BRAZILIAN APHIDOIDEA: I. KEY TO FAMILIES, SUBFAMILIES AND ACCOUNT OF THE PHYLOXERIDAE

CLAUDIO L. COSTA, V.F. EASTOP & ROGER L. BLACKMAN

ABSTRACT - Keys are provided for the identification of the families and subfamilies of Aphidoidea occurring in Brazil. Host plant and geographical distribution data of Phyloxeridae are also provided. The keys are illustrated by 67 line drawings. The check list of aphids occurring in Brazil indicates the presumed origin of each species. The origin of the Brazilian fauna is discussed.

Index terms: Brazilian Aphids, identification Keys, host plants, check list of Genera and Species, distribution.

AFÍDEOS BRASILEIROS: I. CHAVES PARA FAMÍLIAS, SUBFAMÍLIAS E UMA CONTRIBUIÇÃO SOBRE PHYLOXERIDAE

RESUMO - São apresentadas chaves para identificação de famílias e subfamílias de afídeos (Hemiptera, Aphidoidea) que ocorrem no Brasil. Apresentam-se também dados sobre plantas hospedeiras e sobre a distribuição geográfica da família Phyloxeridae. As chaves de identificação são ilustradas com 67 desenhos, e a lista classificada das espécies de afídeos que ocorrem no Brasil inclui a presumível origem de cada uma delas. Discute-se, outrossim, a origem da fauna brasileira.

Termos para indexação: Aphidoidea, afídeos brasileiros, chaves para identificação, hospedeiros, distribuição geográfica.

INTRODUCTION

The works of Lima (1923) and of Moreira (1925) contain the first published reviews about the aphid fauna of Brazil. Oliveira et al. (1977) gave references to a number of early and little known papers on Brazilian aphids and listed species trapped in the state of Espírito Santo. Lima (1928, 1936, 1942), Silva et al. (1968), Bergamin (1957) and Costa et al. (1972) also listed species occurring in the country and provided some information on their host plants.

The importance of some aphid species as vectors of plant viruses has also been pointed out (Costa 1957, Costa et al. 1972). Worldwide, aphids are known to transmit more than 200 plant virus diseases. The effects of predators and parasites on the populations of aphid species, on vegetables and on fruit trees have been studied in the State of Paraná (Schmitt 1974, Bartoszeck 1976a, 1976b, Leal et al. 1976, Lark & Smith 1976, Pereira & Smith 1976a, 1976b, Pimenta 1976, Zúñiga-Salinas 1982).

Information on individual species or groups of pest species of different crops is available, especially from the southern part of the country, but a comprehensive systematic study of Brazilian species is lacking. Bertel's (1973) account of aphid

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species from Rio Grande do Sul is of limited help for the identification of Brazilian aphids, as the species mentioned in the text do not correspond to the keys which were translated with some errors from Blanchard's (1939) excellent revision of Argentinian aphids.

The aim is to provide a means of identifying the aphid species from Brazil and to give information on host plants, geographical distribution and synonymy. This paper contains a key to the families and subfamilies and an account of the Phylloxeridae. Keys to Brazilian genera and species belonging to the other subfamilies have been prepared for publication in accounts of those groups.

Where possible, several different characters are given to discriminate similar species in the keys. This facilitates the identification of incomplete or damaged specimens from trap catches and food contaminants. These mini-descriptions also reduce the risk of confusing previously overlooked or newly introduced species with those already known in Brazil. The keys have been structured to facilitate the addition of further species.

The specimens studied are deposited in the British Museum (Natural History) aphid collection and in that of C.L. Costa in Brasília. Aphids have been seen from the States of Bahia, Ceará, Distrito Federal (Brasília), Espírito Santo, Goiás, Minas Gerais, Maranhão, Mato Grosso, Pará, Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Norte, Rio Grande do Sul, Santa Catarina and São Paulo.

The classification system adopted is that used by Eastop (1977) which recognized three families of Aphidoidea: Aphididae, Adelgidae and Phylloxeridae. Species belonging to 8 out of the 10 subfamilies of Aphididae are known in Brazil; none belonging to Pterocommatinae, Phloeomyzinae or to Adelgidae have been seen. The wide-spread species of Phylloxeridae, *Viteus vitifoliae*, is recorded from Brazil.

The nomenclature adopted is that of Eastop & Hille Ris Lambers (1976) in their "Survey of the World Aphids" hereafter referred to as "Survey".

Of the 115 species of aphids known from Brazil, 18 are native South or Central American species, 5 others also occur in North America but probably occur here naturally. Most if not all the others were probably introduced by man on cultivated plants or weeds. Of these 92 introduced species 15 probably originated from North America, 42 from the Western Palaearctic region including the Mediterranean sub-region, 3 from subtropical areas adjacent to the Western Palaearctic, 5 from South Western Asia, 10 from southern Asia and 12 from the Eastern Palaearctic region. The remaining 5 species are of uncertain origin, being now widespread and without close relatives of a restricted distribution, and living on plants occurring naturally in several geographical regions.

The distribution of species within subfamily groups, including World and Brazilian Fauna, is given in Table 1. The 115 species known to occur in Brazil constitute only 2.8% of the known world fauna.

The information for each collection includes: State, locality, host plant or trap, date and (collector - leg).

Full synonymy is not given as it is readily available in the "Survey". Only synonyms that have been used in Neotropical region literature are given.

### TABELA 1. Distribution of species in the subfamily groups.

<table>
<thead>
<tr>
<th>Family</th>
<th>Subfamily</th>
<th>Brazilian fauna</th>
<th>World Fauna</th>
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<tbody>
<tr>
<td></td>
<td>Number of genera</td>
<td>Species</td>
<td>%</td>
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<td>1</td>
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</tr>
<tr>
<td>ADELGIDAE</td>
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<td>0</td>
<td>0</td>
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<td>Chaitophorinae</td>
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<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Drepanosiphinae</td>
<td>5</td>
<td>12</td>
<td>10.4</td>
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<tr>
<td>Pterocommatinae</td>
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<td>0</td>
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<td>35</td>
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<tr>
<td>Aphidini</td>
<td>(6)</td>
<td>(24)</td>
<td>(20.9)</td>
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<tr>
<td>Aphidina</td>
<td>(2)</td>
<td>(17)</td>
<td>(14.8)</td>
</tr>
<tr>
<td>Rhotosiphina</td>
<td>(4)</td>
<td>(7)</td>
<td>(6.1)</td>
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<tr>
<td>Macrosiphina</td>
<td>(29)</td>
<td>(60)</td>
<td>(52.1)</td>
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<td>Anocerinae</td>
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<td>1</td>
<td>0.9</td>
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<td>Greenideinae</td>
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<td>0.9</td>
</tr>
<tr>
<td>Phloeomyzinae</td>
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<td>0</td>
</tr>
<tr>
<td>Hormaphidinae</td>
<td>1</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Penphiginae</td>
<td>7</td>
<td>8</td>
<td>6.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>55</strong></td>
<td><strong>115</strong></td>
<td><strong>100.0</strong></td>
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</table>

### CLASSIFIED LIST OF BRAZILIAN APHIDS

The presumed origin of each species is indicated in the list below, by * = native South or Central American, EP = Eastern Palearctic, N = North American, Or = Oriental; SWA = South West Asian; WP = Western Palearctic; WP, M = Mediterranean region.

**PHYLOXERIDAE**

Phyloxerin
- **Genus Viteus Shimer, 1867**
  - *Viteus vitifoliae* (Fitch, 1855)
  - N

**APHIDIDAE**

Lachninae

Cinarini
- **Genus Cinara Curtis, 1835**
  - *Cinara (Cinarella) maritimae* (Dufour, 1833)
  - WP
  - *Cinara (Cinarella) piniformosana* (Takahashi, 1923)
  - EP
  - *Cinara (Cupressobium) tujafilina* (del Guercio, 1909)
  - WP
- **Genus Eulachnus del Guercio, 1909**
  - *Eulachnus rileyi* (Wilson, 1911)
  - WP

Lachnini

Genus *Tuberolachmus* Mordvilko, 1909
*Tuberolachmus salignus* (Gmelin, 1790) WP

Chaitophorinae

Siphini
Genus *Sipha* Passerini, 1860
*Sipha flava* (Forbes, 1884) *? or N

Drepanosiphinae (=Callaphidinae)

Neophyllaphidini
Genus *Neophyllaphis* Takahashi, 1920
Subgenus *Chileaphis* Essig, 1954
*Neophyllaphis* (Chileaphis) *? podocarpini* Carrillo, 1980 *

Lizerini
Genus *Lizerius* Blanchard 1923
*Lizerius acunai* (Holman, 1974) *
*Lizerius melanocallis* (Quednau, 1974) *
*Lizerius occoteae* E.E. Blanchard, 1923 *
*Lizerius tuberculatus* (E.E. Blanchard, 1939) *

Subgenus *Paralizerius* Quednau, 1974
*Lizerius* (Paralizerius) *brasiliensis* Quednau, 1974 *
*Lizerius* (Paralizerius) *cernelii* Quednau, 1974 *
*Lizerius* (Paralizerius) *costai* Quednau, 1974 *
*Lizerius* (Paralizerius) *intermedius* Quednau, 1974 *

Phyllaphidini
Genus *Eucallipterus* Schouteden, 1906
*Eucallipterus tiliae* (Linnaeus, 1758) WP
Genus *Myzocallis* Passerini, 1860
*Myzocallis castanicoa* Baker, 1917 WP*
Genus *Tuberculatus* Mordvilko, 1984
Subgenus *Tuberculoides* van der Goot, 1915
*Tuberculatus* (Tuberculoides) *annulus* (Harriq, 1841) WP

Aphidinae

Aphidini

Aphidina
Genus *Aphis* Linnaeus, 1758
*Aphis amaranthi* Holman, 1974 *
*Aphis coreopsis* (Thomas, 1878) ?N
*Aphis craccivora* Koch, 1854 WP
*Aphis fabae* Scopoli, 1763 WP
*Aphis fabae solanella* Theobald, 1914 WP
*Aphis forbesi* Wood, 1889 ?N
*Aphis gossypii* Glover, 1877 ?WP
*Aphis illinoisensis* Shimer, 1866 N
*Aphis nerii* Boyer de Fonscolombe, 1841 ?
*Aphis sambuci* Linnaeus, 1758 ?
*Aphis sedi* Kaltenbach, 1843 WP
*Aphis spiraeola* van der Goot, 1913 EP
*Aphis yuccicola* Wilson, 1911 N
*Aphis* (Protaphis) *middletonii* Thomas, 1879 N

**Aphis (Protaphis) terricola** Rondani, 1847  
**Genus Taxoptera** Koch, 1856  
**Taxoptera aurantii** (Boyer de Fonscolombe, 1907)  
**Taxoptera citricidus** (Kirkaldy, 1907)  

**Rhopalosiphina**  
**Genus Hysteroneura** Davis, 1919  
**Hysteroneura setariae** (Thomas, 1878)  
**Genus Melanaphis** van der Goot, 1917  
**Melanaphis (Longiunguis) Sacchari** (Zehntner, 1897)  
**Genus Rhopalosiphum** Koch, 1854  
**Rhopalosiphum maidis** (Fitch, 1856)  
**Rhopalosiphum nymphaeae** (Linnaeus, 1761)  
**Rhopalosiphum padi** (Linnaeus, 1899)  
**Rhopalosiphum psidiflori (Sasaki, 1899)  
**Genus Schizaphis** Börner, 1931  
**Schizaphis graminum** (Rondani, 1847) 1852)  

**Macrospolini**  
**Genus Acyrthosiphon** Mordvilko, 1914  
**Acyrthosiphon bidenticola** Smith, 1960  
**Acyrthosiphon kondoi** Shinji, 1938  
**Acyrthosiphon malvae** (Mosley, 1841)  
**Acyrthosiphon pisum** (Harris, 1776)  
**Genus Aulacorthum** Mordvilko, 1914  
**Aulacorthum solani** (Kaltenbach, 1843)  
**Aulacorthum (Neomyzus) circumflexus** (Buckton, 1876) Or  

**Genus Brachycaudus** van der Goot, 1913  
**Brachycaudus helichrysi** (Kaltenbach, 1843)  
**Brachycaudus (Acaudus) persicae** (Passerini, 1860)  
**Brachycaudus (Thuleaphis) rumexicolens** (Patch, 1917)  
**Brachycaudus (Appelia) schwartzi** (Börner, 1931)  

**Genus Brevicoryne** van der Goot, 1913  
**Brevicoryne brassicae** (Linnaeus, 1758)  

**Genus Capitophorus** van der Goot, 1913  
**Capitophorus elaeagni** (del Guercio, 1894)  
**Capitophorus hipppophaes** (Walker, 1853)  
**Capitophorus hippochae javanicus** Hille Ris Lambers  

**Genus Carolinaia** Wilson, 1911  
**Carolinaia cypert** Ainslie, 1915  

**Genus Cavariella** del Guercio, 1911  
**Cavariella aegopodi** (Scopoli, 1763)  

**Genus Chaetosiphon** Mordvilko, 1914  
**Chaetosiphon (Pentatrichopus) fragaefolii** (Cockerell, 1901)  
**Chaetosiphon (P.) tetrarhodium** (Walker, 1849)  

**Genus Coloradoa** Wilson, 1910  
**Coloradoa rufomaculata** (Wilson, 1923)  

**Genus Dysaphis** Börner, 1931  
**Dysaphis apiifolia** (Theobald, 1923)  
**Dysaphis cynarae** (Theobald, 1915)  

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Dysaphis emicis (Mimeur, 1935)  
Dysaphis foeniculcus (Tehobald, 1923)  
Genus Glabromyzus Richards, 1960    
Glabromyzus ? howardii (Wilson, 1911) * or N  
Genus Hyadaphis Kirkaldy, 1904  
Hyadaphis foeniculi (Passerini, 1860)  
Genus Hyperomyzus Borner, 1933    
Hyperomyzus carduelinis (Theobald, 1915) - old world subtropics, derived from lactucae *SWA  
Hyperomyzus lactucae (Linnaeus, 1768)  
Genus Lipaphis Mordvilko, 1928  
Lipaphis erysimi (Kaltenbach, 1843) - sub-species pseudobrassicae Davis, 1911, old world subtropics derived from erysimi WP ? M  
Genus Macrosiphoniella del Guercio, 1911  
Macrosiphoniella sanborni (Gillette, 1908) EP  
Macrosiphoniella tanacetariae bonariensis E.E. Blanchard, 1932 WP, M  
Macrosiphoniella yomogifoliae (Shingi, 1924) EP  
Genus Macroryphium Passerini, 1860  
Macroryphium euphorbiae (Thomas, 1878) N  
Macroryphium rosae (Linnaeus, 1758) WP  
Genus Metopolophium Mordvilko, 1914  
Metopolophium dirhodum (Walker, 1849) WP  
Genus Microparsus Patch, 1919  
Microparsus (Picturaphis) brasiliensis (Moreira, 1925) *  
Microparsus (Picturaphis) vignaphilus (E.E. Blanchard, 1922) *  
Genus Myzus Passerini, 1860  
Myzus hemerocallis Takahashi, 1921 Or  
Myzus nicotianae Blackman, 1987 ?Or  
Myzus oryzae Laing, 1932 hybrid origin or Or  
Myzus persicae (Sulzer, 1776) SWA?  
Genus Nasonovia Mordvilko, 1914  
Nasonovia ribisnigri (Mosley, 1841) WP  
Genus Neotoxoptera Theobald, 1915  
Neotoxoptera formosana (Takahashi, 1921) Or or EP  
Neotoxoptera oliveri (Essig, 1935) Or or EP  
Genus Ovatus van der Goot, 1913  
Ovatus crataegarius (Walker, 1850) WP  
Genus Pentalonia Coquerel, 1859  
Pentalonia nigroneura Coquerel, 1859 Or  
Genus Pleotrichophorus Borner, 1930  
Pleotrichophorus chrysanthemi (Theobald, 1920) EP  
Genus Rhodobium Hille Ris Lambers, 1947  
Rhodobium porosum (Sanderson, 1900) ?  
Genus Rhopalosiphoninus Baker, 1920  
Rhopalosiphoninus layrisphion (Davidson, 1912) ?EP  
Genus Sitobion Mordvilko, 1914  
Sitobion avenae (Fabricius, 1775) WP  

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Sitobion lambersi David, 1956
Sitobion luteum (Buckton, 1876)
Sitobion pauliani Remaudiere, 1957
Sitobion ptericolens (Patch, 1919)
Sitobion salviæ (Bartholomew, 1932)

Genus Uroleucon Mordvilko, 1914
Uroleucon ambrosiae (Thomas, 1878) * or N
Uroleucon lizerianum (E.E. Blanchard, 1922) *
Uroleucon sonchi (Linnaeus, 1767) WP
Uroleucon (Lambersius) ergeronensis (Thomas, 1878) * or N
Uroleucon (Uromelan) compositae (Theobald, 1915) Or
Genus Utamphorophora Knowlton, 1947
Utamphorophora commelinensis (Smith, 1960) *

Anoeciinae
Anoeciini
Genus Anoea Koch, 1857
Anoea cornicola (Walsh, 1863) N

Greenideinae
Genus Brasilaphis Mordvilko, 1930
Brasilaphis bondari Mordvilko, 1930 *

Hormaphidinae
Cerataphidini
Genus Cerataphis Lichtenstein, 1882
Cerataphis orchidearum (Westwood, 1879) Or
Cerataphis variabilis HRL, 1953 Or

Pemphiginae
Eriosomatini
Genus Eriosoma (Hausmann, 1802)
Eriosoma lanigerum (Hausmann, 1802) N
Genus Tetraneura Hartig, 1841
Tetraneura (Tetraneurella) nigriabdinalalis (Sasaki, 1899) EP

Fordini
Genus Asiphehella Theobald, 1923
Asiphehella dactytonia (Theobald, 1923)
Genus Geoica Hart, 1894
Geoica lucifuga (Zehtner, 1897) SW Asia
Genus Geopemphigus Hille Ris Lambers, 1933
Geopemphigus floccosus (Moreira, 1925) *
Genus Smythiurodes Westwood, 1849
Smythiurodes beta Westwood, 1849 WP

Pemphigini
Genus Pemphigus Hartig, 1839
Pemphigus bursarius (Linnaeus, 1758) WP
Pemphigus populitranversus Riley, 1879 N

Key to the families and subfamilies of Brazilian aphids

1 (2) All apteræ oviparous and pear-shaped, broadest near the front (Fig. 2), with 3-segmented antennæ bearing only a single rhinarium (Fig. 1a). Alatae with only 3 oblique veins, all simple, in the forewing, and Cu1 and Cu2 with a common base (Fig. 3), and wings held horizontally in repose. Alatae with 3-segmented antennæ, the third segment bearing 2 primary rhinaria (Fig. 3a).

Phylloxeridae.

2 (1) Apteræ viviparæ oval, broadest near the middle across the anterior part of the abdomen (Figs. 1, 4, 5), antennæ usually 5-or 6-segmented and all morphs with a primary rhinarium on each of the last two segments (Figs. 4a, 5a, 10, 11, 32, 34, 38, 40, 55, 57). Alatae with 4 oblique veins in the forewing and the media often once (Figs. 7, 13, 35, 37) or twice (Figs. 8, 18) branched, sometimes simple (Fig. 6) Cu 1 and Cu 2 mostly originating individually (Figs. 6-8, 13, 18, 35) but sometimes adjacent or fused at the base (Fig. 37).

Aphididae.

3 (4) Siphunculi weakly clavate and with a ring of three subapical hairs and 3 or 4 other hairs placed more proximad (Fig. 9); abdomen bearing a pair of elongate tubercles on the 7th tergite better developed in the immatures than in the alate; antennæ 4- or 5-segmented.

Brassíphi (Greenideinae).

4 (3) Siphunculi without hairs (Figs. 1, 4) or some truncate siphunculi bearing a single hair at the very base, or siphunculi flat rings on hairy cones (Figs. 16, 36, 52, 61); siphunculi sometimes absent; abdomen without paired elongate projections posterior to the siphunculi, or if with a pair on the eighth tergite then with lateral pairs of similar tubercles on segments 3, 4, 6 and 7, and cauda strongly knobbed (Lizerius brasilienis, Fig. 12) and antennæ 6-segmented.

5 (10) Terminal process of antennæ at least 0.75 but usually as long as or much longer than the base of the last antennal segment (Figs. 1, 4, 10, 11, 14, 46), in borderline cases (Fig. 26) Drepanosiphinae, take either alternative; usually siphunculi and cauda elongate (Figs. 4, 22, 62-64) or siphunculi truncate and cauda knobbed (Figs. 12, 15), sometimes siphunculi short and tapering and cauda rounded (Figs. 19-21).

6 (7) Siphunculi usually elongate (Figs. 1, 4, 20, 22, 63-65), sometimes short and tapering (Figs. 19, 62); terminal process usually more than twice as long as the base of the last antennal segment (Figs. 4, 10, 11); cauda usually elongate (Figs. 4, 22, 62-65), never knobbed, sometimes broadly rounded, or pentagonal or helmet-shaped (Figs. 19, 21); first tarsal segments usually bearing only 2 or 3 hairs (Figs. 23, 24), if with 4 or 5 (Figs. 29, 30) the siphunculi very elongate (Figs. 63, 64), many times longer than their middle diameter. On many plants, particularly herbs.

Aphidinae.

7 (6) Siphunculi truncate cones, about as long as broad (Figs. 12, 15), cauda knobbed in Brazilian species; terminal process rarely more than twice as long as the base of the last antennal segment (Figs. 14, 26, 46); first tarsal segments bearing 5-7 ventral hairs. (Figs. 27, 28.)

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8 (9) Antennae 5-segmented (Fig. 46), with terminal process about twice as long as the base of fifth segment. Apterae viviparae common, alatae without dorsal hairs on the first tarsal segments and with the media of the fore-wing twice branched. On Gramineae .................................... *Sipha* (Chaitophorinae).

9 (8) Antennae usually 6-segmented; if apterae viviparae present then terminal process of antennae little if any longer than the base of the last segment. Some species only with alatae viviparae and these usually with a pair of dorsal hairs on the first tarsal segments in addition to the 5-7 ventral hairs (Figs. 27, 28), media of fore-wing once (Fig. 13) or twice branched. Mostly on trees and shrubs ........................................... *Drepanosiphinae* in part.

10 (5) Terminal process of antennae usually less than half as long as the base of the last antennal segment (Figs. 5, 17, 25, 32, 34, 38), sometimes relatively longer when the antennae are very short (Figs. 39, 40); cauda broadly rounded (Figs. 5, 36, 45, 52, 61) or knobbed (Figs. 12, 15), never elongate 'finger-like'; siphunculi either truncate (Figs. 12, 15, 39), ring-like (Fig. 42), on flat hairy cones (Figs. 16, 36, 52, 61) or absent (Figs. 5, 45).

11 (12) Cauda strongly knobbed (Figs. 12, 15), antennae 6-segmented, siphunculi truncate (Figs. 12, 15); alatae with once (Fig. 13) or twice branched media and round or oval, or rarely annular secondary rhinia and first tarsal segments usually bearing a pair of dorsal hairs in addition to the 5-7 ventral hairs (Fig. 27). Mostly free living on the leaves of trees and shrubs. .......................................................... *Drepanosiphinae* in part.

12 (11) Cauda broadly rounded (Figs. 5, 36, 45, 52, 61, or slightly constricted near the base (Fig. 39); antennae 4- (Fig. 40), 5-(Figs. 38, 46) or 6-segmented (Figs. 5, 32, 34, 57); siphunculi ring-like (Fig. 42), sometimes placed in broad flat hairy cones (Figs. 16, 36, 52, 61), and sometimes absent (Figs. 5, 45). Media of forewing simple (Fig. 6) or once (Figs. 35, 37) or twice (Fig. 18) branched.

13 (14) First tarsal segments with 9 or more ventral hairs (Figs. 51, 54), empodial hairs very short, inconspicuous (Figs. 31, 54); fifth rostral segment distinct from the fourth with an evident suture between them (Figs. 47, 48, 50); forewing usually with the radius arising from near the apex of an elongate pterostigma, media often pale and twice branched (Fig. 18); apterae with large compound eyes (Fig. 56), abdomen without lateral tubercles; antennae 6-segmented and bearing long hairs and round secondary rhinia (Fig. 32); siphunculi usually on large dark hairy cones (Fig. 16), sometimes little more than sclerotic rings. In South America only known from Coniferae and *Salix* ..................................................... *Lachniniae*.

14 (13) First tarsal segments with 2-7 ventral hairs and without dorsal hairs (Figs. 41, 58, 59); empodial hairs one third or more as long as the claws (Figs. 33, 41, 58, 59); rostral segments 4 and 5 more or less fused, with the suture between them usually indistinct or absent (Figs. 49, 60) but suture often indicated by a clear area; media of forewing once branched (Fig. 37) or simple (Fig. 6) and the pterostigma often short and thick with the radius arising from about its mid length (Fig. 35); true apterae with only 3-faceted eyes but alataform apterae may have small compound eyes.

15 (16) Abdomen with large transparent lateral tubercles on segments 1-5 at least
and sometimes also on segments 6 and 7; siphunculi on broad flat hairy
cones; dorsum usually pigmented (Fig. 35); antennae 6-segmented and
bearing long hairs and round or transversely oval rhinaria (Fig. 34); wax
glands not evident, not aggregated into plates; media of forewing once
branched and pterostigma characteristically broad and dark (Fig. 35); first
tarsal segments with 5-7 ventral hairs; rudimentary gonapophyses indelined,
represented by an irregular row of 10-12 hairs between the genital and anal
plates. On the roots of Gramineae, and in temperate climates on the leaves of
Cornus .................................. Anoechia (Anoechiinae).

16 (15) Abdomen without large transparent lateral tubercles; siphunculi ring like,
small cones (Fig. 61) or absent (Figs. 5, 45); antennae 4- (Fig. 40) or 5-or
6-segmented (Figs. 5, 57) and usually bearing only short hairs (Figs. 51, 57) if
the antennal hairs are long then the siphunculi if present are mere sclerotic
rings or horse-shoe shaped (Fig. 61) and the abdomen bears evident wax
gland plates (Figs. 44, 45, 61); secondary rhinaria often annular (Fig. 38),
sometimes round or oval (Fig. 57); first tarsal segments with only 2 (Figs. 41,
59) or 3-4 (Fig. 58) or rarely 5 hairs; rudimentary gonapophyses usually two
distinct groups of 5-8 hairs between genital and anal plates.

17 (18) Abdomen with only 6 pairs of spiracles. Siphunculi present as rings,
sometimes on small cones and cauda weakly knobbed or rounded. Media of
forewing once branched (Fig. 37) and alatae with 5-segmented antennae
bearing annular rhinaria on segments III-V (Fig. 38). Femur and trochanter
often fused (Fig. 66). Apteræ (Fig. 39) often ‘aleurodiform’; head and
pronotum fused, and the second tarsal segments bear long dorso-apical
capitate hairs, empodial hairs long and slightly expanded at the apex
(Fig. 41). On leaves of palms, grasses and orchids ........ Hörnaphidinæ.

18 (17) Abdomen with 7 pairs of spiracles, siphunculi present (Fig. 61) or absent
(Figs. 5, 45), cauda rounded. Media of forewing once branched or simple
(Fig. 6), if secondary rhinaria annular then antennae 6-segmented, if
antennae of alatae are 5-segmented then the secondary rhinaria are
round or oval. Trochanter usually separated from femur by a distinct suture
(Figs. 5, 67), if not (Asiphonella) then siphunculi absent. Apteræ (Fig. 5)
ever aleurodiform, head and thorax distinct. Tarsal hairs normal, fine
pointed (Figs. 58, 59). On roots of angiosperms or in wooly masses on
Rosaceae .................................. Pemphiginæ.

Family Phyloxeridae

The sole species known in the Brazil is the world-wide “filoxera-da-videira”,
Viteus virifolíaæ Fitch, of which all available Brazilian specimens are apterous.

Viteus virifolíaæ Fitch, 1855 - Figs. 2-3

Collection data:


Distribution in South and Central America: Argentina.

Plate 1

FIG. 1. *Microparsus* (*Picturaphis*) *brasiliensis*.

A. Alata, Antennal segments 1-4. srh: secondary rhinarium
D. Ventral view of subgenital plate (sg), rudimentary gonapophyses (rg) and anal plate (ap).
G. Dorsal view of cauda (ca) and eighth abdominal tergite.
R: rostrum. ph: primary hair. r1-r5: rostral segments 1-5. 4+5 = ultimate rostral segment. sh: subsidiary or secondary hair. W: wing. cu: cubitus. m: media. r: radius. pts: pterostigma.

Plate 2
FIG. 2-3. *Viteus vitifolii*, 2 aperous exule, 2a enlargement of antenna, 3 wings, 3a antenna of alata. 4, *Aphis gossypii*, apera vivipara, 4a enlargement of apex of 5th and base of 6th antennal segment. 5 & 6, *Geopemphigus floccosus*, 5 aperous exule, 5a enlargement of antennal segment V and VI. 6-8 wings, 6 *Geopemphigus floccosus*, 7 *Schizaphis graminum*, 8 *aphis gossypii*.

Plate 3


Plate 4

Plate 5

Plate 6
FIG. 47-50. Ultimate rostral segments. 47 Tuberalchnus salignus. 48 Cinara nijafilina. 49 Geopemphigus floccosus. 50-51 Eulachnor sp., 51 first segment of hind tarsus. 52 Tuberalchnus salignus aptera, abdomen. 53-55 Cinara mariimae alata, 53 head, 54 hind tarsus, 55 antennal segments IV-VI. 56 C. nijafilina aptera, head. 57-58 Pemphigus bursarius alate sexupara, 57 antenna, 58 hind tarsus. 59 Geopemphigus floccosus hind tarsus. 60 Geoica lucifuga ultimate rostral segment.

Plate 7

FIG. 61-65. Abdominal dorsum, 61 Eriosoma lanigerum apterous exule, 62 Rhopalosiphum maidis aptera, 63 Chaitosiphom fragaeolii aptera, 64 Uroleucon ambrosiae aptera, 65 Hyperomyzus carduillimus alata. 66 & 67 hind trochanter and femur, 66 Cerataphis orchidearum, 67 Eriosoma lanigerum.

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REFERENCES


