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A review of the genus *Aphidius* Nees in Greece (Hymenoptera: Braconidae: Aphidiinae) with the description of a new species

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Abstract

A review of *Aphidius* species occurring in Greece is presented. Fourteen species are keyed and illustrated. In addition, a new *Aphidius* species: *Aphidius apolloni* sp. nov. from *Macrosiphum daphnidis* Börner on *Daphne oleoides*, is described. The new species was collected from Mt Tymphi (western Greece). The aphidiines presented in this work have been identified from 60 aphid taxa occurring on 136 plant taxa from a total of 57 sampling sites. Furthermore, 90 original parasitoid–host aphid associations are presented.

Keywords: *Aphidius*, Greece, key, morphological characters, new species, review

Introduction

Southeastern Europe represents a significant centre of biodiversity in Europe because historical events are combined with compound ecological characteristics of the area. According to Turrill (1929) about 27% of the floras in southeastern Europe are endemic. High mountain endemism of the flora in southeastern Europe is very common. It is influenced by geographical, genetic, and ecological isolation of plant populations which led to great diversity and endemism of aphid–aphid parasitoid associations here. Over the period 1998–2003 we found a large number of parasitoid–aphid–plant associations (Kavallieratos et al. 2004a, 2004b) and species new to science (Starý et al. 1998;

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Tomanović and Starý 2001; Tomanović and Kavallieratos 2002; Tomanović et al. 2002, 2003, 2004) in the high mountainous areas of southeastern Europe.

With over 70 species described worldwide, the genus *Aphidius* is the largest in the Aphidiinae, including many of the subfamily's most beneficial species (Mescheloff and Rosen 1990). In this paper we review 14 *Aphidius* species found in Greece and provide an original key for the identification of the species. In addition, a new species from Mt Tymphi in western Greece infesting *Macrosiphum daphnidis* Börner on *Daphne oleoides*, is described. The key and the description include SEM, microscope, and line drawings. The species presented in this work have been identified from 60 aphid taxa occurring on 136 plant taxa from a total of 57 sampling sites. We report 90 original parasitoid–host aphid associations.

The plant genus *Daphne* includes several species which are valuable in landscape architecture (rock gardens, alpine gardens, front of shrub borders) (Hay 1988). The host plant *D. oleoides* is a calcilode evergreen dwarf shrub which is distributed in the mountains of southern and central Europe, in northern Africa, Asia Minor, Afghanistan, and Himalaya (Tutin et al. 1968; Chittenden 1981). The host aphid *M. daphnidis* Börner is holocyclic and monoecious on *Daphne* (Heie 1994).

Materials and methods

Collection of specimens

Specimens were collected during 1995–2004 in several localities in Greece. Samples from various host plants bearing aphid colonies, consisting of both live and mummified aphids, were collected. Furthermore, samples from *D. oleoides* plants bearing aphid colonies consisting of both live and mummified aphids were collected from Mt Tymphi (Epirous, western Greece) (type locality) (Figure 27). Live aphids were preserved in 90% ethyl-alcohol and 75% lactic acid (2:1) (Eastop and van Emden 1972). Mummified aphids were placed in small plastic boxes subsequently placed inside a growth cabinet. On the lid of each box there was a circular opening covered with muslin for ventilation in order to maintain inside the boxes similar conditions to those existing in the growth cabinet (22.5°C, relative humidity 65%, 16 h light: 8 h dark) (Kavallieratos et al. 2001).

The external structure of the emerged parasitoids was studied using Leica MZ6 and Olympus SZX 9 stereomicroscopes. Several specimens were gold coated and examined using a Cambridge S150 scanning electron microscope. The holotype specimen of the new species was slide-mounted in Canada balsam.

Diagnostic characters used in the key

The diagnostic characters were used in the key as follows: number of maxillary palps, number of labial palps, number of longitudinal placode sensilla on first flagellomere (=F₁), length of F₁, width of F₁, colour of F₁, number of antennal segments, length of stigma, width of stigma, length of distal abscissa of R₁ (=metacarpus), length of r-rs vein, length of 3/Rs vein, number of antennal segments, length of tergite 1, width of tergite 1, prominence of ovipositor sheath, sculpture of anterolateral area of tergite 1, colour of body.

Depositories

The material examined in this study is deposited in the collection of the Laboratory of Agricultural Zoology and Entomology (CLAZE), Agricultural University of Athens

(Greece). The holotype is deposited in the collection of the Belgrade Natural History Museum (BNHM) (Serbia and Montenegro). The paratypes are deposited in CLAZE.

Terminology

The terminology used in this paper regarding the diagnostic characters of the aphidiines is based on Huber and Sharkey (1993) and Kavallieratos et al. (2001).

Results

Key for the identification of the species of *Aphidius* Nees, 1811 in Greece (based on adult females)

1. Anterolateral area of tergite 1 rugose (Figure 1) . . . *Aphidius ervi* Haliday, 1834
– Anterolateral area of tergite 1 costate (Figure 2) or costulate (Figure 3) . . . 2
2. Anterolateral area of tergite 1 costate (Figure 2) 3
– Anterolateral area of tergite 1 costulate (Figure 3) 5
3. Antenna 15-segmented. Labial palps 2-segmented (Figure 4). Stigma 1.1–1.2 times as long as distal abscissa of R_1 (Figure 11). Tergite 1, about 4.0 times as long as wide at spiracles. *Aphidius colemani* Viereck, 1912
– Antenna 16–17-segmented. Labial palps 3-segmented (Figures 5, 6). Sometimes one palp 2-segmented. In this case the last segment bears a trace of two segments (Figure 5). Stigma 1.6–2.0 times as long as distal abscissa of R_1 (Figures 12, 13). Tergite 1, 3.0–3.5 times as long as wide at spiracles 4
4. F_1 light brown to yellow, about 3.6 times as long as wide. r-rs vein about 1.1 times as long as $3/Rs$ vein (Figure 12). Body yellow to brown
. *Aphidius transcaspicus* Telenga, 1958
– F_1 black with narrow ring at the base, about 2.6–2.9 times as long as wide. r-rs vein 1.3–1.6 times as long as $3/Rs$ vein (Figure 13). Body dark brown to black. *Aphidius avenae* Haliday, 1834
5. Antenna (12)13–15-segmented 6
– Antenna with more segments. 7
6. Antennae (14)15-segmented. Maxillary palps 3–4-segmented (Figures 7–9). When 3-segmented, the last segment may bear a trace of two segments (Figure 7). Labial palps 2-segmented (Figures 7, 8). Sometimes 1-segmented on one palp (Figure 8). Stigma 1.0–1.2 times as long as distal abscissa of R_1 (Figure 14) *Aphidius matricariae* Haliday, 1834
– Antenna (12)13-segmented. Maxillary palps 4-segmented. Labial palps 3-segmented. Stigma 1.7–2.0 times as long as distal abscissa of R_1 (Figure 14) *Aphidius salicis* Haliday, 1834
7. Labial palps 2-segmented *Aphidius absinthii* Marshall, 1896
– Labial palps 3-segmented 8

- 8. Ovipositor sheath strongly prominent and elongate (Figure 10). Antennae 18–19-segmented *Aphidius funebris* Mackauer, 1961
- Ovipositor sheath prominent but not elongate (Figure 26). Antennae 16–20-segmented 9
- 9. Antennae 16–18-segmented. F_1 2.3–3.0 times as long as wide 10
- Antennae 17–20-segmented. F_1 3.0–3.8 times as long as wide 12
- 10. Antenna 17–18-segmented. Stigma 4.3–4.7 times as long as wide (Figure 16) *Aphidius sussi* Pennacchio and Tremblay, 1988
- Antenna 16–18-segmented. Stigma 2.9–3.6 times as long as wide (Figures 17–21) 11
- 11. Antenna 17–18-segmented. F_1 with three to six longitudinal placode sensilla. Stigma 1.7–2.0 times as long as distal abscissa of R_1 (Figure 17) *Aphidius rosae* Haliday, 1834
- Antenna 16–17(18)-segmented. F_1 with one to two (three) longitudinal placode sensilla. Stigma 1.2–1.5 times as long as distal abscissa of R_1 (Figure 18) *Aphidius uzbekistanicus* Luzhetskii, 1960
- 12. Antenna 19–20-segmented. F_1 about 3.0 times as long as wide (Figure 19) *Aphidius smithi* Sharma and Subba Rao, 1959
- Antenna 17–19-segmented. F_1 3.4–3.8 times as long as wide 13
- 13. Antenna 17–18-segmented. F_1 prevalently yellow, with 0(1) longitudinal placode sensilla. Stigma 0.93–1.20 times as long as distal abscissa of R_1 (Figure 20) *Aphidius urticae* Haliday, 1834
- Antenna 19-segmented. F_1 black with yellow base, with three longitudinal placode sensilla (Figure 23). Stigma about 1.9 times as long as distal abscissa of R_1 (Figure 21) *Aphidius apolloni* sp. nov.

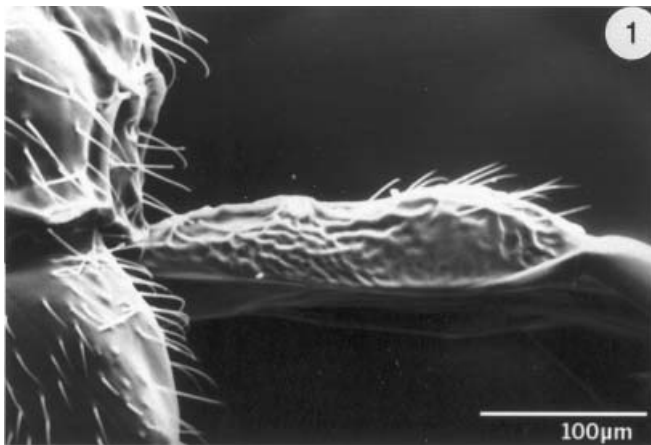


Figure 1. Lateral aspect of tergite 1 of female *Aphidius ervi* Haliday, 1834.

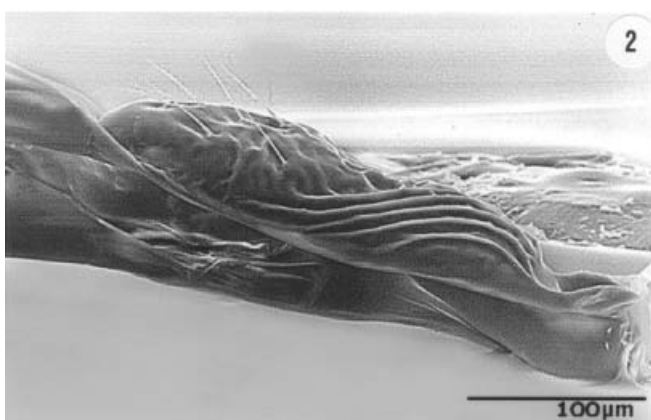


Figure 2. Lateral aspect of tergite 1 of female *Aphidius transcaspicus* Telenga, 1958.

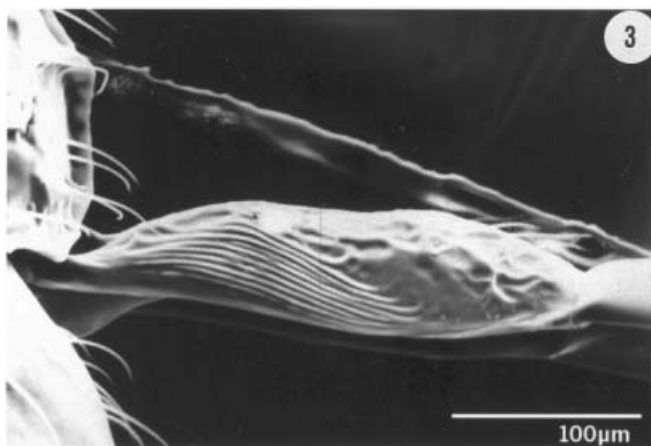


Figure 3. Lateral aspect of tergite 1 of female *Aphidius matricariae* Haliday, 1834.



Figure 4. Maxillary and labial palps of female *Aphidius colemani* Viereck, 1912.



Figure 5. Maxillary and labial palps of female *Aphidius transcaspicus* Telenga, 1958.

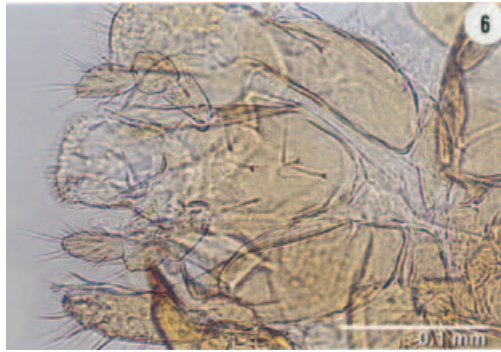
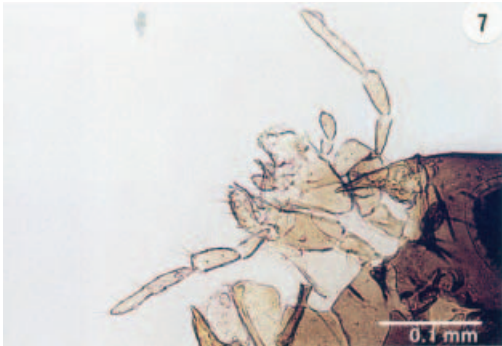


Figure 6. Labial palps of female *Aphidius transcaspicus* Telenga, 1958.



Figures 7, 8. Maxillary and labial palps of female *Aphidius matricariae* Haliday, 1834.

Aphidius Nees, 1818
Aphidius absinthii Marshall, 1896

Material examined

Macrosiphoniella artemisiae (L.): on *Artemisia absinthium* (10♀, 4♂), Athens-Attica, 15 May 2004, *Macrosiphoniella sanborni* (Gillette): on *Dendrathera morifolium* c.v. (7♀,

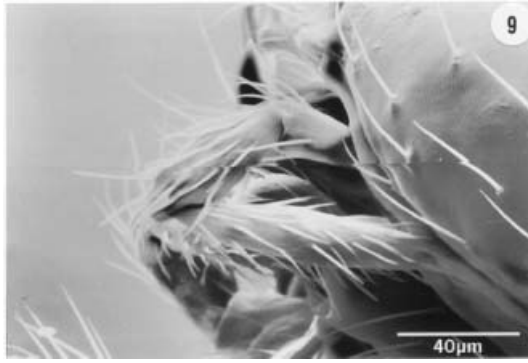


Figure 9. Maxillary palp of female *Aphidius matricariae* Haliday, 1834.

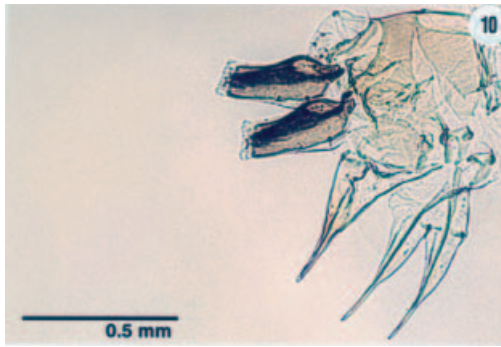


Figure 10. Genitalia of female *Aphidius funebris* Mackauer, 1961.

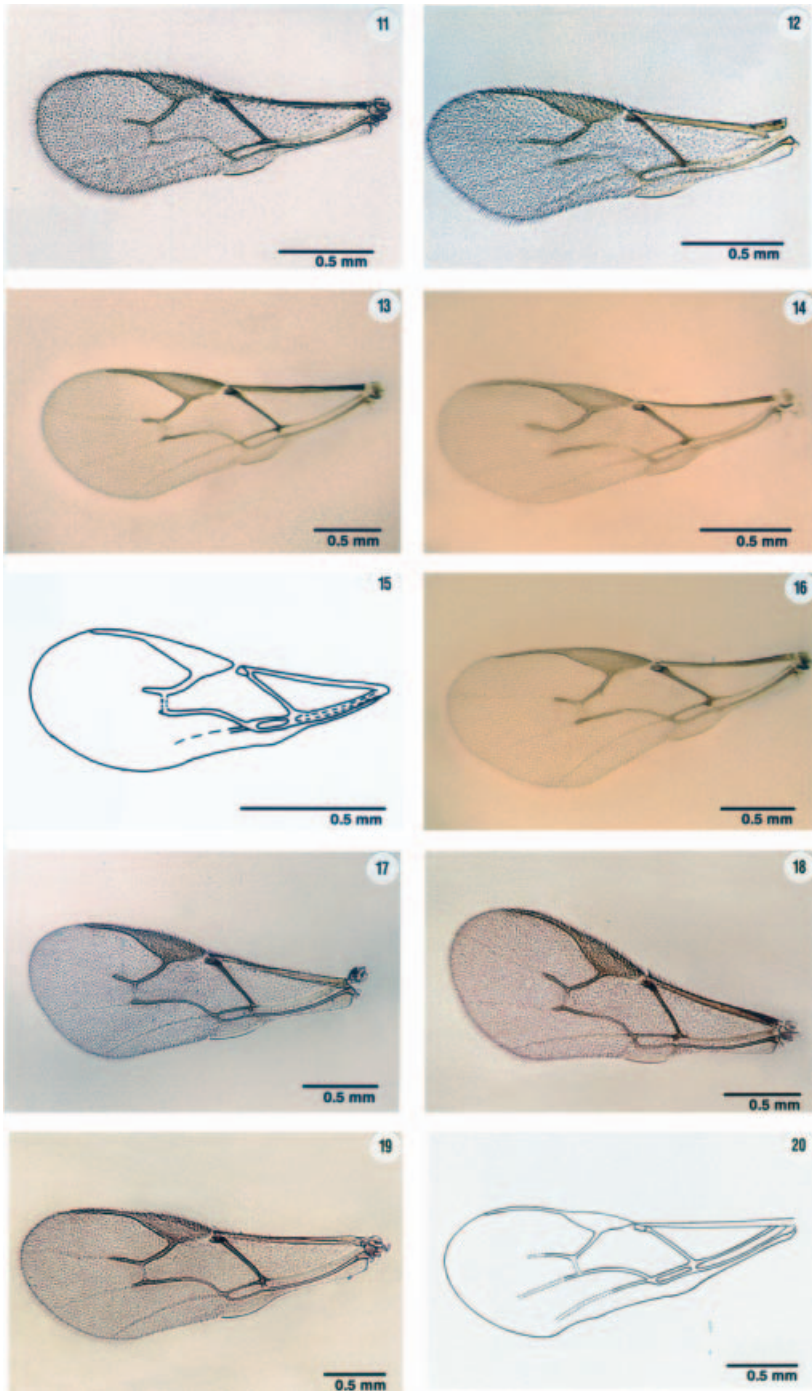
16♂), Marathon-Attica, 24 May 2004, *Macrosiphoniella tanacetaria* (Kaltenbach): on *Tanacetum corymbosum* (13♀, 10♂), Argos Orestikon-Kastoria, 27 May 1999.

Aphidius apolloni Kavallieratos and Tomanović sp. nov.
(Figures 21–26)

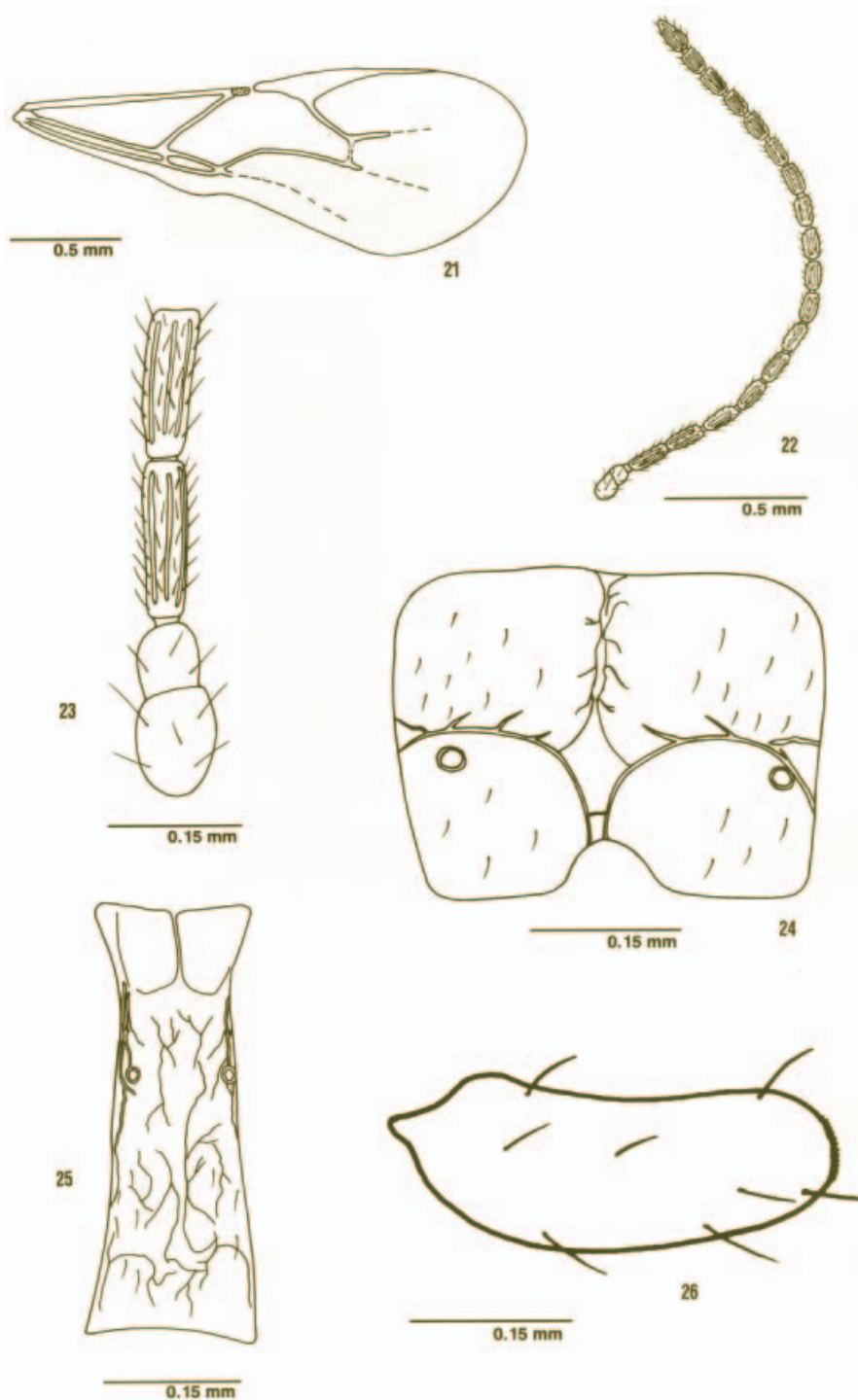
Holotype: female, Mt Tymphi, Ioannina, western Greece, 17 July 2003 (BNHM, slide number 23G/03) reared from *Macrosiphum daphnidis* Börner, 1950 on *Daphne oleoides* Schreber, coll. N. G. Kavallieratos and Ž. Tomanović. Paratypes: same locality, 8♀, 2♂, 3 July 2004, coll. N. G. Kavallieratos, 3♀, 18 July 2004.

Description

Female. Head. Eyes oval. Malar space equal to 0.25 of longitudinal eye diameter. Clypeus oval with about 13 long setae. Tentorial index about 0.46. Antenna (Figure 22) 19-segmented, filiform, moderately thickened at apex, with semi-erected and adpressed setae which are shorter than the half of the diameter of the segments. F₁ (Figures 22, 23) about 3.6 times as long as wide, with three longitudinal placode sensilla. F₂ (Figures 22, 23) about 3.0 times as long as wide, with four longitudinal placode sensilla. F₈ (Figure 22) about 2.2



Figures 11–20. Fore wings of females. (11) *Aphidius colemani* Viereck, 1912. (12) *Aphidius transcaspicus* Telenga, 1958. (13) *Aphidius avenae* Haliday, 1834. (14) *Aphidius matricariae* Haliday, 1834. (15) *Aphidius salicis* Haliday, 1834. (16) *Aphidius sussi* Pennacchio and Tremblay, 1988. (17) *Aphidius rosae* Haliday, 1834. (18) *Aphidius uzbekistamicus* Luzhetskii, 1960. (19) *Aphidius smithi* Sharma and Subba Rao, 1959. (20) *Aphidius urticae* Haliday, 1834.



Figures 21–26. *Aphidius apolloni* sp. nov., holotype female. (21) Fore wing. (22) Antenna. (23) Part of antenna (scapus, pedicel, F₁, F₂). (24) Propodeum, dorsal view. (25) Tergite 1, dorsal aspect. (26) Ovipositor sheath, lateral aspect.



Figure 27. Mt Tymphi, western Greece.

times as long as wide, with six longitudinal placode sensilla. F_1 little longer than F_2 ($F_1/F_2=1.07$). Maxillary palps four-segmented, labial palps three-segmented.

Mesosoma: mesonotum with notaulices distinct in the fore part, slightly crenulated, effaced on the disc. Propodeum (Figure 24) areolated with narrow pentagonal central areola. Upper lateral areola with nine setae and lower lateral areola with four setae (Figure 24).

Fore wing: stigma (Figure 21) about 4.0 times as long as wide and about 1.9 times as long as distal abscissa of R_1 ; r-rs vein (Figure 21) about 1.1 times as long as $3/R_S$ vein; R_1 vein (Figure 21) about 2.1 times longer than stigma width.

Metasoma: tergite 1 (Figure 25) about 3.8 times as long as wide at spiracles with eight costulae on its anterolateral area and with moderately prominent mediodorsal carina. Ovipositor sheath (Figure 26) slightly concave on its dorsal margin.

Colour: head black. Eyes black. Face with mouthparts yellow. Clypeus yellow. Mandibles yellow except for dark apices. F_1 black with yellow base, remainder of antenna black. Prothorax brown, remainder of thorax black. Wings hyaline with brown venation. Tergite 1 brown to dark brown. Rest of metasoma dark brown. First and second pair of legs yellow, with dark apices. The mummy is brown.

Body length about 3.0 mm.

Male. Antenna 18-segmented, filiform, with semi-erected and adpressed setae which are shorter than diameter of the segments. Stigma 3.4 times as long as wide and about 1.9 times as long as distal abscissa of R_1 ; R_1 vein 1.4 times longer than stigma width. Tergite 1 2.7 times as long as wide at spiracles with five costulae on its anterolateral area.

Colour: head, eyes, face black. Mandibles dark brown except for black apices. Clypeus dark brown. Maxillary and labial palps dark brown to black. Antennal scape dark brown.

Antennal pedicel dark brown with light brown apex. Remainder of antenna dark brown. Propleuron, pronotum, mesopleuron, metapleuron, scutellum, postscutellum, mesonotum, and metanotum dark brown to black. Wings hyaline with brown venation. Tergite 1 dark brown. Rest of metasoma dark brown. Legs dark brown.

Body length 2.6 mm.

Diagnosis

The new *Aphidius* species is separated from other congeneric species by the synopsis of the following characters: 19-segmented antennae, F_1 about 3.6 times as long as wide, with three longitudinal placode sensilla, short distal abscissa of R_1 (stigma about 1.9 times as long as distal abscissa of R_1). *Aphidius apolloni* resembles *Aphidius rosae* Haliday, 1834 in the number of longitudinal placode sensilla on the F_1 , slightly longer F_1 than F_2 and short distal abscissa of R_1 (stigma 1.6–1.9 times as long as distal abscissa of R_1), but it is immediately distinguished from *A. rosae* by the proportions between: length and width of F_1 (2.3–2.7 in *A. rosae* instead of about 3.6 in *A. apolloni*), length and width of stigma (3.0–3.6 in *A. rosae* instead of about 4.0 in *A. apolloni*), length of r-rs and $3/R_S$ vein (1.3–2.0 in *A. rosae* instead of about 1.1 in *A. apolloni*), length and width of tergite 1 (2.7–3.3 in *A. rosae* instead of about 3.8 in *A. apolloni*), number of antennal segments (16–18 in *A. rosae* instead of 19 in *A. apolloni*). The new species resembles also *Aphidius urticae* species group in the host range (parasitoid of Macrosiphini aphid), proportions of length and width of F_1 , length and width of stigma, length and width of tergite 1, and number of antennal segments. From the *urticae* species group, *A. apolloni* can be distinguished by the short R_1 vein (proportion between length of stigma and length of R_1 in *A. urticae* species group is 0.93–1.20 instead of about 1.9 in *A. apolloni*), the number of longitudinal placode sensilla on F_1 (zero or one in *A. urticae* instead of three in *A. apolloni*), the colour of F_1 (prevalently yellow in *A. urticae* instead of black with yellow base in *A. apolloni*).

Etymology

The new species took its name from the ancient Greek God Apollo.

Remarks

Recently, we described *Aphidius montenegrinus* Tomanović and Kavallieratos from *Acyrtosiphon daphnidis* Ilharco, 1994/*Daphne alpina* L. associations (Tomanović et al. 2004). The host plant, *Daphne*, is a typical ancient Mediterranean genus with Laurasian pattern of distribution and early Tertiary origin. We have presumed the Mid-Tertiary origin of both associations: *Macrosiphum daphnidis*/*Aphidius apolloni* and *Acyrtosiphon daphnidis*/*Daphne alpina* and the ancient Mediterranean origin of *A. apolloni* and *A. montenegrinus*. Biogeographically, *A. apolloni* and *A. montenegrinus* are characterized most probably by a disjunctive distribution. This type of partition can be attributed to successive paleogeographical and climatic changes. At the end of the Miocene period, the large, probably rapid, climatic subversion must have brought aridity to southeastern Europe, rendering it uninhabitable to the majority of humidity-dependent species (Hsü 1972). However, impermeable sediments on Dinarides massif, including Montenegro's mountains and northern Greek mountains, had kept enough humidity for the survival of many plants and associated herbivorous insects. Subsequently, with decreasing aridity, southeastern Europe

became the main centre of dispersion of different insect groups to the east and west, as well as to the north and south. This fact explains some close interrelationships between many local faunal elements inhabiting the Iberian Peninsula, the Apennines, the Crimea, and the Caucasus, on the one hand, and elements inhabiting southeastern Europe on the other.

From *Macrosiphum daphnidis*/*Daphne oleoides* associations we reared *Aphidius ervi* Haliday, 1834 and the hyperparasitoid *Asaphes suspensus* (Nees) (five specimens).

Aphidius avenae Haliday, 1834

Material examined

Metopolophium dirhodum (Walker): on *Avena sterilis* (3♀), Troizina-Attica, 17 April 1996; ***Myzus persicae*** (Sulzer): on *Prunus persica* c.v. (2♀), Skydra-Pella, 19 August 1997; *Nicotiana tabacum* (1♀), Katerini-Pieria, 1 June 1997; ***Rhopalosiphum padi*** (L.): on *Hordeum vulgare* (2♀, 1♂), Athens-Attica, 4 April 1996; ***Sitobion avenae*** (Fabricius): *Triticum durum* (1♀, 1♂), Athens-Attica, 4 April 1996.

Aphidius colemani Viereck, 1912

Material examined

Aphis craccivora Koch: on *Ailanthus altissima* (14♀, 13♂), Athens-Attica, 19 May 1997; *Capsella bursa-pastoris* (8♀, 14♂), Kopais-Voiotia, 29 May 1997; *Ceratonlia siliqua* (4♀, 4♂), Athens-Attica, 19 May 1997; *Medicago sativa* (3♀), Athens-Attica, 19 May 1997; *Melilotus sulcata* (16♀, 10♂), Athens-Attica, 19 May 1997; ***Aphis fabae*** Scopoli: on *Ammi majus* (38♀, 21♂), Athens-Attica, 19 May 1997; *Cestrum parquii* (7♀, 10♂), Hania-Hania, 30 October 1995; *Euonymus japonicus* c.v. Aureo marginatus (3♀, 7♂), Athens-Attica, 21 April 1996; *Euonymus japonicus* (44♀, 36♂), Athens-Attica, 21 April 1996; *Rumex crispus* (9♀, 1♂), Messologgion-Aitolokarnania, 12 May 1997; *Urtica urens* (3♀), Galatas-Attica, 17 April 1996; *Vicia faba* (9♀, 2♂), Athens-Attica, 19 May 1997; ***Aphis fabae solanella*** Theobald: on *Solanum nigrum* (18♀, 14♂), Athens-Attica, 6–10 April 1997, Skala Oropou-Attica, 29 May 1996; ***Aphis gossypii*** Glover: on *Abelmoschus esculentus* (80♀, 32♂), Athens-Attica, 17 October 1997, 18 May 1999; *Abutilon darwinii* (20♀, 15♂), Athens-Attica, 19 May 1997; *Chaenomeles japonica* (13♀, 8♂), Athens-Attica, 25 April 1999; *Chamomilla recutita* (2♀), Amalias-Ilia, 12 May 1996; *Citrus aurantium* (116♀, 51♂), Athens, 21 April 1997; *C. deliciosa*, (21♀, 6♂), Agrinion-Aitolokarnania, 1 May 1996; *C. limon* (2♀, 1♂), Monemvassia-Lakonia, 2 May 1997; *C. sinensis* (24♀, 8♂), Nea Kios-Argolis, 15 May 1997; *Cucumis sativus* (6♀, 19♂), Athens-Attica, 23 April 1999; *Gladiolus italicus* (12♀, 3♂), Athens-Attica, 27 May 1996, 25 April 1999; *Hibiscus mutabilis* (14♀, 18♂), Athens-Attica, 27 May 1996, 25 April 1999; *H. syriacus* (192♀, 137♂), Athens-Attica, 9 May 1996, Vrahation-Korinthia, 7 May 1996, Thessalonica-Thessalonica, 10 May 1999, Kalamata-Messinia, 26 May 1996; *Lonicera alpigena* (1♀, 1♂), Athens-Attica, 24 May 1999; *Nerium oleander* (2♀, 5♂), Athens-Attica, 1 June 1996, 25 April 1999; *Pyrus communis* (2♀), Athens-Attica, 25 April 1996; *Solanum tuberosum* (9♀), Volos-Magnissia, 23 June 1996; *Viburnum fragrans* (1♀), Athens-Attica, 25 April 1999; ***Aphis hederæ*** Kaltenbach: on *Hedera helix* (2♀), Athens-Attica, 15 May 2004, ***Aphis nerii*** Boyer de Fonscolombe: on *Nerium oleander* (259♀, 158♂), Athens-Attica, 19 April to 27 May 1996, 3 April 1997, Aleksandroupolis-

Evros, 8 June 1999, Corfu-Corfu, 9 August 1996, Komotini-Rodopi, 8 June 1999, Hania-Hania, 19 May 1997; ***Aphis parietariae*** Theobald: on *Parietaria difussa* (85♀, 45♂), Athens-Attica, 3 April 1997; ***Aphis punicae*** Shinji: on *Punica granatum* (35♀, 24♂), Athens-Attica, 12 April 1997, Ermioni-Argolis, 18 May 1997, Skala Oropou-Attica, 29 May 1996; ***Aphis ruborum*** (Börner): on *Rubus ulmifolius* (1♀), Pilion-Magnissia, 30 May 1997; ***Aphis spiraeicola*** Patch: on *Chaenomeles japonica* (1♀), Athens-Attica, 12 April 1997; *Citrus sinensis* (2♀), Athens-Attica, 25 April 1999; *Viburnum tinus* (6♀), Halkis-Evoia, 3 April 1996; ***Aphis umbrella*** (Börner): on *Malva neglecta* (1♀), Athens-Attica, 4 April 1996; ***Aphis viticis*** Ferrari: on *Vitex agnus-castus* (163♀, 118♂), Athens-Attica, 3 April to 22 May 1996, Volos-Magnissia, 10 June 1997; ***Brachycaudus cardui*** (L.): on *Carduus australis* (8♀, 2♂), Troizina-Attica, 8 May 1997; *C. pycnocephalus* (1♀), Athens-Attica, 21 April 1997; *C. tmoleus* ssp. *armatus* (13♀, 2♂), Pilion, 30 June 1997; *Senecio bicolor* ssp. *cineraria* (9♀), Athens-Attica, 27 April 1997, Geranion-Hania, 2 November 1995; ***Brachycaudus helichrysi*** (Kaltenbach): on *Calendula arvensis* (2♀), Athens-Attica, 29 March 1996; ***Lipaphis erysimi*** (Kaltenbach): on *Erysimum graecum* (2♀, 5♂), Marathon-Attica, 8 May 2004; ***Dysaphis apiifolia*** (Theobald): on *Smyrnium orphanidis* (1♀), Syros-Kyklades, 15 May 2001; ***Myzus cerasi*** (Fabricius): on *Prunus avium* (2♀), Nymfaia-Rodopi, 8 June 1999; ***Myzus persicae*** (Sulzer): on *Antirrhinum majus* (2♀), Athens-Attica, 19 April 1996; *Capsicum annuum* (34♀, 20♂), Athens-Attica, 18 April 1996, Heraklion-Heraklion, 14 March 1997; *Chaenomeles japonica* (22♀, 10♂), Athens-Attica, 27 April 1996; *Citrus aurantium* (1♀, 3♂), Athens-Attica, 27 April 1996; *Gazania rigens* (5♀), Psari-Messinia, 21 May 1997; *Gossypium herbaceum* (1♀, 1♂), Farsala-Karissa, 10 June 1999; *Nicotiana tabacum* (19♀, 17♂), Agrinion-Aitoloakarnania, 14 August 1996, Tithorea-Fthiotis, 29 August 1997; *Raphanus sativus* (6♀, 6♂), Thessalonica-Thessalonica, 11 July 1996; *Solanum melongena* (4♀, 3♂), Athens-Attica, 18 April 1996; *Tulipa* sp. (1♀, 1♂), Athens-Attica, 28 April 1996; *Urtica urens* (3♀), Athens-Attica, 28 April 1996; *Viburnum tinus* (5♀, 5♂), Athens-Attica, 30 March to 9 April 1997; ***Myzus varians*** Davidson: on *Clematis vitalba* (14♀, 11♂), Athens-Attica, 8 November 1995; ***Rhopalosiphum padi*** (L.): on *Hordeum murinum* (2♀), Athens-Attica, 1 April 1996; *Hordeum vulgare* (4♀, 3♂), Skala Oropou-Attica, 12 April 2002; ***Rhopalosiphum maidis*** (Linnaeus): on *Hordeum murinum* (3♀, 1♂), Athens-Attica, 1 May 2004; ***Schizaphis graminum*** (Rondani): on *Avena sterilis* (2♀, 3♂), Athens-Attica, 9 May 2004; ***Toxoptera aurantii*** (Boyer de Fonscolombe): on *Citrus aurantium* (102♀, 47♂), Athens-Attica, 17 April 1997; *C. deliciosa* (1♀, 1♂), Agrinion-Aitoloakarnania, 1 May 1996; *C. limon* (18♀, 11♂), Athens-Attica, 3 May 1995; *Viburnum tinus* (7♀, 4♂), Athens-Attica, 30 March to 8 April 1997.

Aphidius ervi Haliday, 1834

Material examined

Acyrtosiphon pisum (Harris): on *Lathyrus clymenum* (1♀), Athens-Attica, 23 April 1997; *Lens culinaris* (1♀), Athens-Attica, 9 April 1996; *Medicago sativa* (15♀, 9♂), Athens-Attica, 19 May to 23 July 1997, Amalias-Ilia, 12 May 1996, Galatas-Attica, 17 April 1997; *Melilotus alba* (1♀), Athens-Attica, 23 April 1997; *Trifolium nigrescens* (7♀), Amalias-Ilia, 12 May 1996; *Vicia benghalensis* (6♀), Athens-Attica, 23 July 1997; *V. narbonensis* (1♀, 1♂), Athens-Attica, 23 April 1997; *V. sativa* (2♀), Athens-Attica, 4 April 1996; *V. villosa* (4♀), Athens-Attica, 23 April 1996; ***Aulacorthum solani*** (Kaltenbach): on *Malva neglecta* (1♀),

Pilion-Magnissia, 30 May 1996; **Macrosiphum daphnidis** Börner: on *Daphnae oleoides* (4♀), Tymphi-Epirous, 17 July 2004, **Macrosiphum euphorbiae** (Thomas): on *Solanum tuberosum* (7♀, 3♂), Livanatai-Fthiotis, 6 June 1996; **Metopolophium dirhodum** (Walker): on *Avena sterilis* (27♀, 38♂), Galatas-Attica, 9 May 1997; **Microlophium carnosum** (Buckton): on *Urtica pilulifera* (2♀), Athens-Attica, 29 March 1997; **Myzus persicae** (Sulzer): on *Gossypium herbaceum* (1♀), Farsala-Larissa, 10 June 1999; *Nicotiana tabacum* (3♀), Tithorea-Fthiotis, 10 June 1996; **Rhopalosiphum padi** (L.): on *Hordeum vulgare* (1♀, 1♂), Athens-Attica, 4 April 1996; **Sitobion avenae** (Fabricius): on *Triticum durum* (24♀, 18♂), Kopais-Voiotia, 29 May 1997.

Aphidius funebris Mackauer, 1961

Material examined

Uroleucon aeneum (Hille Ris Lambers): on *Carduus australis* (24♀, 13♂), Agrinion-Aitoloakarnania, 12 May 1997, Nea Kios-Argolis, 15 May 1997; *C. crispus* (19♀, 5♂), Neapolis-Kozani, 27 May 1997; *C. pycnocephalus* (12♀, 19♂), Athens-Attica, 3 April 1997, Kastoria-Kastoria, 27 May 1999; *C. tmoleus* ssp. *armatus* (13♀, 7♂), Pilion-Magnissia, 29 May 1997; *Carlina corymbosa* (47♀, 30♂), Koutson-Ksanthi, 6 June 1999; *Cirsium vulgare* (2♀), Kyparissia-Messinia, 3 June 1996; ***Uroleucon cichorii*** (Koch): on *Crepis* sp. (2♀), Smolikas-Ioannina 16 July 2003; ***Uroleucon chondrillae*** (Nevsky): on *Reichardia intermedia* (2♀, 10♂), Marathon-Attica, 14 April 1995; ***Uroleucon doronici*** (Börner): on *Doronicum columnae* (27♀, 13♂), Pilion-Magnissia, 30 May 1997; *D. hungaricum* (6♀) Tymphi-Ioannina, 17 July 2003, ***Uroleucon jaceae*** (L.): on *Carlina corymbosa* ssp. *graeca* (9♀, 1♂), Kyparissia-Messinia, 29 May 1997; ***Uroleucon sonchi*** (L.): *Sonchus asper* (15♀, 14♂), Nea Kios-Argolis, 15 May 1997; *S. oleraceus* (38♀, 30♂), Athens-Attica, 2 April 1997, Aiginion-Pieria, 8 May 1999, Ehinios-Ksanthi, 6 June 1999, Nafplion-Argolis, 15 May 1997, Pilion-Magnissia, 29 May 1997, Skala Oropou-Attica, 6 April 1997; *S. palustris* (6♀), Thessalonica-Thessalonica, 23 May 2002; ***Uroleucon* spp.**: on *Carduus crispus* (18♀, 3♂), Athens-Attica, 19 May 1997; *Crepis neglecta* (14♀, 14♂), Kyparissia-Messinia, 3 June 1996.

Aphidius matricariae Haliday, 1834

Material examined

Aphis craccivora Koch: on *Melilotus officinalis* (2♀, 14♂), Nafplion-Argolis, 24 April 1997; ***Aphis fabae*** Scopoli: on *Chenopodium glaucum* (10♀, 19♂), Nafplion-Argolis, 24 April 1997; *Euonymus japonicus* c.v. *Albo marginatus* (4♀, 5♂), Athens-Attica, 23 May 1996; *Euonymus japonicus* (10♀, 6♂), Athens-Attica, 23 May 1996; *Galium aparine* (1♀), Skala Oropou-Attica, 6 April 1997; ***Aphis fabae cirsiacanthoidis*** Scopoli: on *Carduus australis* (1♀), Kopais-Voiotia, 27 May 1997; ***Aphis fabae solanella*** Theobald: on *Solanum nigrum* (3♀, 7♂), Athens-Attica, 7 June 1996, Skala Oropou-Attica, 6 April 1996; ***Aphis gossypii*** Glover: on *Capsella bursa-pastoris* (8♀, 17♂), Athens-Attica, 25 April 1996; *Citrus aurantium* (13♀, 7♂), Athens-Attica, 21 April 1996; *C. deliciosa* (1♀, 5♂), Agrinion-Aitoloakarnania, 1 May 1996; *C. sinensis* (5♀), Nea Kios-Argolis, 26 May 1997; *Duranta*

plumieri (12♀), Athens-Attica, 23 May 1996; *Gladiolus italicus* (2♀, 9♂), Athens-Attica, 27 May 1996, 25 April 1999; *Hibiscus syriacus* (26♀, 10♂), Athens-Attica, 9 May 1996, 18 May 1999; *Lapsana communis* (2♀), Amalias-Attica, 12 May 1996; *Pyrus communis* (2♀), Athens-Attica, 25 April 1996; *Malva neglecta* (11♀), Athens-Attica, 23 May 1996; *Nerium oleander* (3♀, 5♂), Athens-Attica, 23 May 1996, 18 May 1999; *Solanum tuberosum* (7♀), Volos-Magnissia, 23 June 1996; ***Aphis parietariae*** Theobald: on *Parietaria diffusa* (1♀, 1♂), Athens-Attica, 3 April 1997; ***Aphis ruborum*** (Börner): on *Rubus ulmifolius* (6♀, 4♂), Amalias-Ilia, 12 May 1996, Pilion-Magnissia, 30 May 1997; ***Aphis spiraeicola*** Patch: on *Senecio bicolor* ssp. *cineraria* (3♀), Athens-Attica, 7 June 1996; ***Aphis umbrella*** (Börner): on *Malva neglecta* (14♀, 9♂), Athens-Attica, 2–9 April 1996, Kopais-Voiotia, 11 April 1997; *M. sylvestris* (4♀, 9♂), Marathon-Attica, 14 April 1995; ***Aphis urticata*** Gmelin: on *Urtica dioica* (2♀), Pilion-Magnissia, 29 May 1997; ***Aphis* sp.:** on *Vinca minor* (3♀, 7♂), Athens-Attica, 21 April 1995; ***Aulacorthum solani*** (Kaltenbach): on *Capsicum annum* (1♀), Skydra-Pella, 28 February 1997; *Malva neglecta* (4♀, 1♂), Athens-Attica, 2–4 April 1996; *Salvia splendens* (2♀), Athens-Attica, 22 May 1996; ***Brachycaudus amygdalinus*** (Schouteden): on *Prunus dulcis* (3♀), Athens-Attica, 2 May 1997, Ermioni-Argolis, 28 April 1997; ***Brachycaudus cardui*** (L.): on *Calendula arvensis* (7♀, 2♂), Athens-Attica, 22 May 1996; *Carduus australis* (1♀, 8♂), Nea Kios-Argolis, 22 April 1996, Troizina-Attica, 17 April 1997; *C. crispus* (12♀, 8♂), Athens-Attica, 17 April 1997; *C. nutans* (1♀), Galatas-Attica, 22 April 1997; *C. pycnocephalus* (17♀, 20♂), Athens-Attica, 1–21 April 1997; *C. tmoleus* ssp. *armatus* (14♀, 6♂), Pilion-Magnissia, 30 May 1997; *Onopordum illyricum* (1♀, 1♂), Athens-Attica, 22 April 1997; *Senecio bicolor* ssp. *cineraria* (5♀), Athens-Attica, 23 May 1996, 27 April 1997; ***Brachycaudus helichrysi*** (Kaltenbach): on *Calendula arvensis* (16♀, 7♂), Athens-Attica, 28–29 March 1996; *Carduus australis* (5♀, 1♂), Galatas-Attica, 17 April 1997; *C. crispus* (2♀), Athens-Attica, 3 April 1997; *Carlina corymbosa* ssp. *graeca* (19♀, 38♂), Nea Kios-Argolis, 22 April 1996; *Chamomilla recutita* (21♀, 18♂), Athens-Attica, 30 March 1996; *Chrysanthemum coronarium* (7♀, 6♂), Athens-Attica, 28 March to 12 April 1996, Nafplion-Argolis, 22 April 1996, Halkis-Evoia, 3 April 1996; *C. uliginosum* (18♀, 37♂), Nafplion-Argolis, 22 April 1996; *Cirsium creticum* (14♀, 9♂), Athens-Attica, 9 May 1996, Amalias-Ilia, 12 May 1996; *C. italicum* (1♀, 1♂), Skala Oropou, 6 April 1997; *C. tuberosum* (5♀, 16♂), Nea Kios-Argolis, 22 April 1996; *C. vulgare* (10♀, 2♂), Athens-Attica, 10 April 1997; *Citrus aurantium* (3♀), Athens-Attica, 5 May 1997; *C. limon* (2♀), Paros-Kyklades, 21 May 1997; *Cynoglossum creticum* (9♀, 3♂), Galatas, 17 April 1997; *Gazania rigens* (2♀, 7♂), Athens-Attica, 30 March 1996; *Leucanthemum vulgare* (33♀, 20♂), Agrinion-Aitoloakarnania, 12 May 1997, Athens-Attica, 22–25 April 1996; *Silybum marianum* (10♀, 8♂), Messologgion-Aitoloakarnania, 28 April 1997, Nea Kios-Argolis, 4 April 1997; *Stellaria media* (1♀), Nafplion-Argolis, 22 April 1996; ***Brachycaudus persicae*** (Passerini): on *Prunus persica* c.v. (9♀, 15♂), Skala Oropou-Attica, 8 April 2004; ***Capitophorus elaeagni*** (Del Guercio): on *Carduus crispus* (81♀, 19♂), Athens-Attica, 3 April 1997; ***Capitophorus inulae*** (Passerini): on *Dittrichia viscosa* (64♀, 36♂), Kyparissia-Messinia, 21 May 1997, Galatas-Attica, 17 April 1997; *Inula conyza* (7♀, 5♂), Amalias-Ilia, 15 April 1997; ***Dysaphis plantaginea*** (Passerini): on *Pyrus communis* (4♀, 6♂), Athens-Attica, 27 April 1996, Argastiri-Hania, 17 May 1999; ***Lipaphis erysimi*** (Kaltenbach): on *Erysimum graecum* (2♀, 5♂), Marathon-Attica, 14 April 1995; *Sisymbrium orientale* (3♀, 5♂), Galatas-Attica, 17 April 1997; ***Myzus cerasi*** (Fabricius): on *Prunus avium* (7♀, 1♂), Nymfaia-Rodopi, 8 June 1999, Farsala-Larissa, 10 June 1999, *P. cerasus* (6♀, 10♂), Farsala-Larissa, 10 June 1999, ***Myzus persicae*** (Sulzer): on *Antirrhinum majus* (264♀, 123♂), Athens-Attica, 16–19 April 1996; *Calendula arvensis* (3♀, 4♂), Athens-Attica, 28 March

1996; *Capsicum annuum* (38♀, 35♂), Velestinon-Magnissia, 10 June 1999, Herakleion-Herakleion, 14 March 1997, Mintilogli-Ahaia, 22 April 1997, Skydra-Pella, 27 February 1997; *Cardaria draba* (5♀, 1♂), Athens-Attica, 26 March to 22 April 1996, Nea Kios-Argolis; *Carduus crispus* (1♀), Athens-Attica, 1 April 1997; *Chaenomeles japonica* (9♀, 7♂), Athens-Attica, 8 November 1995; *Chamomilla recutita* (2♀, 3♂), Athens-Attica, 30 March to 26 April 1996; *Chrysanthemum coronarium* (17♀, 8♂), Athens-Attica, 25 March 1996; *Citrus aurantium* (7♀, 7♂), Athens-Attica, 27 April 1996; *Malva neglecta* (80♀, 43♂), Athens-Attica, 6 April to 9 May 1996, Amalias-Ilia, 12 May 1996; *Nicotiana tabacum* (26♀, 17♂), Agrinion-Aitoloakarnania, 14 August 1997, Amfikleia-Fthiotis, 31 August 1995, Katerini-Pieria, 20 August 1995, Tithorea-Fthiotis, 22 July 1996, *Phacelia tanacetifolia* (10♀, 4♂), Athens-Attica, 9 April 1996; *Prunus persica* c.v. (9♀, 4♂), Skydra-Pella, 20 June 1996, 1 June 1997; *Raphanus sativus* (10♀, 7♂), Thessalonica-Thessalonica, 11 July 1996; *Rumex crispus* (24♀, 17♂), Kozani-Kozani, 28 May 1999; *Sisymbrium irio* (1♀), Loutsattica, 9 April 1996; *S. orientale* (2♀, 4♂), Galatas-Attica, 30 April 1997; *Tulipa* sp. (2♀, 14♂), Athens-Attica, 11 April 1996; *Urtica urens* (217♀, 136♂), Athens-Attica, 12–28 April 1996, 1–9 April 1997; ***Myzus varians*** Davidson: on *Clematis vitalba* (12♀, 4♂), Athens-Attica, 8 November 1995; ***Ovatus crataegarius*** (Walker): on *Mentha spicata* (2♀), Nafplion-Argolis, 3 June 1996; *Crataegus monogyna* (31♀, 19♂), Kyparissia-Messinia, 4–24 April 1997; ***Ovatus insitus*** (Walker): on *Crataegus monogyna* (10♀, 1♂), Kyparissia-Messinia, 3 June 1996; ***Phorodon humuli*** (Schrank): on *Prunus domestica* var. *insititia* c.v. (4♀, 3♂), Dilesi-Attica, 8 April 2004; ***Rhopalosiphum maidis*** (Fitch): on *Bromus madritensis* (1♀, 2♂), Athens-Attica, 29 March 1996; *Hordeum distichon* var. *nudum* (3♀), Athens-Attica, 4 April 1996; *H. murinum* (2♀, 4♂), Athens-Attica, 1–20 April 1997; *H. vulgare* (2♀), Athens-Attica, 28 March 1996; ***Rhopalosiphum padi*** (L.): on *Bromus madritensis* (45♀, 27♂), Athens-Attica, 29 March to 2 April 1996; *B. ramosus* (1♀, 1♂), Nea Kios-Argolis, 20 April 1996, 24 April 1997; *Hordeum distichon* (5♀), Athens-Attica, 29 March 1996; *H. murinum* (169♀, 117♂), Athens-Attica, 1–20 April 1996, 1 April 1997; *H. vulgare* (10♀, 6♂), Athens-Attica, 28 March to 4 April 1996; *Lolium perenne* (12♀, 10♂), Neohorion-Ilia, 27 April 1997; *Piptatherum miliaceum* (1♀), Kopais-Voiotia, 25 November 1996; *Triticum durum* (18♀, 5♂), Athens-Attica, 4 April 1996; ***Schizaphis graminum*** Rondani: on *Triticum durum* (11♀, 2♂), Skala Oropou-Attica, 26 May 2004; ***Sitobion avenae*** (Fabricius): on *Hordeum vulgare* (1♀), Kopais-Voiotia, 3 April 1996; ***Sitobion fragariae*** (Walker): on *Avena sterilis* (33♀, 19♂), Athens-Attica, 30 March to 9 May 1996; *Bromus madritensis* (34♀, 6♂), Athens-Attica, 29 March to 2 April 1996; *B. ramosus* (2♀, 1♂), Athens-Attica, 9 May 1996; *B. sterilis* (1♀, 18♂), Athens-Attica, 28 March 1996; *Hordeum murinum* (49♀, 25♂), Athens-Attica, 11 April to 9 May 1996; *Piptatherum miliaceum* (6♀, 1♂), Athens-Attica, 9 May 1996, Dasia-Corfu, 11 April 1999; ***Toxoptera aurantii*** (Boyer de Fonscolombe): on *Citrus aurantium* (7♀, 16♂), Athens-Attica, 8 April 1997; *C. deliciosa* (2♀), Agrinion-Aitoloakarnania, 1 May 1996.

Aphidius rosae Haliday, 1834

Material examined

Macrosiphum rosae (L.): *Rosa* sp. c.v. (24♀, 3♂), Katsikas-Ioannina, 18 June 1999, Kozani-Kozani, 25 May 1999, Pilion-Magnissia, 30 May to 10 June 1997, Florina-Florina, 26 May 1999, Hania-Hania, 17 May 1999, Hrysaugi-Thesprotia, 5 July 1999.

Aphidius salicis Haliday, 1834*Material examined*

Cavariella aegopodii (Scopoli): on *Ammi majus* (7♀, 3♂), Varda-Ilia, 13 May 1996; *Foeniculum vulgare* (4♀, 3♂), Varda-Ilia, 13 May 1996; ***Cavariella archangelicae*** (Scopoli): on *Apium graveolens* (2♀), Korinthos-Korithia, 22 April 1996; ***Cavariella theobaldi*** (Gillette and Bragg): on *Daucus carota* (1♀), Skala Oropou-Attica, 6 April 1997; ***Hyadaphis foeniculi*** (Passerini): on *Torilis arvensis* (3♀, 1♂), Polydamion-Larissa, 2 June 2004.

Aphidius smithi Sharma and Subba Rao, 1959*Material examined*

Acyrtosiphon pisum (Harris): on *Bromus sterilis* (3♀), Amalias-Ilia, 12 May 1996; *Lathyrus cicera* (11♀, 7♂), Athens-Attica, 9 April 1996, 1 April 1997; *L. clymenum* (12♀, 6♂), Athens-Attica, 23 April 1997; *L. ochrus* (4♀), Athens-Attica, 23 April 1997, *L. sativus* (6♀, 6♂), Athens-Attica, 4 April 1996, 23 April 1997; *Lens culinaris* (14♀, 3♂), Athens-Attica, 9 April 1996; *Medicago disciformis* (1♀), Neohorion-Ilia, 27 April 1997; *M. sativa* (10♀, 7♂), Athens-Attica, 19 May 1997, Kopais-Voiotia, 9 May 1996; *Melilotus officinalis* (3♀, 1♂), Amalias-Ilia, 12 May 1997; *M. sulcata* (1♀), Athens-Attica, 23 April 1997; *Trifolium nigrescens* (2♀), Amalias-Ilia, 12 May 1997; *Vicia narbonensis* (1♀), Athens-Attica, 23 April 1997; *V. pannonica* (1♀, 1♂), Athens-Attica, 1 April 1997; *V. sativa* ssp. *amphicarpa* (3♀), Athens-Attica, 4 April 1996; *V. sativa* (13♀, 4♂), Athens-Attica, 4–26 April 1996, Kyparissia-Messinia, 3 June 1996; *V. villosa* (3♀, 1♂), Athens-Attica, 23 April 1997.

Aphidius sussi Pennacchio and Tremblay, 1988*Material examined*

Delphiniobium junackianum Karsch.: on *Aconitum napellus* (4♀), Central Macedonia, 21 June 2002.

Aphidius transcaspicus Telenga, 1958*Material examined*

Hyalopterus amygdali (Blanchard): on *Prunus dulcis* (3♀, 1♂), Aliartos-Voiotia, 13 June 1996; ***Hyalopterus pruni*** (Geoffroy): on *Phragmites australis* (46♀, 147♂), Gerani-Hania, 2 November 1995, Messologgion-Aitoloakarnania, 13 May 1997, Pilion-Magnissia, 29 May 1997.

Aphidius urticae Haliday, 1834*Material examined*

Aulacorthum solani (Kaltenbach): *Citrus aurantium* (1♀), Agrinion-Aitoloakarnania, 2 May 1996.

Aphidius uzbekistanicus Luzhetzki, 1960*Material examined*

Metopolophium dirhodum (Walker): on *Avena sterilis* (8♀), Troizina-Attica, 17 April 1997; *Sitobion avenae* (Fabricius): on *Triticum durum* (4♀, 7♂), Kopais-Voiotia, 27 May 1997; *Sitobion fragariae* (Walker): on *Avena sterilis* (3♀, 2♂), Agios Thomas-Aitolokarnania, 13 May 1997, Athens-Attica, 26 April 1996; *Bromus madritensis* (6♀, 1♂), Athens-Attica, 25 May 2002; *B. ramosus* (5♀, 1♂), Athens-Attica, 26 April 1996; *Hordeum murinum* (9♀, 1♂), Athens-Attica, 9 May 1996; *Piptatherum miliaceum* (1♀), Athens-Attica, 20 April 1996.

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