

Notes on aphid parasitoids of Porto Santo Island, Madeira Archipelago (Hymenoptera, Aphidiidae)

A. CECÍLIO, M. T. PITA, F. A. ILHARCO

Six aphidiid species are reported for the first time to Porto Santo Island: *Aphidius colemani* Viereck, *Aphidius ervi* Haliday, *Aphidius funebris* MacKauer, *Diaeretiella rapae* (M'Intosh), *Lysiphlebus fabarum* (Marshall) and *Trioxys angelicae* (Haliday). The species *A. colemani* and *A. funebris* are reported for the first time to Madeira Archipelago. The parasitoid/aphid/plant associations were identified and the tritrophic relationship was analysed. Six new parasitoid/host aphid associations and nine new parasitoid/host plant associations are reported to Madeira Archipelago.

The aphidiid species previously reported parasitizing aphids of the genus *Aphis* in Madeira Island were *L. fabarum* and *Lysiphlebus testaceipes* (Cresson), the last one appeared as the dominant species on hosts belonging to the genus *Aphis*. In Porto Santo Island, *A. colemani*, *L. fabarum* and *T. angelicae* were the species parasitizing species of *Aphis*. The aphid parasitoid fauna present in Madeira Archipelago can be considered as an extension of the West Mediterranean aphidiid fauna. The presence of *A. colemani* as a parasite of *Aphis* species can be associated to the Ethiopian fauna.

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Key words: Aphid parasitoids, Hymenoptera, Aphidiidae, Porto Santo Island, Madeira Archipelago.

INTRODUCTION

This work reports the species of parasitoids of aphids, the aphidiids (Hymenoptera, Aphidiidae) collected in Porto Santo Island. The objective was to study the aphid fauna in the island, the biodiversity of natural enemies and to establish the trophic relations in the ecosystem.

The aphid fauna of Madeira Archipelago was recently studied (AGUIAR & ILHARCO, 1997, 2001; PITA & ILHARCO, 1998). More recently PITA & ILHARCO (2001) reported a new list of the aphids of Porto Santo

Island. The aphid parasitoids of Madeira Island were reported by GRAHAM (1986) and STARÝ, CECÍLIO & AGUIAR (1996). The latter authors reported the tritrophic relations of aphids, parasitoids and host plants surveyed.

Six aphidiid species are reported for the first time to Porto Santo Island: *Aphidius colemani* Viereck, *Aphidius ervi* Haliday, *Aphidius funebris* MacKauer, *Diaeretiella rapae* (M'Intosh), *Lysiphlebus fabarum* (Marshall) and *Trioxys angelicae* (Haliday). *A. colemani* and *A. funebris* are also new to Madeira Archipelago.

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MATERIAL AND METHODS

The aphid samples were collected by one of us (M.T.P.) from spontaneous vegetation, agricultural fields and urban areas, during a survey to Porto Santo Island in June 1997 and May 1998. The plants with parasitized aphids were kept in boxes with ventilation, till the emergence of the parasitoids. The host plants, the aphid samples and the parasitoids emerged from the mummies in laboratory were identified.

RESULTS

Parasitoid / host associations

The records of parasitoid/host associations identified from samples collected are organised as follows: the host aphids are listed alphabetically under each parasitoid species. After each host aphid species, the information concerning the site, date of collection, register number in Coleção de Afidiídeos da Estação Agronómica Nacional (CAFEAN), host plant, and number of specimens per sample (within brackets) is given.

Aphidius colemani Viereck, 1912

Aphis gossypii Glover: Campo de Baixo, 10-06-1997, no. 1123, *Malus domestica* Borkh. (5); Camacha, 21-05-1998, no. 1131-a, *Lupinus* sp., (14); Farrobo, 21-05-1998, no. 1132-a, *Eriobotrya japonica* (Thunb.) Lindl. (1).

Aphis nerii Boyer de Fonscolombe: Cidade Vila Baleira, 07-06-1997, no. 1121, *Nerium oleander* L. (7).

Aphidius ervi Haliday, 1834

Macrosiphum euphorbiae (Thomas): Camacha, 20-05-1998, no. 1128, *Lycopersicon esculentum* Mill. (1).

Aphidius funebris MacKauer, 1961

Uroleucon sonchi (L.): Cidade Vila Baleira, 20-05-98, no. 1126, *Sonchus oleraceus* L. (1).

Diaeretiella rapae (M'Intosh, 1855)

Brevicoryne brassicae (L.): Camacha, 20-05-98, no. 1129, *Brassica oleracea* L. (9).

Lysiphlebus fabarum (Marshall, 1896)

Aphis fabae Scopoli: Farrobo, 21-05-98, no. 1130, *Vicia faba* L. (1).

Trioxys angelicae (Haliday, 1833)

Aphis gossypii Glover: Lapeira, 19-05-98, no. 1124, *Citrus sinensis* (L.) Osbeck (11); Farrobo, 21-05-1998, no. 1132-b, *Eriobotrya japonica* (Thunb.) Lindl. (1); Camacha, 21-05-1998, no. 1131-b, *Lupinus* sp. (1).

Aphis spiraeicola Patch: Farrobo, 21-05-98, no. 1133, *Citrus sinensis* (L.) Osbeck (2).

The parasitism of four aphidiid species observed in Porto Santo Island was associated to new trophic relations for Madeira Archipelago.

In the following list of parasitoids/aphid hosts/plant hosts of Porto Santo Island, two aphidiid species are new to Madeira Archipelago and are marked with (♦). Some parasitoid associations are also new to Madeira Archipelago: six parasitoid/host aphid associations marked with (◇), and nine parasitoid/host plant associations marked with (*).

LIST OF PARASITOIDS / APHID HOSTS / PLANT HOSTS OF PORTO SANTO ISLAND

♦ *Aphidius colemani* Viereck

◇ *Aphis gossypii* Glover / **Eriobotrya japonica* (Thunb.) Lindl., **Lupinus* sp., **Malus domestica* Borkh.

◇ *Aphis nerii* Boyer de Fonscolombe / **Nerium oleander* L.

Aphidius ervi Haliday

◇ *Macrosiphum euphorbiae* (Thomas) / **Lycopersicon esculentum* Mill.

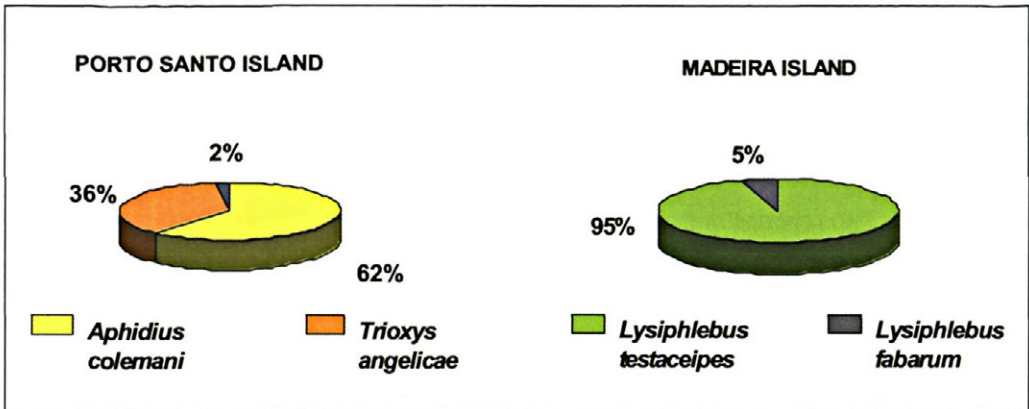


Fig. 1: Percentage of parasitoid species reared from aphids of the genus *Aphis*. Porto Santo Island and Madeira Island

◆ *Aphidius funebris* MacKauer

- ◇ *Uroleucon sonchi* (L.) / **Sonchus oleraceus* L.

Diaeretiella rapae (M'Intosh)

- Brevicoryne brassicae* (L.) / *Brassica oleracea* L.

Lysiphlebus fabarum (Marshall)

- Aphis fabae* Scopoli / *Vicia faba* L.

Trioxys angelicae (Haliday)

- ◇ *Aphis gossypii* Glover / **Citrus sinensis* (L.) Osbeck, **Eriobotrya japonica* (Thunb.) Lindl., **Lupinus* sp.
 ◇ *Aphis spiraecola* Patch / **Citrus sinensis* (L.) Osbeck

Explanation of symbols: new aphidiid species (◆), new parasitoid/host aphid association (◇), or new parasitoid/host plant association (*) for the Madeira Archipelago.

The aphidiid species previously reported parasitizing aphids of the genus *Aphis*, in Madeira Island (Fig. 1) were *L. fabarum* and *L. testaceipes*. The latter appeared as the dominant species on hosts of the genus *Aphis* and its presence in Madeira Island has been presumed as a natural expansion from the West Mediterranean Region (STARÝ, CECÍLIO & AGUIAR, 1996).

However, in Porto Santo Island, *A. colemani*, *L. fabarum* and *T. angelicae* are the species observed parasitizing aphids of the genus *Aphis* (Fig. 1). *A. colemani* is the dominant species parasitizing the genus *Aphis* in this island, and a similar aphid host range can be observed for this parasitoid species in the fauna of the Ethiopian Region.

CECÍLIO (1994) analysed the biodiversity of aphidiids parasitizing *Aphis* species in Continental Portugal for the period 1988/92. The dominant species observed was *L. testaceipes* and the second and third more frequent species were *L. fabarum* and *T. angelicae*.

The expansion of *L. testaceipes* from Madeira Island to Porto Santo Island could be expected, considering the proximity of the two islands. However, the environmental conditions of Porto Santo with a long dry season and the subsequent scarcity of host plants and aphids, could explain the apparent absence of *L. testaceipes* in the island.

The complex parasitoid/aphid/plant now identified, associated to *A. ervi*, *A. funebris* and *D. rapae* are according to the host range observed in the Mediterranean area. ILHARCO (1973) comments the scarceness of parasitized aphids observed in Porto Santo Island.

The survey now reported suggests an evolution along the last decades to an apparent richer aphid parasitoid biodiversity. However, only a more intensive sampling in the Madeira Archipelago, could clarify the balance of species now reported and their trophic relations.

ILHARCO (1986) reported the aphid fauna of Madeira Archipelago as an extension of the Mediterranean aphid fauna and the aphidiid fauna observed in Madeira Archipelago can be considered an extension of the Iberian fauna, as part of the western Mediterranean biodiversity. The presence of *A. colemani* with the host range observed in Porto Santo

Island can be associated to the Ethiopian fauna.

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RESUMEN

CECÍLIO, A., M.T. PITA, F.A. ILHARCO. 2004. Parasitoides de áfidos de la Isla de Porto Santo, Archipiélago de Madeira (Hymenoptera, Aphidiidae). *Bol. San. Veg. Plagas*, **30**: 13-17.

Se citan por primera vez, seis especies de áfidos para la Isla de Porto Santo: *Aphidius colemani* Viereck, *Aphidius ervi* Haliday, *Aphidius funebris* MacKauer, *Diaeretiella rapae* (M'Intosh), *Lysiphlebus fabarum* (Marshall) y *Trioxys angelicae* (Haliday). Las especies *A. colemani* y *A. funebris* son citadas por primera vez, para el Archipiélago de Madeira. El complejo de las asociaciones parasitoide/áfido/planta fueron identificadas y analizadas las relaciones tritróficas. Seis nuevas asociaciones parasitoide/áfido hospedador y nueve nuevas asociaciones parasitoide/planta hospedadora son citadas para el Archipiélago de Madeira.

Las especies de áfidos anteriormente citadas parasitando el género *Aphis*, en la Isla de Madeira fueron *L. fabarum* y *Lysiphlebus testaceipes* (Cresson), la última es la especie dominante para los hospedadores del género *Aphis*. En la Isla de Puerto Santo, *A. colemani*, *L. fabarum* y *T. angelicae* fueron las especies observadas parasitando el género *Aphis*.

La fauna de parasitoides de áfidos en Archipiélago de Madeira se considera la continuación de la fauna Oeste Mediterránea. La presencia de *A. colemani* parasitando el género *Aphis* se puede relacionar con la fauna de la Region Etiópica.

Palabras clave: Parasitoides de los áfidos, áfidos, Hymenoptera, Aphidiidae, Isla de Porto Santo, Archipiélago de Madeira.

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