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Aphids (Homoptera: Aphidoidea) from Madeira Island – New Records and Corrections

A. M. FRANQUINHO AGUIAR y Fernando ALBANO ILHARCO

Se citan como nuevas para la afidofauna de la Isla de Madeira, 12 especies de pulgones de los cuales 8 tambien lo son para la Macaronesia.

Las nuevas citas incluyen: [Pemphigidae]: *Aploneura lentisci* (Passerini); [Drepanosiphidae]: *Atheroides serrulatus* Haliday; *Drepanosiphum oregonensis* Granovsky and *Euceraphis punctipennis* (Zetterstedt); [Aphididae]: *Holcaphis holci* Hille Ris Lambers, *Illinoia lambersi* (MacGillivray), *Lipaphis erysimi* (Kaltenbach), *Macrosiphoniella artemisiae* (Boyer de Fonscolombe), *Nasonovia (Kakimia) dasyphylli* Stroyan, *Neotoxoptera formosana* (Takahashi), and *Uroleucon hypochoeridis* (Fabricius); [Lachnidae]: *Essigella californica* (Essig). Asi la presente aportación lleva el numero de especies conocidas a un total de 154 para la Isla de Madeira y un total de 157 para el archipielago.

Un porcentaje significativo de las especies mencionadas ha sido collectado en trampas de Moericke. Se presentan consideraciones faunisticas generales para cada especie, incluyendo su distribución geográfica.

A. M. FRANQUINHO AGUIAR. Laboratório Agrícola da Madeira-DSIA, 9135-260 Camacha, Madeira, Portugal. E-mail: antonio.aguiar@srafp.pt

F. A. ILHARCO. Estação Agronómica Nacional, 2784-505 Oeiras, Portugal.

Palabras clave: Pulgones, Archipielago de Madeira, Macaronesia

INTRODUCTION

The authors on previous papers (AGUIAR *et al.*, 1995; AGUIAR & ILHARCO, 1997) recorded several new species for the aphid fauna of Madeira proper. On the present work, twelve new species are recorded for the first time to Madeira, and taxonomic corrections to some early records are given.

The complete list of species for the Madeiran Archipelago published in AGUIAR *et al.* (1995) should now list 154 species for Madeira proper, which represents 98% of the total number of species (157) for the whole archipelago.

Almost half of the new aphids were collected by Moericke water traps installed on citrus and tropical fruit groves, at different altitudes, ranging from 180 to 400 metres in both north and south coasts of the main island. The remaining species were collected directly on their host plants, mainly on exotic forest and agricultural ecosystems.

All the studied samples are mounted on slides and/or preserved on ethanol on the insect collections of the Laboratório Agrícola da Madeira (ICLAM), referenced by code numbers beginning by letter «A» (e.g. A710), and that of Estação Agronómica Nacional (CAEAN), registered only by numbers (e.g. CAEAN 6287).

LIST OF NEW RECORDS

The classification followed on the Madeiran list of aphid species is the one proposed

by ILHARCO (1992) and within each family the species are listed alphabetically.

Pemphigidae

Aploneura PASSERINI, 1863

1. Aploneura lentisci (PASSERINI, 1856)

In the Mediterranean (Israel) each annual gall on the leaves of *Pistacia lentiscus* is formed by a single *A. lentisci* nymph which when adult reproduces parthenogenetically within the gall, producing up to 500 alates, which then abandon the gall (WOOL & MANHEIM, 1986). As the primary host plant of *A. lentisci*, *P. lentiscus*, is absent from Madeira island, the aphid is most probably anholocyclic on Gramineae roots as in Africa, South of the Sahara were it is common. MUSTAFA & AKKAWI (1987) reported economic damage to wheat in Jordan.

According to BLACKMAN & EASTOP (1994), *A. lentisci* has a wide distribution: Europe, excluding the northern countries, the Middle East, Central Asia, some African countries, Australia, New Zealand and Argentina. REMAUDIÈRE *et al.* (1992), cite this species for Bolivia and Chile. In Macaronesia it was only known from the Islands of Cape Verde.

Material studied: 1 alate (Fig. 1), Quebradas, São Martinho, 140m, 21-April-1999, A710, Moericke water trap, leg. F. Aguiar & J. Jesus.

Drepanosiphidae

Atheroides HALIDAY, 1839

2. Atheroides serrulatus HALIDAY, 1839

This small to medium-sized aphid with a markedly elongated body lives on the leaves

Fig. 1.–*Aploneura lentisci* alate. Wingspan - 3,5 mm.

of several Gramineae (*Festuca*, *Poa*, *Agrostis*, *Holcus* etc.).

The distribution area of *A. serrulatus* goes from Europe (except continental Portugal), Asia and Canada (HEIE, 1982). It is a new record for Macaronesia.

Material studied: 1 alate (Fig. 2), Pico, Santana, 395 m., 6-May-1997, A613, Moericke water trap, leg. F. AGUIAR & J. JESUS.

Drepanosiphum Koch, 1855

*3. **Drepanosiphum oregonensis** GRANOVSKY, 1939.*

***Drepanosiphum platanoidis** (Schrank), AGUIAR & ILHARCO, Bol. San. Veg. Plagas 23: 567 (1997)*

The genus *Drepanosiphum* has according to Remaudière & Remaudière (1997) seven valid species. All these species are associated with *Acer* and those collected in Madeira with *A. pseudoplatanus*. Viviparae alate of *D. oregonensis* were collected in this host, mixed with *D. platanoidis* in large aggregations on undersides of leaves. *D. oregonensis* was in an earlier instalment (AGUIAR & ILHARCO, 1997) wrongly identified as *D. platanoidis*, although it is now certain that both species are present in Madeira.

According to BLACKMAN & EASTOP (1994), *D. oregonensis* distribution includes Southern and Central Europe, Mediterranean, southwest Asia, India and introduced to western USA. *D. oregonensis*, already known from the Azores and continental Portugal, is a new record for Madeira.

Material studied: 35 alate viviparae (Fig. 3), ex *Acer pseudoplatanus*, Queimadas, Santana, 880 m, 21-September-2000, A732, F. Aguiar leg.; 30 alate viviparae [same data as previous], CAEAN 6415; 2

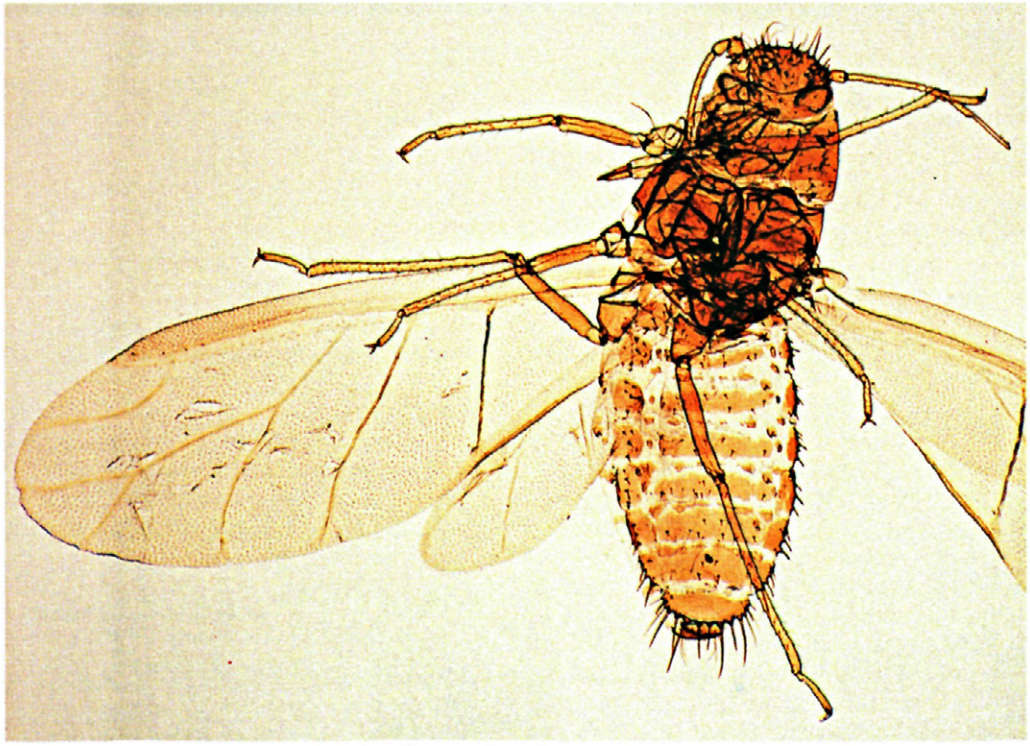


Fig. 2.–*Atheroides serrulatus* alate. Wingspan - 4,3 mm.

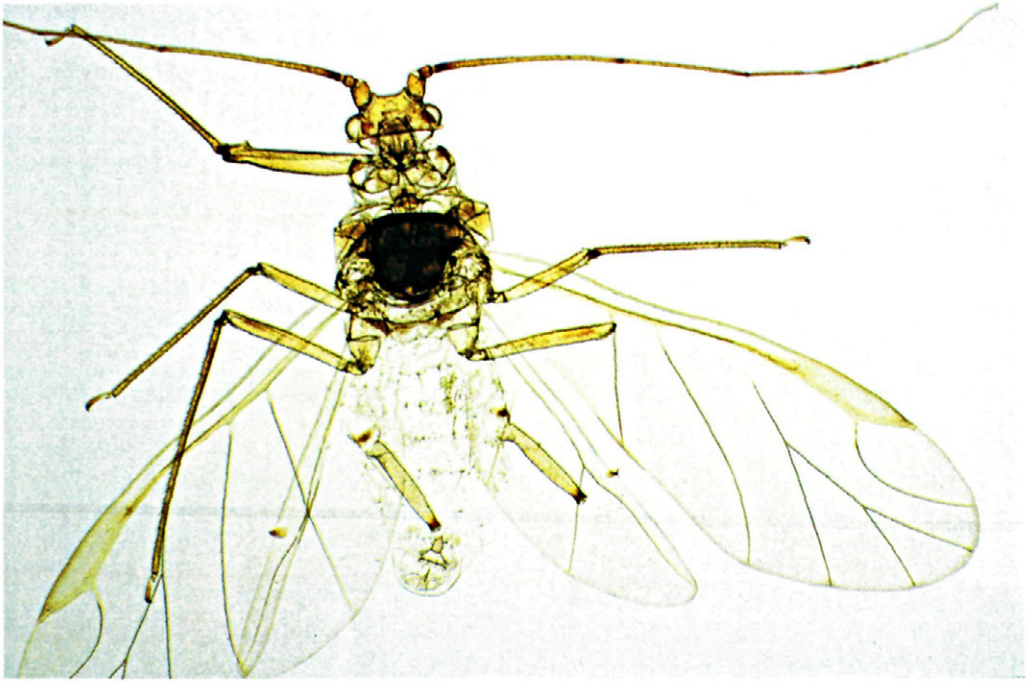


Fig. 3.–*Drepanosiphum oregonensis* alate. Wingspan – 8,5 mm.

alate viviparae, ex *Acer pseudoplatanus*, Ribeiro Frio, 850 m, A733, 21-September-2000, A732, F. Aguiar leg

Euceraphis Walker, 1870

4. *Euceraphis punctipennis* (Zetterstedt, 1828)

The most common aphids on birch (*Betula* spp.) in Western Europe belong to the genus *Euceraphis*. In southern England two species are present on birches, which are described and compared by Blackman (1977), based on seasonal variations in morphometrics, pigmentation and development of wax glands. A key to the alate virginoparae, which also includes the North American species, is provided in the same work.

E. punctipennnis can be found all over Europe and is a new record for Macaronesia.

Material studied: 2 alatae (Fig. 4), ex *Betula celtiberica*, Boca da Corrida, Jardim da Serra, 1000 m., 13-May-1999, A701, leg. F. Aguiar & J. Jesus.

Aphididae

Holcaphis Hille Ris Lambers, 1939

5. *Holcaphis holci* Hille Ris Lambers, 1956

This European species is a specialist feeder on *Holcus* spp. (Gramineae). Ilharco & Vieira (1992) recorded it for the first time in Portugal.

H. holci is a new record for Macaronesia and curiously, as all specimens collected in continental Portugal, the sole specimen found in Madeira was also an alate caught on a yellow water trap. *H. holci* was introduced in North America.

Material studied: 1 alate (Fig. 5), Preces, Câmara de Lobos, 180 m., 2-December-1997, A681, Moericke water trap, leg. F. Aguiar & J. Jesus.

Fig. 4.–*Euceraphis punctipennis* alate. Wingspan - 10,1 mm.

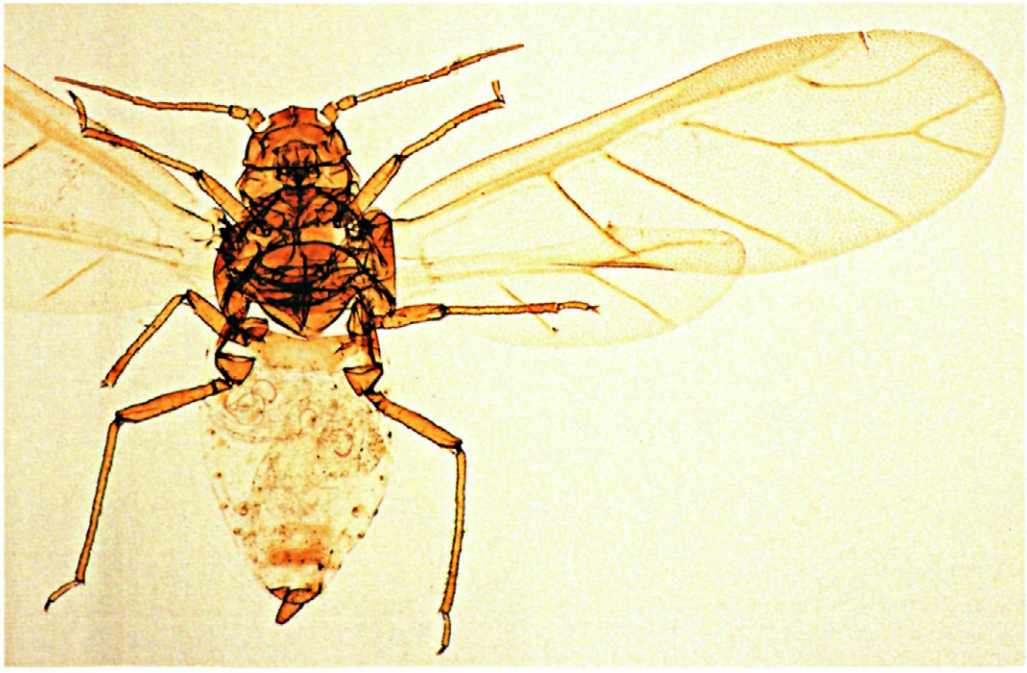


Fig. 5.–*Holcaphis holci* alate. Wingspan - 4,4 mm.

Illinoia WILSON, 1910

6. *Illinoia lambersi* (MACGILLIVRAY, 1960)

This species was described from western North America and Stroyan (1971) recorded it as a common pest of rhododendrons in the Netherlands and England, of which according to Hille Ris Lambers (1973) attacks not only evergreen hybrids but also hybrids and cultivars of deciduous species. The leaves of infested shoots remain undeveloped and no flower buds are produced.

Distribution ranges from western North America to Europe (England, Denmark, the Netherlands) and South America (Chile) were it was introduced (Blackman & Eastop, 1989). *I. lambersi* is a new record for Macaronesia.

Material studied: 2 apterae (Fig. 6), 1 nymph, ex *Rhododendron* sp., Casa do Lanço, São Vicente, 240m, 2-September-1997, A628, leg. F. Aguiar & J. Jesus.

Lipaphis MORDWILKO, 1928

7. *Lipaphis erysimi* (KALTENBACH, 1843)

We are probably in presence of the European form of the Turnip or Mustard aphid. Normally this form is not a pest of Brassica crops as occurs in Japan, India, China and New Zealand on different oilseed brassicas, rape, mustard and radish, transmitting a number of non-persistent viruses, including cabbage black ring spot and mosaic diseases

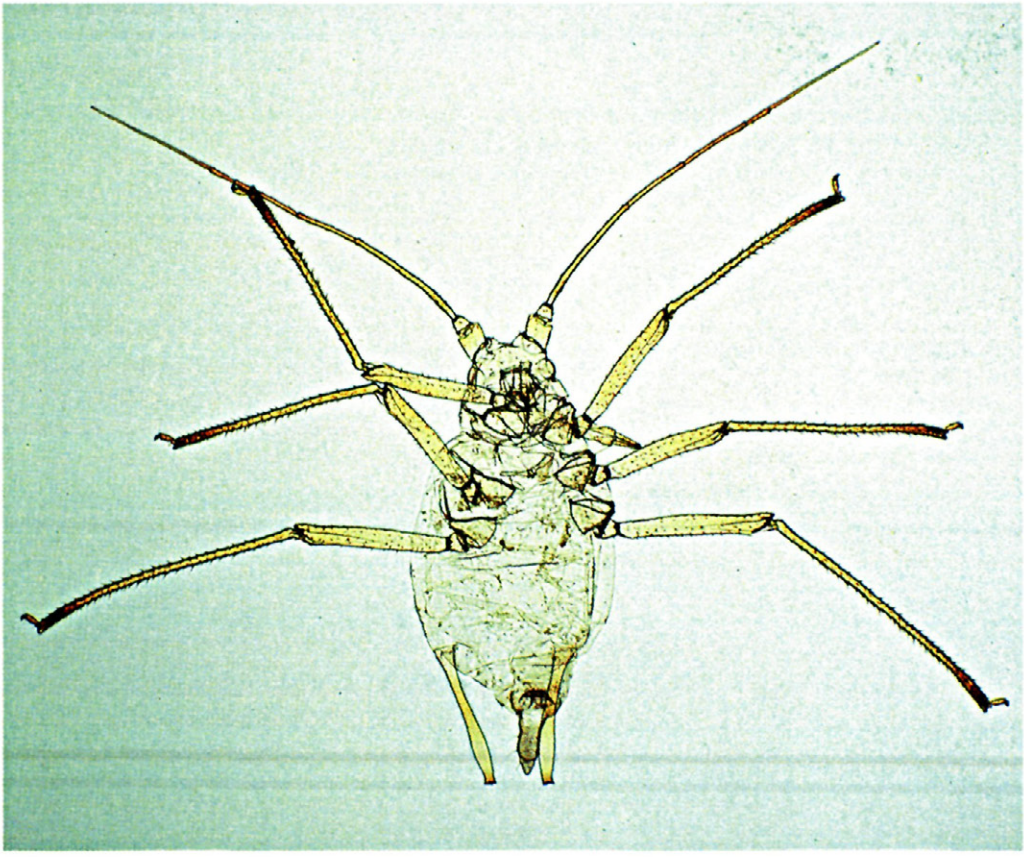


Fig. 6.–*Illinoia lambersi* aptera. Body length - 2,2 mm.

of cauliflower, radish and turnip. Its host plants belong to many genera and species of Cruciferae (BLACKMAN & EASTOP, 1989; 1997). If by any chance this species becomes a pest of Brassica crops in Madeira, there is the hope of natural control due to the existence of an efficacious natural enemy, the micro wasp *Diaretiella rapae* (Mc'Intosh) (Aphidiidae).

Although holocyclic forms have been observed, anholocycly predominates in warmer climates (BLACKMAN & EASTOP, 1989).

In Macaronesia already known from the Azores (São Miguel and Terceira islands), and Canary islands (Tenerife) (Ilharco, 1982; NIETO-NAFRIA *et al.*, 1977). It is virtually distributed worldwide.

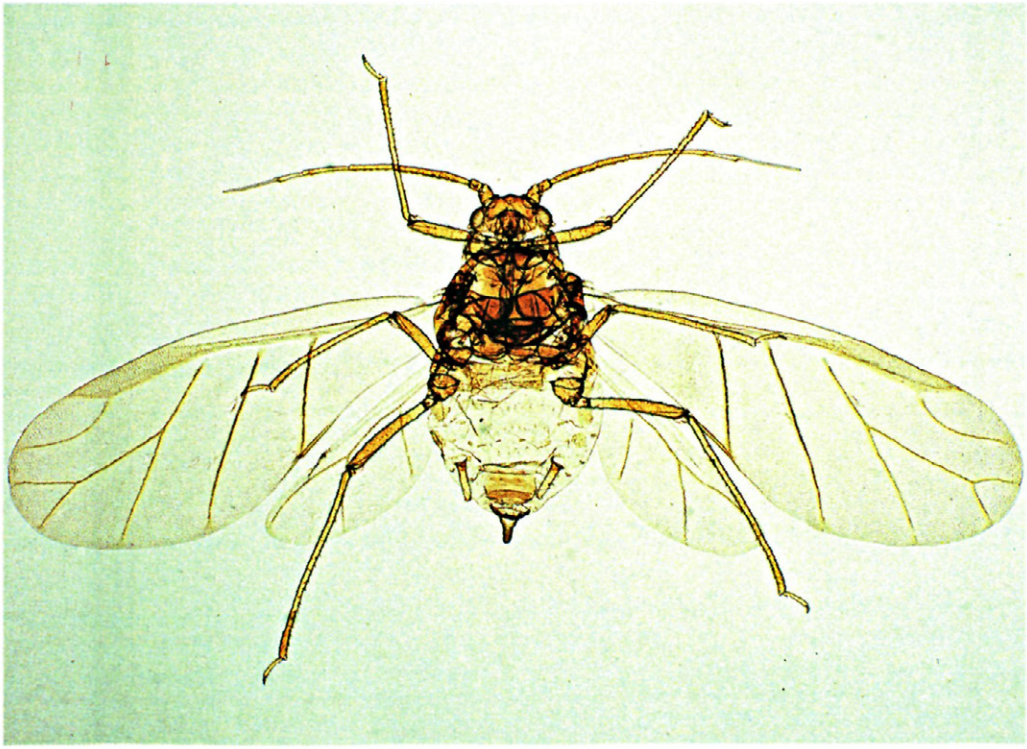
Material studied: 6 alatae (Fig. 7), ex *Raphanus raphanistrum*, Pico, Santana, 395 m., 12-November-1998, A688 in ICLAM Coll., leg. F. Aguiar & J. Jesus; 4 apterae, ex *Raphanus raphanistrum*, Pico, Santana, 395 m., 28-January-1999, A689 in ICLAM Coll., leg. F. Aguiar & J. Jesus; Unspecified number of individuals, the same data as the later, except that is deposited at CAEAN 6287; 8 apterae, ex *Raphanus raphanistrum*, Miradouro do Faial, 410 m., 25-February-1999, A698 in ICLAM Coll., leg. F. Aguiar & J. Jesus.

Macrosiphoniella DEL GUERCIO, 1911

8. *Macrosiphoniella artemisiae* (BOYER DE FONSCOLOMBE, 1841)

This is a Palaearctic species which was introduced in the Nearctic region (ILHARCO, 1982).

From Macaronesia it was already recorded from Tenerife, La Gomera and La Palma Islands (Canary Islands) (NIETO-NAFRIA *et al.*, 1977) and from the Terceira Island - Azores (ILHARCO, 1982).



Fig, 7.–*Lipaphis erysimi* alate. Wingspan - 5,8 mm.

Material studied: 27 apterae (Fig. 8), ex *Artemisia arborescens*, Quebradas, São Martinho, 140m, 20-February-1997, A598 in ICLAM Coll., leg. F. Aguiar & J. Jesus; Unspecified number of individuals, the same data as the later, except that is deposited at CAEAN 6127; 1 alate and 4 apterae, ex *Artemisia vulgaris*, Pico, Santana, 395 m, A683, 15-December-1998, F. Aguiar & J. Jesus leg.

Nasonovia MORDVILKO, 1914

Subgen. *Kakimia* GILLETTE & PALMER, 1928

9. Nasonovia (Kakimia) dasyphylli STROYAN, *1957*

This species feeds preferably on Crassulaceae (*Aeonium*, *Aichryson*, *Sedum*) and also on Saxifragaceae. *N. dasyphylli* is known from allover Europe. *N. dasyphylli* constitutes a new record for Macaronesia.

Material studied: Unspecified number of apterae and nymphs, ex flower buds of *Aeonium glutinosum*, Miradouro do Pico do Facho, Machico, 300 m., 12-May-1997, JHM7016 in NHM-London Coll., leg. & det. Jon H. Martin; 4 alatae (Fig. 9) and 8 apterae, ex *Aichryson divaricatum*, Montado do Sabugal, Santana, 850 m, 20-July-2000, A727 in ICLAM Coll., Aguiar & Jesus leg. (part of this sample is deposited in the CAEAN under number 6413); unspecified number of apterae and alatae, ex *Aichryson dichotomum*, Las Mercedes, Tenerife, Canary Islands, 26-31-May-1972, in NHM-London (Hille Ris Lambers collection 720), leg. K. W. R. Zwart.

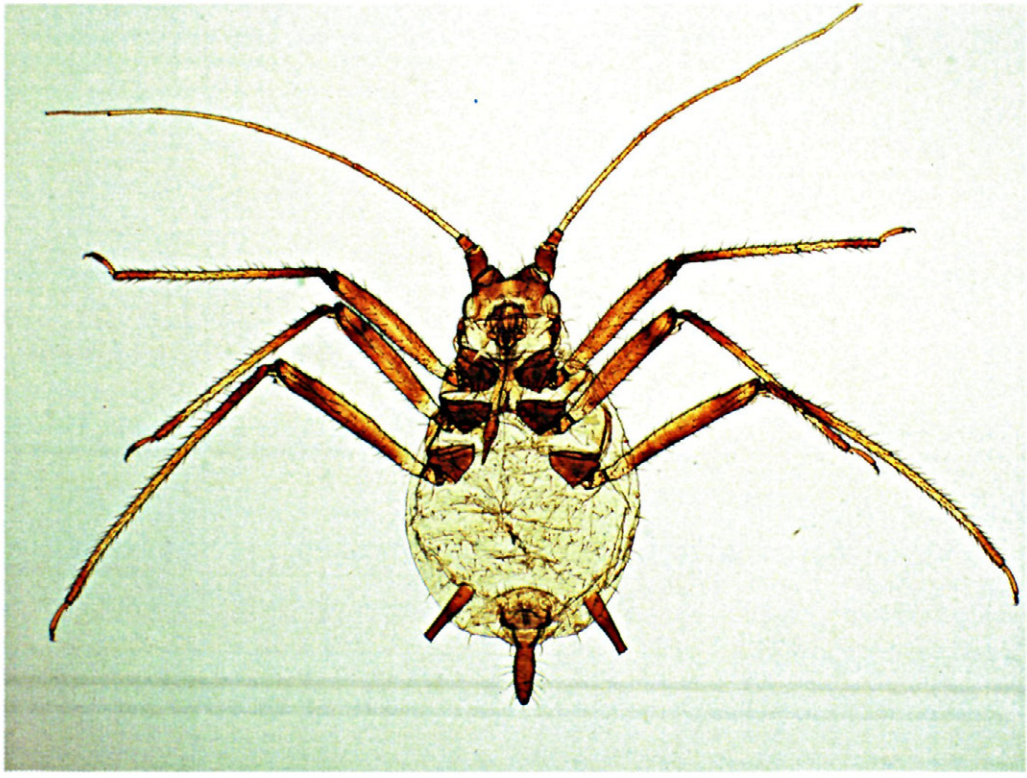


Fig. 8.–*Macrosiphoniella artemisiae* aptera. Body length - 2,5 mm.

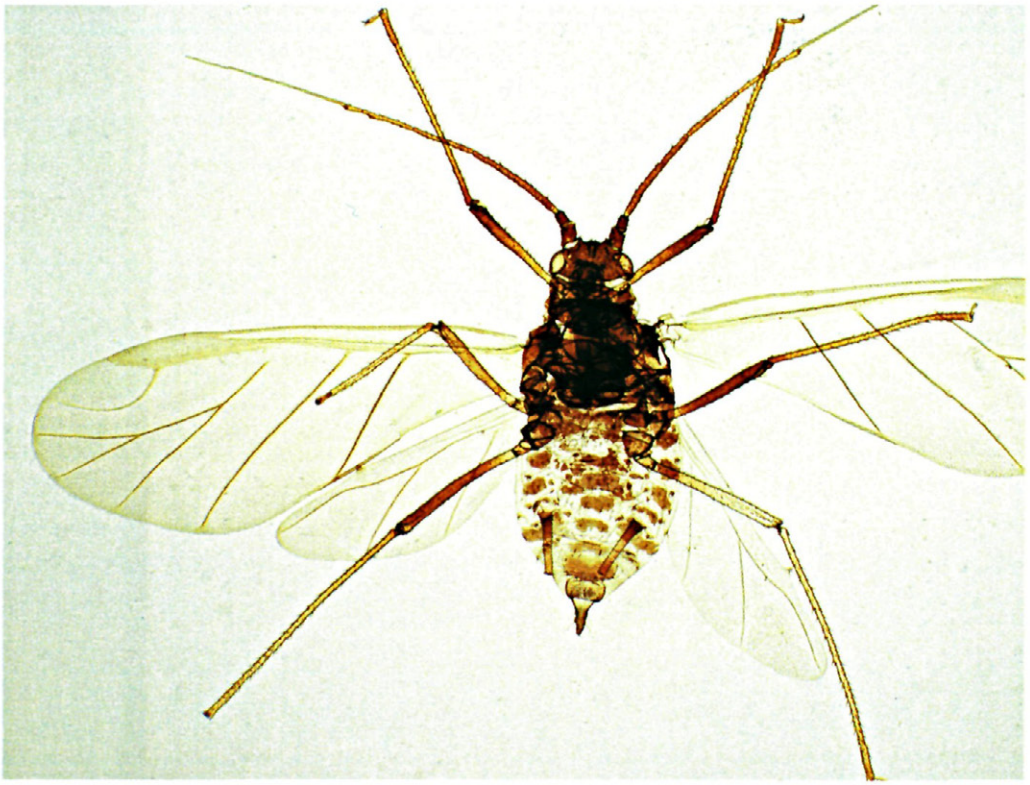


Fig. 9.–*Nasonovia dasyphylli* alate. Wingspan - 6,8 mm.

Neotoxoptera THEOBALD, 1915

10. Neotoxoptera formosana (TAKAHASHI, 1921)

The Onion Aphid can originate large colonies on leaves of *Allium* spp. including the common onion and garlic. *N. formosana* seems to be involved in the transmission of the Garlic Latent Virus that produces typical mosaic symptoms to several species of *Allium*, specially garlic (SAKO *et al.*, 1990).

The distribution of *N. formosana* includes Europe (Finland, Netherlands), Japan, China, Taiwan, Korea, New Guinea, Australia, New Zealand, Hawaii, and North America (BLACKMAN & EASTOP, 1997). SOUSA-SILVA & ILHARCO (1995) record its existence in Brazil. Starý *et al.* (1994) and FUENTES-CONTRERAS *et al.* (1997) include this species in the Chilean aphid fauna. *N. formosana* is a new record for Madeira and Macaronesia.

Material studied: 1 alate (Fig. 10), inside house, Lombo da Boa Vista, Funchal, 175 m. 4-November-1999, A712 in ICLAM Coll., leg. F. Aguiar.

Uroleucon MORDVILKO, 1914

11. Uroleucon hypochoeridis (FABRICIUS, 1779)

This European species lives in the Compositae genera *Hypochoeris* and *Leontodon*. The larger colonies are seen on the upper parts of stems, near the inflorescenses. *U. hypochoeridis* is a new record for Macaronesia, although already known from continental Portugal.

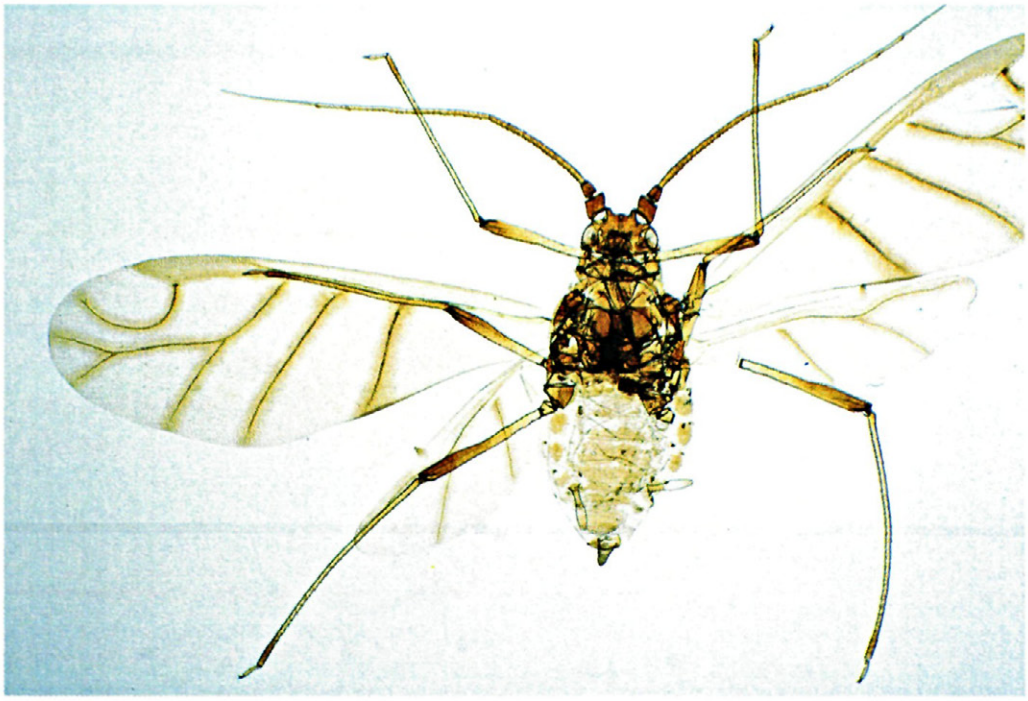


Fig. 10.–*Neotoxoptera formosana* alate. Wingspan - 7 mm.

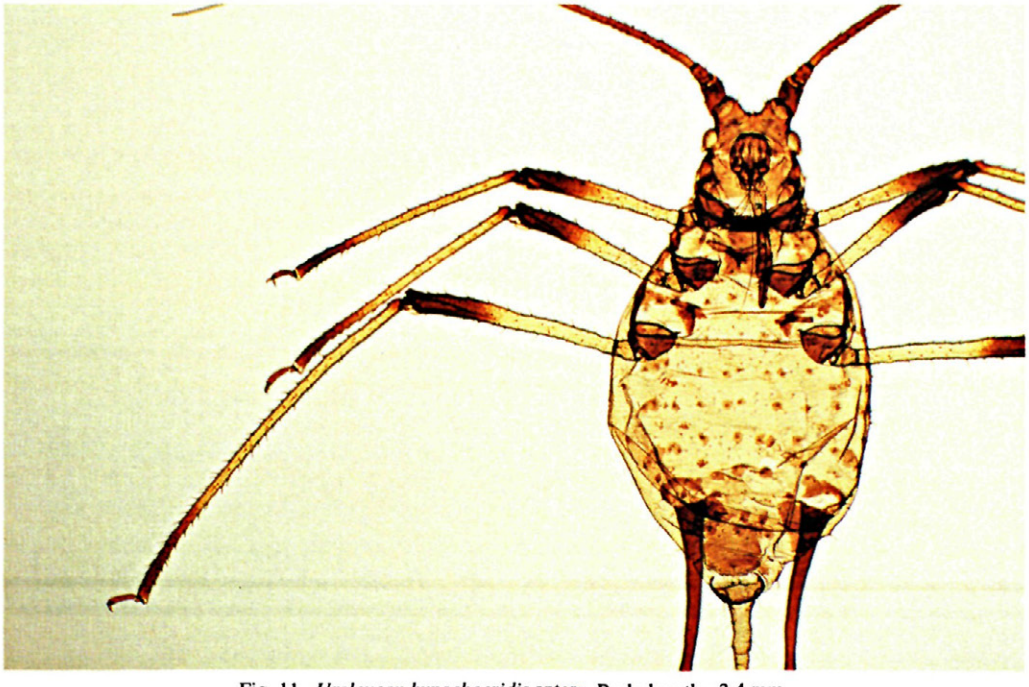


Fig. 11.–*Uroleucon hypochoeridis* aptera. Body length - 3,4 mm.

Material studied: Unspecified number of alatae and apterae (Fig. 11) ex *Tolpis* sp., Fajã da Nogueira, Santana, 600 m, 7-June-1993, A236 in ICLAM Coll., leg. F. Aguiar & J. Jesus (part of this sample is deposited in the CAEAN under number 6436).

Lachnidae

***Essigella* DEL GUERCIO, 1909**

Subgen. *Essigella* s. str.

*12. **Essigella californica** (ESSIG, 1909)*

This aphid species feeds singly on needles of *Pinus* spp. and it also occurs on *Pseudotsuga* spp. of which several introduced species can be found in Madeira.

E. californica is a North American species, recently introduced in France (TURPEAU & RÉMAUDIÈRE, 1990) and Spain (SECO-FERNÁNDEZ & MIER-DURANTE, 1992). It was previously unknown in Macaronesia. ACCORDING TO BLACKMAN & EASTOP (1994), in California it has an anholocyclic life cycle.

Material studied: 1 alate (Fig. 12), ex *Pinus pinaster*, Curral das Freiras, 600 m., 27-August-1998, A670 in ICLAM Coll., leg. F. Aguiar & J. Jesus.

CORRECTIONS TO THE LIST

Aphididae

***Brachycaudus* VAN DER GOOT, 1913**

*Subgen. **Appelia** BÖRNER, 1930*

***Brachycaudus (Appelia) schwartzi** (BÖRNER, 1931)*

Brachycaudus prunicola (Kalt.); Ilharco, F. A., Agronomia lusit., 34: 241 (1973); BOCAGIANA 35, p.13 (1974).

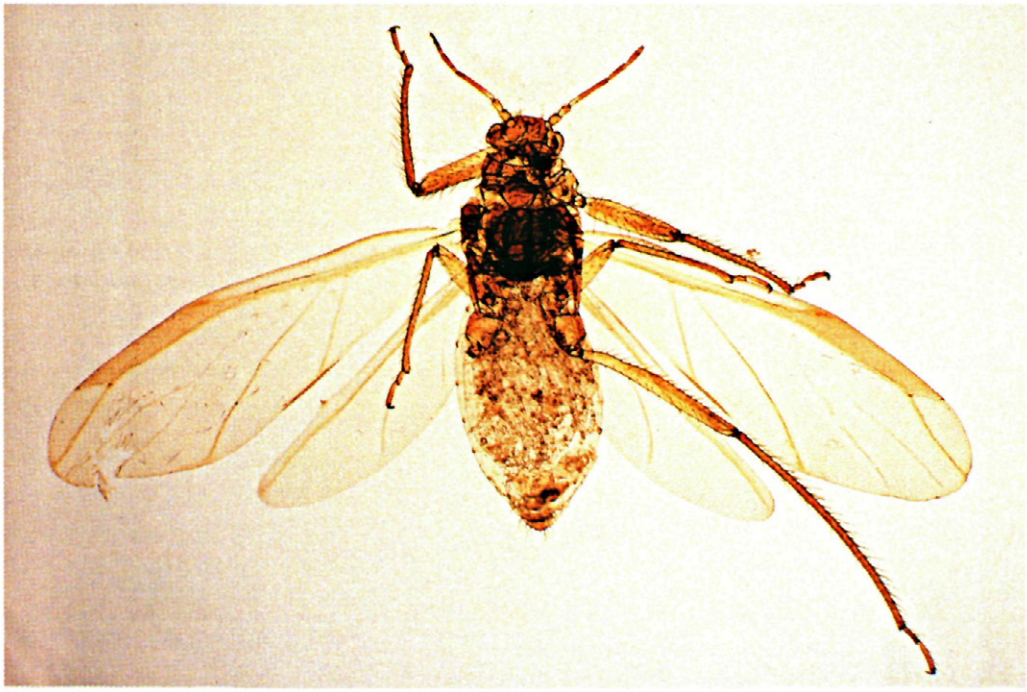


Fig. 12.–*Essigella californica* alate. Wingspan - 6,4 mm.

Previously identified as *B. prunicola* (Kaltenbach), this is a very common species in Madeira, feeding mainly on several species of *Prunus*.

According to BLACKMAN & EASTOP (1989), *B. schwartzi* is known from Europe, Iran, India, South America, and California. Previous records from continental Portugal and the Azores also refer to *B. schwartzi* and probably also for the record from Tenerife by Nieto-Nafría *et al.* (1977).

Uroleucon MORDVILKO, 1914

Uroleucon mierae TIZADO & NIETO-NAFRÍA, 1994

Uroleucon picridis (F.); Ilharco, F. A., Agronomia lusit., 34: 251 (1973); Bocagiana No. 35: 32 (1974); Bolm. Mus. Mun Funchal, 36 (163): 194 (1984)

TIZADO-MORALES & NIETO-NAFRÍA (1990) studied populations classified as *U. picridis* and collected on *Andryala* and *Picris* spp. These studies evidenced the existence of two morphologically different groups. Later, when additional biological data was available, Tizado & Nieto-Nafría (1994) described the populations living on *Andryala* spp. as a new species – *U. mierae*.

The species previously recorded from Porto Santo (ILHARCO, 1973) and Madeira (ILHARCO, 1974, 1984) as *Uroleucon picridis* (F.) is in fact *U. mierae* (TIZADO & NIETO-NAFRÍA, 1994). In Madeira *U. mierae* has been collected on *Andryala varia*, *Leontodon rothi*, *Sonchus oleraceus* and *S. squarrosus*.

Both species, *U. picridis* and *U. mierae* exist in Continental Portugal, the later living on *Andryala arenaria*, *A. integrifolia*, *A. sinuata*, *Cichorium endivia*, *C. intybus*, *Erigeron* x *flahaultianum* and *Hypochoeris glabra*. The distribution of *U. mierae* includes Portugal as stated above and according to TIZADO & NIETO-NAFRÍA (1994), also Spain, France and Algeria.

Material studied: 4 apterae ex *Sonchus oleraceus*, Pico, Santana, 395 m, 11-February-1999, A693 in ICLAM Coll., leg. F. Aguiar & J. Jesus.

Drepanosiphidae

Drepanosiphum KOCH, 1855

Drepanosiphum platanoidis (SCHRANK, 1801)

This species was recorded as new to Madeira by AGUIAR & ILHARCO (1997), although some material studied included another species of the same genus already referred earlier in the present work. After careful reviewing, the contents of those samples are the following: [*Drepanosiphum oregonensis*] ex *Acer pseudoplatanus*, Ribeiro Frio, 840 m, 16-November-1994, CAEAN 5455, F. Ilharco, F. Aguiar, J. Pinto, M. Pita & J. Brazão leg.; [*Drepanosiphum oregonensis*] ex *Acer pseudoplatanus*, Ribeiro Frio, 840 m, 31-October-1995, CAEAN 5625a, F. Aguiar leg.; [*Drepanosiphum platanoidis*], same data as previous, CAEAN 5625b

ABSTRACT:

Twelve aphid species not previously recorded are added to the aphid fauna of Madeira Island, with 8 of them new to Macaronesia. These new records include the [Pemphigidae]: *Aploneura lentisci* (Passerini); [Drepanosiphidae]: *Atheroides serrulatus* Haliday, *Drepanosiphum oregonensis* Granovsky and *Euceraphis punctipennis* (Zeterstedt); [Aphididae]: *Holcaphis holci* Hille Ris Lambers, *Illinoia lambersi* (MacGillivray), *Lipaphis erysimi* (Kaltenbach), *Macrosiphoniella artemisiae* (Boyer de Fonscolombe), *Nasonovia (Kakimia) dasyphylli* Stroyan, *Neotoxoptera formosana* (Takahashi) and *Uroleucon hypochoeridis* (Fabricius); [Lachnidae]: *Essigella californica* (Essig). This raises the number of known species from Madeira proper to 154.

A significant proportion of the species involved was collected in Möericke water traps. General faunistic considerations are presented for each one of the species treated, including their geographical distribution.

Key words: Aphids, Madeira Archipelago, Macaronesia

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