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A cladistic analysis of whiteflies, subfamily Aleyrodinae (Hemiptera: Sternorrhyncha: Aleyrodidae)

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Abstract

Relationships within the Aleyrodinae are investigated phylogenetically through a cladistic analysis of 94 (70 binary and 24 multistate) morphological characters derived from the pupal case. This is the first attempt to construct a phylogenetic classification at genus level on a world basis for the subfamily Aleyrodinae. More than 430 species, about one third of all described species, were examined. These belonged to 124 genera, of which 117 were aleyrodines (including two undescribed genera) and seven were out-groups from the subfamily Aleurodicinae (Hemiptera: Aleyrodidae). Maximum parsimony analysis yielded more than 30 000 most-parsimonious trees (length=2730, RI=0.672, CI=0.137). Based upon the strict consensus tree, only 33 of the currently accepted genera, for which we had multiple representatives, were found to be monophyletic (44 genera of the 117 examined genera were monobasic and/or only one species was available for study). Monophyly of some economically important genera, e.g. *Aleurolobus*, *Bemisia* and *Dialeurodes*, as well as that of most previously proposed tribes, was not supported. No parallel diversification of whiteflies with host plants was detected, mostly because of within-species host switching. Problems in determining generic level characters and applicability of tribal classification for this subfamily are discussed. One new genus, *Pseudozaphanera* Manzari **gen. n.**, and seven new combinations, *Aleuroclava lanceolata* (Takahashi) **comb. n.**, *Crescentaleyrodes fumipennis* (Hempel) **comb. n.**, *Pseudozaphanera niger* (Maskell) **comb. n.**, *Pseudozaphanera papyrocarpae* (Martin) **comb. n.**, *Pseudozaphanera rhachisreticulata* (Martin) **comb. n.**, *Pseudozaphanera splendida* (Martin) **comb. n.**, *Pseudozaphanera wariensis* (Martin) **comb. n.**, are proposed as well as three new generic synonyms; *Taiwanaleyrodes* Takahashi is placed in synonymy with *Aleuroclava* Singh **syn. n.**, *Hempelia* Sampson & Drews with *Aleurothrixus* Quaintance & Baker **syn. n.** and *Rositaleyrodes* Meganathan & David with *Aleurolobus* Quaintance & Baker **syn. n.**

Keywords: *Host–plant relationships, phylogeny, successive approximations character weighting, tribal classification*

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Introduction

The Aleyrodidae is composed of tiny insects (1–3 mm in body length), usually called whiteflies, though one of the most widespread pest species, *Aleurocanthus woglumi* Ashby, is called the citrus blackfly (Mound 1973). Mound and Halsey (1978) catalogued the whiteflies of the world and listed 1156 species, which has now increased to approximately 1450 (Martin et al. 2000). However, the real number is certainly much higher.

Many whiteflies are agricultural pests, especially in the tropics and subtropics (Calvert et al. 2001). Feeding activity damages their host plants and some species are known to transmit diseases, especially those caused by viruses (Gullan and Martin 2003). In spite of this, the family is poorly studied taxonomically, particularly in a phylogenetic context. Almost all publications dealing with whitefly taxonomy are restricted to alpha taxonomy. Major publications provide lists of species and descriptions of new species and/or the genera, mostly with restricted geographical compass (e.g. Singh 1931; Takahashi 1932; Corbett 1935; Russell 1948; Mound 1965; Cohic 1966; David and Subramaniam 1976; Bink-Moenen 1983; Jesudasan and David 1991; Martin 1999).

The taxonomy of the Aleyrodidae has long been problematic. Unusually amongst insects, whitefly generic classification is largely based on one of the immature stages, the so-called, pupal case (=puparium=fourth instar=last nymphal stage=last larval stage), rather than on the adults (Gill 1990). Quite often, third instar larvae have been used in species descriptions, having been mistaken for the so-called puparial stage (Martin 1999). Unfortunately, whitefly puparia are notorious for displaying variation induced by environmental and physical factors, such as temperature and humidity (Mohanty and Basu 1986), as well as by the type of leaf surface upon which they have developed (Russell 1948; Mound 1963; David and Ananthakrishnan 1976; Neal and Bentz 1999; Guershon and Gerling 2001). Their generic classification was largely laid out by Quaintance and Baker (1913, 1914) and is based mainly on pupal characters; the morphological traits of adults are currently poorly understood and so do not readily permit differentiation between genera or species (Frohlich et al. 1999).

Apart from a few genealogical diagrams proposed (e.g. Quaintance and Baker (1913) (Figure 1); Bondar 1923), the first attempt to construct a phylogenetic classification for whiteflies using morphological characters was made by Jensen (1999) for the species of *Dialeurodes* Cockerell. In Jensen's article, alternative generic names were not proposed despite the fact that his results showed the genus to be paraphyletic with respect to several others. Subsequently, Jensen (2001) proposed the use of three pre-existing generic names, *Dialeurodes*, *Massilieurodes* Goux and *Singhiella* Sampson, for many of the *Dialeurodes* of the world based on the placement of the type-species of these genera in the cladograms or based on the examination of original descriptions.

Phylogenetic analysis of 18S rDNA nucleotide sequences of hemipteran exemplars, shows the Sternorrhyncha appears to be monophyletic forming a sister group to all other hemipterans (the Euhemiptera, including Auchenorrhyncha and Heteroptera) (Campbell et al. 1994, 1995a, 1995b; von Dohlen and Moran 1995). However, relationships within the Sternorrhyncha (which includes psyllids, whiteflies, aphids and scales) are controversial with molecular and morphological data supporting different scenarios. Based upon the same molecular evidence, whiteflies form a sister group to aphids and scales, while psyllids form a sister group to all other Sternorrhyncha (Campbell et al. 1994, 1995a). However, some morphological evidence supports a sister-group relationship between whiteflies and psyllids (e.g. Quaintance and Baker 1913; Goodchild 1966; Hennig 1981; Carver et al. 1991; Shcherbakov 2000; Shcherbakov and Popov 2002), though Evans' (1963)

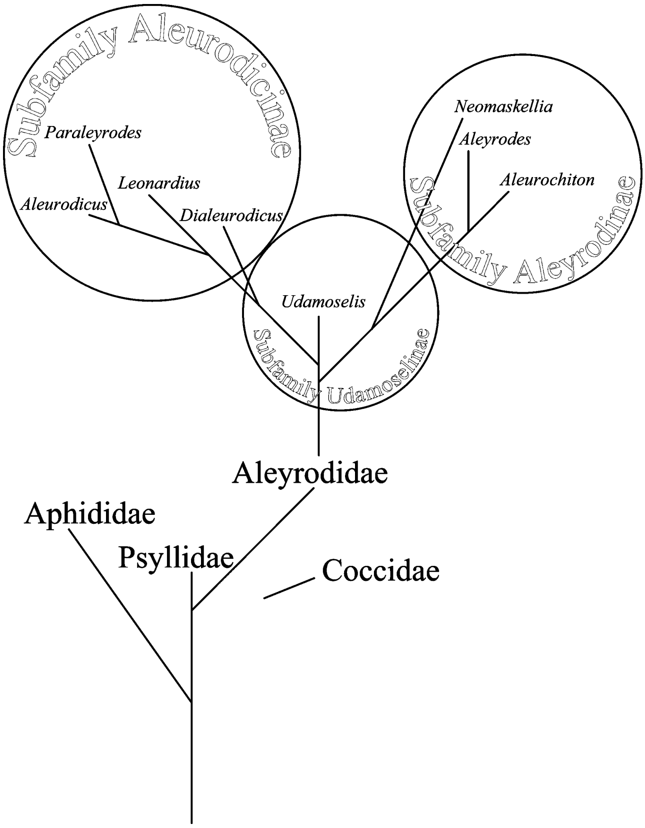

Figure 1. Genealogical diagram of the Aleyrodidae; after Quaintance and Baker (1913).

morphologically based conclusions are more in agreement with the available molecular studies. Some molecular studies of their primary bacterial endosymbionts (P-endosymbionts) generally concur with the available morphological evidence, with an analysis of 16S rDNA symbiont sequences supporting a sister relationship between primary endosymbionts of psyllids and whiteflies (Spaulding and von Dohlen 1998, 2001).

Efforts to determine the phylogenetic origin of whiteflies have been further impeded by gaps in the hemipteran fossil record, and especially a paucity of fossil whiteflies (Campbell et al. 1994). Owing to their size and fragility, adult aleyrodids would not be expected to be preserved as impression fossils often, and still less, their larvae (Evans 1963). The possibility that they arose in tropical latitudes may also account for their absence in fossil deposits now located in northern latitudes, where fossils of aphids are often found (Shcherbakov and Wegierek 1991). The oldest known fossil whiteflies, *Juleyrodes gilli* Shcherbakov and *J. visnyai* Shcherbakov, belong to an extinct subfamily, Bernaeinae, and are from the Late Jurassic or Early Cretaceous (more than 140 myr ago) (Shcherbakov 2000).

Monophyly of the Aleyrodoidea, and consequently of its single included family, Aleyrodidae, is well-supported by synapomorphies (Shcherbakov and Popov 2002). Five subfamilies have been established at various times within the extant Aleyrodidae, of which only two are now considered valid: the Aleurodicinae, found mainly in Central and South America, and the Aleyrodinae, which are more widespread (Mound and Halsey 1978; Gill 1990). The Udamoselinae was proposed on the basis of a single specimen of a South

American species, a male with a body length of 7 mm (Enderlein 1909). This subfamily is now considered dubious and the name is treated as *nomen dubium* (Mound and Halsey 1978), though Shcherbakov (2000) restored Udamoselinae in a broad sense (including Aleurodicinae). The type genera of the fourth and fifth subfamilies, Uraleyrodinae and Siphonaleyrodinae, i.e. *Uraleyrodes* Sampson & Drews and *Siphonaleyrodes* Takahashi, were synonymized with the aleyrodine genus *Aleurocerus* Bondar and the psyllid genus *Trioza*, respectively (Mound and Halsey 1978). These authors also synonymized Siphonaleyrodinae with Triozinae. Russell (2000) provides a more detailed account of the authorships of family group names in the Aleyrodidae, and on the validities of the names of the current subfamilies within the Aleyrodidae. Recent molecular studies on their P-endosymbionts support five, or more, major groupings within the family (Baumann and Thao 2004), so perhaps a revised classification into more subfamiles may well ensue. However, the two main divisions found by Baumann and Thao (2004) correspond largely to the Aleurodicinae and Aleyrodinae.

The Aleyrodinae consists of more than 140 described genera, but their relationships are equivocal. Although 13 tribes have been proposed (Aleurocanthini Takahashi, Aleurochitonini Sampson, Aleurolobini Takahashi, Aleuroplatini David, Aleyrodini Sampson, Bemisini David, Dialeurodini Sampson, Lipaleyrodini David, Neomaskellini Sampson, Siphoninini Sampson, Tetraleurodini David, Trialeurodini Russell and Zaphanerini David; see Sampson 1943; Russell 1947; Takahashi 1954; David 1990), at least half of the genera have not been allocated to tribes and there is little consensus about the composition of those tribes that have been proposed. For example, the well-known genus *Bemisia* Quaintance & Baker has been placed in three different tribes, viz. Dialeurodini, Aleurolobini and Bemisini by Sampson (1943), Takahashi (1954) and David (1990), respectively (Appendix A). Characters used previously to identify the tribes are shown in Appendix B.

The application of molecular techniques such as DNA nucleotide-sequencing for whitefly taxonomy has mainly been restricted to determining the biotypes of a few economically important species, especially *Bemisia tabaci* (Gennadius), and phylogenetic relationships among them rather than building a phylogenetic classification (e.g. Campbell et al. 1993; Perring et al. 1993; Wool et al. 1994; Guirao et al. 1997; Frohlich et al. 1999; Brown et al. 2000; Cervera et al. 2000; De Barro et al. 2000; Lima et al. 2000; Viscarret et al. 2003; Wu et al. 2003). Campbell et al. (1995a) presented a cladogram based on 18S rDNA sequences for 11 whitefly species belonging to seven genera, of which 10 species were from the subfamily Aleyrodinae and the last one from the Aleurodicinae. In this cladogram, the aleurodicine was sister to all aleyrodines, and among aleyrodines, members of the genus *Bemisia* formed a sister clade to all other species.

The present study is the first attempt to construct a phylogenetic classification at genus level for the Aleyrodinae on a world basis as well as testing the applicability of its tribe level classification. To avoid considering current described genera as monophyletic units, multiple representative species of each genera were selected where possible (obviously excepting monobasic genera) so as to represent a wide range of the morphological variation present, and these were treated separately in the analyses; making it possible to test the monophyly of genera and to evaluate the current whitefly classification.

Materials and methods

In total, 439 whitefly species, about one third of all described species, were examined and used to define character systems. These comprised 124 genera, of which 117 were aleyrodines (including two undescribed genera mentioned as New genus 1 and New genus 2) and seven were aleurodicines, which were used as out-groups. All examined species were slide-mounted specimens and, in most cases, several specimens were studied for each species. Ninety-four morphological characters, 70 binary and 24 multistate, all of which were derived from the pupal case, were scored.

Choice of species examined was largely dictated by the material in the collection of The Natural History Museum, London (BMNH), which houses one the world's largest collections of whiteflies, and includes almost all described genera. Additional material was borrowed from the United States Department of Agriculture, Beltsville, Maryland, USA (Sternorrhyncha collections of the United States National Museum of Natural History, Washington DC) (USNM).

No specimens were available for the following 25 small genera (nearly all of which are monobasic): *Aleuroporosus* Corbett, *Anomaleyrodes* Takahashi & Mamet, *Axacalia* Danzig, *Dialeurotrachelus* Takahashi, *Dothioia* Dumbleton (the paratype puparium in the BMNH was entirely black (i.e. unbleached) and no characters recognisable), *Hesperaleyrodes* Sampson, *Hindaleyrodes* Meganathan & David, *Juglasaleyrodes* Cohic, *Keralaleyrodes* Meganathan & David, *Lankaleurodes* David, *Luederwaldtiana* Hempel, *Metaleyrodes* Sampson, *Mexicaleyrodes* Sampson & Drews, *Mohanasundaramiella* David, *Nealeyrodes* Hempel, *Neoaleurodes* Bondar (all five specimens on the *Neoaleurodes* slide from USNM were constricted and not cleared), *Neoaleurolobus* Takahashi, *Plataleyrodes* Takahashi & Mamet, *Pseudaleurolobus* Hempel, *Pseudaleyrodes* Hempel, *Rosanovia* Danzig, *Shanthiniae* David, *Trichoaleyrodes* Takahashi & Mamet, *Vasantharajiella* David, and *Xenobemisia* Takahashi. The monobasic genus *Laingiella* Corbett was erected by Corbett (1926) to accommodate specimens collected on bamboo. The syntype specimens of *L. bambusae* Corbett have been deposited in the USNM and BMNH (Mound and Halsey 1978). Those in the USNM were not examined but all syntypes in the BMNH were third instar larvae and agreed with its original description (one syntype lacked its ventral surface, so there was no way to determine whether it was a third instar larva or a pupal case). Most probably, therefore, the genus was described based on the characters of third instar larvae and for this reason it was omitted from the analysis. The genera and species included in the cladistic analysis are given in Appendix C.

The characters scored include nearly all those used to describe new genera/species in the literature. Different minor ornamentations of pupal cases of some species, which were almost impossible to code consistently for all taxa, were not included. We have attempted to make character state definitions as objective as possible to minimise miscoding of the characters used in this study.

Basic morphological terminology follows that of Russell (1943, 1947, 1948, 1965, 1986), Bink-Moenen (1983), Martin (1987) and Gill (1990). Figure 2 shows the stylized pupal case with major characters.

Phylogenetic analysis

The data matrix used is given in Appendix D. Multistate characters were treated as unordered and without *a priori* weighting. Inapplicable characters and missing data were coded as question marks (Lee and Bryant 1999; Strong and Lipscomb, 1999). Characters which the "part" (e.g. seta) and "character-variable" (e.g. seta shape) could be coded as separate characters and/or fused into a single character, were coded as separate characters to avoid loss of phylogenetic information (Lee and Bryant 1999). Multistate taxa were coded as

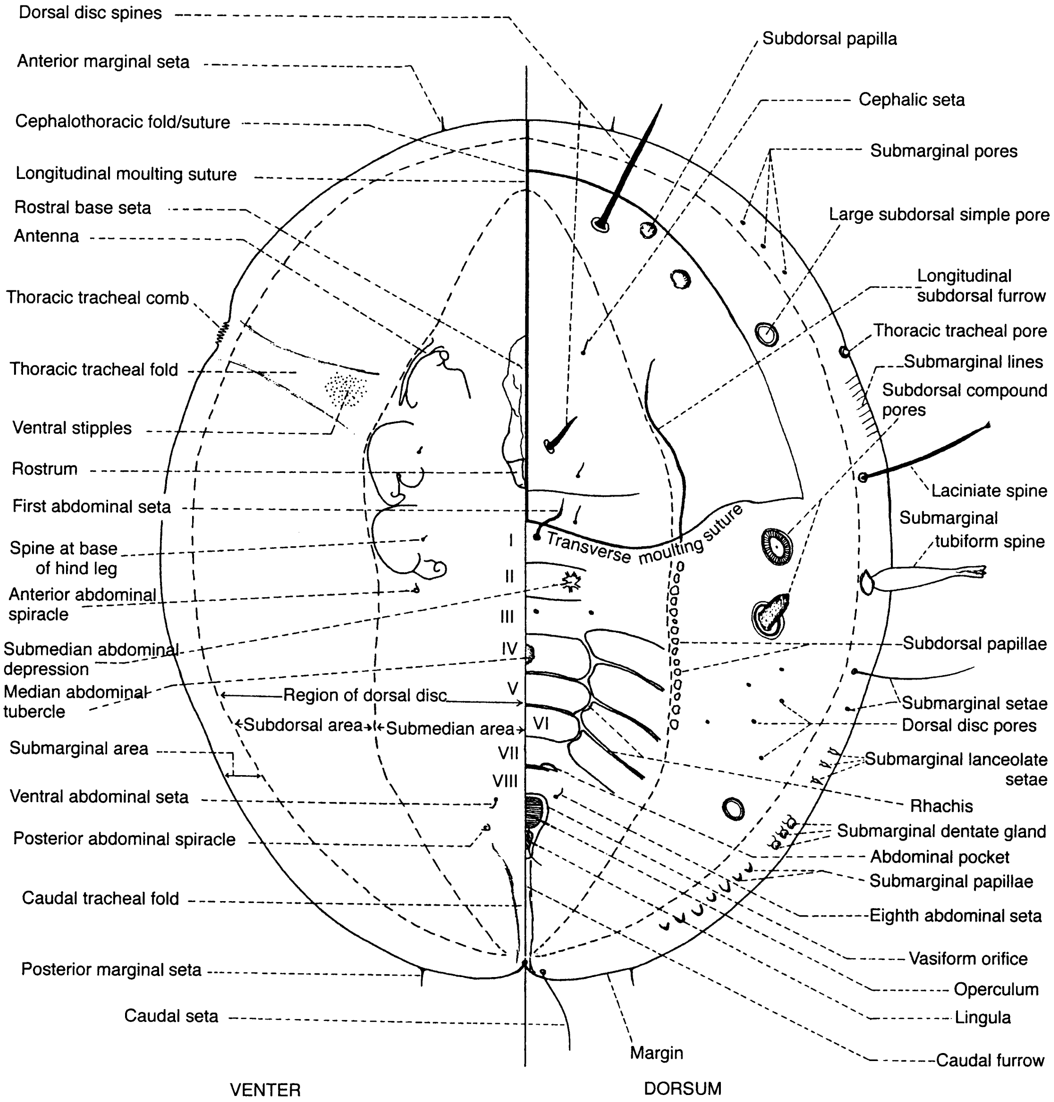

Figure 2. Stylized whitefly puparium with major morphological features annotated (from Martin 1987).

polymorphisms. Maximum parsimony analysis (MP) was carried out using PAUP*, version 4.0b10 (Swofford 1998). Heuristic searches were carried out with 1000 random additions followed by branch swapping using tree–bisection–reconnection (TBR) holding a single tree (NCHUCK=1, CHUCKSCORE=1) (Morris et al. 1999; Sallum et al. 2000; Hall and Harvey 2001; Skevington and Yeates 2001; Vardal et al. 2002). The resulting tree(s) were used for a final round of branch swapping with maxtrees 30 000. The new strategy for estimating large phylogenies (changing the landscape) was employed to help find more parsimonious trees (Quicke et al. 2001). The approach was used with maximum and minimum retention index (RI), and maximum and minimum consistency index (CI).

The bootstrap support for individual branches was estimated using 100 pseudoreplicates each of 100 random additions (Felsenstein 1985), though this will be very conservative due to the difficult nature of this data set (e.g. Gauthier et al. 2000). Parsimony Jackknifing with 36.79% deletion, i.e. resampling 63.21% of characters, proposed by Farris et al. (1996) was also carried out to find support for branches as well as finding Bremer support (Bremer 1994) for some clades. To carry out Bremer support using PAUP*, a constraint tree description for the taxa of the clade in question was created and a search then performed by enforcing the topological constraint, but with the programme to only search for trees that were NOT compatible with that constraint. As a result, if the node in question is strongly supported, the best trees found that do not contain that node, i.e. are not compatible with the constraint, will be at least one step longer than the most parsimonious tree found from the initial unconstraint analysis. This discrepancy in tree length is the decay index or Bremer support value.

Additionally, successive approximation weighting (SAW) (Farris 1969) was applied for unweighted analysis using each of the four above-mentioned indices to increase resolution. Analyses were performed constraining some traditional whitefly genera to be monophyletic, and the resulting trees compared with the initial unconstrained ones using the Templeton (Wilcoxon sined-ranks) test implemented in PAUP*. The same procedure was used to find most-parsimonious trees (MPTs) for constraint analysis, i.e. heuristic searches with 1000 random additions, and employing the new strategy. Characters were traced on to cladograms using MacClade 4.0 (Maddison and Maddison 2000) and were optimised using the accelerated transformation algorithm (AccTran). In all cases, the obtained trees were rooted using the out-group taxa.

Characters and character coding using in the analysis

Pupal case

[1] Pupal case margin: (0) smooth (Figure 3A); (1) undulate and/or indistinctly indentate (Figure 3B); (2) distinctly toothed (Figure 3C–L). Comments: in all cases, the word 'margin' is used to mean the real margin rather than the apparent margin, which may be submarginal in the case of marginal recurvature (see character 3). In other words, the real margin was used as a criterion to score the relevant characters.

[2] If pupal case margin distinctly toothed: (0) crenate (Figure 3C); (1) dentate (Figure 3D); (2) lobulate (Figure 3E); (3) truncate–lobulate (Figure 3F, G); (4) serrate (Figure 3H); (5) each tooth with apical notch, which gives the teeth the appearance of being twinned and sometimes being triangular (Figure 3I–K); (6) close-set lanceolate processes, each arising from a blunt marginal tooth (Figure 3L).

[3] Recurvature of margin: (0) margin not recurved; (1) margin partially recurved ventrally; (2) margin completely recurved ventrally. Comments: when the ventral surface of pupal case is much smaller than the dorsal surface the margin is evenly reflexed, a part of the submargin is recurved or the whole submargin is recurved. In some species the margin may easily be recurved by the mounting process and can cause misinterpretation when the character is coded.

Setae–spines

[4] Anterior marginal setae: (0) absent; (1) present (Figure 2).

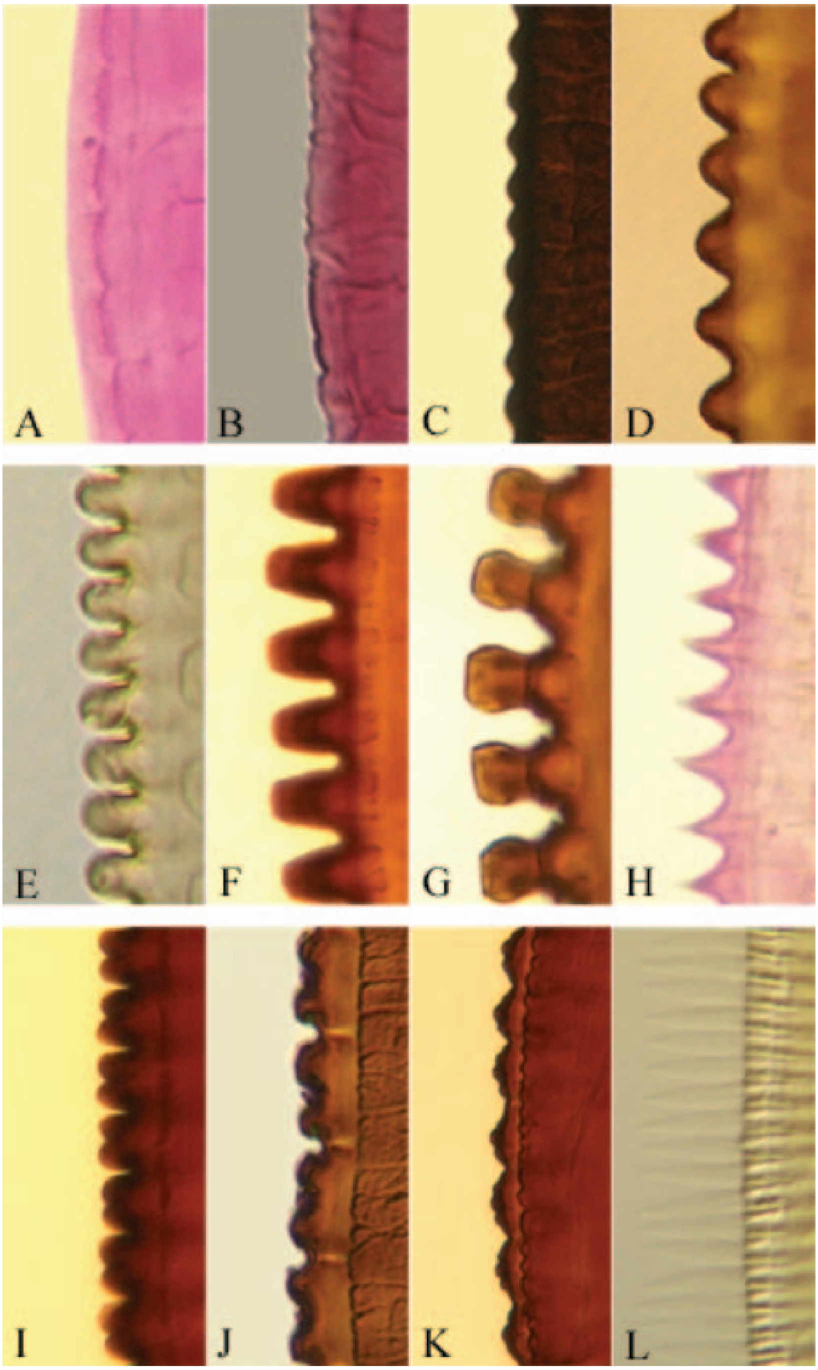

Figure 3. Different shapes of margin. (A) Smooth line; (B) undulate and/or indistinctly indentate; (C) crenate; (D) dentate; (E) lobulate; (F, G) truncate-lobulate; (H) serrate; (I–K), each tooth with apical notch, which gives the teeth the appearance of being twinned and sometimes being triangular; (L) close-set lanceolate processes, each arising from a blunt marginal tooth.

[5] Posterior marginal setae: (0) absent; (1) present (Figure 2). Comments: although Bink-Moenen (1983) states they are probably always present, careful examination here at ×1000 shows they are completely absent in some cases.

[6] Cephalic setae: (0) absent; (1) present.

[7] Position of cephalic setae: (0) nearly above, lateral or anterior to mouthparts; (1) far removed from mouthparts toward the front, margin, or both.

[8] Mesothoracic setae: (0) absent; (1) present.

[9] Metathoracic setae: (0) absent; (1) present.

[10] First abdominal setae: (0) absent; (1) present.

[11] Position of first abdominal setae: (0) nearly above, lateral or anterior to hind legs; (1) distinctly mediad of hind legs. Comments: the presence of the first abdominal setae can be of taxonomic value at genus level but in some genera there is interspecific variation (Bink-Moenen 1983). In the literature, the term 1st abdominal "pseudo-setae" is sometimes used for 1st abdominal setae when they are thickened, their bases submedial and often close-set (e.g. Martin 1999 for the genus *Aleuroduplidens* Martin). Their function then seems to be to keep the third-instar exuviae attached to the pupal case. Such setae are not always considered as 1st abdominal setae, e.g. for *Aleurocanthus* Quaintance & Baker, Bink-Moenen (1983) stated that "1st abdominal setae absent" but Martin (1999) stated "1st abdominal setae present but usually thickened, sometimes similar to glandular spines". In this study, these setae were accepted as 1st abdominal setae and mostly separated from the normal ones based on their position on the 1st abdominal segment.

[12] Eighth abdominal setae: (0) absent; (1) present.

[13] Position of eighth abdominal setae: (0) at the base of anterior margin and/or lateral to vasiform orifice (Figure 4A); (1) anterolateral to vasiform orifice (Figure 4B); (2) anterior to vasiform orifice (Figure 4C).

[14] Caudal setae: (0) absent; (1) present.

[15] Position of caudal setae: (0) close to margin; (1) on about half way from the posterior end of vasiform orifice to margin; (2) close to vasiform orifice.

[16] Length of caudal setae: (0) distinctly shorter than vasiform orifice; (1) approximately as long as vasiform orifice; (2) distinctly longer than vasiform orifice. Comments: the length of caudal setae shows both interspecific and intraspecific variation in relation to the vasiform orifice, but appears to be fixed for the species of some genera.

[17] Submarginal setae (excluding those in character 14): (0) absent; (1) present.

[18] Submarginal setae (excluding those in character 14): (0) hair-like, short or long (Figure 5A); (1) stout, apical acute and/or rounded, short or long (Figure 5B); (2) somewhat swollen at base and pointed apically (lanceolate) (Figure 5C); (3) capitate (Figure 5D); (4) apical bended (Figure 5E); (5) laciniate (Figure 5F); (6) almost T-shaped (Figure 5H); (7) almost arrow-shaped (Figure 5I). Comments: see the comments for character 20.

[19] Setae of dorsal disc area (except those in characters 6, 8, 9, 10 and 12): (0) absent; (1) present.

[20] Setae of dorsal disc area (except those in characters 6, 8, 9, 10 and 12): (0) hair-like, short or long (Figure 5A); (1) stout, apical acute and/or rounded, short or long (Figure 5B); (2) somewhat swollen at base and pointed apically (lanceolate) (Figure 5C); (3) capitate (Figure 5D); (4) apical bended (Figure 5E); (5) laciniate (Figure 5F); (6) very stout, apical truncate-capitate (Figure 5G); (7) almost T-shaped (Figure 5H); (8) almost arrow-shaped (Figure 5I). Comments: the length

and position of setae as well as their number is variable within some species, e.g. *Aleurolobus gruveli* Cohic (Bink-Moenen 1983). Except for a few genera, for which the position and number of setae are characteristic, e.g. *Corbettia* Dozier, their number and position have not usually been used as diagnostic characters at genus level (unlike for the aleurodicine genera). This is most probably due to variability so that even for a given number of setae for a species, it seems they are submarginal when small, but are located more subdorsally when they are enlarged. Therefore, the number of setae and their positions (except being on submargin or dorsal disc area) were not coded as separate characters. In the case of lack of submarginal line (see character 28), it is sometimes very difficult to assign setae as being submarginal or subdorsal when they are located far from the margin. In such cases, other features such as submarginal ridges radiating from the margin, colour differences or different ornamentations depending on the examined taxa were used to help define the submarginal limit. It is worth mentioning that according to Bink-Moenen (1983), the division of the dorsal surface into submargin, subdorsum, submedian and median areas (the three latter areas all together is called dorsal disc area) is artificial, as can be seen from the variable position of some setae in many species. Even when the submargin is separated by a furrow, the same setae may occur as often on the submargin as on the subdorsum.

[21] Submarginal spines: (0) absent; (1) present. Comments: there is almost no distinct boundary between setae and spines in some cases in the literature and the same feature has been defined as a seta and/or a spine by different authors. In general, if there is no circle at the base of this character indicating a socket, it is considered as a spine. The length, position and number of spines are variable as mentioned above for the setae.

[22] Submarginal spines: (0) stout and acute (Figure 5L); (1) stout and laciniate (Figure 5N); (2) tubiform (siphon-like) (Figure 5O).

[23] Spines of dorsal disc area: (0) absent; (1) present.

[24] Spines of dorsal disc area: (0) spines reduced to capitate seta-like structures (Figure 5K); (1) stout and acute (Figure 5L); (2) stout spines with a seta acutely pointed at the tip (Figure 5M); (3) stout and laciniate (Figure 5N); (4) tubiform (siphon-like) (Figure 5O).

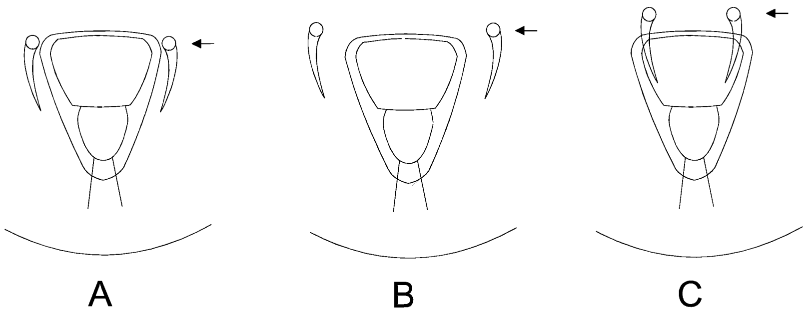

Figure 4. Position of eighth abdominal setae (arrowed). (A) At the base of anterior margin and/or lateral to vasiform orifice; (B) anterolateral to vasiform orifice; (C) anterior to vasiform orifice.

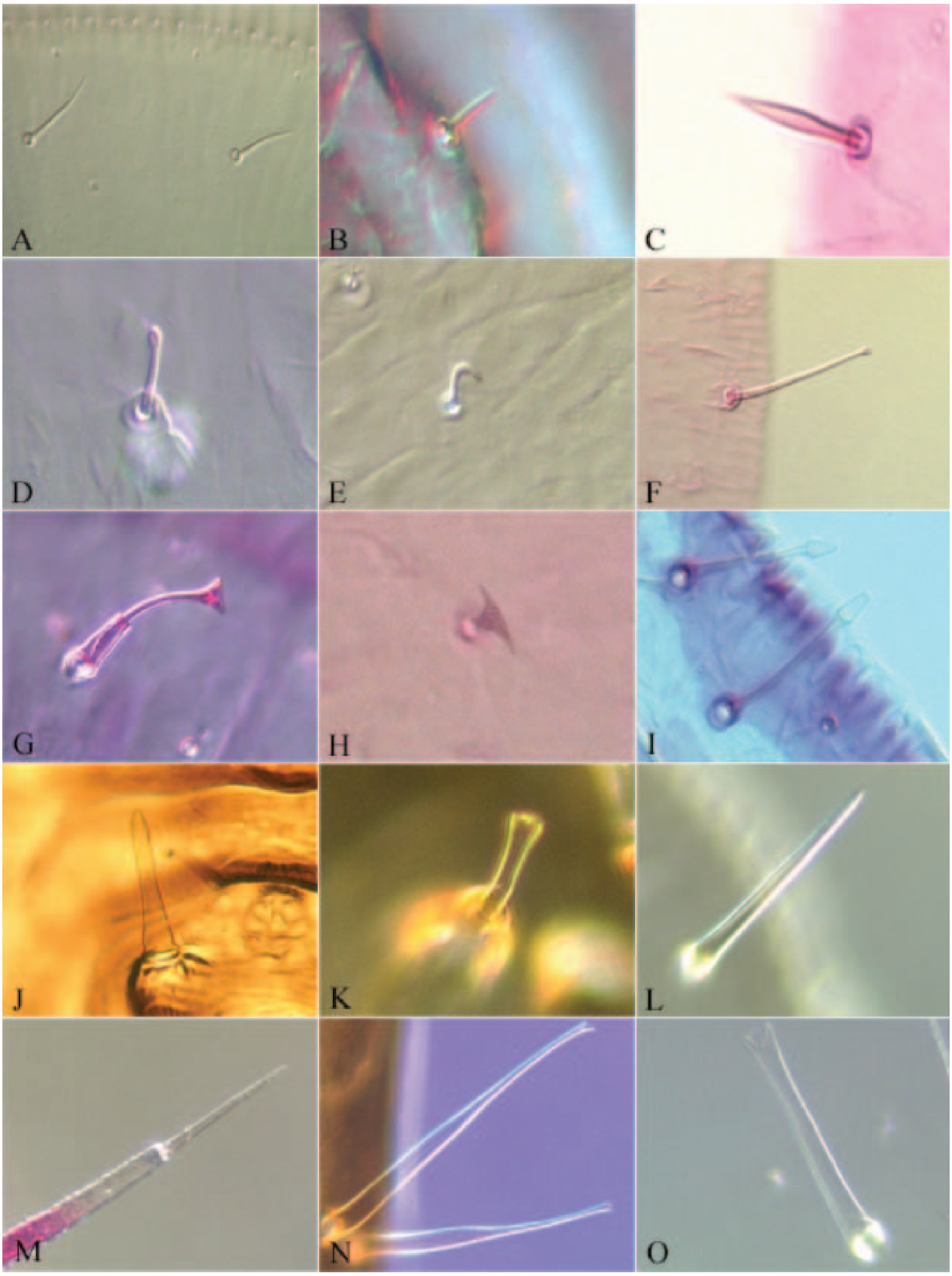

Figure 5. Different shapes of setae (A)–(J) and spines (K)–(O). (A) hair-like, short or long; (B) stout, apical acute and/or rounded, short or long; (C) somewhat swollen at base and pointed apically (lanceolate); (D) capitate; (E) apical bended; (F) laciniate; (G) very stout, apical truncate-capitate; (H) almost T-shaped; (I) almost arrow-shaped; (J) trumpet-like wax-secreting setae; (K) spines reduced to capitate seta-like structures; (L) stout and acute; (M) stout spines with a seta acutely pointed at the tip; (N) stout and laciniate; (O) tubiform (siphon-like).

Moulting sutures – major dorsal marking

[25] Transverse moulting suture: (0) not reaching margin of pupal case; (1) reaching margin of pupal case.

[26] Shape of transverse moulting suture: (0) like Figure 6A; (1) not bent near 90° in middle of each side (Figure 6B); (2) curves anteriorly at the junction of longitudinal moulting suture and posteriorly at the middle of each side (Figure 6C); (3) like Figure 6D; (4) each side curves anteriorly (Figure 6E); (5) like Figure 6F; (6) like Figure 6G; (7) each side bends to anterior and meets in the midline (Figure 6H); (8) each side curves anteriorly in the form of a pear together with a pair of membranous furrows (Figure 6I); (9) each sides curves anteriorly in the form of an almost triangular together with a pair of membranous furrows (Figure 6J). Comments: the shape of transverse moulting suture is quite variable and the 10 shapes chosen above were almost the main shapes and other intermediate states were assignable to one the main ones.

[27] Longitudinal moulting suture: (0) not reaching margin of pupal case; (1) reaching margin of pupal case. Comments: only in one species studied, *Viennotaleyrodes curvisetosus* Martin, the longitudinal moulting suture was absent. For this species the character was coded as a question mark similar to those few species that the distal extremity of the suture was not clearly discernible due to slide quality.

[28] Submarginal line or fold, which separates submargin from the dorsal disc area: (0) absent; (1) present.

[29] If submarginal line or fold present: (0) parallel and longitudinal or almost bracket-shaped, not meeting at both anterior and posterior; (1) not parallel and longitudinal, meeting at both anterior and posterior, concentric with margin or nearly so; (2) like state 1, but with breaks at eyespot regions; (3) like state 1, but interrupted at caudal area; (4) like state 1, but with breaks at eyespot regions and interrupted at caudal area. Comments: in the literature, the shape of submarginal line or fold has sometimes been cited but almost never with clear diagnostic states separated or compared between taxa.

[30] Extra submarginal lines encircling the pupal case: (0) absent; (1) present.

[31] Longitudinal subdorsal furrow: (0) absent; (1) present.

[32] Subdorsal line, which separates subdorsal area from submedian area: (0) absent; (1) present.

[33] Cephalothoracic fold: (0) absent; (1) present. Comments: in some species, e.g. *Cockerelliella psidii* (Corbett), the cephalothoracic fold joins to the distal extremities of the transverse and longitudinal moulting sutures and forms a "trapdoor". This feature is similar to character 26, state 7 but in the latter, each side of the transverse moulting suture curves anteriorly and is connected with the longitudinal moulting suture.

Vasiform orifice

[34] Vasiform orifice shape: (0) semicircular; (1) nearly circular (Figure 7A); (2) nearly triangular (Figure 7E–J); (3) nearly tetrahedral (Figure 7K–M); (4) oval, truncate at the top (scutellate) (Figure 7B); (5) subcordate (Figure 7C); (6) transversely elliptical (Figure 7D). Comments: Maskell (1895) was the first to describe and name the vasiform orifice and its components the lingula, operculum and lingular setae. The shape of vasiform orifice is very variable and the same feature has been defined using different

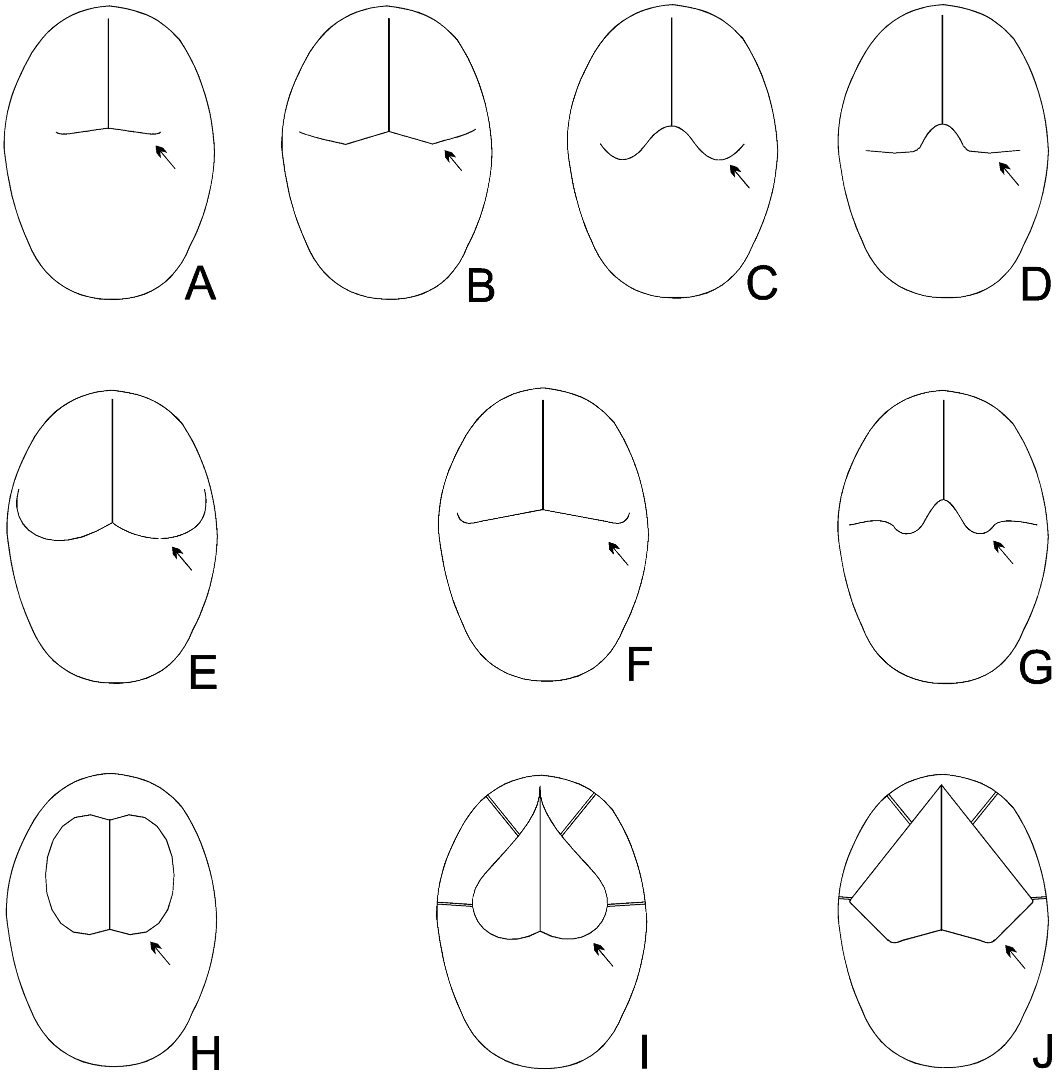

Figure 6. Different shapes of transverse moulting suture (arrow shows transverse moulting suture).

terms and/or short sentences by different authors. The shapes chosen in the characters 34–36 were the main shapes and other intermediate states were assignable to one of these states. The shape of vasiform orifice, at least in some cases, may be subjective but it has been used in many generic and species descriptions and so it has been included here and we have been as objective as possible in differentiating the states.

[35] If vasiform orifice nearly triangular: (0) triangular, straight-sided (Figure 7E); (1) cordate (Figure 7F); (2) triangular, not very elongate, emarginate-sided (Figure 7G); (3) elongate-triangular, straight-sided (Figure 7H); (4) elongate–cordate (Figure 7I); (5) elongate-triangular, sinuous-sided (Figure 7J).

[36] If vasiform orifice nearly tetrahedral: (0) squarish (Figure 7K); (1) rectangular (Figure 7L); (2) nearly trapezoidal (Figure 7M).

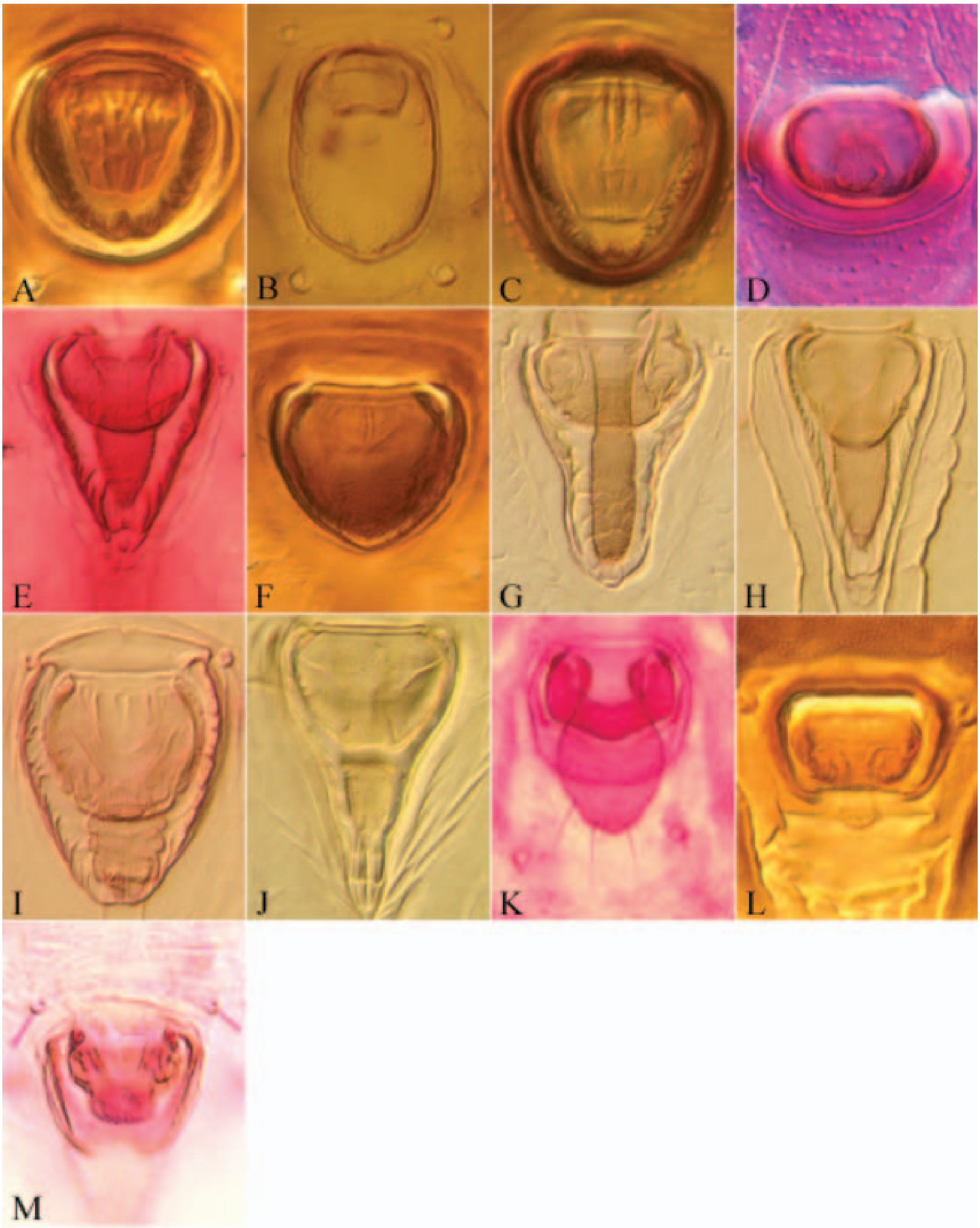

Figure 7. Vasiform orifice shape. (A) nearly circular; (B) oval, truncate at the top (scutellate); (C) subcordate; (D) transversely elliptical; (E) triangular, straight-sided; (F) cordate; (G) triangular, not very elongate, emarginate-sided; (H) elongate-triangular, straight-sided; (I) elongate–cordate; (J) elongate-triangular, sinuous-sided; (K) squarish; (L) rectangular; (M) nearly trapezoidal.

[37] Vasiform orifice: (0) not elevated; (1) elevated. Comments: although in some genera e.g. *Aleurocanthus*, this character is easily recognisable, but it is sometimes less obvious. For example, for the genus *Siphoninus* Silvestri, Martin (1999) stated that "vasiform orifice not elevated", which is the opposite of what Bink-Moenen (1983) stated, i.e. "vasiform orifice elevated". The latter author defined two major types of vasiform orifice: "open" vasiform orifice and "elevated" vasiform orifice. To recognize the latter type she stated that "the elevated vasiform orifice is situated on an elevation; its margin is often surrounded by a sclerotized ring; caudal furrow and ridges are absent". In this study, it has been found that the absence of caudal furrow and ridges is not always true and in some species for example, in *Dialeurolonga elongata* Dozier and *Zaphanera papyrocarpae* Martin, the vasiform orifice is elevated and the caudal furrow and ridges are present. Elevation of the vasiform orifice is probably not generically important but is important at the species level (J. H. Martin, BMNH, personal communication).

[38] Vasiform orifice inner margin teeth (carinae): (0) absent; (1) present.

[39] Vasiform orifice posterior notch: (0) absent; (1) present. Comments: although the shape of notch also shows variation, this variation appears to be continuous rather than discrete. As far it is known from the literature, with the exception of Jensen's articles (1999, 2001), the shape of vasiform orifice notch has never been used as a diagnostic character, at least at genus level.

[40] Position of vasiform orifice: (0) inset from posterior margin of pupal case by less than its own length; (1) inset from posterior margin of pupal case by about its own length; (2) inset from posterior margin of pupal case by distinctly more than its own length (sometimes two or more times).

[41] Operculum size: (0) occupying about 0.25 of orifice; (1) occupying about 0.5 of orifice; (2) occupying about 0.75 of orifice; (3) occupying about whole of orifice. Comments: there are two types of vasiform orifice: the orifice is nearly or completely filled by the operculum and the lingula is normally not visible in dorsal view, and in the other type, the operculum does not fill the posterior part of the orifice and the lingula is usually visible (Gill 1990). Here, these two main states were divided into four states so as to cover all those used by various authors in generic and/or species descriptions to date.

[42] Operculum shape: (0) transversely elliptical (Figure 8A); (1) nearly trapezoidal, rounded at angles (Figure 8B); (2) nearly rectangular, wide about twice as long as length, posterior angles toothed and/or slightly indentate (Figure 8C); (3) subcordate (Figure 8D); (4) semicircular (Figure 8E); (5) rectangular, convex-sided, hind margin straight and/or slightly curving anteriorly (Figure 8F); (6) rectangular, convex-sided, hind margin with a wide projection (Figure 8G); (7) cordate or slightly elongate-cordate (Figure 8H); (8) rectangular shaped pushed inward at posterior margin (Figure 8I); (9) squarish, convex-sided, narrowed posteriorly (Figure 8J). Comments: as with the vasiform orifice, the shape of the operculum is also variable and the same feature has been defined using different terms and/or short sentences used by different authors (see comments for character 34). This character has not been used as frequently as the shape of vasiform orifice in species or generic descriptions.

[43] Opercular setae: (0) absent at posterior margin of the operculum; (1) present at posterior margin of the operculum (two setae).

[44] Head of lingula: (0) completely obscured by opaque operculum, not visible; (1) completely obscured by transparent operculum, visible; (2) incompletely obscured by operculum, partly visible; (3) not obscured by operculum.

[45] Head of lingula: (0) elongate (Figure 9H–J); (1) not elongate (Figure 9A–G, K).

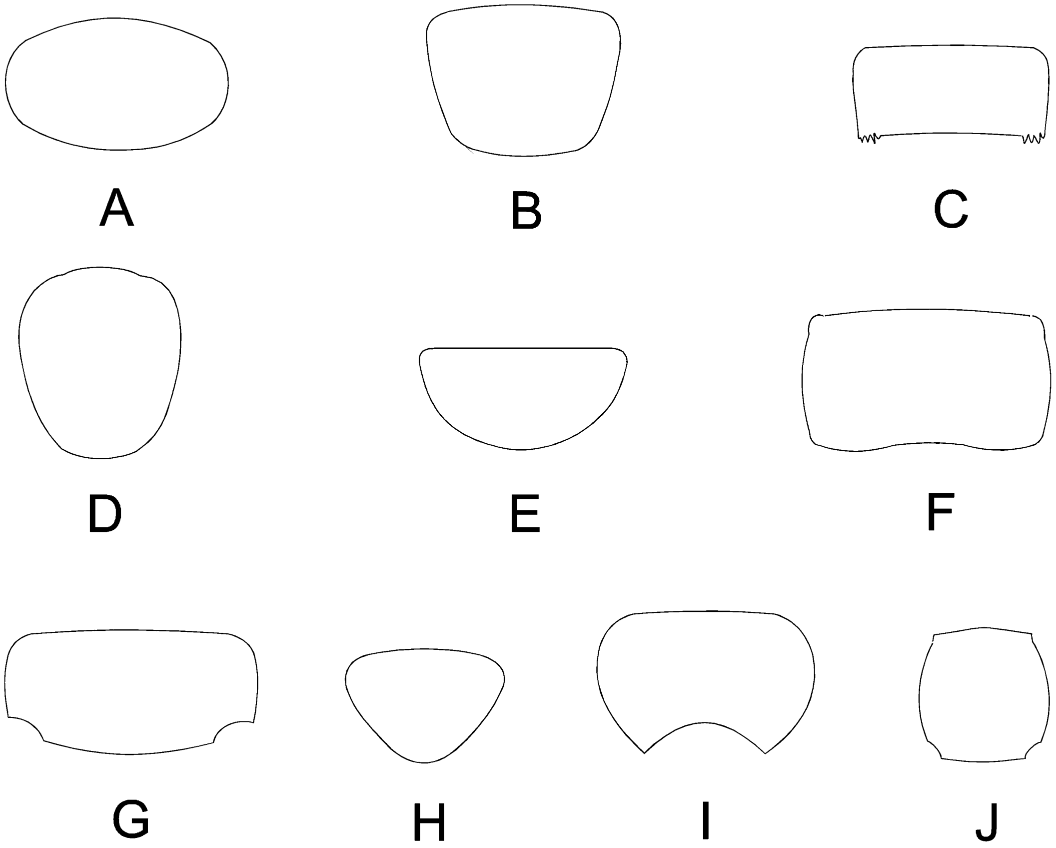

Figure 8. Different shapes of the operculum. (A) transversely elliptical; (B) nearly trapezoidal, rounded at angles; (C) nearly rectangular, wide about twice as long as length, posterior angles toothed and/or slightly indentate; (D) subcordate; (E) semicircular; (F) rectangular, convex-sided, hind margin slightly curves anteriorly and/or straight; (G) rectangular, convex-sided, hind margin with a wide projection; (H) cordate or slightly elongate-cordate; (I) rectangular shaped pushed inward at posterior margin; (J) squarish, convex-sided, narrowed posteriorly.

[46] If head of lingula elongate: (0) lanceolate (Figure 9H); (1) cylindrical, rounded posteriorly (Figure 9I); (2) large and almost conical (Figure 9J).

[47] If head of lingula not elongate: (0) blunt apex exposed; (1) expanded apically (Figure 9B); (2) spatulate, sometimes nearly triangular (Figure 9G); (3) forked-shaped (Figure 9D); (4) lobular (Figure 9E); (5) large and tongue-shaped (Figure 9K); (6) bilobate (Figure 9C); (7) knobbed (Figure 9A); (8) transversely elliptical (Figure 9F). Comments: the same as for the vasiform orifice and operculum but the character shows some discrete states (e.g. states 3 and 6).

[48] Lingula: (0) not extending beyond posterior margin of vasiform orifice; (1) extending beyond posterior margin of vasiform orifice. Comments: sometimes the lingula may be protruded by the mounting process and can cause misinterpretation this character. It should be noted that in some species the length of lingula is longer than vasiform orifice but it folds inside the orifice. To avoid any error in determining its true length in such species, the normal state of lingula was chosen, i.e. the character was coded as having the first state (not extending beyond posterior margin of vasiform orifice).

[49] Lingular setae: (0) absent or not apparent; (1) present.

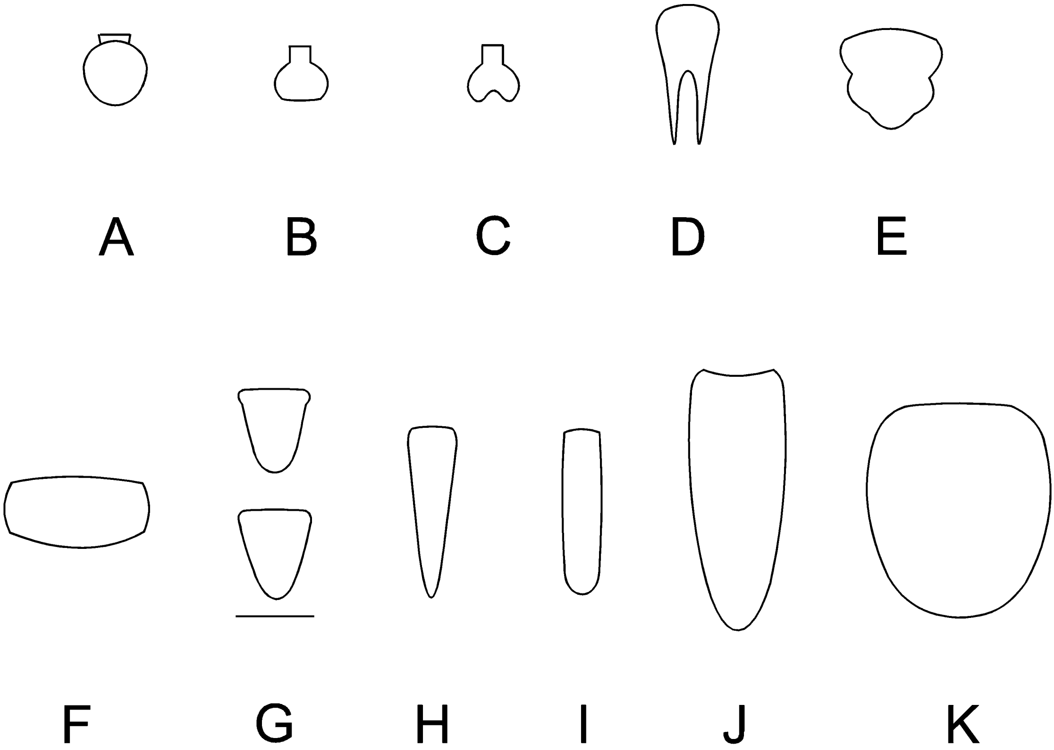

Figure 9. Different shapes of lingula. (A) knobbed; (B) expanded apically; (C) bilobate; (D) forked-shaped; (E) lobular; (F) transversely elliptical; (G) spatulate, sometimes nearly triangular; (H) lanceolate; (I) cylindrical, rounded posteriorly; (J) large and almost conical; (K) large and tongue-shaped.

[50] Number of lingular setae: (0) two (if two more setae are present, these are minute and often visible only at ×1000 magnification with a light microscope); (1) four. Comments: the lingula is usually spinulose and the number of conspicuous setae generally varies from without any seta to having four setae. In the Aleurodicinae, some of whose members were used as out-groups, the lingula almost always has four conspicuous setae. In the Aleyrodinae, only two apical setae have usually been mentioned in original descriptions. Russell (1947) was the first to report the presence of two more small lateral lingular setae (for some species of Trialeurodini that she described as a new tribe including three genera (see Appendix A)). In this study, examination of thousands specimens belonging to about one third of all described whitefly species at ×1000 magnification indicates that with the exception of lack of lingular setae in some species, these two small lateral setae are also present in other genera and quite visible when the lingula is in a right position. It seems that they have been neglected, even by Russell in her other publications, because they are small and difficult to see at least at ×400. However, since these two small lingular setae somehow differ from those of the Aleurodicinae, the character was included here.

Tracheal pores–tracheal folds

[51] Thoracic tracheal pores: (0) no discernible pore; (1) not forming a distinct pore, margin slightly curved inwardly/outwardly or thickened (Figure 10A); (2) somewhat

invaginated and with slightly thickened cuticle (Figure 10B); (3) crenulated to a lesser degree than the rest of margin (Figure 10C); (4) in the form of a comb of modified teeth, sometimes only two or three teeth (Figure 10D–F); (5) C-shape pore without teeth (Figure 10G, H); (6) C-shape with teeth (Figure 10I, J); (7) deeply emarginate and covered by a smooth rounded lobe (Figure 10K); (8) gland spines forming a comb (Figure 10L). Comments: each state shows variations even within some species, so for such a large-scale study it was almost impossible to score all numerous visible states that did not seem to be generic and even sometimes species level characters. The eight states coded are as objective as possible.

[52] Thoracic tracheal folds: (0) absent; (1) present. Comments: in some species tracheal folds are finely stippled or defined by microtubercles.

[53] Caudal tracheal fold: (0) absent; (1) present. Comments: the same as for the character 52.

[54] Secondary tracheal folds underline abdominal sutures III/IV: (0) absent; (1) present. Comments: this character was only observed in one monobasic genus, *Gagudjuia* Martin. In the future the character may be seen in other species, so it was added to the character system to help for further studies, though in this study it is parsimony-uninformative.

[55] Caudal furrow: (0) absent; (1) present.

[56] Caudal furrow: (0) narrow, half-width or less than half-width of vasiform orifice, sometimes suture-like; (1) wide at base (near vasiform orifice), the rest part narrow; (2) wide, more than half-width of vasiform orifice; (3) narrow at base, the rest part wide.

[57] Caudal ridges: (0) absent; (1) present.

Abdominal segments

[58] Lengths of seventh abdominal segment: (0) length of abdominal segment VII not significantly (half-length or less than half-length of segment VI) reduced medially; (1) length of abdominal segment VII significantly reduced medially. Comments: the length of abdominal segment VII, comparing to abdominal segment VI, is quite variable but the reduction of its length medially has been used as a diagnostic character for some genera, e.g. *Bemisia* and *Pealius* Quaintance & Baker, without clearly defining that how much reduction is significant. To make it clear and practical to score the character and subsequently to justify its validity as being a diagnostic character, the above-mentioned criterion was used.

[59] Submedian abdominal depressions: (0) absent; (1) present.

[60] Median abdominal tubercles: (0) absent; (1) present; (2) tubercle-like markings.

[61] Abdominal rhachis: (0) absent; (1) present.

[62] Lateral arms arising from abdominal rhachis: (0) absent; (1) present.

[63] Eighth abdominal bifid process: (0) absent; (1) present (Figure 11A).

[64] Segmentation between the abdominal segments: (0) normal; (1) first three abdominal segments joined together, apparently forming a single structure.

Papillae–tubercles–glands–pores

[65] Submarginal papillae: (0) absent; (1) present (Figure 11B). Comments: there is no clear distinction between papillae and tubercles in most cases in the literature. Their

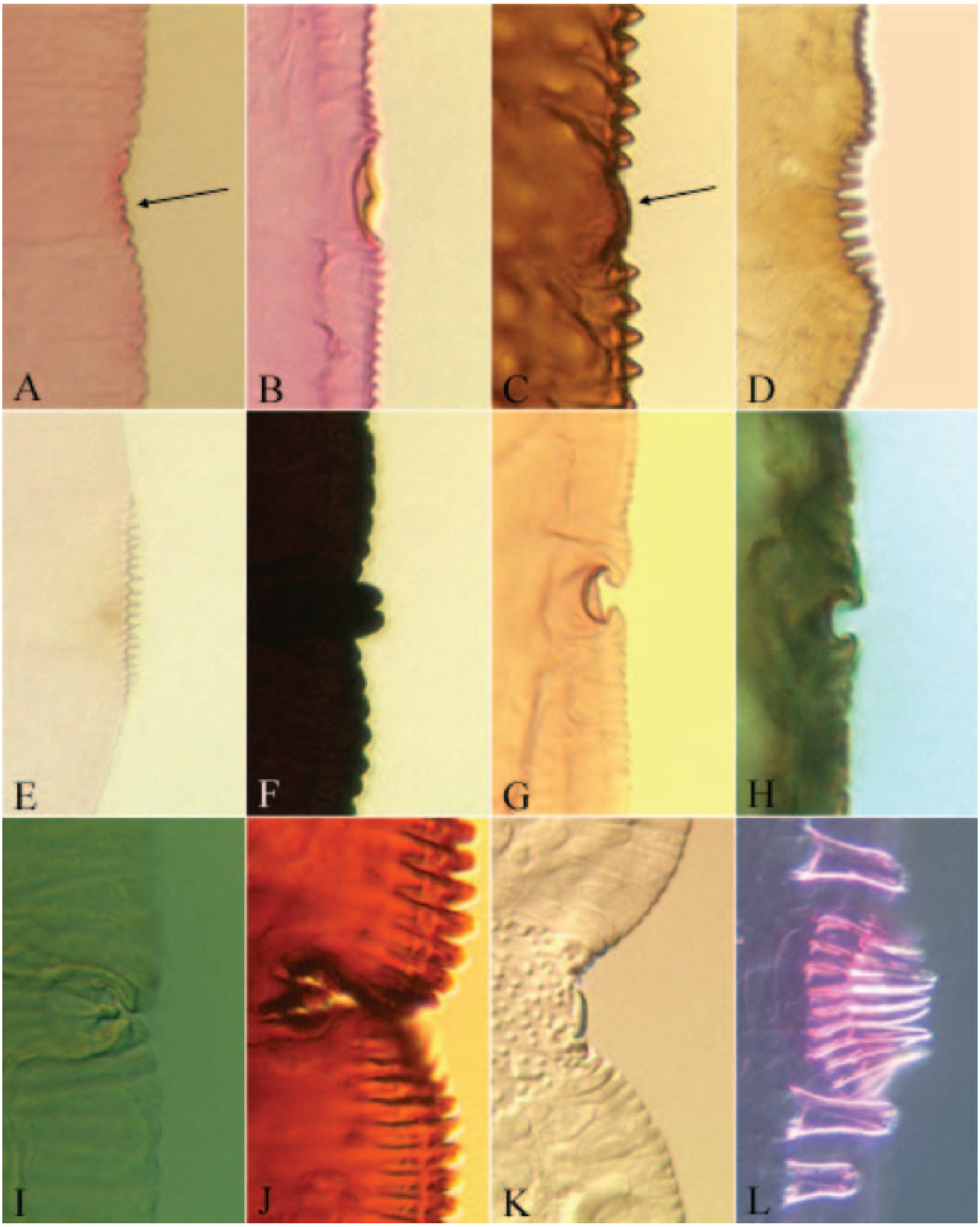

Figure 10. Different forms of the tracheal pore. (A) Not forming a distinct pore, margin slightly curved inwardly/outwardly or thickened (arrowed); (B) somewhat invaginated and with slightly thickened cuticle; (C) crenulated to a lesser degree than the rest of margin (arrowed); (D)–(F) a comb of modified teeth, sometimes only two or three teeth; (G, H) C-shape pore without teeth; (I, J) C-shape with teeth; (K) deeply emarginate and covered by a smooth rounded lobe; (L) gland spines forming a comb.

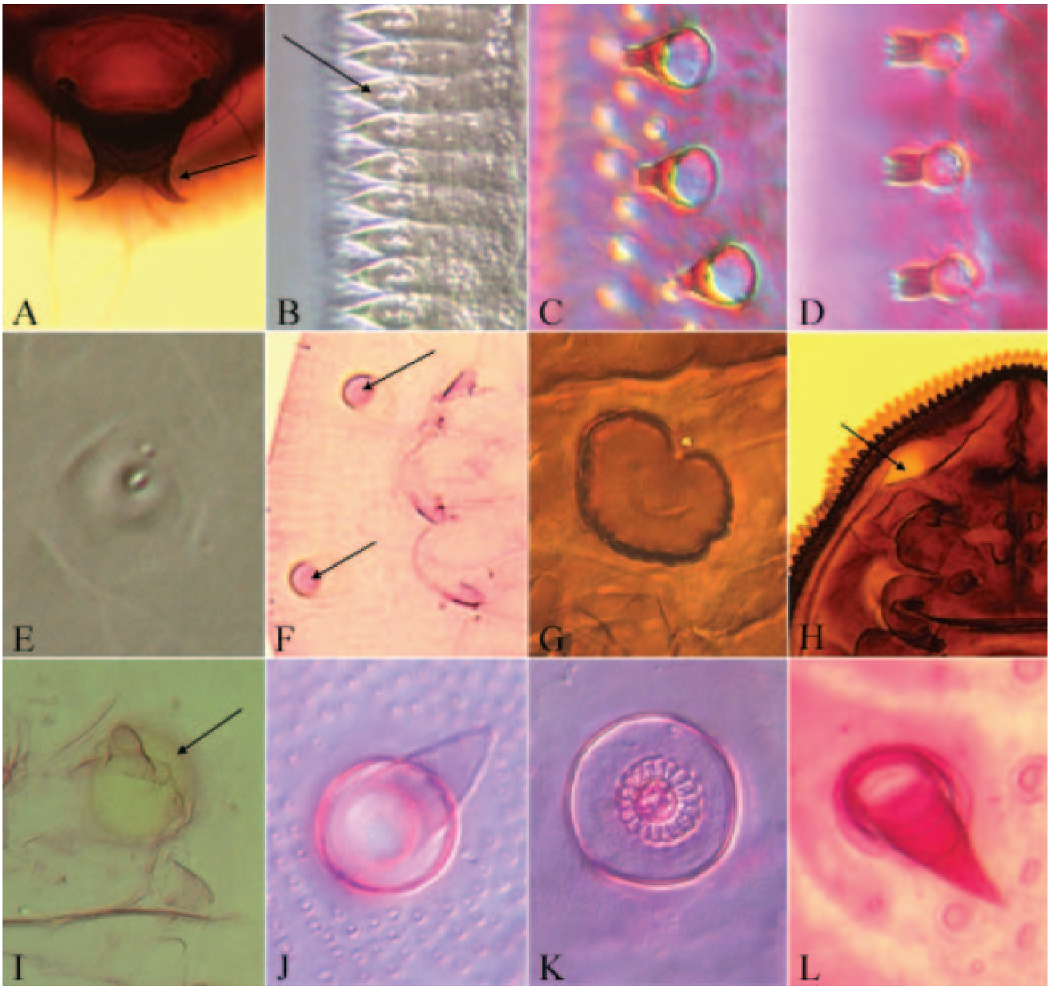

Figure 11. Different characters of pupal cases. (A) eighth abdominal segment showing bifid process (arrowed); (B) submarginal papillae (arrowed); (C) submarginal glands (tips of glands smooth); (D) submarginal glands (tips of glands dentate); (E) geminate pore/porettes; (F) large subdorsal simple pores (arrowed); (G) modified papillae of dorsal disc area, which are slightly elevated, nearly flat and plate-like; (H) eyespot (arrowed); (I) dorsal gland (arrowed); (J)–(L) compound wax pores.

presence, size and structure are very variable even within a species. Therefore, only the presence and absence of these characters on the submargin (this character and character 66) or on the dorsal disc area (characters 74 and 75) was scored. Compared with papillae, tubercles are more shapeless, usually irregularly distributed and have no associated pore. According to J. H. Martin (BMNH, personal communication), tubercles are often environmentally induced characters.

[66] Submarginal tubercles (excluding the tubercle between caudal setae, when is present, and those at the bases of the larger setae): (0) absent; (1) present. Comments: see character 65.

[67] Submarginal glands: (0) absent; (1) present (Figure 11C, D). Comments: these structures were named by Russell (1958), thought they have also been called papillae, pores, or tubercles by other writers.

[68] Shape of submarginal glands: (0) tips of glands smooth (Figure 11C); (1) tips of glands dentate (Figure 11D). Comments: the tips of the glands in the ten species described/redescribed by Russell (1958) were dentate. Later, Bink-Moenen (1983) described such glands for the monobasic genus, *Arachnaleyrodes* Bink-Moenen, but in that case their tips were smooth, and was used as one of the diagnostic character for the genus. Glands with smooth tip were only observed in one taxon, so this parsimony-uninformative character was automatically ignored by the analyses.

[69] Submarginal simple pores: (0) absent; (1) present.

[70] Submarginal geminate pore/porettes: (0) absent; (1) present (Figure 11E). Comments: these structures are also called combined pores and sometimes pores and porettes are widely spaced from each other. According to Russell (1948) and Bink-Moenen (1983), their distribution is of some value at the species level.

[71] Simple pores of dorsal disc area: (0) absent; (1) present.

[72] Geminate pore/porettes of dorsal disc area: (0) absent; (1) present (Figure 11E). Comments: the same as for the character 70.

[73] Large subdorsal simple pores: (0) absent; (1) present (Figure 11F). Comments: these structures are usually a generic level diagnostic feature but at least in *Dialeuropora decempuncta* (Quaintance & Baker) these large simple pores are sometimes absent or much reduced in size. It is considered likely that this is a modification arising from environmental factors which remain obscure (Martin 1999).

[74] Subdorsal papillae: (0) absent; (1) present. Comments: the same as for character 65.

[75] Tubercles of dorsal disc area (except the tubercles mentioned in the character 60): (0) absent; (1) present. Comments: the same as for character 65.

[76] Modified papillae of dorsal disc area, which are slightly elevated, nearly flat and plate-like: (0) absent; (1) present (Figure 11G).

[77] Eyespots: (0) absent; (1) present (Figure 11H). Comments: according to Bink-Moenen (1983), the presence of eyespots can be of taxonomic value at the species level, but presence and expression are often variable interspecifically. Both states were scored for those species that at least some individuals with them.

[78] Dorsal glands: (0) absent; (1) present (Figure 11I). Comments: these glands are easily distinguished from those mentioned in the characters 67 and 68 (see Figure 11C, D, I).

[79] Subdorsal compound wax pores and/or agglomerate pores: (0) absent; (1) present (Figures 11J–L and 12A, B). Comments: only members of the subfamily Aleurodicinae that have been chosen as out-groups for this study have compound wax pores and/or agglomerate pores. For this reason, these characters were not treated separately.

[80] Glandular bases to marginal teeth: (0) absent; (1) present (Figure 12C). Comments: in the literature, this structure has sometimes been described as "a double row of teeth" or rarely "a translucent membranous area at the bases of the marginal teeth". According to Bink-Moenen (1983), these are probably wax-secreting pores or papillae.

[81] Trumpet-like wax-secreting setae: (0) absent; (1) present (Figure 5J). Comments: these setae were considered by Tremblay and Iaccarino (1978) as a generic character for the monobasic genus, *Aleurotuba* Tremblay & Iaccarino. Because they were observed only in this single taxon, it is parsimony-uninformative.

[82] Chain-like design along some abdominal and thoracic sutures: (0) absent; (1) present (Figure 12D).

[83] Submedian conspicuous invaginations; sometimes hemispherical: (0) absent; (1) present (Figure 12E, F).

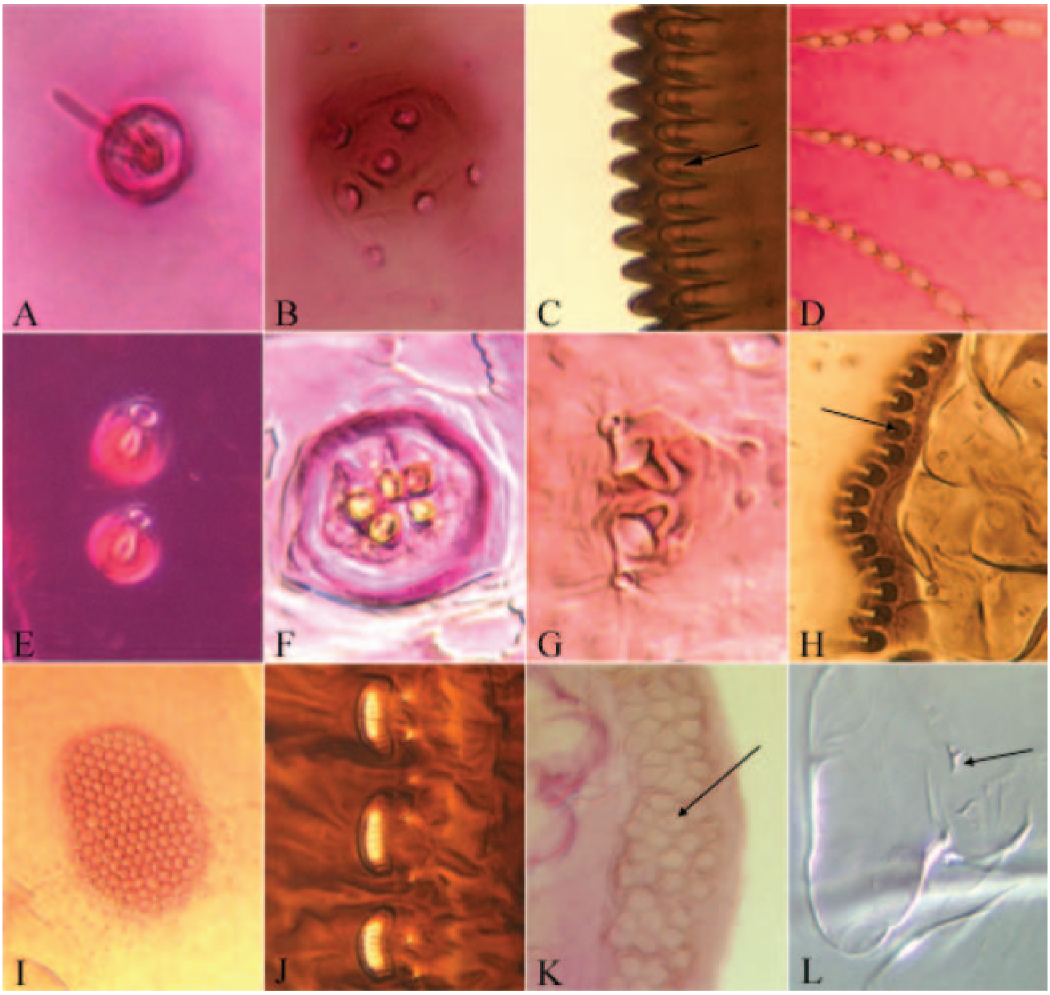

Figure 12. Different characters of pupal cases. (A, B) Compound wax pores and/or agglomerate pores; (C) glandular bases to marginal teeth (arrowed); (D) chain-like design along some abdominal and thoracic sutures; (E, F) submedian conspicuous invaginations; sometimes hemispherical; (G) subdorsal plate with conical pores; (H) a row of scallop-shaped thickenings along the longitudinal subdorsal furrow (arrowed); (I) prominent glandular areas with polygonal reticulate pattern, sometimes resembling compound eyes; (J) crescent-shaped pores; (K) submarginal wax-plat cluster (arrowed); (L) basal leg spine (arrowed).

[84] Subdorsal plate with one or two conical pores connected with tracheal pore area: (0) absent; (1) present (Figure 12G).

[85] A row of scallop-shaped thickenings along the longitudinal subdorsal furrow: (0) absent; (1) present (Figure 12H).

[86] Prominent glandular areas with polygonal reticulate pattern, sometimes resembling compound eyes: (0) absent; (1) present (Figure 12I).

[87] Submarginal crescent-shaped pores: (0) absent; (1) present (Figure 12J).

[88] Submarginal wax-plat cluster: (0) absent; (1) present (Figure 12K).

Legs and antennae

[89] Apical adhesion pad of legs: (0) absent; (1) present.

[90] Tarsal claw: (0) absent; (1) present.

[91] Basal mid- and hind leg seta: (0) absent; (1) present. Comments: this character has sometimes been used in species and/or generic descriptions, especially whenever the seta(e) have been long enough to be easily recognisable. In some cases, there is no clear distinction between setae and spines (character 92) and, apparently, the terms have been used synonymously by some authors. For example, for *Acaudaleyrodes africana* (Dozier), Mound (1965) stated "*A. africanus* can be distinguished from the other species in *Acaudaleyrodes* by the absence of setae from the base of legs, ...". Based on the criterion given in the comments for the character 21, what are absent from the base of legs in this species are spines not setae. Here, examination of thousands of specimens at × 1000 magnification, clearly showed that at least one microseta is always present at the base of each mid- and hind leg. Sometimes one or rarely two or more setae can be seen in some species but because of slide quality it was almost impossible to count them precisely for each species for such a large-scale study. It seems that the existence of extra seta(e) at most can be important at species level, but it is sometimes variable even for the same species. This character was automatically ignored due to being always present, i.e. a constant character.

[92] Basal mid- and hind leg spine: (0) absent; (1) present (Figure 12L).

[93] Antenna length: (0) limited to front legs or slightly more; (1) reaching middle of mid legs or more. Comments: sexual dimorphism occurs in some genera and species as a difference in the length of the antenna. In this case, the antennae of males are comparatively longer than the antennae of females. Such species were scored as polymorphic.

[94] Position of antenna relative to the prothoracic legs: (0) mesal to the prothoracic legs; (1) lateral to the prothoracic legs.

Results

Parsimony analysis

Maximum parsimony holding a single tree yielded one MPT (length=2759, RI=0.668, CI=0.136). This shortest tree was hit only once during the 1000 random additions, showing that this is a rather difficult data set to analyse. Branch swapping with maxtrees set at 30 000 using this tree as the starting tree gave 30 000 equally MPTs with a length of 2743 (RI=0.671, CI=0.137). Application of the new strategy (changing the landscape) for these trees using maximum RI to weight characters found 30 000 (limited by computer memory) equally MPTs with a length of 2730 (RI=0.672, CI=0.137) (employing the same strategy using maximum CI, minimum CI or minimum RI to weight characters found no shorter trees). The strict consensus tree of these is shown in Figure 13. Although the strict consensus tree contains several monophyletic clades, the relationships among most of these are unresolved. Ignoring 44 of the 117 examined genera that are monobasic and/or only one species were available for study, the following 33 genera (the author's names of all genera are given in Appendix C) were found to be monophyletic: *Acanthaleyrodes*, *Acaudaleyrodes*, *Africaleurodes*, *Aleurocerus*, *Aleurocybotus*, *Aleuroduplidens*, *Aleuroglandulus*, *Aleuroparadoxus*, *Aleuropteridis*, *Bellitudo*, *Combesaleyrodes*, *Corbettia*, *Dialeuropora*, *Fascaleyrodes*, *Filicaleyrodes*, *Fippataleyrodes*, *Indoaleyrodes*, *Leucopogonella*, *Metabemisia*,

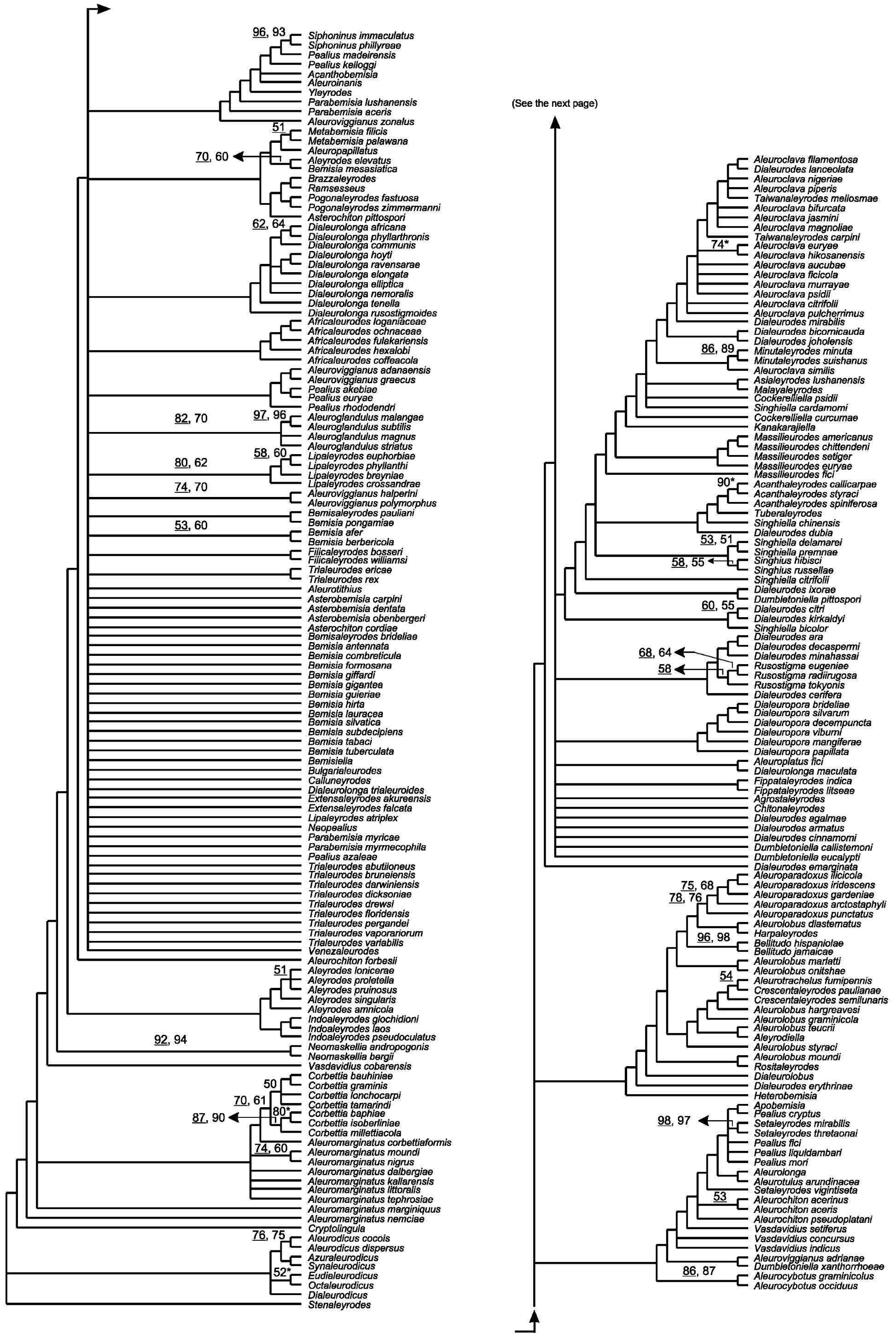

Figure 13. Strict consensus tree of 30 000 UW-MPTs resulting from analyses of morphological data. Figures above branches show bootstrap and Jacknife (underlined figures) values. Figures with an asterisk indicate the same value for both bootstrap and Jacknife.

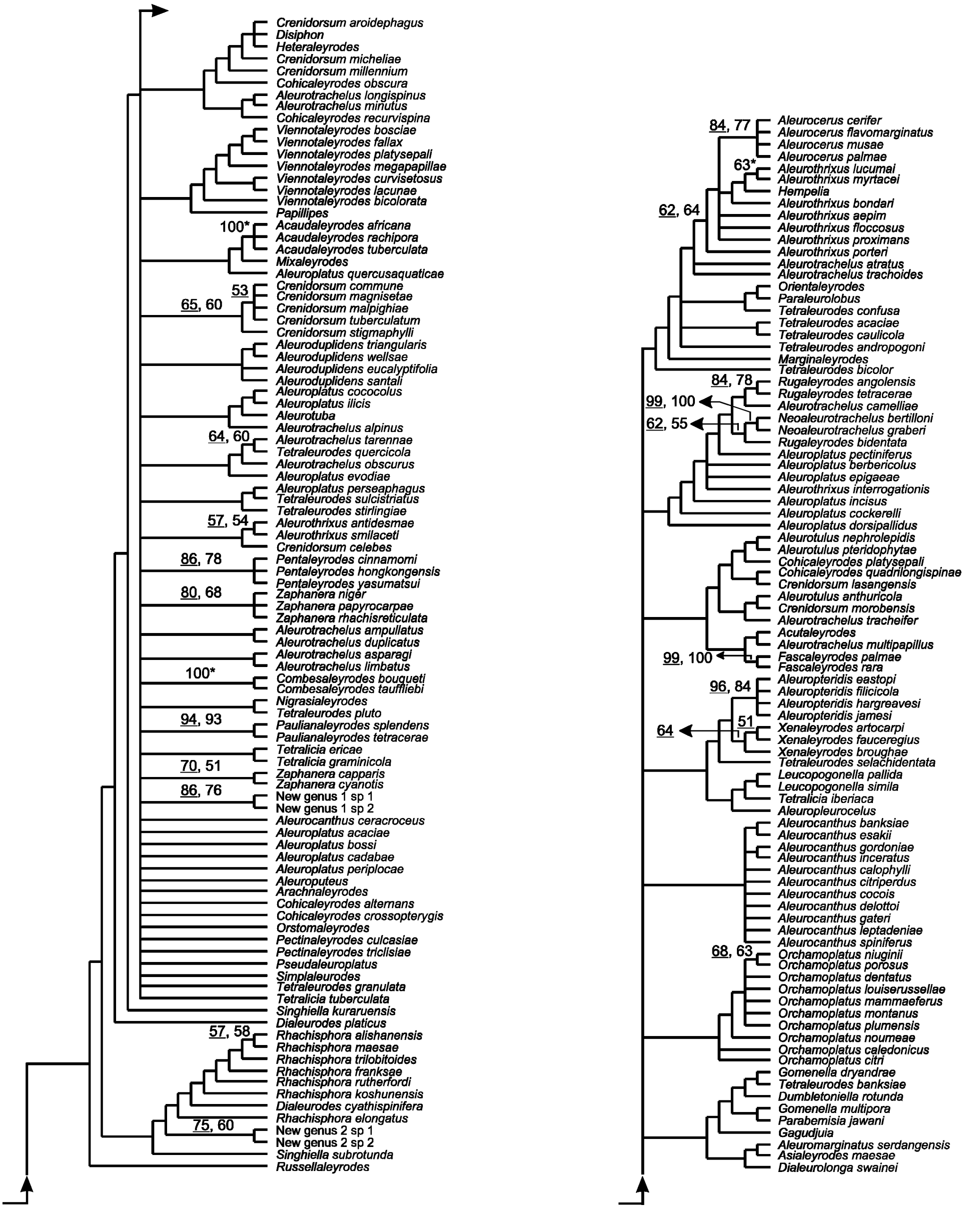

Figure 13. (Continued).

Minutaleyrodes, *Neoaleurotrachelus*, *Neomaskellia*, New genus 1, New genus 2, *Orchamoplatus*, *Paulianaleyrodes*, *Pentaleyrodes*, *Pogonaleyrodes*, *Rusostigma*, *Siphoninus*, *Singhius*, *Viennotaleyrodes*, *Xenaleyrodes*. This means that 40 genera were not recovered to be monophyletic. However, some of these were rendered non-monophyletic by a single species or very small groups of aberrant ones, viz. *Aleurocanthus* excluding *A. ceracroceus* Martin, *Aleyrodes* excluding *A. elevatus* Silvestri, *Lipaleyrodes* excluding *L. atriplex* (Froggatt), *Massilieurodes* excluding *M. fici* (Takahashi), *Rhachisphora* excluding *R. elongatus* Regu & David, *Rugaleyrodes* excluding *R. bidentata* Bink-Moenen, *Setaleyrodes* excluding *S. vigintiseta* Martin, and most of the species of the genus *Dialeurolonga* including the type-species as well as those species of *Crenidorsum* described by Russell (1945), including the type-species formed monophyletic clades. None of the mentioned excluded species are the type-species of their genera.

Successive approximation weighting

Applying SAW gave more resolution for unresolved nodes of the tree. More than 10% of the 30 000 MPTs obtained from the unweighted analysis (UW-MPTs) were selected so that to have at least 100 representatives from each 1000 MPTs. Then, the approach was used with four different indices, i.e. maximum RI, maximum CI, minimum RI, and minimum CI to weight characters, and four, eight, four, and eight cycles of reweighting were needed, respectively, before stability was reached. When all characters were set back to unit weight, the lengths of the trees were 2733, 2953, 2734 and 2927, respectively. Comparing these lengths with the length of UW-MPTs, i.e. 2730, indicates that the trees obtained from applying SAW using maximum and minimum RI (MPTs-SAW-MaxRI and MPTs-SAW-MinRI) are only three and four steps longer, respectively, and here the strict consensus tree of these trees (MPTs-SAW-MaxRI) is presented (Figure 14) and discussed. It is worth mentioning that the topology of the strict consensus trees of MPTs-SAW-MaxRI and MPTs-SAW-MinRI was almost the same as each other, and both were more in agreement with the strict consensus tree of UW-MPTs (Table I). The strict consensus trees obtained from applying SAW using maximum and minimum CI (MPTs-SAW-MaxCI and MPTs-SAW-MinCI) showed two different topologies and were somewhat less in agreement with the strict consensus tree of UW-MPTs (Table I).

In the strict consensus tree of MPTs-SAW-MaxRI (Figure 14), of the 33 genera recovered as monophyletic in the initial analyses, two, viz. *Dialeuropora* and *Pogonaleyrodes*, were no longer recovered, but the former excluding *D. silvarum* (Corbett) (not the type-species) did form a monophyletic clade. However, *Pectinaleyrodes* was monophyletic in this tree, whereas it was not in the initial tree. The monophyly of other mentioned genera were the same.

Monophyly of large genera

The evidence against monophyly of two economically important genera, *Bemisia* and *Trialeurodes*, as well as several large genera, i.e. *Aleuroplatus*, *Aleurotrachelus*, *Dialeurodes*, and *Tetraleurodes*, which were not recovered to be monophletic in either unweighted or SAW analyses was investigated. Separate analyses were performed constraining each of these to be monophyletic, and the resulted trees compared statistically with the initial unconstrained ones using the non-parametric ranked-sign test of Templeton.

Constraining *Bemisia* to be monphyletic resulted in one MPT (length=2772) and using the new tree searching strategy yielded more than 1000 MPTs (length=2756). The Templeton test showed that there were significantly longer than the best unconstrained ones (P=0.0196–0.0419) (Table II). Constraining *Dialeurodes* to be monophyletic yielded trees of length 2771 which were not different from unconstrained ones based on the Templeton test (P>0.07).

In all constraint analyses, only one MPT found after performing a heuristic search with 1000 random additions, which were significantly different from the UW-MPTs except for *Bemisia* and *Trialeurodes*. The final results changed for some genera after finding shortest

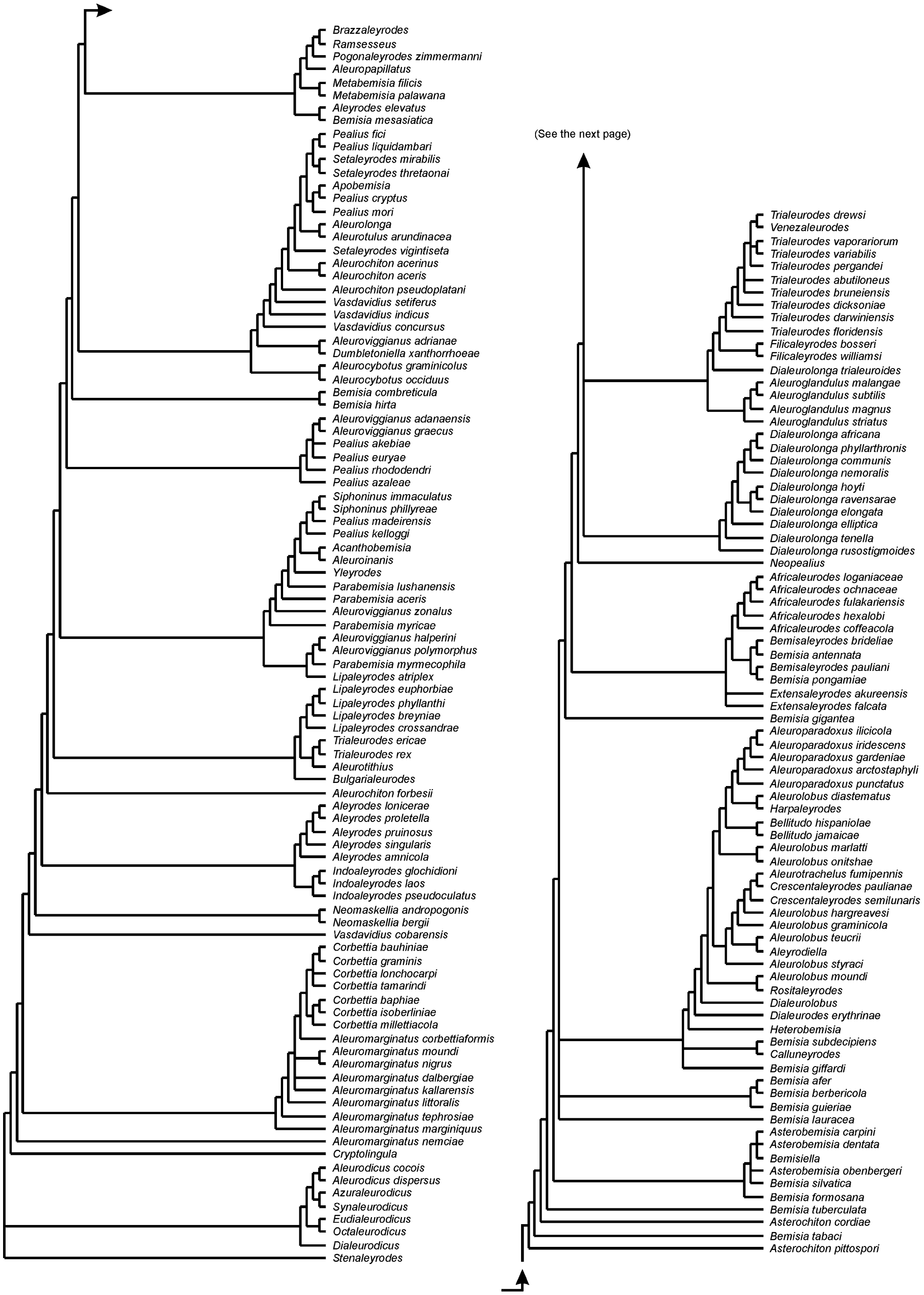

Figure 14. Strict consensus tree of more than 10 000 MPTs-SAW-MaxRI.

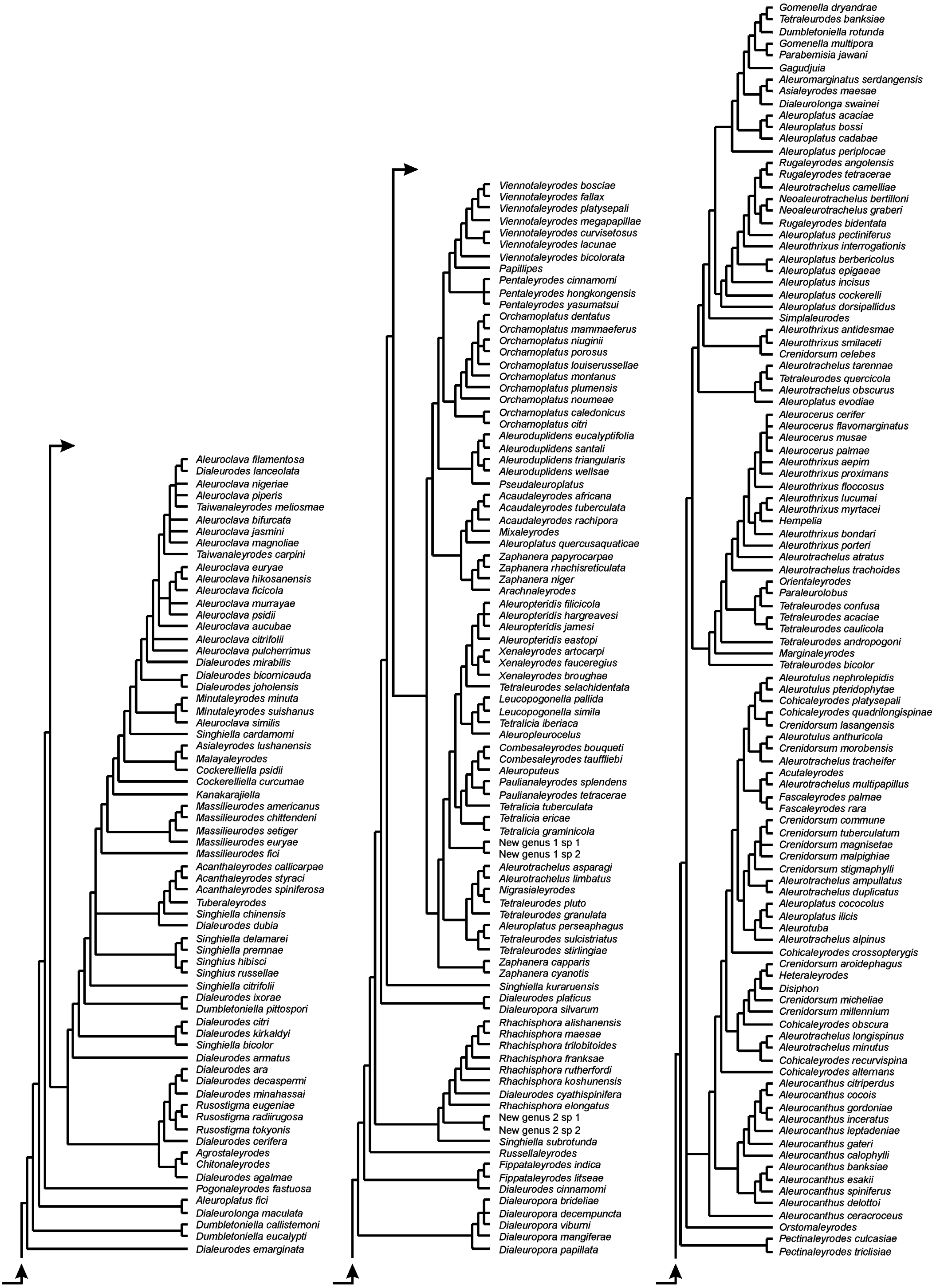

Figure 14. (Continued).

Table I. Symmetric-difference distances between different trees obtained from unweighted analysis and by applying successive approximation weighting.

Between trees	Symmetric-difference distances
MPTs-SAW-MaxRI–MPTs-SAW-MinRI	42–50
MPTs-SAW-MaxRI–UW-MPTs	73–98
MPTs-SAW-MinRI–UW-MPTs	100–124
MPTs-SAW-MaxCI–MPTs-SAW-MinCI	437–444
MPTs-SAW-MaxCI–UW-MPTs	611–620
MPTs-SAW-MinCI–UW-MPTs	614–624

possible trees applying the new strategy (at least 500 trees were compared), which are shown in Table II. Generally, the monophyly of *Aleurotrachelus* and *Bemisia* was statistically rejected, while that of *Aleuroplatus*, *Dialeurodes*, *Tetraleurodes*, and *Trialeurodes* was not (Table II). These results will be discussed in detail later.

The finding that statistical significance can increase when difference in tree length decreases (as a result of finding most parsimonious trees) indicates that it is important to reduce the variance, i.e. noise, in the estimate of numbers of character steps, and the test is only meaningful if the shortest possible trees to be compared. If they are not the MPTs, there will be a degree of "randomness" in the character lengths and such random variation might occasionally be on the side of increasing significance, sometimes not.

Evaluating the current tribe classification

As already mentioned, 13 tribes have been proposed so far within the Aleyrodinae. In addition to the problems posed by unplaced genera, there is little agreement about the composition of some proposed tribes (Sampson 1943, 1947; Russell 1947; Takahashi 1954; David 1990). Before starting to evaluate the current tribe classification, it should be mentioned that some of the genera in Appendix A have been synonymized and these will be indicated in the discussion of each tribe. Furthermore, except the tribe proposed by Russell (1947), Trialeurodini, the other tribes were only defined in identification keys by the authors, who erected them (see above). Tribal level characters used by these authors for each tribe are given in Appendix B to avoid repeating them when each tribe is discussed.

Table II. Results of the Templeton test obtained by comparing the shortest trees for those genera constrained to be monophletic, with the UW-MPTs.

Constrained genus	Constrained tree length	Tree length of UW-MPTs	Templeton test *P* values
Aleuroplatus	2757	2730	0.0513–0.2019
Aleurotrachelus	2780	2730	0.0085*–0.0186*
Bemisia	2756	2730	0.0196*–0.0419*
Dialeurodes	2771	2730	0.0785–0.1120
Tetraleurodes	2764	2730	0.0469*–0.0948
Trialeurodes	2741	2730	0.5590–0.7035

*Significant difference at $P<0.05$.

Tribe Aleurocanthini

Three genera, viz. *Aleurocanthus*, *Aleurotrachelus*, and *Pentaleyrodes*, were placed in the Aleurocanthini by Takahashi (1954), and only *Aleurocanthus* by David (1990) for the whiteflies of Japan and India, respectively (Appendix A). As mentioned before, the latter excluding *A. ceracroceus* was found to be monophyletic and the monophyly of *Aleurotrachelus* even statistically rejected (Table II). However, the type-species of *Aleurotrachelus*, *A. tracheifer* (Quaintance), was never recovered in the same clade either with *Aleurocanthus* or *Pentaleyrodes* in the strict consensus tree of UW-MPTs (Figure 13), whereas in the strict consensus tree of MPTs-SAW-MaxRI (Figure 14) it was found in a different clade from the *Aleurocanthus* clade within a big clade.

Tribe Aleurochitonini

Sampson (1943) proposed this tribe on the basis of a single genus, *Aleurochiton* (Appendix A). Two of the four studied species of this genus, *A. acerinus* Haupt and *A. aceris* (Modeer) (the type-species), were recovered as forming a monophyletic group in this study (Figures 13 and 14). Although in the strict consensus trees of MPTs-SAW-MaxCI and MPTs-SAW-MinCI (trees not presented), *A. pseudoplatani* Visnya also came out with the former two species, *A. forbesii* (Ashmead) was not recovered with them in the same clade in any analysis. Interestingly, Sampson (1943) erected a new subgenus, *Nealeurochiton* Sampson, to accommodate *A. forbesii*, but this was subsequently synonymized with *Aleurochiton* by Mound and Halsey (1978).

Tribe Aleurilobini

This tribe was proposed by Takahashi (1954), for five genera based on Japanese species (*Acanthobemisia*, *Aleurolobus*, *Apobemisia*, *Bemisia*, *Parabemisia*). All studied species of *Aleurolobus* including the type-species, *A. marlatti* (Quaintance), were recovered in the same clade but not as a monophyletic group. The only examined species of *Apobemisa*, *A. kuwanai* (Takahashi) (the type-species), was not found with *Aleurolobus* in the same clade, and the type-species of *Bemisia* (not recovered as a monophyletic genus), *B. tabaci*, was never recovered either with *Aleurolobus* or *Apobemisia*. The type-species of *Parabemisia* was not studied but the five examined species did not form a clade. *Acanthobemisia* and the four species of *Parabemisia* were only recovered in the same clade in the strict consensus tree of MPTs-SAW-MaxRI (Figure 14). David (1990) later transferred *Bemisia* to a separate tribe, Bemisini (see below), but Takahashi's Aleurolobini, even excluding *Bemisia*, was not supported in this study.

David (1990) and Regu and David (1993) classified six genera from India in this tribe (Appendix A). Only the type-species of *Aleuropapillatus* and *Orientaleyrodes* were studied and these appeared in two distantly separated clades. *Africaleurodes* was found as a monophyletic genus, but did not form a clade with the other five genera. Two examined species of *Asterochiton* (but not the type-species) were recovered on two different branches. All species of *Aleurolobus* and *Crescentaleyrodes* were found in the same clade (Figures 13, 14 and 19), and the possible monophyly of the latter will be discussed later.

Tribe Aleuroplatini

David (1990) placed two genera in this tribe (Appendix A), of which *Moundiella* David was later synonymized with *Viennotaleyrodes* (David et al. 1994). Unlike the latter genus, *Aleuroplatus* was found to be non-monophyletic, though its monophyly was not rejected statistically using the Templeton test (Table II) (see also "Discussion"). The type-species of *Aleuroplatus*, *A. quercusaquaticae* (Quaintance), and *Viennotaleyrodes* gathered in two different clades within a relatively big monophyletic clade in the strict consensus tree of MPTs-SAW-MaxRI (Figure 14).

Tribe Aleyrodini

The Aleyrodini originally comprised 24 genera (Sampson 1943), and the author added another genus in 1947. Five more genera were added later (Drews and Sampson 1956; Sampson and Drews 1956) (Appendix A). Of these *Aleuromigada* Singh is considered as *nomina nuda* and the name *Frauenfeldiella* Gomez-Menor is not available in Aleyrodidae as it is preoccupied in the *Cecidomyidae*; the genus is now known as *Aleurotuba* (Mound and Halsay 1978; Tremblay and Iaccarino 1978). There were no specimens available for *Hesperaleyrodes*, *Luederwaldtiana*, *Mexicaleyrodes*, *Nealeyrodes*, and *Neoaleurodes*, and *Laingiella* was also omitted from the analysis (see "Materials and methods"). Furthermore, *Aleurocanthus*, *Aleurotrachelus*, and *Pentaleyrodes* were transferred to Aleurochantini (see above), but David (1990) later reassigned *Aleurotrachelus* to Aleyrodini. Russell (1947) transferred *Aleurotithius* to Trialeurodini, and David (1990) relocated *Acaudaleyrodes*, *Tetraleurodes*, and *Zaphanera* in Neomaskellini, Tetraleurodini, and Zaphanerini, respectively (see below). Monophyly of Aleyrodini based on Sampson's classification even excluding *Acaudaleyrodes*, *Aleurocanthus*, *Aleurotithius*, *Aleurotrachelus*, *Pentaleyrodes*, *Tetraleurodes*, and *Zaphanera* was not supported in this study.

Takahashi (1954) placed only five genera from Japan in the Aleyrodini (Appendix A), of which two genera are now considered as synonyms: *Odontaleyrodes* Takahashi was synonymized with *Pealius* by Martin (1999). This tribal classification, too, failed to be monophyletic. Except *Aleyrodes*, David (1999) transferred all genera placed by Takahashi in Aleyrodini, to Bemisini and placed two more genera in the latter tribe (see Bemisini below).

David's (1999) classification of Aleyrodini with five genera from India, viz. *Aleurocybotus*, *Aleuromarginatus*, *Aleurotrachelus*, *Aleurotulus* and *Aleyrodes*, was not supported by this study.

Tribe Bemisini

Four of the six genera placed in this tribe by David (1990) (Appendix A) were briefly discussed above. The type-species of *Pealius* was not studied but the 10 examined species did not form a monophyletic clade. *Setaleyrodes* including the type-species, *S. mirabilis* Takahashi, also appeared non-monophyletic, but they were recovered together with some species of *Pealius* in the same clade (Figures 13 and 14). *Indoaleyrodes* (three species examined including the type-species, *I. laos* (Takahashi)) was recovered as monophyletic but in a separate clade. The type-species of *Neopealius* (the only examined species of this small genus) was on its own branch. As already mentioned, the monophyly of *Bemisia* was refuted statistically (Table II) (see also "Discussion") and its type-species, *B. tabaci*, was on its own branch.

Tribe Dialeurodini

Sampson (1943, 1947) placed 32 genera in the tribe Dialeurodini and 13 more genera were later added by Sampson and Drews in 1956 (Appendix A). Of these, *Aleuroclava* and

Aleurotuberculatus Takahashi are now treated under the former name (Martin 1999), as well as *Corbettella* Sompson, *Neobemisia* Visnya and *Roucasia* Goux, which were synonymized with *Pealius*, *Asterobemisia* (Mound and Halsey 1978) and *Bemisia* (Danzig 1964), respectively. Also, *Nipaleyrodes* and *Stenaleyrodes* have since been classified as members of the Aleurodicinae (Mound and Halsey 1978) (see also "Discussion" for *Stenaleyrodes*). For *Aleuroporosus*, *Anomaleyrodes*, *Dialeurotrachelus*, *Neoaleurolobus*, *Metaleyrodes*, *Plataleyrodes*, *Pseudaleurolobus*, *Pseudaleyrodes*, *Trichoaleyrodes* and *Xenobemisia* there were no specimens available for study. Although more than half of the 29 remaining genera were not found to be monophyletic, considering only their type-species, they never form a monophyletic clade, and the picture is not improved by excluding those genera that were later transferred to other tribes, viz. *Acanthobemisia*, *Africaleurodes*, *Aleurolobus*, *Aleuroparadoxus*, *Aleuroplatus*, *Asterochiton*, *Bemisia*, *Parabemisia*, *Pealius*, *Setaleyrodes*, and *Trialeurodes* (Russell 1947; Takahashi 1954; David 1990; Regu and David 1993).

Takahashi (1954) placed only four genera from Japan in this tribe (Appendix A), of which *Rhachisphora* was recovered in a separate clade from the other three genera in all analyses (Figures 13 and 14) but not as a monophyletic genus. All examined species of *Taiwanaleyrodes* and *Aleuroclava* (=*Aleurotuberculatus*) (see above), and also a few species of *Dialeurodes* including the type-species, *D. citri* (Ashmead) were in the same clade together with some other genera in both strict consensus trees (Figures 13, 14 and 17). *Aleuroclava* and *Taiwanaleyrodes* will be discussed in detail later.

David (1990) and David and Sundararaj (1993) classified 19 genera from India in the Dialeurodini (Appendix A), of which three genera have now been synonymized (*Martiniella* Jesudasan & David and *Aleurotuberculatus* were synonymized with *Aleuroclava* by Martin (1999)). Also, the three subgenera of *Dialeurodes*, viz. *Dialeuronomada*, *Gigaleurodes*, and *Rabdostigma* of Quaintance & Baker, which were raised to the generic level by Indian authors (David and Sundararaj 1993; Sundararaj and David 1994), were here treated under *Dialeurodes* (the four examined species of the latter genus, viz. *D. cerifera* Quaintance & Baker, *D. cinnamomi* Takahashi *D. ixorae* Singh and *D. minahassai* Martin are assignable to *Gigaleurodes*, *Gigaleurodes*, *Dialeuronomada* and *Rabdostigma*, respectively, but none of them is the type-species). *Kanakarajiella* (only the type-species examined), *Minutaleyrodes*, and *Singhius* gathered in the same clade with *Aleuroclava*, *Dialeurodes*, and *Taiwanaleyrodes* (Figure 17). The type-species of *Asialeyrodes* and *Cockerelliella* were not studied but one of the two examined species of the former and all examined species of the latter genus as well as six of the eight examined species of *Singhiella* including the type-species, *S. bicolor* (Singh), were also recovered in this clade, while *Rusostigma* was only found in this clade in the MPTs-SAW-MaxRI (Figure 14). Furthermore, except *D. cinnamomi*, the other three species of *Dialeurodes*, all were found in this clade but only in the MPTs-SAW-MaxRI (*D. ixorae* was also found in the UW-MPTs), i.e. recovering the representatives of all three subgenera. The four remaining genera, *Dialeurolonga*, *Dialeuropora*, *Fippataleyrodes*, and *Rhachisphora* also appeared in four different clades.

Tribe Lipaleyrodini

David (1990) included only *Lipaleyrodes* for this tribe (Appendix A) and the genus excluding *L. atriplex* was recovered to be monophyletic (including the type-species, *L. phyllanthi* Takahashi). *L. atriplex* had originally been described in *Aleyrodes*, and was subsequently transferred to *Lipaleyrodes* by Martin (1999), though it did not group even with the species of *Aleyrodes* in this study.

Tribe Neomaskellini

Sampson (1943) based the monotypic Neomaskellini on *Neomaskellia*, and later *Acaudaleyrodes* was added by David (1990) (Appendix A). Both genera were recovered to be monophyletic but located in two distantly separated clades in all analyses (Figures 13 and 14).

Tribe Siphoninini

This tribe includes only the monophyletic genus *Siphoninus* (Sampson 1943; David 1990).

Tribe Tetraleurodini

The only included genus, *Tetraleurodes*, was not found to be monophyletic in any analyses, though its monophyly was not rejected statistically (Table II) (see also "Discussion").

Tribe Trialeurodini

Russell (1947) erected this tribe and stated "only the known genera *Aleuroparadoxus* and *Aleurotithius* of Quaintance and Baker and *Trialeurodes* Cockerell appear to be assignable to this tribe". Subsequently, Russell (1967) added her new monobasic genus, *Venezaleurodes*. In the strict consensus tree of UW-MPTs (Figure 13), nine of the 11 examined species of *Trialeurodes* including the type-species, *T. pergandei* (Quaintance), as well as *Aleurotithius* (only the type-species studied), *Venezaleurodes* and several different genera formed a polytomy, and only two species of *Trialeurodes* were recovered in the same clade. *Aleuroparadoxus* was found to be monophyletic and formed a separate clade with several different genera. In the MPTs-SAW-MaxRI (Figure 14), the nine species of *Trialeurodes*, and *Venezaleurodes* were recovered in the same clade, and *Aleurotithius* formed a separate small clade with the two other species of *Trialeurodes*.

Tribe Zaphanerini

This tribe was proposed by David (1990) for *Zaphanera*, (Appendix A). Five species of this genus including the type-species, *Z. cyanotis* Corbett, were included in the present study. These formed two separate monophyletic clades which were supported by relatively high Jacknife values (Figure 13). The African and oriental species (*Z. capparis* Bink-Moenen and *Z. cyanotis*, respectively) were recovered in one, and the three Australian species in another (Figures 13 and 14). Thus, the Australian species (*Z. niger* (Maskell), *Z. papyrocarpae* Martin, and *Z. rhachisreticulata* Martin) do not appear to be congeneric with the type-species and a new genus needs to be erected for them (see "Nomenclatural changes").

Whitefly–host plant relationships

Host plant information at family, order and higher group levels for all whitefly species included in this study is given in Appendix E. All botanical names follow the system of the Angiosperm Phylogeny Group (APG) (Bremer et al. 1998, 2003; Soltis et al. 2000). Whitefly host plant information was obtained from Mound and Halsey (1978), Bink-Moenen (1983) and Martin (1999), as well as from more recent original descriptions, and from unpublished information available on slides examined.

Except for the only gymnosperm host record, *Dioon spinulosum* (Zamiaceae) for *T. vaporariorum* (Westwood), and also those few species recorded from Pteridophyta (see below), whiteflies are found mainly on angiosperms. Furthermore, few whitefly species are known to be monophagous, most being oligo- or polypahgous. The number of host plant orders attacked by the species studied here varies from one to 31 (probably the true number is higher) (Appendix E).

Twenty described, and three or four undescribed, species are reported from fern hosts (Pteridophyta) (Mound and Halsey 1978; Martin and Camus 2001), of which the fern host record for *T. vaporariorum* (which is highly polyphagous on Angiospermae) is uncertain, and the identification of one of these species as *B. tabaci* (also highly polyphagous on Angiospermae) is not definitive (Martin and Camus 2001). Here, 14 described species recorded from ferns (ignoring *B. tabaci* and *T. vaporariorum*) were scored. Of these, all described species of *Aleuropteridis* and *Filicaleyrodes*, were recovered as monophyletic, but they were distantly separated in trees from both analyses (Figures 13 and 14). The results were the same for the two fern-feeding species of *Metabemisia* (*M. filicis* Mound and *M. palawana* Martin), as well as the two fern-feeding species of *Aleurotulus* (*A. nephrolepidis* (Quaintance) (the type-species) and *A. pteridophytae* Martin). Neither the type-species of *Metabemisia* (not examined) nor the other species of *Aleurotulus* have been recorded from ferns. The latter genus appears not to be monophyletic and, apparently, its non-fern-feeding species are not congeneric with the type-species (it should be noted that one of its non-fern-feeding species, *A. arundinacea* Singh, is considered as species *incertae sedis* (Mound et al. 1994)). For *Trialeurodes*, three of the 11 examined species, *T. bruneiensis* Martin, *T. dicksoniae* Martin, and *T. rex* Martin, colonise ferns, but they were not recovered in the same clade. The only studied species of *Mixaleyrodes* were not recovered as a sister group to any of the fern-feeding species. In general, the position of these 14 species on the both cladograms did not support a clear Pteridophyta–whitefly relationship for the all fern-feeding species, although separate correlations were found for some species at genus level.

Almost the same results were obtained after mapping angiosperm hosts on both strict consensus trees. In general, some small monophyletic clades appear to be specialized on particular host plant orders, but in most cases, there was little of any indication of correlation between the species of a particular clade and host plant order.

Three genera for which a clear relationship with host plant order was apparent were *Aleuromarginatus*, *Corbettia*, and *Viennotaleyrodes*. The last two appeared to be monophyletic, but *Aleuromarginatus* was not found to be so, though most of its examined species formed a monophyletic clade with *Corbettia* (Figure 15). Virtually all species of these three genera have been recorded from Fabaceae (the exception being *C. graminis* Mound on Poaceae, *V. bosciae* Bink-Moenen recorded from Brassicaceae, and *C. millettiacola* Dozier which has additionally been recorded from Apocynaceae) (there is no host record for *A. serdangensis* Takahashi but this species most probably does not belong to *Aleuromarginatus*; see "Discussion") (Appendix E). Furthermore, the monobasic genus *Papillipes*, which is also recorded from Fabaceae, formed a sister group to *Viennotaleyrodes* (Figures 13 and 14), but this clade did not form a sister group to *Aleuromarginatus*+*Corbettia*.

Discussion

The family Aleyrodidae is taxonomically difficult. The genera usually have no reliable suite of morphological characters to allow them to be recognised unambiguously, and this is obvious from many of the original descriptions. Many of the larger genera have some species included which differ in at least one of the characters given in the description of the genus (e.g. *Aleurotrachelus asparagi* (Lewis) and *A. tarennae* Bink-Moenen have a

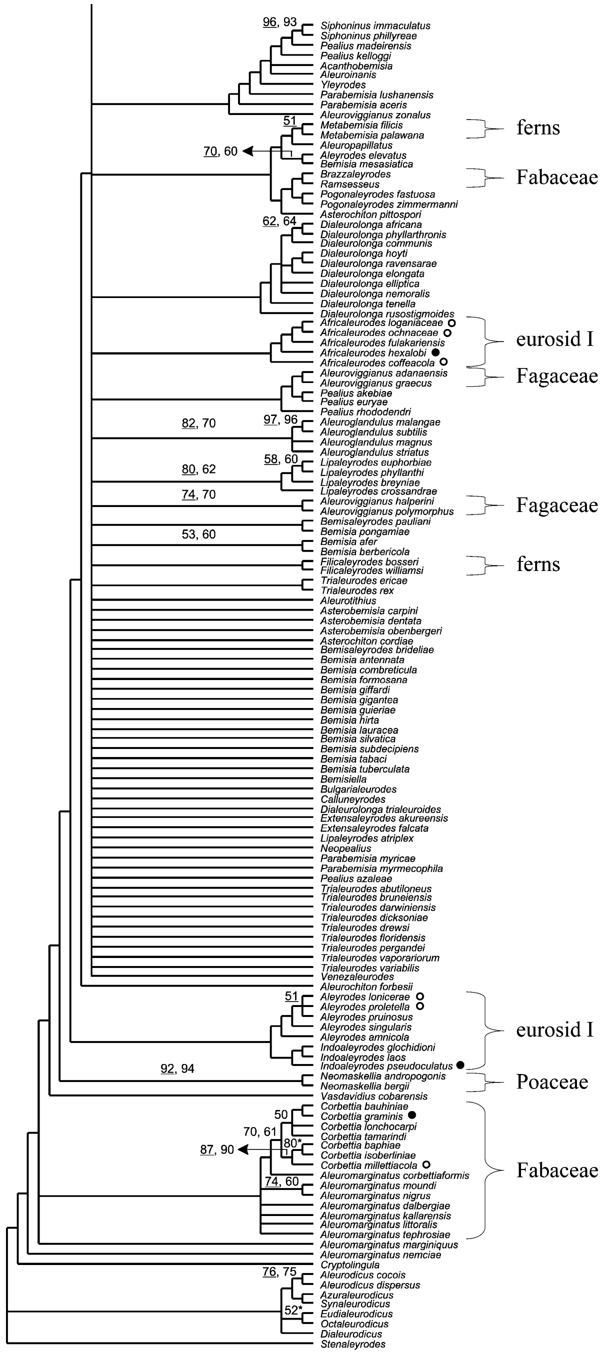

Figure 15. Correlation of the species in the basal part of the strict consensus tree of UW-MPTs with host plants. Figures above branches show bootstrap and Jacknife (underlined figures) values. Figures with an asterisk indicate the same value for both bootstrap and Jacknife. A black circle indicates that the species was not recorded from the same host family/higher group in the relevant clade. An empty circle indicates additional host family/higher group record for the species in the relevant clade.

submarginal line or fold, whereas, based on the original description of the genus, the submarginal area is not separated from the dorsal disc (Quaintance and Baker 1914)) and, sometimes, there is really no reason for a species to have been placed in its current genus at all (e.g. *Aleuromarginatus serdangensis*; see below).

These and other problems created some difficulties in choosing possible genus level characters for the cladistic analyses. We attempted to code all puparial characters used by authors in generic descriptions, although in most cases there are no distinct boundaries between genus level characters and those of species level. For example, Bink-Moenen (1983) while describing three new genera, *Arachnaleyrodes*, *Papillipes* and *Yleyrodes*, and comparing them with their morphologically closely related genera, i.e. *Orchamoplatus*, *Viennotaleyrodes* and *Africaleurodes* respectively, used the absence and/or presence of first abdominal setae as one of the diagnostic characters to separate the new genera from their allied genera. This character, however, has also been used to differentiate two species of a particular genus, e.g. *Dialeurolobus rhamni* Bink-Moenen and *D. pulcher* Danzig (Bink-Moenen and Gerling 1990), and *Crenidorsum millennium* Martin and *C. celebes* Martin (Martin 1999). As stated by Martin (2003), there is nothing inherently wrong with the use of immature stages taxonomically, but the problem is that, with our current poor understanding of the true significance of many puparial characters, we have yet to maximise their value. The lack of such information has impeded our understanding of relationships between aleyrodids, rather than any lack of characters for use (immature stages have been used taxonomically in other insects such as Psylloidea (White and Hodkinson 1982) and Lepidoptera (Kitching 2002, 2003; Willmott 2003)). For example, as mentioned in comments for character 80 (glandular bases to marginal teeth), this structure has sometimes been described as "a double row of teeth" or rarely "a translucent membranous area at the bases of the marginal teeth", and according to Bink-Moenen (1983), these are probably wax-secreting pores or papillae. In the latter case, characters 65 (submarginal papillae) and 80, apart from their shape differences, can be considered the same in a broad sense. Table III shows some examples regarding the opinions of different authors about the relationships between some genera. In fact, with whitefly puparial taxonomy lacking objective criteria (it seems to be partly a matter of guess-work at genus level), there is likely to be quite a lot of apparent homoplasy (in addition to some true homoplasy) due to misinterpreting similar character states during the coding stage.

Owing to the high level of homoplasy in the data set, the maximum consistency index may be the best choice for reweighting characters for SAW, because it cannot weight characters as zero, so potentially useful characters would not be excluded from the analysis (Quicke et al. 2001). It should be noted that when stability was reached in SAW analyses and all characters then set back to unit weight, the lengths of the MPTs-SAW-MaxCI and MPTs-SAW-MinCI were much higher (223 and 197 steps, respectively) than that of UW-MPTs, while MPTs-SAW-MaxRI and MPTs-SAW-MinRI were only a few steps longer (see "Results").

Retention indices (ri) for each non-constant character were calculated to evaluate how much of the variation displayed by the characters could be attributed to true synapomorphy on trees, as well as calculating consistency indices (ci) to evaluate the amount of homoplasy of each character, and length. The results are shown in Table IV. In all UW-MPTs, the retention indices of characters 5, 14, and 86 were zero, i.e. contributing no synapomorphy to the cladograms. In contrast, retention index had the maximum value for the characters 22, 24, 30, 46 (only the best fit), 63, 64, 76, 78/79 (only the best fit), 82–84, 87/88 and 90, indicating the contribution of maximum synapomorphy to the cladograms (Table IV). Of

Table III. Relationships between whitefly genera proposed by various authors.

Genus	Allied genera	Reference
Aleuroduplidens	*Aleuroplatus*, *Zaphanera*, *Tetraleurodes*	Martin (1999)
Aleuroglandulus	*Aleyrodes*	Russell (1944)
Aleuropapillatus	*Aleurolobus*, *Crescentaleyrodes*	Regu and David (1993)
Aleuroparadoxus	*Trialeurodes*	Russell (1947)
Aleyrodiella	*Aleuroparadoxus*, *Aleurotithius*, *Trialeurodes*	Danzig (1966)
Asialeyrodes	*Africaleurodes*, *Aleurolobus*, *Dialeurodes*	Corbett (1935)
Bellitudo	*Aleuroparadoxus*, *Pseudaleurolobus*, *Africaleurodes*, *Aleurolobus*, *Paraleurolobus*	Russell (1943)
Brazzaleyrodes	*Aleurolonga*, *Ramsesseus*	Bink-Moenen (1983)
Bulgarialeurodes	*Corbettia*	Corbett (1936)
Chitonaleyrodes	*Zaphanera*, *Gagudjuia*	Martin (1999)
Cockerelliella	*Asialeyrodes*	Sundararaj and David (1992)
Cockerelliella	*Asialeyrodes*, *Dialeurodes*	Martin (1999)
Crenidorsum	*Aleuroplatus*, *Aleurotrachelus*, *Aleurotulus*, *Aleuroputeus*, *Laingiella*	Russell (1945)
Crenidorsum	*Aleurotrachelus*, *Aleurotulus*	Martin et al. (2001)
Dumbletoniella	*Aleuroputeus*, *Aleuroclava*	Jesudasan and David (1990)
Dumbletoniella	*Aleuroclava*, *Aleuroplatus*, *Pseudaleuroplatus*	Martin (1999)
Extensaleyrodes	*Dialeurolonga*, *Aleuromarginatus*	Bink-Moenen (1983)
Fascaleyrodes	*Aleurocanthus*	Bink-Moenen (1983)
Filicaleyrodes	*Trialeurodes*	Takahashi (1962); Mound (1966)
Gomenella	*Indoaleyrodes*, *Asialeyrodes*	Martin (1999)
Heterobemisia	*Bemisia*	Takahashi (1957)
Leucopogonella	*Aleurotrachelus*	Dumbleton (1961)
Malayaleyrodes	*Africaleurodes*, *Asialeyrodes*, *Aleurolobus*	Corbett (1935)
Marginaleyrodes	*Aleurotrachelus*	Takahashi (1961)
Metabemisia	*Parabemisia*, *Apobemisia*	Takahashi (1963)
Mixaleyrodes	*Aleurotrachelus*	Takahashi (1936a); Jesudasan and David (1991)
Neopealius	*Pealius*, *Bemisia*	Takahashi (1954)
Nigrasialeyrodes	*Asialeyrodes*, *Gomenella*	Martin (1999)
Papillipes	*Viennotaleyrodes*	Bink-Moenen (1983)
Pseudaleuroplatus	*Aleuroduplidens*, *Aleuroplatus*, *Trialeurodes*, *Zaphanera*	Martin (1999)
Rositaleyrodes	*Aleurolobus*	Meganathan and David (1994)
Rugaleyrodes	*Neoaleurotrachelus*, *Cohicaleyrodes*	Bink-Moenen (1983)
Setaleyrodes	*Pealius*	Martin (1999)
Taiwanaleyrodes	*Aleurotuberculatus*, *Aleurocybotus*	Takahashi (1932)
Tetralicia	*Aleuropleurocelus*	Drews and Sampson (1956); Mound (1966)
Tetralicia	*Aleuropleurocelus*, *Tetraleurodes*	Martin (1999)
Trialeurodes	*Aleuroparadoxus*, *Aleurotithius*	Russell (1948)
Trialeurodes	*Filicaleyrodes*	Mound (1966)
Trialeurodes	*Dialeurolonga*	Bink-Moenen (1983)
Venezaleurodes	*Trialeurodes*	Russell (1967)
Xenaleyrodes	*Aleuroplatus*	Takahashi (1936b)
Xenaleyrodes	*Aleurocanthus*	Martin (1999)
Yleyrodes	*Africaleurodes*	Bink-Moenen (1983)
Zaphanera	*Aleurotrachelus*	Corbett (1926)
Zaphanera	*Dialeurolobus*, *Tetraleurodes*	Martin (1999)

Table IV. Range of retention indices, consistency indices and lengths for each non-constant character calculated for the UW-MPTs. B=Best; Ch=Character; Ma=Maximum; Mi=Minimum; W=Worst. Characters 54, 68 and 81 are parsimony uninformative.

	Retention index		Consistency index		Length			Retention index		Consistency index		Length	
Ch	B	W	B	W	Mi	Ma	Ch	B	W	B	W	Mi	Ma
[1]	0.73	0.71	0.07	0.07	54	58	**[48]**	0.40	0.35	0.73	0.72	45	46
[2]	0.58	0.57	0.10	0.10	58	60	**[49]**	0.84	0.83	0.08	0.08	36	37
[3]	0.54	0.53	0.15	0.15	33	34	**[50]**	0.80	0.80	0.50	0.50	2	2
[4]	0.64	0.64	0.09	0.09	11	11	**[51]**	0.56	0.55	0.09	0.08	106	109
[5]	0.00	0.00	0.50	0.50	2	2	**[52]**	0.61	0.59	0.05	0.05	64	67
[6]	0.61	0.57	0.05	0.04	22	24	**[53]**	0.52	0.50	0.03	0.03	67	70
[7]	0.80	0.80	0.17	0.17	12	12	**[54]**	0/0	0/0	1.00	1.00	1	1
[8]	0.69	0.68	0.07	0.07	29	30	**[55]**	0.90	0.89	0.05	0.04	21	23
[9]	0.73	0.71	0.03	0.03	32	34	**[56]**	0.64	0.64	0.12	0.12	42	43
[10]	0.79	0.77	0.12	0.11	43	46	**[57]**	0.90	0.89	0.04	0.04	23	25
[11]	0.86	0.86	0.17	0.17	6	6	**[58]**	0.70	0.70	0.08	0.07	40	41
[12]	0.33	0.33	0.33	0.33	3	3	**[59]**	0.68	0.66	0.04	0.03	56	59
[13]	0.62	0.60	0.06	0.06	84	88	**[60]**	0.43	0.40	0.25	0.23	57	60
[14]	0.00	0.00	0.20	0.20	5	5	**[61]**	0.69	0.67	0.02	0.02	48	51
[15]	0.42	0.40	0.04	0.04	50	52	**[62]**	0.45	0.42	0.05	0.04	22	23
[16]	0.63	0.62	0.27	0.26	111	114	**[63]**	1.00	1.00	1.00	1.00	1	1
[17]	0.68	0.65	0.03	0.03	58	62	**[64]**	1.00	1.00	1.00	1.00	1	1
[18]	0.60	0.57	0.42	0.41	52	54	**[65]**	0.61	0.58	0.22	0.21	18	19
[19]	0.70	0.68	0.07	0.07	54	57	**[66]**	0.54	0.54	0.20	0.20	20	20
[20]	0.58	0.53	0.52	0.49	50	53	**[67]**	0.90	0.90	0.50	0.50	2	2
[21]	0.50	0.38	0.20	0.17	5	6	**[68]**	0/0	0/0	1.00	1.00	1	1
[22]	1.00	1.00	1.00	1.00	2	2	**[69]**	0.73	0.69	0.04	0.03	28	32
[23]	0.72	0.72	0.17	0.17	6	6	**[70]**	0.71	0.71	0.03	0.03	40	40
[24]	1.00	1.00	1.00	1.00	4	4	**[71]**	0.62	0.60	0.03	0.02	39	41
[25]	0.59	0.57	0.03	0.03	34	36	**[72]**	0.64	0.60	0.05	0.05	20	22
[26]	0.61	0.59	0.10	0.10	88	92	**[73]**	0.75	0.75	0.75	0.75	4	4
[27]	0.62	0.59	0.08	0.07	40	43	**[74]**	0.63	0.60	0.27	0.25	15	16
[28]	0.71	0.69	0.04	0.04	23	24	**[75]**	0.48	0.45	0.11	0.11	82	85
[29]	0.69	0.69	0.27	0.27	15	15	**[76]**	1.00	1.00	1.00	1.00	1	1
[30]	1.00	1.00	1.00	1.00	1	1	**[77]**	0.48	0.44	0.08	0.07	39	42
[31]	0.78	0.76	0.08	0.08	12	13	**[78]**	1.00	0.50	1.00	0.50	1	2
[32]	0.35	0.30	0.07	0.07	14	15	**[79]**	1.00	0.80	1.00	0.50	1	2
[33]	0.44	0.33	0.09	0.08	11	13	**[80]**	0.64	0.63	0.03	0.03	38	40
[34]	0.68	0.68	0.09	0.09	79	80	**[81]**	0/0	0/0	1.00	1.00	1	1
[35]	0.66	0.63	0.14	0.13	37	40	**[82]**	1.00	1.00	1.00	1.00	1	1
[36]	0.69	0.69	0.33	0.33	6	6	**[83]**	1.00	1.00	1.00	1.00	1	1
[37]	0.88	0.88	0.04	0.04	27	27	**[84]**	1.00	1.00	1.00	1.00	1	1
[38]	0.75	0.74	0.04	0.04	49	52	**[85]**	0.67	0.67	0.17	0.17	6	6
[39]	0.65	0.64	0.07	0.07	30	31	**[86]**	0.00	0.00	0.20	0.20	5	5
[40]	0.59	0.57	0.03	0.03	68	72	**[87]**	1.00	1.00	1.00	1.00	1	1
[41]	0.77	0.75	0.09	0.09	53	56	**[88]**	1.00	1.00	1.00	1.00	1	1
[42]	0.67	0.65	0.10	0.09	94	97	**[89]**	0.90	0.90	0.33	0.33	3	3
[43]	0.86	0.86	0.50	0.50	2	2	**[90]**	1.00	1.00	1.00	1.00	1	1
[44]	0.79	0.79	0.25	0.25	71	72	**[91]**	–	–	–	–	–	–
[45]	0.57	0.43	0.14	0.11	7	9	**[92]**	0.41	0.33	0.06	0.05	17	19
[46]	1.00	0.50	1.00	0.67	2	3	**[93]**	0.53	0.50	0.56	0.54	36	37
[47]	0.75	0.75	0.25	0.25	48	48	**[94]**	0.73	0.71	0.22	0.21	18	19

Character 91 is a constant character; see the comments of this character.

these 15 characters, characters 79 (subdorsal compound wax pores and/or agglomerate pores) and 90 (tarsal claw) are restricted to the Aleurodicinae, although *Dialeurodicus* lacks character 79 and *Stenaleyrodes* lacks both characters.

Excluding *Stenaleyrodes* from out-group taxa, puts it in the position of being a sister group to all ingroup taxa. Although Takahashi (1938) gave no information about the subfamily placement in his description of the monobasic genus *Stenaleyrodes* – as well as Mamet (1952) giving supplementary notes on the type-species, *S. vinsoni* Takahashi – but at the end of the description, the author stated "related to *Trialeurodes* Laing, but differs in the elongate vasiform orifice, ... Resembles *Bemisia* Quaint. et Baker in the characters of vasiform orifice, ..." (Takahashi 1938). In other words, Takahashi was indicating similarities to two aleyrodine genera. As already mentioned, Sampson (1943, 1947) placed *Stenaleyrodes* in the Aleyrodinae, tribe Dialeurodini (Appendix A). Mound and Halsey (1978) listed the genus under Aleurodicinae and synonymized *Dialeurodicus elongatus* Dumbleton, which had already been transferred to *Stenaleyrodes* by Cohic (1968), with *S. vinsoni*. The former authors also stated "the material in the BMNH from Tanzania listed here as *Stenaleyrodes* sp. indet. represents a distinct species, which as in the case of *vinsoni*, can only be distinguished from *Dialeurodicus* at present by the elongate shape of its pupal case". No syntype materials of *S. vinsoni* were examined, but a paratype of *D. elongatus* and another specimen of *S. vinsoni* collected from the type locality (Reunion Island) and from the host of *S. vinsoni* (palm) as well as Tanzanian samples were studied. These samples lacked both the tarsal claw and apical adhesion pad. The illustration of hind leg in the original description of *S. vinsoni* (Takahashi 1938, Figure 5) is in agreement with this observation. It seems that Mound and Halsey (1978) did not notice the absence of the tarsal claw in *Stenaleyrodes* while comparing it with *Dialeurodicus*, in which the character is present, and only mentioned the elongation of pupal case to distinguish these genera from each other.

From a consideration of puparial characters, there is no reason for *Stenaleyrodes* to be in Aleurodicinae due to its lack of the tarsal claw and lack of compound wax pores and/or agglomerate pores, i.e. the two basic puparial characters of the Aleurodicinae, though the vasiform orifice and the general size are similar to those of aleurodicine members. However, the examination of recently collected material of an undescribed species of *Stenaleyrodes* in BMNH has revealed aleurodicine characters in adults. Therefore, it would seem expedient to retain *Stenaleyrodes* in Aleurodicinae.

All 13 remaining characters with maximum retention indices (ri=1) (except characters 22, 24, and 46) are autapomorphic characters of certain genera, e.g. characters 63 (eighth abdominal bifid process) and 82 (chain-like design along some abdominal and thoracic sutures) support monophyly of *Aleurocerus* and *Bellitudo* respectively. Thus, these characters did not provide any phylogenetic information about relationships between genera.

According to Bink-Moenen (1983), character 3 (recurvature of margin) is mostly of value at the genus level, although in our analyses it had an intermediate ri and pretty low ci (Table IV). Furthermore, Mound (1961), who erected the genus *Aleuropteridis*, mentioned that "this genus is near *Tetralicia* and *Aleuropleurocelus* in that the true margin is deflexed ventrally, i.e. the dorsal disc is larger than the ventral surface". Although in these three genera the character is quite typical, it can also be seen in several species putatively belonging to other genera such as *Bemisia hirta* Bink-Moenen and *Tetraleurodes caulicola* Nakahara, which it is not a specific character of the latter genera. All examined species currently placed in *Tetralicia*, in spite of their sharing this character, were not found to be monophyletic. *Aleuropteridis* formed a sister group to *Xenaleyrodes* (also shows the character), and among the taxa gathered with *Aleuropteridis* in the same clade (Figure 16), two examined species of *Leucopogonella* lacked this character. In this clade, *Tetraleurodes selachidentata* Bink-Moenen was described as a species *incertae sedis* (Bink-Moenen 1983). Incidentally, some examined species of *Corbettia* and *Viennotaleyrodes* (both genera were recovered as monophyletic) lacked the character. Thus, character 3 seems to be far less reliable than past authors have suggested.

Submarginal line or fold (character 28) have been thought to be an important character at genus level and has been used by authors both in generic descriptions and identification keys (e.g. Mound 1965; Bink-Moenen 1983; Jesudasan and David 1991; Martin et al. 2000). It separates the submargin from the dorsal disc area and can appear in different forms (see character 29). In general, this character could not gather the genera possessed it in a separate clade, at least those that it appears in an identical shape. It should be noted that *Aleurotuberculatus*, in spite of having the character, was synonymized with *Aleuroclava* (Martin 1999). Although the 15 examined species (seven species had the character) of the latter large genus were not found to be monophyletic in this analysis (Figure 17), but

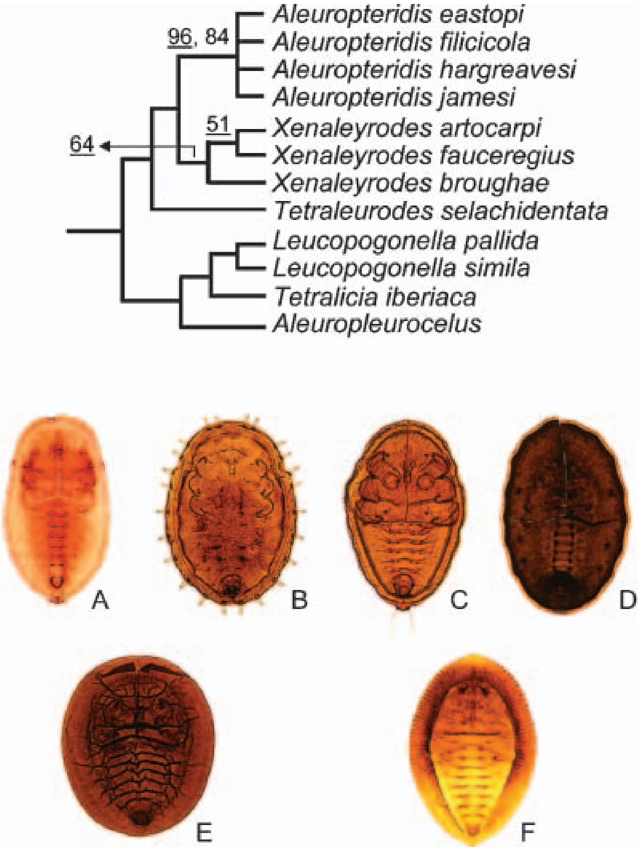

Figure 16. One of the clades of the strict consensus tree of UW-MPTs. Figures above branches show bootstrap and Jacknife (underlined figures) values. (A) *Aleuropteriddis filicicola* (Newstead); (B) *Xenaleyrodes artocarpi* Takahashi; (C) *Tetraleurodes selachidentata* Bink-Moenen; (D) *Leucopogonella simila* Dumbleton; (E) *Tetralicia iberica* Bink-Moenen; (F) *Aleuropleurocelus nigrans* (Bemis).

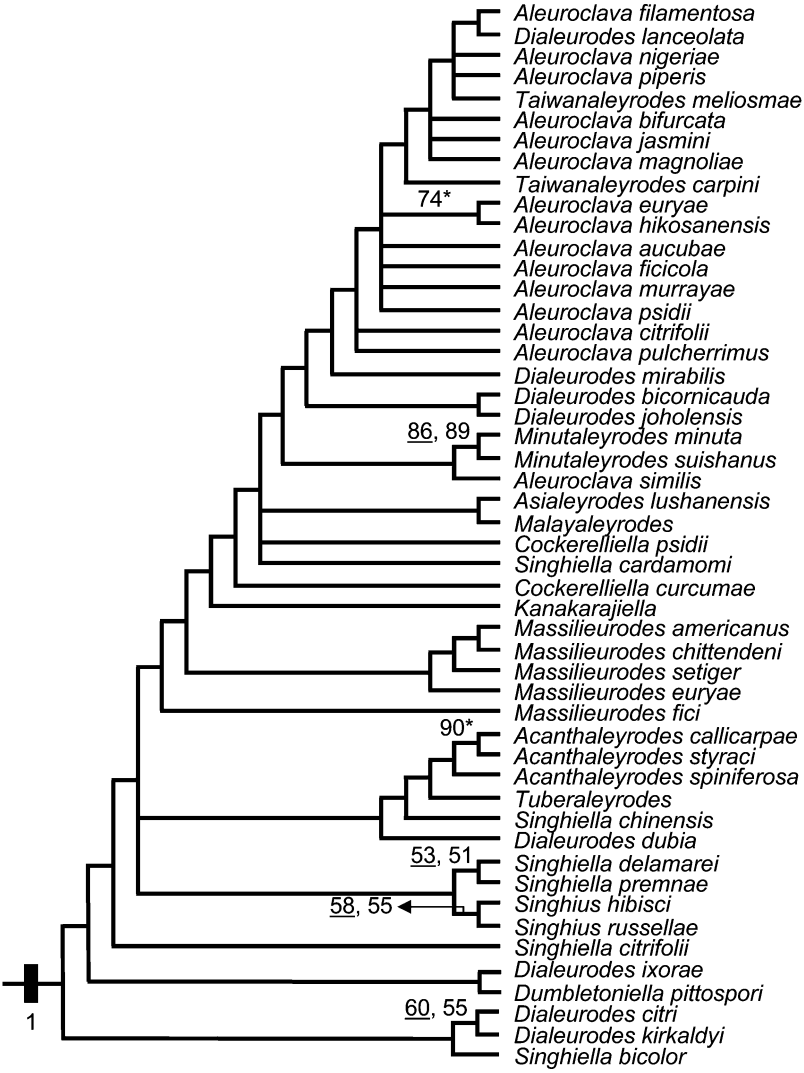

Figure 17. One of the clades of the strict consensus tree of UW-MPTs. Figures above branches show bootstrap and Jacknife (underlined figures) values. Figures with an asterisk indicate the same value for both bootstrap and Jacknife. Black rectangles and the figure below indicate the Bremer support.

Aleuroclava can be considered as a monophyletic genus if some new combinations and synonymy are accepted (see "nomenclatural changes").

Some binary characters, e.g. 7 (position of cephalic setae), 11 (position of first abdominal setae), 37 (elevation of vasiform orifice), 43 (opercular setae), 49 (lingular setae), 50 (number of lingular setae), 55 (caudal furrow), 57 (caudal ridges), 67 (submarginal glands) and 89 (apical adhesion pad of legs), which have had little attention paid to some of them by aleyrodid systematists, had high retention indices ($0.8<\mathrm{ri}<1$), of which the four characters, 37, 49 , 55 and 57 were important in supporting main clades in the strict consensus tree of UW-MPTs. The general topology of this tree is shown in Figure 18. With a few exceptions all taxa included in clade B (Figure 18) have elevated vasiform orifice (character 37), and considering its presence in some other small clades in the remaining

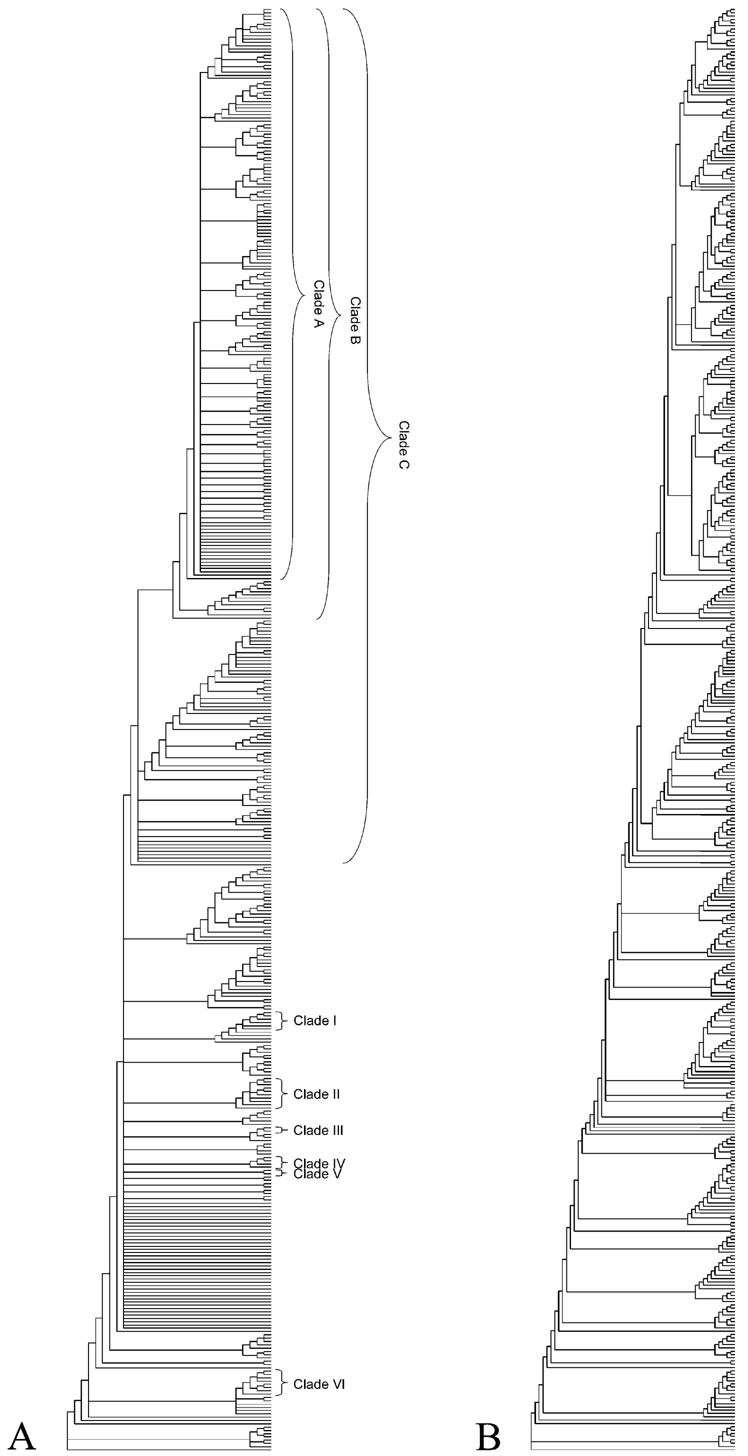

Figure 18. The general topologies of the strict consensus trees of UW-MPTs (A) and MPTs-SAW-MaxRI (B). See text for the discussion of indicated clades.

part of the tree, e.g. clades II and VI, it can be hypothesized that the character has independently evolved several times. The same hypothesis probably applies to characters 49, 55 and 57. Most taxa in the clade C (Figure 18) lack lingular setae (or the setae are not apparent) (character 49), and those in the clade A lack both caudal furrow (character 55) and caudal ridges (character 57), but as for character 37, some other small clades in the other part of the tree lack these characters too, e.g. clades III and V for character 49, and clades I and IV for both characters 55 and 57.

The applicability of any tribe level classification for the Aleyrodinae seems to be premature. Sampson (1943) was the first to classify aleyrodine genera to five tribes (Appendix A). Whereas, in 1956, in their identification key for the genera of the subfamily, Sampson and Drews (1956) placed almost all described genera by that time in two tribes, Aleyrodini and Dialeurodini, and the other three tribes was each comprised of a single genus. The authors also did not include the sixth tribe proposed by Russell (1947) in the key because of difficulty of finding characters to separate it from the others, and nothing was mentioned about the two tribes proposed by Takahashi (1954). It seems that erecting more tribes, as done by David (1990), with our current poor understanding the significance of puparial characters will not help. For example, none of the genera placed in the Alyrodini by three different authors (Appendix A) was recovered in the same clade as *Aleyrodes* in this study, and *Indoaleyrodes*, which was placed in the Bemisini by David (1990), formed a sister group to *Aleyrodes* (Figure 15). Bearing in mind that defining a reliable suite of morphological characters at genus level is still problematic and many genera lack objective definitive, it will obviously be difficult to find some synapomorphic characters to define different tribes confidently.

Unfortunately, some strikingly obvious structural apomorphies have probably been independently derived in a number of quite closely related species. Such characters can easily confuse attempts at phylogenetic reconstruction as they are difficult to differentiate from genuine synapomorphies. Often such striking characters are considered to be of "generic worth" and in practice many species which show these kinds of characters are placed in separate monobasic or oligobasic genera (Gauld and Mound 1982). It seems that the ability to develop apomorphies of this type independently in closely related taxa can be found in Aleyrodidae. The taxa of the clade shown in Figure 19 may be good examples. In this clade, three genera, *Aleuroparadoxus*, *Bellitudo*, and *Crescentaleyrodes*, have obvious apomorphies, i.e. characters 76 (modified papillae of dorsal disc area, which are slightly elevated, nearly flat and plate-like), 82 (chain-like design along some abdominal and thoracic sutures) and 87 (submarginal crescent-shaped pores) respectively. Of these three genera, *Crescentaleyrodes* was not recovered as monophyletic and *Aleurotrachelus fumipennis* (Hempel) made it paraphyletic (Figure 19). David and Jesudasan (1987) proposed *Crescentaleyrodes* for *Tetraleurodes semilunaris* Corbett, which had already been transferred to *Aleurolobus* by Bink-Moenen (1983), as well as transferring two species of *Aleurolobus*, *A. monodi* Cohic and *A. paulianae* Cohic to *Crescentaleyrodes*. The main diagnostic character of *Crescentaleyrodes*, as the name implies, is the presence of crescent-shaped (semilunate) pores (Figure 12J) along the submargin. It should be noted that the syntype materials of *A. fumipennis* were not examined and its original description (Hempel 1899) provides no illustration and is inadequate for the positive identification of the species. The examined specimens (from Brazil collected on grasses, the same locality and host plant as the syntypes) identified as *A. fumipennis* in BMNH had submarginal crescent-shape pores (character 87) and were in agreement with the redescription and illustration of *A. fumipennis* provided by Bondar (1923), i.e. belonging to *Crescentaleyrodes* (see also

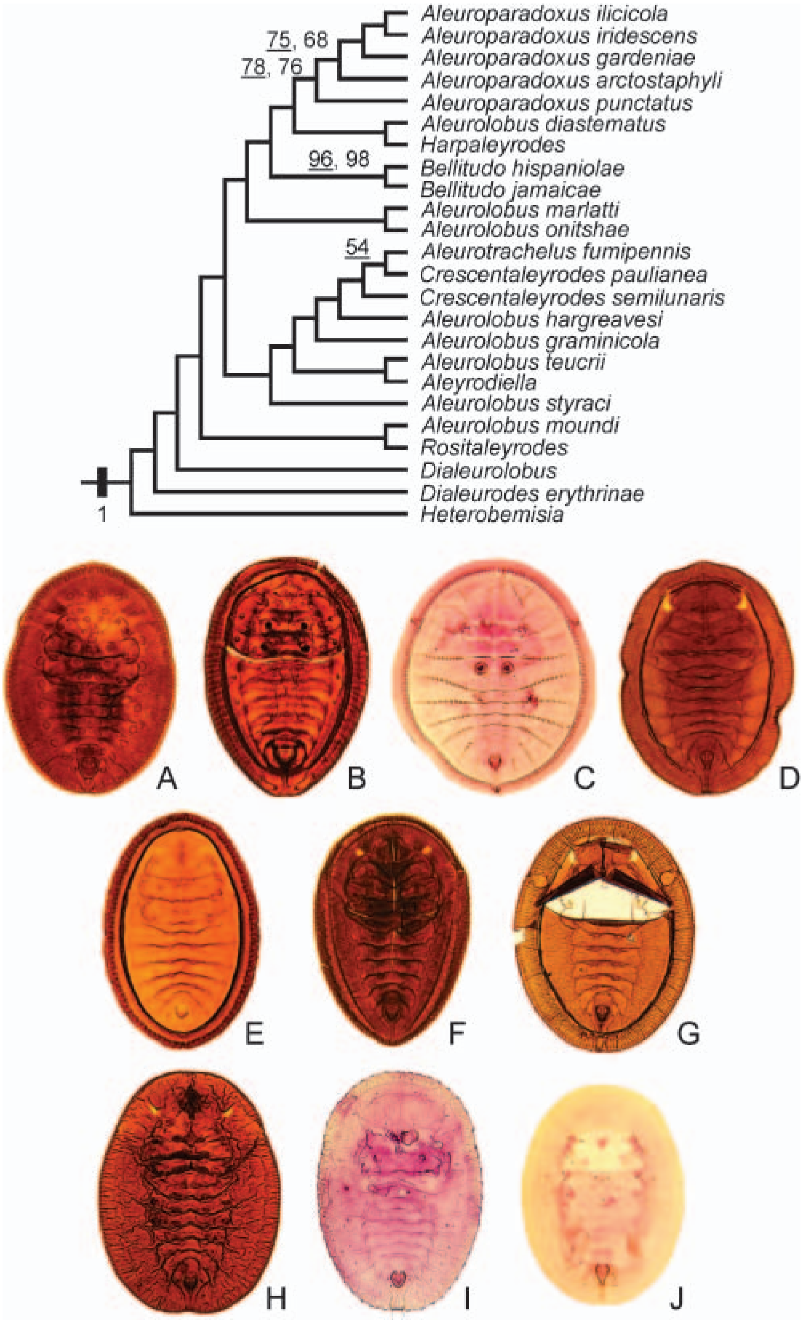

Figure 19. One of the clades of the strict consensus tree of UW-MPTs. Figures above branches show bootstrap and Jacknife (underlined figures) values. Black rectangular and the figure below indicate the Bremer support. (A) *Aleuroparadoxus arctostaphyli* Russell; (B) *Harpaleyrodes tuberculata* Bink-Moenen; (C) *Bellitudo jamaicae* Russell; (D) *Aleurolobus marlatti* (Quaintance); (E) *Crescentaleyrodes semilunaris* (Corbett); (F) *Aleyrodiella lamellifera* Danzig; (G) *Rositaleyrodes oplismeni* (Takahashi); (H) *Dialeurolobus rhamni* Bink-Moenen; (I) *Dialeurodes erythrinae* Corbett; (J) *Heterobemisia alba* Takahashi.

"Nomenclatural changes"). Furthermore, there are three monobasic genera, *Aleyrodiella*, *Harpaleyrodes* and *Rositaleyrodes*, in this clade. The latter was proposed for *Aleurolobus oplismeni* Takahashi by Meganathan and David (1994), who erroneously proposed a new holotype and six paratypes from their samples collected for an extant species of another author. The authors stated "this genus resembles *Aleurolobus* Quaintance & Baker in all the characters, but it differs from it, by having the submargin entirely demarcated from dorsum by a submarginal furrow and thoracic and caudal tracheal combs differentiated from margin by teeth and a pouch like structure". The entire submarginal furrow can be seen in other species of *Aleurolobus*, e.g. *A. hargreavesi* Dozier, and also the differentiation of tracheal area from the margin is variable in this genus. It seems that there is no reason for proposing a separate genus (see also "Nomenclatural changes"). Danzig (1966) erected *Aleyrodiella* and stated "an extremely distinctive genus whose taxonomic position is uncertain". The author then discussed its similarity to the three genera, *Aleuroparadoxus*, *Aleurotithius*, and *Trialeurodes* (Table III), as well as its differences from them. These three genera are those that Russell (1947) placed in the Trialeurodini (Appendix A) but only *Aleuroparadoxus* was recovered here in the same clade as *Aleyrodiella*. The latter two genera were found here to be more closely related to *Aleurolobus* than to *Trialeurodes* and/or *Aleurotithius* (Table III). The third monobasic genus in this clade, *Harpaleyrodes*, was erected by Bink-Moenen (1983) and, as the author stated, it resembles *Aleurolobus*. One of its differences from *Aleurolobus* is its strongly recurved submargin (Bink-Moenen 1983) (character 3), and as discussed above, this is variable in some genera. It is possible that *Harpaleyrodes* and *Aleurolobus* are congeneric, in spite of the alleged differences. It is also worth mentioning that according to Danzig (1964), *Dialeurolobus* (with two described species so far), which formed a sister group to all discussed taxa in this clade (Figure 19), is allied to *Aleurolobus* and differs from the latter in having no submarginal fold (character 28). The variability of this character has been discussed, above. *Dialeurodes erythrinae* Corbett has also much in common with the members of this clade (Figure 19) rather than with *Dialeurodes*, and its placement in *Dialeurodes* is doubtful (species *incertae sedis*).

As is common in phylogenetic analyses, the sister groups of some clearly monophyletic genera are often paraphyletic assemblages, e.g. *Aleurocerus* rendering *Aleurothrixus* paraphyletic (Figure 20). Seven of the 10 examined species, including the type-species, *Aleurothrixus floccosus* (Maslell), as well as *Hempelia* (see "Nomenclatural changes" for proposed synonymy of *Hempelia* with *Aleurothrixus* as well as the discussion of the other three species of *Aleurothrixus*) were recovered in the same clade as *Aleurocerus*. This clade was relatively highly supported in both bootstrap and parsimony Jackknifing analyses (Figure 20). A close relationship between *Aleurocerus* and *Aleurothrixus* was also postulated by Russell (1986) and the presence of the eighth abdominal bifid process (character 63) (Figure 11A) in *Aleurocerus* its only diagnostic character.

The same was found for *Corbettia*, recovered as monophyletic here, but rendering *Aleuromarginatus* paraphyletic (Figure 15). Interestingly, *Aleuromarginatus* and *Corbettia* also colonize the same host plant family, Fabaceae (see "Results"). Seven of the 10 examined species, including the type-species, *A. tephrosiae* Corbett, were found in the same clade as *Corbettia*. The two other species scored, *A. marginiquus* Martin and *A. nemciae* Martin, are apparently not congeneric with the type-species and this uncertainty was alluded to by the author (Martin 1999). Based on the results of this study, the placement of these species in *Aleuromarginatus* is uncertain (species *incertae sedis*). *A. serdangensis*, as already mentioned, seems to be a misplaced species differing in several characters (e.g. 4, 8, 9, 44 and 94) from the type and the other included species. *A. serdangensis* was recovered in

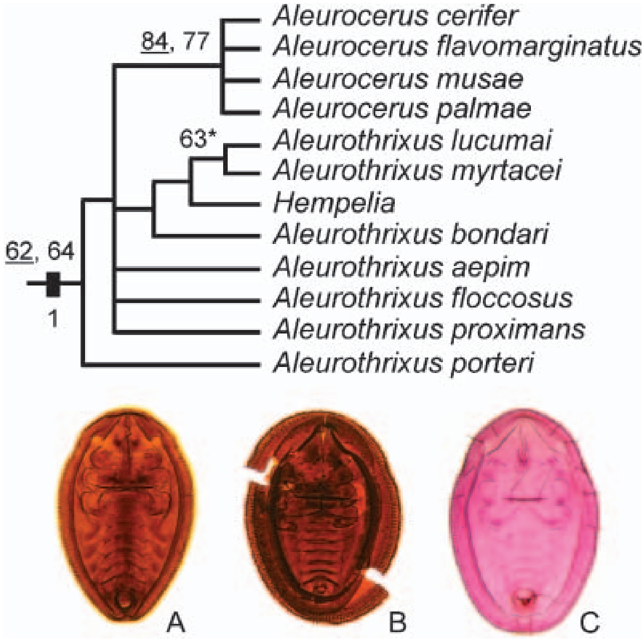

Figure 20. The terminal clade of the strict consensus tree of UW-MPTs. Figures above branches show bootstrap and Jacknife (underlined figures) values. Figure with an asterisk indicate the same value for both bootstrap and Jacknife. Black rectangular and the figure below indicate the Bremer support. (A) *Aleurocerus musae* Russell; (B) *Hempelia chivelensis* Sampson & Drews; (C) *Aleurothrixus proximans* Bondar.

a quite distantly separated clade that includes several diverse species putatively belonging to different genera (Figures 13 and 14).

Monophyly of large genera

Aleuroplatus, *Aleurotrachelus*, and *Tetraleurodes* are genera with many included species and worldwide distribution (Mound and Halsey 1978). Currently each includes many diverse species and lacks a suite of distinguishing characters. Therefore, there is no reason to assume that species currently classified in any of these, especially from different geographical regions, are related to one another. As expected, these genera were not found to be monophyletic, but only for *Aleurotrachelus*, was monophyly rejected statistically. The reason for this may be the lack of distinct generic characters. In other words, the species of these genera just have combinations of characters shared with various other genera. Regarding *Aleurotrachelus*, it should be noted that the specimens checked as *A. fumipennis*, as discussed above, had the typical character of *Crescentaleyrodes* and in the constraint analysis it was not excluded from *Aleurotrachelus*. Thus, it is quite likely that this species contributed largely to the statistical rejection of monophyly of *Aleurotrachelus*. To test this, another constraint analysis was performed for this genus excluding *A. fumipennis*. The length of the MPTs was 2773 compared with 2730 for the UW-MPTs. The result of the Templeton test (500 trees were compared) showed that the constrained trees were not consistently significantly longer with P values for the majority of the trees above 0.05 (P=0.0390–0.0793; see also Table II). Such interpretation may also apply to *Dialeurodes*, which in spite of many of its some species having been transferred to *Massilieurodes* and *Singhiella* by Jensen (2001), it is still a large and heterogeneous genus.

In contrast, although monophyly of *Trialeurodes* was not also rejected statistically, the same interpretation does not seem to apply. *Trialeurodes* is quite well characterised and most of its species are certainly of New World origin (Mound 1984). *T. vaporariorum*, which has long been known as a worldwide pest, almost certainly evolved in the south western part of North America (Russell 1948). In the strict consensus tree of MPTs-SAW-MaxRI (Figure 14), nine of the 11 examined species including the type-species, *T. pergandei*, as well as the closely related monobasic genus *Venezaleurodes* (probably should be synonymized with *Trialeurodes*) were recovered as a monophyletic group. These species were unresolved in the strict consensus tree of UW-MPTs (Figure 13). The probabilities that this genus is monophyletic (Templeton test: $P=0.5590$–0.7035) are much higher than for the other constrained genera (Table II). The factors mentioned above for *Trialeurodes* may also be applicable to *Bemisia*. According to Mound (1984), it seems probable that the *Bemisia* group primarily originated in the Palaearctic, though it was previously suggested that *B. tabaci* was Indian region in origin (Mound 1965). The main problem with this genus is that in spite of including the well-known pest, *B. tabaci*, it is not well defined. For this reason, it is expected that the genus includes at least several misplaced species which resulted its monophyly to be rejected statistically.

Host plant relationship

Relationships between whiteflies and their host plants are unclear. According to Mound and Halsey (1978), since the majority of aleyrodids are known only from the Angiosperms, it seems unlikely that this family evolved until after the radiation of the flowering plants. These authors compared the Cronquist's (1968) plant classification with the host plants of whiteflies and deduced that most whitefly species were recorded from plants belonging to four smaller, less highly evolved subclasses. The authors then stated: "As the Asteridae and Rosidae are the most advanced groups of higher plants, it may be that the aleyrodids did not evolve at the same rate but retained a relationship with the more primitive groups of plants. Alternatively the relationship may be a reflection of the geographical distributions of the organisms, the Asteridae and Rosidae being most common in temperate regions, whereas the Aleyrodidae are mainly a tropical group."

Based on the system of the Angiosperm Phylogeny Group (APG) (Bremer et al. 2003), 328 of the 439 whitefly species examined in this study are known from the two advanced groups, i.e. asterids (including euasterids I and euasterids II) and rosids (including eurosids I and eurosids II). In this system, euasterids II and euasterids I are two of the most recently derived groups. More than 100 of the examined whitefly species are known from these groups (21 from euasterids II, 78 form euasterids I, and 17 from both) (Appendix E). The positions of these species in the strict consensus tree of UW-MPTs as well in the MPTs-SAW-MaxRI show no pattern. Thus, parallel diversification with host plants and whiteflies is not apparent and it appears that widespread host switching has obscured any basic associations. Having said this, the evolution of aleyrodid host plant affiliations does not seem to be totally random as some groups have species feeding on related plants.

Nomenclatural changes

The results obtained from phylogenetic analyses presented above, indicate the great need for reclassification of the Aleyrodinae. It is quite possible that those species whose pupal cases differ considerably from each other, nevertheless have adults showing apparently unique apomorphies and therefore they should be placed in the same genus (Bink-Moenen 1992, discussing the genus *Aleuroviggianus*). On the other hand, adults can differ markedly despite of great similarities in their pupal cases, and so are placed in different genera (Russell 2000, discussing the genera *Aleurocybotus* and *Vasdavidius*). Since adults for the majority of described species are unknown, it is not desirable to change the current genus concepts defined based on pupal case character only, unless the true significance of the latter is known. This will be the next necessary step in improving the taxonomy of whiteflies.

Checking such a large number species, belonging to more than 100 genera, revealed the necessity for proposing some nomenclatural changes. These are only proposed for those taxa where the necessity of changing their current taxonomic positions has been supported by the pylogenetic analysis, in addition to the convictions obtained during the visual examination of specimens. Those genera mentioned here as New genus 1 and New genus 2 will be described somewhere else.

Aleuroclava Singh, 1931

Type-species: *Aleuroclava complex* Singh, 1931.

Aleurotuberculatus Takahashi, 1932. Type-species: *Aleurotuberculatus gordoniae* Takahashi, 1932 [synonymized by Martin 1999].

Martiniella Jesudasan & David, 1990. Type-species: *Aleurotuberculatus canangae* Corbett, 1935 [synonymized by Martin 1999].

Taiwanaleyrodes Takahashi, 1932. Type-species: *Taiwanaleyrodes meliosmae* Takahashi, 1932. **Syn. n.**

Comments: Takahashi (1932) erected *Aleurotuberculatus* mentioning that it was closely allied to *Aleuroclava* and may be a synonym of it. In the same article, he erected *Taiwanaleyrodes* and stated "allied to *Aleurotuberculatus* Takah., but differs from it in lacking dorsal tubercles and thoracic tracheal clefts, but in possessing a distinct marginal rim on the venter, and also distinguishable from …" (Takahashi 1932). Takahashi (1939) in the original description of *Taiwanaleyrodes carpini* Takahashi stated "cephalothorax with a pair of large rounded tubercle-like markings on the pronotum, and also on the mesonotum, and 2 pairs of similar ones on the metanotum, …, thoracic tracheal folds very short, the clefts indistinct, very shallow, wide, without teeth". In this article, the author transferred *Aleurotuberculatus pyracanthae* Takahashi to *Taiwanaleyrodes* (apparently Mound and Halsey (1978) did not noticed this transformation and listed the latter species under *Aleurotuberculatus* and/or did not accept it, but mentioned nothing), although in the original description of *A. pyracanthae* stated "venter with no rim" (Takahashi 1933). It is clear that the two species of *Taiwanaleyrodes*, which placed in this genus by the author of the genus, are not quite agree with the type-species, *T. meliosmae* Takahashi, in having the three diagnostic characters. Examination of many specimens of *Aleuroclava*, in addition to those included in this analysis, indicated that the dorsal tubercles and thoracic tracheal clefts definition is so variable and these characters should not be used for the separation of these genera. In the current study the type-species of *Taiwanaleyrodes*, as well as its one other included species were recovered within *Aleuroclava* (Figure 17). *Taiwanaleyrodes* is, therefore, here regarded as a junior synonym of *Aleuroclava* **syn. n.**

Jesudasan and David (1990) proposed *Minutaleyrodes* for four species formerly included within *Aleurotuberculatus*. The genus was provisionally retained for its included species by

Martin (1999), who synonymized *Aleurotuberculatus* and *Martiniella* with *Aleuroclava*. *Aleuroclava similis* (Takahashi) formed a sister group to *Minutaleyrodes* in this study (Figure 17). Of the characters specified for *Minutaleyrodes* by Jesudasan and David (1990), demarcation of the submargin on the ventral surface, can be seen in some species of *Taiwanaleyrodes* (discussed above). The shape of transverse moulting suture is the same that of in *A. similis*, but the size of this species is not similar to *Minutaleyrodes* and submargin not ventrally demarcated in *A. similis*. Unlike *Aleuroclava*, the first abdominal setae in *Minutaleyrodes* are absent (not mentioned by the authors) but some species of the former genus, e.g. *A. similis* and *A. nigeriae* (Mound), also lack these setae. In the latter species, these setae are sometimes present (Bink-Moenen 1983). Therefore, *Minutaleyrodes* seems to be congeneric with *Aleuroclava*, but because of the three species of *Dialeurodes* recovered between these two genera (see Figure 17), it is not synonymized. These three species currently accommodated in *Dialeurodes*, are not quite typical for their current genus nor for *Aleuroclava*, and it appears they have much in common with *Aleuroclava*, especially *D. mirabilis* Takahashi, rather than *Dialeurodes*.

Aleuroclava lanceolata (Takahashi) **comb. n.**

Dialeurodes lanceolata Takahashi, 1949. Holotype, Riouw (Riau) Islands (south of Singapore): Rempang [not examined].

Material examined: Singapore: Botanic Gardens, 15.ix.1980, (D.H. Murphy), ex: *Bhesa panicula* (2 slides).

Comments: Specimens checked were in agreement with the original description and illustration, and indicate that the inclusion of this species in *Aleuroclava* is appropriate. As stated by Takahashi (1949), this species is not a typical form of *Dialeurodes*. *A. lanceolata* is closely related to *A. filamentosa* (Corbett) (Figure 17).

Aleurolobus Quaintance & Baker, 1914

Type-species: *Aleurodes marlatti* Quaintance, 1903.
Rositaleyrodes Meganathan & David, 1994. Type-species: *Aleurolobus oplismeni* Takahashi, 1931. **Syn. n.**

Comments: As discussed before, according to Meganathan and David (1994), *Rositaleyrodes* resembles *Aleurolobus* in all the characters, but it differs from it, by having the submargin entirely demarcated from dorsum by a submarginal furrow and thoracic and caudal tracheal combs differentiated from margin by teeth and a pouch like structure. The latter character is variable in *Aleurolobus* and the entire submarginal furrow can be seen in other species of this genus, e.g. *A. hargreavesi*. *Rositaleyrodes* is therefore here regarded as a junior synonym of *Aleurolobus* **syn. n.**

Aleurothrixus Quaintance & Baker, 1914

Type-species: *Aleyrodes howardi* Quaintance, 1907, a junior synonym of *Aleurodes floccosa* Maskell, 1895.
Hempelia Sampson & Drews, 1941. Type-species: *Hempelia chivelensis* Sampson & Drews, 1941. **Syn. n.**

Comments: As already discussed, seven of the 10 examined species of *Aleurothrixus* including the type-species, *A. floccosus* (Maslell), as well as *Hempelia* were recovered in a monophyletic clade with *Aleurocerus* (Figure 20). The syntype material of the type-species of monobasic genus *Hempelia* showed no clear differences from *Aleurothrixus* that appear to be of generic significance and here *Hempelia* is regarded as a junior synonym of *Aleurothrixus* **syn. n.**

Aleurothrixus antidesmae Takahashi and *A. smilaceti* Takahashi are closely related to each other and do not seem to be congeneric with the type-species. A different genus is needed for them; almost certainly a new one. The situation is the same for the American species, *A. interrogationis* (Bemis), but it differs from these two Asian species. It was recovered within some species of *Aleuroplatus* and its placement in *Aleurothrixus* is doubtful (species *incertae sedis*).

Crescentaleyrodes David & Jesudasan, 1987

Type-species: *Tetraleurodes semilunaris* Corbett, 1926.

Crescentaleyrodes fumipennis (Hempel) **comb. n.**

Aleurodes fumipennis Hempel, 1899. Syntypes, Brazil: São Paulo [not examined].
Aleurotrachelus fumipennis (Hempel) Quaintance & Baker, 1914.

Material examined: Brazil: Mato Grosso, 25.iii.1968, (O.W. Richards), ex: undetermined grass (2 slides).

Comments: as already mentioned in detail, the redescription and illustrations provided by Bondar (1923) as well as the specimens examined, clearly indicate the appropriate inclusion of this species in *Crescentaleyrodes*. This species is very close to *C. paulianae* (Cohic) and maybe they are synonym, but this need to check the type material of the latter species. The specimens of *C. paulianae* studied for this study were from the same locality and host plant of type materials and showed slightly differences from *C. fumipennis*.

Pseudozaphanera Manzari **gen. n.**

Type-species: *Aleurodes niger* Maskell, 1895.

Description: Pupal case. Cuticle black. Margin toothed, thoracic and caudal tracheal pore areas not differentiated from margin. Submargin not separated from dorsal disc area by a line or fold. Longitudinal moulting suture reaching margin, transverse moulting suture curving anteriorly and reaching margin. Abdomen with exaggerated intersegmental sutures extending into outer subdorsum. Abdominal rhachis present or absent. Dorsum usually punctuated by geminate pore/porettes. Vasiform orifice cordate or subcordate, often elevated. Operculum almost filling vasiform orifice. Caudal furrow absent or faintly indicated. Eyespots absent or present.

Chaetotaxy: Cephalic and first abdominal setae absent, eight abdominal and caudal setae present. A row of submarginal setae present but their total number as well as their number on abdomen and cephalothorax variable (6–11, usually 7/8 pairs excluding the caudal setae), occasionally with a few pair subdorsal setae. All setae very small and often capitate.

Venter: Thoracic and caudal tracheal folds present. Antennae long, reaching middle of middle legs or more, male antennae much longer.

Distribution: Australia.

Hosts: Fabaceae.

Etymology: This genus is named to reflect its superficial similarity to *Zaphanera*.

Species included: *Pseudozaphanera niger* (Maskell) **comb. n.**; *Pseudozaphanera papyrocarpae* (Martin) **comb. n.**; *Pseudozaphanera rhachisreticulata* (Martin) **comb. n.**; *Pseudozaphanera splendida* (Martin) **comb. n.**; *Pseudozaphanera wariensis* (Martin) **comb. n.**

Comments: except the type-species, all above species included in this genus were originally been described in *Zaphanera*. The type-species has already been transferred to *Aleurolobus*, *Tetraleurodes* and *Zaphanera* by Quaintance and Baker (1914), Dumbleton (1956) and Martin (1999), respectively. *Pseudozaphanera* differs from *Zaphanera* in the number of submarginal setae as well as their shape, absence of cephalic setae, position of eight abdominal setae, shape of transverse moulting suture, and length of antennae. In *Zaphanera*, there are five pairs of setae (excluding the caudal setae), two pairs on the cephalothorax and three pairs on the abdomen, and these setae are not capitate. Antennae do not reach beyond front legs, and the eighth abdominal setae are located adjacent to postero-lateral margin of vasiform orifice. In three of the four described species (examined) retained in *Zaphanera*, including the type-species, *Z. cyanotis*, cephalic setae are present, and based on the redescription provided by David and Subramaniam (1976), they are not discernible in *Z. publicus* (Singh) (not examined). In *Zaphanera* abdominal segmentation is distinct only in the submedian area in contrast to *Pseudozaphanera* (see also tribe Zaphanerini).

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References

Baumann P, Thao M-LL. 2004. Evolutionary relationships of primary prokaryotic endosymbionts of whiteflies and their hosts. Applied and Environmental Microbiology 70:3401–3406.

Bink-Moenen RM. 1983. Revision of the African whiteflies (Aleyrodidae). Monografieën van de Nederlandse Entomologische Vereniging Amsterdam 10:1–211.

Bink-Moenen RM. 1992. Whitefly from Mediterranean evergreen oaks (Homoptera: Aleyrodidae. Systematic Entomology 17:21–40.

Bink-Moenen RM, Gerling D. 1990. Aleyrodidae of Israel. Bollettino del Laboratorio di Entomologia Agraria "Filippo Silvestri", Portici 47:3–49.

Bondar G. 1923. Aleyrodideos do Brasil, catalogo descriptivo dos Hemipteros–Homopteros da familia dos Alyrodideos, insectos parasitas das plantas, encontrados no Brasil. Bahia, Imprensa Official do Estado.

Bremer B, Bremer K, Chase MW, Reveal JL, Soltis DE, Soltis PS, Stevens PF, Anderberg AA, Fay MF, Goldblatt P, Judd WS, Kallersjo M, Karehed J, Kron KA, Lundberg J, Nickrent DL, Olmstead RG, Oxelman B, Pires JC, Rodman JE, Rudall PJ, Savolainen V, Sytsma KJ, van der Bank M, Wurdack K, Xiang JQY, Zmarzty S. 2003. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II. Botanical Journal of the Linnean Society 141:399–436.

Bremer K. 1994. Branch support and tree stability. Cladistics 10:295–304.

Bremer K, Chase MW, Stevens PF, Anderberg AA, Backlund A, Bremer B, Briggs BG, Endress PK, Fay MF, Goldblatt P, Gustafsson MHG, Hoot SB, Judd WS, Kallersjo M, Kellogg EA, Kron KA, Les DH, Morton CM, Nickrent DL, Olmstead RG, Price RA, Quinn CJ, Rodman JE, Rudall PJ, Savolainen V, Soltis DE, Soltis PS, Sytsma KJ, Thulin M. 1998. An ordinal classification for the families of flowering plants. Annals of the Missouri Botanical Garden 85:531–553.

Brown JK, Perring TM, Cooper AD, Bedford ID, Markham PG. 2000. Genetic analysis of *Bemisia* (Hemiptera: Aleyrodidae) populations by isoelectric focusing electrophoresis. Biochemical Genetics 38:13–25.

Calvert LA, Cuervo M, Arroyave JA, Constantino LM, Bellotti A, Frohlich D. 2001. Morphological and mitochondrial DNA marker analyses of whiteflies (Homoptera: Aleyrodidae) colonizing cassava and beans in Colombia. Annals of the Entomological Society of America 94:512–519.

Campbell BC, Duffus JE, Baumann P. 1993. Determining whitefly species. Technical comments. Science 261:1333.

Campbell BC, Steffen-Campbell JD, Gill RJ. 1994. Evolutionary origin of whiteflies (Hemiptera: Sternorrhyncha: Aleyrodidae) inferred from 18S rDNA sequences. Insect Molecular Biology 3:73–88.

Campbell BC, Steffen-Campbell JD, Gill RJ. 1995a. Origin and radiation of whiteflies: an initial molecular phylogenetic assessment. In: Gerling D, Mayer RT, editors. Bemisia 1995: Taxonomy, biology, damage control and management. Andover, Intercept. pp 29–51.

Campbell BC, Steffen-Campbell JD, Sorensen JT, Gill RJ. 1995b. Paraphyly of Homoptera and Auchenorrhyncha inferred from 18S rDNA nucleotide sequences. Systematic Entomology 20:175–194.

Carver M, Gross GF, Woodward TE. 1991. Hemiptera (bugs, leafhoppers, cicadas, aphids, scale insects etc.). In: Naumann ID, Carne PB, Lawrence JF, Nielsen ES, Spradbery JP, Taylor RW, Whitten MJ, Littlejohn MJ, editors. The Insects of Australia. A textbook for students and research workers. Vol. I, 2nd ed. Melbourne University Press. pp 429–509.

Cervera MT, Cabezas JA, Simon B, Martinez-Zapater JM, Beitia F, Cenis JL. 2000. Genetic relationships among biotypes of *Bemisia tabaci* (Hemiptera: Aleyrodidae) based on AFLP analysis. Bulletin of Entomological Research 90:391–396.

Cohic F. 1966. Contribution a l'étude des aleurodes africains (1^{e} Note). Cahiers de l'Office de la Recherche Scientifique et Technique Outre-mer, Série Biologie 1:3–59.

Cohic F. 1968. A propos de *Dialeurodicus elongatus* Dumbl. et de *Stenaleyrodes vinsoni* Tak. Aleurodes parasites des palmiers. Annales de l'Université d'Abidjan (E) 1:9–17.

Corbett GH. 1926. Contribution towards our knowledge of the Aleyrodidae of Ceylon. Bulletin of Entomological Research 16:267–284.

Corbett GH. 1935. Malayan Aleurodidae. Journal of the Federated Malay States Museums 17:722–852.

Corbett GH. 1936. New Aleurodidae (Hem.). Proceedings of the Royal Entomological Society of London B 5:18–22.

Cronquist A. 1968. The evolution and classification of flowering plants. London: Nelson.

Danzig EM. 1964. The whiteflies (Homoptera: Aleyrodoidea) of the Caucasus. Entomologicheskoe Obozrenie 43:633–646.

Danzig EM. 1966. The whiteflies (Homoptera: Aleyrodoidea) of the Southern Primor'ye (Soviet Far East). Entomologicheskoe Obozrenie 45:364–386. [English translation in Entomological Review 45: 197–209].

David BV. 1990. Key to tribes of whiteflies (Aleyrodidae: Homoptera) of India. Journal of Insect Science 3:13–17.

David BV, Ananthakrishnan TN. 1976. Host correlated variation in *Trialeurodes rara* Singh and *Bemisia tabaci* (Gennadius) (Aleyrodidae: Homoptera: Insecta). Current Science 45:223–225.

David BV, Jesudasan RWA. 1987. Description of a new genus, *Crescentaleyrodes* for *Aleurolobus semilunaris* (Coebett) (Aleyrodidae: Homoptera) and two new combinations. Current Science 56:42–44.

David BV, Krishnan B, Thenmozhi K. 1994. A new species of *Viennotaleyrodes* Cohic (Aleyrodidae: Homoptera) from India. Hexapoda 6:33–38.

David BV, Subramaniam TR. 1976. Studies on some Indian Aleyrodidae. Records of the Zoological Survey of India 70:133–233.

David BV, Sundararaj R. 1993. Studies on Dialeurodini (Aleyrodidae: Homoptera) of India: *Kanakarajiella* gen. nov. Journal of Entomological Research 17:289–295.

De Barro PJ, Driver F, Trueman JWH, Curran J. 2000. Phylogenetic relationships of world populations of *Bemisia tabaci* (Gennadius) using ribosomal ITS1. Molecular Phylogenetics and Evolution 16:29–36.

Drews EA, Sampson WW. 1956. *Tetralicia* and a new related genus, *Aleuropleurocelus* (Homoptera: Aleyrodidae). Annals of the Entomological Society of America 49:280–283.

Dumbleton LJ. 1956. The Australian Aleyrodidae (Hemiptera-Homoptera). Proceedings of the Linnaean Society of New South Wales 81:159–183.

Dumbleton LJ. 1961. The Aleyrodidae (Hemiptera-Homoptera) of New Caledonia. Pacific Science 15:114–136.

Enderlein G. 1909. *Udamoselis* eine neue Aleurodiden-Gattung. Zoologischer Anzeiger 34:230–233.

Evans JW. 1963. The phylogeny of the Homoptera. Annual Review of Entomology 8:77–94.

Farris JS. 1969. A successive approximations approach to character weighting. Systematic Zoology 18:374–385.

Farris JS, Albert VA, Källersjö M, Lipscomb D, Kluge AG. 1996. Parsimony jackknifing outperforms neighbor-joining. Cladistics 12:99–124.

Felsenstein J. 1985. Confidence limits on phylogenies: an approach using the bootstrap. Evolution 39:783–791.

Frohlich DR, Torres-Jerez I, Bedford ID, Markham PG, Brown JK. 1999. A phylogeographical analysis of the *Bemisia tabaci* species complex based on mitochondrial DNA markers. Molecular Ecology 8:1683–1691.

Gauld ID, Mound LA. 1982. Homoplasy and the delineation of holophyletic genera in some insect groups. Systematic Entomology 7:73–86.

Gauthier N, Lasalle J, Quicke DLJ, Godfray HCJ. 2000. Phylogeny of Eulophidae (Hymenoptera: Chalcidoidea), with a reclassification of Eulophinae and the recognition that Elasmidae are derived eulophids. Systematic Entomology 25:521–539.

Gill RJ. 1990. The morphology of whiteflies. In: Gerling D, editor. Whiteflies: Their bionomics, pest status and management. Andover, Intercept. p 13–46.

Goodchild AJP. 1966. Evolution of the alimentary canal in the Hemiptera. Biological Reviews of the Cambridge Philosophical Society 41:97–140.

Guershon M, Gerling D. 2001. Effect of foliar tomentosity on phenotypic plasticity in *Bemisia tabaci* (Hom., Aleyrodidae). Journal of Applied Entomology 125:449–453.

Guirao P, Beitia F, Cenis JL. 1997. Biotype determination of Spanish populations of *Bemisia tabaci* (Hemiptera: Aleyrodidae). Bulletin of Entomological Research 87:587–593.

Gullan PJ, Martin JH. 2003. Sternorrhyncha (jumping plant lice, whiteflies, aphids, and scale insects). In: Resh VH, Cardé RT, editors. Encyclopedia of Insects. London: Academic Press. pp 1079–1089.

Hall JPW, Harvey DJ. 2001. A phylogenetic analysis of the Neotropical riodinid butterfly genera *Juditha*, *Lemonias*, *Thisbe* and *Uraneis*, with a revision of *Juditha* (Lepidoptera: Riodinidae: Nymphidiini). Systematic Entomology 26:453–490.

Hempel A. 1899. Descriptions of three new species of Aleurodidae from Brazil. Psyche 8:394–395.

Hennig W. 1981. Insect phylogeny (translated and edited by AC Pont). New York: Wiley.

Jensen AS. 1999. Cladistics of a sampling of the world's diversity of whiteflies of the genus *Dialeurodes* (Hemiptera: Aleyrodidae). Annals of the Entomological Society of America 92:359–369.

Jensen AS. 2001. A cladistic analysis of *Dialeurodes*, *Massilieurodes* and *Singhiella*, with notes and keys to the Nearctic species and descriptions of four new *Massilieurodes* species (Hemiptera: Aleyrodidae). Systematic Entomology 26:279–310.

Jesudasan RWA, David BV. 1990. Revision of two whitefly genera, *Aleuroclava* Singh and *Aleurotuberculatus* Takahashi (Homoptera: Aleyrodidae). Fredrick Institute of Plant Protection and Toxicology (FIPPAT) Entomology Series 2:1–13.

Jesudasan RWA, David BV. 1991. Taxonomic studies on Indian Aleyrodidae (Insecta: Homoptera). Oriental Insects 25:231–434.

Kitching IJ. 2002. The phylogenetic relationships of Morgan's Sphinx, *Xanthopan morganii* (Walker), the tribe Acherontiini, and allied long-tongued hawkmoths (Lepidoptera: Sphingidae, Sphinginae). Zoological Journal of the Linnean Society 135:471–527.

Kitching IJ. 2003. Phylogeny of the death's head hawkmoths, *Acherontia* [Laspeyres], and related genera (Lepidoptera: Sphingidae: Sphinginae: Acherontiini). Systematic Entomology 28:71–88.

Lee DC, Bryant HN. 1999. A reconsideration of the coding of inapplicable characters: assumption and problems. Cladistics 15:373–378.

Lima LHC, Navia D, Inglis PW, de Oliveira MRV. 2000. Survey of *Bemisia tabaci* (Gennadius) (Hemiptera: Aleyrodidae) biotypes in Brazil using RAPD markers. Genetics and Molecular Biology 23:781–785.

Maddison DR, Maddison WP. 2000. MacClade: analysis of phylogeny and character evolution. version 4. Sunderland, MA: Sinauer Associates.

Mamet R. 1952. A note on Stenaleyrodes vinsoni Takahashi (Hemiptera: Aleyrodidae). Proceedings of the Royal Entomological Society of London B 21:134.

Martin JH. 1987. An identification guide to common whitefly pest species of the world (Homoptera, Aleyrodidae). Tropical Pest Management 33:298–322.

Martin JH. 1999. The whitefly fauna of Australia (Sternorrhyncha: Aleyrodidae), a taxonomic account and identification guide. Technical Paper, Commonwealth Scientific and Industrial Research Organization (CSIRO), Entomology 38:1–197.

Martin JH. 2003. Whiteflies (Hemiptera: Aleyrodidae) – their systematic history and the resulting problems of conventional taxonomy, with special references to descriptions of *Aleyrodes proletella* (Linnaeus, 1758) and *Bemisia tabaci* (Gennadius, 1889). Entomologist's Gazette 54:125–136.

Martin JH, Camus JM. 2001. Whiteflies (Sternorrhyncha, Aleyrodidae) colonising ferns (Pteridophyta: Filicopsida), with descriptions of two new *Trialeurodes* and one new *Metabemisia* species from south-east Asia. Zootaxa 2:1–19.

Martin JH, Mifsud D, Rapisarda C. 2000. The whiteflies (Hemiptera: Aleyrodidae) of Europe and the Mediterranean Basin. Bulletin of Entomological Research 90:407–448.

Martin JH, Aguiar AMF, Baufeld P. 2001. *Crenidorsum aroidephagus* Martin & Aguiar sp. nov. (Sternorrhyncha: Aleyrodidae), a New World whitefly species now colonising cultivated Araceae in Europe, Macaronesia and the Pacific Region. Zootaxa 4:1–8.

Maskell WM. 1895. Contributions towards a monograph of the Aleurodidae, a family of Hemiptera-Homoptera. Transactions and Proceedings of the New Zealand Institute 28:411–449.

Meganathan P, David BV. 1994. Aleyrodid fauna (Aleyrodidae: Homoptera) of Silent Valley, a tropical evergreen rain-forest, in Kerala, India. Fredrick Institute of Plant Protection and Toxicology (FIPPAT) Entomology Series 5:1–76.

Mohanty AK, Basu AN. 1986. Effect of host plants and seasonal factors on intraspecific variations in pupal morphology of the whitefly vector, *Bemisia tabaci* (Genn.) (Homoptera: Aleyrodidae). Journal of Entomological Research 10:19–26.

Morris DC, Mound LA, Schwarz MP, Crespi BJ. 1999. Morphological phylogenetics of Australian gall-inducing thrips and their allies: the evolution of host-plant affiliations, domicile use and social behaviour. Systematic Entomology 24:289–299.

Mound LA. 1961. A new genus and four new species of whitefly from ferns (Homoptera, Aleyrodidae). Revue de Zoologie et de Botanique Africaines 64:127–132.

Mound LA. 1963. Host-correlated variation in *Bemisia tabaci* (Gennadius) (Homoptera: Aleyrodidae). Proceedings of the Royal Entomological Society of London A 38:171–180.

Mound LA. 1965. An introduction to the Aleyrodidae of Western Africa (Homoptera). Bulletin of the British Museum (Natural History) (Entomology) 17:113–160.

Mound LA. 1966. A revision of the British Aleyrodidae (Hemiptera: Homoptera). Bulletin of the British Museum (Natural History) (Entomology) 17:397–428.

Mound LA. 1973. Thrips and whitefly. In: Gibbs AJ, editor. Viruses and invertebrates. Amsterdam: North-Holland. pp 229–242.

Mound LA. 1984. Zoogeographical distribution of whiteflies. Current Topics in Vector Research 2:185–197.

Mound LA, Halsey SH. 1978. Whitefly of the world, a systematic catalogue of the Aleyrodidae (Homoptera) with host plant and natural enemy data. London: British Museum (Natural History)/Wiley.

Mound LA, Martin JH, Polaszek A. 1994. The insect fauna of *Selaginella* (Pteridophyta: Lycopsida), with descriptions of three new species. Journal of Natural History 28:1403–1415.

Neal JW Jr, Bentz JA. 1999. Evidence for the stage inducing phenotypic plasticity in pupae of the polyphagous whiteflies *Trialeurodes vaporariorum* and *Bemisia argentifolii* (Homoptera: Aleyrodidae) and the raison d'être. Annals of the Entomological Society of America 92:774–787.

Perring TM, Cooper AD, Rodriguez RJ, Farrar CA, Bellows TS. 1993. Identification of a whitefly species by genomic and behavioral studies. Science 259:74–77.

Quaintance AL. 1903. New Oriental Aleurodidae. Canadian Entomologist 35:61–64.

Quaintance AL. 1907. The more important Aleurodidae infesting economic plants with description of new species infesting the orange. Technical Series, US Department of Agriculture Bureau of Entomology 12:89–94.

Quaintance AL, Baker AC. 1913. Classification of the Aleyrodidae. Part I. Technical Series, US Department of Agriculture Bureau of Entomology 27:1–93.

Quaintance AL, Baker AC. 1914. Classification of the Aleyrodidae. Part II. Technical Series, US Department of Agriculture Bureau of Entomology 27:95–109.

Quicke DLJ, Taylor J, Purvis A. 2001. Changing the landscape: a new strategy for estimating large phylogenies. Systematic Biology 50:60–66.

Regu K, David BV. 1993. Taxonomic studies on Indian aleyrodids of the tribe Aleurolobini (Aleyrodinae: Aleyrodidae: Homoptera). Fredrick Institute of Plant Protection and Toxicology (FIPPAT) Entomology Series 4:1–79.

Russell LM. 1943. A new genus and four new species of whiteflies from the West Indies (Homoptera, Aleyrodidae). Proceedings of the Entomological Society of Washington 45:131–141.

Russell LM. 1944. A taxonomic study of the genus *Aleuroglandulus* Bondar (Homoptera: Aleyrodidea). Proceedings of the Entomological Society of Washington 46:1–9.

Russell LM. 1945. A new genus and twelve new species of Neotropical whiteflies (Homoptera: Aleyrodidae). Journal of the Washington Academy of Sciences 35:55–65.

Russell LM. 1947. A classification of the whiteflies of the new tribe Trialeurodini (Homoptera: Aleyrodidae). Revista de Entomologia, Rio de Janerio 18:1–44.

Russell LM. 1948. The North American species of whiteflies of the genus *Trialeurodes*. Miscellaneous Publications. US Department of Agriculture 635:1–85.

Russell LM. 1958. *Orchamoplatus*, an Australian genus (Homoptera: Aleyrodidae). Proceedings of the Hawaiian Entomological Society 16:389–410.

Russell LM. 1965. A new species of *Aleurodicus* Douglas and two close relatives (Homoptera: Aleyrodidae). Florida Entomologist 48:47–55.

Russell LM. 1967. *Venezaleurodes pisoniae*, a new genus and species of whitefly from Venezuela (Homoptera: Aleyrodidae). Florida Entomologist 50:235–241.

Russell LM. 1986. The whitefly genus *Aleurocerus* Bondar (Hemiptera, Homoptera, Aleyrodidae). Entomography 4:137–183.

Russell LM. 2000. Notes on the family Aleyrodidae and its subfamilies: redescription of the genus *Aleurocybotus* Quaintance and Baker and description of *Vasdavidius*, a new genus (Homoptera: Aleyrodidae). Proceedings of the Entomological Society of Washington 102:374–383.

Sallum MAM, Schultz TR, Wilkerson RC. 2000. Phylogeny of Anophelinae based on morphologic characters. Annals of the Entomological Society of America 93:745–775.

Sampson WW. 1943. A generic synopsis of the hemipterous superfamily Aleyrodoidea. Entomologica Americana 23:173–223.

Sampson WW. 1947. Additions and corrections to "a generic synopsis of the Alyrodoidea". Bulletin of the Brooklyn Entomological Society 42:45–50.

Sampson WW, Drews EA. 1941. Fauna Mecxicana IV. A review of the Aleyrodidae of Mexico (Insecta, Homoptera). Anales de la Escuela Nacional de Ciencias Biologicas 2:143–189.

Sampson WW, Drews EA. 1956. Keys to the genera of the Aleyrodidae and notes on certain genera (Homoptera: Aleyrodinae). Annals and Magazine of Natural History 9:689–697.

Shcherbakov DE. 2000. The most primitive whiteflies (Hemiptera; Aleyrodidae; Bernaeinae subfam. nov.) from the Mesozoic of Asia and Burmese amber, with an overview of Burmese amber hemipterans. Bulletin of the Natural History Museum London (Geology) 56:29–37.

Shcherbakov DE, Wegierek P. 1991. Creaphididae a new and the oldest aphid family from the Triassic of middle Asia. Psyche 98:81–85.

Shcherbakov DE, Popov YA. 2002. Superorder Cimicidea Laicharting, 1781, Order Hemiptera Linné, 1785, the bugs, cicadas, plantlice, scale insects, etc. In: Rasnitsyn AP, Quicke DLJ, editors. History of Insects. Dordrecht: Kluwer. pp 143–157.

Singh K. 1931. A contribution towards our knowledge of the Aleyrodidae (whiteflies) of India. Memoirs of the Department of Agriculture in India 12:1–98.

Skevington JH, Yeates DK. 2001. Phylogenetic classification of Eudorylini (Diptera: Pipunculidae). Systematic Entomology 26:421–452.

Soltis DE, Soltis PS, Chase MW, Mort ME, Albach DC, Zanis M, Savolainen V, Hahn WH, Hoot SB, Fay MF, Axtell M, Swensen SM, Prince LM, Kress WJ, Nixon KC, Farris JS. 2000. Angiosperm phylogeny inferred from 18S rDNA, *rbcL*, and *atpB* sequences. Botanical Journal of the Linnean Society 133:381–461.

Spaulding AW, von Dohlen CD. 1998. Phylogenetic characterization and molecular evolution of bacterial endosymbionts in psyllids (Hemiptera: Sternorrhyncha). Molecular Biology and Evolution 15:1506–1513.

Spaulding AW, von Dohlen CD. 2001. Psyllid endosymbionts exhibit patterns of co-speciation with hosts and destabilizing substitutions in ribosomal RNA. Insect Molecular Biology 10:57–67.

Strong EE, Lipscomb D. 1999. Character coding and inapplicable data. Cladistics 15:363–371.

Sundararaj R, David BV. 1992. On the genera *Asialeyrodes* Corbett and *Cockerelliella* gen. nov. from India. Journal of the Bombay Natural History Society 88:415–424.

Sundararaj R, David BV. 1994. On the Indian species of the genus *Gigaleurodes* Quaintance and Baker (Aleyrodidae: Homoptera) from India. Journal of the Bombay Natural History Society 91:328–330.

Swofford DL. 1998. PAUP*. Phylogenetic analysis using parsimony (*and other methods), version 4.0b10. Sunderland, MA: Sinauer Associates.

Takahashi R. 1931. Some white-flies of Formosa (Part II). Transactions of the Natural History Society of Formosa 21:261–265.

Takahashi R. 1932. Aleyrodidae of Formosa, Part I. Report of Department of Agriculture, Government Research Institute, Formosa 59:1–57.

Takahashi R. 1933. Aleyrodidae of Formosa, Part II. Report of Department of Agriculture, Government Research Institute, Formosa 60:1–24.

Takahashi R. 1936a. Notes on the Aleyrodidae of Japan (Homoptera) IV. Kontyû 10:150–151.

Takahashi R. 1936b. Some Aleyrodidae, Aphididae, Coccidae (Homoptera), and Thysanoptera from Micronesia. Tenthredo 1:109–120.

Takahashi R. 1938. A new genus and species of Aleyrodidae from the Island of Reunion (Homoptera). Transactions of the Natural History Society of Formosa 28:269–271.

Takahashi R. 1939. Notes on the Aleyrodidae of Japan (Homoptera) VII. Kontyû 13:76–81.

Takahashi R. 1949. Some Aleyrodidae from the Riouw Islands (Homoptera). Mushi 20:47–53.

Takahashi R. 1954. Key to the tribes and genera of Aleyrodidae of Japan, with descriptions of three new genera and one new species (Homoptera). Insecta Matsumurana 18:47–53.

Takahashi R. 1957. Some Aleyrodidae from Japan (Homoptera). Insecta Matsumurana 21:12–21.

Takahashi R. 1961. Some species of Aleyrodidae from Madagascar IV (Homoptera). Mémoires de l'Institut Scientifique de Madagascar (E) 12:323–339.

Takahashi R. 1962. Two new genera and species of Aleyrodidae from Madagascar (Homoptera). Proceedings of the Royal Entomological Society of London B 31:100–102.

Takahashi R. 1963. Some species of Aleyrodidae from Japan (Homoptera). Kontyû 31:49–57.

Tremblay E, Iaccarino FM. 1978. *Aleurotuba jelineki* (Frauen.) per *Aleurotrachelus jelineki* (Frauen.) (Homoptera Aleyrodidae) su viburno. Bollettino del Laboratorio di Entomologia Agraria "Filippo Silvestri", Portici 35:57–66.

Vardal H, Bjorlo A, Saether OA. 2002. Afrotropical *Polypedilum* subgenus *Tripodura*, with a review of the subgenus (Diptera: Chironomidae). Zoologica Scripta 31:331–402.

Viscarret MM, Torres-Jerez I, De Manero EA, Lopez SN, Botto EE, Brown JK. 2003. Mitochondrial DNA evidence for a distinct new world group of *Bemisia tabaci* (Gennadius) (Hemiptera: Aleyrodidae) indigenous to Argentina and Bolivia, and presence of the Old World B biotype in Argentina. Annals of the Entomological Society of America 96:65–72.

von Dohlen CD, Moran NA. 1995. Molecular phylogeny of the Homoptera: a paraphyletic taxon. Journal of Molecular Evolution 41:211–223.

White IM, Hodkinson ID. 1982. Psylloidea (nymphal stages), Hemiptera, Homoptera. Handbooks for the Identification of British Insects 2:1–50.

Willmott KR. 2003. Cladistic analysis of the Neotropical butterfly genus *Adelpha* (Lepidoptera: Nymphalidae), with comments on the subtribal classification of Limenitidini. Systematic Entomology 28:279–322.

Wool D, Calvert L, Constantino LM, Bellotti AC, Gerling D. 1994. Differentiation of *Bemisia tabaci* (Genn.) (Hem., Aleyrodidae) populations in Colombia. Journal of Applied Entomology 117:122–134.

Wu XX, Li ZX, Hu DX, Shen ZR. 2003. Identification of Chinese populations of *Bemisia tabaci* (Gennadius) by analyzing ribosomal ITS1 sequence. Progress in Natural Science 13:276–281.

Appendix A: the tribes of the Aleyrodinae and their included genera according to different authors

Based on	Tribe	Included genera
Sampson (1943)	Aleurochitonini	*Aleurochiton* Tullgren
	Aleyrodini	*Acaudaleyrodes* Takahashi[1], *Aleurocanthus* Quaintance & Baker, *Aleurocerus* Bondar, *Aleurocybotus* Quaintance & Baker, *Aleuromarginatus* Corbett, *Aleuromigda* Singh, *Aleuropleurocelus* Drews & Sampson[2], *Aleuroputeus* Corbett, *Aleurothrixus* Quaintance & Baker, *Aleurotithius* Quaintance & Baker, *Aleurotrachelus* Quaintance & Baker, *Aleurotulus* Quaintance & Baker, *Aleyrodes* Latreille, *Bulgarialeurodes* Corbett, *Corbettia* Dozier, *Crenidorsum* Russell[3], *Frauenfeldiella* Gomez-Menor[4], *Hempelia* Sampsom & Drews, *Hesperaleyrodes* Sampson, *Heteraleyrodes* Takahashi[5], *Laingiella* Corbett, *Luederwaldtiana* Hempel, *Mexicaleyrodes* Sampson & Drews, *Nealeyrodes* Hempel, *Neoaleurodes* Bondar, *Pentaleyrodes* Takahashi, *Simplaleurodes* Goux[6], *Tetraleurodes* Cockerell, *Tetralicia* Harrison, *Zaphanera* Corbett
	Dialeurodini	*Acanthaleyrodes* Takahashi, *Acanthobemisia* Takahashi, *Africaleurodes* Dozier, *Aleuroclava* Singh, *Aleuroglandulus* Bondar, *Aleurolobus* Quaintance & Baker, *Aleuroparadoxus* Quaintance & Baker, *Aleuroplatus* Quaintance & Baker, *Aleuroporosus* Corbett, *Aleurotuberculatus* Takahashi, *Anomaleyrodes* Takahashi & Mamet[7], *Asialeyrodes* Corbett, *Asterobemisia* Trehan, *Asterochiton* Maskell, *Bellitudo* Russell[8], *Bemisia* Quaintance & Baker, *Corbettella* Sampson, *Dialeurodes* Cockerell, *Dialeurolonga* Dozier[9], *Dialeuropora* Quaintance & Baker, *Dialeurotrachelus* Takahashi[10], *Malayaleyrodes* Corbett, *Metaleyrodes* Sampson, *Mixaleyrodes* Takahashi, *Neoaleurolobus* Takahashi[11], *Neoaleurotrachelus* Takahashi & Mamet[12], *Neobemisia* Visnya[13], *Nipaleyrodes* Takahashi[14], *Parabemisia* Takahashi[15], *Paraleurolobus* Sampson & Drews, *Pealius* Quaintance & Baker, *Plataleyrodes* Takahashi & Mamet[16], *Pseudaleurolobus* Hempel, *Pseudaleyrodes* Hempel, *Rhachisphora* Quaintance & Baker[17], *Roucasia* Goux[18], *Setaleyrodes* Takahashi, *Singhiella* Sampson, *Stenaleyrodes* Takahashi, *Taiwanaleyrodes* Takahashi, *Trialeurodes* Cockerell, *Trichoaleyrodes* Takahashi & Mamet[19], *Tuberaleyrodes* Takahashi, *Xenaleyrodes* Takahashi, *Xenobemisia* Takahashi[20]
	Neomaskellini	*Neomaskellia* Quaintance & Baker
	Siphoninini	*Siphoninus* Silvestri
Russell (1947)	Trialeurodini	*Aleuroparadoxus*, *Aleurotithius*, *Trialeurodes*, *Venezaleurodes* Russell[21]
Takahashi (1954)*	Aleurocanthini	*Aleurocanthus*, *Aleurotrachelus*, *Pentaleyrodes*
	Aleurolobini	*Acanthobemisia*, *Aleurolobus*, *Apobemisia* Takahashi, *Bemisia*, *Parabemisia*
	Aleyrodini	*Aleyrodes*, *Neopealius* Takahashi, *Odontaleyrodes* Takahashi, *Pealius*, *Setaleyrodes*
	Dialeurodini	*Aleurotuberculatus*, *Dialeurodes*, *Rhachisphora*, *Taiwanaleyrodes*
David (1990)**	Aleurocanthini	*Aleurocanthus*
	Aleurolobini	*Africaleurodes*[22], *Aleurolobus*, *Aleuropapillatus* Regu & David[23], *Asterochiton*, *Crescentaleyrodes* David & Jesudasan, *Orientaleyrodes* David[24]
	Aleuroplatini	*Aleuroplatus*, *Moundiella* David
	Aleyrodini	*Aleurocybotus*, *Aleuromarginatus*, *Aleurotrachelus*, *Aleurotulus*, *Aleyrodes*
	Bemisini	*Bemisia*, *Indoaleyrodes* David & Subramaniam, *Neopealius*, *Odontaleyrodes*, *Pealius*, *Setaleyrodes*
	Dialeurodini	*Aleuroclava*, *Aleurotuberculatus*, *Asialeyrodes*, *Cockerelliella* Sundararaj & David[25], *Dialeurodes*, *Dialeurolonga*, *Dialeuronomada* Quaintance & Baker[26], *Dialeuropora*, *Fippataleyrodes* Sundararaj & David[27], *Gigaleurodes* Quaintance & Baker[28], *Kanakarajiella* David & Sundararaj[29], *Martiniella* Jesudasan & David[30], *Minutaleyrodes* Jesudasan & David[31], *Rabdostigma* Quaintance & Baker[32], *Rhachisphora*, *Rusostigma* Quaintance & Baker, *Singhiella*, *Singhius* Takahashi, *Taiwanaleyrodes*
	Lipaleyrodini	*Lipaleyrodes* Takahashi
	Neomaskellini	*Acaudaleyrodes*, *Neomaskellia*
	Siphoninini	*Siphoninus*
	Tetraleurodini	*Tetraleurodes*
	Trialeurodini	*Trialeurodes*
	Zaphanerini	*Zaphanera*

*The whitefly genera of Japan only. **The whitefly genera of India only.

1, 4–7, 9–20: Added by Sampson and Drews in 1956; 2: Added by Drews and Sampson in 1956; 3, 8: Added by Sampson in 1947; 21: Added by Russell in 1967; 22–24: Added by Regu and David in 1993; 25–32: Added by David and Sundararaj in 1993.

Appendix B: characters used to identify the tribes of Aleyrodinae according to different authors

Based on	Tribe	Characters
Sampson[1] (1943); corrected in 1947	Aleurochitonini	Lingula elongate, much longer than wide. Dorsum completely covered with simple pores. Adults with radial$_1$, radial sector, and cubital veins in fore wing.
	Aleyrodini	Lingula elongate, much longer than wide. Dorsum with relatively few simple pores. Thoracic tracheal folds, combs, pores and anal fold absent. Adults with radial sector and cubital veins in fore wing and with tarsal paronychium.
	Dialeurodini	Lingula elongate, much longer than wide. Dorsum with relatively few simple pores. Thoracic tracheal folds and combs or pores, or pores or combs only, and anal fold, or only anal fold, present. Adults with radial sector and cubital veins in fore wing and with tarsal paronychium.
	Neomaskellini	Lingula extremely short, hardly longer than wide. Adults with radial sector vein only in fore wing.
	Siphoninini	Lingula elongate, much longer than wide. Dorsum with elongate, siphon-like wax tubes and with relatively few simple pores. Adults with radial sector and cubital veins in fore wing and lacking tarsal paronychium.
Russell[2] (1947)	Trialeurodini	Main points: a submarginal row of disc pores and porettes with which are associated variously conspicuous papillae. Submargin and subdorsum not separated by a furrow. Submarginal setae shorter than the width of a submarginal ridge or without distinguishable setae. Vasiform orifice ending abruptly, its sides without minute spines. Thoracic tracheal folds without angular markings and usually without spines. Antennae not reaching to posterior thoracic spiracles.
Takahashi[2] (1954)	Aleurocanthini	Tracheal pores or clefts absent, tracheal combs sometimes developed. Vasiform orifice not notched at the hind end, rounded, not elongated, sometimes elevated; lingula concealed under the operculum. Caudal furrow absent. Eyespots present in some species. Seventh abdominal segment nearly as long as, or a little shorter than, the six.
	Aleurolobini	Tracheal pores or clefts absent, tracheal combs sometimes developed. Vasiform orifice not notched at the hind end, subcordate, triangular or truncated at the hind end, elongated in some species; lingula exposed, knobbed and with a pair of long setae, sometimes large, knobbed part of lingula elongate, much longer than wide. Caudal furrow sometimes developed. Eyespots present in some species. Seventh abdominal segment much shortened at the median area in many genera.
	Aleyrodini	Tracheal pores or clefts absent, tracheal combs sometimes developed. Vasiform orifice not notched at the hind end, subcordate, triangular or truncated at the hind end, elongated in some species; lingula exposed, knobbed and with a pair of long setae, sometimes large, knobbed part of lingula globular, not distinctly longer than wide. Caudal furrow sometimes developed. Eyespots present in some species. Seventh abdominal segment much shortened at the median area in many genera.
	Dialeurodini	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 eyespots lacking.

Appendix B. (Continued).

Based on	Tribe	Characters
David[2] (1990)	Aleurocanthini	Thoracic and caudal tracheal combs, clefts, or pores or furrows absent. Vasiform orifice elevated, rounded; lingula concealed by operculum. Margin with a single row of teeth or smooth. Submargin not separated from dorsal disc. Many prominent spines on the dorsum, often longer.
	Aleurolobini	Thoracic and caudal tracheal combs, clefts, or pores or furrows present. Submargin separated from dorsal disc. Margin generally toothed. Seventh abdominal segment much shortened at the median area in many genera. Eighth abdominal segment often trilobed. Caudal furrow sometimes discernible. Vasiform orifice nearly triangular or subcordate; lingula knobbed and exposed.
	Aleuroplatini	Tracheal pores, clefts, folds, furrows absent but thoracic and caudal tracheal combs indicated. Submargin generally not separated from dorsal disc, if separated, eighth abdominal segment not trilobed. Margin toothed. Pores on dorsum variously distributed. Dorsum with a prominent central ridge terminating cephalad in a more or less arrow-shaped figure, or elevated and fringed with rounded protrusions around. Lingula usually concealed.
	Aleyrodini	Thoracic and caudal tracheal combs, clefts, or pores or furrows absent. Vasiform orifice not elevated; lingula generally exposed, knobbed, but in some concealed. Margin toothed or crenulate. Dorsum with rhachis and a pair of longitudinal fold in some genera. Seventh abdominal segment much shortened at the median area in many genera. Caudal furrow sometimes discernible.
	Bemisini	Tracheal pores, clefts, folds, furrows present but combs absent. Submargin generally not separated from dorsal disc, if separated, eighth abdominal segment not trilobed. Rhachis present or absent. Dorsum generally with setae/tubercles. Submargin with row of papillae. Margin with series of setae in some genera. Vasiform orifice subcordate or triangular or subrectangular, sometimes in a ribbed pyriform pit; lingula long or spatulate, setose and exposed.
	Dialeurodini	Tracheal pores, clefts, folds, furrows present but combs absent. Submargin generally not separated from dorsal disc, if separated, eighth abdominal segment not trilobed. Rhachis present or absent. Dorsum generally with setae/tubercles. Submargin with row of papillae. Margin with series of setae in some genera. Vasiform orifice cordate or subcordate; lingula usually small, concealed and wanting setae.
	Lipaleyrodini	Thoracic and caudal tracheal combs, clefts, or pores or furrows present. Submargin with wax plates in cluster arranged in a row.
	Neomaskellini	Thoracic and caudal tracheal combs, clefts, or pores or furrows absent. Vasiform orifice elevated, elongately elliptic or transversely oval; operculum transversely rectangular and extremely short, exposing lingula. Margin with a single row of teeth or smooth. Submargin not separated from dorsal disc. Rhachis sometimes present. Submargin in some with a row of setae.
	Siphoninini	Thoracic and caudal tracheal combs, clefts, or pores or furrows absent. Dorsum with elongate siphon-like wax tubes.
	Tetraleurodini	Thoracic and caudal tracheal combs, clefts, or pores or furrows absent. Vasiform orifice elevated, subcordate or rounded; lingula concealed by operculum. Margin with a single row of teeth or smooth. Submargin separated from dorsal disc.
	Trialeurodini	Tracheal pores, clefts, folds, furrows absent. Submargin generally not separated from dorsal disc, if separated, eighth abdominal segment not trilobed. Margin dentate, smooth or crenulate. Submargin with a row of disc pores and porettes with variously associated conspicuous papillae. Lingula exposed with a pair of setae. Caudal furrow discernible.
	Zaphanerini	Thoracic and caudal tracheal combs, clefts, or pores or furrows absent. Vasiform orifice elevated; lingula concealed by operculum. Margin with two rows of teeth. Submargin not separated from dorsal disc.

1. Pupal case and adult characters.
2. Pupal case characters only.

Appendix C: checklist of species examined for cladistic analysis

Note: Underlined words and/or figures from slide labels were interpreted with some uncertainty. The list is arranged alphabetically based on the most recent name

Aleyrodinae

1. *Acanthaleyrodes* Takahashi

A. callicarpae Takahashi
Taiwan: Taichung, 18.xii.1968, (Y.C. Chang), ex: Grape, 2/69 (5 slides).
Taiwan: Taichung, 2.xi.1968, (Y.C. Chang), ex: *Vitis vinifera* (3 slides).
A. spiniferosa (Corbett)
Syntype, Malaya: Kuala Lumpur, 16.ii.1928, (G.H. Corbett), ex: *Diospyros* sp., B.M. 1932-511.
A. styraci Takahashi
Hong Kong: Pok Fu Lam, Reservoir Road, at Peak Road, 12.xii.2001, (J.H. Martin 7563), ex: *Rubus reflexus* (3 slides).

2. *Acanthobemisia* Takahashi

A. distylii Takahashi
Japan: Nagasaki, 27.viii.1957, (R. Takahashi), ex: *Distylium racemosum*, 86/62, B.M. 1962-401 (4 slides).

3. *Acaudaleyrodes* Takahashi

A. africana (Dozier)
Syntype, Belgian Congo: Barumbu, i.1926, (J. Ghesquière), ex: *Desmodium* sp., B.M. 1933.
Nigeria: Ibadun, 20.i.1914, (W.A. Lambourn), ex: herbaceus plant, 204/61, B.M. 1916-190 (2 slides).
A. rachipora (Singh)
Syntypes, Egypt: Meadi, 12.viii.1931, ex: Pomegranate.
Syntype, Egypt: Myniah, 14.xi.1931, ex: *Alhagi* sp.
Cyprus: 10.x.1928, (H.M. Morris), ex: Pomegranate, I.B.E. 2052, 36/61, B.M. 1961-4 (3 slides).
Iraq: Abu-Ghraib, 23.xii.1961, ex: *Zizyphus* sp., C.I.E. 6763, 71/62, B.M. 1962-3 (2 slides).
Sudan: Red Sea Prov. nr Mismar, Atbara-Haiya Jct., 31.iii.1981, (J.H. Martin 3226), ex: *Calotropis procera*.
Sudan: S. Darfur, Ed Da'ein, 3.v.1981, (J.H. Martin 3373), ex: *Calotropis procera*.
India: Madras, Coimbatore, 23.viii.1962, ex: *Prosopis* sp., C.I.E. 15456.
A. tuberculata Bink-Moenen
Holotype, Chad: Bebedjia, 395 m, 16.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Anogeissus leiocarpus*, B.M. 1977-471.
Paratypes, Chad: Boro, 453 m, 6.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Bridelia ferruginea*, B.M. 1977-471.

4. ***Acutaleyrodes*** **Takahashi**

A. palmae Takahashi
Syntypes, Réunion Island: Saint Philippe, xii.1955, (R. Paulian), ex*: Acanthophoenix rubra.*

5. ***Africaleurodes*** **Dozier**

A. coffeacola Dozier
Syntypes, Belgian Congo: Lodja, iii.1928, (J. Ghesquière), ex: *Coffea robusta*, B.M. 1933.
Nigeria: Bida, 26.x.1960, (M.O. Ezeigwe), ex: indet.
Aldabra Island: Middle camp, 15.viii.1974, (L.F.H. Merton), ex: *Canthium* sp., 3/74 (5 slides).
A. fulakariensis Cohic
Syntype, Congo: Brazzaville, Fulakary, 28.iii.1965, (R. Paulian), ex: *Neosloetiopsis kamerunensis*, B.M. 1965-305.
A. hexalobi Bink-Moenen
Holotype+paratypes, Chad: Bentam, 29.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Hexalobus monopetalus*, B.M. 1977-471.
Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 6.xi.1989, (L.D.C. Fishpool), ex: *Cryptolepis sanguinolenta.*
A. loganiaceae Dozier
Syntype, Belgian Congo: Sankuru, i.1928, (J. Ghesquière), ex: Loganiaceae, B.M. 1933.
A. ochnaceae Dozier
Syntype, Belgian Congo: Kole, 8.i.1928, (J. Ghesquière), ex: *Ochna* sp., B.M. 1933.
Nigeria: Ibadan, viii.1966, (E.A. James), ex: *Cola nitida*, 22/66.

6. ***Agrostaleyrodes*** **Ko**

A. arcanus Ko
Paratype, Taiwan: Wulai, 13.viii.1990, (C.C. Ko), ex: *Miscanthus* sp.

7. ***Aleurocanthus*** **Quaintance & Baker**

A. banksiae (Maskell)
Australia: Aldingo Scrub, xii.1967, (L.A. Mound), ex: *Banksia marginata*, 39/71 (3 slides).
Australia: Kangaroo Island, 18.ii.1990, (J.H. Martin 5661), ex: *Banksia ornata*, B.M. 1998-50.
Australia: nr Victor Harbour, 20.iv.1977, (P. Borrett), ex: *Banksia marginata*, 25/80.
A. calophylli (Kotinsky)
Syntypes, Fiji: Levuca, 30.x.1899, (A. Koebele), ex: *Calophyllum inophyllum.*
A. ceracroceus Martin
Paratypes, Australia: Queensland, creek-bed, 3 km north of Cape Tribulation, 16.vii.1996, (J.H. Martin 6895), ex: *Neolitsea* spp. (2 slides).
A. citriperdus Quaintance & Baker
Hong Kong: 14.iv.1974, (D.S. Hill), ex: *Citrus* sp. (2 slides).
Hong Kong: Tai Pokau Orchard, 21.ii.1971, ex: Orange, C.I.E. 4663, 11/71 (2 slides).
A. cocois Corbett
Papua New Guinea: New Britain Prov., Gazelle Peninsula, Vunakanau, 18.v.1956, (J.L. Gressit), ex: *Cocos* sp., B.204 (2 slides).

Solomon Island: Kukum, 13.ii.1956, (E.S. Brown), ex: Coconut, C.I.E. 3898Aa/14609.
Solomon Island: Guadalcanal Kukum, 20.viii.1954, (E.S. Brown), ex: Coconut, C.I.E. 3177/13920.
A. delottoi Cohic
Paratype, Kenya: Nairobi, 27.viii.1958, (G. de Lotto), ex: *Chaetachme aristata*, 4/65, B.M. 1965-224.
Kenya: Langata, Nairobi, 7.v.1988, (J.H. Martin 5272), ex: *Pappea capensis*, B.M. 1988-188.
A. esakii Takahashi
Papua New Guinea: Morobe Prov. coast, Buso, 1.xi.1979, (J.H. Martin 2783), ex: *Pometia pinnata* (2 slides).
A. gateri Corbett
West Malaysia: Selangor, Sardang, 7.ii.1985, (J.H. Martin 4417), ex: *Cocos nucifera* (2 slides).
A. gordoniae Takahashi
Hong Kong: slopes of the Peak, above Pok Fu Lam Reservoir Road, 12.xi.1996, (J.H. Martin 6795), ex: *Gordonia axillaris* (2 slides).
A. inceratus Silvestri
Hong Kong: rec'd., v.1990, ex: *Michelia champaca*, C.I.E. A.20977.
A. leptadeniae Cohic
Sudan: Wad Medani, xii.1961, (L.A. Mound), ex: *Leptadenia heterophylla*, 161/162.
A. spiniferus (Quaintance)
Syntypes, Tanzania: ?Dar es Salaam, ?iv.1902, (?A. Zimmermann), ex: ?*Citrus* sp. (2 slides).
India: Coimbatore, 14.iv.1967, (B.V. David), ex: Rose, 10/67, B.M. 1967-280.
Uganda: E. Buganda, Bulemezi, Sabawali, Bugema, 5.vi.1970, (D.N. McNutt), ex: *Citrus sinensis* (2 slides).
Australia: Queensland, Stratford, Cairns, 8.viii.1983, (A.J. Wait), ex: Custard apple (3 slides).
Micronesia: Kosrae I., vi.2001, ex: *Citrus* sp.

8. ***Aleurocerus*** **Bondar**

A. cerifer (Sampson & Drews)
Panama: Canal Zone, Cerro Galera, 26.iii.1983, (J.H. Martin 4154), ex: *Tetracera* sp. (2 slides).
Panama: Canal Zone, Barro Colorado I., 13.iii.1983, (J.H. Martin 3986), ex: *Tetracera* sp. (2 slides).
Costa Rica: Guanacaste Province, 60 km south of Liberia, 26.i.1983, (J.H. Martin 3693), ex: *Mastichodendron* ?*capiri* (2 slides).
A. flavomarginatus Bondar
Costa Rica: N. Heredia Province, 15 km north of Puerto Viejo, 3.ii.1983, (J.H. Martin 3770), ex: *Heliconia* sp. (2 slides).
Ecuador: Mapo Coca, 16.v.1982, (G. Omore), ex: *Elaeis guineensis*, 80/82 (2 slides).
A. musae Russell
Mexico: San Diego, 31.vii.1995, (A. Endo), ex: *Zingiber* sp., 022090 CA, B.M. 1998-131.
Panama: Canal Zone, Pipeline Road, 19.iii.1983, (J.H. Martin 4050), ex: Bignoniaceae (2 slides).

Panama: Canal Zone, Gamboa Hill, 20.iii.1983, (J.H. Martin 4088 B), ex: *Warszewiczia coccinea* (2 slides).
Costa Rica: N. Heredia Province, 10 km north of Puerto Viejo, 2.ii.1983, (J.H. Martin 3740), ex: indet. (2 slides).
A. palmae Russell
Paratypes, Mexico: intercepted at Dallas, Texas, USA, 21.ii.1962, (L. Russell), ex: *Chamaedorea elegans*, ref. 62-15982 (2 slides).
Belize: Cayo, Chiquibul forest, Las Cuevas plots, 3.xi.1994, (J.H. Martin 6438), ex: *Pouteria* sp.

9. *Aleurochiton* Tullgren

A. acerinus Haupt
Czechoslovakia: Radotin, 2.iii.1969, (J. Zahradnik), ex: *Acer campestris* (2 slides).
England: Kent, Polhill Down, near Sevenoaks, 28.v.1983, (W.R. Dolling), ex: *Acer campestre*, 2/83 (2 slides).
Italy: Sicily, (CT), Bronte, 30.x.1981, (C. Rapisarda), ex: *Acer campestre*, 50/84.
Hungary: Szarvas, 21.vi.1990, (V.F. Eastop 19144), ex: *Acer campestre*.
A. aceris (Modeer)
England: Hants, Alice Holt forest, 29.vii.1984, (J.H. Martin 4363), ex: *Acer platanoides* (2 slides).
England: Hants, Alice Holt forest near Alton, 10.vii.1994, (J.H. Martin 6419), ex: *Acer platanoides*.
Netherlands: Bennekom, 7.x.1971, (V.F. Eastop), ex: *Acer platanoides*, 7/72 (3 slides).
A. forbesii (Ashmead)
USA: Illinois, Urbana, 10.x.1970, (L.A. Mound), ex: *Acer saccharinum*, 29/71 (4 slides).
USA: Maryland, Prince Georges Co Beaver Dam Rd, 2.vii.1998, (J.H. Martin 7103), ex: *Acer rubrum* (2 slides).
A. pseudoplatani Visnya
Sicily: (CT/ME), Monti Nebrodi, near Bronte, 10.x.1985, (J.H. Martin 5068), ex: *Acer pseudoplatanus* (2 slides).
Netherlands: Amerongen, 28.ix.1975, (R.M. Bink-Moenen), ex: *Acer pseudoplatanus*, B.M. 1976-56 (2 slides).

10. *Aleuroclava* Singh

A. aucubae (Kuwana)
Japan: Osaka, Taishi, 3.xi.1956, (R. Takahashi), ex: *Paederia* sp., 76/62, B.M. 1962-401 (2 slides).
Japan: Tokyo, 9.x.1963, (H. Takada), ex: *Celtis* sp.
A. bifurcata (Corbett)
Paratype, Malaya: Kajang, 4.v.1927, (G. H. Corbett), ex: *Nephelium lappaceum*, B.M. 1932.511.
West Malaysia: Pahang Prov., Tioman I., Kampung Tekek, 20.iii.1984, (J.H. Martin 4309), ex: indet.
West Malaysia: Pahang Prov., Taman Negara, Tembeling path, 11.iii.1984, (J.H. Martin 4250), ex: indet.
A. citrifolii (Corbett)

India: Punjab, 29.iii.1926, (M.A. Husain), ex: *Citrus* sp., I.B.E. 309.
Pakistan: Peshawar, 31.i.1963, (L.A. Mound), ex: *Murraya exotica*, 10/64.
A. euryae (Kuwana)
Japan: Odaiga - Hara, near Nara, 18.viii.1956, (R. Takahashi), ex: *Trochodendron* sp., 73/62, B.M. 1962-401.
A. ficicola (Takahashi)
Taiwan: Wufeng, 18.iv.1994, (K.C. Chou), ex: *Morus* sp., B.M. 1994.
Taiwan: Wufeng, 9.v.1994, (K.C. Chou), ex: *Morus* sp., B.M. 1994.
A. filamentosa (Corbett)
Brunei: Belait, Peat Swamp forest, East of Seria, 4.x.1992, (J.H. Martin 6122), ex: indet.
A. hikosanensis (Takahashi)
Japan: Mt. Ikoma, near Osaka, 18.ix.1955, (R. Takahashi), ex: Buxa, 78/62, B.M. 1962-401 (2 slides).
A. jasmini (Takahashi)
Hong Kong: Kowloon, 29.viii.1979, (J.H. Martin 2478), ex: indet. (2 slides).
Singapore: Ayer Rajah, housing blocks, 10.iv.2000, (J.H. Martin 7338), ex: *Jasminum* sp.
Singapore: Ayer Rajah, housing blocks, 10.iv.2000, (J.H. Martin 7334), ex: *Citrus* sp.
Taiwan: Formosa, Tobacco Res. Inst., 12.iv.1967, (Y.C. Chang), ex: *Murraya paniculata*, 9/67, B.M. 1967-258.
A. magnoliae (Takahashi)
Japan: Odaiga - Hara near Nara, 16.viii.1956, (R. Takahashi), ex: Lauraceae, 75/62, B.M. 1962-401.
A. murrayae (Singh)
Pakistan: Peshawar, 31.i.1963, (L.A. Mound), ex: *Murraya exotica*, 9/64, C.I.E. 19214.
Pakistan: Peshawar, 31.i.1963, (L.A. Mound), ex: *Murraya exotica*, 9/64.
A. nigeriae (Mound)
Paratype, Nigeria: Ibadan, 28.ix.1956, ex: Guava, 54/59.
Paratype, Nigeria: Ibadan, Moor Plantation, xii.1960, (M.O. Ezeigwe), ex: *Psidium guajava* (2 slides).
Paratype, Nigeria: Kusheriki, ix.1960, (L.A. Mound), ex: indet. (2 slides).
A. piperis (Takahashi)
Japan: Enoshima, 31.viii.1949, (R. Takahashi), ex: *Piper* sp., 74/62, B.M. 1962-401 (2 slides).
A. psidii (Singh)
Taiwan: Formosa: Tobacco Res. Inst., 3.iv.1967, (Y.C. Chang), ex: *Litchi chinensis*, 4/67, B.M. 1967-186.
Taiwan: Taichung, 10.ix.1967, (Y.C. Chang), ex: *Prunus salicinia*, 20/67, B.M. 1967-592.
Taiwan: Taichung, 18.xii.1968, (Y.C. Chang), ex: Grape, 2/69.
A. pulcherrimus (Corbett)
Java: Jakarta, Kemang, 16.xii.1979, (J.H. Martin 2953), ex: indet.
A. similis (Takahashi)
Japan: Asakawa, near Tokyo, 27.vii.1949, (R. Takahashi), ex: *Pieris japonica*, 77/62, B.M. 1962-401 (2 slides).

11. *Aleurocybotus* Quaintance & Baker

A. graminicolus (Quaintance)

Paralectotype, USA: Florida, Lake City, 25.vii.1898, (Prof. Rolfs), Q 6775, ex: Grass, B.M. 1998-131.

A. occiduus Russell

Paratype, USA: California, ix–x.1961, (L.D. Anderson), ex: Grass, 8/65, B.M. 1965-451 (2 slides).

USA: California, El Centro Imp. Co., 5.x.1961, (O.V. Wadgner), ex: *Sorghum* sp., B.M. 1968-368.

12. *Aleuroduplidens* Martin

A. eucalyptifolia Martin

Paratypes, Australia: ACT, Molonglo Gorge (near Queanbeyan, NSW), 8.xii.1996, (J.H. Martin 6852), ex: *Eucalyptus nortonii*, B.M. 1998-50 (2 slides).

Paratypes, Australia: S.A., Belair, National Park, 29.iv.1957, (D.C. Swan), ex: *Eucalyptus* sp. (3 slides).

Australia: WA, Bungle Bungles, Frog Hole Gorge, 8.v.2000, (J.H. Martin 7443), ex: *Eucalyptus saplings*.

A. santali Martin

Paratypes, Australia: Queensland, Mt. Isa, 3.x.1996, (P. De Barro 66), ex: *Santalum lanceolatum* (2 slides).

Paratypes, Australia: Queensland, 25 mi. W. of Dalby, ix.1985, (L.A. Mound), ex: indet., B.M. 1998-51 (2 slides).

A. triangularis Martin

Paratype, Australia: Northern Territory, King's Canyon, 5.ii.1990, (J.H. Martin 5643), ex: *Acacia ?mcdonnelliensis*, B.M. 1998-50 (2 slides).

A. wellsae Martin

Paratypes, Australia: Victoria, Merbein South, near Mildura, 27.i.1997, (A. Wells), ex: *Acacia melvillei*, B.M. 1998-50 (3 slides).

Paratypes, Australia: River Murray, 30 mls, N. of Overland Corner, 10.x.1965, (D.E. Symon), ex: *Acacia wilhelmiana*, 3/66, B.M. 1966-50 (3 slides).

13. *Aleuroglandulus* Bondar

A. magnus Russell

Costa Rica: Guanacaste Province, Santa Rosa Nat. park, 6.iii.1990, (J.M. Cox 63), ex: indet.

A. malangae Russell

Costa Rica: Turrialba, 14.xii.1981, (A. King), ex: *Colocasia* sp., 2/82.

Costa Rica: Turrialba, 640 m., Trop. Agric. Centre, C.A.T.I.E., 2.iii.1983, (J.H. Martin 3954), ex: *Colocasia* sp. (4 slides).

A. striatus Sampson & Drews

Costa Rica: N. Heredia Province, 10 km north of Puerto Viejo, 2.ii.1983, (J.H. Martin 3739), ex: indet. (2 slides).

A. subtilis Bondar

Panama: Darién, Ensenada del Guayabo, sea level - 250 m., 11.i.1983, (J.H. Martin 3588), ex: *Psidium guajava* (2 slides).

Panama: Canal Zone, Gamboa Hill, 20.iii.1983, (J.H. Martin 4095), ex: Bombacaceae.

Panama: Canal Zone, Barro Colorado I., 13.iii.1983, (J.H. Martin 3987), ex: *Inga ?pezizifera*.
Panama: Canal Zone, Barro Colorado I., 17.iii.1983, (J.H. Martin 4032), ex: *?Palicourea guianensis* (2 slides).

14. ***Aleuroinanis*** **Martin**

A. myrtacei Martin
Paratypes, Australia: Queensland, strand 2 km north of Cape Tribulation, 15.xii.1996, (J.H. Martin 6883), ex: *Syzygium* sp., B.M. 1998-50.

15. ***Aleurolobus*** **Quaintance & Baker**

A. diastematus Bink-Moenen
Sudan: S. Darfur, Ed Da'ein, 3.v.1981, (J.H. Martin 3371), ex: *Guiera senegalensis*.
Sudan: S. Darfur, Jebel Marra, S. W. side, Wadi Golol, 28.iv.1981, (J.H. Martin 3332), ex: *Salix subserrata*.
A. graminicola Bink-Moenen
Paratypes, Chad: Baïbokoum, 700 m., 8.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Cymbopogon giganteus*, B.M. 1977-471 (2 slides).
A. hargreavesi Dozier
Syntype, Uganda: Kampala, 16.ii.1928, (H. Hargreaves 0182), ex: *Hyparrhenia* sp.
Nigeria: Enugu, 15.i.1957, (V.F. Eastop 6558), ex: indet.
A. marlatti (Quaintance)
Paralectotypes, Japan: Hokata, 21.v.1901, (Quaintance 10227, via Marlatt), ex: Orange.
Australia: Queensland, rocky coast, 3 km north of Cape Tribulation, 16.xii.1996, (J.H. Martin 6897), ex: ?Euphorbiaceae, B.M. 1998-50.
Australia: Queensland, strand 2 km north of Cape Tribulation, 15.xii.1996, (J.H. Martin 6888), ex: *Clerodendron inerme*, B.M. 1998-50.
Australia: Queensland, Cape Tribulation, 18.xii. 1996, (J.H. Martin 6909), ex: *Aegiceras corniculatus*, B.M. 1998-50 (2 slides).
A. moundi David & Subramaniam
India: Kovilpatti, 31.i.1967, (B.V. David), ex: *Bassia latifolia*, 10/67, B.M. 1967-280/16 (3 slides).
India: Coimbatore, 7.xi.1967, (B.V. David), ex: *Bassia longifolia*, 10/67, B.M. 1967-280/17.
A. onitshae Mound
Paratypes, Nigeria: Onitsha, 13.i.1957, (V.F. Eastop 6553), ex: *Phyllanthus floribundus*, 198/61.
Paratype, Nigeria: Onitsha, 14.i.1957, (V.F. Eastop 6553), ex: *Phyllanthus floribundus*.
Paratypes, Nigeria: Moor Plantation area, i.1961, (L.A. Mound), ex: *Flueggea virosa*.
A. styraci Takahashi
Japan: Tokyo, 16.ix.1950, (R. Takahashi), ex: *Styrax* sp., 80/62, B.M. 1962-401 (2 slides).
A. teucrii Mifsud & Palmeri
Paratypes, Malta: Gozo Island, Xlendi, valley side, 16.iii.1994, (D. Mifsud & G.W. Watson 91), ex: *Teucrium fruticanus* (3 slides).

16. ***Aleurolonga*** Mound

A. cassiae Mound
Paratypes, Nigeria: Ibadan, Moor Plantation, i.1960, (L.A. Mound), ex: *Cassia siamea* (2 slides).
Angola: 3 m N Santa Comba, 8.iii.1972, (D. Hollis), ex: *Brachystegia* sp., 2/74 (2 slides).

17. ***Aleuromarginatus*** Corbett

A. corbettiaformis Martin
Paratypes, Papua New Guinea: Morobe Province coast, Buso, 10.x.1979, (J.H. Martin 2680), ex: *Desmodium umbellatum* (3 slides).
A. dalbergiae Cohic
Chad: Bebedjia, 395 m, 22.xi.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Pterocarpus lucens*, B.M. 1976-56.
A. kallarensis David & Subramaniam
Paratypes, India: Madras, Tambaram, 4.i.1970, (B.V. David), ex: Papilionaceous shrub, B.M. 1972-24.
A. littoralis Martin
Paratypes, Papua New Guinea: Morobe Province coast, Buso, 10.ix.1979, (J.H. Martin 2529), ex: ?*Derris trifoliata* (2 slides).
West Malaysia: Pahang Prov., Pulau Tioman, kg Penuba, beach-top, 19.xi.1992, (J.H. Martin 6219), ex: *Desmodium umbellatum* (2 slides).
A. marginiquus Martin
Paratypes, Australia: Western Australia, Perth, Forrestfield, 23.xi.1997, (P.J. Gullan), ex: *Daviesia horrida*.
A. moundi Martin
Paratypes, Australia: Queensland, 54 km W. of Mitchel, 30.iii.1998, (L.A. Mound 3420), ex: *Acacia* ?*aneura*, B.M. 1998-51.
A. nemciae Martin
Paratypes, Australia: Western Australia, Darling District, West Talbot Road, 27.ix.1993, (M.D. Crisp 8517), ex: *Nemcia* sp.
A. nigrus Martin
Paratypes, Australia: New South Wales, Braidwood - Nelligen Road, scarp descent, 30.xi.1996, (J.H. Martin 6840), ex: *Oxylobium ilicifolium*, B.M. 1998-50 (2 slides).
Paratypes, Australia: Australian Capital Territory, Molonglo Gorge, 8.xii.1996, (J.H. Martin 6854), ex: *Acasia* sp., B.M. 1998-50.
A. serdangensis Takahashi
Syntype, Malaya: Serdang, 20.i.1945, (R. Takahashi), ex: indet., B.M. 1955-799.
A. tephrosiae Corbett
Chad: Bebedjia, 395 m, 15.viii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Tephrosia linearis*, B.M. 1976-56.

18. ***Aleuropapillatus*** Regu & David

A. kumariensis Regu &David
Paratype, India: Tamil Nadu, Mondaikadu, 4.viii. 1989, (K. Regu), ex: *Gmelina asiatica*.

19. *Aleuroparadoxus* Quaintance & Baker

A. arctostaphyli Russell
Paratype, USA: Boulder Creek, Calif., 13.x.1891, (V. Bailey), ex: *Arctostaphylos nummularia*, B.M. 1998-131.
A. gardeniae Russell
Paratypes, Mexico: 29.xii.1937, ex: *Gardenia* sp., B.M. 1998-131.
Paratypes, Mexico: 10.xii.1936, (J.M. Singleton), ex: *Gardenia* sp., B.M. 1998-131.
A. ilicicola Russell
Paratype, USA: Alabama, Gulf Shores, 12.i.1944, (L.A. Mayer), ex: *Ilex* sp., B.M. 1998-131.
A. iridescens (Bemis)
?Paralectotype, USA: California, Santa Clara Valley, 1.iv.1901, (F.E. Bemis 7084), ex: *Heteromeles arbutifolia*, B.M. 1998-131.
USA: California, C. Costa Co., Russelmann Park, 21.v.1968, (R.F. Wilkey), ex: *Rhamnus crocea* var. *ilicifolia*, B.M. 1998-131.
A. punctatus Quaintance & Baker
Chile: Santiago, Univ. campus, ix.1995, (V.F. Eastop), ex: indet. (2 slides).

20. *Aleuroplatus* Quaintance & Baker

A. acaciae Bink-Moenen
Paratypes, Egypt: Aswan, Elefantine, 21.i.1977, (F.A. Bink & R.M. Bink-Moenen), ex: *Acacia tortilis*.
Sudan: Khartoum North, 11.iv.1981, (J.H. Martin 3265), ex: *Pithecollobium dulce* (2 slides).
A. berbericolus Quaintance & Baker
USA: California, Trial, Oregon in quarantine Hornbrook, 6.x.1966, (B. Palmer), ex: *Mahonia aquifolium*, 25/66 (4 slides).
A. bossi Takahashi
Kenya: Westermann's Safari Camp, 30 km S. of Voi, 16.v.1988, (J.H. Martin 5312), ex: ?Oleaceae, B.M. 1988-188.
Kenya: ~20 km S. W. of Malindi, inland, 19.v.1988, (J.H. Martin 2348), ex: *Ochna mossambicensis*, B.M. 1988-188.
Sudan: Kordofan, En Nahud - Wad, Banda route, 22.iv.1981, (J.H. Martin 3314), ex: *Boscia senegalensis*.
A. cadabae Priesner & Hosny
Sudan: Kassala Province, Jebel Kassala, 5.iv.1981, (J.H. Martin 3254), ex: *Cadaba rotundifolia* (2 slides).
A. cockerelli (Ihering)
Syntypes, Brazil: S. Paulo Prov., (?V. Ihering), ex: *Baccaris paucifloscula*, B.M. 1920-107.
A. cococolus Quaintance & Baker
Belize: Cayo, Chiquibul forest, San Pastor track, 14.ii.1996, (J.H. Martin 6668), ex: *pimenta dioica*.
Belize: Cayo, Chiquibul forest, Millionario - Grano de Oro, 12.ii.1996, (J.H. Martin 6645), ex: *Guettarda combesii*.
A. dorsipallidus Martin
Paratypes, Indonesia: Sulawesi Utara, Dumoga-Bone N.P., Toraut forest, 11.iii.1985, (J.H. Martin 4639), ex: probably *Taxotrophis ilicifolius* (2 slides).

Paratypes, Indonesia: Sulawesi Utara, Dumoga-Bone N.P., Toraut forest, 20.iii.1985, (J.H. Martin 4709), ex: *Taxotrophis ilicifolius*.

Paratypes, Indonesia: Sulawesi Utara, lakeside, Danau Mooat, Gunung Muajat, 22.iii.1985, (J.H. Martin 4716), ex: ?*Palaquium* sp.

A. epigaeae Russell

Paratypes, Canada: at Boston, 26.v.1939, (W.J. Ehinger), ex: *Epigaea repens*, B.M. 1998-131.

A. evodiae Takahashi

Syntypes, Réunion Island: Plaine des Affouches, v.1957, (J. Bosser), ex: *Evodia* sp., 111/62, B.M. 1962-401.

A. fici Takahashi

Taiwan: Taipei, 1.ii.1987, (C.C. Ker), ex: *Ficus vasculosa*, B.M. 1987-197.

A. ilicis Russell

USA: Texas, in quarantine at Sanders, Arizona, 13.xi.1965, (A.T. Guest), ex: *Ilex* sp., 25/66 (2 slides).

A. incisus Quaintance & Baker

Ceylon: Haputalo, xii.1904, ex: *Ostodes zeylanica*, B.M. 1927-451.

A. pectiniferus Quaintance & Baker

Paratype, India: Tamil Nadu, Burliar, 20.vi.1985, (R.W.A. Jesudasan), ex: *Cinnamomum* sp., B.M. 1987-185.

Paralectotypes, Ceylon: Peradeniya, i.1905, (E.E. Green), ex: *Ficus gibbosa*, B.M. 1927-451.

Australia: Northern Territory, Kakadu Nat. Park, Ubirr rocks, 35 km N. of Jabiru, 22.xii.1996, (J.H. Martin 6956), ex: *Strychnos* sp., B.M. 1998-50.

Hong Kong: Lantau Island, near Tung Chung, 16.x.1990, (J.H. Martin 5779), ex: indet.

Hong Kong: Lantau Island, near Tung Chung, 16.x.1990, (J.H. Martin 5781), ex: *Aguilaria sinensis*.

A. periplocae (Dozier)

Syntype, Belgian Congo: Barumbu, viii.1925, (J. Ghesquière 592), ex: *Periploca nigrescens*.

A. perseaphagus Martin *et al.*

Paratypes, Madeira: Funchal, Lombo da Boa Vista, 3.vii.1993, (via M. Pita C220), ex: *Persea americana* (2 slides).

Paratypes, Madeira: Santa Cruz village, 20.ii.1994, (A.F. Aguiar), ex: *Persea americana*.

A. quercusaquaticae (Quaintance)

USA: Virginia, Vienna, 18.viii.1912, (A.C. Baker 15), ex: Chestnut, B.M. 1924-137.

21. *Aleuropleurocelus* Drews & Sampson

A. nigrans (Bemis)

USA: California, Pasadena, 26.ii.1945, (R.H. Smith), ex: *Rhamnus californica*, B.M. 1998-131.

22. *Aleuropteridis* Mound

A. eastopi Mound

Holotype, Ghana: Tafo, 12.v.1957, (V.F. Eastop 6982), ex: Fern, 109/61.

Paratypes, Ghana: Tafo, 12.v.1957, (V.F. Eastop 6982), ex: Fern, 109/61 (3 slides).

A. filicicola (Newstead)

Syntypes, England: Surrey, Kew Gardens, ?1890, (J.W. Douglas 1205), ex: *Pteris togoensis* & *Cyclosorus dentatus*, 97/61, B.M. 1904-120 (2 slides).
Syntypes, Tanzania (German East Africa): Sigithal near Amani, 4.viii.1902, (A. Zimmermann 18), ex: Fern, 49/62 (4 slides).
A. hargreavesi Mound
Syntypes, Sierra Leone: Freetown, Mokinma, 9.ix.1924, (E. Hargreaves), ex: Bush fern, 108/61.
A. jamesi Mound
Syntypes, Nigeria: Ibadan, Moor Plantation, Ajibi V., 2.x.1959, (E.A. James), ex: *Pteris togoensis*, C.I.E. 5387, 21/60, B.M. 1960-101 (4 slides).
Syntypes, Nigeria: Ibadan, Moor Plantation, Ajibi V., 29.xii.1960, (E.A. James), ex: *Pteris togoensis*.

23. ***Aleuroputeus*** **Corbett**

A. perseae Corbett
West Malaysia: Pahang Prov., Taman Negara, Kuala Tahan, 11.iii.1984, (J.H. Martin 4260), ex: indet. small tree (2 slides).
Indonesia: Java, Jakarta, Kemang, 16.xii.1979, (J.H. Martin 2952), ex: *Psidium guajava*.

24. ***Aleurothrixus*** **Quaintance & Baker**

A. aepim (Göldi)
Brazil: 23.v.1978, (M. Samways "A"), ex: *Manihot* sp., 8/78.
Brazil: 23.v.1978, (M. Samways "B"), ex: *Manihot* sp., 8/78.
A. antidesmae Takahashi
Indonesia: Sulawesi Utara, Dumoga-Bone N.P., Toraut forest, near base camp, 6.v.1985, (J.H. Martin 4926), ex: indet.
Indonesia: Sulawesi Utara, Dumoga-Bone N.P., Toraut forest, near base camp, 30.iii.1985, (J.H. Martin 4767), ex: ?Myrtaceae.
Hawaiian Islands: Maui, Wailuku, 3.iv.1999, (J.H. Martin 7201), ex: *calophyllum inophyllum*.
A. bondari Costa Lima
Brazil: Vicosa, (H.L. Parker 953-16), ex: *Triumfetta semitriloba*, 44-27574, B.M. 1998-131.
A. floccosus (Maskell)
Singapore: Napier/Cluny Rds, Botanic Gardens, 11.iv.2000, (J.H. Martin 7364), ex: *Citrus retusa* (2 slides).
Singapore: Napier/Cluny Rds, Botanic Gardens, 11.iv.2000, (J.H. Martin 7363), ex: *Noringi crenulata*.
A. interrogationis (Bemis)
USA: California, Arcadia, 3.xi.1970, (H.G. Walker), ex: *Ceanothus cyaneus*, B.M. 1998-131.
USA: California, Riverside, 11.v.1961, (L.A. Mound), ex: *Ceanothus* sp., 91/61, B.M. 1961-369 (2 slides).
USA: California, Riverside, 13.ii.1957, (M. Johnson), ex: *Ceanothus* sp.
A. lucumai Costa Lima
Brazil: Vicosa, 25.v.1944, (H.L. Parker 953-26), ex: *Citrus* sp., 44-27574, B.M. 1998-131.
A. myrtacei Bondar

Belize: Cayo, Chiquibul forest, Las Cuevas plots, 17.xi.1994, (J.H. Martin 6491), ex: *Pimenta dioica* (2 slides).

A. porteri Quaintance & Baker

Syntypes, Chile: Villa del Mar, 1.iv.1899, (D.G. Fairchild) ex: Solanaceae, B.M. 1998-131.

A. proximans Bondar

?Syntypes, Brazil: xii.1922, (G. Bondar 653), ex: Lauraceae, B.M. 1998-131 (2 slides).

A. smilaceti Takahashi

Taiwan: Kenting, 4.iv.1986, (C.C. Ker.), ex: *Gardenia* sp., B.M. 1987-197.

25. *Aleurotithius* Quaintance & Baker

A. timberlakei Quaintance & Baker

USA: California, San Diego, Encanto, 10.iv.1968, (R. Thomas), ex: *Eriodictyon crassifolium*, B.M. 1968-368 (2 slides).

USA: California, Pala, 1.xi.1950, (R.A. Flock via L.A. Mound), ex: *Eriodictyon* sp., 87/61, B.M. 1961-369.

26. *Aleurotrachelus* Quaintance & Baker

A. alpinus Takahashi

Taiwan: 20.x.1989, (C.C. Ko), ex: *Polygonum* sp.

A. ampullatus Bink-Moenen

Paratypes, Chad: Boro, 6.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Burkea africana*, B.M. 1977-471.

A. asparagi (Lewis)

Syntypes, South Africa: Natal, iv.1893, (R.T. Lewis), ex: *Asparagus* sp., B.M. 1893-75 (2 slides).

A. atratus Hempel

Topotype, Brazil: Bahia, 7.xii.?23, (G. Bondar), ex: *Cocus nucifera*, B.M. 1924-44.

Tenerife: Canary Islands, Santa Cruz de T., 22.v.1997, (J.H. Martin 7072 & E.H. Suarez), ex: *Arecastrum* sp. (3 slides).

A. camelliae (Kuwana)

Japan: Hyogo, 15.iv.1956, (R. Takahashi), ex: *Camellia japonica*, 83/62, B.M. 1962-401 (2 slides).

A. duplicatus Bink-Moenen

Paratypes, Chad: Bebedjia, 28.xi.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Mitragyna inermis*, B.M. 1977-471.

A. fumipennis (Hempel)

Brazil: Mato Grosso, 25.iii.1968, (O.W. Richards), ex: Grass, B.M. 1968-260 (2 slides).

A. limbatus (Maskell)

Australia: Victoria, nr McKenzie Falls, 23,viii.1965, (D.E. Symon), ex: *Styphelia adscendens*.

Australia: Victoria, nr McKenzie Falls, 23,viii.1965, (D.E. Symon), ex: *Styphelia adscendens*, 3/65, B.M. 1966-50 (2 slides).

A. longispinus Corbett

Syntypes, Ceylon: Telloola, xi.1905, (E.E. Green), ex: indet. 86/61, B.M. 1927-451 (2 slides).

A. minutus Takahashi
Singapore: Botanic Garden, 15.ix.1980, (D.H. Murphy), ex: Annonacae, 10/85.
A. multipapillus Singh
Indonesia: Sulawesi Utara, Dumoga-Bone N.P., Toraut forest, near base camp, 14.iii1985, (J.H. Martin 4660), ex: Bamboo.
A. obscurus Bink-Moenen
Paratypes, Chad: Boro, 6.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Daniella oliveri*, B.M. 1977-471.
A. tarennae Bink-Moenen
Paratype, Chad: Timberi, 29.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Tarenna* sp., B.M. 1977-471.
A. tracheifer (Quaintance)
Belize: Cayo, Chiquibul forest, Las Cuevas, Monkey Tail trail, 17.ii.1996, (J.H. Martin 6685), ex: *Strychnos* sp.
Belize: Cayo, Chiquibul forest, Las Cuevas, Monkey Tail trail, 5.iii.1996, (J.H. Martin 6752), ex: woody recumbent (2 slides).
Panama: Canal Zone, Barro Colorado I., 1.i.1983, (J.H. Martin 3478), ex: *Mouriri myrtilloides*.
A. trachoides (Back)
Tahiti; Papeete, 0-50 m., 8.iii.1979, (N.L.H. Krauss), ex: Vine, ?Convolvulaceae (2 slides).
Costa Rica: Guanacaste Province, 100 km S. E. of Liberia, 29.i.1983, (J.H. Martin 3734), ex: Simaroubaceae.

27. *Aleurotuba* Tremblay & Iaccarino

A. jelinekii (Frauenfeld)
England: Mddx., Staines station, 31.x.1976, (J.H. Martin 1660), ex: *Viburnum ?tinus*.
England: Notts., Radcliffe -on- Trent, 5.iv.1986, (J.H. Martin 5069), ex: *Viburnum tinus* (2 slides).
England: London, Battersea Park, 7.xi.1976, (J.H. Martin 1674), ex: *Viburnum ?tinus*.
Morocco: 45 km S. of Oujda, Col de Jerada, 23.iv.1992, (J.H. Martin 6060), ex: *Viburnum tinus*, B.M. 1992-73.
Morocco: Western Rif, 20 km S.W. of Chefchaouene, Ouezzane Road, 29.iv.1992, (J.H. Martin 6085), ex: *Arbutus unedo*, B.M. 1992-73.
France: Corsica, Gorges, de la Restonica, 23.v.1990, (J.H. Martin 5716), ex: *Arbutus unedo*.

28. *Aleurotulus* Quaintance & Baker

A. anthuricola Nakahara
Paratypes, Colombia: at Miami, 28.iii.1984, (J. Russo), ex: *Anthurium* sp.
A. arundinacea Singh
Papua New Guinea: Morobe Prov. coast, Buso, 21.ix.1979, (J.H. Martin 2598), ex: Bamboo.
A. nephrolepidis (Quaintance)
Type series, England: Surrey, Kew Gardens, 17.ix.1937, (C.B. Williams), ex: Ferns, 166/62, B.M. 1962-643 (2 slides).

Azores: São Miguel, road to Sete Cidades, 27.ix.1998, (A. Polaszek & E.M. Hernandez-Suares), ex: *Blechnum spicant* (2 slides).
Brazil: S.P., ?Campinas, rec'd., iii.1982, (A. Lourencao), ex: *Pteris* sp., 3/82.
A. pteridophytae Martin
Paratypes, Costa Rica: North Heredia Province, La Selva Biological Reserve, xi.1992, (L.A. Mound), ex: *Selaginella eurynota* (4 Slides).
Venezuela: Parque Nacional, El Cumbre, 2.xii.1938, (A.H.G. Alston), ex: *Anemia phyllitidis*, 162/60 (2 slides).

29. *Aleuroviggianus* Iaccarino

A. adanaensis Bink-Moenen
Paratypes, Turkey: Adana, 19.iv.1987, (H. Elekcioglu), ex: *Quercus coccifera*, 22/87 (4 slides).
Syria: Idleeb, 15.v.1995, (Badar Munir), ex: *Quercus calliprinos*, B.M. 1995-187.
A. adrianae Iaccarino
Italy: nr Naples, x.1981, (F.M. Iaccarino), ex: *Quercus ilex* group, 281/81.
Morocco: Middle Atlas, Ifrane, 25.iv.1992, (J.H. Martin 6067), ex: *Quercus* sp., B.M. 1992-73.
Morocco: Western Rif, 5 km S. of Chefchaouene, roadside, 19.iv.1992, (J.H. Martin 6043), ex: *Quercus ?suber*, B.M. 1992-73.
Costa Rica: Cargèse, 31.x.1998, (J.H. Martin 7189), ex: *Quercus ilex* (2 slides).
A. graecus Bink-Moenen
Holotype, Greece: Corfu, Kerkira Kariotikon, 13.v.1980, (F.A. Bink & R.M. Bink-Moenen), ex: *Quercus coccifera*.
A. halperini Bink-Moenen
Paratypes, Israel: Golan Heights, 5.xii.1967, (J. Halperin), ex: *Quercus calliprinos*.
Paratype, Israel: Tivon, 20.xii.1958, (M. Sternlicht 3811), ex: *Quercus calliprinos*, C.I.E. 5001/16428.
Turkey: Içel, 30.iii.1987, (H. Elekcioglu), ex: *Quercus coccifera* (2 slides).
A. polymorphus Bink-Moenen
Paratypes, Spain: Colmenar Viejo, 12.v.1978, (F.A. Bink & R.M. Bink-Moenen), ex: *Quercus rotundifolia* (2 slides).
Paratype, France: Pyrenées Or., N.W. of Ille-s-Têt, 11.v.1987, (F.A. Bink & R.M. Bink-Moenen), ex: *Quercus ilex*.
Morocco: Western Rif, 5 km S. of Chefchaouene, roadside, 19.iv.1992, (J.H. Martin 6043), ex: *Quercus ?suber*, B.M. 1992-73 (2 slides).
Morocco: 45 km S. of Oujda, Col de Jerada, 23.iv.1992, (J.H. Martin 6064), ex: *Quercus coccifera*, B.M. 1992-73.
A. zonalus Bink-Moenen
Paratype, Greece: Crete, Montes Psiloriti, 5.vii.?1942, (L.A. Mound & R.M. Bink), ex: *Quercus coccifera*.
Paratypes, Greece: Crete, Omalus, 8.v.1979, (F.A. Bink & R.M. Bink-Moenen), ex: *Quercus coccifera*.

30. *Aleyrodes* Latreille

A. amnicola Bemis

USA: California, Vista, San Diego, 14.xi.1966, (Waldrip & Kruz), ex: indet., 8/72 (3 slides).
A. elevatus Silvestri
Spain: Almeria Province, gorge N of Berja, Road A337, 9.x.1998, (J.H. Martin 7162), ex: *Ficus carica* (2 slides).
France: Corsica, Ile Rousse, 4.vii.1980, (J.H. Martin 3028), ex: *Ficus ?carica*, 47/80.
A. lonicerae Walker
England: London, New Cross, 21.x.1968, (J.M. Palmer), ex: *Lonicera serotina*, 5/69 (3 slides).
England: Notts., Radcliffe -on- Trent, 4.x.1980, (J.H. Martin 3108), ex: *Lonicera periclymenum*, 50/80.
England: Notts., Radcliffe -on- Trent, 18.ix.1982, (J.H. Martin 3448), ex: *Mentha* sp., 57/82.
Austria: Ossiach, 14.viii.1966, (V.F. Eastop), ex: *Aegopodium podograria.*
A. proletella (Linnaeus)
Angola: C.E. Cavaco, 7.xii.1970, (P. Carvalho), ex: *Brassica oleracea*, 17616/1571 (2 slides).
Austria: Ossiach, 6.viii.1966, (V.F. Eastop), ex: *Chelidonium* sp. (2 slides).
England: Kent, Dunton Green, 30.ix.1969, (W.R. Dolling), ex: *Aegopodium podograria*, 3/80 (2 slides).
Tenerife: Canary Islands, La Matanza de Acentejo, 20.v.1997, (J.H. Martin 7058), ex: *Lactuca serriola.*
Malta: Gozo Island, Xlendi, gariugue habitat, valley side, 16.iii.1994, (G.W. Watson 90), ex: *Reichardia picroides.*
A. pruinosus Bemis
Type material: USA: Colorado, Boulder, pre 1912, (T.D.A. Kockerell), ex: indet., 96/61, B.M. 1912-49.
USA: California, San Diego, 24.x.1966, (J. Kenyon), ex: *Heteromeles arbutifolia*, 8/12 (2 slides).
USA: California, Riverside, 11.ii.1957, (M. Frost), ex: *Photinia arbutifolia.*
A. singularis Danzig
Paratype, USSR: Georgia, Marneul District, 1962, (T. Chavchanidze), ex: *Euphorbia* sp., 4/66, B.M. 1966-67 (4 slides).

31. *Aleyrodiella* Danzig

A. lamellifera Danzig
Paratypes, USSR: Vladivostock, Okeanskaya, 31.viii.1961, (E.M. Danzig), ex: *Ulmus laciniata.*

32. *Apobemisia* Takahashi

A. kuwanai (Takahashi)
Japan: Amani, Oshima, 6.iv.1960, (R. Takahashi), ex: *Ficus pumila*, 87/62, B.M. 1962-401 (3 slides).

33. *Arachnaleyrodes* Bink-Moenen

A. insignis Bink-Moenen

Paratypes, Chad: Bebedjia, 395 m, 27.vi.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Combretum hypopilinum*, B.M. 1976-56 (2 slides).
Paratypes, Chad: Baïbokoum, 700 m, 9.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Combretum glutinosum*, B.M. 1976-56.

34. *Asialeyrides* Corbett

A. lushanensis Ko
Paratypes, Taiwan: Lushanwenchuan, 6.ix.1986, (C.C. Ko), ex: *Syzygium buxifolium*, B.M. 1987-197 (2 slides).
A. maesae (Takahashi)
Taiwan: Hapan, 11.i.1987, (C.C. Ko), ex: indet., B.M. 1987-197.

35. *Asterobemisia* Trehan

A. carpini (Koch)
England: Herts., near Barford, 18.iv.1936, (C.B. Williams), ex: Hornbeam, 133/60, B.M. 1960-483 (2 slides).
England: Herts., Harpenden, Bluebell Wood, 16.x.1935, (C.B. Williams), ex: Hornbeam, 94/61, B.M. 1969-483 (2 slides).
A. dentata Danzig
Turkmenistan: Kapem, Dag, 10.x.1988, ex: *Rhamnus* sp.
A. obenbergeri (Zahradnik)
Paratype, Czechoslovakia: Mohelno, Moravia Occid., 29.ix.1954, ex: *Thymus* sp.
Paratypes, Czechoslovakia: Mohelno, 30.viii.1957, (J. Zahradnik), ex: *Thymus* sp., B.M. 1969-370.

36. *Asterochiton* Maskell

A. cordiae David & Subramaniam
Paratype, India: Madras, 19.vii.1971, (B.V. David), ex: *Cordia myxa*, B.M. 1972-24.
A. pittospori Dumbleton
New Zealand: Auckland, i.1979, (L.A. Mound 1346), ex: *Pittosporum eugenioides* (2 slides).

37. *Bellitudo* Russell

B. jamaicae Russell
Paratype, Jamaica: Holly Mount, 25–27.v.1904, (W.R. Maxon), ex: *Coccoloba longiflora*, B.M. 1998-131.
West Indies: Jamaica, La Rozelle, Morant Bay, 16.iv.1969, (K. Heinze 12), ex: *Coccoloba unifera*.
Jamaica: La Rozelle, 23.x.1969, (K. Heinze), ex: *Coccoloba unifera*, B.M. 1998-131.
B. hispaniolae Russell
Haiti: Port-au-Prince, 28.v.1930, (H.L. Dozier), ex: *Coccoloba unifera*, B.M. 1998-131.

38. *Bemisaleyrodes* Cohic

B. brideliae Bink-Moenen

Paratypes, Chad: Boro, 450 m, 6.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Bridelia ferruginea*, B.M. 1976-56 (3 slides).
B. pauliani Cohic
Paratype, Nigeria: Ibadan, 29.x.1960, (F.A. Squire), ex: *Ficus* sp.
Paratype, Cameroon: Bamenda, 2.xi.1957, (V.F. Eastop), ex: *Ficus* sp.

39. *Bemisia* Quaintance & Baker

B. afer (Priesner & Hosny)
Israel: Slopes of Wadi Keren, after Zuriel, Upper Galilee, 15.x.1968, (D. Gerling 132), ex: *Smilax aspersa*, B.M. 1969-220.
Israel: Yoknean Junclion, nr Zikhron Yaekov., 15.x.1968, (D. Gerling 013), ex: *Morus* sp., B.M. 1969-220.
Pakistan: Lyallpur, 24.viii.1966, (J.I. Qureshi 102), ex: *Morus alba*, 21/66 (2 slides).
Pakistan: Lyallpur, 25.viii.1966, (J.I. Qureshi 104), ex: *Dalbergia sissoo*, 21/66.
Iraq: Mosul University, ?1977, ex: *Bauhinia* sp., No. 35, C.I.E. A.10124.
Iran: Fars, Shiraz, 28.x.1990, (M. Zarrabi 8), ex: *Rosa canina.*
B. antennata Gameel
Chad: Bebedjia, 395 m, 4.vii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Cordia africana*, B.M. 1976-56.
Sudan: Wad Medani, x.1961, (L.A. Mound), ex: *Ficus sycamora.*
Sudan: Wad Medani, xi.1961, (L.A. Mound), ex: *Ficus sycamora.*
Sudan: Wad Medani, i.1962, (L.A. Mound), ex: *Ficus sycamora*, B.M. 1963-777.
Sudan: Wad Medani, v.1962, (L.A. Mound), ex: *Ficus sycamora.*
Sudan: Wad Medani, 1962, (L.A. Mound), ex: *Ficus sycamora.*
B. berbericola (Cockerell)
USA: California, Riverside, 11.v.1961, (L.A. Mound), ex: *Photinia arbutifolia*, 86/61, B.M. 1961-369.
USA: California, Riverside, 11.v.1961, (L.A. Mound), ex: *Ceanothus arbutitifolia*, 93/61, B.M. 1961-369.
USA: California, Riverside, 11.v.1961, (L.A. Mound), ex: *Ceanothus* sp., 91/61, B.M. 1961-369 (2 slides).
B. combreticula Bink-Moenen
Holotype, Chad: Bebedjia, 395 m, 27.vii.1972, (F.A. Bink & R.M. Bink-Moenen), ex: *Anogeissus leiocarpus.*
B. formosana Takahashi
Taiwan: Chihpenwenchuan, 26.ix.1989, (I.C. Hsu), ex: *Setaria palmifolia*, B.M. 1994 (3 slides).
B. giffardi (Kotinsky)
Australia: Queensland, Koah, 19.iii.1959, (G.W. Saunders), ex: *Citrus* sp., C.I.E. 5435 1686, 40/60, B.M. 1960-240.
Australia: Adelaide, Highgate, iv.1958, (H.M. Brookes), ex: Orange, 88/58, B.M. 1965-517.
Hong Kong: NT, Sek Kong, 1.iii.1990, (J.H. Martin 5681), ex: *Citrus* sp.
Nepal: Kathmandu, 15.iv.1965, (K.C. Sharma), ex: *Citrus* sp., C.I.E. 8855.A266, B.M. 196.
Tahiti: Fada, ix.1976, (M. Monnot), ex: *Citrus aurantiifolia*, C.I.E. A.10644, 10/82.
B. gigantea Martin

Australia: Queensland, Happy Valley, 3 km W. of Babinda, 3.v.1998, (C. Burwell & C. Rodriguez), ex: *Elaeocarpus angustifolius*, B.M. 1998-51 (3 slides).

B. guieriae Bink-Moenen

Sudan: Kordofan, 100 km W. of Umm, Ruwaba, EL Obeid Road, 18.iv.1981, (J.H. Martin 3296), ex: *Guiera senegalensis* (2 slides).

B. hirta Bink-Moenen

Sudan: N. Darfur, EL Fasher, 25.iv.1981, (J.H. Martin 3329), ex: *Boscia senegalensis*.

Sudan: Kassala Prov., Jebel Kassala, 6.iv.1981, (J.H. Martin 3258), ex: *Boscia senegalensis*.

Sudan: Kordofan, 20 km W. of EL Obeid, 18.iv.1981, (J.H. Martin 3300), ex: *Boscia senegalensis*.

B. lauracea Martin et al.

Paratypes, Madeira: Faja da Noguiera, 28.iii.1995, (J.H. Martin & A.F. Aguiar, JHM 6553), ex: *Ocotea foetens* (2 slides).

Paratypes, Madeira: cliffs above Seixal, 200–300 m, 29.iii.1995, (J.H. Martin & A.F. Aguiar, JHM 6556), ex: *Laurus azorica* (2 slides).

Paratype, Madeira: Fanal, 1150 m. N. E. of Rabacal, 30.iii.1995, (J.H. Martin & A.F. Aguiar, JHM 6574), ex: *Laurus azorica*.

Paratypes, Madeira: Fanal, 1150 m. N. E. of Rabacal, 30.iii.1995, (J.H. Martin & A.F. Aguiar, JHM 6575), ex: *Ocotea foetens*.

B. mesasiatica Danzig

Paratype, Tadjikistan, 15.vi.1964, (E. Danzig), ex: *Exochorda alberti*.

B. pongamiae Takahashi

West Malaysia: Pahang Prov., Tioman I., Kampung Tekek, 16.iii.1984, (J.H. Martin 4272), ex: ?Leguminosae (2 slides).

Philippine Islands: Palawan, st. paul N. P., Sabang H. Q., 24.i.1988, (J.H. Martin 5163), ex: strand legume vine, B.M. 1988-2.

Philippine Islands: Palawan, Puerto Princesa, White Beach, 27.i.1988, (J.H. Martin 5177), ex: strand Leguminosae shrub, B.M. 1988-2.

Taiwan: Taipei, 6.ix.1985, (C.C. Ko), ex: *Pongamia pinnata*.

B. silvatica Danzig

Paratypes, USSR: Alekseyevka, Lazarevskaya, District, 11.viii.1960, (E.M. Danzig), ex: *Rhododendron flavum*.

B. subdecipiens Martin

Paratypes, Australia: Kangaroo Island, Flinders Chase N. P., 17.ii.1990, (J.H. Martin 5652), ex: *Melaleuca* sp., B.M. 1998-50 (2 slides).

B. tabaci (Gennadius)

Jordan: 1977, (K. Makkouk 21), ex: *Solanum lycopersicon*, 105/84 (2 slides).

Kuwait: Al-Jabriyah, 10.i.1977, (W. Al-Houty), ex: *Solanum melongena*, 6/77 (2 slides).

Greece: N. Evia, Isteia, viii.1982, (A. Kourmadas), ex: *Hibiscus esculentus*, 34/82.

Iran: Gorgan, Ghalandar Mahaleh, 1.xi.1986, ex: Cotton, C.I.E. A18482 (2 slides).

Iran: Gorgan, ?.xi.1986, ex: Cotton, C.I.E. A18482.

Iran: Khuzistan, Ramin, 2.iii.1978, (V.F. Eastop 15893), ex: Euphorbiaceae, 129/81.

Iran: Khuzistan, Ahvaz, 6.ii.1978, (V.F. Eastop 15787), ex: *Malva* sp. or ?*Hibiscus* sp., 120/81.

Iraq: Haidei, 21.vi.1961, ex: Cotton, C.I.E. 6384-18046, B.M. 1962-3 (2 slides).

B. tuberculata Bondar

Paraguay: iv.1995, (Romero), ex: *Manihot esculenta*, P95-042 (2 slides).

Colombia: Ciat, Valle Palmira, viii.1997, (M. Pilar Hernandez), ex: *Yuca* sp.

40. ***Bemisiella*** **Danzig**

B. artemisiae Danzig
Paratypes, Russia: Voronezh, 3.viii.1999, (J. Yavrilov) ex: *Artemisia vulgaris*, BMNH (E) 2000-64.

41. ***Brazzaleyrodes*** **Cohic**

B. eriococciformis Cohic
Belgian Congo: Yang-Steui, 13.xii.1936, (J. Ghesquière 3472), ex: *Cynometra hankei.*

42. ***Bulgarialeurodes*** **Corbett**

B. cotesii (Maskell)
Syntypes, Bulgaria: 30.viii.1930, (Dr P. Tchorbadjiev), ex: *Rosa damascena*, B.M. 1935-284.
Iran: Fars, Shiraz, 28.x.1990, (M. Zarrabi 8), ex: *Rosa canina.*

43. ***Calluneyrodes*** **Zahradnik**

C. callunae (Ossiannilsson)
?Syntype, Sweden: Södermanland, Nacka Erstavik, 27.x.1946, (Ossiannilsson).

44. ***Chitonaleyrodes*** **Martin**

C. canberrensis Martin
Paratype, Australia: Canberra, A.C.T., viii.1968, (L.A. Mound), ex: *Callistemon* sp., 34/71 (4 slides).
Paratypes, Australia: Canberra, A.C.T., i.1968, (L.A. Mound), ex: *Callistemon* sp., 33/71 (2 slides).

45. ***Cockerelliella*** **Sundararaj & David**

C. curcumae (Corbett)
West Malaysia: Pahang Prov., Taman Negara, Kuala Tahan, 4.iii.1984, (J.H. Martin 4220), ex: Musaceae (2 slides).
West Malaysia: Pahang Prov., Taman Negara, Kuala Tahan, 2.iii.1984, (J.H. Martin 4191), ex: Zingiberaceae.
West Malaysia: Cameron Highlands, nr Ringlet, ~1000 m, 14.ii.1985, (J.H. Martin 4489), ex: Zingiberaceae.
West Malaysia: Genting Highlands, ~3000′, 10.ii.1985, (J.H. Martin 4445), ex: Zingiberaceae.
C. psidii (Corbett)
Singapore: Bukit Timah, Forest Reserve, 13.v.2000, (J.H. Martin 7465), ex: indet.
Papua New Guinea: Morobe Prov. coast, Buso, 9.x.1979, (J.H. Martin 2681), ex: *Premna* sp. (2 slides).
Papua New Guinea: Morobe Prov. coast, Buso, 3.x.1979, (J.H. Martin 2655), ex: *Myrtella* sp.

Papua New Guinea: Morobe Prov. coast, Buso, 12.x.1979, (J.H. Martin 2687), ex: *Anisoptera thurifera* (2 slides).
Papua New Guinea: Morobe Prov. coast, Lasanga Island, 7.xi.1979, (J.H. Martin 2817), ex: indet. tree (2 slides).

46. *Cohicaleyrodes* Bink-Moenen

C. alternans (Cohic)
?Paratype, Congo: Brazzaville, 17.iv.1964, (F. Cohic), ex: Papilionaceae, B.M. 1965-305.
Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 13.x.1989, (L.D.C. Fishpool 17), ex: *Terminalia ivorensis*.
C. crossopterygis Bink-Moenen
Paratypes, Chad: Boro, 453 m, 6.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Crossopteryx febrifuga*.
C. obscura Bink-Moenen
Holotype, Chad: Timberi, 29.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Tarenna* sp.
C. platysepali (Cohic)
Paratype, Congo: Brazzaville, 16.iv.1965, (F. Cohic), ex: *Platysepalum vanderystii*, B.M. 1965-305.
C. quadrilongispinae Bink-Moenen
Paratypes, Chad: Bebedjia, 395 m, 23.vii.1972, (F.A. Bink & R.M. Bink-Moenen), ex: *Cissus* sp.
Paratype, Chad: Bebedjia, 395 m, 25.x.1972, (F.A. Bink & R.M. Bink-Moenen), ex: *Cissus* sp.
Paratypes, Chad: Doba, 21.vi.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Paullinia pinnata*.
C. recurvispina (Cohic)
Syntype, Congo: Brazzaville, 21.iii.1964, (F. Cohic), ex: *Tetracera alnifolia*, B.M. 1965-305.
Chad: Doba, 27.xii.1972, (F.A. Bink & R.M. Bink-Moenen), ex: *Hexalobus monopetalus*, B.M. 1973-226.

47. *Combesaleyrodes* Cohic

C. bouqueti Cohic
Syntype, Congo: Brazzaville, 25.ii.1965, (F. Cohic), ex: *Colletoecema dewevrei*, B.M. 1965-305.
C. tauffliebi Cohic
Syntype, Congo: Brazzaville, 25.ii.1965, (F. Cohic), ex: *Urophyllum hirtellum*, B.M. 1965-305.

48. *Corbettia* Dozier

C. baphiae Russell
Kenya: Matuga, 4.ix.1982, (I. Robertson 3361), ex: *Cassia* sp., 54/82 (2 slides).
Malawi: Bunda, Lilongwe, 17.xi.1995, (Y. Tembo), ex: *Sesbania sesban*.
C. bauhiniae Cohic

Sudan: Bahr el Ghazal Prov., N. of Aweil, 9.v.1981, (J.H. Martin 3387), ex: *Piliostigma* sp. (2 slides).

Sudan: S. Darfur, Kas-Nyala Road, 1.v.1981, (J.H. Martin 3368), ex: *Bauhinia*|*Piliostigma* sp. (2 slides).

C. graminis Mound

Paratypes, Nigeria: Onitsha, 13.i.1957, (V.F. Eastop 6544), ex: Gramineae (3 slides).

C. isoberliniae Bink-Moenen

Paratypes, Chad: Boro, 453 m, 6.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Isoberlinia doka*, B.M. 1976-56 (2 slides).

C. lonchocarpi Bink-Moenen

Paratypes, Chad: Boro, 450 m, 6.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Lonchocarpus laxiflorus*, B.M. 1976-56 (2 slides).

C. millettiacola Dozier

Paralectotype, Belgian Congo: Sankuru, Kole, 22.i.1928, (J. Ghesquière), ex: *Millettia versicolor*, B.M. 1933.

Nigeria: Ibadan, Moor Plantation, 10.v.1956, (V.F. Eastop 5929), ex: *Lonchocarpus sericeus*.

Nigeria: Olokomeji, (V.F. Eastop 5942), ex: *Mucuna* sp.

Chad: Bebedjia, 395 m, 30.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Swartzia madagascariensis*, B.M. 1976-65 (2 slides).

C. tamarindi Takahashi

Chad: Bebedjia, 395 m, 19.ix.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Tamarindus indicus*, B.M. 1976-56 (2 slides).

49. *Crenidorsum* Russell

C. aroidephagus Martin & Aguiar

Paratypes, Costa Rica: San José, 22.i.1983, (J.H. Martin 3648), ex: ?*Philodendron* (2 slides).

Paratypes, Madeira: Funchal, 16.iii.1999, (A. Aguiar C873), ex: *Epipremnum aureus* (2 slides).

Paratypes, Germany: Berlin, Botanic Gardens, iii.2001, (P. Baufeld), ex: *Philodendron gloriosum* (2 slides).

Paratype, USA: Hawaii, Foster Botanical Gardens, 10.iv.2001, (B. Kumashiro & J. Dooley), ex: Aroid. B.M.N.H. (E) 2001-140.

C. celebes Martin

Paratypes, Indonesia: Sulawesi Utara, Dumoga-Bone N.P., Clark's camp area, 18.iv.1985, (J.H. Martin 4881), ex: ?Proteaceae (cf. *Helicia* sp.) (4 slides).

Paratype, Indonesia: Sulawesi Utara, Dumoga-Bone N.P., Clark's camp area, 12.v.1985, (J.H. Martin 4940), ex: ?Sapotaceae.

Paratypes, Indonesia: Sulawesi Utara, lakeside, Danau Mooat, Gunung Muajat, 22.iii.1985, (J.H. Martin 4720), ex: *Persea americana*.

Paratypes, Indonesia: Sulawesi Utara, Dumoga-Bone N.P., Clark's camp area, 15.iv.1985, (J.H. Martin 4846), ex: *Weinmannia* sp.

C. commune Russell

Paratype, Bahamas: Harbour Island, 18.ii.-4.iii.1907, (E.G. Britton), ex: *Coccoloba laurifolia*, B.M. 1998-131.

Paratypes, Navassa Island: 6.i.1930, (H. Rehder), ex: *Coccoloba laurifolia*, B.M. 1998-131.

C. lasangensis Martin

Paratypes, Papua New Guinea: Morobe Province coast, Lasanga Island, 18.ix.1979, (J.H. Martin 2586), ex: *Musa* sp. (2 slides).

C. magnisetae Russell

Paratype, Haiti: Massif, Port Margot, (E.L. Ekman), ex: *Coccoloba retusa*, B.M. 1998-131.

Haiti: Morne-d-Cabrits, 19.xii.1930, (H.L. Dozier), ex: *Bunchosia* sp., B.M. 1998-131.

C. malpighiae Russell

Puerto Rico: Guajataca, Gorge, 13.iii.1952, (Martorell & L.M. Russell), ex: *Torrubia fragans*, B.M. 1998-131.

C. micheliae (Takahashi)

Hong Kong: NT, Tai Po Kau, headland forest, 21.xi.1999, (J.H. Martin 7247), ex: *Embelia laeta* (2 slides).

C. millennium Martin

Holotype, Australia: Northern Territory, Kakadu Nat. Park, Gubara Walk, Burdulba Creek, 20 km S. of Jabiru, 22.xii.1996, (J.H. Martin 6954), ex: *Xanthostemon eucalyptoides*.

C. morobensis Martin

Paratypes, Papua New Guinea: Morobe Province coast, Buso, 3.x.1979, (J.H. Martin 2655), ex: *Myrtella* sp. (3 slides).

Paratype, Papua New Guinea: Morobe Province coast, Buso riverbank, 11.ix.1979, (J.H. Martin 2531), ex: ?*Decaspermum* sp.

Paratype, Papua New Guinea: Morobe Province coast, Buso riverbank, 12.ix.1979, (J.H. Martin 2547), ex: indet.

C. stigmaphylli Russell

Paratypes, Cuba: Hanabanilla Falls, near Cumanayagua, Santa Clara, 7.iv.1925, (J.G. Myers Q.Z. 3388), ex: *Stigmaphyllon sagraeanum*, B.M. 1998-131.

Puerto Rico: El Asomante Rd, 21.iii.1952, (Martorell & L.M. Russell), ex: *Stigmaphyllon tomentosum*, B.M. 1998-131.

C. tuberculatum Russell

Paratype, Puerto Rico: West of Ponce, 26.x.1902, (A.A. Heller), ex: *Coccoloba obtusifolia*, B.M. 1998-131.

Puerto Rico: Central Aguirre, 25.vi.1925, (H.L. Dozier), ex: *Cordia* sp.

50. *Crescentaleyrodes* David & Jesudasan

C. paulianae (Cohic)

Ivory Coast: Lamto, 25.xi.1988, (J.S. Noyes), ex: *Sorghastrum bipennatum* (3 slides).

C. semilunaris (Corbett)

Syntypes, Ceylon: Colombo, xi.1903, (E.E. Green), ex: *Cymbopogon* sp., 232/61, B.M. 1927-451 (4 slides).

India: Vellayani, (via New Delhi), 5.viii.1985, ex: *Cymbopogon flexuosus*, C.I.E. A.17357, 25/85.

India: Burliar, 20.vi.1985, (B.V. David), ex: *Cymbopogon* sp. (2 slides).

Brunei: Borneo, Penanjong, 3.iii.1989, (J.H. Martin 5432), ex: Coastal grass, B.M. 1989-89.

51. *Cryptolingula* Martin & Carver

C. perplexa Martin & Carver

Paratypes, Australia: S.A., Black Hill, 14.ix.1952, (D.E. Symon), ex: indet., (4 slides).

52. *Dialeurodes* Cockerell

D. agalmae Takahashi
Hong Kong: Lantau Island, Po Lin, Monastery – Tung Chung path, 26.xi.1999, (J.H. Martin 7300), ex: *Schefflera octophylla* (2 slides).
D. ara Corbett
Singapore: Napier, Cluny Rds, 29.xii.1996, Botanic Gardens, (J.H. Martin 6991), ex: *Calophyllum* sp. (2 slides).
D. armatus David & Subramaniam
Paratypes, India: Coimbatore, 5.xi.1966, (B.V. David), ex: *Azadirachta indica*, B.M. 1972-24.
D. bicornicauda Martin
Paratypes, Australia: Queensland, 2 km north of Cape Tribulation, 14.xii.1996, (J.H. Martin 6881), ex: *Dysoxylum parasiticum* (2 slides).
D. cerifera Quaintance & Baker
?Syntypes, South Africa: Am. Bur. Ent. Coll., B.M. 1921-35, (6 slides).
D. cinnamomi Takahashi
Taiwan: Shihmen, 23.i.1987, (C.C. Ker), ex: indet., B.M. 1987-197.
D. citri (Ashmead)
USSR: Truziya, Batumi, 23.viii.1960, (E.M. Danzig), ex: *Citrus* sp., B.M. 1963-708.
Turkey: Adana, 1976, ex: *Citrus* sp., C.I.E. A.9030, 8/77.
USA: Florida, Nursery at Enfield, Middlesex, 19.xi.1974, ex: *Citrus mitis*.
Greece: Corfu, (Olive Inst.), vii.1979, (S. Pappas), ex: indet., 13/80.
Algeria: Boufarik, 14.xi.1978, (F.D. Bennett), ex: *Citrus* sp., C.I.E. A.10842.
Italy: Vicenza, Po Valley, x.1993, ex: *Ligustrum* sp., I.I.E. 22957.
Taiwan: Meifeng, 9.vi.1986, (C.C. Ker), ex: *Prunus phaeosticta*, B.M. 1987-197.
Taiwan: Wuling, 10.xi.1986, (C.C. Ker), ex: *Eriobotrya deflexa*, B.M. 1987-197.
D. cyathispinifera Corbett
?Syntype, Malaya: Kuala Lumpur, 11.iii.1929, (G.H. Corbett), ex: indet., B.M. 1932-511.
D. decaspermi Martin
Paratypes, Papua New Guinea: Morobe Province coast, Buso, 10.ix.1979, (J.H. Martin 2528), ex: *Decaspermum* sp., (4 slides).
Paratypes, Papua New Guinea: Morobe Province coast, Buso riverbank, 16.x.1979, (J.H. Martin 2713), ex: *Decaspermum* sp.
Paratypes, Papua New Guinea: Morobe Province coast, Buso riverbank, 13.x.1979, (J.H. Martin 2690), ex: ?*Decaspermum* sp.
Paratypes, Papua New Guinea: Morobe Province coast, Buso riverbank, 23.x.1979, (J.H. Martin 2755), ex: *Decaspermum* sp.
D. dubia Corbett
West Malaysia: Pahang Prov., Taman Negara, Tembeling path, 12.iii.1984, (J.H. Martin 4263), ex: indet. (3 slides).
D. emarginata (Mound)
Holotype, Nigeria: Olokomeji, near Ibadan, iii.1961, (E.A. James), ex: *Cola cordifolia*.
Paratypes, Nigeria: Olokomeji, near Ibadan, iii.1961, (E.A. James), ex: *Cola cordifolia* (2 slides).
D. erythrinae Corbett
Indonesia: Java, Jogjakarta, Hotel Santika, 14.i.2001. (P. De Barro), ex: indet. (2 slides).
D. ixorae Singh
?Syntypes, India: Madras, (Y. Ram Chandra Rao), ex: *Ixora coccinea* (2 slides).

?Syntypes, India: Chepauk, Madras, 10.viii.1907, (E. Ballard), ex: *Ixora coccinea*, B.M. 1916-75.
Denmark: import fm. Sri Lanka, 1994, Ministry of Agriculture, Sample no. 1057/94, ex: *Ixora odorata*, I.I.E. 23154.
D. joholensis Corbett
West Malaysia: Pahang Prov., Taman Negara, Tembeling path, 12.iii.1984, (J.H. Martin 4261), ex: indet. (3 slides).
D. kirkaldyi (Kotinsky)
Paralectotypes, Hawaii: Honolulu, Hawaiian Sugar Planters Experimental Station, 22.viii.1906, (J. Kotinsky/Quaintance collection Q.4107), ex: Jessamine, B.M. 1998-131 (2 slides).
Malaya: Kuala Lumpur, 16.x.1973, (L.A. Mound), ex: *Pittosporum ferrugineum*, 68/84.
Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 20.ix.1989, (L.D.C. Fishpool), ex: *Clerodendron* sp.
Cyperus: ex: *Jasminum sambac*.
D. lanceolata Takahashi
Singapore: Botanic Gardens, 15.ix.1980, (D.H. Murphy), ex: *Bhesa panicula*, 14/85 (2 slides).
D. minahassai Martin
Paratypes, Indonesia: Sulawesi Utara, Gunung Mogogonipa, 13.vi.1985, (J.H. Martin 5025), ex: *Eugenia caryophyllata* (2 slides).
Paratypes, Indonesia: Sulawesi Utara, Gunung Mogogonipa, 8.iv.1985, (J.H. Martin 4806), ex: *Eugenia caryophyllata*.
D. mirabilis Takahashi
Hong Kong: NT, Tai Lung Farm, Sheung Shui, 13.xii.2001, (J.H. Martin 7539A), ex: *Aporusa dioica*.
D. platicus Bondar
Brazil: Bahia, 7.xii.1923, (G. Bondar), ex: Myrtaceae, B.M. 1924-44.

53. *Dialeurolobus* Danzig

D. rhamni Bink-Moenen
Paratypes, Israel: 1 km S. Solomon's pools, Judaean Hills, 18.ix.1968, (D. Gerling), ex: *Rhamnus* sp. (2 slides).
Iran: Fars, Farashband, 22.x.1990, (M. Zarrabi 19), ex: *Punica granatum* (2 slides).
Turkey: Iskenderun, 15.xii.1986, (via N. Hygun 3), ex: *Punica granatum*.

54. *Dialeurolonga* Dozier

D. africana (Newstead)
Syntypes, Nigeria: Ibadan, Moor Plantation, v.1917, (C.O. Farquharson), ex: *Salacia* sp. (4 slides).
D. communis Bink-Moenen
Holotype, Chad: Bebedjia, 395 m, 26.xii.1972, (F.A. Bink & R.M. Bink-Moenen), ex: *Allophylus africanus*, B.M. 1976-56.
Paratype, Chad: Bebedjia, 395 m, 26.xii.1972, (F.A. Bink & R.M. Bink-Moenen), ex: *Allophylus africanus*, B.M. 1976-56.

Paratype, Chad: Baïbokoum, 500 m, 19.xi.1972, (F.A. Bink & R.M. Bink-Moenen), ex: *Citrus* sp., B.M. 1976-56.

Sudan: Wad Medani, xi.1961, (L.A. Mound), ex: *Citrus* sp., B.M. 1963-777 (2 slides).

D. elliptica Takahashi

Madagascar: Ihosy, v.1951, (R. Takahashi), ex: *Plumeria* sp., 104/62, B.M. 1962-401 (3 slides).

D. elongata Dozier

Syntypes, India: Punjab, 29.iii.1926, (M.A. Husain), ex: *Citrus* sp., I.B.E. 309 (2 slides).

Syntypes, India: Punjab, ?1928, (M.A. Husain), ex: *Citrus* sp., I.B.E. 309, 46/61, cf. B.M. 1928-181 (2 slides).

Syntypes, India: Punjab, (M.A. Husain), ex: *Citrus* sp., I.B.E. 309, B.M. 1928-181.

India: Maharashtra, Akola, 10.i.1985, ex: *Citrus* sp., C.I.E. A.17113 (2 slides).

D. hoyti Mound

Holotype+paratype, Nigeria: Agege, near Lagos, xi.1959, (C.P. Hoyt), ex: Coffee.

Paratypes, Nigeria: Agege, near Lagos, xi.1959, (C.P. Hoyt), ex: ?Coffee, (4 slides).

Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 22.xi.1989, (L.D.C. Fishpool 81), ex: *Trichilia heudelotii.*

D. maculata (Singh)

Patatypes, India: Madras, 3.viii.1971, (B.V. David), ex: *Ficus religiosa*, B.M. 1972-24.

D. nemoralis Bink-Moenen

Holotype, Chad: Bentam (Donia), 451 m, 29.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Hexalobus monopetalus*, B.M. 1976-56.

Paratype, Chad: Bentam (Donia), 451 m, 29.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Hexalobus monopetalus*, B.M. 1976-56.

D. phyllarthronis Takahashi

Madagascar: Antsirabé, vii.1955, (R. Paulian), ex: Cerisier du Brésil, 106/62, B.M. 1962-401 (3 slides).

D. ravensarae Takahashi & Mamet

Syntypes, Madagascar: Besanatrihely, Haut Sambirano, 1000 m, x. 1949, (R. Paulian), ex: *Ravensara* sp.

D. rusostigmoides Martin

Paratypes, Australia: Queensland, Cooper's Creek, 20 km S. of Cape Tribulation, 18.xii.1996, (J.H. Martin 6915), ex: indet., B.M. 1998-50 (2 slides).

D. swainei Martin

Paratypes, Australia: Queensland, Broadbeach, viii–ix.1970, (G. Swaine), ex: *Ficus* sp., 16/71, (6 slides).

D. tenella Takahashi

Syntypes, Madagascar: Ambilobé, iv.1951, (R. Paulian), ex: Barabanja, 103/62, B.M. 1962-401 (2 slides).

Syntype, Madagascar: Ambilobé, iv.1951, (R. Paulian), ex: Barabanja.

D. trialeuroides Takahashi & Mamet

Syntypes, Madagascar: Antsohihy, x.1949, (R. Paulian), ex: indet.

55. *Dialeuropora* Quaintance & Baker

D. brideliae (Takahashi)

Taiwan: Keelung, 28.vi.1990, (C.C. Ko), ex: indet., B.M. 1994 (2 slides).

Taiwan: Hungyeh, 26.ii.1990, (C.C. Ko), ex: indet.

D. decempuncta (Quaintance & Baker)

Paralectotypes, Sri Lanka: Royal Botanic Gardens, 7.x.1910, (R.S. Woglum/Quaintance collection Q. 6729A), ex: *Cinnamomum* sp., B.M. 1998-131 (3 slides).

Hong Kong: NT, East Ping Chau I, 5.xii.2001, (J.H. Martin 7528), ex: *Celtis* sp.

Hong Kong: Lantau Island, hillside E. of Shek Pik Reservoir, 15.xi.1996, (J.H. Martin 6820), ex: *Glochidion eriocarpum*.

Hong Kong: Victoria Peak, Harlech Road, 22.x.1990, (J.H. Martin 5826), ex: *Litsea glutinosa*.

West Malaysia: Pahang Prov., Taman Negara, Kuala Tahan, 11.iii.1984, (J.H. Martin 4259), ex: *Flemingia macrophylla* (2 slides).

Australia: WA, Kununurra, 5.v.2000, (J.H. Martin 7430), ex: *Eucalyptus grandifolia*.

D. mangiferae (Corbett)

West Malaysia: Pahang Prov., Genting Highlands at 2000′, 24.iii.1984, (J.H. Martin 4314), ex: *Mangifera indica*.

D. papillata Cohic

Syntype, Congo: Brazzaville, 5.iii.1965, (F. Cohic), ex: *Platysepalum vanderystii*, B.M. 1965-305.

Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 5.x.1989, (L.D.C. Fishpool 8), ex: *Microdesmis puberula*.

Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 17.xi.1989, (L.D.C. Fishpool 79), ex: *Smeathmannia pubescens*.

Sudan: S. Darfur, Jebel Marra, S. W. side, Wadi Golol, 28.iv.1981, (J.H. Martin 3348), ex: *Ficus ?capensis*.

Sudan: S. Darfur, Jebel Marra, S. W. side, Wadi Golol, 30.iv.1981, (J.H. Martin 3358), ex: *Syzygium guineense* (2 slides).

Cameroon: Mbalmayo, viii.2000, (A. Polaszek), ex: *Musa* sp. (2 slides).

D. silvarum (Corbett)

West Malaysia: Pahang Prov., Tioman I., Kampung Tekek, 16.iii.1984, (J.H. Martin 4276), ex: ?Leguminosae (3 slides).

D. viburni (Takahashi)

Taiwan, Nanjenshan, 24.ii.1990, (C.C. Ko), ex: indet.

Taiwan, Nanjenshan, 24.ii.1990, (C.C. Ko), ex: indet., B.M. 1994.

Taiwan, Loloshan, 13.ii.1987, (C.C. Ko), ex: *Turpinia formosana*, B.M. 1994.

56. ***Disiphon*** **Russell**

Disiphon sp.

Belize: Cayo, Chiquibul forest, Las Cuevas plots, 6.xi.1994, (J.H. Martin 6462), ex: *Piper* sp. (2 slides).

Belize: Cayo, Chiquibul forest, Grano de Oro track, 22.xi.1994, (J.H. Martin 6506), ex: ?Laurel.

57. ***Dumbletoniella*** **Jesudasan & David**

D. callistemoni Martin

Paratypes, Australia: A.C.T., Canberra, Black Mountain, Nat. Botanic Gardens, 27.xi.1996, (J.H. Martin 6833), ex: *Callistemon shiresii*, B.M. 1998-50 (2 slides).

Paratypes, Australia: A.C.T., Canberra, Black Mountain, Nat. Botanic Gardens, 27.xi.1996, (J.H. Martin 6833), ex: *Callistemon* sp., B.M. 1998-50.
Australia: New South Wales, Univ. W. Sydney, Hawkesbury – Richmond campus, 15.iv.2000, (J.H. Martin 7387), ex: *Callistemon* sp. (2 slides).
D. eucalypti (Dumbleton)
Paratypes, New Zealand: Waikakaho, Blenheim, 3.xi.1950, (L.J. Dumbleton), ex: *Eucalyptus globulus* (3 slides).
New Zealand: ?Nelson, ?Waskaho, ex: *Eucalyptus globulus*, 9/65, B.M. 1964-721 (2 slides).
New Zealand: ?Nelson, ?Waskaho, ex: *Eucalyptus globulus*, B.M. 1964-721.
New Zealand: ?Nelson, ex: *Eucalyptus globulus*, 9/65, B.M. 1964-721.
D. pittospori Martin & Carver
Paratypes, Australia: Victoria, Mallee, 1925, (J.E. Dixon), ex: *Pittosporum phylliraeoides*, 32/61, B.M. 1961-4 (3 slides).
Paratypes, Australia: Adelaide, Waite Hill, 23.xi.1967, (L.A. Mound), ex: *Pittosporum phylliraeoides*, 36/71 (3 slides).
D. rotunda Martin & Carver
Paratypes, Australia: Vic, Indigo, 17.ix.1914, (E.E. Pescott), ex: *Eucalyptus leucoxylon*.
Paratypes, Australia: Queensland, Barakula, 5.x.1939, ex: *Eucalyptus crebra* (4 slides).
Paratypes, Australia: Western Australia, Perth, King's Park, 4.iii.1959, (V.F. Eastop 7362), ex: *Banksia* sp. (?*Dryandra* sp.), 149/61, B.M. 1960-144. (In the original description ex: *Eucalyptus* sp.).
D. xanthorrhoeae Martin
Paratypes, Australia: S.A., Kangaroo Island, Flinders Chase N. P., 17.ii.1990, (J.H. Martin 5657), ex: *Xanthorrhoea australis*, B.M. 1998-50, (5 slides).

58. ***Extensaleyrodes*** **Bink-Moenen**

E. akureensis (Mound)
Holotype, Nigeria: Akure, 8.i.1957, (V.F. Eastop 6511), ex: indet., 65/61.
Paratypes, Nigeria: Akure, 8.i.1957, (V.F. Eastop 6511), ex: indet., 65/61 (2 slides).
E. falcata Bink-Moenen
Holotype, Chad: Boro, 453 m, 6.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Isoberlinia doka*, B.M. 1976-56.
Paratypes, Chad: Boro, 453 m, 6.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Isoberlinia doka*, B.M. 1976-56 (2 slides).

59. ***Fascaleyrodes*** **Bink-Moenen**

F. palmae (Gameel)
Nigeria: Moor Plantation area, iii.1961, (?L.A. Mound), ex: Palm (2 slides).
Nigeria: Moor Plantation area, iv.1961, (?L.A. Mound), ex: Palm.
F. rara Bink-Moenen
Holotype, Chad: Donia (Bentam, in the original description), 29.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Hexalobus monopetalus*.
Paratypes, Chad: Donia (Bentam, in the original description), 29.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Hexalobus monopetalus*.

60. ***Filicaleyrodes*** **Takahashi**

F. bosseri Takahashi
Syntypes, Madagascar: Tsimbazaza, Tananarive, viii.1956, (J. Bosser), ex: Fern, 114/61, B.M. 1961-455.
F. williamsi (Trehan)
Lectotype, England: Surrey, Kew Gardens, 17.ix.1937, (K.N. Trehan and/or C.B. Williams), ex: *Oleandra africana*, 207/62, B.M. 1962-643.
Type series, England: Surrey, Kew Gardens, 20.i.1937, (K.N. Trehan and/or C.B. Williams), ex: *Oleandra* sp., 207/62, B.M. 1962-643.
Type series, England: Surrey, Kew Gardens, ii.1938, ex: Ferns.

61. ***Fippataleyrodes*** **Sundararaj & David**

F. indica Sundararaj & David
Paratype, India: Cumbum, 10.i.1988, (S. Selvakumaran), ex: *Ficus racemosa.*
F. litseae ?Sundararaj & David
Paratype, India: Mahableshwar, 28.iii.1987, (B.V. David), ex: *Litsea stocksii.*

62. ***Gagudjuia*** **Martin**

G. allosyncarpiae Martin
Paratypes, Australia: Northern Territory, Kakadu Nat. Park, Gubara Walk, Burdulba Creek, 20 km S. of Jabiru, 22.xii.1996, (J.H. Martin 6955), ex: *Allosyncarpia ternata* (6 slides).

63. ***Gomenella*** **Dumbleton**

G. dryandrae (Takahashi)
Lectotype, Australia: Western Australia, Nedlands, 20.v.1940, (K.R. Norris), ex: *Dryandra floribunda*, 7/40, B.M. 1955-799.
Australia: Western Australia: Perth, King's Park, 4.iii.1959, (V.F. Eastop 7362 × 1), ex: *Banksia* sp. (or ?*Dryandra* sp.), B.M. 1960-144.
Australia: New South Wales, Cowan, 24.x.1978, (F. Wheelhouse 10), ex: *Banksia spinulosa*, C.I.E. A.12322.
USA ex-Australia: New York, 30.iii.1974, (R. Scott), ex: *Banksia hookeriana*, B.M. 1998-131.
G. multipora Dumbleton
Paratype, New Caledonia: Tinip, 4.xi.1954, (L.J. Dumbleton), ex: indet., B.M. 1964-221.

64. ***Harpaleyrodes*** **Bink-Moenen**

H. tuberculata Bink-Moenen
Paratypes, Chad: Bebedjia, 390 m, 17.vi.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Combretum hypopilinum*, B.M. 1977-471 (3 slides).

65. ***Hempelia*** **Sampson & Drews**

H. chivelensis Sampson & Drews
Syntype, Mexico: Chivela, Oaxaca, iv.1926, (G.F. Ferris), ex: indet., B.M. 1998-131.

Belize: Cayo, Chiquibul forest, Las Cuevas Res. Stn, 4.xi.1994, (J.H. Martin 6451), ex: *Persea ?americana* (3 slides).
Belize: Cayo, Chiquibul forest, Las Cuevas clearing, 10.ii.1996, (J.H. Martin 6633), ex: *Persea* sp.

66. *Heteraleyrodes* Takahashi

H. bambusicola Takahashi
Holotype, Malaya: Kuala Lumpur, 13.iii.1944, (R. Takahashi), ex: Bamboo, B.M. 1955-799.
West Malaysia: Kuala Lumpur, Lake Gardens, 11.ii.1985, (J.H. Martin 4454), ex: Bamboo.

67. *Heterobemisia* Takahashi

H. alba Takahashi
Syntype, Japan: Odaig-ahara, Nara Pref., 15.viii.1956, (R. Takahashi), ex: *Itea japonica*.

68. *Indoaleyrodes* David & Subramaniam

I. glochidioni Martin & Carver
Paratypes, Australia: Queensland, Great Keppel Island, 2.vii.1991, (J.J. Bruhl & G.N. Batianoff), ex: *Glochidion lobocarpum*, B.M. 1998-51 (2 slides).
Australia: Queensland, 50 km S. of Bowen, 20.iv.2001, (P. De Barro 76), ex: *Glochidion* sp.
I. laos (Takahashi)
Paratypes: India: Coimbatore, 25.iii.1967, (B.V. David), ex: *Morinda tinctoria*, B.M. 1972-24 (2 slides).
India: Madras, 6.i.1972, (B.V. David), ex: *Morinda tinctoria*, 3/72, (4 slides).
I. pseudoculatus Martin
Paratypes, Papua New Guinea: Morobe Province coast, Buso, 8.x.1979, (J.H. Martin 2674), ex: *Syzygium* sp. (4 slides).

69. *Kanakarajiella* David & Sundararaj

K. vulgaris (Singh)
India: Chikmugalur, Coffee Research Stn, i–ii.1969, ex: Coffee, C.I.E. A2803, 1/69 (4 slides).
Burma: Rangoon, 28.viii.1984, (T.J. Crowe), ex: *Jasminum* sp., C.I.E. A16401, 147/84 (2 slides).

70. *Leucopogonella* Dumbleton

L. pallida Dumbleton
Paratypes, New Caledonia: Plum, (L.J. Dumbleton), ex: *Leucopogon* sp., B.M. 1964- 721.
L. simila Dumbleton
Paratypes, New Caledonia: Plum, (L.J. Dumbleton), ex: *Leucopogon* sp., B.M. 1964- 721.

71. ***Lipaleyrodes*** **Takahashi**

L. atriplex (Froggatt)
Paralectotype, Australia: N.S.W. Broken hill, 25.v.1911, (W.W. Froggatt), ex: Saltbush (2 slides).
L. breyniae (Singh)
Maldives: Addu Atoll, Feydhoo, 12.xi.1993, (G.W. Watson 100), ex: *Phyllanthus distichus*, I.I.E. 22974, (4 slides).
L. crossandrae David & Subramaniam
Paratypes, India: Coimbatore, 18.xi.1966, (B.V. David), ex: *Achyranthes aspera*, B.M. 1972-24 (2 slides).
L. euphorbiae David & Subramaniam
Paratypes, India: Madurai, 28.i.1967, (B.V. David), ex: *Euphorbia prostrata*, B.M. 1972-24.
India: Hebbal, Bangalore, 20.vi.1997, (via A. Polaszek), ex: *Phyllanthus fratteranae*.
Kenya: Ganze, 30.xi.1983, (I. Robertson 9/9), ex: *Phyllanthus amarus*, 21/84 (3 slides).
L. phyllanthi Takahashi
Syntypes, Madagascar: Massif de l'Tremo, 1700 m, (J. Bosser), ex: *Phyllanthus* sp., 115/61, B.M. 1961-455.
Hong Kong: HK, Tai Tam, Interm. Reservoir, 6.xii.1999, (J.H. Martin 7311), ex: *Blumea* sp.

72. ***Malayaleyrodes*** **Corbett**

M. ?lumpurensis corbett
West Malaysia: Pahang Prov., Pulau Tioman I., Kampung Tekek, 17.ii.1985, (J.H. Martin 4509), ex: ?*Tetracera* sp.

73. ***Marginaleyrodes*** **Takahashi**

M. ixorae Takahashi
Syntypes, Madagascar: Between Mahattsinjo and Andriba, ex: *Ixora* sp., 102/62, B.M. 1962-401 (3 slides).

74. ***Massilieurodes*** **Goux**

M. americanus Jensen
USA: Maryland, Prince George's Co., Beltsville, Beaver Dam Road area, 2.vii.1998, (J.H. Martin 7108), ex: *Ilex* sp.
USA: Maryland, Prince George's Co., Beltsville, USDA campus, 3.vii.1998, (J.H. Martin 7112), ex: *Ilex* sp. (2 slides).
M. chittendeni (Laing)
Lectotype, England: Ascot, 23.v.1928, (G. Fox-Wilson), ex: *Rhododendron* sp.
Paralectotypes, England: Ascot, vi.1928, (G. Fox-Wilson), ex: *Rhododendron* sp., (4 slides).
England: Surrey, Richmond Park, 19.vi.1984, (J.H. Martin 4352), ex: *Rhododendron* sp.
England: Surrey, Richmond Park, 27.vi.1984, (J.H. Martin 4353), ex: *Rhododendron* sp.
Italy: Cermenake (Co.), vi.2000, (M. Colombo 2), I.I.E. 24199, ex: *Rhododendron* ifs, B.M. (E) 2001-110.
M. euryae (Takahashi)

Syntypes, Taiwan: Neng Kao, 6.viii.1939, (R. Takahashi), ex: *Eurya glaberrima*, B.M. 1994 (3 slides).

M. fici (Takahashi)

Taiwan: Sanhsing, 23.ix.1993, (K.C. Chou), ex: *Ficus virgata*, B.M. 1994 (2 slides).

Taiwan: Taipei, 4.x.1986, (C.C. Ker), ex: *Bischofia javanica*.

Taiwan: Taichung, 5.ix.1967, (Y.C. Chang 8), ex: *Bischofia javanica*, 20/67, B.M. 1967-592 (3 slides).

M. setiger (Goux)

France: Corsica, Solenzara, Col de Larone road, D268, 27.x.1999, (J.H. Martin 7237), ex: *Viburnum tinus*.

Italy: Campania, Portici grounds, 10.vi.1987, (A. Polaszek & S. Laudonia), ex: *Viburnum* sp., C.I.E. A19249, 4/88 (2 slides).

Italy: Portici, 9.iv.1984, (F.M. Laccarino), ex: *Viburnum tinus*, 59/84.

Morocco: Middle Atlas, Ifrane, ± 1600 m, 26.iv.1992, (J.H. Martin 6076), ex: *Viburnum tinus*, B.M. 1992-73 (2 slides).

75. ***Metabemisia*** **Takahashi**

M. filicis Mound

Paratypes, Scotland: Edinburgh, Royal Botanic Gardens, glasshouse, 27.v.1966, (L.A. Mound & B.R. Pitkin), ex: *Dryopteris* sp. (4 slides).

Paratypes, Scotland: Edinburgh, Royal Botanic Gardens, glasshouse, 31.i.1966, (E.C. Pelham-Clinton), ex: Ferns, B.M. 1966-73 (4 slides).

M. palawana Martin

Paratypes, Philippine Islands: Palawan, Irawan/Iwahig, forest, 2000′, 11.ii.1988, (J.H. Martin 5265), ex: *Lastreopsis ?subsparsa*, B.M. 1988-2 (2 slides).

76. ***Minutaleyrodes*** **Jesudasan & David**

M. minuta (Singh)

India: Madras, 11.ii.1972, (B.V. David), ex: *Ixora coccinea*, B.M. 1972-24.

Singapore: Botanic Gardens, 15.ix.1980, (D.H. Murphy), ex: *Bhesa paniculata*, 14/58.

Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 1.xi.1989, (L.D.C. Fishpool 31), ex: *Ixora* sp.

Taiwan: Fengshan, 22.xi.1993, (K.C. Chou), ex: *Ixora* sp.

M. suishanus (Takahashi)

Philippine Islands: Palawan, Honda Bay, 7.ii.1988, (J.H. Martin 5251), ex: indet., B.M. 1988-2 (2 slides).

77. ***Mixaleyrodes*** **Takahashi**

M. ?polystichi Takahashi

Taiwan: Lienhuachih, 2.v.1994, (K.C. Chou), ex: *Angiopteris lygodiifolia*, B.M. 1994 (2 slides).

78. ***Neoaleurotrachelus*** **Takahashi & Mamet**

N. bertilloni (Cohic)

Syntype, Congo: Brazzaville, 21.iii.1964, (F. Cohic), ex: *Tetracera alnifolia*, B.M. 1965-305.
Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 6.xi.1989, (L.D.C. Fishpool 40), ex: *Cryptolepis sanguinolenta.*
N. graberi (Cohic)
Sudan: S. Darfur, Jebel Marra, S. W. side, Wadi Golol, 28.iv.1981, (J.H. Martin 3348), ex: *Ficus ?capensis.*
Sudan: Khartoum, Botanic Garden, 13.iv.1981, (J.H. Martin 3280), ex: indet. (2 slides).
Sudan: Wad Medani, xii.1962, (L.A. Mound), ex: *Zizyphus spinachrish*, B.M. 1963-777 (2 slides).
Sudan: Wad Medani, i.1962, (L.A. Mound), ex: *Lawsonia alba*, B.M. 1963-777.
Chad: Timberi, 407 m, 29.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Gardenia triacantha*, 74/81.

79. *Neomaskellia* Quaintance & Baker

N. andropogonis Corbett
Syntypes, Ceylon: Bandarawalla, v.1906, (E.E. Green), ex: *Andropogon* sp., B.M. 1927-451.
Hong Kong: NT, west Tai Mo Shan, Country Park, Ho Pui reservoir, 13.xii.2001, (J.H. Martin 7567), ex: *Saccharum ?spontaneum*, (2 slides).
India: Lucknols, Inst. Sugar Cane Res., iv.1966, ex: Sugar Cane, C.I.E. A1284, 26/66 (2 slides).
West Malaysia: Pahang Prov., Taman Negara, Kuala Tahan, 10.iii.1984, (J.H. Martin 4247), ex: *Saccharum* sp.
West Malaysia: Selangor Prov., Genting Highlands, 1.v.1994, (D.J. Williams 1507), ex: indet.
Pakistan, Rawalpindi, 1.iv.1960, ex: *Bauhinia variegata*, C.I.E. 18414, 16/63.
N. bergii (Signoret)
S. Nigeria: Ibadan, 6.i.1964, (W.A. Lambom), ex: Grass, 40/62 (2 slides).
E. Nigeria: Ikom, 11.ii.1957, (Eastop 6766), ex: Elephant grass.
Brunei: 1971, (Kassim bin Ahmad), ex: Sugar Cane, C.I.E. A4463/18, 1/71 (2 slides).
Seychelles: Mahé, v.1970, (P.L. Mathias), ex: Gramineae, 1/72 (3 slides).
Papua New Guinea: Morobe Prov., Lasanga Island, 20.x.1979, (J.H. Martin 2735), ex: *Saccharum ?officinarum* (2 slides).
Papua New Guinea: Bubia, Dept. of Agriculture, 15.vii.1968, ex: Sugar Cane, C.I.E. A3299/12, 11/69.
Pakistan: Dacca, Locust Waming & Plant Quar. Dept., 27.vi.1967, ex: Sugar Cane, C.I.E. A1797/10, 16/67.
Topotypic, Fiji Islands: (R. Veitch), ex: Gramineae, B.M. 1915-240 (3 slides).

80. *Neopealius* Takahashi

N. rubi Takahashi
Taiwan: 24.xi.1993, (Warren), ex: *Rubus* sp., 22176/7, 93-1369, I.I.E. 22997.

81. *Nigrasialeyrodes* Martin & Carver

N. convexus Martin & Carver
Paratypes: Australia: Queensland, Townsville, James Cook University campus, 2.vi.1992, (D.W. Burrows), ex: *Melaleuca viridiflora*, B.M. 1998-51 (3 slides).
Paratypes: Australia: Queensland, Townsville, James Cook University campus, 19.xii.1991, ex: *Melaleuca quinquenervia*, B.M. 1998-51.

82. *Orchamoplatus* Russell

O. caledonicus (Dumbleton)
Paratype, New Caledonia: Noumea, 24.v.1955, (L.J. Dumbleton), ex: *Citrus* sp., B.M. 1964-721.
New Caledonia: 28.ii.1956, (J.F. Schoen 56-2755), ex: *Ochrosia* sp., B.M. 1998-131.
O. citri (Takahashi)
Australia: Adelaide, xi.1967, (L.A. Mound), ex: *Citrus* sp., 35/71 (4 slides).
Lord Howe Island: xi.2001, (L.A. Mound), ex: *Psidium cattelianum* (2 slides).
O. dentatus (Dumbleton)
Paratype, New Caledonia: Carenage, 8.iv.1955, (L.J. Dumbleton), ex: Myrtaceae, B.M. 1964-721.
New Caledonia: near Nouméa, 1912, (Franc), ex: *Microsemma salicifolia* (2 slides).
O. louiserussellae Martin
Paratypes, Australia: Queensland, strand 2 km north of Cape Tribulation, 15.vii.1996, (J.H. Martin 6883), ex: *Syzygium* sp., B.M. 1998-50 (5 slides).
O. mammaeferus (Quaintance & Baker)
Lectotype, Samoa: Upolu, Apia, iv.1925, (P.A. Buxton & G.H. Hopkins), ex: Croton.
Paralectotypes, Samoa: Upolu, Apia, iv.1925, (P.A. Buxton & G.H. Hopkins), ex: Croton (3 slides).
Cook Islands: Aitutaki, ii.1960, (N.L.K. Krauss 2), ex: indet. (3 slides).
Fiji: Viti Levu, Rakiraki, iv.1982, (L.A. Mound), ex: indet., 14/82.
Fiji: Nausori, 30.iii.1967, (G. Swaine), ex: Croton, C.I.E. A1757, 15/67.
Fiji: Viti Levu, Suva, 23.iii.1976, (P. Maddison), ex: *Codiaeum variegatum*, C.I.E. A9356.
French Polynesia: Tahiti, 9.vii.1976, (P. Maddison), ex: *Citrus reticulata*, C.I.E. A9023.
French Polynesia: Tahiti, 8.vii.1976, (P. Maddison), ex: *Citrus grandis*, C.I.E. A9023.
O. montanus (Dumbleton)
Pararypes, New Caledonia: Plaine des Lacs, 8.iv.1955, (L.J. Dumbleton), ex: indet., B.M. 1964-721 (2 slides).
New Caledonia: near Nouméa, 1912, (Franc), ex: *Microsemma salicifolia* (2 slides).
O. niuginii Martin
Paratypes, Papua New Guinea: Morobe Prov. coast, Lasanga Island, 18.ix.1979, (J.H. Martin 2581), ex: *Calophyllum inophllum* (4 slides).
Paratypes, Papua New Guinea: Morobe Prov. coast, Buso, 30.ix.1979, (J.H. Martin 2643), ex: *Calophyllum inophllum* (2 slides).
Paratypes, Papua New Guinea: Morobe Prov. coast, Buso, 8.ix.1979, (J.H. Martin 2676), ex: *Durandea* sp. (2 slides).
O. noumeae Russell
Paratype, New Caledonia: Noumea, 31.x.1940, (F.X. Williams), ex: *Citrus* sp., B.M. 1998-131.
O. plumensis (Dumbleton)

Paratype, New Caledonia: Plum, (L.J. Dumbleton), ex: indet., B.M. 1964-721.
O. porosus (Dumbleton)
Paratype, New Caledonia: Carenage, 8.iv.1955, (L.J. Dumbleton), ex: Myrtaceae, B.M. 1964-721.

83. ***Orientaleyrodes*** **David**

O. zeylanicus (Corbett)
Syntypes, Sri Lanka: Trincomalee, v.1906, (T.B. Fletcher), ex: indet., B.M. 1927-451.
Syntypes, Sri Lanka: Trincomalee, vi.1906, (T.B. Fletcher), ex: indet., B.M. 1927-451 (3 slides).

84. ***Orstomaleyrodes*** **Cohic**

O. fimbriae (Mound)
Paratypes, Nigeria: Ibadan, Moor Plantation, ii.1961, (L.A. Mound), ex: *Cassia siamea* (5 slides).
Paratypes, Nigeria: Ibadan, Moor Plantation, i.1961, (L.A. Mound), ex: *Cassia siamea.*
Paratypes, Nigeria: Ibadan, Moor Plantation, iii.1961, (E.A. James), ex: *Cassia siamea.*
Congo: Brazzaville, 29.i.1964, ex: *Caloncoba welwitschii*, Al 14-65, B.M. 1965-305.
Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 3.xi.1989, (L.D.C. Fishpool 33), ex: *Milletia zechiana.*

85. ***Papillipes*** **Bink-Moenen**

P. spinifer Bink-Moenen
Holotype, Chad: Bebedjia, 395 m, 4.i.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Daniellia olivera*, B.M. 1977-471.

86. ***Parabemisia*** **Takahashi**

P. aceris (Takahashi)
Taiwan: Taipei, 15.i.1986, (C.C. Ker), ex: *Acer* sp., B.M. 1987-197.
P. jawani Martin
Paratypes, Papua New Guinea: Morobe Prov. coast, Jawani Island, 2.xi.1979, (J.H. Martin 2789), ex: ?*Timonius* sp. (5 slides).
P. lushanensis Ko & Luo
Paratypes, Taiwan: Nengkao, 24.x.1989, (C.C. Ko), ex: indet.
P. myricae (Kuwana)
Australia: Queensland, Carnarvon Gorge, 24.x.2001, (P. De Barro 107), ex: *Glochidion* sp.
Israel: Hefar, Placcab, 26.ix.1978, (A. Sternlicht), ex: *Citrus* sp., 15/78.
Israel: Akko, iii.1979, (A. Sternlicht), ex: *Citrus* or *Persea*, 1/69.
Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 20.xii.1989, (L.D.C. Fishpool 115), ex: *Persea americana.*
Turkey: Adana, 15.ii.1986, (E. Sekeroglu), ex: *Citrus* sp., 2/86.
P. myrmecophila Martin
Paratypes, Papua New Guinea: Morobe Prov. coast, Buso, 27.ix.1979, (J.H. Martin 2629), ex: *Cryptocarya* sp. (3 slides).

Paratypes, Papua New Guinea: Morobe Prov. coast, Buso, 27.ix.1979, (J.H. Martin 2626), ex: *Anisoptera thurifera* (2 slides).

Paratypes, Papua New Guinea: Morobe Prov. coast, Buso, 27.ix.1979, (J.H. Martin 2627), ex: *Macaranga* sp.

Paratypes, Papua New Guinea: Morobe Prov. coast, Buso, 26.ix.1979, (J.H. Martin 2622), ex: *Prunus* sp.

Paratypes, Papua New Guinea: Morobe Prov. coast, Buso, 5.xi.1979, (J.H. Martin 2799), ex: *Prunus* sp.

87. ***Paraleurolobus*** Sampson & Drews

P. chamaedoreae Russell

Paratypes, Mexico: intercepted at San Antonio, USA, 4.i.1970, (C. Parker), ex: *Chamaedorea* sp., B.M. 1998-131.

Paratype, Mexico: intercepted at San Antonio, USA, ix.1974, (C. Parker), ex: *Chamaedorea* sp.

Paratypes, Mexico: intercepted at San Antonio, USA, 2.v.1970, (D. Johnston), ex: *Chamaedorea* sp., B.M. 1998-131.

Costa Rica: N. Heredia Province, ~10 km north of Puerto Viejo, 2.ii.1983, (J.H. Martin 3746), ex: indet.

Costa Rica: N. Heredia Province, ~10 km north of Puerto Viejo, 2.ii.1983, (J.H. Martin 3747), ex: ?*Flacoutiae* sp.

88. ***Paulianaleyrodes*** Cohic

P. splendens Cohic

Syntype, Congo: Brazzaville, 10.xii.1964, ex: *Dichapetalum brazzae*, B.M. 1965-305.

P. tetracerae Cohic

Syntype, Congo: Brazzaville, 8.i.1964, ex: *Tetracera alnifolia*, B.M. 1965-305.

89. ***Pealius*** Quaintance & Baker

P. akebiae (Kuwana)

Japan: Hikawa, Tokyo, 9.viii.1950, (R. Takahashi), ex: *Akebia lobata*, 97/62, B.M. 1962-401 (3 slides).

P. azaleae (Baker & Moles)

Paratypes, India: Ootacamund (Nilgiris), 7000′, 3.vii.1969, (B.V. David), ex: *Azalea indica*, B.M. 1972-24.

Australia: A.C.T., Canberra, Weston, 19.xi.1996, (J.H. Martin 6826), ex: *Azalea* sp., B.M. 1998-50 (3 slides).

England: Surrey, Wisley, R.H.S. gdns., xi.1968, (K.M. Harns), ex: *Azalea* sp.

England: Wisley, R.H.S. gdns., 8.vii.1965, (L.A. Mound 76), ex: *Rhododendron mucronatum*.

Taiwan: Fenchifu, 11.iii.1990, (C.C. Ko), ex: *Rhododendron* sp.

P. cryptus Martin

Paratypes, Australia: Northern Territory, Kakadu Nat. Park, Nawurlandja lookout, 25 km S. of Jabiru, 21.xii.1996, (J.H. Martin 6948), ex: *Ficus platypodia*, B.M. 1998-50 (3 slides).

P. euryae (Takahashi)

Syntypes, Japan: Ome, nr Tokyo, 17.viii.1949, (R. Takahashi), ex: *Eurya* sp., 96/62, B.M. 1962-401 (3 slides).

P. fici Mound

Paratypes, Nigeria: Samaru, Zaria, 26.x.1960, (M.O. Ezeigwe), ex: *Ficus asperifolia* (3 slides).

Paratypes, Nigeria: Agege nr Lagos, 10.viii.1960, (M.O. Ezeigwe), ex: *Ficus asperifolia*.

Paratype, Nigeria: Ibadan, Oyo Road, vi.1961, ex: *Ficus* sp.

Paratypes, Nigeria: Ibadan, 16.v.1956, (V.F. Eastop 5950), ex: *Ficus* sp.

Sudan: S. Darfur, Jebel Marra, S. W. side, Wadi Golol, 28.iv.1981, (J.H. Martin 3348), ex: *Ficus ?capensis*.

Sudan: S. Darfur, Jebel Marra, S. W. side, Wadi Golol, 29.iv.1981, (J.H. Martin 3353), ex: *Ficus ?glumosa*.

P. kelloggi (Bemis)

USA: California, Sacramento, 11.vii.1966, (R.F. Wilkey), ex: *Prunus lyoni*, 25/66 (8 slides).

P. liquidambari (Takahashi)

Taiwan: Taipei, 28.xii.1985, (C.C. Ko), ex: *Liquidambar formosana*.

Taiwan: Taipei, 22.xi.1985, (C.C. Ko), ex: *Liquidambar formosana*, B.M. 1987-197.

P. madeirensis Martin *et al.*

Paratypes, Madeira: Faja da Noguiera, hydro dam, 28.iii.1995, (J.H. Martin & A.F. Aguiar, JHM 6552), ex: *Picconia excelsa* (2 slides).

Paratypes, Madeira: Ribeiro Frio, 800 m, 28.iii.1995, (J.H. Martin & A.F. Aguiar, JHM 6545), ex: *Picconia excelsa* (2 slides).

Paratypes, Madeira: Santana, Caldeirao do Inferno, 985 m, 27.vi.1993, (M. Pita C214), ex: *Picconia excelsa*.

P. mori Takahashi

Taiwan: Taipei, 18.vi.1968, (Y.C. Chang), ex: *Morus australis*, 4/68 (4 slides).

Taiwan: Taipei, 26.iv.1992, (C.C. Ko), ex: *Ficus* sp.

Thailand: Bangkok, iii.1973, (K. Sombatsiri), ex: Mulberry, 6/73 (3 slides).

P. rhododendri (Takahashi)

Hawaiian Islands: Hawai'i, Akaka Falls, 10 mi. N. of Hilo, 5.iv.1999, (J.H. Martin 7207), ex: *Rhododendron* sp. (2 slides).

Hong Kong: H K Island west, University campus, 12.xi.1996, (J.H. Martin 6784), ex: *Rhododendron pulchrum* (4 slides).

Japan: Minoh nr Osaka, 29.viii.1955, (R. Takahashi), ex: *Rhododendron* sp., 95/62, B.M. 1962-401 (3 slides).

90. *Pectinaleyrodes* Bink-Moenen

P. culcasiae (Cohic)

Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 20.x.1989, (L.D.C. Fishpool 20), ex: *Culcasia liberica* (2 slides).

P. triclisiae (Cohic)

Syntype, Belgian Congo: Brazzaville, 7.ix.1965, ex: *Triclisia gilletii*, B.M. 1965-305.

Chad: Donia, 29.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: Annonaceae, B.M. 1976-56 (2 slides).

91. ***Pentaleyrodes*** Takahashi

P. cinnamomi (Takahashi)
Taiwan, Wulai, 27.xii.1931, (R. Takahashi), ex: *Machilus* sp., B.M. 1994 (3 slides).
P. hongkongensis Takahashi
Hong Kong: Pok Fu Lam, Country Park, below High West, 12.xii.2001, (J.H. Martin 7557), ex: *Litsea rotundifolia* var. *oblongifolia* (2 slides).
Hong Kong: Victoria Peak, 3.iii.1990, (J.H. Martin 5693), ex: *Machilus chinensis* (2 slides).
P. yasumatsui Takahashi
Japan: Nara, 10.v.1959, (R. Takahashi), ex: *Lindera* sp., 99/62, B.M. 1962-401, (5 slides).

92. ***Pogonaleyrodes*** Takahashi

P. fastuosa Takahashi
Syntype, Madagascar: Manjakatompo, 2000 m, 24.v.1950, (R. Mamet), ex: indet., B.M. 1998-131.
P. zimmermanni (Newstead)
Syntypes, German East Africa (Tanzania): Amani, ix.1902, (A. Zimmermann 19), ex: Acanthaceae, 48/62 (2 slides).
Nigeria: Ibadan, Moor Plantation, xi.1959, (E.A. James), ex: indet.
Nigeria: Ibadan, Moor Plantation, vii.1960, (M.O. Ezeigwe), ex: indet.
Tanganyika: Tukuyu, South Highlands Prov., xii.1957, (R.G. Tapley), ex: *Coffea arabica*, C.I.E. 4678/15780, 51/62, B.M. 1962-3 (2 slides).
Cote d'Ivoire (Ivory Coast): 20 km W. Abidjan, Adiopodoume, IIRSDA, 17.xi.1989, (L.D.C. Fishpool 74), ex: *Aidia genipiflora*.
Kenya: Gedi forest, south of Malindi, 17.v.1988, (J.H. Martin 5318), ex: *Tricalysia ovalifolia*.

93. ***Pseudaleuroplatus*** Martin

P. kiensis Martin
Paratypes, Australia: S.A., Kangaroo Island, 17.ii.1990, (J.H. Martin 5652), ex: *Melaleuca* sp., B.M. 1998-50 (2 slides).

94. ***Ramsesseus*** Zahradnik

R. follioti Zahradnik
Paratype, Egypt: Ramsesseum, 10.i.1963, (J. Zahradnik), ex: *Acacia* sp.

95. ***Rhachisphora*** Quaintance & Baker

R. alishanensis Ko et al.
Paratype, Taiwan: Alishan, 26.iv.1990, (C.C. Ko), ex: *Eurya* sp.
Paratypes, Taiwan: Alishan, 26.iv.1990, (C.C. Ko), ex: *Eurya strigillosa*.
Paratype, Taiwan: Tatachiaanpu, 27.iv.1990, (C.C. Ko), ex: *Eurya* sp.
R. elongatus Regu & David
Paratype, India: Kunnathoor, 24.i.1989, (K. Regu), ex: *Mimusops elengi*.
R. franksae Martin

Paratypes, Australia: Queensland, 2 km north of Cape Tribulation, 13.xii.1996, (J.H. Martin 6870), ex: *Fagraea gracilipes*, B.M. 1998-50 (3 slides).
R. koshunensis (Takahashi)
Taiwan: Kentingkunyen, 22.i.1990, (W.J. Wu), ex: *Cinnamomum reticulatum* (2 slides).
R. maesae (Takahashi)
Taiwan: Nanshanchi, 28.x.1989, (C.C. Ko), ex: *Maesa* sp.
Taiwan: Jihyuetan, 9.vi.1986, (C.C. Ker), ex: *Maesa japonica*, B.M. 1987-197.
Taiwan: Chiaochiwenchuan, 14.ii.1990, ex: ex: *Maesa* sp.
Malaya: Cameron Highlands, Tanah Rata, 12.x.1973, (L.A. Mound), ex: indet. shrub, 66/84.
R. rutherfordi (Quaintance & Baker)
India: Kunnathoor, 24.i.1989, (K. Regu), ex: *Loranthus elasticus*.
R. trilobitoides (Quaintance & Baker)
Ceylon: Sigiriya, 23.viii.1909, (E.E. Green), ex: indet., B.M. 1927-451.
Ceylon: Trincomalee, ix.1910, (E.E. Green), ex: ?Tree, B.M. 1927-451 (2 slides).
Ceylon: Maha, ix.1909, (E.E. Green), ex: *Memecylon* sp., B.M. 1927-451.
Ceylon: Kesbewa, iv.1903, (E.E. Green), ex: *Memecylon* sp., B.M. 1927-451.
Pakistan: Lahore, 24.iii.1981, ex: *Syzigium cumini*, C.I.E. A12961 (2 slides).
Philippine Islands: Palawan, Irawan forest, 1000′, 19.i.1988, (J.H. Martin 5133), ex: indet., B.M. 1988-2.

96. *Rositaleyrodes* Meganathan & David

R. oplismeni (Takahashi)
India: Kunnathoor, 25.i.1989, (K. Regu), ex: Grass.

97. *Rugaleyrodes* Bink-Moenen

R. angolensis (Cohic)
Chad: Doba, 389 m, 21.vi.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Syzygium guineense*, 73/81.
R. bidentata Bink-Moenen
Holotype+paratypes, Chad: Baibokoum, 19.xi.1972, (F.A. Bink & R.M. Bink-Moenen), ex: *Hexalobus monopetalus*.
R. tetracerae (Cohic)
Syntype, Congo: Brazzaville, 18.iii.1964, (F, Cohic), ex: *Tetracera alnifolia*, B.M. 1965-305.

98. *Rusostigma* Quaintance & Baker

R. eugeniae (Maskell)
Syntypes, India: Maharashtra, Poona, (W.M. Maskell), ex: *Eugenia jambolana*, 13/85 (3 slides).
India: Gujarat, Navsari, ix.1985, ex: *Syzygium* sp., C.I.E. 18160, 27/86 (2 slides).
R. radiirugosa (Quaintance & Baker)
Syntypes, Indonesia: Billiton Isle, 5.ii.1911, (R.S. Woglum), ex: Mango, Q.6727-A, B.M. 1998-131.

Indonesia: Sulawesi Utara, Dumoga-Bone N.P., Clark's camp area, 10.v.1985, (J.H. Martin 4934), ex: [*Eugenia* sp.] *Syzygium* sp.
West Malaysia: Pahang Prov., Taman Negara, Bukit Teresek, 2.iii.1984, (J.H. Martin 4202), ex: indet.
Malaysia: Sarawak, Gn. Mulu Nat. Park, Kerangas plot, 14.x.1977, (D. Hollis M9/13), ex: indet., 53/82 (2 slides).
Singapore: Bukit Timah Forest, 31.iii.1989, (J.H. Martin 5543), ex: *Eugenia* sp., B.M. 1989-89.
Brunei: Temburong District, Sungai, Temburong, Kuala Baki, 16.x.1992, (J.H. Martin 6145), ex: indet.
R. tokyonis (Kuwana)
Japan: Tokyo, 9.viii.1949, (R. Takahashi), ex: *Sakakia* sp., 94/62, B.M. 1962-401 (3 slides).

99. ***Russellaleyrodes*** **David**

R. cumiugum (Singh)
Philippine Islands: Palawan, Irawan forest, 1000′, 19.i.1988, (J.H. Martin 5127), ex: indet., B.M. 1988-2.
Philippine Islands: Palawan, Irawan forest, 1000′, 21.i.1988, (J.H. Martin 5148), ex: indet., B.M. 1988-2.

100. ***Setaleyrodes*** **Takahashi**

S. mirabilis Takahashi
Taiwan: Wufeng, 24.v.1994, (K.C. Chou), ex: *Stephania japonica*, B.M. 1994 (3 slides).
Taiwan: Wufeng, Taiwan Agric. Res. Institute, 18.v.1994, (K.C. Chou), ex: *Stephania japonica*, B.M. 1994 (2 slides).
S. thretaonai David
Paratypes, India: Kerala, Walayar, 24.iii.1972, (B.V. David), ex: *Homonoia riparia*, 18/85.
Australia: Northern Territory, Humpty Doo, Solar Village, 45 km S. E. of Darwin, 24.xii.1996, (J.H. Martin 6963), ex: *Ficus* sp.
S. vigintiseta Martin
Paratypes, Australia: Northern Territory, Humpty Doo, Solar Village, 45 km S. E. of Darwin, 24.xii.1996, (J.H. Martin 6965), ex: *Acacia ?aulacocarpa*, B.M. 1998-50 (3 slides).

101. ***Simplaleurodes*** **Goux**

S. hemisphaerica Goux
Morocco: 45 km S. of Oujda, Col de Jerada, 22.iv.1992, (J.H. Martin 6054), ex: Oleaceae, B.M. 1992-73.

102. ***Singhiella*** **Sampson**

S. bicolor (Singh)
India: New Delhi, iv.1964, (T.S. Muthukrishnan), ex: *Eugenia jambolana*, B.M. 1967-280/19 (2 slides).
Pakistan: Rawalpindi, 23.iv.1979, ex: *Eugenia jambolana*, C.I.E. A11232.

S. cardamomi (David & Subramaniam)
West Malaysia: Pahang Prov., Taman Negara, Kuala Tahan, 2.iii.1984, (J.H. Martin 4191), ex: Zingiberaceae (2 slides).
Brunei: Borneo, nr Bukit Bedawan, 30.iii.1989, (J.H. Martin 5516), ex: Zingiberaceae, B.M. 1989-89.
S. chinensis (Takahashi)
Hong Kong: Lantau Island, Shek Pik – Taio Road, 18.x.1990, (J.H. Martin 5798), ex: *Machilus chinensis*.
S. citrifolii (Morgan)
Hong Kong: NT, Tai Lung Farm, Sheung Shui, 22.xi.1999, (J.H. Martin 7250), ex: *Citrus grandis*.
Hong Kong: NT, Tai Lung Farm, Sheung Shui, 22.xi.1999, (J.H. Martin 7252), ex: *Citrus paradisi*.
Hong Kong: HK, Botanical & Zoological Gardens, 7.xii.1999, (J.H. Martin 7319), ex: *Randia spinosa*.
Costa Rica: Turrialba, 13.iii.1990, (J.M. Cox 81), ex: *Citrus* sp.
Costa Rica: San Gerardo, nr San Isidro, 10.ii.1983, (J.H. Martin 3818), ex: *Citrus* sp.
Jamaica: Kingston, 26.x.1970, (L.A. Mound), ex: *Citrus* sp., 31/71.
Lebanon: Byblos, ix.2000, (M.R. Wilson), ex: *Citrus* sp.
USA: Florida, Nursery at Broxbourne, Herts., 19.xi.1974, ex: *Citrus mitis*.
S. delamarei (Cohic)
Chad: Doba, 389 m, 21.vi.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Hexalobus monopetalus*, B.M. 1976-56.
Kenya: Gedi forest, south of Malindi, 17.v.1988, (J.H. Martin 5321), ex: *Monanthotaxis fornicata*, B.M. 1988-188.
S. kuraruensis (Takahashi)
Taiwan: Sanhsian, 22.vi.1990, (C.C. Ko), ex: *Machilus kusanoi*.
S. premnae Martin
Paratypes, Australia: Queensland, strand 2 km north of Cape Tribulation, 13.xii.1996, (J.H. Martin 6862), ex: *Premna serratifolia*, B.M. 1998-50.
S. subrotunda (Takahashi)
Taiwan: Wuling, 11.x.1986, (C.C. Ker), ex: *Litsea akoensis*, B.M. 1987-197.
Taiwan: Fenchifu, 13.ii.1986, (C.C. Ker), ex: *Phoebe formosana*, B.M. 1987-197.

103. *Singhius* Takahashi

S. hibisci (Kotinsky)
Syntypes, Hawaii: Hilo, xi.1905, (B.M. Newell), ex: *Hibiscus roseorinctus*, B.M. 1923-278 (3 slides).
Hong Kong: Victoria Peak, 2.iii.1990, (J.H. Martin 5684), ex: ?*Bridelia monoica*.
Hong Kong: Wanchai, 25.ii.1990, (J.H. Martin 5667), ex: indet. shrub.
Taiwan: Wufeng, 8.xii.1985, (C.C. Ker), ex: *Mallotus japonicus*, B.M. 1987-197.
S. russellae (David & Subramaniam)
Paratypes, India: Valparai, 6000 ft, 16.iv.1967, (B.V. David), ex: indet., B.M. 1972-24.

104. *Siphoninus* Silvestri

S. immaculatus (Heeger)

England: Colchester, Essex, ii.1973, (E. Milne-Redhead), ex: Ivy, 11/73 (5 slides).
England: Camberley, Surrey, 25.viii.1920, (E.E. Green), ex: Ivy, B.M. 1930-488 (2 slides).
S. phillyreae (Haliday)
France: Corsica, Bussaglia, near Porto, 2.vii.1980, (J.H. Martin 3014), ex: *Crataegus* sp.
France: Corsica, Bussaglia, near Porto, 2.vii.1980, (J.H. Martin 3015), ex: *Fraxinus* sp.
Hungary: Budapest, Plant Protection Inst., 19.viii.1983, (L.A. Mound), ex: indet.
Spain: Cadiz Prov., E. of Grazalema, A372, 11.x.1998, (J.H. Martin 7170), ex: *Crataegus* sp.
Spain: Burgos Prov., Sanctuario de Santa Casilda, near Briviesca, 950 m, 6.viii.1993, (J.H. Martin 6294), ex: *Crataegus* sp.
England: Camberley, Surrey, 1.x.1927, (E.E. Green), ex: Hawthorn, B.M. 1930-488.
USA: California, U. Cal. Riverside campus, 3.vii.1990, (J. LaSalle), ex: *Citrus* sp.

105. *Taiwanaleyrodes* Takahashi

T. carpini Takahashi
Taiwan: Hapan, 17.vi.1994, (K.C. Chou), ex: *Maesa* sp., B.M. 1994 (2 slides).
T. meliosmae Takahashi
Japan: Kushimoto, Wakayama Prefecture, vi.1955, (R. Takahashi), ex: *Daphniphyllum* sp., 101/62, B.M. 1962-401, (5 slides).

106. *Tetraleurodes* Cockerell

T. acaciae (Quaintance)
Mexico: Tamaulipas state, Miquihuana, 1.iv.2001, (E. Danzig), ex: *Sophora secundaria* (2 slides).
Hong Kong: Pok Fu Lam, Country Park, 10.xii.2001, (J.H. Martin 7545), ex: ?Mimosaceae (2 slides).
Jamaica: Negril, 17.vi.1969, (M. Schuiling 39), ex: *Piscidia piscipula*, 10/69 (2 slides).
T. andropogoni (Dozier)
Syntypes, Belgian Congo: Lodja, x.1929, (J. Ghesquière), ex: *Andropogon* sp., B.M. 1933.
Uganda: W. Buganda, Kyadondo, 3900′, Kawanda Res. Stn, 25.iii.1971, (D.N. McNutt), ex: *Phragmanthera rufescens* var. *sigensis*, 9/72 (3 slides).
Belgian Congo: Brazzaville, 23.ii.1966, ex: *Loranthus* sp., Al 263-66.
Burundi: Rumonge, 3.ix.1983, (G. Remaudière), ex: *Elaeis guineensis*, 46/83.
T. banksiae Martin
Paratypes, Australia: S.A., Kangaroo Island, 17.ii.1990, (J.H. Martin 5654), ex: *Banksia marginata*, B.M. 1998-50 (3 slides).
T. bicolor Bink-Moenen
Turkey: Adana, 16.ii.1987, (via N. Uygun), ex: *Myrtus communis*, 13/87, (4 slides).
T. caulicola Nakahara
Paratypes, USA: California, Palm Canyon, 31.iii.1963, (L.D. Anderson), ex: *Dalea* sp., B.M. 1998-131.
T. confusa Nakahara
Paratypes, USA: Florida, Ormond Beach, 7.viii.1959, (Smith & Roberts), ex: *Magnolia virginiana*, B.M. 1998-131.
T. granulata Bink-Moenen

Paratypes, Chad: Doba, 21.vi.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *gardenia triacantha*, B.M. 1977-471 (2 slides).

Paratypes, Chad: Bebedjia, 11.vii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Hymenocardia acida*, B.M. 1977-471.

Paratypes, Chad: Donia, 29.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Hexalobus monopetalus*, B.M. 1977-471 (2 slides).

T. pluto Dumbleton

Australia: W.A. Ravensthorpe, 25.ix.1980, (H.J. Banks), ex: *Hakea* sp. (3 slides).

T. quercicola Nakahara

Paratypes, USA: Utah, iv.1966, (G.F. Knowlton), ex: Evergreen oak, B.M. 1998-131.

T. selachidentata Bink-Moenen

Paratypes, Chad: Bebedjia, 26.xi.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Stereospermum kunthianum*.

T. stirlingiae Martin

Paratypes, Australia: intercepted at SFKIA, 26.x.1987, (T. Moreno 88 0550), ex: *Stirlingia* sp., B.M. 1998-131.

Paratypes, Australia: intercepted at San Francisco, 25.vii.1988, (A. Mendoza), ex: *Stirlingia latifolia*, B.M. 1998-131.

T. sulcistriatus Martin

Paratypes, Australia: Queensland, strand 2 km north of Cape Tribulation, 15.xii.1996, (J.H. Martin 6887), ex: *Ficus microcarpa*, B.M. 1998-50.

Paratypes, Australia: Queensland, strand 2 km north of Cape Tribulation, 13.xii.1996, (J.H. Martin 6866), ex: *Calophyllum inophyllum*, B.M. 1998-50 (2 slides).

Paratype, Australia: Northern Territory, Kakadu Nat. Park, Gubara Walk, Burdulba Creek, 20 km S. of Jabiru, 22.xii.1996, (J.H. Martin 6954), ex: ?*Xanthostemon eucalyptoides*, B.M. 1998-50.

107. *Tetralicia* Harrison

T. ericae Harrison

Topotypes, England: Durham, Waldridge Fell, (B.J. Selman), ex: *Erica tetralix*, 10/65, (4 slides).

England: Surrey, Camberley, xi.1929, (E.E. Green), ex: *Erica tetralix*, B.M. 1929-545 (3 slides).

T. graminicola Bink-Moenen

Paratypes, Chad: Baibokoum, 8/9.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Hyparrhenia rufa*.

T. iberiaca Bink-Moenen

Paratypes, Portugal: Monchique, ca. 300 m, 29.iv.1978, (F.A. Bink & R.M. Bink-Moenen), ex: *Erica arborea*.

T. tuberculata Bink-Moenen

Holotype+paratypes, Chad: Bebedjia, 395 m, 11.vii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Vitex simplicifolia*.

108. *Trialeurodes* Cockerell

T. abutiloneus (Haldeman)

USA: Arizona, East of Roll, 22.ix.1954, (R.D. Dickson), ex: *Euphorbia* sp., B.M. 1998-131.

USA: Florida, Haven, 2.xi.1959, (V. Norton & F. Weems), ex: *Hibiscus mutabilis*, B.M. 1998-131.

USA: California, Three Rivers Tulore Co., 4.xi.1978, (L. Vet), ex: *Euphorbia supina*.

T. bruneiensis Martin

Paratypes, Brunei: Borneo, near Bukit Bedawan, 30.iii.1989, (J.H. Martin 5523), ex: Fern, B.M. 1989-89, (5 slides).

T. darwiniensis Martin

Paratypes, Australia: Northern Territory, Darwin, Nightcliff, foreshore, 20.xii.1996, (J.H. Martin 6931 & A. Wells), ex: *Flueggea ?virosa*, B.M. 1998-50 (5 slides).

T. dicksoniae Martin

Paratypes, Australia: Victoria, Tall Trees, nr Mansfield, 22.i.1990, (J.H. Martin 5621), ex: *Dicksonia antarctica*, B.M. 1998-50 (4 slides).

T. drewsi Sampson

USA: California, Sacramento, Sac. Co., 27.ii.1968, (P.W. Hiatt), ex: *Quercus ilex*, 9/68, B.M. 1968-368.

T. ericae Bink-Moenen

Paratypes, Netherlands: Leersum, reserve Leersumse Veld, 6.vi.1975, (R.M. Bink-Moenen), ex: *Erica tetralix*, B.M. 1976-56 (2 slides).

Netherlands: Ilpendam, reserve Ilpenveld, 29.v.1975, (F.A. Bink & R.M. Bink-Moenen), ex: *Erica tetralix*, B.M. 1976-56.

Netherlands: Amerongen, 27.iv.1975, (F.A. Bink & R.M. Bink-Moenen), ex: *Erica tetralix*, B.M. 1976-56.

T. floridensis (Quaintance)

USA: Florida, Tampa, 11.ii.1976, (C.W. Hale), ex: *Persea americana*, B.M. 1998-131.

Panama: Canal Zone, Barro Colorado I., 13.iii.1983, (J.H. Martin 3988), ex: *Inga* nr *pezizifera*.

Costa Rica: Guanacaste Province, 60 km S. of Liberia, 26.i.1983, (J.H. Martin 3693), ex: *Mastichodendron ?capiri* (2 slides).

T. pergandei (Quaintance)

USA: Florida, nr Brooksville, 11.ii.1922, (A.L. Quaintance 20590), ex: *Bignonia* sp., B.M. 1998-131.

USA: Maryland, Silver Spring, 1.ix.1941, (L.M. Russell), ex: *Rubus* sp., B.M. 1998-131.

?USA: pres. T.D.A. Cockerell, det. Quaintance, ex: Rose, B.M. 1923-178 (2 slides).

USA: Maryland, Allegany Co., Green Ridge, State Forest, 29.vi.1998, (J.H. Martin 7101), ex: *Crataegus* sp.

T. rex Martin

Paratypes, Indonesia: Sulawesi Utara, Dumoga-Bone N.P., Clark's camp area, 18.iv.1985, (J.H. Martin 4869), ex: Fren.

Paratypes, Indonesia: Sulawesi Utara, Dumoga-Bone N.P., Clark's camp area, 18.iv.1985, (J.H. Martin 4879), ex: Fren (3 slides).

T. vaporariorum (Westwood)

?Type series, England: "on leaf in Westwood's Taxonomic Series", Hope Department, Oxford, no data (3 slides).

Syntypes, South Africa: Durban, Pretoria, Chief Entomologist, vi.1923, ex: *Nicotiana tabacum*, B.M. 1935-248 (2 slides).

England: Berkshire, Ascot, Silwood Park, 5.xi.1978, (J.H. Martin 2323), ex: *Solanum ducamara*, 9/78.

South Africa: GAU, Delmas, v.2000, (R. Tukker HA/60), ex: *Cucumis sativus*, B.M. 2001-198.

Azores: Pico, hotel grounds, 26.vi.2000, (A. Polaszek), ex: *Oenothera* sp.
Madeira: Portela, 550 m above Porto da Cruz, 28.iii.1995, (J.H. Martin 6560 & A.F. Aguiar), ex: *Ageratina* sp.
Iran: Isfahan, University of Technology, viii.1986, ex: *Nicotiana tabacum*, C.I.E. A18545, 2/87.
Iran: Fars, Badjgah, 13.x.1990, (M. Zarrabi 17), ex: *Cichorium intybus*.
Italy: Po River Valley, 1998, ex: Strawberry, C.I.E. A20129.
USA: California, Riverside Co., UCR campus, (L. Vet), ex: *Nicotiana glauca*.
T. variabilis (Quaintance)
USA: Florida, Miami, 1.xii.1921, (G.F. Moznette), ex: *Carica papaya*, B.M 1998-131.
Jamaica: Kingston, vii.1965, ex: *Carica papaya*, B.M 1965-433.
Belize: Cayo, Chiquibul forest, Las Cuevas, 6.xi.1994, (J.H. Martin 6463), ex: *Carica* sp. (2 slides).
Trinidad: Tableland, 3.xii.1991, I.I.E. 22137, ex: ex: *Carica papaya*.

109. *Tuberaleyrodes* Takahashi

T. machili Takahashi
Hong Kong: Victoria Peak, 3.iii.1990, (J.H. Martin 5693), ex: *Machilus chinensis* (4 slides).

110. *Vasdavidius* Russell

V. cobarensis (Martin)
Paratypes, Australia: New South Wales, Cobar, 1979, ex: Pasture grass, C.I.E. 11292 (2 slides).
V. concursus (Ko)
Paratypes, Taiwan: Taipei City, 10.xii.1989, (T.C. Hsu), ex: Gramineae.
Paratypes, Taiwan: Taipei City, 30.i.1994, (K.C. Chou), ex: Gramineae.
Hong Kong: NT, west Tai Mo Shan, Country Park, Ho Pui area, 13.xii.2001, (J.H. Martin 7566), ex: *Saccharum ?spontaneum*, (2 slides).
Hong Kong: NT, E. side of Ma On Shan, Country Park, near Hebe Haven, 14.xi.1996, (J.H. Martin 6817), ex: Grass.
V. indicus (David & Subramaniam)
Paratypes, India: Coimbatore, 20.v.1966, (B.V. David), ex: *Chloris barbata*, B.M. 1972-24 (2 slides).
Nigeria: Ibadan, I.I.T.A., 20.ii.1983, (M.S. Alam), ex: Rice, C.I.E. A15041.
Nigeria: Badeggi, 25.x.1977, (S.A. Apeji), ex: Rice, C.I.E. A9972.
Burkina Faso (Upper Volta): Bo-Bo rice area, 31.vii.1973, (C.L. Tao), ex: *Oryza sativa*, C.I.E. A10811, 64/82 (2 slides).
V. setiferus (Quaintance & Baker)
Hong Kong: Tai Lung Farm, NT, 14.vii.1976, (R. Winney), ex: Grass, C.I.E. A9278 (2 slides).
Papua New Guinea: Morobe Prov. coast, Buso, 15.x.1979, (J.H. Martin 2702), ex: *Imperata cylindrica* (3 slides).

111. *Venezaleurodes* Russell

V. pisoniae Russell
Paratypes, Venezuela: Ipare, near Altagracia de Orituco, xi.1966, (F.A. Lee), ex: *Pisonia macranthocarpa*, B.M. 1998-131 (2 slides).

Paratypes, Venezuela: Guarcio, near Altagracia de Orituco, Guatopo, xi.1966, ex: *Pisonia macranthocarpa* (2 slides).

112. *Viennotaleyrodes* Cohic

V. bicolorata Martin
Paratypes, Australia: Queensland, 150 km S. of Mackay, 19.vii.1968, (L.A. Mound), ex: *Acacia harpophylla*, 22/71, (9 slides).
V. bosciae Bink-Moenen
Holotype: Cameroun: 22 km S. of Waza, 23.i.1966, (A.J.M. Leeuwenberg), ex: *Boscia senegalensis*.
Sudan: Bahr el Ghazal Prov., ~20 km N. of Aweil, 9.v.1981, (J.H. Martin 3386), ex: *Boscia senegalensis* (2 slides).
V. curvisetosus Martin
Paratypes, Australia: New South Wales, Tamworth, 29.iii.1920, (W.W. Froggatt), ex: *Acacia pendula* (4 slides).
V. fallax Bink-Moenen
Paratypes, Chad: Boro, 450 m, 6.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Burkea africana*, B.M. 1976-56 (2 slides).
Paratypes, Chad: Boro, 443 m, 30.vii.1972, (F.A. Bink & R.M. Bink-Moenen), ex: *Burkea africana*, B.M. 1976-56.
V. lacunae Martin
Paratypes, Australia: ACT, Molonglo Gorge (near Queanbeyan, NSW), 8.xii.1996, (J.H. Martin 6849), ex: *Acacia rubida*, B.M. 1998-50 (4 slides).
V. megapapillae (Singh)
Hong Kong: Pok Fu Lam, Country Park, 10.xii.2001, (J.H. Martin 7547), ex: *Millettia* sp., (4 slides).
Taiwan: Hsini, 23.xii.1995, (K.C. Chou), ex: *Bauhinia championii*.
Taiwan: 22.i.1990, (Y.C. Shiau), ex: indet.
V. platysepali (Cohic)
Syntype, Congo: Brazzaville, 5.iii.1965, ex: *Platysepalum vanderystii*, B.M. 1965-305.
Chad: Galaba, 407 m, 2.ix.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Entada africana*, B.M. 1976-56 (2 slides).
Chad: Timberi, 435 m, 29.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Dialium guineense*, B.M. 1976-56.

113. *Xenaleyrodes* Takahashi

X. artocarpi Takahashi
Australia: Queensland, strand 2 km north of Cape Tribulation, 13.xii.1996, (J.H. Martin 6863), ex: *Ficus microcarpa*, B.M. 1998-50 (2 slides).
Australia: Queensland, strand 2 km north of Cape Tribulation, 15.xii.1996, (J.H. Martin 6887), ex: *Ficus microcarpa*, B.M. 1998-50.
Australia: Queensland, creek mouth 2 km north of Cape Tribulation, 15.xii.1996, (J.H. Martin 6885), ex: *Pouteria obovoidea*, B.M. 1998-50.
Australia: Queensland, 2 km north of Cape Tribulation, garden/orchard, 17.xii.1996, (J.H. Martin 6903), ex: *Pouteria caimito*, B.M. 1998-50.

Papua New Guinea: Morobe Prov. coast, Buso, 9.x.1979, (J.H. Martin 2681), ex: *Premna* sp. (2 slides).

X. broughae Martin

Paratypes, Papua New Guinea: S. Highlands Province, Eraue, 21.vii.1983, (E.J. Brough C630), ex: *Citrus* sp., C.I.E. A15579, 37/84, (7 slides).

X. fauceregius Martin

Paratypes, Australia: Northern Territory, King's Canyon, 5.ii.1990, (J.H. Martin 5643), ex: *Acacia ?mcdonnelliensis*, B.M. 1998-50.

Paratypes, Australia: New South Wales, Native Dog Bore, 1890, (W.W. Froggatt), ex: indet. (2 slides).

Australia: South Australia, 2 km N. of Roxby Downs, 25.iv.2000, (J.H. Martin 7397), ex: *Acacia ?ramulosa*.

Australia: Queensland, 40 km E. of St. George, 12.iv.2000, (L.A. Mound 3860), ex: *Acacia aneura*.

114. ***Yleyrodes*** Bink-Moenen

Y. isoberliniae Bink-Moenen

Paratypes, Chad: Boro, 440 m, 6.xii.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Isoberlinia doka*, B.M. 1977-471.

115. ***Zaphanera*** Corbett

Z. capparis Bink-Moenen

Paratypes, Chad: Bebedjia, 12.vi.1973, (F.A. Bink & R.M. Bink-Moenen), ex: *Capparis corymbosa*, B.M. 1977-471 (2 slides).

Sudan: Bahr el Ghazal Prov., 160 km S.W. of El Muglad, 7.v.1981, (J.H. Martin 3385), ex: indet. woody plant.

Z. cyanotis Corbett

Lectotype, Ceylon: Maskeliya, v.1911, (J. Pole), ex: *Cyanotis* sp., B.M. 1927-451.

Paralectotype, Ceylon: Maskeliya, v.1911, (J. Pole), ex: *Cyanotis* sp., B.M. 1927-451.

Paralectotypes, Ceylon: Pundaluoya, (E.E. Green), ex: *Cyanotis* sp., B.M. 1927-451 (2 slides).

Pakistan: Balakot, 12.iv.1963, ex: *Dicliptera roxburghii*, C.I.E. 19214, 2/64.

Z. niger (Maskell)

Australia: S.A., Mt Lofty Ranges, Basket Range, 1.i.2000, (J. Hardy), ex: *Acacia* sp. (2 slides).

Australia: S.A., Carey Gully, nr Adelaide, i.2000, (J. Hardy), ex: *Acacia* sp.

Australia: S.A., Adelaide, Crafers, 25.xii.1997, (L.A. Mound & A. Wells), ex: *Acacia melanoxylon* (2 slides).

Australia: A.C.T., Canberra, Nat. Bot. Gdns, Black Mtn, 21.x.1994, (L.A. Mound), ex: *Acacia longifolia*.

Z. papyrocarpae Martin

Paratypes, Australia: S.A., Billakilina Station, 26.iv.2000, (J.H. Martin 7406), ex: *Acacia papyrocarpa* (3 slides).

Paratypes, Australia: S.A., Roxby Downs, 27.iv.2000, (J.H. Martin 7408), ex: *Acacia papyrocarpa* (3 slides).

Paratypes, Australia: S.A., Roxby Downs, 11.i.2000, (J. Hardy), ex: *Acacia papyrocarpa*.

Paratypes, Australia: S.A., Roxby Downs, 20.x.1999, (P. Bailey), ex: *Acacia papyrocarpa*.

Z. rhachisreticulata Martin

Paratypes, Australia: W.A., Wubin, iv.1997, (L.A. Mound), ex: *Acacia mackeyana*, B.M. 1998-51 (4 slides).

116. New genus 1

New genus 1 sp. 1
Belize: Cayo, Chiquibul Forest, Las Cuevas plots, 20.xi.1994, (J.H. Martin 6502), ex: Piperaceae (2 slides).
Belize: Cayo, Chiquibul Forest, New Maria track, 12.ii.1996, (J.H. Martin 6647), ex: indet. (2 slides).
Belize: Cayo, Chiquibul Forest, San Pastor track, 28.xi.1994, (J.H. Martin 6523), ex: *Piper* sp. (3 slides).
Belize: Cayo, Chiquibul FR., Monkey Tail trail, 22.vi.2002, (J.H. Martin 7703), ex: *Piper* sp. (2 slides).
New genus 1 sp. 2
Belize: Cayo, Chiquibul Forest, Las Cuevas plots, 5.xi.1994, (J.H. Martin 6458), ex: *Piper* sp.
Belize: Cayo, Chiquibul Forest, Las Cuevas plots, 20.xi.1994, (J.H. Martin 6502), ex: Piperaceae.
Belize: Cayo, Chiquibul Forest, San Pastor Hill path, 26.ii.1996, (J.H. Martin 6710), ex: *Piper* sp.
Belize: Cayo, Chiquibul FR., Monkey Tail trail, 22.vi.2002, (J.H. Martin 7703), ex: *Piper* sp.

117. New genus 2

New genus 2 sp. 1
Costa Rica: Turrialba, 640 m, Trop. Agric. Centre, C.A.T.I.E., 3.iii.1983, (J.H. Martin 3964), ex: ?Myrtaceae (2 slides).
Costa Rica: Turrialba, 640 m, Trop. Agric. Centre, C.A.T.I.E., 1.iii.1983, (J.H. Martin 3923), ex: *Hoffmannia* sp.
New genus 2 sp. 2
Costa Rica: Cerro, Chirripó Nat. Park, ~2600 m, 18.ii.1983, (J.H. Martin 3882), ex: indet. (2 slides).

Aleurodicinae

1. *Aleurodicus* Douglas

A. cocois (Curtis)
Paralectotypes, Barbados: (Sir R. Schomburgk), ex: Coconut tree (3 slides).
A. dispersus Russell
Paratypes, USA: Florida, Key West, 12.vi.1964, (H.V. Weems), ex: Coconut Palm (3 slides).
Hawaiian Islands: Oahu, Bishop, Museum grounds, 30.iii.1999, (J.H. Martin 7194), ex: *Colocasia esculenta*.
Hawaiian Islands: Hawai'i, coast, Kilauea Volcano, Pu'u O'o lava edge, 6.iv.1999, (J.H. Martin 7209), ex: indet. shrub.
Hawaiian Islands: Maui, Kailua, Hana route, Waianapanapa, 1.iv.1999, (J.H. Martin 7197), ex: *Hibiscus tiliaceus*.

Panama: Canal Zone, Cerro Galera, 26.iii.1983, (J.H. Martin 4144), ex: *Acalypha diversifolia*.
Panama: Darién, Ensenada del Guayabo, sea level - 250 m., 11.i.1983, (J.H. Martin 3582), ex: Leguminosae.

2. ***Azuraleurodicus*** **Martin**

A. pentarthrus Martin
Paratype, Belize: Cayo, Chiquibul forest, Grano de Oro track, 22.xi.1994, (J.H. Martin 6486), ex: *Guettarda ?combesii*.
Paratypes, Belize: Cayo, Chiquibul forest, Grano de Oro track, 16.xi.1994, (J.H. Martin 6486), ex: *Guettarda ?combesii*.
Paratypes, Belize: Cayo, Chiquibul For. Res., near Caracol Jct., 16.ii.1996, (J.H. Martin 6630A), ex: *Guettarda combesii* (2 slides).

3. ***Dialeurodicus*** **Cockerell**

D. cockerellii (Quaintance)
Syntypes, Brazil: Campinas, São Paulo, 30.iii.1898, (F. Noak, via Cockerell), ex: Myrtaceae, B.M. 1998-131.
Brazil: São Paulo, Embu-Guaco, 29.v.–2.vi.1998, (A.E. Campos-Farinha), ex: *Psidium* sp., Lot #9805640, B.M. 1998-168.

4. ***Eudialeurodicus*** **Quaintance & Baker**

E. bodkini Quaintance & Baker
Syntypes, Guyana: Berbice, 2.iii.1915, (G.E. Bodkin), ex: *Erythrina glauca*, B.M. 1998-131 (2 slides).

5. ***Octaleurodicus*** **Hempel**

O. nitidus Hempel
?Syntypes, Brazil: Bahia, 7.xii.1923, (G. Bondar), ex: *Cocos nucifera*, B.M. 1924-44.

6. ***Stenaleyrodes*** **Takahashi**

S. vinsoni Takahashi
Paratype, New Caledonia: Noumea, 20.v.1955, (L.J. Dumbleton), ex: *Cocos nucifera*, B.M. 1964-721.
Réunion Island: Saint Denis, 14.x.1963, (J.G. Pointel), ex: Palm, B.M. 1998-131.

7. ***Synaleurodicus*** **Solomon**

S. hakeae Solomon
Lectotype, Australia: Western Australia, Perth, iii.1934, (M.E. Solomon), ex: *Hakea prostrata*, B.M. 1936-84.
Australia: Western Australia, Perth, King's Park, 26.ix.1967, (L.A. Mound 215), ex: *Hakea ?pritzelli* (4 slides).

Appendix D: data matrix used in the cladistic analysis of the subfamily Aleyrodinae

Note: polymorphisms are coded as follows: A = 0&1, B = 0&2, C = 0&3, D = 0&6, E = 0&7, F = 1&2, G = 1&3, H = 1&8, K = 2&3, M = 2&5, N = 2&7, P = 0&1&2.

In-groups	1 2 3 4 5 6 7 8 9
	1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Acanthaleyrodes callicarpae	1?011101010101010?0?0?120000?10005??111231021?000?51101010010000000?010100100000000000000101000
Acanthaleyrodes spiniferosa	1?01111001010102131 10?0?0000?00005??110233021?000?50101110010000000?010100100000000000000101000
Acanthaleyrodes styraci	1?01110101010102 0?0?0?120000?10005??111233021?000?51101010010000000?010100100000000000000101000
Acanthobemisia	200111011101110012120?0?1110?000020?000111031?201011100?0110000000?010100000000000000000101000
Acaudaleyrodes africana	2021110000?11121100?0?0?0210?01004??110002031?101001000?000B1100000?011100100000000000000101000
Acaudaleyrodes rachipora	2201110000?11111100?0?0?0210?01004??110002031?101001000?00021100000?01110010A001000000000101100
Acaudaleyrodes tuberculata	2021110000?11111100?0?0?0210?01004??110002031?101001000?01011100000?001100101000000000000101100
Acutaleyrodes	200111011 0?101110?100?0?0010?00001??101216031?2A1040100?0010000000?010100000000000000000101000
Africaleurodes coffeacola	1?01110000?10100101A0?0?01013000025?010211031?201041101011000000000?010100000000000000000101000
Africaleurodes fulakariensis	1?01110000?10100100?0?0?01013000020?010211031?201041101011000000000?0101000000000000000010????
Africaleurodes hexalobi	1?01110000?1010010100?0?01013000020?010211031?201041101011000000000?010100000000000000000101000
Africaleurodes loganiaceae	1?01110000?11100100?0?0?01013000021?010215031?200?6110101100000000?010100000000000000000101000
Africaleurodes ochnaceae	1?01110000?10100100?0?0?01013000021?010211031?201041101011000000000?010100000000000000000101000
Agrostaleyrodes	1?01110010?101020?0?0?0?0010?00105??000211021?000?0000111010100000000?010100000000000000000101001
Aleurocanthus banksiae	20211100011111102100?0?101310?00005??11023300???00?01100?0000110000 0?100100001000000000000101000
Aleurocanthus calophylli	2301110101111102100?0?110200?001021?10023100???00?00100?0000100000 0?101000000000000000000101000
Aleurocanthus ceracroceus	20011100011101121 00?0?130210?00005??10023300???00?00000?000000000 00?100100000000000000000101000
Aleurocanthus citriperdus	22211101011101021 00?10111210?00005??110031021?000?01100?0000100000 0?000000010000000000000101000
Aleurocanthus cocois	220111010111111121 00?10110210?00105??110231021?011001100?0000100000 0?00000000000100000000001010A0
Aleurocanthus delottoi	220111010111111121 00?0?110310?00001??11013300???00?00100?0000110000 0?101000000100000000000101000
Aleurocanthus esakii	202111000111111221 10?0?111310?00005??11013300???00?00000?0000100000 0?100000000000000000000101000
Aleurocanthus gateri	230111000111011121 00?0?111310?00105??10013102 1?001000100?0000100000 0?100000000000000000000101100
Aleurocanthus gordoniae	230111001111011121 00?0?111210?00105??11003300???00?00000?0000100000 0?000000000001000000000101000
Aleurocanthus inceratus	230111011111111121 00?0?111110?00101??110231021?000?01000?0000110000 0?000000001001000000000101000
Aleurocanthus leptadeniae	220111010111111121 00?0?111310?00005??100231021?000?01100?0000100000 0?001000000000100000000101100
Aleurocanthus spiniferus	220111011111101021 00?10110310?00005??110133021?001000000?0000100000 0?100100001001000000000101000
Aleurocerus cerifer	210110?010?11122110?0?0?02112000000??10023400???00?01100?0010101000 0?101000000100000000000101000
Aleurocerus flavomarginatus	220110?010?11122110?0?0?02112000000??10023400???00?11100?0010101000 0?101000000100100000000101000
Aleurocerus musae	220110?010?11122110?0?0?02112000000??10023400???00?11100?0010101000 0?101000000100100000000101000
Aleurocerus palmae	220110?010?11122110?0?0?02112000000??10023400???00?11100?0010101000 0?101000000100100000000101000
Aleurochiton acerinus	2021110001010 10B1A100?0?1410?00003?100023503 1?111000001110100000000?010100000000000000000101000
Aleurochiton aceris	20211100010101 0010100?0?1410?00003?100023503 1?111001101110100000000?010100000000000000000101000
Aleurochiton forbesii	2121110000?10100100?0?0?1110?000020?010211031?201000000?0010000001 0?010100100000000000000101000
Aleurochiton pseudoplatani	20211100010101 00100?0?0?1110?00003?100023503 1?111000001110101000000?010100000000000000000101000

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9
	1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Aleuroclava aucubae	20011110010111020?0?0?0111300002 1?00123300???00?5110101001110001 0?010100100000000000000101000
Aleuroclava bifurcata	210111100101F1020?0?0?0110?00005??00023300???00?21101210010000010?000100100000000000000101000
Aleuroclava citrifolii	1?01111001011101 0?0?0?0111300005??00113300???00?51101200011000010?000100100000000000000101000
Aleuroclava euryae	20011110010111000?0?0?0111300005??00123300???00?00001210011000010?010100100000000000000101000
Aleuroclava ficicola	20011??0010121020?100?0?0110?00005??00123300???00?50001210011000010?010100100000000000000101000
Aleuroclava filamentosa	21011110010111020?0?0?0010?00005??00123300???00?50101210000000010?000100000000000000000101000
Aleuroclava hikosanensis	20011110010111000?0?0?0111300005??00123300???00?20001210011000010?010100101000000000000101000
Aleuroclava jasmini	21011110010111020?0?0?0110?00003?200123300???00?21101210010000010?010100100000000000000101000
Aleuroclava magnoliae	2001111001011 10?0?0?0?0110?00005??00123300???00?21101210110000010?010100100000000000000101000
Aleuroclava murrayae	1?01111001011102 0?0?0?0111300005??00113300???00?50001010011000010?010100100000000000000101000
Aleuroclava nigeriae	2101111000?111020?0?0?0110?00005??00123300???00?201012100A00000A0?010100A00000000000000101000
Aleuroclava piperis	21011110010111020?0?0?0110?00005??00123300???00?21101210000000010?010100000000000000000101000
Aleuroclava psidii	1?01111001010102 0?0?0?0111300005??00123300???00?50001010011000010?000100100000000000000101000
Aleuroclava pulcherrimus	1?01111001011101 0?0?0?0111300005??00123300???00?51101010010000010?010100100000000000000101000
Aleuroclava similis	1?0111100 0?111000?0?0?0?0410?00005??00123300???00?50001010000000000?010100000000000000000101000
Aleurocybotus graminicolus	20011100010101 0?10100?0?1110?000020?010111031?201010001110100000000?010100000000000000000101011
Aleurocybotus occiduus	200111000101010110100?0?1110?000023?010011031?201010001110100000000?010100000000000000000101011
Aleuroduplidens eucalyptifolia	250110?00111012 0100?0?0?0110?00001??11013300???00?00100?00001000000?010100001000000000000101000
Aleuroduplidens santali	2501110001110101 1?0?0?0?0110?00001??11013300???00?01100?00100000000?010100001000000000000101000
Aleuroduplidens triangularis	250110?0011111011 10?0?0?0410?00005??11013300???00?41100?00100000000?010100001000000000000101000
Aleuroduplidens wellsae	250110?00111010110 0?0?0?0410?00005??11013300???00?41101200101000000?010100001000000000000101100
Aleuroglandulus magnus	1?011100010101001?0?0?0?0010?000024?010121031?401041101110100000000?000100000100000000000101000
Aleuroglandulus malangae	0?011100010101011?0?0?0?0010?000024?010021031?401041101110100000000?000100000100000000000101100
Aleuroglandulus striatus	0?011100010101001?0?0?0?0010?000024?011221031?401041101110100000000?000100100000000000000101000
Aleuroglandulus subtilis	0?011100010101011?0?0?0?0010?000024?010021031?401041101110100000000?000100000100000000000101100
Aleuroinanis	260111001 0?11100100?0?0?0510?000021?000225031?201011100?00100000000?010100000000000000000101000
Aleurolobus diastematus	2101110111011100111 10?0?0401300005??011237011?201031101011110000010?010100100000000000000101001
Aleurolobus graminicola	0?011100010101001 00?0?0?0401300005??00023301 1?201041101110110000000?010100101000000000000101010
Aleurolobus hargreavesi	1?0111000101010 1100?0?0?0401100002 1?000237011?201041101110101000000?010100100000000000000101000
Aleurolobus marlatti	2001110001010100110?0?0?0111300002 0?010137011?201041101010111000010?010100101000000000000101000
Aleurolobus moundi	1?0111011101010010100?0?0111300002 1?000237011?201041101010101000000?010100001001000000000101010
Aleurolobus onitshae	200111000101010014 0?0?0?0111300002 1?010137011?201001101 01A101000000?010100A01000000000000101010
Aleurolobus styraci	20011100010101001 00?0?0?0401300002 3?010227011?201041101011101000000?010100101000000000000101010
Aleurolobus teucrii	200111000101110011110?0?0401300002 1?000237011?201000101010100000100?010100000000000000000101000
Aleurolonga	1?1111000101010211100?0?1111000002 4?011223031?201000101210100000000?101000000000000000000101000

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9
	1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Aleuromarginatus corbettiaformis	21001101110111000?100?0?1110?000021?010215031?201001101311120000000?01010100000100000000101001
Aleuromarginatus dalbergiae	20001101110111000?140?0?1110?001021?010215031?201001001011001000000?01010100000100000000101001
Aleuromarginatus kallarensis	20001101110111000?140?0?1110?001021?010215031?200?01101011001000000?01010100000100000000101001
Aleuromarginatus littoralis	20001101110101000?140?0?1110?000024?010215031?201011101011100000000?01010000000100000000101001
Aleuromarginatus marginiquus	20001101110111200?100?0?1110?000021?010215031?700?00001010100000000?10100000000000000000001001
Aleuromarginatus moundi	20001101110111100?140?0?0110?000021?011215031?701001100?01020000000?01010110000100000000101001
Aleuromarginatus nemciae	1?001101110101200?100?0?1110?000021?000225031?201000000?01100000000?10100000000000000000001001
Aleuromarginatus nigrus	20001101110111100?140?0?0110?001021?010215031?201000000?01101000000?01010110100100000000101001
Aleuromarginatus serdangensis	20011110010101000?100?0?0000?000121?10023300???00?21000?00100000000?10100000000100000000101000
Aleuromarginatus tephrosiae	21001101110111000?140?0?1110?000021?010215031?20100000131A100000000?01110010000100000000001001
Aleuropapillatus	1?0111011101110011110?0?01?13000020?010127031?201000001010100000100?010100001000000000001010A0
Aleuroparadoxus arctostaphyli	210?1110010101001?0?0?0?0110?00005??011037011?401041001010100000100?01010101000100000000101000
Aleuroparadoxus gardeniae	21011110010111011?0?0?0?0110?00005??011037011?401061101010100000100?01010111000100000000101000
Aleuroparadoxus ilicicola	20011110010111001?0?0?0?0110?00005??011037011?401061001010100000100?01010111000100000000101000
Aleuroparadoxus iridescens	20011110010111001?0?0?0?0110?00005??01A037011?401061101010101000100?01010101000100000000101000
Aleuroparadoxus punctatus	21011100010111001?0?0?0?0110?00105??010137011?401041101010110000100?01010111000000000000101000
Aleuroplatus acaciae	2021110000?121100?100?0?0110?000021?100023031?211001000?00100000000?00010000100000000000101000
Aleuroplatus berbericolus	2201110000?111000?0?0?0?0210?00105??11002300???00?41000?00001100000?01010000100100000000101000
Aleuroplatus bossi	2021110000?111010?100?0?1110?00005??1000330B1?001001100?00000000000?00100000100100000000101100
Aleuroplatus cadabae	2001110000?101020?0?0?0?0110?000021?10023700???00?01100?00000000000?00100000100100000000101100
Aleuroplatus cockerelli	210110?000?101000?0?0?0????0?00005??10013300???00?01100?00001100000?01110000000000000000101000
Aleuroplatus cococolus	2201110110?111010?0?0?0?0210?00005??11013300???00?11100?00000000000?01110000100100000000101000
Aleuroplatus dorsipallidus	2201110110?101020?0?0?0?0510?00005??10023300???00?01100?00011000000?00110010000100000000101000
Aleuroplatus epigaeae	2101110000?11112100?0?0?0210?00005??11012300???00?31100?00101100000?01010000100100000000101000
Aleuroplatus evodiae	2301110000?1111?100?0?0?0210?00005??10013300???00?01100?00010000000?10110010000100000000101000
Aleuroplatus fici	1?011100010101020?100?0?0110?000021?000235021?001011101011100000000?01010010000000000000101000
Aleuroplatus ilicis	2201110110?111211?0?0?0?0210?00005??10011300???00?11000?00001000000?01010000100100000000101000
Aleuroplatus incisus	220?110000?1010?0?0?0?0?0510?00005??11013300???00?61000?00?01000000?0111000000010000000010??00
Aleuroplatus pectiniferus	2201110000?101000?100?0?0110?000021?10112100???00?41100?00000000000?01110000000100000000101000
Aleuroplatus periplocae	2201110010?111000?0?0?0?01?0?00005??100231021?010?00000?00000000000?0010000000000000000010????
Aleuroplatus perseaphagus	200110?000?111020?0?0?0?0210?00005??10013300???00?01100?00010000000?00110010100000000000101000
Aleuroplatus quercusaquaticae	200110?000?11101100?0?0?0210?00006??11013300???00?10000?00100000000?01110000100000000000101000
Aleuropleurocelus	202?10?110?111100?0?0?0?0110?00005??10023300???00?00000?00101000000?0101001010010000000010?000
Aleuropteridis eastopi	2021110010?10102100?0?0?0100?00005??110133011?701040000?00100000000?01010000000100000000101000
Aleuropteridis filicicola	2021110010?1010F10100?0?0100?00005??110233011?701041100?00100000000?01010000000100000000101000

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9
	1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Aleuropteridis hargreavesi	2021110010?1110210100?0?0100?00005??110133011?701040000?00100000000?01010000000100000000101000
Aleuropteridis jamesi	2021110010?1010210100?0?0100?00005??110233011?701040000?00100000000?01010010000100000000101000
Aleuroputeus	2201110000?11102100?0?0?0110?001021?100225031?700?00100?01111000000?110100100000000000000101000
Aleurothrixus aepim	210110?010?11112110?0?0?0211200000??10023400???00?10100?00001000000?10100000000100000000101000
Aleurothrixus antidesmae	2201110000?1011010160?0?0110?00005??110133021?001001100?00100000000?100100000001000000000101000
Aleurothrixus bondari	210110?010?10122110?0?0?0411200000??10022400???00?01100?00001000000?10110000000100000000101000
Aleurothrixus floccosus	220110?010?11112110?0?0?0211200000??10023400???00?01100?00001000000?10110000000100000000101000
Aleurothrixus interrogationis	2101110010?111120?0?0?0?0410?00005??110121021?000?41100?00001000000?01110000000000000000101000
Aleurothrixus lucumai	220110?010?10102110?0?0?0211400000??100222031?100?00100?00001000000?10010000000100000000101000
Aleurothrixus myrtacei	220110?010?10112110?0?0?0211200000??100212031?100?11100?00001000000?10010000000100000000101000
Aleurothrixus porteri	200110?010?10112110?0?0?0211400000??100235021?000?01100?00001000000?10110000100100000000101000
Aleurothrixus proximans	220110?010?11112110?0?0?0211200000??10023500???00?11100?00001000000?10100000000100000000101000
Aleurothrixus smilaceti	2201110000?1011110160?0?0100?00005??110121021?001000000?00001000000?10010000000100000000010100?
Aleurotithius	1?01111001011101100?0?0?0100?00000??011215031?401000000?01100000100?01010100000000000000101000
Aleurotrachelus alpinus	2201110110?11100100?0?0?0110?01005??11023300???00?01100?00001000000?01010000000100000000101000
Aleurotrachelus ampullatus	21011101111111200?120?0?0110?01005??10013300???00?00000?00111100000?01010010100100000000101100
Aleurotrachelus asparagi	2001110000?1110?110?0?0?0111000005??10013300???00?01100?00001100000?00010000000100000000101100
Aleurotrachelus atratus	230110?010?111020?0?0?0?0211400005??10023300???00?01100?00001000000?11010000100100000000101000
Aleurotrachelus camelliae	2201110000?1110010100?0?0310?01005??11012100???00?40100?00001100000?01010000000100000000101000
Aleurotrachelus duplicatus	2211110010?101020?100?0?0210?01005??10013300???00?01100?00111100000?01010010100100000000101000
Aleurotrachelus fumipennis	1?01110001011101110?0?0?0401100005??110221021?001011100?00111000000?010100100001000000101010A0
Aleurotrachelus limbatus	2001110001110101100?0?0?1611000005??10013300???00?00000?00001100000?01010000000100000000101000
Aleurotrachelus longispinus	2201110110?11112100?0?0?0210?01005??110033021?001000000?00001100000?00110000000100000000101000
Aleurotrachelus minutus	2201110010?11112100?0?0?0310?01005??10013300???00?00000?00001100000?00110010000100000000101000
Aleurotrachelus multipapillus	2001110110?101120?0?0?0?0010?010024?110111031?701000100?00001100000?01010010000100000000101000
Aleurotrachelus obscurus	2101110010?111200?0?0?0?0210?01003?110023500???00?01100?00001100000?10110010100100000000101000
Aleurotrachelus tarennae	230110?000?0?12010100?0?0311301005??10023300???00?01100?00001100000?11110010100100000000101000
Aleurotrachelus tracheifer	2201110010?101120?0?0?0?0210?01005??100133031?711001100?00101000000?10010000000100000000101000
Aleurotrachelus trachoides	220110?010?101020?0?0?0?0311400003?0100231031?611001100?00101000000?10010000100100000000101000
Aleurotuba	2101110110?11101100?0?0?0310?01005??11013300???00?10100?00011100000?01110000000110000000101000
Aleurotulus anthuricola	2101110010?11101100?0?0?0210?00003?0100115031?7A1000100?00101000000?10010000000100000000101000
Aleurotulus arundinacea	20211100010101021A100?0?0110?00003?0000225031?7A1000001110100000000?10100010000000000000101000
Aleurotulus nephrolepidis	2101110110?11102100?0?0?0210?00003?0100129031?7A1011100?00121000000?01010000000000000000101000
Aleurotulus pteridophytae	2101110110?10102100?0?0?0210?00005??100123031?7010A1100?00101000000?01110000000100000000101000
Aleuroviggianus adanaensis	2101110000?10101100?0?0?1110?000024?000211031?2A0?01101111100000000?01010000000000000000101000

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9 1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Aleuroviggianus adrianae	20211100010111010?100?0?1110?000024?010123021?000?00001110011000000?00100010000000000000101000
Aleuroviggianus graecus	21011101110101000?0?0?0?1110?000020?000111031?2A0?00001111100000000?01010000000000000000101000
Aleuroviggianus halperini	2021110001010100100?0?0?1110?000024?010111031?200?40001011100000000?00010010000000000000101000
Aleuroviggianus polymorphus	202111000101010AA0A10?0?1110?000024?010111031?200?101010111A0000000?000100A000000000000010100A
Aleuroviggianus zonalus	20B1110000?10100100?0?0?1110?000020?010211031?200?11101011100000000?01010000000000000000101000
Aleyrodes amnicola	1?01110001011100100?0?0?0000?000020?010111031?201001100?00101000000?10100000000000000000101000
Aleyrodes elevatus	200111000101110210110?0?0000?000020?010111031?201000001010011000000?1010001000000000000010100A
Aleyrodes lonicerae	1?0111000101A10A10A00?0?0000?000020?010115031?201000101010111000000?10010000000000000000101000
Aleyrodes proletella	1?01110001010100100?0?0?0000?000021?000115031?201000101010101000000?10010000000000000000101000
Aleyrodes pruinosus	1?01110001010100100?0?0?0000?000021?010111031?201000101010101000000?10010000000000000000101000
Aleyrodes singularis	1?01110001010101100?0?0?0000?00005??110111031?201000100?00101000000?1001000000000000000010100A
Aleyrodiella	2101110000?101000?0?0?0?07013000021?000237011?200?00001010101000100?01010010100000000000101000
Apobemisia	2021110000?101010?110?0?1110?000024?000211031?211000001111100000000?00010010000000000000101000
Arachnaleyrodes	2001110000?1112010100?0?0410?00001??11013300???00?41100?00100000000100101000000000000000101100
Asialeyrodes lushanensis	0?01111000?111000?100?0?01013000021?00023700???00?51101010000000000?01010000000000000000101000
Asialeyrodes maesae	0?01111001011100100?0?0?01011000021?11023700???00?61100?00101000000?01100010000000000000101000
Asterobemisia carpini	1?011100010101000?100?0?0700?000020?010111031?201011100?111A0000000?01010010000000000000101000
Asterobemisia dentata	1?0111000101010010100?0?0700?000023?0101110300?01011100?11100000000?01010010000000000000101000
Asterobemisia obenbergeri	21011100010101000?100?0?0700?000020?0101110300?01011101010100000000?01010010000000000000101000
Asterochiton cordiae	1?0111000101010010110?0?01113000020?010117021?001011001011100000000?010100000000000000001010A0
Asterochiton pittospori	1?0111000101010110110?0?0110?000020?010211031?701051101010000000000?01010010000000000000101000
Bellitudo hispaniolae	21011100010111020?0?0?0?01113000021?011237011?201061101010100000000?0101000000000110000010100?
Bellitudo jamaicae	21011100010111010?0?0?0?01113000021?011237011?401061101010100000000?01010000000001100000101000
Bemisaleyrodes brideliae	1?0111000101010014140?0?0810?000025?0102110300?01041101011010000010?01010010000000000000101010
Bemisaleyrodes pauliani	1?0111000101010014140?0?0900?001022?010211031?201041101011000000000?01010000000000000000101010
Bemisia afer	1?011100010101000?1A0?0?0010?000025?0101170300?010111010111A0000000?010100A0000000000000101000
Bemisia antennata	1?0111000101010010110?0?0110?000025?0101170300?01041101011010000000?01010010000000000000101010
Bemisia berbericola	1?011100010101000?1A0?0?0010?000025?0101170300?01011101011110000000?01010010000000000000101000
Bemisia combreticula	20011100010101010?110?0?0110?000020?010111031?201000101011100000000?01010000000000000000101000
Bemisia formosana	1?011100010101020?1A0?0?0100?000020?010117031?201001101011100000000?01010010000000000000101000
Bemisia giffardi	1?011100010101010?1A0?0?0110?001023?0102170300?01011101011100000000?01010010000000000000101001
Bemisia gigantea	1?011100010101000?0?0?0?0110?000025?010217031?201041101011100000000?01010000000000000000101000
Bemisia guieriae	1?011101110111000?110?0?0110?000025?0100170300?01001001011110000000?01010010000000000000101000
Bemisia hirta	0?211100010111010?110?0?0110?000020?010111031?201000001011110000000?01010010000000000000101000
Bemisia lauracea	200111000101010010100?0?0110?000125?010217031?201011101011100000000?11110010000000000000101000

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9 1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Bemisia mesasiatica	1?0111000101110210110?0?0100?000020?010111031?2010000010101000000000?101000000000000000010100?
Bemisia pongamiae	2001110001010100141 40?0?1110?000022?010218031?2010411010101000000000?010100000000000000000101010
Bemisia silvatica	0?0111000101010010100?0?0700?000025?0101110300?0104110101110000000000?010100100000000000000101000
Bemisia subdecipiens	200111000101010000?100?0?0110?000022?0102110301?0100000101110000000000?010100100000000000000101000
Bemisia tabaci	1?01110001010101101A0?0?0010?000020?010011031?201011001011 1A0000000?010100A00000000000000101000
Bemisia tuberculata	1?0111000101010010100?0?0010?000020?010117031?2010110010111100000000?010100100000000000000101000
Bemisiella	2001110001010100101 00?0?0700?000022?010117031?201001100?1110000000000?010100100000000000000101000
Brazzaleyrodes	1?21110001010101 0?1A0?0?0110?000021?011221031?20??01001010100000000?010100000000000000000101001
Bulgarialeurodes	1?011100010101001 00?0?0?1110?000021?000111031?70100000?0110000000000?010100000000000000000101000
Calluneyrodes	200110?000?1010010100?0?0110?000023?0101110301?0101110101110000000000?0101000000000000000001010??
Chitonaleyrodes	1?0110?000?111000?100?0?0110?00005??00023 1021?000?0110101000000000000?010100000000000000000101011
Cockerelliella curcumae	1?01111000?1110010100?0?0000?00015??01123300???00?511011101A00000A0?010100100000000000000101000
Cockerelliella psidii	0?01111000?1110010100?0?0000?00015??00123300???00?511011100A00000A0?010100100000000000000101000
Cohicaleyrodes alternans	230111 0110?111120?0?0?140210?01001??10023300???00?00000?000000000000?0000000000000000000000101000
Cohicaleyrodes crossopterygis	2201110110?11112100?0?0?0210?01001??10023300???00?01100?0000100000 0?010100100000000000000101000
Cohicaleyrodes obscura	2201110110?1111 0100?0?0?0210?01005??11023300???00?00100?0000110000 0?001100000000000000000101000
Cohicaleyrodes platysepali	2001110110?1110 2100?0?0?0210?01005??10022303 1?70100??00?0011110000 0?01010010000000000000010??00
Cohicaleyrodes quadrilongispinae	2201110100?1110 2100?0?0?0210?01005??10013300???00?01100?0111000000 0?010100000000000000000101000
Cohicaleyrodes recurvispina	2201110110?1112 2100?0?0?0610?01005??10023300???00?00000?0000110000 0?001100000000000000000101000
Combesaleyrodes bouqueti	0?21110001011100 0?100?0?1110?00005??10023903 1?710?30000?0111100000 0?001100100000000100000101000
Combesaleyrodes taufflιebi	0?21110001010102 0?100?0?1110?000021?10023103 1?710?30000?0111100000 0?001100100000000100000101000
Corbettia baphiae	0?2111011101110 20?1A0?0?1110?000021?11021503 1?2A10110013111000000000?000101001000000000000001010A1
Corbettia bauhiniae	2001110111011102 1A0?0?0?1110?000021?11021503 1?201000101311100000000 0?010101001000000000000001010A1
Corbettia graminis	1?0?110111011102 1A0?0?0?1110?00001??11021503 1?20??0010131110000000 00?010101100000000000000000101001
Corbettia isoberliniae	0?2111011101110 20?1A0?0?1110?000021?11021503 1?20101100101110000000 00?000101001000000000000001010A1
Corbettia lonchocarpi	2001110111011102 140?0?0?1110?00005??11021503 1?201001101311100000000 0?010101001000000000000001010A1
Corbettia millettiacola	0?2111011101110 20?1A0?0?1110?00005??11021503 1?2A10011013111000000000?000101001000000000000001010A1
Corbettia tamarindi	200?1101110111021 00?0?0?1110?000021?11021503 1?201001101011100000000 0?010101001000000000000000101001
Crenidorsum aroidephagus	2101110A10?1110P0?0?0?0?0210?01015??1102290K1?EA10011011101010000000?011100000000000001000101000
Crenidorsum celebes	21011100010111 1P100?0?0?0610?01005??10013302 1?001000100?00001000000?100100000000100001000101000
Crenidorsum commune	2201110110?11110 0?0?0?0?0210?01005??10013300???00?011012101010000000?011100000000100001000101000
Crenidorsum lasangensis	2201110010?11102 100?0?0?0210?01005??1002310K1?EA1001100?0110000000000?010100000000000000000101000
Crenidorsum magnisetae	2201110110?1111010100?0?0210?01005??1001330C1?7AA001101210100000000 0?011100000000100001000101000
Crenidorsum malpighiae	2201110110?1111010100?0?0210?01005??10013300???00?0110121111000000 0?011100000000100001000101000
Crenidorsum micheliae	2201110110?1110A100?0?0?0210?01005??11013302 1?001000100?00101100000 0?010100000000100001000101000

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9 1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Crenidorsum millennium	2201110110?111000?100?0?0610?010021?11023700???00?01100?00101100000?0011000000000000100010100?
Crenidorsum morobensis	2201110010?11111100?0?0?0610?01005??1001330C1?7A1011000?00101100000?10010000000100000000101000
Crenidorsum stigmaphylli	2201110110?1112010100?0?0210?01005??1001330C1?7AA001100?00100000000?01110000000100001000101000
Crenidorsum tuberculatum	2201?10110?111000?100?0?0210?01005??10013300???00?01101210110000000?01110000000100001000101000
Crescentaleyrodes paulianae	1?01110001010101110?0?0?0401100005??000221011?201041100?00100000000?010100000000000000101010A0
Crescentaleyrodes semilunaris	1?01110001010101110?0?0?04011000021?000221011?201001101210100000000?100100000000000000101010A0
Cryptolingula	2020011110?111200?0?0?0?0410?00005??10020610???00?00000?00100000000?10100000000000000000001011
Dialeurodes agalmae	1?01110000?1010010100?0?0110?00001??011231021?000?61101010010000010?01010010000000000000101000
Dialeurodes ara	0?01110000?1110016170?0?0000?000021?000221031?2A0?51101010000000000?01010000000000000000101000
Dialeurodes armatus	0?0111000101010010100?0?0110?00005??01023300???00?61101010000000000?01010000000000000000101100
Dialeurodes bicornicauda	1?01111001011100100?0?0?0410?000021?001237031?311061101111000000000?01010010000000000000101000
Dialeurodes cerifera	2001110??1011100110?0?0?0700?00005??010231021?000?61101010000000000?01010000000100000000101000
Dialeurodes cinnamomi	1?011100010101000?100?0?0100?000121?10023700???00?41101010100000000?01010010000000000000101000
Dialeurodes citri	1?01110000?1010010100?0?0110?00015??01123300???00?61101110000000000?01010010000000000000101000
Dialeurodes cyathispinifera	0?011101110101121N1H0?0?0111300005??10113300???00?50?01110011100000?0000000000000000000010101?
Dialeurodes decaspermi	0?011100010111100?130?0?0000?000021?100221031?2A0?61100?00000000000?01010000000000000000101010
Dialeurodes dubia	1?0111100101010013130?0?0000?00001??01023300???00?01101110100000000?01010000000000000000101000
Dialeurodes emarginata	1?011100010101000?100?0?0900?000024?010221031?100?71101010100000000?01010010000000000000101000
Dialeurodes erythrinae	21011100010101010?1A0?0?0110?000021?000137011?201011101011101100100?010100000000000000001010A0
Dialeurodes ixorae	1?01110001011100100?0?0?0110?00005??11023300???00?61101110000000000?01010010000000000000101000
Dialeurodes joholensis	1?011110010111000?0?0?0?0110?000021?101215031?200?50001110000000000?01010010000000000000101000
Dialeurodes kirkaldyi	1?0111000101010A10100?0?0110?00015??01123300???00?61101110000000000?010100A0000000000000101000
Dialeurodes lanceolata	21011110010111020?0?0?0?0010?00005??00123300???00?51101210000000010?01010010000000000000101000
Dialeurodes minahassai	0?0111000101010013130?0?0000?000021?000221021?000?61101000000000000?01010000000000000000101000
Dialeurodes mirabilis	1?011110010111010?0?0?0?0110?00003?200123300???00?51101110010000010?01010010000000000000101000
Dialeurodes platicus	1?211100010101100?100?0?1110?00006??10023000???00?51100?00000000000?00010000000000000000101000
Dialeurolobus	200111000A01010010110?0?0410?000021?010137011?201041101011101000000?01010000100000000000101000
Dialeurolonga africana	20011100010111000?0?0?0?0100?00005??110215031?401061101010000000000?01010000100000000000101100
Dialeurolonga communis	20011100010101000?0?0?0?0110?00005??110223031?401061101011A00000A00?010101000000000000001011A0
Dialeurolonga elliptica	1?011100010101000?0?0?0?0110?000024?110221031?4A1061100?10000000100?01010000000000000000101100
Dialeurolonga elongata	1?011100010111000?0?0?0?0110?000024?111221031?401061101010100000A00?01010A000000000000001011A0
Dialeurolonga hoyti	1?011100010111020?0?0?0?1110?00005??111227031?401061101010101000100?01010110000000000000101100
Dialeurolonga maculata	1?01110001011100100?0?0?0110?000021?0002310K1?BA0?41101011100000000?01010000000000000000101000
Dialeurolonga nemoralis	1?011100010111000?0?0?0?0110?00005??110221031?401061101010000000100?01010110000000000000101100
Dialeurolonga phyllarthronis	20011100010111000?0?0?0?0100?00005??110221031?401061100?00000000000?110100000000000000001011A0

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9 1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Dialeurolonga ravensarae	20011100010111000?0?0?0?1110?000024?111223021?00101110101010000100?010101000000000000000101110
Dialeurolonga rusostigmoides	1?01110001010100 0?100?0?0410?001024?010221031?40106110101100000000 0?010100100000000000000101000
Dialeurolonga swainei	2001110000?111000?0?0?0?1110?000021?110220031?400?61100?0110000000 0?101000001000000000000101000
Dialeurolonga tenella	1?011100010101000?100?0?0010?000021?110221031?401061101010000000000?010100000000000000000101100
Dialeurolonga trialeuroides	1?011100010101000?0?0?0?0110?000024?011221031?401041101010100000100?010100000000000000000101100
Dialeuropora brideliae	1?011110010101000?100?0?0010?00005??100231031?610?011011101A0000000?010110100000000000000101000
Dialeuropora decempuncta	1?0111100101010B12110?0?0000?00005??100231031?610?1110111010000000 0?0101A0000000000000000101000
Dialeuropora mangiferae	1?011110010101001010 0?0?0000?00005??100231021?000?41101110100000000?010110000000000000000101010
Dialeuropora papillata	1?0111100101010B10100?0?0010?00005??1002330K1?DA0?311010101A0000000?010110A0000000000000101000
Dialeuropora silvarum	1?011110010101020?100?0?0010?00005??1002K30C1?6A0?11100?00010000100?0101A0100000000000000101000
Dialeuropora viburni	0?01111000?1110110100?0?0000?00005??100226031?610?41100?0010000000000?010110000000000000000101000
Disiphon	210111 0110?1110210 0?0?140210?01011??110221021?001010100?0010100000 0?010100000000000001000101000
Dumbletoniella callistemoni	1?011100010101020?0?0?0?0110?000024?0102210B1?000?11101311100000010?101000100000000000000101000
Dumbletoniella eucalypti	1?011100010101010?0?0?0?0110?00005??0102210B1?000?0010131010000000 0?010100100000000000000101000
Dumbletoniella pittospori	1?011100010111010?0?0?0?0110?00005??11023300???00?1110111010100000 0?010100001000000000000101000
Dumbletoniella rotunda	200110?000?100??0?0?0?0?0110?00005??0102K10B1?000?0110111100000000 0?101000000000000000000101000
Dumbletoniella xanthorrhoeae	20011100010101010?0?0?0?1110?000024?010121031?200?0000111011000000 0?0101001000000000000001010A0
Extensaleyrodes akureensis	1?011100010101000?100?0?0110?000024?010211031?2010411010110000000 00?010100000000000000000101000
Extensaleyrodes falcata	1?011100010101000?100?0?1110?00005??110211031?20104110101100100000 0?010100000000000000000101000
Fascaleyrodes palmae	220111 0110?111120?100?0?0010?01005??100133011?70100010 0?000110010 00?010100000000000000000101000
Fascaleyrodes rara	220111 0110?111120?100?0?0010?01005??100133011?70100010 0?000110010 00?010100000000000000000101000
Filicaleyrodes bosseri	1?011100010111000?0?0?0?0100?00005??111121011?401051101111101000100?010100000000000000000101000
Filicaleyrodes williamsi	1?011100010111000?0?0?0?0100?000020?011111031?401041001111100000100?100100000000000000000101000
Fippataleyrodes indica	1?011100010101000?110?0?0010?00005??10023300???00?0010101010000000 0?010100100000000000000101000
Fippataleyrodes litseae	1?011100010111000?130?0?0110?00005??10123300???00?0010100010000000 0?010100100000000000000101000
Gagudjuia	200110?110?111100?100?0?0100?000021?00023 4021?000?0111100001000001 0?101000100000000000000101000
Gomenella dryandrae	1?0110?000?100??0?0?0?0?0101300021?01123700???00?61101011000000000 0?101000000000000000000101000
Gomenella multipora	200110?000?10101110?0?0?0001300005??000233011?200?5010111101000000 0?1010001000000000000010??01
Harpaleyrodes	0?2?1101110111011A110?0?0101300005??01123300???00?0010100100100001 0?01010010A000000000001010A1
Hempelia	220110?010?10112110?0?0?0211200000??100222021?000?01100?0000100000 0?101100000001000000000101001
Heteraleyrodes	210111 0110?10102100?110?0310?01005??100233021?0010001012101010000 00?001100000000000001000101000
Heterobemisia	20011???010101000?100?0?0700?000023?010127011?20101110101110000000 0?010100000000100000000101000
Indoaleyrodes glochidioni	1?0110?000?101100?0?0?0?0100?000022?010111031?20105110100100000001 0?101000000000000000000101000
Indoaleyrodes laos	1?011100010101000?0?0?0?0110?000022?010211031?20106110100100000000 0?101100000000000000000101000
Indoaleyrodes pseudoculatus	0?011100010101001 00?0?0?0100?000020?010211031?2010611 00?001000000000?101100000000000000100101000

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9 1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Kanakarajiella	1?01111000?1110010100?0?0010?00003?20112330B1?000?51101100100000000?010100100000000000000101000
Leucopogonella pallida	1?0110?000?111000?110?0?1110?00005??10023300???00?00100?0001100000?0101001000010000000101?00
Leucopogonella simila	1?0110?000?111210?110?0?1110?00006??10023000???00?00000?0010100000?0101000000100000000101000
Lipaleyrodes atriplex	2001110001010102100?0?0?0010?000024?01011031?201000101011000000000?0101000000000000000000101000
Lipaleyrodes breyniae	1?01110000?1101100?0?0?0110?000020?01001103l?2A1001100?0100000000?01010000000000000000001101000
Lipaleyrodes crossandrae	1?011100010111011100?0?0?00113000020?01001403l?2A1000100?0110000000?01010000000000000000001101000
Lipaleyrodes euphorbiae	1?0111000A01110210O?0?0?01113000020?00001103l?2A1001100?0110000000?00010000000000000000001101000
Lipaleyrodes phyllanthi	1?01110000?11102100?0?0?00013000020?00001103l?2A1001100?0110000000?01010000000000000000001101000
Malayaleyrodes	0?01111000?1110?10100?0?0101100005??00123102l?000?5???1000000000000?0101001000000000001000??????
Marginaleyrodes	220111000O?12110110?0?0?0211301005??10113300???00?01000?0010000000?1011000010010000000000101000
Massilieurodes americanus	1?0111100101110P101A0?0?0010?00003?20112230 21?000?2110111000000010?0101001000000000000000101000
Massilieurodes chittendeni	1?01111000?1A10010100?0?0010?00003?20112230O???00?0110111000000010?0101001000000000000000101000
Massilieurodes euryae	1?01111001011100101 00?0?0010?00005??01122302l?000?5110111010000000?0101000000000000000000101000
Massilieurodes fici	1?0111100101110013100?0?0010?00005??01123300???00?5110111010000000?0101000000000000000000101000
Massilieurodes setiger	1?011110010101001 01A0?0?0010?00005??01122302l?000?2110111000000000?0101000000000000000000101000
Metabemisia filicis	1?21110001011102110?0?0?1110?000023?01001903l?20106000101010000010 0?0101000000000000000000101000
Metabemisia palawana	1?211100010111021G0?0?0?0110?00005??11111903l?400?100010101100000000?0101000000000000000000101000
Minutaleyrodes minuta	1?01111000?111000?0?0?0?1410?00005??11023300???00?5100131001000000?0101001000000000000000101000
Minutaleyrodes suishanus	1?0111A000?111000?0?0?0?1410?00005??11123300???00?5100121011000000?0101001000000000000000101000
Mixaleyrodes	2001110?00?111010?0?0?0?0310?01005??11003301l?201001100?0011100000?0111000000000000000000101000
Neoaleurotrachelus bertilloni	2201110000?1011B12120?0?0210?01003?01102210O???00?61100?0010100000?1111000000000000001000101000
Neoaleurotrachelus graberi	2201110000?1011010120?0?0210?01003?01102210O???00?61100?0010100000?1111000000000000001000101000
Neomaskellia andropogonis	20011100010101021l0?0?0?1110?00006??1102120 31?80100000O?0010100000?0010000000000000000000101001
Neomaskellia bergii	1?0111000101010211O?0?0?1110?00016??11021203l?80100000O?0010100000?0000000000000000000000101001
Neopealius	1?0111000101010 00?100?0?0110?000024?00011103l?2010401010101000000000?0101000000000000000000101000
Nigrasialeyrodes	200110?000?10101100?0?0?0701100005??10023102l?000?51100?0000100000 0?0101000000000000000000101011
Orchamoplatus caledonicus	2001110001110102100?0?0?0200?00015??11013300???00?81100?00000000011010100001000000000000101000
Orchamoplatus citri	2001110001110102100?0?0?0610?00005??11013300???00?81100?000000000110101000000000000000000101000
Orchamoplatus dentatus	220110?0011101121 00?0?0?0200?00015??11013300???00?81000?0010000000111001000010000000000000101000
Orchamoplatus louiserussellae	1?0111000111011210O?0?0?0200?00015??11023300???00?81100?000000000111001000000000000000000101000
Orchamoplatus mammaeferus	1?0110?0011101021 00?0?0?0200?00015??11013300???00?81100?0010000000111001000000000000000000101000
Orchamoplatus montanus	1?0111000111011210O?0?0?0200?00005??11013300???00?81100?0010000000111001000000000000000000101000
Orchamoplatus niuginii	1?01110001110112100?0?0?0200?00015??11013300???00?80000?0010000000111001000000000000000000101000
Orchamoplatus noumeae	1?01110001110102100?0?0?0200?00005??11013300???00?81100?0010000000110001000000000000000100101000
Orchamoplatus plumensis	0?01110001110102100?0?0?0200?00005??11013300???00?40100?00100000001110010000000000000000000101?00

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9 1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Orchamoplatus porosus	1?01110001110112100?0?0?0200?00015??1?0127?31?200?80000?00100000001110010000000000000100101000
Orientaleyrodes	1?01110000?11112110?0?0?04011000021?10013700???00?41101001100000000?100100001000000000001010A0
Orstomaleyrodes	220111000A110110100?0?0?0210?00005??1A023300???00?11100?00010000000?1001001000000000000000101000
Papillipes	0?2010?000?10102110?0?0?1110?00005??11023300???00?0AA00?01100000100?0101010000000000000000001001
Parabemisia aceris	2001110000?10100100?0?0?0110?000022?000211030 0?01011101011100000000?010100000000000000000010100?
Parabemisia jawani	200010?001010101100?0?0?1110?000021?00022103 1?2A0?21101011000000000?10100000000000000000101001
Parabemisia lushanensis	2001110000?10100100?0?0?1110?000020?00021103 1?20100110101010000000?010100000000000000000101000
Parabemisia myricae	2101110000?10100100?0?0?1110?000020?01011103 1?20100A10101110000000?010100000000000000000101000
Parabemisia myrmecophila	2101110001010101100?0?0?1110?000024?01011103 1?20101010101110000000?010100000000000000000101000
Paraleurolobus	2301110110?111100?0?0?0?01011000021?10023700???00?41100?00100000000?100100001001000000000101000
Paulianaleyrodes splendens	2121110110?111020?0?0?0?0110?00005??10023021?000?00000?01110000010?01010010000000000000101000
Paulianaleyrodes tetracerae	1?21111110?111020?0?0?0?0110?00005??10023021?00100000?01100000010?01010110000000000000101000
Pealius akebiae	2201110000?10101100?0?0?0110?00005??00011103 1?7A1001101111100000000?010100000000000000000101000
Pealius azaleae	2001110001010102100?0?0?0110?00005??01011103 1?70101000111110000000?010100000000000000000101000
Pealius cryptus	2001110000?101020?110?0?1110?00003?200021103 1?70100000101100000000?010100100000000000000101000
Pealius euryae	2201110000?10101100?0?0?0110?000020?00011103 1?20100000121110000000?010100000000000000000101000
Pealius fici	1?B111000A?1010111A10?0?1110?00003?200022503 1?71101110110110000000?0101 00A00000000000000101000
Pealius kelloggi	2101110001012100100?0?0?0110?00005??00010203 1?10101110 0?00000000000?010100000000000000000101000
Pealius liquidambari	F0B11100010111021 0110?0?0110?00003?200022503 1?7A0?10001101100000000?01010000000000000000010100?
Pealius madeirensis	1?011100010111 02110?0?0110?00005??10011103 1?101001100?01000000000?010100000000000000000101000
Pealius mori	2001110000?1010F1A1A0?0?1110?00003?200022503 1?7A1001101111000000100?010101100000000000000101000
Pealius rhododendri	2201110000?1010F1A0?0?0?1110?000020?01011103 1?20100000111110000000?010100000000000000000101000
Pectinaleyrodes culcasiae	2001110010?10102100?0?0?0210?00005??10023300???00?41100?00000000000?110100000000000000000101000
Pectinaleyrodes triclisiae	2001110000?12100100?0?0?0210?00001??11023300???00?41100?00000000000?110100000000000000000101000
Pentaleyrodes cinnamomi	2001110001010102110?0?0?0110?00005??01023300???00?01100?00100000000?010100000001000000000101000
Pentaleyrodes hongkongensis	2001110001010102110?0?0?0110?00005??01023300???00?01100?00100000000?010100000001000000000101000
Pentaleyrodes yasumatsui	2001110001010102110?0?0?0110?00005??01023300???00?01100?00100000000?010100000001000000000101000
Pogonaleyrodes fastuosa	1?2111000101010010110?0?0110?00005??010233021?000?50001210100000010?0101001000000000000??????
Pogonaleyrodes zimmermanni	1?21110001010100140?0?0?0100?000021?01022103 1?20105000101010000010?011100100000000000000101000
Pseudaleuroplatus	200110?001110100100?0?0?0410?00005??11003300???00?01000?00100000000?010100000001000000000101000
Ramsesseus	1?2110?000?0?1000?110?0?1410?000021?11012103 1?20100010101010000000?0101000000000000000010??01
Rhachisphora alishanensis	1?01110000?1110011110?0?0210?010024?01123700???00?51101110001100000?010100000000000100010 1000
Rhachisphora elongatus	1?01110111010101121K0?0?0010?00105??10123300???00?51101010001000000?000100000000000000000101010
Rhachisphora franksae	1?01110000?111001K130?0?0210?010021?100231021?010?51101110001100000?010100000000000000000101010
Rhachisphora koshunensis	0?011101110101001K130?0?0210?01001??11123300???00?51101110001100000?010100000000000000000101010

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9
	1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Rhachisphora maesae	1?01110110?1010011110?0?0210?010024?00123700???00?51101110101100000?0101000000000000000000101000
Rhachisphora rutherfordi	1?01110110?111001K130?0?1410?010024?11123700???00?61001010001100000?0101000000000000000000101010
Rhachisphora trilobitoides	1?01110000?11100110?0?0?0210?01005??10123300???00?61101010001100000?0101000010000000000000101000
Rositaleyrodes	1?01110001010102101 10?0?01011000021?010237011?20104110101010100000?1101000010000000000000101000
Rugaleyrodes angolensis	220111000 0?1010B0?100?0?0610?01005??11011100???00?00100?00011100000?0111001000010000000000101000
Rugaleyrodes bidentata	210111000 0?101001010 0?0?0210?01005??11021100???00?41100?00101000000?0111001000010000100000101000
Rugaleyrodes tetracerae	210111000 0?1010?0?100?0?0200?01005??11012100???00?00100?00011100000?0111001000010000000000101000
Rusostigma eugeniae	1?011100010111001010 0?0?0100?000021?001221021?000?61101100100000000?0101000000000000000000101000
Rusostigma radiirugosa	1?0111000101110 01C1C0?0?0100?000021?001221021?000?61101200100000000?0101000000000000000000101000
Rusostigma tokyonis	1?01110001011120 0?100?0?0100?000021?100225021?000?61101200100000000?0101000000000000000000101000
Russellaleyrodes	1?011100010101 0B10100?0?0210?00005??1002330B1?0A0?41101210001000000?1111100000000000000000101000
Setaleyrodes mirabilis	2010110001010102110?0?0?1110?00003?201022103 1?7A1010001F1111100000 0?0101001000000000000000101000
Setaleyrodes thretaonai	20101100010101021111 0?0?1110?00003?201022103 1?701010001F1111100000 0?0101001000000000000000101000
Setaleyrodes vigintiseta	202110?000?10102110?0?0?0110?00003?100023503 1?1110011010101000000 00?0101001000000000000000101000
Simplaleurodes	220111000 0?101100?100?0?0110?00005??10023300???00?00100?00001000000?0011000000010000000000101?0?
Singhiella bicolor	1?011100010101001010 0?0?0110?00005??01123700???00?11101110100000000?0101000000000000000000101000
Singhiella cardamomi	1?01110000?111000?130?0?0000?00005??00122302 1?000?51101110000000000?0101000000000000000000101000
Singhiella chinensis	1?011100010101011515 0?0?0000?00005??01023300???00?00001110010000000?0101001000000000000000101000
Singhiella citrifolii	1?01110000?111001313 0?0?0010?00005??01023300???00?61101110000000000?0101000000000000000000101000
Singhiella delamarei	1?0111000101010113 0?0?0?0110?00005??00023300???00?01101110010000100?0101010000000000000000101000
Singhiella kuraruensis	1?01110000?1110013 0?0?0?0110?00005??10023300???00?51000?0000000000 0?0101000000000000000000101000
Singhiella premnae	1?0111100101110113 0?0?0?0110?00005??00023302 1?0A0?11101110100000100?0101010000000000000000101000
Singhiella subrotunda	1?01110001011102111A0?0?0100?00005??10023300???00?21001210000000100?0101010000000000000000101000
Singhius hibisci	1?011110010111 0F0?0?0?0?0010?00003?10002330 0???00?21101110100000000?0101001000000000000000101000
Singhius russellae	1?01111001011100 0?0?0?0?0010?00003?10002330 0???00?01101110110000010?0101001000000000000000101000
Siphoninus immaculatus	1?011100010111021 00?12140110?00005??11011503 1?20104010 0?00000000000?0000000000000000000000101000
Siphoninus phillyreae	1?011100010111021 00?12140110?00005??11010503 1?10104000 0?0010000000 0?0000000000000000000000101000
Taiwanaleyrodes carpini	2101111001010102 0?0?0?0?01113000021?0011330 0???00?21001010010000010?0101001000000000000000101000
Taiwanaleyrodes meliosmae	2121111001010 10F0?0?0?0?0110?00005??0011330 0???00?00101210000000000?0101001000000000000000101000
Tetraleurodes acaciae	2201110110?1110F0?0?0?0?0211000005??1001330 0???00?01100?001A0000010?1001001000010000000000101000
Tetraleurodes andropogoni	2201110100?100??0?0?0?0?0411100005??1002330 0???00?01100?0010000000 0?1011000010010000000000101000
Tetraleurodes banksiae	1?0110?000?101000?0?0?0?0001300005??1102330 0???00?00000?0100000000 0?1010000000000000000000101000
Tetraleurodes bicolor	2201110000?1011110 0?0?0?01A1301005??1002330 0???00?01100?0010000000 0?1011000000010000000000101000
Tetraleurodes caulicola	2121110110?1110A0?0?0?0?0211000005??1002330 0???00?01100?0010100001 0?1011000000010000000000101000
Tetraleurodes confusa	220110?110?111120?0?0?0?02111000021?1002330 0???00?01100?0010000000 0?1001000010010000000000101000

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9 1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Tetraleurodes granulata	2101110010?1010F0?0?0?0401100001??10013300???00?01100?0010100000 0?0101001000010000000000101000
Tetraleurodes pluto	2001110000?1110100?0?0?0401100003?110023400???00?41100?0000100000 0?0101000010010000000000101010
Tetraleurodes quercicola	232110?000?0?110100?0?0?0211001005??10023300???00?01100?0110100000 0?1111000010010000000000101000
Tetraleurodes selachidentata	2420010010?111120?0?0?0?0501100005??10023300???00?00000?0110000000 0?0101000000010000000000101000
Tetraleurodes stirlingiae	200110?000?0?0??0?0?0?0?0211200001??10013700???00?01100?0010110000 0?0101000010000000000000101100
Tetraleurodes sulcistriatus	220110?001110102100?0?0?0211100005??10013300???00?01100?0000100000 0?1001001010000000000000101000
Tetralicia ericae	1?21110000?101010?0?0?0?0110?00005??11013300???00?00000?0011100000 0?0101000000000000000000101000
Tetralicia graminicola	1?21110010?111020?0?0?0?0110?00005??10013300???00?00100?0011100000 0?0101000000010000000000101000
Tetralicia iberiaca	1?2?10?000?111000?0?0?0?0110?00005??10023300???00?00000?0010110000 0?0101000000010000000000101000
Tetralicia tuberculata	2021110010?111020?0?0?0?0110?00005??11023300???00?00000?0011100000 0?0101001000000000000000101000
Trialeurodes abutiloneus	20001100010101 0A0?0?0?0?0110?000024?011111031?40100000101110000010 0?01010A0000000000000000101001
Trialeurodes bruneiensis	2001110001010101 0?0?0?0?0110?000024?011111031?40100000101110000010 0?0101000000000000000000101001
Trialeurodes darwiniensis	2001110001010100 0?0?0?0?0110?000024?010221031?40100000101110000010 0?0101000000000000000000101100
Trialeurodes dicksoniae	200110?0010101000?0?0?0?0110?000024?011111031?40101000101110000010 0?0101000000000000000000101000
Trialeurodes drewsi	2001110000?101000?0?0?0?0110?000024?011111031?40100000101110000010 0?1111010000000000000000010100?
Trialeurodes ericae	1?0011011101010 00?0?0?0?1110?000024?010111031?40100000 0?0110000010 0?1111010000000000000000101001
Trialeurodes floridensis	2001110001010100 0?0?0?0?0110?0000M4?011227011?40104100101111000010 0?0101001000000000000000101001
Trialeurodes pergandei	1?0111000101010 10?0?0?0?0110?000024?011111031?40100000101110000010 0?1101000000000000000000101101
Trialeurodes rex	1?0011000101110 10?0?0?0?0010?000024?000121031?40100000 0?0110000010 0?1010000000000000001001 01000
Trialeurodes vaporariorum	2001110001010101 0?0?0?0?0110?000024?011121031?40104000101110000010 0?11010A0000000000000000101001
Trialeurodes variabilis	2001110001010101 0?0?0?0?0110?000024?011127031?40100000101 11A0000A00?1001000000000000000000101101
Tuberaleyrodes	1?0111100101110211110?0?0000?00005??011233021?000?011011100100000000?0101001000000000000000101000
Vasdavidius cobarensis	2001110001011110 0?100?0?1110?000021?110215031?20100000 0?0010000000 0?0010000000000000000000101001
Vasdavidius concursus	210111000101110110100?0?1110?000024?010115031?20100000111010000000 0?0101000000000000000000101000
Vasdavidius indicus	202111000101110F1A100?0?1110?000024?010115031?20100000111110100000 0?0101000000000000000000101000
Vasdavidius setiferus	2001110001010100120?0?0?1110?000021?110215031?2A100000111010100000 0?0101000000000000000000101000
Venezaleurodes	F0011100010101000?130?0?0110?000020?011217031?40100110101110000010 0?1111010000000000000000101001
Viennotaleyrodes bicolorata	2000110001010102 0?0?0?0?1110?00105??11013300???00?40000?0110000000 0?1010001000000000000000001001
Viennotaleyrodes bosciae	202011011101110211110?0?0110?00105??11023300???00?00000?0011000000 0?0001001000010000000000001001
Viennotaleyrodes curvisetosus	2000110111011101 0?0?0?0?11?0?00005??11023301 1?20100110 0?0010000001 0?1001001000000000000000010A1
Viennotaleyrodes fallax	2020110111010102 0?100?0?0110?00105??11021503 1?20100000 0?0111000000 0?1001001000010000000000001001
Viennotaleyrodes lacunae	200010?1110100??0?0?0?0?1111100005??11022302 1?00100010 0?0000000000 0?1010000010000000000000001011
Viennotaleyrodes megapapillae	0?2011011101010 20?0?0?0?1110?00105??11023301 1?20104110 0?0110000000 0?1011001000000000000000001001
Viennotaleyrodes platysepali	2020110111010102 0?1C0?0?0110?00105??11023301 1?20100000 0?0111000000 0?1001001000000000000000001001
Xenaleyrodes artocarpi	2020110001110112100?120?0100?00015??1110210B1?000?40000?00000000000?0101000010000000000000101000

Appendix D. (Continued).

	1 2 3 4 5 6 7 8 9
	1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
Xenaleyrodes broughae	2421110001110112100?120?0600?00015??11023300???00?00000?00100000000?0101000010010000000101000
Xenaleyrodes fauceregius	2020110001111102111112140600?00015??110221021?000?00000?00101000000?1011000010000000000101000
Yleyrodes	2001110001110100100?0?0?11111000020?000211031?201011101000100000000?0101000000000000000101000
Zaphanera capparis	2101110000?10102110?0?0?01A0?00005??10023300???00?01100?00101000000?0101000010010000000101000
Zaphanera cyanotis	2101110000?10102110?0?0?0210?00005??10023300???00?01100?00101000000?0101000010010000000101100
Zaphanera niger	200110?000?11100130?0?0?1410?00005??110233011?200?01100?00100000000?0101001000000000000101010
Zaphanera papyrocarpae	200110?000?1110013130?0?1410?00005??110233011?200?01101310101000000?0101001000000000000101011
Zaphanera rhachisreticulata	250110?000?11100130?0?0?1410?00005??110223011?200?01100?00101000000?0101000010010000100101010
New genus 1 sp 1	2621110000?1110B0?0?0?0?0610?00005??10023300???01001100?00101000000?0101000000000000000101000
New genus 1 sp 2	2121110000?111020?0?0?0?0610?00005??10023300???01011100?00101000000?0101001000000000000101000
New genus 2 sp 1	1?011100011101021G130?0?0110?000024?11123300???01051101010010000000?0101001000000000000101010
New genus 2 sp 2	1?211100011101021G130?0?0110?00005??10023300???00?51101010010000010?0101001000000000000010??10
Out-groups	
Stenaleyrodes	2001110110?1211010100?0?0100?000020?0000181300?01140000?00100000100?1010000000010000000001011
Dialeurodicus	0?01110110?1110010100?0?0010?000021?000215131?501140000?00100000000?1010000000000000000011011
Aleurodicus cocois	0?0010?110?1210110100?0?0110?00005??0002151302?11100000?01100000000?1010001000100000000011010
Aleurodicus dispersus	0?0010?110?12101100?0?0?0100?000021?0002151302?11100000?01000000000?1010000000100000000011010
Azuraleurodicus	0?0110?000?1210A100?0?0?1110?00003?0000216131?511100000?01100000000?0010000000100000000011010
Eudialeurodicus	1?01110110?1010010100?0?0000?00006??100228031?801000000?01000000000?0111001000100000000011011
Octaleurodicus	1?0110?110?1110010100?0?0000?000024?010215131?201100000?00100000000?0111000000110000000001101?
Synaleurodicus	1?0110?000?12100120?0?0?????0?00005??110218131?2A0?00000?00100000100?1000000000100000000001100?

For monobasic genera and/or those genera, for which only one species were available for study, the names of species were deleted in the data matrix in order to be indicated in the obtained trees from the other genera with multiple representative species. See Appendix C for the species names of these genera.

Appendix E: host plant association of the whitefly species selected for the phylogenetic study

Note: an asterisk indicates families unplaced to order but included in higher groups. All botanical names follow the system of the Angiosperm Phylogeny Group (Bremer et al. 1998, 2003; Soltis et al. 2000). Pteridophyta (ferns) are unplaced to higher group (§ shows orders of Pteridophyta). ‡ shows the only gymnosperm record (unplaced to higher group). Bold taxa are out-groups.

Species	Host plant family	Host plant order	Host plant higher group
Acanthaleyrodes callicarpae	Euphorbiaceae, Rosaceae, Verbenaceae, Vitaceae*	Lamiales, Malpighiales, Rosales	euasterids I, eurosids I, rosids
Acanthaleyrodes spiniferosa	Ebenaceae	Ericales	asterids
Acanthaleyrodes styraci	Styracaceae	Ericales	asterids
Acanthobemisia distylii	Hamamelidaceae	Saxifragales	core eudicots
Acaudaleyrodes africana	Fabaceae	Fabales	eurosids I
Acaudaleyrodes rachipora	Euphorbiaceae, Fabaceae	Fabales, Malpighiales	eurosids I
Acaudaleyrodes tuberculata	Combretaceae, Euphorbiaceae	Malpighiales, Myrtales	eurosids I, rosids
Acutaleyrodes palmae	Arecaceae	Arecales	commelinids
Africaleurodes coffeacola	Combretaceae, Euphorbiaceae, Malvaceae, Rhamnaceae, Rubiaceae, Sapindaceae	Gentianales, Malpighiales, Malvales, Myrtales, Rosales, Sapindales	euasterids I, eurosids I, eurosids II, rosids
Africaleurodes fulakariensis	Moraceae	Rosales	eurosids I
Africaleurodes hexalobi	Annonaceae, Apocynaceae	Gentianales, Magnoliales	euasterids I, magnoliids
Africaleurodes loganiaceae	Icacinaceae*, Loganiaceae, Malvaceae, Pandaceae, Rubiaceae, Salicaceae	Gentianales, Malpighiales, Malvales	euasterids I, eurosids I, eurosids II
Africaleurodes ochnaceae	Malvaceae, Ochnaceae	Malpighiales, Malvales	eurosids I, eurosids II
Agrostaleyrodes arcanus	Poaceae	Poales	commelinids
Aleurocanthus banksiae	Myrtaceae, Proteaceae	Myrtales, Proteales	eudicots, rosids
Aleurocanthus calophylli	Clusiaceae	Malpighiales	eurosids I
Aleurocanthus ceracroceus	Lauraceae, Monimiaceae, Myrtaceae	Laurales, Myrtales	magnoliids, rosids
Aleurocanthus citriperdus	Rutaceae	Sapindales	eurosids II
Aleurocanthus cocois	Arecaceae, Lauraceae, Myrtaceae	Arecales, Laurales, Myrtales	commelinids, magnoliids, rosids
Aleurocanthus delottoi	Rutaceae, Ulmaceae	Sapindales, Rosales	eurosids I, eurosids II
Aleurocanthus esakii	Rosaceae	Rosales	eurosids I
Aleurocanthus gateri	Arecaceae	Arecales	commelinids
Aleurocanthus gordoniae	Theaceae	Ericales	asterids
Aleurocanthus inceratus	Magnoliceae, Rutaceae	Magnoliales, Sapindales	eurosids II, magnoliids
Aleurocanthus leptadeniae	Apocynaceae, Brassicaceae, Zygophyllaceae*	Brassicales, Gentianales	euasterids I, eurosids I, eurosids II
Aleurocanthus spiniferus	Annonaceae, Convolvulaceae, Ebenaceae, Elaeocarpaceae, Euphorbiaceae, Hamamelidaceae, Lardizabalaceae, Rosaceae, Rutaceae, Sabiaceae*, Salicaceae, Vitaceae*	Ericales, Magnoliales, Malpighiales, Oxalidales, Ranunculales, Rosales, Sapindales, Saxifragales, Solanales	asterids, core eudicots, euasterids I, eudicots, eurosids I, eurosids II, magnoliids, rosids
Aleurocerus cerifer	Dilleniaceae*, Sapotaceae	Ericales	asterids, core eudicots
Aleurocerus flavomarginatus	Arecaceae, Musaceae	Arecales, Zingiberales	commelinids
Aleurocerus musae	Bignoniaceae, Rubiaceae, Zingiberaceae	Gentianales, Lamiales, Zingiberales	euasterids I, commelinids
Aleurocerus palmae	Arecaceae, Sapotaceae	Arecales, Ericales	asterids, commelinids
Aleurochiton acerinus	Sapindaceae	Sapindales	eurosids II
Aleurochiton aceris	Sapindaceae	Sapindales	eurosids II
Aleurochiton forbesii	Sapindaceae	Sapindales	eurosids II
Aleurochiton pseudoplatani	Sapindaceae	Sapindales	eurosids II
Aleuroclava aucubae	Aquifoliaceae, Araliaceae, Caprifoliaceae, Cornaceae, Juglandaceae, Lauraceae, Moraceae, Oleaceae, Pittosporaceae, Rosaceae, Rubiaceae, Rutaceae, Salicaceae, Theaceae, Ulmaceae	Apiales, Aquifoliales, Cornales, Dipsacales, Ericales, Fagales, Gentianales, Lamiales, Laurales, Malpighiales, Rosales, Sapindales	asterids, euasterids I, euasterids II, eurosids I, eurosids II, magnoliids
Aleuroclava bifurcata	Sapindaceae	Sapindales	eurosids II
Aleuroclava citrifolii	Rutaceae	Sapindales	eurosids II

Appendix E. (Continued).

Species	Host plant family	Host plant order	Host plant higher group
Aleuroclava euryae	Aquifoliaceae, Ericaceae, Lauraceae, Magnoliaceae, Theaceae, Trochodendraceae	Aquifoliales, Ericales, Laurales, Magnoliales	asterids, euasterids II, magnoliids
Aleuroclava ficicola	Moraceae	Rosales	eurosids I
Aleuroclava filamentosa	Euphorbiaceae, Rubiaceae	Gentianales, Malpighiales	euasterids I, eurosids I
Aleuroclava hikosanensis	Aquifoliaceae, Buxaceae, Lauraceae, Pittosporaceae, Theaceae	Apiales, Aquifoliales, Ericales, Laurales	asterids, euasterids II, magnoliids
Aleuroclava jasmini	Combretaceae, Euphorbiaceae, Myrsinaceae, Oleaceae, Rubiaceae, Rutaceae	Ericales, Gentianales, Lamiales, Malpighiales, Myrtales, Sapindales	asterids, euasterids I, eurosids I, eurosids II, rosids
Aleuroclava magnoliae	Actinidiaceae, Betulaceae, Clethraceae, Cornaceae, Ericaceae, Fabaceae, Hamamelidaceae, Lauraceae, Magnoliaceae, Oleaceae, Rosaceae, Sapindaceae, Saxifragaceae	Cornales, Ericales, Fabales, Fagales, Lamiales, Laurales, Magnoliales, Rosales, Sapindales, Saxifragales	asterids, core eudicots, euasterids I, eurosids I, eurosids II, magnoliids
Aleuroclava murrayae	Lauraceae, Proteaceae, Rutaceae	Laurales, Proteales, Sapindales	eudicots, eurosids II, magnoliids
Aleuroclava nigeriae	Anacardiaceae, Bignoniaceae, Combretaceae, Ebenaceae, Loganiaceae, Moraceae, Myrtaceae, Rubiaceae, Salicaceae, Sapindaceae, Sapotaceae, Simaroubaceae, Ulmaceae, Verbenaceae	Ericales, Gentianales, Lamiales, Malpighiales, Myrtales, Rosales, Sapindales,	asterids, euasterids I, eurosids I, eurosids II, rosids
Aleuroclava piperis	Piperaceae	Piperales	magnoliids
Aleuroclava psidii	Caprifoliaceae, Euphorbiaceae, Lauraceae, Moraceae, Myrsinaceae, Myrtaceae, Rosaceae, Salicaceae, Sapindaceae, Ulmaceae	Dipsacales, Ericales, Laurales, Malpighiales, Myrtales, Rosales, Sapindales	asterids, euasterids II, eurosids I, eurosids II, magnoliids, rosids
Aleuroclava pulcherrimus	Fabaceae	Fabales	eurosids I
Aleuroclava similis	Aquifoliaceae, Ericaceae, Theaceae	Aquifoliales, Ericales	asterids, euasterids II
Aleurocybotus graminicolus	Poaceae	Poales	commelinids
Aleurocybotus occiduus	Cyperaceae, Poaceae	Poales	commelinids
Aleuroduplidens eucalyptifolia	Myrtaceae	Myrtales	rosids
Aleuroduplidens santali	Santalaceae	Santalales	core eudicots
Aleuroduplidens triangularis	Fabaceae	Fabales	eurosids I
Aleuroduplidens wellsae	Fabaceae	Fabales	eurosids I
Aleuroglandulus magnus	Arecaceae	Arecales	commelinids
Aleuroglandulus malangae	Araceae	Alismatales	monocots
Aleuroglandulus striatus	Polygonaceae	Caryophyllales	core eudicots
Aleuroglandulus subtilis	Arecaceae, Rubiaceae	Arecales, Gentianales	commelinids, euasterids I
Aleuroinanis myrtacei	Myrtaceae	Myrtales	rosids
Aleurolobus diastematus	Combretaceae, Salicaceae	Malpighiales, Myrtales	eurosids I, rosids
Aleurolobus graminicola	Poaceae	Poales	commelinids
Aleurolobus hargreavesi	Poaceae	Poales	commelinids
Aleurolobus marlatti	Araceae, Daphniphyllaceae, Moraceae, Rutaceae, Ulmaceae	Alismatales, Rosales, Sapindales, Saxifragales	core eudicots, eurosids I, eurosids II, monocots
Aleurolobus moundi	Sapotaceae	Ericales	asterids
Aleurolobus onitshae	Euphorbiaceae	Malpighiales	eurosids I
Aleurolobus styraci	Styracaceae	Ericales	asterids
Aleurolobus teucrii	Lamiaceae	Lamiales	euasterids I
Aleurolonga cassiae	Fabaceae	Fabales	eurosids I
Aleuromarginatus corbettiaformis	Fabaceae	Fabales	eurosids I
Aleuromarginatus dalbergiae	Fabaceae	Fabales	eurosids I
Aleuromarginatus kallarensis	Fabaceae	Fabales	eurosids I
Aleuromarginatus littoralis	Fabaceae	Fabales	eurosids I
Aleuromarginatus marginiquus	Fabaceae	Fabales	eurosids I
Aleuromarginatus moundi	Fabaceae	Fabales	eurosids I
Aleuromarginatus nemciae	Fabaceae	Fabales	eurosids I
Aleuromarginatus nigrus	Fabaceae	Fabales	eurosids I
Aleuromarginatus serdangensis	Host indet.		
Aleuromarginatus tephrosiae	Fabaceae	Fabales	eurosids I
Aleuropapillatus kumariensis	Verbenaceae	Lamiales	euasterids I
Aleuroparadoxus arctostaphyli	Ericaceae	Ericales	asterids

Appendix E. (Continued).

Species	Host plant family	Host plant order	Host plant higher group
Aleuroparadoxus gardeniae	Ebenaceae, Rubiaceae	Ericales, Gentianales	asterids, euasterids I
Aleuroparadoxus ilicicola	Aquifoliaceae	Aquifoliales	euasterids II
Aleuroparadoxus iridescens	Lamiaceae, Rhamnaceae, Rosaceae	Lamiales, Rosales	euasterids I, eurosids I
Aleuroparadoxus punctatus	Anacardiaceae, Euphorbiaceae, Rosaceae, Salicaceae	Malpighiales, Rosales, Sapindales	eurosids I, eurosids II
Aleuroplatus acaciae	Fabaceae	Fabales	eurosids I
Aleuroplatus berbericolus	Aquifoliaceae, Berberidaceae	Aquifoliales, Ranunculales	euasterids II, eudicots
Aleuroplatus bossi	Apocynaceae, Brassicaceae, Canellaceae, Meliaceae, Polygalaceae, Smilacaceae	Brassicales, Canellales, Fabales, Gentianales, Liliales, Sapindales	euasterids I, eurosids I, eurosids II, magnoliids, monocots
Aleuroplatus cadabae	Apocynaceae, Brassicaceae	Brassicales, Gentianales	euasterids I, eurosids II
Aleuroplatus cockerelli	Asteraceae	Asterales	euasterids II
Aleuroplatus cococolus	Arecaceae, Myrtaceae	Arecales, Myrtales	commelinids, rosids
Aleuroplatus dorsipallidus	Cunoniaceae, Lauraceae, Moraceae	Laurales, Oxalidales, Rosales	eurosids I, magnoliids
Aleuroplatus epigaeae	Ericaceae, Lauraceae	Ericales, Laurales	asterids, magnoliids
Aleuroplatus evodiae	Rutaceae	Sapindales	eurosids II
Aleuroplatus fici	Moraceae	Rosales	eurosids I
Aleuroplatus ilicis	Aquifoliaceae, Ericaceae, Lauraceae	Aquifoliales, Ericales, Laurales	asterids, euasterids II, magnoliids
Aleuroplatus incisus	Clusiaceae, Euphorbiaceae	Malpighiales	eurosids I
Aleuroplatus pectiniferus	Betulaceae, Euphorbiaceae, Malvaceae, Moraceae, Myrtaceae, Rutaceae, Salicaceae, Theaceae	Ericales, Fagales, Malpighiales, Malvales, Myrtales, Rosales, Sapindales	asterids, eurosids I, eurosids II, rosids
Aleuroplatus periplocae	Apocynaceae	Gentianales	euasterids I
Aleuroplatus perseaphagus	Lauraceae	Laurales	magnoliids
Aleuroplatus quercusaquaticae	Fagaceae	Fagales	eurosids I
Aleuropleurocelus nigrans	Boraginaceae*, Caprifoliaceae, Ericaceae, Fagaceae, Lamiaceae, Lauraceae, Ranunculaceae, Rhamnaceae, Rosaceae	Dipsacales, Ericales, Fagales, Lamiales, Laurales, Ranunculales, Rosales	asterids, euasterids I, euasterids II, eudicots, eurosids I, magnoliids
Aleuropteridis eastopi	Oleandraceae	§Aspleniales	
Aleuropteridis filicicola	Oleandraceae, Pteridaceae, Thelypteridaceae	§Aspleniales, §Parkeriales	
Aleuropteridis hargreavesi	Undetermined fern		
Aleuropteridis jamesi	Pteridaceae	§Parkeriales	
Aleuroputeus perseae	Lauraceae, Myrtaceae	Laurales, Myrtales	magnoliids, rosids
Aleurothrixus aepim	Asteraceae, Convolvulaceae, Euphorbiaceae, Rubiaceae, Rutaceae	Asterales, Gentianales, Malpighiales, Sapindales, Solanales	euasterids I, euasterids II, eurosids I, eurosids II
Aleurothrixus antidesmae	Euphorbiaceae	Malpighiales	eurosids I
Aleurothrixus bondari	Malvaceae	Malvales	eurosids II
Aleurothrixus floccosus	Anacardiaceae, Annonaceae, Apocynaceae, Asteraceae, Chrysobalanaceae, Ebenaceae, Liliaceae, Loranthaceae, Malvaceae, Myrtaceae, Nyctaginaceae, Polygonaceae, Rubiaceae, Rutaceae, Sapotaceae, Solanaceae, Zygophyllaceae*	Asterales, Ericales, Caryophyllales, Gentianales, Liliales, Magnoliales, Malpighiales, Malvales, Myrtales, Santalales, Sapindales, Solanales	asterids, core eudicots, euasterids I, euasterids II, eurosids I, eurosids II, magnoliids, monocots, rosids
Aleurothrixus interrogationis	Rhamnaceae	Rosales	eurosids I
Aleurothrixus lucumai	Sapotaceae	Ericales	asterids
Aleurothrixus myrtacei	Myrtaceae	Myrtales	rosids
Aleurothrixus porteri	Anacardiaceae, Lauraceae, Myrtaceae, Rutaceae, Sapotaceae, Solanaceae, Verbenaceae	Ericales, Lamiales, Laurales, Myrtales, Sapindales, Solanales,	asterids, euasterids I, eurosids II, magnoliids, rosids
Aleurothrixus proximans	Lauraceae	Laurales	magnoliids
Aleurothrixus smilaceti	Smilacaceae	Liliales	monocots
Aleurotithius timberlakei	Boraginaceae*		euasterids I
Aleurotrachelus alpinus	Rosaceae	Rosales	eurosids I
Aleurotrachelus ampullatus	Fabaceae	Fabales	eurosids I
Aleurotrachelus asparagi	Liliaceae	Liliales	monocots
Aleurotrachelus atratus	Arecaceae	Arecales	commelinids
Aleurotrachelus camelliae	Theaceae	Ericales	asterids
Aleurotrachelus duplicatus	Rubiaceae	Gentianales	euasterids I
Aleurotrachelus fumipennis	Poaceae	Poales	commelinids

Appendix E. (Continued).

Species	Host plant family	Host plant order	Host plant higher group
Aleurotrachelus limbatus	Ericaceae, Fabaceae	Ericales, Fabales	asterids, eurosids I
Aleurotrachelus longispinus	Rubiaceae	Gentianales	euasterids I
Aleurotrachelus minutus	Moraceae	Rosales	eurosids I
Aleurotrachelus multipapillus	Poaceae	Poales	commelinids
Aleurotrachelus obscurus	Fabaceae	Fabales	eurosids I
Aleurotrachelus tarennae	Rubiaceae	Gentianales	euasterids I
Aleurotrachelus tracheifer	Loganiaceae, Melastomataceae	Gentianales, Myrtales	euasterids I, rosids
Aleurotrachelus trachoides	Asteraceae, Bignoniaceae, Casuarinaceae, Convolvulaceae, Dioscoreaceae, Melastomataceae, Rubiaceae, Solanaceae, Verbenaceae	Asterales, Dioscoreales, Fagales, Gentianales, Lamiales, Myrtales, Solanales	euasterids I, euasterids II, eurosids I, monocots, rosids
Aleurotuba jelinekii	Adoxaceae, Ericaceae, Myrtaceae	Dipsacales, Ericales, Myrtales	asterids, euasterids II, rosids
Aleurotulus anthuricola	Araceae	Alismatales	monocots
Aleurotulus arundinacea	Poaceae	Poales	commelinids
Aleurotulus nephrolepidis	Aspleniaceae, Blechnaceae, Cyatheaceae, Dryopteridaceae (Aspidiaceae), Oleandraceae, Pteridaceae, Schizaeaceae, Thelypteridaceae, Woodsiaceae	§Aspleniales, §Cyatheales, §Parkeriales, §Schizaeales	
Aleurotulus pteridophytae	Selaginellaceae, Pteridaceae, Schizaeaceae	§Parkeriales, §Schizaeales, §Selaginellales	
Aleuroviggianus adanaensis	Fagaceae	Fagales	eurosids I
Aleuroviggianus adrianae	Fagaceae	Fagales	eurosids I
Aleuroviggianus graecus	Fagaceae	Fagales	eurosids I
Aleuroviggianus halperini	Fagaceae	Fagales	eurosids I
Aleuroviggianus polymorphus	Fagaceae	Fagales	eurosids I
Aleuroviggianus zonalus	Fagaceae	Fagales	eurosids I
Aleyrodes amnicola	Salicaceae	Malpighiales	eurosids I
Aleyrodes elevatus	Euphorbiaceae, Moraceae	Malpighiales, Rosales	eurosids I
Aleyrodes lonicerae	Apiaceae, Asteraceae, Balsaminaceae, Brassicaceae, Campanulaceae, Caprifoliaceae, Clusiaceae, Euphorbiaceae, Grossulariaceae, Lamiaceae, Onagraceae, Oxalidaceae, Papaveraceae, Ranunculaceae, Rosaceae, Scrophulariaceae, Urticaceae, Violaceae	Apiales, Asterales, Brassicales, Dipsacales, Ericales, Lamiales, Malpighiales, Myrtales, Oxalidales, Ranunculales, Rosales, Saxifragales	asterids, core eudicots, euasterids I, euasterids II, eudicots, eurosids I, eurosids II, rosids
Aleyrodes proletella	Apiaceae, Asteraceae, Balsaminaceae, Berberidaceae, Brassicaceae, Campanulaceae, Euphorbiaceae, Fabaceae, Fagaceae, Papaveraceae, Ranunculaceae, Scrophulariaceae	Apiales, Asterales, Brassicales, Ericales, Fabales, Fagales, Lamiales, Malpighiales, Ranunculales	asterids, euasterids I, euasterids II, eudicots, eurosids I, eurosids II
Aleyrodes pruinosus	Euphorbiaceae, Rosaceae, Rhamnaceae	Malpighiales, Rosales	eurosids I
Aleyrodes singularis	Euphorbiaceae	Malpighiales	eurosids I
Aleyrodiella lamellifera	Ulmaceae	Rosales	eurosids I
Apobemisia kuwanai	Moraceae	Rosales	eurosids I
Arachnaleyrodes insignis	Combretaceae	Myrtales	rosids
Asialeyrodes lushanensis	Myrtaceae	Myrtales	rosids
Asialeyrodes maesae	Myrsinaceae	Ericales	asterids
Asterobemisia carpini	Anacardiaceae, Betulaceae, Cannabaceae, Caprifoliaceae, Ericaceae, Fabaceae, Fagaceae, Grossulariaceae, Malvaceae, Ranunculaceae, Rosaceae, Salicaceae, Sapindaceae, Saxifragaceae, Ulmaceae	Dipsacales, Ericales, Fabales, Fagales, Malpighiales, Malvales, Ranunculales, Rosales, Sapindales, Saxifragales	asterids, core eudicots, euasterids II, eudicots, eurosids I, eurosids II
Asterobemisia dentata	Moraceae	Rosales	eurosids I
Asterobemisia obenbergeri	Lamiaceae	Lamiales	euasterids I
Asterochiton cordiae	Boraginaceae*		euasterids I
Asterochiton pittospori	Pittosporaceae	Apiales	euasterids II
Bellitudo hispaniolae	Polygonaceae	Caryophyllales	core eudicots
Bellitudo jamaicae	Polygonaceae	Caryophyllales	core eudicots

Appendix E. (Continued).

Species	Host plant family	Host plant order	Host plant higher group
Bemisaleyrodes brideliae	Euphorbiaceae	Malpighiales	eurosids I
Bemisaleyrodes pauliani	Moraceae, Ulmaceae	Rosales	eurosids I
Bemisia afer	Lythraceae, Moraceae, Rutaceae	Myrtales, Rosales, Sapindales	eurosids I, eurosids II, rosids
Bemisia antennata	Boraginaceae*, Fabaceae, Moraceae	Fabales, Rosales	euasterids I, eurosids I
Bemisia berbericola	Berberidaceae, Euphorbiaceae, Moraceae, Rhamnaceae, Rosaceae	Malpighiales, Ranunculales, Rosales	eudicots, eurosids I
Bemisia combreticula	Combretaceae	Myrtales	rosids
Bemisia formosana	Poaceae	Poales	commelinids
Bemisia giffardi	Boraginaceae*, Oleaceae, Rutaceae	Lamiales, Sapindales	euasterids I, eurosids II
Bemisia gigantean	Elaeocarpaceae	Oxalidales	eurosids I
Bemisia guieriae	Combretaceae	Myrtales	rosids
Bemisia hirta	Brassicaceae	Brassicales	eurosids II
Bemisia lauracea	Lauraceae	Laurales	magnoliids
Bemisia mesasiatica	Caprifoliaceae, Rosaceae	Dipsacales, Rosales	euasterids II, eurosids I
Bemisia pongamiae	Fabaceae	Fabales	eurosids I
Bemisia silvatica	Anacardiaceae, Betulaceae, Ericaceae, Fabaceae, Fagaceae, Rhamnaceae, Rosaceae	Ericales, Fabales, Fagales, Rosales, Sapindales	asterids, eurosids I, eurosids II
Bemisia subdecipiens	Myrtaceae	Myrtales	rosids
Bemisia tabaci	Acanthaceae, Amaranthaceae, Anacardiaceae, Annonaceae, Apiaceae, Apocynaceae, Araceae, Aristolochiaceae, Asteraceae, Bignoniaceae, Bixaceae, Brassicaceae, Cannabaceae, Caprifoliaceae, Chrysobalanaceae, Cistaceae, Clusiaceae, Commelinaceae, Convolvulaceae, Cucurbitaceae, Ericaceae, Euphorbiaceae, Fabaceae, Fagaceae, Geraniaceae, Grossulariaceae, Lamiaceae, Lauraceae, Linaceae, Loganiaceae, Lythraceae, Malvaceae, Menispermaceae, Moraceae, Moringaceae, Musaceae, Myrtaceae, Nyctaginaceae, Oleaceae, Oxalidaceae, Passifloraceae, Pedaliaceae, Poaceae, Ranunculaceae, Rhamnaceae, Rosaceae, Rubiaceae, Rutaceae, Salicaceae, Sapindaceae, Scrophulariaceae, Solanaceae, Thymelaeaceae, Ulmaceae, Urticaceae, Verbenaceae, Zygophyllaceae*	Alismatales, Apiales, Asterales, Brassicales, Caryophyllales, Commelinales, Cucurbitales, Dipsacales, Ericales, Fabales, Fagales, Gentianales, Geraniales, Lamiales, Laurales, Magnoliales, Malpighiales, Malvales, Myrtales, Oxalidales, Piperales, Poales, Ranunculales, Rosales, Sapindales, Saxifragales, Solanales, Zingiberales	asterids, commelinids, core eudicots, euasterids I, euasterids II, eudicots, eurosids I, eurosids II, magnoliids, monocots, rosids
Bemisia tuberculata	Euphorbiaceae	Malpighiales	eurosids I
Bemisiella artemisiae	Asteraceae	Asterales	euasterids II
Brazzaleyrodes eriococciformis	Fabaceae	Fabales	eurosids I
Bulgarialeurodes cotesii	Rosaceae	Rosales	eurosids I
Calluneyrodes callunae	Ericaceae	Ericales	asterids
Chitonaleyrodes canberrensis	Fabaceae	Fabales	eurosids I
Cockerelliella curcumae	Musaceae, Zingiberaceae	Zingiberales	commelinids
Cockerelliella psidii	Dipterocarpaceae, Magnoliaceae, Meliaceae, Moraceae, Myrtaceae, Verbenaceae	Lamiales, Magnoliales, Malvales, Myrtales, Rosales, Sapindales	euasterids I, eurosids I, eurosids II, magnoliids, rosids
Cohicaleyrodes alternans	Clusiaceae, Combretaceae, Connaraceae, Euphorbiaceae, Fabaceae, Loganiaceae, Rubiaceae, Salicaceae, Verbenaceae	Fabales, Gentianales, Lamiales, Malpighiales, Myrtales, Oxalidales	euasterids I, eurosids I, rosids
Cohicaleyrodes crossopterygis	Combretaceae, Rubiaceae	Gentianales, Myrtales	euasterids I, rosids
Cohicaleyrodes obscura	Rubiaceae	Gentianales	euasterids I
Cohicaleyrodes platysepali	Fabaceae, Zingiberaceae	Fabales, Zingiberales	commelinids, eurosids I

Appendix E. (Continued).

Species	Host plant family	Host plant order	Host plant higher group
Cohicaleyrodes quadrilongispinae	Annonaceae, Bignoniaceae, Combretaceae, Euphorbiaceae, Fabaceae, Loganiaceae, Melastomataceae, Moraceae, Rubiaceae, Sapindaceae, Verbenaceae, Vitaceae*	Fabales, Gentianales, Lamiales, Magnoliales, Malpighiales, Myrtales, Rosales, Sapindales	euasterids I, eurosids I, eurosids II, magnoliids, rosids
Cohicaleyrodes recurvispina	Annonaceae, Dilleniaceae*, Moraceae, Rubiaceae	Gentianales, Magnoliales, Rosales	core eudicots, euasterids I, eurosids I, magnoliids
Combesaleyrodes bouqueti	Rubiaceae	Gentianales	euasterids I
Combesaleyrodes tauffliebi	Dilleniaceae*, Rubiaceae	Gentianales	core eudicots, euasterids I
Corbettia baphiae	Fabaceae	Fabales	eurosids I
Corbettia bauhiniae	Fabaceae	Fabales	eurosids I
Corbettia graminis	Poaceae	Poales	commelinids
Corbettia isoberliniae	Fabaceae	Fabales	eurosids I
Corbettia lonchocarpi	Fabaceae	Fabales	eurosids I
Corbettia millettiacola	Apocynaceae, Fabaceae	Fabales, Gentianales	euasterids I, eurosids I
Corbettia tamarindi	Fabaceae	Fabales	eurosids I
Crenidorsum aroidephagus	Araceae	Alismatales	monocots
Crenidorsum celebes	Cunoniaceae, Lauraceae	Laurales, Oxalidales	eurosids I, magnoliids
Crenidorsum commune	Polygonaceae	Caryophyllales	core eudicots
Crenidorsum lasangensis	Musaceae	Zingiberales	commelinids
Crenidorsum magnisetae	Polygonaceae	Caryophyllales	core eudicots
Crenidorsum malpighiae	Malpighiaceae	Malpighiales	eurosids I
Crenidorsum micheliae	Magnoliaceae, Myrsinaceae	Ericales, Magnoliales	asterids, magnoliids
Crenidorsum millennium	Myrtaceae	Myrtales	rosids
Crenidorsum morobensis	Myrtaceae	Myrtales	rosids
Crenidorsum stigmaphylli	Malpighiaceae	Malpighiales	eurosids I
Crenidorsum tuberculatum	Polygonaceae	Caryophyllales	core eudicots
Crescentaleyrodes paulianae	Poaceae	Poales	commelinids
Crescentaleyrodes semilunaris	Poaceae	Poales	commelinids
Cryptolingula perplexa	Host indet.		
Dialeurodes agalmae	Araliaceae	Apiales	euasterids II
Dialeurodes ara	Moraceae	Rosales	eurosids I
Dialeurodes armatus	Meliaceae	Sapindales	eurosids II
Dialeurodes bicornicauda	Meliaceae	Sapindales	eurosids II
Dialeurodes cerifera	Celastraceae	Celastrales	eurosids I
Dialeurodes cinnamomi	Lauraceae	Laurales	magnoliids
Dialeurodes citri	Apocynaceae, Araliaceae, Arecaceae, Bignoniaceae, Boraginaceae*, Caprifoliaceae, Ebenaceae, Euphorbiaceae, Fagaceae, Hamamelidaceae, Lauraceae, Lythraceae, Magnoliaceae, Malpighiaceae, Meliaceae, Moraceae, Myrsinaceae, Myrtaceae, Oleaceae, Proteaceae, Rosaceae, Rubiaceae, Rutaceae, Sabiaceae*, Simaroubaceae, Smilacaceae, Staphyleaceae, Theaceae, Vitaceae*	Arecales, Apiales, Crossosomatales, Dipsacales, Ericales, Fagales, Gentianales, Lamiales, Laurales, Liliales, Magnoliales, Malpighiales, Myrtales, Proteales, Rosales, Sapindales, Saxifragales	asterids, commelinids, core eudicots, euasterids I, euasterids II, eudicots, eurosids I, eurosids II, magnoliids, monocots, rosids
Dialeurodes cyathispinifera	Host indet.		
Dialeurodes decaspermi	Myrtaceae	Myrtales	rosids
Dialeurodes dubia	Host indet.		
Dialeurodes emarginata	Loganiaceae, Malvaceae	Gentianales, Malvales	euasterids I, eurosids II
Dialeurodes erythrinae	Fabaceae	Fabales	eurosids I
Dialeurodes ixorae	Rubiaceae, Sapotaceae	Ericales, Gentianales	asterids, euasterids I
Dialeurodes joholensis	Host indet.		
Dialeurodes kirkaldyi	Apocynaceae, Combretaceae, Loganiaceae, Lythraceae, Malpighiaceae, Malvaceae, Oleaceae, Rubiaceae, Rutaceae, Verbenaceae	Gentianales, Lamiales, Malpighiales, Malvales, Myrtales, Sapindales	euasterids I, eurosids I, eurosids II, rosids
Dialeurodes lanceolata	Celastraceae	Celastrales	eurosids I
Dialeurodes minahassai	Myrtaceae	Myrtales	rosids
Dialeurodes mirabilis	Host indet.		

Appendix E. (Continued).

Species	Host plant family	Host plant order	Host plant higher group
Dialeurodes platicus	Myrtaceae	Myrtales	rosids
Dialeurolobus rhamni	Lythraceae, Rhamnaceae	Myrtales, Rosales	eurosids I, rosids
Dialeurolonga africana	Celastraceae	Celastrales	eurosids I
Dialeurolonga communis	Loganiaceae, Rubiaceae, Rutaceae, Sapindaceae	Gentianales, Sapindales	euasterids I, eurosids II
Dialeurolonga elliptica	Apocynaceae	Gentianales	euasterids I
Dialeurolonga elongata	Rubiaceae, Rutaceae, Sapindaceae	Gentianales, Sapindales	euasterids I, eurosids II
Dialeurolonga hoyti	Rubiaceae	Gentianales	euasterids I
Dialeurolonga maculata	Cunoniaceae	Oxalidales	eurosids I
Dialeurolonga nemoralis	Annonaceae	Magnoliales	magnoliids
Dialeurolonga phyllarthronis	Bignoniaceae	Lamiales	euasterids I
Dialeurolonga ravensarae	Lauraceae	Laurales	magnoliids
Dialeurolonga rusostigmoides	Host indet.		
Dialeurolonga swainei	Moraceae	Rosales	eurosids I
Dialeurolonga tenella	Apocynaceae	Gentianales	euasterids I
Dialeurolonga trialeuroides	Host indet.		
Dialeuropora brideliae	Euphorbiaceae, Lardizabalaceae, Lauraceae	Malpighiales, Ranunculales, Laurales	eudicots, eurosids I, magnoliids
Dialeuropora decempuncta	Annonaceae, Araceae, Boraginaceae*, Dipterocarpaceae, Euphorbiaceae, Fabaceae, Lauraceae, Meliaceae, Moraceae, Rosaceae, Salicaceae, Verbenaceae	Alismatales, Fabales, Lamiales, Laurales, Magnoliales, Malpighiales, Malvales, Rosales, Sapindales	euasterids I, eurosids I, eurosids II, magnoliids, monocots
Dialeuropora mangiferae	Anacardiaceae	Sapindales	eurosids II
Dialeuropora papillata	Annonaceae, Arecaceae, Euphorbiaceae, Fabaceae, Linaceae, Malvaceae	Arecales, Fabales, Magnoliales, Malpighiales, Malvales	commelinids, eurosids I, eurosids II, magnoliids
Dialeuropora silvarum	Host indet.		
Dialeuropora viburni	Caprifoliaceae	Dipsacales	euasterids II
Disiphon sp.	Myrtaceae, Piperaceae?	Myrtales, Piperales?	magnoliids?, rosids
Dumbletoniella callistemoni	Myrtaceae	Myrtales	rosids
Dumbletoniella eucalypti	Myrtaceae	Myrtales	rosids
Dumbletoniella pittospori	Pittosporaceae	Apiales	euasterids II
Dumbletoniella rotunda	Myrtaceae	Myrtales	rosids
Dumbletoniella xanthorrhoeae	Liliaceae	Liliales	monocots
Extensaleyrodes akureensis	Host indet.		
Extensaleyrodes falcata	Fabaceae	Fabales	eurosids I
Fascaleyrodes palmae	Arecaceae	Arecales	commelinids
Fascaleyrodes rara	Annonaceae	Magnoliales	magnoliids
Filicaleyrodes bosseri	Undetermined fern		
Filicaleyrodes williamsi	Aspleniaceae, Blechnaceae, Dryopteridaceae (Aspidiaceae), Oleandraceae, Schizaeaceae, Thelypteridaceae, Woodsiaceae	§Aspleniales, §Schizaeales	
Fippataleyrodes indica	Lauraceae, Moraceae, Myrsinaceae, Salicaceae	Ericales, Laurales, Malpighiales, Rosales	asterids, eurosids I, magnoliids
Fippataleyrodes litseae	Lauraceae	Laurales	magnoliids
Gagudjuia allosyncarpiae	Myrtaceae	Myrtales	rosids
Gomenella dryandrae	Proteaceae	Proteales	eudicots
Gomenella multipora	Host indet.		
Harpaleyrodes tuberculata	Combretaceae	Myrtales	rosids
Hempelia chivelensis	Lauraceae	Laurales	magnoliids
Heteraleyrodes bambusicola	Poaceae	Poales	commelinids
Heterobemisia alba	Grossulariaceae	Saxifragales	core eudicots
Indoaleyrodes glochidioni	Euphorbiaceae	Malpighiales	eurosids I
Indoaleyrodes laos	Euphorbiaceae, Rubiaceae	Malpighiales	eurosids I
Indoaleyrodes pseudoculatus	Myrtaceae	Myrtales	rosids
Kanakarajiella vulgaris	Asteraceae, Fabaceae, Myrtaceae, Oleaceae, Rubiaceae	Asterales, Fabales, Gentianales, Lamiales, Myrtales	euasterids I, euasterids II, eurosids I, rosids
Leucopogonella pallida	Ericaceae	Ericales	asterids
Leucopogonella simila	Ericaceae	Ericales	asterids
Lipaleyrodes atriplex	Amaranthaceae	Caryophyllales	core eudicots
Lipaleyrodes breyniae	Euphorbiaceae	Malpighiales	eurosids I

Appendix E. (Continued).

Species	Host plant family	Host plant order	Host plant higher group
Lipaleyrodes crossandrae	Acanthaceae, Amaranthaceae	Lamiales, Caryophyllales	core eudicots, euasterids I
Lipaleyrodes euphorbiae	Euphorbiaceae	Malpighiales	eurosids I
Lipaleyrodes phyllanthi	Asteraceae, Euphorbiaceae	Asterales, Malpighiales	euasterids II, eurosids I
Malayaleyrodes ?lumpurensis	Moraceae	Rosales	eurosids I
Marginaleyrodes ixorae	Rubiaceae	Gentianales	euasterids I
Massilieurodes americanus	Aquifoliaceae, Betulaceae, Cornaceae, Ebenaceae, Ericaceae, Hamamelidaceae, Magnoliaceae, Oleaceae, Symplocaceae	Aquifoliales, Cornales, Ericales, Fagales, Lamiales, Magnoliales, Saxifragales	asterids, core eudicots, euasterids I, euasterids II, eurosids I, magnoliids
Massilieurodes chittendeni	Ericaceae	Ericales	asterids
Massilieurodes euryae	Theaceae	Ericales	asterids
Massilieurodes fici	Euphorbiaceae, Moraceae, Myrsinaceae, Rhamnaceae, Rutaceae, Theaceae, Ulmaceae	Ericales, Malpighiales, Rosales, Sapindales	asterids, eurosids I, eurosids II
Massilieurodes setiger	Adoxaceae	Dipsacales	euasterids II
Metabemisia filicis	Davalliaceae, Dryopteridaceae (Aspidiaceae), Oleandraceae, Pteridaceae, Thelypteridaceae	§Aspleniales, §Parkeriales	
Metabemisia palawana	Dryopteridaceae	§Aspleniales	
Minutaleyrodes minuta	Celastraceae, Rubiaceae	Celastrales, Gentianales	euasterids I, eurosids I
Minutaleyrodes suishanus	Lauraceae, Myrsinaceae	Ericales, Laurales	asterids, magnoliids
Mixaleyrodes ?polystichi	Dryopteridaceae (Aspidiaceae), Marattiaceae, Pteridaceae	§Aspleniales, §Marattiales, §Parkeriales	
Neoaleurotrachelus bertilloni	Apocynaceae, Bignoniaceae, Dilleniaceae*, Euphorbiaceae, Loganiaceae, Meliaceae, Menispermaceae, Moraceae, Ochnaceae, Rubiaceae	Gentianales, Lamiales, Malpighiales, Ranunculales, Rosales, Sapindales	core eudicots, euasterids I, eudicots, eurosids I, eurosids II
Neoaleurotrachelus graberi	Annonaceae, Bignoniaceae, Celastraceae, Combretaceae, Euphorbiaceae, Lythraceae, Meliaceae, Moraceae, Myrtaceae, Rhamnaceae, Rubiaceae	Celastrales, Gentianales, Lamiales, Magnoliales, Malpighiales, Myrtales, Sapindales, Rosales	euasterids I, eurosids I, eurosids II, magnoliids, rosids
Neomaskellia andropogonis	Poaceae	Poales	commelinids
Neomaskellia bergii	Poaceae	Poales	commelinids
Neopealius rubi	Fabaceae, Lamiaceae, Lauraceae, Rosaceae	Fabales, Lamiales, Laurales, Rosales	euasterids I, eurosids I, magnoliids
Nigrasialeyrodes convexus	Myrtaceae	Myrtales	rosids
Orchamoplatus caledonicus	Moraceae, Rutaceae, Ulmaceae	Rosales, Sapindales	eurosids I, eurosids II
Orchamoplatus citri	Rutaceae	Sapindales	eurosids II
Orchamoplatus dentatus	Loranthaceae, Myrtaceae	Myrtales, Santalales	core eudicots, rosids
Orchamoplatus louiserussellae	Loranthaceae, Myrtaceae	Myrtales, Santalales	core eudicots, rosids
Orchamoplatus mammaeferus	Euphorbiaceae, Myrtaceae, Rutaceae	Malpighiales, Myrtales, Sapindales	eurosids I, eurosids II, rosids
Orchamoplatus montanus	Araliaceae, Cunoniaceae, Ericaceae	Apiales, Ericales, Oxalidales	asterids, euasterids II, eurosids I
Orchamoplatus niuginii	Clusiaceae, Linaceae	Malpighiales	eurosids I
Orchamoplatus noumeae	Rutaceae	Sapindales	eurosids II
Orchamoplatus plumensis	Host indet.		
Orchamoplatus porosus	Myrtaceae	Myrtales	rosids
Orientaleyrodes zeylanicus	Brassicaceae	Brassicales	eurosids II
Orstomaleyrodes fimbriae	Bignoniaceae, Combretaceae, Fabaceae, Salicaceae, Sapindaceae, Ulmaceae	Fabales, Lamiales, Malpighiales, Myrtales, Rosales, Sapindales	euasterids I, eurosids I, eurosids II, rosids
Papillipes spinifer	Fabaceae	Fabales	eurosids I
Parabemisia aceris	Sapindaceae	Sapindales	eurosids II
Parabemisia jawani	Host indet.		
Parabemisia lushanensis	Host indet.		
Parabemisia myricae	Ebenaceae, Elaeocarpaceae, Ericaceae, Fagaceae, Lauraceae, Moraceae, Myricaceae, Myrsinaceae, Myrtaceae, Rosaceae, Rubiaceae, Rutaceae, Salicaceae, Theaceae	Ericales, Fagales, Gentianales, Laurales, Malpighiales, Myrtales, Oxalidales, Rosales, Sapindales	asterids, euasterids I, eurosids I, eurosids II, magnoliids, rosids

Appendix E. (Continued).

Species	Host plant family	Host plant order	Host plant higher group
Parabemisia myrmecophila	Dipterocarpaceae, Euphorbiaceae, Lauraceae, Rosaceae	Laurales, Malpighiales, Malvales, Rosales	eurosids I, eurosids II, magnoliids
Paraleurolobus chamaedoreae	Arecaceae	Arecales	commelinids
Paulianaleyrodes splendens	Dichapetalaceae	Malpighiales	eurosids I
Paulianaleyrodes tetracerae	Annonaceae, Clusiaceae, Cucurbitaceae, Dilleniaceae*	Cucurbitales, Magnoliales	core eudicots, eurosids I, magnoliids
Pealius akebiae	Lardizabalaceae	Ranunculales	eudicots
Pealius azaleae	Ericaceae	Ericales	asterids
Pealius cryptus	Moraceae	Rosales	eurosids I
Pealius euryae	Theaceae	Ericales	asterids
Pealius fici	Moraceae	Rosales	eurosids I
Pealius kelloggi	Fagaceae, Rosaceae	Fagales	eurosids I
Pealius liquidambari	Hamamelidaceae	Saxifragales	core eudicots
Pealius madeirensis	Oleaceae	Lamiales	euasterids I
Pealius mori	Moraceae, Salicaceae	Malpighiales, Rosales	eurosids I
Pealius rhododendri	Ericaceae	Ericales	asterids
Pectinaleyrodes culcasiae	Annonaceae, Araceae, Connaraceae, Malvaceae	Alismatales, Magnoliales, Malvales, Oxalidales	eurosids I, eurosids II, magnoliids, monocots
Pectinaleyrodes triclisiae	Annonaceae, Bignoniaceae, Connaraceae, Dilleniaceae*, Euphorbiaceae, Fabaceae, Meliaceae, Menispermaceae, Rubiaceae, Salicaceae,Verbenaceae	Fabales, Gentianales, Lamiales, Magnoliales, Malpighiales, Oxalidales, Ranunculales, Sapindales	core eudicots, euasterids I, eudicots, eurosids I, eurosids II, magnoliids
Pentaleyrodes cinnamomi	Lauraceae	Laurales	magnoliids
Pentaleyrodes hongkongensis	Lauraceae	Laurales	magnoliids
Pentaleyrodes yasumatsui	Lauraceae	Laurales	magnoliids
Pogonaleyrodes fastuosa	Host indet.		
Pogonaleyrodes zimmermanni	Acanthaceae, Rubiaceae	Gentianales, Lamiales	euasterids I
Pseudaleuroplatus kiensis	Myrtaceae	Myrtales	rosids
Ramsesseus follioti	Fabaceae	Fabales	eurosids I
Rhachisphora alishanensis	Theaceae	Ericales	asterids
Rhachisphora elongatus	Sapotaceae	Ericales	asterids
Rhachisphora franksae	Loganiaceae	Gentianales	euasterids I
Rhachisphora koshunensis	Lauraceae	Laurales	magnoliids
Rhachisphora maesae	Myrsinaceae	Ericales	asterids
Rhachisphora rutherfordi	Loranthaceae	Santalales	core eudicots
Rhachisphora trilobitoides	Boraginaceae*, Melastomataceae, Myrtaceae, Rubiaceae, Sapindaceae, Sapotaceae	Ericales, Gentianales, Myrtales, Sapindales	asterids, euasterids I, eurosids II, rosids
Rositaleyrodes oplismeni	Poaceae	Poales	commelinids
Rugaleyrodes angolensis	Icacinaceae*, Marantaceae, Ochnaceae	Malpighiales, Zingiberales	commelinids, euasterids I, eurosids I
Rugaleyrodes bidentata	Annonaceae	Magnoliales	magnoliids
Rugaleyrodes tetracerae	Dichapetalaceae, Dilleniaceae*, Linaceae, Loganiaceae, Meliaceae, Myrtaceae, Ochnaceae	Gentianales, Malpighiales, Myrtales, Sapindales	core eudicots, euasterids I, eurosids I, eurosids II, rosids
Rusostigma eugeniae	Myrtaceae	Myrtales	rosids
Rusostigma radiirugosa	Anacardiaceae, Myrtaceae	Myrtales, Sapindales	eurosids II, rosids
Rusostigma tokyonis	Aquifoliaceae, Theaceae	Aquifoliales, Ericales	asterids, euasterids II
Russellaleyrodes cumiugum	Host indet.		
Setaleyrodes mirabilis	Menispermaceae, Moraceae	Ranunculales, Rosales	eudicots, eurosids I
Setaleyrodes thretaonai	Euphorbiaceae, Moraceae	Malpighiales, Rosales	eurosids I
Setaleyrodes vigintiseta	Fabaceae	Fabales	eurosids I
Simplaleurodes hemisphaerica	Oleaceae	Lamiales	euasterids I
Singhiella bicolor	Myrtaceae	Myrtales	rosids
Singhiella cardamomi	Zingiberaceae	Zingiberales	commelinids
Singhiella chinensis	Lauraceae	Laurales	magnoliids
Singhiella citrifolii	Moraceae, Rubiaceae, Rutaceae	Gentianales, Rosales, Sapindales	euasterids I, eurosids I, eurosids II
Singhiella delamarei	Annonaceae	Magnoliales	magnoliids
Singhiella kuraruensis	Lauraceae	Laurales	magnoliids
Singhiella premnae	Verbenaceae	Lamiales	euasterids I
Singhiella subrotunda	Lauraceae	Laurales	magnoliids

Appendix E. (Continued).

Species	Host plant family	Host plant order	Host plant higher group
Singhius hibisci	Annonaceae, Asteraceae, Convolvulaceae, Euphorbiaceae, Lauraceae, Malvaceae, Moraceae, Oleaceae, Salicaceae, Solanaceae, Ulmaceae, Vitaceae*	Asterales, Lamiales, Laurales, Magnoliales, Malpighiales, Malvales, Rosales, Solanales	euasterids I, euasterids II, eurosids I, eurosids II, magnoliids, rosids
Singhius russellae	Host indet.		
Siphoninus immaculatus	Araliaceae	Apiales	euasterids II
Siphoninus phillyreae	Fabaceae, Lythraceae, Oleaceae, Rhamnaceae, Rosaceae, Rutaceae	Fabales, Lamiales, Myrtales, Rosales, Sapindales	euasterids I, eurosids I, eurosids II, rosids
Taiwanaleyrodes carpini	Betulaceae, Lauraceae, Myrsinaceae	Ericales, Fagales, Laurales	asterids, eurosids I, magnoliids
Taiwanaleyrodes meliosmae	Daphniphyllaceae, Lauraceae, Sabiaceae*, Sapindaceae	Laurales, Sapindales, Saxifragales	core eudicots, eudicots, eurosids II, magnoliids
Tetraleurodes acaciae	Anacardiaceae, Burseraceae, Caprifoliaceae, Euphorbiaceae, Fabaceae, Geraniaceae, Moraceae, Myrtaceae, Nyctaginaceae, Rhamnaceae, Rosaceae, Salicaceae, Solanaceae, Urticaceae	Caryophyllales, Dipsacales, Fabales, Geraniales, Malpighiales, Myrtales, Rosales, Sapindales, Solanales	core eudicots, euasterids I, euasterids II, eurosids I, eurosids II, rosids
Tetraleurodes andropogoni	Annonaceae, Arecaceae, Clusiaceae, Connaraceae, Costaceae, Euphorbiaceae, Fabaceae, Linaceae, Loranthaceae, Poaceae, Rutaceae, Salicaceae	Arecales, Fabales, Magnoliales, Malpighiales, Oxalidales, Poales, Santalales, Sapindales, Zingiberales	commelinids, core eudicots, eurosids I, eurosids II, magnoliids
Tetraleurodes banksiae	Proteaceae	Proteales	eudicots
Tetraleurodes bicolor	Myrtaceae	Myrtales	rosids
Tetraleurodes caulicola	Fabaceae	Fabales	eurosids I
Tetraleurodes confusa	Fagaceae, Lauraceae, Magnoliaceae, Theaceae	Ericales, Fagales, Laurales, Magnoliales	asterids, eurosids I, magnoliids
Tetraleurodes granulata	Annonaceae, Combretaceae, Euphorbiaceae, Fabaceae, Loganiaceae, Rubiaceae	Fabales, Gentianales, Magnoliales, Malpighiales, Myrtales	euasterids I, eurosids I, magnoliids, rosids
Tetraleurodes pluto	Fabaceae	Fabales	eurosids I
Tetraleurodes quercicola	Fagaceae	Fagales	eurosids I
Tetraleurodes selachidentata	Anacardiaceae, Annonaceae, Bignoniaceae, Boraginaceae*, Combretaceae, Euphorbiaceae, Fabaceae, Loganiaceae, Rhamnaceae, Rubiaceae, Verbenaceae	Fabales, Gentianales, Lamiales, Magnoliales, Malpighiales, Myrtales, Rosales, Sapindales	euasterids I, eurosids I, eurosids II, magnoliids, rosids
Tetraleurodes stirlingiae	Proteaceae	Proteales	eudicots
Tetraleurodes sulcistriatus	Avicenniaceae, Clusiaceae, Moraceae, Myrtaceae	Lamiales, Malpighiales, Myrtales, Rosales	euasterids I, eurosids I, rosids
Tetralicia ericae	Ericaceae	Ericales	asterids
Tetralicia graminicola	Poaceae	Poales	commelinids
Tetralicia iberiaca	Ericaceae	Ericales	asterids
Tetralicia tuberculata	Verbenaceae	Lamiales	euasterids I
Trialeurodes abutiloneus	Acanthaceae, Apocynaceae, Asteraceae, Balsaminaceae, Boraginaceae*, Brassicaceae, Convolvulaceae, Cucurbitaceae, Euphorbiaceae, Fabaceae, Geraniaceae, Hamamelidaceae, Lamiaceae, Lythraceae, Malvaceae, Moraceae, Myrtaceae, Onagraceae, Oxalidaceae, Polygonaceae, Portulacaceae, Ranunculaceae, Rhamnaceae, Rosaceae, Rutaceae, Sapindaceae, Scrophulariaceae, Solanaceae, Ulmaceae, Urticaceae, Verbenaceae, Violaceae	Asterales, Brassicales, Caryophyllales, Cucurbitales, Ericales, Fabales, Gentianales, Geraniales, Lamiales, Malpighiales, Malvales, Myrtales, Oxalidales, Ranunculales, Rosales Sapindales, Saxifragales, Solanales	asterids,core eudicots, euasterids I, euasterids II, eudicots, eurosids I, eurosids II, rosids
Trialeurodes bruneiensis	Thelypteridaceae	§Aspleniales	
Trialeurodes darwiniensis	Euphorbiaceae	Malpighiales	eurosids I
Trialeurodes dicksoniae	Dicksoniaceae	§Cyatheales	
Trialeurodes drewsi	Fagaceae	Fagales	eurosids I
Trialeurodes ericae	Ericaceae	Ericales	asterids

Appendix E. (Continued).

Species	Host plant family	Host plant order	Host plant higher group
Trialeurodes floridensis	Anacardiaceae, Annonaceae, Bignoniaceae, Chrysobalanaceae, Convolvulaceae, Dilleniaceae*, Lauraceae, Fabaceae, Lythraceae, Malpighiaceae, Malvaceae, Meliaceae, Myrtaceae, Polygonaceae, Rhamnaceae, Rubiaceae, Rutaceae, Sapotaceae, Verbenaceae, Zygophyllaceae*	Caryophyllales, Ericales, Fabales, Gentianales, Lamiales, Laurales, Magnoliales, Malpighiales, Malvales, Myrtales, Rosales, Sapindales, Solanales	asterids, euasterids I, core eudicots, eurosids I, eurosids II, magnoliids, rosids
Trialeurodes pergandei	Bignoniaceae, Caprifoliaceae, Hydrangeaceae, Oleaceae, Rosaceae, Rutaceae, Smilacaceae	Cornales, Dipsacales, Lamiales, Liliales, Rosales, Sapindales	asterids, euasterids I, euasterids II, eurosids I, eurosids II, monocots
Trialeurodes rex	Undetermined fern		
Trialeurodes vaporariorum	Acanthaceae, Alismataceae, Anacardiaceae, Apocynaceae, Aquifoliaceae, Araceae, Araliaceae, Asteraceae, Balsaminaceae, Begoniaceae, Berberidaceae, Bignoniaceae, Boraginaceae*, Brassicaceae, Campanulaceae, Caprifoliaceae, Caryophyllaceae, Clusiaceae, Convolvulaceae, Cucurbitaceae, Cunoniaceae, Ebenaceae, Ericaceae, Euphorbiaceae, Fabaceae, Fagaceae, Garryaceae, Geraniaceae, Gesneriaceae, Grossulariaceae, Haloragaceae, Hamamelidaceae, Hydrangeaceae, Iridaceae, Juglandaceae, Lamiaceae, Lauraceae, Liliaceae, Loganiaceae, Lythraceae, Magnoliaceae, Malvaceae, Melianthaceae, Myrtaceae, Oleaceae, Onagraceae, Oxalidaceae, Papaveraceae, Passifloraceae, Pedaliaceae, Phytolaccaceae, Pittosporaceae, Platanaceae, Plumbaginaceae, Polemoniaceae, Polygalaceae, Polygonaceae, Primulaceae, Proteaceae, Ranunculaceae, Rhamnaceae, Rosaceae, Rubiaceae, Rutaceae, Salicaceae, Sapindaceae, Sapotaceae, Scrophulariaceae, Smilacaceae, Solanaceae, Thymelaeaceae, Tropaeolaceae, Ulmaceae, Urticaceae, Verbenaceae, Violaceae, Vitaceae*, ‡Zamiaceae	Alismatales, Apiales, Aquifoliales, Asparagales, Asterales, Brassicales, Caryophyllales, Cornales, Cucurbitales, ‡Cycadales, Dipsacales, Ericales, Fabales, Fagales, Garryales, Gentianales, Geraniales, Lamiales, Laurales, Liliales, Magnoliales, Malpighiales, Malvales, Myrtales, Oxalidales, Proteales, Ranunculales, Rosales, Sapindales, Saxifragales, Solanales	asterids, core eudicots, euasterids I, euasterids II, eudicots, eurosids I, eurosids II, magnoliids, monocots, rosids
Trialeurodes variabilis	Caricaceae, Euphorbiaceae, Polygonaceae, Rubiaceae, Rutaceae, Sapindaceae	Brassicales, Caryophyllales, Gentianales, Malpighiales, Sapindales	core eudicots, euasterids I, eurosids I, eurosids II
Tuberaleyrodes machili	Lauraceae	Laurales	magnoliids
Vasdavidius cobarensis	Poaceae	Poales	commelinids
Vasdavidius concursus	Poaceae	Poales	commelinids
Vasdavidius indicus	Poaceae	Poales	commelinids
Vasdavidius setiferus	Pandanaceae, Poaceae, Rutaceae	Poales	commelinids
Venezaleurodes pisoniae	Nyctaginaceae	Caryophyllales	core eudicots
Viennotaleyrodes bicolorata	Fabaceae	Fabales	eurosids I
Viennotaleyrodes bosciae	Brassicaceae	Brassicales	eurosids II
Viennotaleyrodes curvisetosus	Fabaceae	Fabales	eurosids I
Viennotaleyrodes fallax	Fabaceae	Fabales	eurosids I
Viennotaleyrodes lacunae	Fabaceae	Fabales	eurosids I
Viennotaleyrodes megapapillae	Fabaceae	Fabales	eurosids I
Viennotaleyrodes platysepali	Fabaceae	Fabales	eurosids I

Appendix E. (Continued).

Species	Host plant family	Host plant order	Host plant higher group
Xenaleyrodes artocarpi	Clusiaceae, Lauraceae, Lecythidaceae, Moraceae, Musaceae, Sapindaceae, Sapotaceae, Verbenaceae	Ericales, Lamiales, Laurales, Malpighiales, Rosales, Sapindales, Zingiberales	asterids, commelinids, euasterids I, eurosids I, eurosids II, magnoliids
Xenaleyrodes broughae	Rutaceae	Sapindales	eurosids II
Xenaleyrodes fauceregius	Fabaceae	Fabales	eurosids I
Yleyrodes isoberliniae	Fabaceae	Fabales	eurosids I
Zaphanera capparis	Brassicaceae	Brassicales	eurosids II
Zaphanera cyanotis	Acanthaceae, Commelinaceae	Commelinales, Lamiales	commelinids, euasterids I
Zaphanera niger	Fabaceae	Fabales	eurosids I
Zaphanera papyrocarpae	Fabaceae	Fabales	eurosids I
Zaphanera rhachisreticulata	Fabaceae	Fabales	eurosids I
New genus 1 sp. 1	Piperaceae	Piperales	magnoliids
New genus 1 sp. 2	Piperaceae	Piperales	magnoliids
New genus 2 sp. 1	Rubiaceae	Gentianales	euasterids I
New genus 2 sp. 2	Host indet.		
Aleurodicus cocois	Anacardiaceae, Annonaceae, Arecaceae, Chrysobalanaceae, Euphorbiaceae, Fabaceae, Lauraceae, Malvaceae, Moraceae, Musaceae, Myrtaceae, Piperaceae, Polygonaceae, Rubiaceae	Arecales, Caryophyllales, Fabales, Gentianales, Laurales, Magnoliales, Malpighiales, Malvales, Myrtales, Piperales, Rosales, Sapindales, Zingiberales	commelinids, core eudicots, euasterids I, eurosids I, eurosids II, magnoliids, rosids
Aleurodicus dispersus	Acanthaceae, Anacardiaceae, Annonaceae, Apocynaceae, Araceae, Araliaceae, Arecaceae, Begoniaceae, Burseraceae, Clusiaceae, Combretaceae, Euphorbiaceae, Fabaceae, Lamiaceae, Lauraceae, Lecythidaceae, Moraceae, Musaceae, Myrtaceae, Orchidaceae, Polygonaceae, Rosaceae, Rubiaceae, Rutaceae, Sapotaceae, Solanaceae	Alismatales, Apiales, Arecales, Asparagales, Caryophyllales, Cucurbitales, Ericales, Fabales, Gentianales, Lamiales, Laurales, Magnoliales, Malpighiales, Myrtales, Rosales, Sapindales, Solanales, Zingiberales	asterids, commelinids, core eudicots, euasterids I, euasterids II, eurosids I, eurosids II, magnoliids, monocots, rosids
Azuraleurodicus pentarthrus	Rubiaceae	Gentianales	euasterids I
Dialeurodicus cockerellii	Myrtaceae	Myrtales	rosids
Eudialeurodicus bodkini	Fabaceae	Fabales	eurosids I
Octaleurodicus nitidus	Arecaceae	Arecales	commelinids
Stenaleyrodes vinsoni	Arecaceae	Arecales	commelinids
Synaleurodicus hakeae	Proteaceae	Proteales	eudicots