BRAZILIAN APHIDOIDEA: I. KEY TO FAMILIES, SUBFAMILIES AND ACCOUNT OF THE PHYLLOXERIDAE[1]

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ABSTRACT - Keys are provided for the identification of the families and subfamilies of Aphidoidea occurring in Brazil. Host plant and geographical distribution data of Phylloxeridae 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 PHYLLOXERIDAE

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 Phylloxeridae. 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, Phloemyzinae 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.

Family / Subfamily	Brazilian fauna Number of genera	Brazilian fauna Species Nº	Brazilian fauna Species %	World Fauna Species Nº	World Fauna Species %
PHYLLOXERIDAE	1	1	0.9	67	1.6
ADELGIDAE	0	0	0	48	1.2
APHIDIDAE	54	114	99.1	3937	97.2
Lachninae	3	5	4.3	346	8.5
Chaitophorinae	1	1	0.9	150	3.7
Drepanosiphinae	5	12	10.4	407	10.0
Pterocommatinae	0	0	0	44	1.1
Aphidinae	35	84	73.0	2412	59.5
Aphidini	(6)	(24)	(20.9)		
Aphidina	(2)	(17)	(14.8)		
Rhopalosiphina	(4)	(7)	(6.1)		
Macrosiphini	(29)	(60)	(52.1)		
Anoecinae	1	1	0.9	19	0.5
Greenideinae	1	1	0.9	122	3.0
Phloeomyzinae	0	0	0	1	0.1
Hormaphidinae	1	2	1.7	167	4.1
Pemphiginae	7	8	6.9	269	6.6
Total	55	115	100.0	4052	100.0

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 Palaearctic, N = North American, Or = Oriental; SWA = South West Asian; WP = Western Palaearctic; WP, M = Mediterranean region.

PHYLLOXERIDAE
Phylloxerini
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 *Tuberolachnus* Mordvilko, 1909	
Tuberolachnus 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	*
Lizeriini	
Genus *Lizerius* Blanchard 1923	
Lizerius acunai (Holman, 1974)	*
Lizerius melanocallis (Quednau, 1974)	*
Lizerius ocoteae E.E. Blanchard, 1923	*
Lizerius tuberculatus (E.E. Blanchard, 1939)	*
Subgenus *Paralizerius* Quedanu, 1974	
Lizerius (*Paralizerius*) *brasiliensis* Quednau, 1974	*
Lizerius (*Paralizerius*) *cermelii* 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 castanicola Baker, 1917	WP
Genus *Tuberculatus* Mordvilko, 1984	
Subgenus *Tuberculoides* van der Goot, 1915	
Tuberculatus (*Tuberculoides*) *annulatus (Hartig, 1841)*	*WP*
Aphidinae	
Aphidini	
Aphidina	
Genus Aphis Linnaeus, 1758	
Aphis amaranthi Holman, 1974	*
Aphis coreopsidis (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 spiraecola van der Goot, 1913	EP
Aphis yuccicola Wilson, 1911	N
Aphis (*Protaphis*) *middletonii* Thomas, 1879	N

Aphis (Protaphis) terricola Rondani, 1847	WP
Genus *Toxoptera* Koch, 1856	
Toxoptera aurantii (Boyer de Fonscolombe, 1907)	EP
Toxoptera citricidus (Kirkaldy, 1907)	EP
Rhopalosiphina	
Genus *Hysteroneura* Davis, 1919	
Hysteroneura setariae (Thomas, 1878)	N
Genus *Melanaphis* van der Goot, 1917	
Melanaphis (Longiunguis) Sacchari (Zehtner, 1897)	EP
Genus *Rhopalosiphum* Koch, 1854	
Rhopalosiphum maidis (Fitch, 1856)	?N or EP
Rhopalosiphum nymphaeae (Linnaeus, 1761)	?N or WP
Rhopalosiphum padi (Linnaeus, 1899)	?N or WP
Rhopalosiphum rufiabdominalis (Sasaki, 1899)	?N or EP
Genus *Schizaphis* Borner, 1931	
Schizaphis graminum (Rondani, (1847) 1852)	WP
Macrosiphini	
Genus *Acyrthosiphon* Mordvilko, 1914	
Acyrthosiphon bidenticola Smith, 1960	*
Acyrthosiphon kondoi Shinji, 1938	SWA
Acyrthosiphon malvae (Mosley, 1841)	WP
Acyrthosiphon pisum (Harris, 1776)	WP
Genus *Aulacorthum* Mordvilko, 1914	
Aulacorthum solani (Kaltenbach, 1843)	?WP
Aulacorthum (Neomyzus) circumflexus (Buckton, 1876)	Or
Genus *Brachycaudus* van der Goot, 1913	
Brachycaudus helichrysi (Kaltenbach, 1843)	WP
Brachycaudus (Acaudus) persicae (Passerini, 1860)	WP
Brachycaudus (Thuleaphis) rumexicolens (Patch, 1917)	WP, M
Brachycaudus (Appelia) schwartzi (Borner, 1931)	WP
Genus *Brevicoryne* van der Goot, 1913	
Brevicoryne brassicae (Linnaeus, 1758)	WP
Genus *Capitophorus* van der Goot, 1913	
Capitophorus elaeagni (del Guercio, 1894)	WP
Capitophorus hippophaes (Walker, 1853)	WP
Capitophorus hippophaes javanicus Hille Ris Lambers	Or
Genus *Carolinaia* Wilson, 1911	
Carolinaia cyperi Ainslie, 1915	* or N
Genus *Cavariella* del Guercio, 1911	
Cavariella aegopodii (Scopoli, 1763)	WP
Genus *Chaetosiphon* Mordvilko, 1914	
Chaetosiphon (Pentatrichopus) fragaefolii (Cockerell, 1901)	N
Chaetosiphon (P.) tetrarhodum (Walker, 1849)	WP
Genus *Coloradoa* Wilson, 1910	
Coloradoa rufomaculata (Wilson, 1923)	EP
Genus *Dysaphis* Borner, 1931	
Dysaphis apiifolia (Theobald, 1923)	WP
Dysaphis cynarae (Theobald, 1915)	WP

Dysaphis emicis (Mimeur, 1935)	WP
Dysaphis foeniculus (Tehobald, 1923)	WP
Genus *Glabromyzus* Richards, 1960	
Glabromyzus ? howardii (Wilson, 1911)	* or N
Genus *Hyadaphis* Kirkaldy, 1904	
Hyadaphis foeniculi (Passerini, 1860)	WP
Genus *Hyperomyzus* Borner, 1933	
Hyperomyzus carduellinus (Theobald, 1915) - old world subtropics, derived from *lactucae*	?SWA
Hyperomyzus lactucae (Linnaeus, 1768)	WP
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 tanacetaria bonariensis E.E. Blanchard, 1932	WP, M
Macrosiphoniella yomogifoliae (Shingi, 1924)	EP
Genus *Macrosiphum* Passerini, 1860	
Macrosiphum euphorbiae (Thomas, 1878)	N
Macrosiphum rosae (Linnaeus, 1758)	WP
Genus *Metopolophium* Mordvilko, 1914	
Metopolophium dirhodum (Walker, 1849)	WP
Genus *Microparsus* Patch, 1919	
Microparsus (*Picturaphis*) *brasiliensis* (Moreira, 1925)	*
Microparsus (*Picturaphis*) *vignaphillus* (E.E. Blanchard, 1922)	*
Genus *Myzus* Passerini, 1860	
Myzus hemerocallis Takahashi, 1921	Or
Myzus nicotianae Blackman, 1987	?Or
Myzus ornatus 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 nigronervosa 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 latysiphon (Davidson, 1912)	?EP
Genus *Sitobion* Mordvilko, 1914	
Sitobion avenae (Fabricius, 1775)	WP

Sitobion lambersi David, 1956	Or
Sitobion luteum (Buckton, 1876)	Or
Sitobion pauliani Remaudiere, 1957	?Africa
Sitobion ptericolens (Patch, 1919)	N
Sitobion salviae (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) erigeronensis (Thomas, 1878)	* or N
Uroleucon (Uromelan) compositae (Theobald, 1915)	Or
Genus *Utamphorophora* Knowlton, 1947	
Utamphorophora commelinensis (Smith, 1960)	*
Anoeciinae	
Anoeciini	
Genus *Anoecia* Koch, 1857	
Anoecia 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) nigriabdominalis (Sasaki, 1899)	EP
Fordini	
Genus *Asiphonella* Theobald, 1923	
Asiphonella dactylonii (Theobald, 1923)	SWA
Genus *Geoica* Hart, 1894	
Geoica lucifuga (Zehtner, 1897)	SW Asia
Genus *Geopemphigus* Hille Ris Lambers, 1933	
Geopemphigus floccosus (Moreira, 1925)	*
Genus *Smynthurodes* Westwood, 1849	
Smynthurodes betae Westwood, 1849	WP
Pemphigini	
Genus *Pemphigus* Hartig, 1839	
Pemphigus bursarius (Linnaeus, 1758)	WP
Pemphigus populitranversus Riley, 1879	N

TAXONOMY OF BRAZILIAN APHIDS

Key to the families and subfamilies of Brazilian aphids

1 (2) All apterae oviparous and pear-shaped, broadest near the front (Fig. 2), with 3-segmented antennae 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 antennae, the third segment bearing 2 primary rhinaria (Fig. 3a). . . . . Phylloxeridae.

2 (1) Apterae viviparae oval, broadest near the middle across the anterior part of the abdomen (Figs. 1, 4, 5), antennae 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; antennae 4- or 5-segmented. . . . . *Brasilaphis* (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 brasiliensis,* Fig. 12) and antennae 6-segmented.

5 (10) Terminal process of antennae 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 antenal 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).

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 rhinaria 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 rhinaria (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 ..... Lachninae.

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 pterogstigma often short and thick with the radius arising from about its mid length (Fig. 35); true apterae with only 3-facetted eyes but alatiform 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. 36); 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 ill-defined, 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* ..... *Anoecia* (Anoeciinae).

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). Apterae (Fig. 39) often 'aleyrodiform'; 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 ..... Hormaphidinae.

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 separeted from femur by a distinct suture (Figs. 5, 67), if not (*Asiphonella*) then siphunculi absent. Apterae (Fig. 5) never aleyrodiform, head and thorax distinct. Tarsal hairs normal, fine pointed (Figs. 58, 59). On roots of angiosperms or in wooly masses on Rosaceae ..... Pemphiginae.

Family Phylloxeridae

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

Viteus vitifoliae **Fitch, 1855 - Figs. 2-3**

Collection data:

SÃO PAULO: Campinas, 14.x.1970 (A.H. Camargo - C.L. Costa).

Distribution in South and Central America: Argentina.

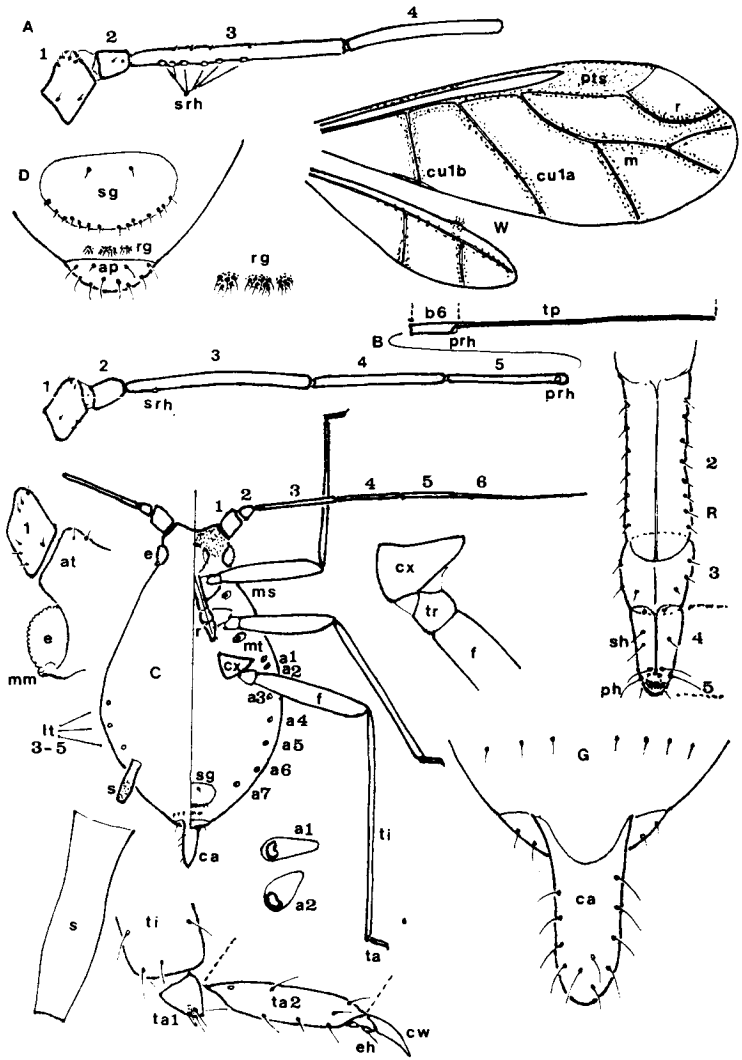

Plate 1

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

A. Alata, Antennal segments 1-4. srh: secondary rhinarium .

B. Aptera, antennal segments 1-6. b6: base of sixth antennal segment. prh: primary rhinarium. srh: secondary rhinarium. tp: terminal process of last antennal segment.

C. Aptera. a1-a7: abdominal spiracles 1-7. at: antennal tubercle. ca: cauda. cw: claw. cx: coxa. e: eye. eh: empodial hair. f: femur. lt: lateral tubercle. mm: triomatidion. ms: mesothoracic spiracle. mt: metathoracic spiracle. r: rostrum. s: siphunculus. sg: subgenital plate. ta: tarsus. ti: tibia. tr: trochanter.

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.

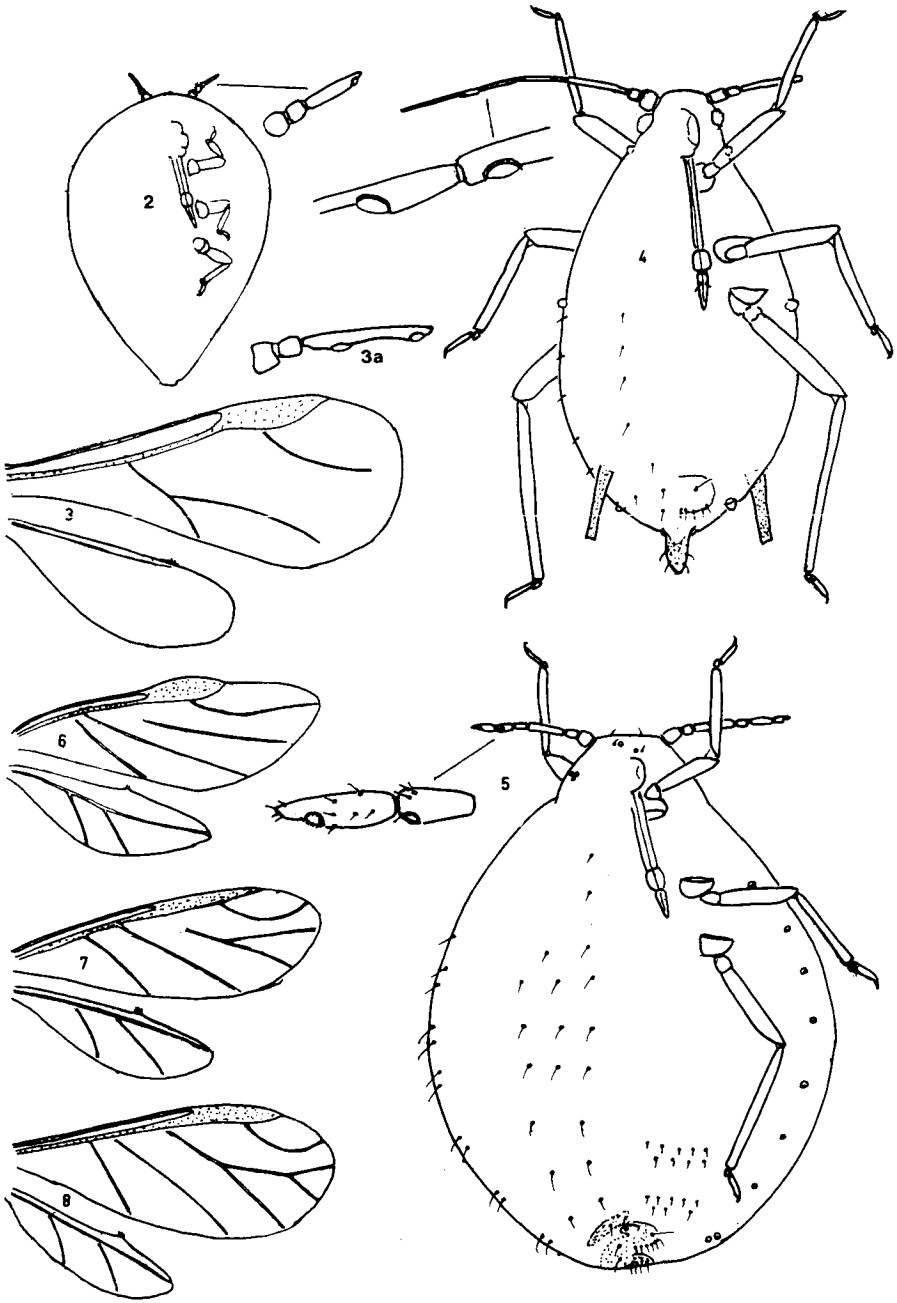

Plate 2

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

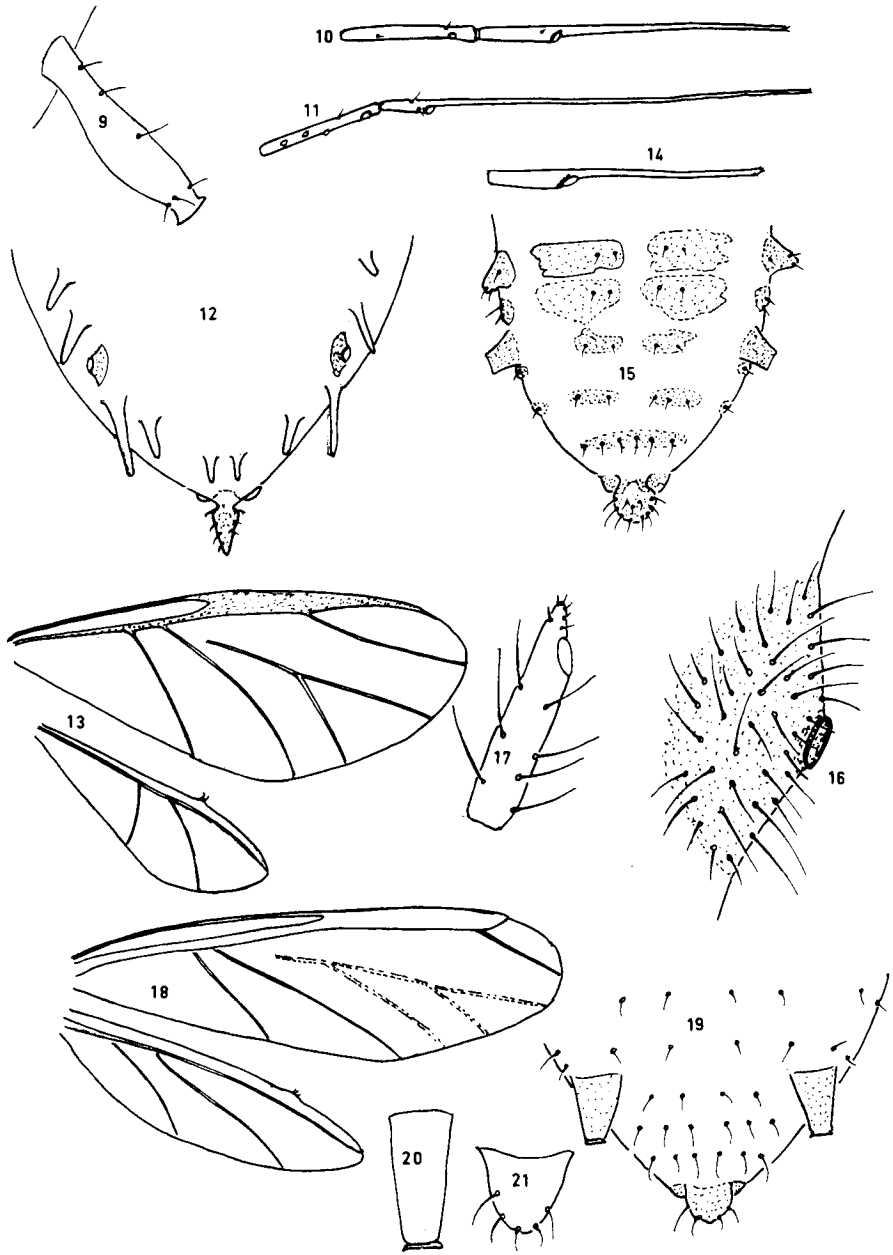

Plate 3

FIG. 9. *Brasilaphis bondari,* **alata, siphunculus. 10-11 antennal segments V & VI, 10** *Aphis gossypii,* **11** *Hyperomyzus lactucae.* **12-13** *Lizerius brasiliensis* **alata, 12 apex of abodmen, 13 wings. 14-15** *Myzocallis castanicola* **alata, 14 antenna VI, 15 abdominal tergites 4-8 and cauda. 16** *Cinara maritimae* **aptera, siphunculus, 17-18** *Cinara tujafilina* **alata, 17 antennal VI, 18 wings. 19-21** *Brachycaudus helichrysi,* **19 aptera, apex of abdomen, 20 & 21 alata, 20 siphunculus, 21 cauda.**

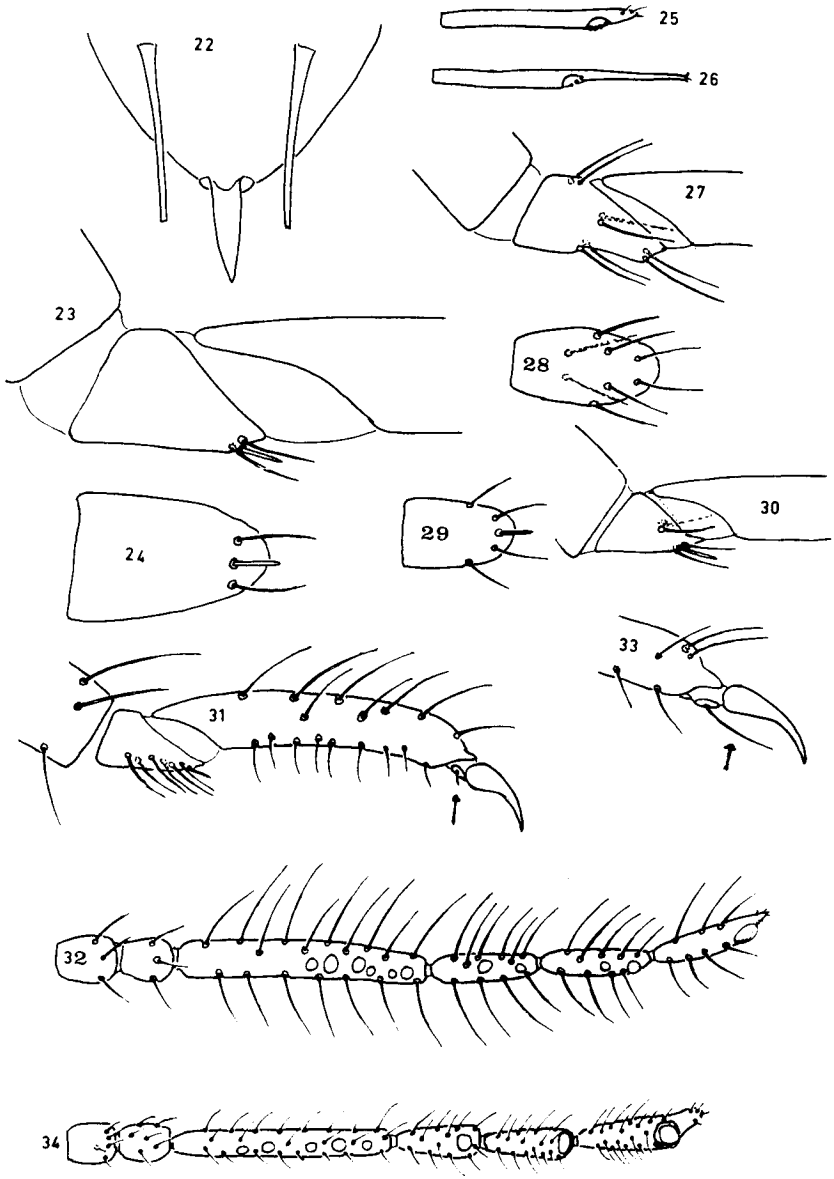

Plate 4

FIG. 22-24. *Acyrthosiphon pisum,* **22 aptera, apex of abdomen, 23 & 24 alata, first tarsal segments of hind leg, 23 lateral view, 24 ventral view. 25-26** *Lizerius* **spp., alatae, antennal VI, 25** *L. costai,* **26** *L. cermelii.* **27-30 first tarsal segments of hind leg, 27 & 28** *Myzocallis castanicola,* **27 lateral view, 28 ventral view, 29, 30** *Uroleucon sonchi,* **29 ventral view, 30 lateral view. 31-32** *Cinara tujafilina* **alata, 31 hind tarsus, 32 antenna. 33-34** *Anoecia cornicola* **alata, 33 apex of second segment of hind tarsus and claw, 34 antenna.**

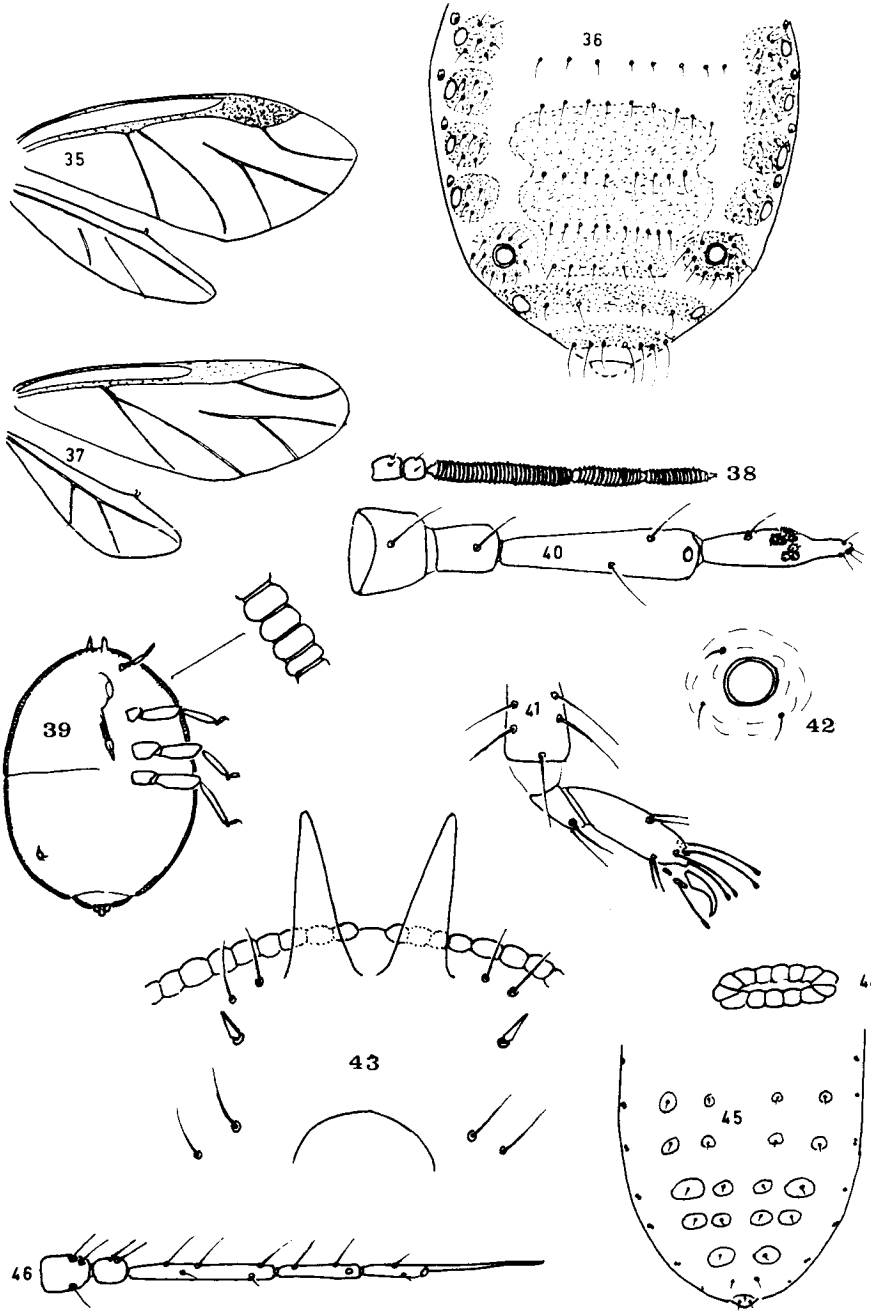

Plate 5

FIG. 35-36. *Anoecia cornicola* **alata, 35 wing, 36 abdomen. 37-43** *Cerataphis* **spp. 37-38,** *C. orchidearum* **alata, 37 wings, 38 antenna, 39-43** *C. variabilis* **aptera, 40 antenna, 41 hind tarsus, 42 siphunculus, 43 front of head ventral view. 44** *Eriosoma lanigerum* **aptera, wax plate. 45** *Pemphigus bursarius* **apterous exule, abdomen showing distribution of wax plates. 46** *Sipha flava* **aptera, antenna.**

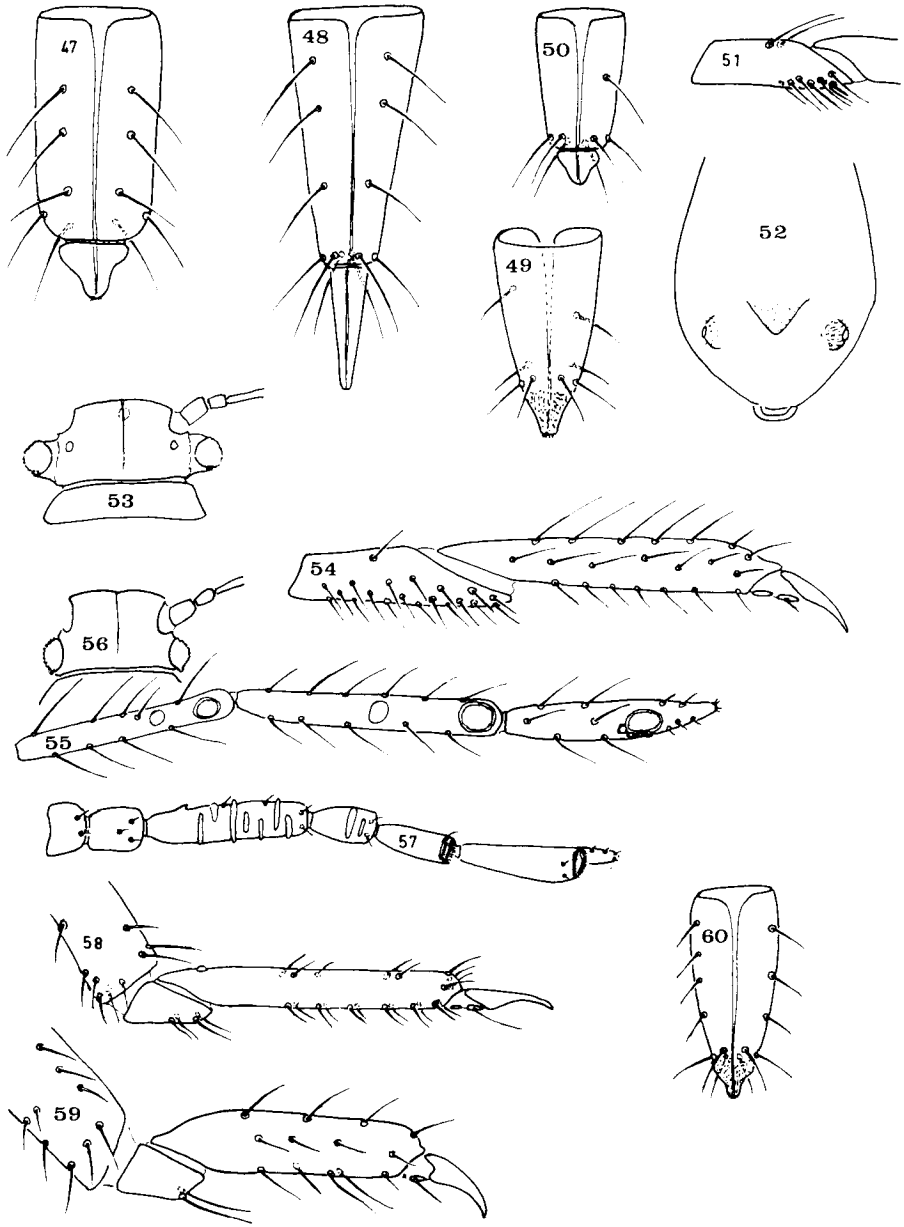

Plate 6

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

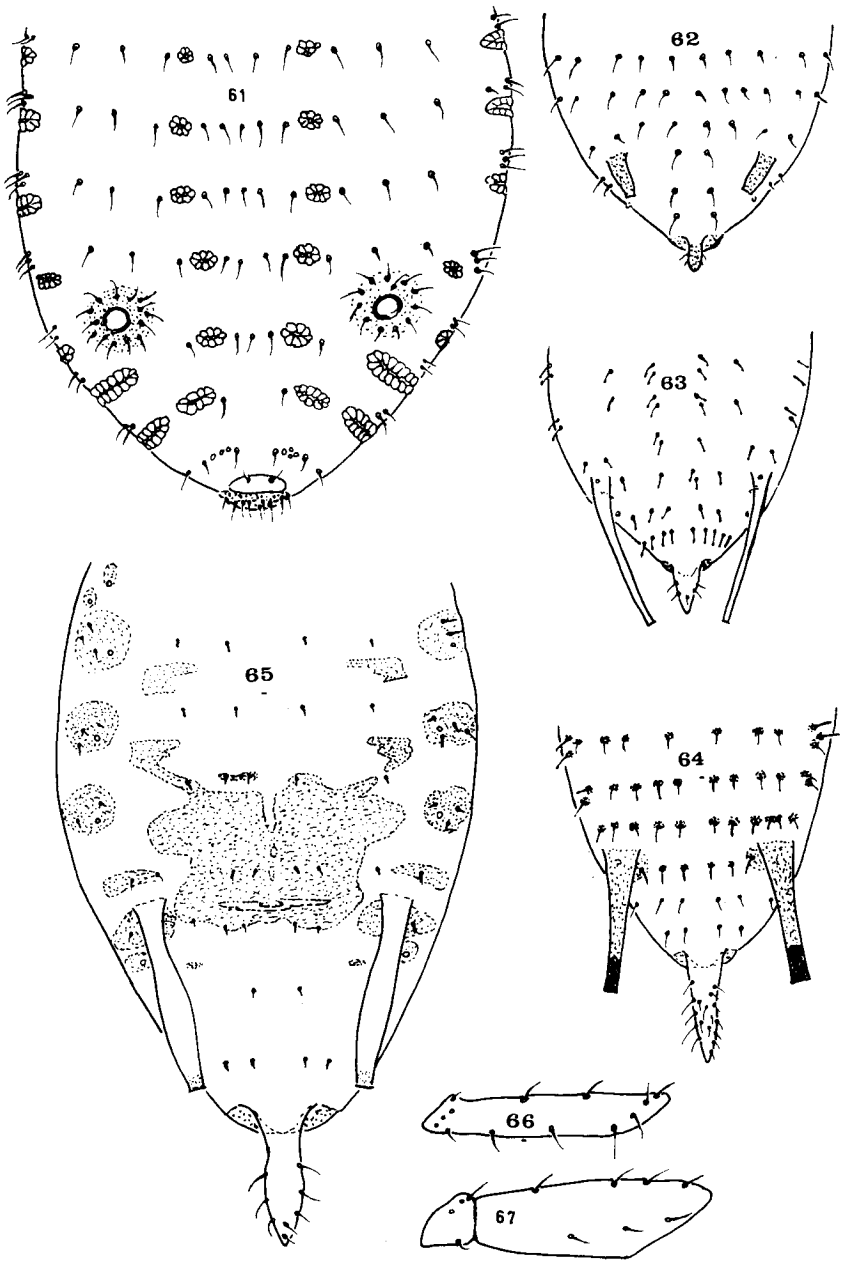

Plate 7

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

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