not extending beyond the hind end of vasiform orifice. *Parabemisia* TAKAH.

- Lingula extending much beyond the hind end of vasiform orifice, stout.....
*Apobemisia* n.
- (13) Vasiform orifice much longer than wide, rounded at the hind end.... *Neopealius* n.
 — Vasiform orifice nearly as long as wide, or wider than long.(14)
- (14) Vasiform orifice widely truncated at the hind end, the seventh abdominal segment
 much shorter than the sixth at the median part.(15)
- Vasiform orifice subcordate, rounded at the hind end; dorsum without a submarginal
 series of setae, the seventh abdominal segment nearly as long as the sixth,
*Aleyrodes* LATR.
- (15) Dorsum with a series of submarginal setae at least along the anterior and posterior
 body margins. (16)
- Dorsum without a series of submarginal setae.*Pealius* QUAINT. et BAKER.
- (16) Body elliptic, lingula large, with a pair of long setae; marginal teeth prominent;
 basal abdominal segment without dorsal setae. *Odontaleyrodes* n.
- Body narrow, lingula not large, without a pair of long setae; marginal teeth not
 prominent; basal abdominal segment with dorsal setae.*Setaleyrodes* TAKAH.

Odontaleyrodes n. genus.

Pupa case: Elliptic. Pronotum not defined from the head; abdomen widely segmented, the 7th segment very short, the 8th as long as the 6th; pockets not contiguous. Submarginal area not defined from the dorsal disk. Dorsum without lateral ridges (rhachis), papillae and tubercles, wanting setae on the basal abdominal segment and on the meso- and metanota, with a series of submarginal setae close to the body margin; the 8th abdominal setae each laterad of the base of vasiform orifice; caudal setae long, close to the hind end. Marginal teeth prominent, rounded or pointed apically. Thoracic tracheal folds wanting, combs not differentiated. Vasiform orifice large, nearly as long as wide, narrowed posteriorly, but wide and truncated at the hind end, thin at the hind margin, not elevated, without marginal teeth; anterior marginal area defined. Operculum wider than long, truncated at the hind end, occupying half the orifice. Lingula large, knobbed; the knobbed part almost globular, exposed, setose, with a pair of long setae, slightly or not reaching beyond the hind margin of vasiform orifice, with a small lateral tubercle at the base. A short shallow pit present adjacent to the hind end of vasiform orifice; the pit much wider than long, sometimes with a few transverse sculptures. Caudal furrow not well defined laterally. Caudal ridges weakly or scarcely developed. Antennae shorter than the fore leg, with a rather short apical process. Setae near the bases of legs minute, simple.

Genotype: *Pealius akebiae* KUWANA.

The morphological details of *Pealius maskelli* BEMIS, the genotype of *Pealius* QUAINT. et BAKER, are not known, but the present new genus differs from that genus principally in the presence of a series of setae along the body margin, tracheal combs not differentiated, and the more developed marginal teeth.

Also related to *Setaleyrodes* TAKAH., but differentiated by the ellip-

tical body, the larger lingula with a pair of long setae, the absence of dorsal setae on the basal abdominal segment, the developed marginal teeth, and the head not defined from the pronotum.

Some of the Japanese and Formosan species described under the genus *Pealius* should be included here, and the following species are now known in Japan: *Odontaleyrodes akebiae* KUWANA on *Akebia*, *O. rhododendri* TAKAH. (syn. *Palaius rhododendri* TAKAH.) on *Rhododendron*, *O.* sp. on *Eurya japonica* near Tokyo, *O.* sp. on *Pertya ovata* at Mt. Mitake near Tokyo.

Pealius contains the following species in Japan: *Pealius rubi* TAKAH. on *Rubus thunbergii*, *P.* sp. on *Clerodendron tricotomum*, *P.* sp. on *Callicarpa japonica*, *Callicarpa* sp., *Ficus elastica*, etc.; *P. azaleae* BAKER et MOLES on *Rhododendron*, *P. rubi* TAKAH. is hitherto known from Formosa.

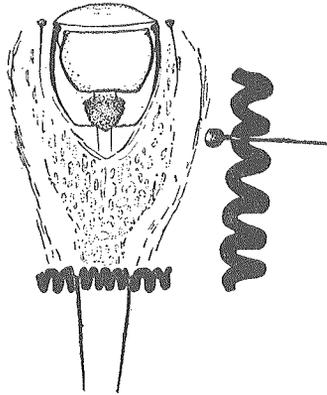


Fig 1. *Odontaleyrodes akebiae* KUWANA.

Pupa case.

Vasiform orifice, posterior part and margin.

Neopealius n. genus.

Pupa case: Elliptical. Pronotum not defined from the head; the 7th abdominal segment much shorter than the 6th; pockets not contiguous. Dorsum without lateral ridges (rhachis), tubercles and papillae, with a pair of setae on the head and on the basal abdominal segment; the 8th abdominal setae each laterad of the basal part of vasiform orifice; caudal setae at the hind end of body. Submarginal area not defined from the dorsal disk. Marginal rim or pleura with low ridges; marginal teeth short, rounded, small. Tracheal folds and pores or clefts wanting, combs not well differentiated. Vasiform orifice large, much longer than wide, narrowed posteriorly, rounded at the hind

end, not elevated; the anterior marginal area not defined. Operculum wider than long, nearly straight at the hind margin, occupying less than half the orifice. Lingula large, knobbed, exposed; the knobbed part globular not elongated, setose, with a small lateral tubercle at the base and a pair of long setae. Caudal furrow not prominent. Caudal ridges weakly developed. Setae near the bases of legs minute.

Genotype: *Neopealius rubi* n. sp.

Related to *Pealius* QUAINT. et BAKER, but differs in the elongated vasiform orifice and the absence of a pit behind the orifice.

Resembles *Bemisia* QUAINT. et BAKER in the shape of vasiform orifice, but different from that genus in the knobbed part of lingula being globular and in the absence of tracheal folds.

Neopealius rubi n. sp.

Pupa case : Pale in colour. Body oval, about 1.5 times as long as wide, broadest at the 2nd abdominal segment, narrower at the hind end than at the front end, slightly constricted across the cephalothorax, not or slightly indented at the hind end. Pronotum not defined from the head, mesonotum longer than the metanotum, transverse molting suture long, but not reaching the body margin; abdomen widely segmented, suture between the 2nd and 3rd segments extending latero-anteriorly at the lateral part, nearly reaching the basal segment; the 7th segment short, the 8th somewhat longer than the 6th slightly over twice as long as the 7th; pockets stout, not contiguous. Dorsum without tubercles and papillae, with many shallow concaves and not smooth on the unsegmented area, but without distinct granules or sculptures; some very small pores scattered, 4 similar ones on each tergite; depressed markings not prominent on the abdomen; usual setae minute on the head and basal abdominal segment, the 8th abdominal setae minute, each laterad of the basal part of vasiform orifice, much posterior to the anterior end of the orifice; caudal setae long, at the hind end of body, each arising from a small tubercle. Thoracic tracheal folds and combs not discernible, but 4 or 5 very small rounded teeth present at the mesal margin of marginal rim at the site of tracheal fold; these teeth much smaller than the marginal teeth. Caudal comb with about 3 similar teeth, which are not distinct in some individuals; about 6 narrow ridge-like markings present on the marginal rim at the site of caudal comb. Marginal teeth rather small, very short, much wider than long, broadly rounded or truncated apically, irregular in width. Venter with a very narrow marginal rim which is a little sclerotized. Vasiform orifice much longer than wide, longer than the 8th tergite, much longer than the caudal furrow, narrowed posteriorly, rounded at the hind end, slightly concave at the middle part of lateral margin, with about 4 slender sculptures on each side, roughly with large polygonal sculptures, and a small short rounded median tubercle apart from the hind end; anterior marginal area not defined. Operculum wider than long, nearly straight at the hind margin, occupying a little less than half the orifice. Lingula knobbed, not reaching the hind end of vasiform orifice; the knobbed part exposed, globular, a little longer than wide, blunt at the apex, slightly divided at the tip, setose, with a small blunt lateral tubercle at the base, and a pair of long subapical setae which are reaching

the hind end of the orifice; the lateral tubercle smaller than the basal tubercles of caudal setae. Caudal furrow rather wide, a little broadened basally, not sclerotized at the lateral margin, without markings. Caudal ridges surrounding the vasiform orifice, rather weakly developed, wide, much wider than the caudal furrow, reaching the hind margin of body, with minute spinules in transverse rows; mesal margin of caudal ridge distinct laterad of, and apart from, the vasiform orifice. Venter without markings. Antennae normal. Ventral abdominal setae at the base of vasiform orifice. A small simple seta present near the base of each middle and hind leg, a median pair of minute setae in front of the mouth parts. Body about 1.0 mm. long.

Host plants : *Rubus microphyllus*, *Rubus palmatus*, *Lindera obtusiloba*, *Benzoin umbellatum*, *Lespedeza buergeri*.

Mt. Takao near Tokyo (30. VII. 1949), Mt. Mitake near Tokyo (21. VIII. 1949); coll. by R. TAKAHASHI. The specimens in the writer's collection. Rather scarce.

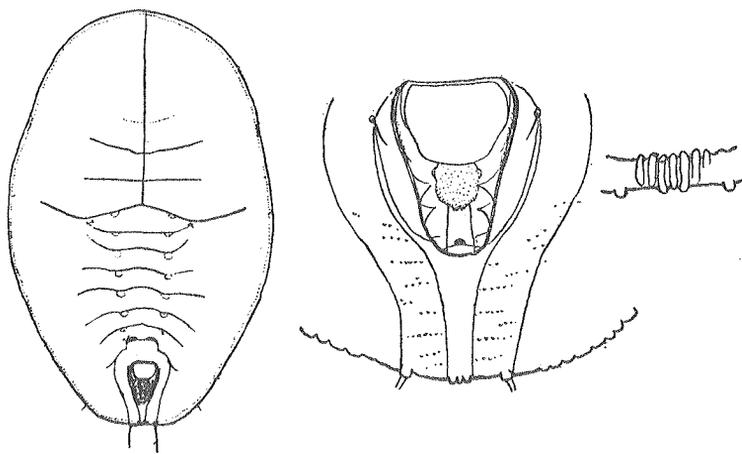


Fig 2. *Neopealius rubi* n. sp.

Pupa case, its caudal region and marginal rim at hind end (venter).

Apobemisia n. genus.

Pupa case : Elliptical. Pronotum faintly defined from the head; the 7th abdominal segment obscured at the median area, pockets contiguous, reaching the 6th segment. Dorsum with a series of setae along the body margin, lateral ridges (rhachis) wanting, the 8th abdominal setae each laterad of the base of vasiform orifice, caudal setae at the hind end. Submarginal area not defined from the dorsal disk. Marginal teeth small, short; thoracic tracheal combs not differentiated or represented by a blunt tubercle. Vasiform orifice large, narrower posteriorly, truncated widely at the hind end, not longer than wide, not elevated; anterior marginal area wide, defined. Operculum wider than

long, tuncated at the hind end, occupying about half the orifice. Lingula large, knobbed, exposed, reaching beyond the hind end of vasiform orifice; the knobbed part stout, much longer than wide, divided at the tip, with a small blunt lateral tubercle at the base and a pair of long setae. Caudal furrow distinct, with sculptures. Caudal ridges not developed.

Genotype : *Bemisia kuwanai* TAKAH.

Closely related to *Parabemisia* TAKAH., but differs in the knobbed part of lingula being stout, reaching beyond the hind end of vasiform orifice, and in the shorter vasiform orifice. Resembles *Corbettella* SAMPSON, differing, however, in the elongated knobbed part of lingula.

Pealius celti TAKAH. from Formosa should be included in this new genus.

Apobemisia kuwanai TAKAH.

Bemisia kuwanai TAKAHASHI, Dept. Agr., Govt. Res. Inst. Formosa, Rept. no. 63, p. 60 (1934).

Pupa case : Different from the original description in the body not notched at the front end, thoracic tracheal combs not differentiated, the abdomen with a rather small rounded tubercle at the lateral end of each of posterior 4 or 5 tergites, and the dorsum with 16 long stout setae in a row along the body margin on each side (including the caudal seta), of which 8 are on the cephalothorax.

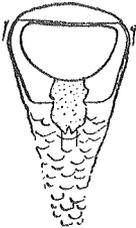


Fig. 3. *Apobemisia kuwanai* TAKAH.

Pupa case.

Vasiform orifice and caudal furrow.

Host plant : *Ficus* sp.

Fukuoka, some unstained specimens in KUWANA'S collection. Hitherto known from Formosa.

The original description was prepared from an incomplete specimen and the Formosan specimens may normally possess 8 submarginal setae on each side of cephalothorax like the Japanese ones. This name is here adopted with some doubt.