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Agromyzidae of Greece

Abstract - 14 species of Agromyzidae have been collected in the years 1999-2003 new for Greece. Other 27 species are known in the past years and from different Authors examined, as contribution to the knowledge of the fauna of this leaf-miners of the Greece.

Riassunto - *Agromizidi della Grecia.*

Vengono segnalate 14 specie di Agromizidi raccolti in Grecia negli anni 1999-2003, precedentemente non segnalati e sono menzionate altre 27 specie già note, come contributo alla check list di questi minatori.

Key words: Agromyzidae, leaf miners, Greece, new records.

In the years 1999-2002 there was the occasion to get several researches on Agromyzidae, living on spontaneous and cultivated plants, in the continental area of Greece. The interest to study this family started with the introduction and the diffusion in Greece of *Liomyza trifolii* and *L. huidobrensis*, causing considerable damage to horticultural crops (Souliotis *et al.*, 1998).

Only a few number of species of this Family has been recorded from Greece till now; so we collected these leaf-miners, as contribution for the knowledge of the fauna of the Agromyzidae of this country.

It's interesting to underline that it's possible to find out indications about this group of Diptera from Bulgaria and South-East Italy, in similar environments. It seems clear that the number of species present in Greece is less than in the more temperate areas of Europe, but it's possible that this study will reveal interesting leaf-miners specific of the Mediterranean area and others of general European distribution.

SPECIES RECORDED TO DATE

Ophiomyia Braschnikov

Ophiomyia beckeri (Hendel, 1923)

HOST PLANTS: *Crepis*, *Hypochoeris*, *Leontodon*, *Picris*, *Sonchus*, *Taraxacum*.

DISTRIBUTION: “*Terrae mediterraneae*”, Canary Islands, Fennoscandia, South Africa, India.

REMARKS: Hendel (1931) treated this species as *Melanagromyza* and confirmed in Crete and Paros too.

Ophiomyia cornifera Hendel, 1920

HOST PLANTS: unknown.

DISTRIBUTION: Greece.

REMARKS: *O. cornifera* was described by Hendel (1920), with examination of a single male, caught by Becker in Athens.

Ophiomyia longilingua (Hendel, 1920)

HOST PLANTS: *Knautia arvensis*.

DISTRIBUTION: Austria, Greece, Latvia, Finland, France, Norway and Switzerland.

REMARKS: the lectotype; a male collected in Corinthus by Becker, was designated by Spencer (1966a).

Ophiomyia pinguis (Fallén, 1920)

HOST PLANTS: *Cichorium intybus*, *C. endivia*, *Lactuca sativa*, *Leontodon* sp.

DISTRIBUTION: widespread in Europe.

REMARKS: Hendel (1931) informs on the presence of this leaf-miner, between others, in “*Terrae mediterraneae (inc. Asia minor et Creta)*”. This Agromyzidae causes damage of economic importance to cultivated chicory, in particular in Belgium, Netherlands, France and Italy (Süss, 1970).

Ophiomyia simplex (Loew, 1869)

HOST PLANT: *Asparagus officinalis*.

DISTRIBUTION: Western Europe, United States and Canada.

REMARKS: the larva of “asparagus miner” forming an external stem-mine. *O. simplex* is present in most areas of asparagus cultivation; the attacks in some occasions can be considered very serious. In the United States it has been established that the cause of the damage is an infection of *Fusarium oxysporum*, but it is a consequence of the attack of *Ophiomyia simplex* (Spencer, 1973). The asparagus miner was collected in Greece the first time by Anagnou-Veroniki *et al.* (2003) in Kavala, 8/VII/2003; Aridea, 14/VII/2003 and Agrinio, 21/VII/2003.

Melanagromyza Hendel

Melanagromyza cunctans (Meigen, 1830)

HOST PLANT: *Lotus corniculatus*.

DISTRIBUTION: Austria, England, Germany, Sweden; common in Mediterranean area,

with records in Italy, Corsica, Spain and ex Yugoslavia (Spencer, 1966b).

REMARKS: Hendel (1931) referred on specimens caught in Crete.

Agromyza Fallén

Agromyza abiens Zetterstedt, 1948

HOST PLANTS: *Anchusa*, *Asperugo*, *Borago*, *Cynoglossum*, *Echium*, *Pentaglottis*, *Pulmonaria*, *Symphytum*.

DISTRIBUTION: it's a very common species (Spencer, 1976), widespread in almost all Europe.

REMARKS: Hendel (1931) erroneously classified this species as *A. rufipes* Meig., indicating its presence in Crete too. Spencer (1963) and Nowakowski (1964) clarified the species of this group; consequently was established that the "true" *A. rufipes*, living on *Artemisia vulgaris*, is localized in the area of Baltic and a certain identification is possible with examination of the male genitalia.

Agromyza apfelbecki Strobl, 1902

HOST PLANTS: *Cynara cardunculus*, *C. scolymus*, *C. betica*.

DISTRIBUTION: Dalmazia, France, Italy (Sicily), Malta, Spain, and Greece (Spencer, 1973). It was introduced in Chile.

REMARKS: sometimes this species causes damages of economic importance on *Cynara cardunculus* (cardoon) and *C. scolymus* (globe artichoke).

Agromyza hiemalis Becker, 1908

HOST PLANTS: *Urtica* spp.

DISTRIBUTION: Canary Island, Greece, Italy (Sicily).

REMARKS: Hendel (1920; 1931) found this species in Athens. It's one of the four *Agromyza* Palaearctic species, living on *Urtica*. Its presence is restricted in the Mediterranean area.

Agromyza nigrescens Hendel, 1920

HOST PLANTS: *Geranium* spp.

DISTRIBUTION: Austria, Canary Island, Denmark, Finland, Germany, Italy, Norway, Spain, Sweden, Switzerland and Greece (Hendel, 1931).

REMARKS: widespread in Europe, including Mediterranean area (Spencer, 1976).

Amauromyza Hendel

Amauromyza balcanica (Hendel, 1931)

HOST PLANTS: *Phlomis* spp.

DISTRIBUTION: Dalmatia, Greece, Iran, Spain.

REMARKS: Spencer (1966b) observed that Hendel (1931), in occasion of the description of this species writes "Ich besitze sie aus Athen von Becker". This specimen is labelled by Hendel "*graeca* sp.n.", but is included in the collection under the name "*balcanica*". This specimen, a female, was designated by Spencer as lectotype. *Am. balcanica* was caught in Greece (Antrum Jovis, Ida Mountain), and in Crete (Canea).

Cerodontha Rondani

Cerodontha (C.) *denticornis* (Panzer, 1806)

HOST PLANTS: *Agropyron*, *Alopecurus*, *Avena*, *Calamagrostis*, *Dactylis*, *Festuca*, *Holcus*, *Hordeum*, *Phalaris*, *Poa*, *Triticum*.

DISTRIBUTION: widespread in Europe, Sicily (Spencer, 1966c) and Marocco (Spencer, 1967) including.

REMARKS: this species was collected in Crete too (Hendel, 1932). The larva feeds in leaf-sheat and pupating internally. The biology has been examined by Venturi (1946). When the species occurs in large number, from February to April, the damages can be significant.

Liriomyza Mik

Liriomyza orbona (Meigen, 1830)

HOST PLANTS: probably *Gramineae*.

DISTRIBUTION: widespread in Europe, including Mediterranean area.

REMARKS: Hendel (1931) described a new species, *L. orbonella*, from a male caught at "Cornea" (= Canea) (Crete), with other specimen from Hungary, Italy and Tunisia; no significant differences appears to be with *L. orbona*; consequently *L. orbonella* is synonymised with *orbona*.

Liriomyza richteri Hering, 1927

HOST PLANTS: probably *Gramineae*.

DISTRIBUTION: by Hendel (1931) this species is recorded from "*Europa sept. et centr., Ins. Creta*".

REMARKS: it is possible that the specimen ♂ caught in Crete (Canea, February, leg. Biró) stays at Natural History Museum in Hungary, but it was impossible to examine the male genitalia. *L. richteri* was included in the "*flaveola*-group", in which the species are leaf-miners of *Gramineae*; the correct classification is possible only with the examination of the genitalia. Spencer (1976) studied the problem of this *Agromyzidae* and the conclusion was that *L. richteri* is essentially northern; so it's probable that the Hendel's classification was a mistake and that the specimens caught in Crete was *L. flaveola* (s. str.) or another species of the group.

***Liriomyza trifolii* (Burgess) and *Liriomyza huidobrensis* (Blanchard)**

This harmful nearctic leaf-miners, attacking many vegetables in greenhouses of Greece, was studied by Mikelakis (1983); Nucifora & Mikelakis (1984); Roditakis (1993); Roditakis & Golfopoulou (1995); Roditakis & Roditakis (1995); Souliotis *et al.* (1998).

During this study, we had occasion to caught *L. huidobrensis* on *Rumex scutatus* too, at Volos (4/VI/2000).

***Liriomyza strigata* (Meigen, 1830) and *Liriomyza bryoniae* (Kaltenbach, 1858)**

Also this two Palaearctic very polyphagous species are recorded in many regions of the Greece (Souliotis *et al.*, 1998). Thanks to our researches, it's possible to add the following localities and host plants:

Species	Host plant	Locality	Date
<i>L. bryoniae</i>	<i>Anthirrinum</i> sp.	Volos	25/II/2002
	<i>Anthirrinum</i> sp.	Alexandroupolis	12/V/2002
	<i>Coelosia critica</i>	Volos	10/VIII/2002
<i>L. strigata</i>	<i>Galeopsis tetrahit</i>	Volos	23/V/2001
	<i>Papaver roheas</i>	Volos	23/V/2001

Phytoliriomyza* Hendel**Phytoliriomyza pectoralis* (Becker, 1908)**

HOST PLANTS: unknown.

DISTRIBUTION: Canary Islands (Laguna auf Teneriffe), Madeira, Corfu (Hendel, 1931).

REMARKS: this species resembles to *Phyt. dorsata*, but in *Phyt. pectoralis* the dark area of mesonotum is entire, with only a small, yellow, central area adjoining the scutellum; the palps are black.

Phytomyza* Fallén**Phytomyza conyzae* Hendel, 1920**

HOST PLANTS: *Inula* spp., *Pulicaria dysenterica*, *Arnica montana*.

DISTRIBUTION: widespread in Europe, very common in Mediterranean area (Hendel, 1935; Spencer, 1976), without specific records from Greece.

REMARKS: *P. conyzae* was caught in Athens (Acropolis), on *Inula* sp., the 23/III/2003; this record confirms the generic Hendel's and Spencer's indications.

***Phytomyza plantaginis* Robineau-Desvoidy, 1851**

HOST PLANTS: *Plantago* spp.

DISTRIBUTION: very common throughout many Europe's countries, with extension east to Kirghizistan and Uzbekistan; it was also collected in Japan, Canada and U.S.A. (Spencer, 1969).

REMARKS: Hendel (1935) indicates this species also in *Insula Creta*. In occasion of our researches *P. plantaginis* was caught at Pelion Mountain, the 4/VI/2000.

***Phytomyza ranunculi* (Schränk, 1803)**

HOST PLANTS: *Ranunculus* spp.

DISTRIBUTION: common throughout Europe, with extension to Kamchatka (Hendel, 1935); it's present in Canada too (Spencer, 1969).

REMARKS: this Agromyzidae is characterized for the remarkable variation of colour; so it should have been described with 15 different names! It's present in Crete (Hendel, 1935). We caught this leaf-miner on *Ranunculus* spp. on the Pelion Mountain the 2/V/2000 and in Volos, the 23/IV/2001.

***Phytomyza rufipes* Meigen, 1830**

HOST PLANTS: leaf miner on *Cruciferae*, in particular on *Brassica*; can be a pest of economic importance.

DISTRIBUTION: common throughout Europe, with extension to Egypt, Madeira and Canary Islands.

REMARKS: Hendel (1935) gives a generic indication about the presence in Greece too.

***Phytomyza tenella* Meigen, 1830**

HOST PLANTS: *Pedicularis* spp., particularly on *P. palustris*.

DISTRIBUTION: common throughout Europe, it's present in Canada and Quebec too (Spencer, 1969).

REMARKS: Hendel (1935) indicates its presence also in Crete.

***Chromatomyia* Hardy**

***Chromatomyia horticola* (Goureaux, 1851) and *Chromatomyia syngenesiae* (Hardy, 1849)**

This two highly polyphagous species, in the past years known as "*atricornis*" Meig., are common in Europe, particularly in Mediterranean area. We collected them in several localities, on different host plants:

Species	Host plant	Locality	Date
<i>Chr. horticola</i>	<i>Sinapis alba</i>	Volos	12/IV/2000
	<i>Malva neglecta</i>	Tanagra	23/II/2002
	<i>Carduus nutans</i>	Volos	12/IV/2002
	<i>Carduus</i> sp.	Volos	23/II/2002
	<i>Cinara cardunculus</i>	Volos	21/III/2001
	<i>Sonchus arvensis</i>	Volos Grevena	19/IV/1999 23/III/2001
	<i>Sinapis arvensis</i>	Volos	16/V/1999
	<i>Chrysanthemum myconis</i>	Volos	25/IV/2000
	<i>Sonchus oleraceus</i>	Pelion Mount.	1/V/2000
	<i>Papaver rhoeas</i>	Tanagra	10/V/2002
	<i>Brassica oleracea</i>	Volos	25/II/2001
	<i>Anthriscum</i> sp.	Komotini	14/V/2002
<i>Chr. syngenesiae</i>	<i>Sonchus oleraceus</i>	Pelion Mount.	1/V/2000

NEW RECORDS FROM GREECE

Others 14 species are here examined, collected in several regions of continental Greece. The classification of host-plant was on the works of Polunin (1980) and Pignatti (1982).

Agromyza Fallén*Agromyza flavipennis* Hendel, 1920

HOST PLANT AND LOCALITY: *Lamium album*, Volos: 16/V/2002.

REMARKS: this leaf-miner is widespread in Europe, but uncommon. Larva forming a blotch-mine adjoining the margin of the leaf.

Agromyza frontella (Rondani, 1875)

HOST PLANT AND LOCALITY: *Medicago sativa*, Volos: 16/V/2002.

REMARKS: widespread in Europe, including Italy; the mine is initially very narrow, following the leaf margin; successively developing into a blotch in the middle of the leaf. In our case, the lucerne – with a very high colonisation – was in a biological vineyard.

Agromyza johannae De Mejière, 1924

HOST PLANT AND LOCALITY: *Cytisus scoparius*, mouth of Evros River: 10/V/2002; Xanthi: 12/V/2002.

REMARKS: leaf-miner on *Cytisus scoparius*, or more rarely on *Genista* spp. and *Lupinus* spp.. The larva forms a narrow linear mine along the leaf-margin; later produces a blotch in the area of midrib (the mine is similar to them of *A. frontella*). This Agromyzidae is widespread in Europe, also in Italy and Spain. During our researches, in many localities of Greece, we caught mines on *Cytisus* and *Genista*. The shape was the same of the *A. johannae*'s mines, but it was impossible to obtain adults. So, only in the case of the leafs collected near Xanthi and at the mouth of Evros River we had the possibility to confirm the presence of this Agromyzidae, probably widespread in Greece on *Cytisus scoparius*.

***Agromyza nigrella* (Rondani, 1875)**

HOST PLANT AND LOCALITY: *Hordeum sativum*, Kavala: 14/V/2002.

REMARKS: very common on a high number of *Gramineae*, widespread in Europe (in Italy too), in the past sometimes confused with *A. ambigua* Fallén. The morphological differences are studied by Spencer (1966), both in larval posterior spiracles, and in the aedeagus. This miner attacks in particular the flag-leaf. This is important in the translocation of food to the developing grain; so it's possible to have damages on cultivated cereals. In occasion of our records, the mines are very diffused, interesting the flag-leaf on 30% of examined plants of *Hordeum sativum*.

***Agromyza pseudoreptans* Nowakowski, 1967**

HOST PLANTS AND LOCALITIES: *Urtica dioica*, *U. urens*, Florina: 30/V/2000; Athens (Acropolis): 23/III/2003.

REMARKS: this species was in various occasions misidentified with *A. reptans* Fallén. In fact, the mines are very similar: the larva forming a linear-blotch mine, following the leaf-margin and widening into an irregular blotch. The aedeagus is different. Both species are presents, sometimes widespread, in areas near ruins of several countries of Europe, including Italy.

***Agromyza hiemalis* Becker, 1908**

HOST PLANT AND LOCALITY: *Urtica urens*, Athens (Acropolis): 23/III/2003.

REMARKS: of the four species of *Agromyza* on *Urtica* in Europe, *A. hiemalis* is restricted to the Mediterranean area. It was confirmed by Massa & Rizzo (2000), with collected specimens in Sicily.

***Japanagromyza* Sasakawa**

***Japanagromyza salicifolii* (Collin, 1911)**

HOST PLANT AND LOCALITY: *Populus x canadensis*, Preveza: 3/VII/2001.

REMARKS: this leaf-miner occurs on *Populus* and on *Salix* and was described from specimens caught in Egypt, on *Populus*. Successively was recorded in different localities throughout the Mediterranean area, from Portugal and Canary Islands to Turkey,

Israel and Kirghizistan (Spencer, 1990). In Italy, the presence of this Agromyzidae was confirmed by Süß (1978).

Amauromyza Hendel

Amauromyza (Trilobomyza) labiatarum (Hendel, 1920)

HOST PLANTS AND LOCALITIES: *Lamiastrum galeobdolon*, *Lamium* sp., Pelion Mountain: 16/IV/2000; Grevena: 1/VII/2001.

REMARKS: common and widespread in Europe, on many *Labiatae*, but particularly on *Ballota*, *Lamium* and *Stachys*; the first instars larva produces a linear mine, later developing into a whitish blotch, with sparse frames.

Galiomyza Spencer

Galiomyza violiphaga (Hendel, 1932)

HOST PLANT AND LOCALITY: *Viola alba*, Volos: 23/II/2001.

REMARKS: widespread in Europe, but uncommon. Hendel (1932) described it in *Liriomyza*; Hennig (1957) included *violiphaga* in *Metopomyza*; Spencer (1981) erected the new genus *Galiomyza* and transferred to *Galiomyza* three species of *Liriomyza* living on *Viola* (*violiphaga* from Europe, *violivora* from United States and *takakoae* from Japan) (Spencer, 1990). The larva forms a blotch whitish mine on the upper surface of the leaf.

Paraphytomyza Hendel

Paraphytomyza hendeliana (Hering, 1926)

HOST PLANT AND LOCALITY: *Lonicera* sp., Kavala: 14/V/2002.

REMARKS: this species lives on *Lonicera* and *Symphoricarpos*; the correct classification was studied by Spencer (1976), with examination of the larva and aedeagus. So it was possible to note the differences from *Pa. cornigera* Griffiths, *Pa. luteo-scutellata* (de Meijère) and *Pa. atlantidis* Spencer, feeding on the same host. Spencer (1976) concludes that *Pa. hendeliana* is an isolated species, widespread in most localities of Europe.

Phytomyza Fallén

Phytomyza campanulae Hendel, 1920

HOST PLANTS AND LOCALITY: *Campanula trachelium*, *C. glomerata*, Kavala: 14/V/2002.

REMARKS: widespread in many countries of Europe, from U.K. to Kirghizistan, this

species belongs to *albiceps* group and closing resembling to *tussilaginis*. Both species can be separated by host plant and male genitalia.

Phytomyza pauliloewi Hendel, 1920

HOST PLANT AND LOCALITY: *Peucedanum* sp., Grevena: 1/VII/2001.

REMARKS: it's present in different countries of Europe, but not widespread. The adult is very small (wing length 1,9-2 mm). The larva forms a small blotch and it's possible to find several larvae feeding in the same mine.

Phytomyza petoei Hering, 1924

HOST PLANTS AND LOCALITIES: *Mentha pulegium*, Volos: 3/V/1999; *M. arvensis*; Thiba: 12/V/2002.

REMARKS: the first record of *P. petoei* was from Rumania, but it's widespread from Britain to Balkans. The larva forms an irregular linear mine starting near the margin of the leaf. The mine goes towards the central nervature but, at the end, returns on herself.

Phytomyza vitalbae Kaltenbach, 1874

HOST PLANTS AND LOCALITIES: *Clematis vitalba*, Volos: 14/IV/1999; Rodopi Mountains (between Xanthi and Kavala): 13/V/2002.

REMARKS: *P. vitalbae* is common in Europe on several species of *Clematis*. We had the possibility to catch a lot of miners in occasion of the trip by car from Xanthi to Kavala.

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Accepted 10 June 2004