

## Some new records for Turkish leafminers (Diptera: Agromyzidae) fauna from Izmir province\*

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### Summary

This study was carried out during 1996 and 1997 in Izmir province. The leafminer species which were found as new records for Turkish fauna are below: *Agromyza frontella* (Rondani, 1875), *Calycomyza humeralis* (Roser, 1840), *Chromatomyia milii* (Kaltenbach, 1864), *Liriomyza balcanica* (Strobl, 1900), *L. centaureae* Hering, 1927, *Napomyza clematidis* (Kaltenbach, 1859), *N. gymnostoma* (Loew, 1858), *N. lateralis* (Fallén, 1823), *Ophiomyia cunctata* (Hendel, 1920), *O. curvipalpis* (Zetterstedt, 1848), *Paraphytomyza orphana* (Hendel, 1920), *Phytomyza petoei* Hering, 1924, *P. plantaginis* Rob.-Desvoidy, 1851, *P. rufescens* Roser, 1840, *Phytomyza rufipes* Meigen, 1830, *P. tenella* Meigen, 1830 and *Pseudonapomyza hispanica* Spencer, 1973. All these 17 species were collected from fields, gardens, orchards and forests.

**Key words:** Agromyzidae, leafminers, new record, Turkey

**Anahtar sözcükler:** Agromyzidae, galerisinekleri, yeni kayıt, Türkiye

### Introduction

Larvae of leafminers (Diptera: Agromyzidae) are fed into the leaves and stems. The plants that are expose to leafminer damage are getting weak by destroying their transmission system. Also adults are transmitted some diseases from infested plants to healthy ones (Civelek & Önder, 1997).

According to Spencer (1973) there are 1800 agromyzids species belonging to 26 genera in the world. Among the species, 776 species were identified in

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Europe. Up to this study 39 species has been determined in Turkey (Deeming & Civelek, 1997; Giray, 1980; Spencer, 1966; Uygun et al., 1995; Yabaş et al., 1995).

In recent years, the damage of leafminers on crops has been continuously increasing, especially in vegetables and ornamental plants grown in greenhouses in Izmir province. This study was aimed to determine the fauna of leafminers in Izmir province. Thus this study will be provide a base for future research regarding the control of leafminers.

## Material and Method

This study was carried out during 1996 and 1997 in Izmir province and leafminer specimens have been the main material of this study. Izmir province was divided into four subareas for the convenience of the collection of the specimens in addition to it being more economical. The specimens were collected from both cultural and non-cultural plants at different altitudes once a week. The adults of leafminers were obtained by sweeping and also by rearing in laboratory from infested leaves. The specimens were identified by John Deeming and Dr. Michael Von Tschirnhaus\*. The plants that thought hosts of leafminers were identified by Prof. Dr. Yıldız Nemli\*\* and Dr. George Hutchinson\*\*\*.

## Results

In this study, 17 new records of agromyzid species were determined belonging to 9 genera.

*Agromyza* Fallén, 1810

*Agromyza frontella* (Rondani, 1875)

Wing length from 1.9 to 2.2 mm, shining greyish-black species; frons black, with 2 ors - 2 ori; all antennae black; mesonotum with 3+1 dorsocentral and 4-5 rows acrostichal bristles; costa extending vein R<sub>4+5</sub>; squamae brownish and fringe black.

Aedeagus as in Figure 1.

Distribution: Widespread in Europe also in U.S.A.(Spencer, 1976).

Hosts: The species of Leguminoseae such as *Medicago* spp. (Spencer, 1976).

In this study, *A. frontella* was found in Bayındır on *Medicago sativa* in 10.9.1996 (1 ♀) and 23.10.1996 on *M. sativa* (1 ♂, 1 ♀); in Bergama on *M. sativa* in 6.11.1996 (1 ♂, 1 ♀); in Seferihisar on *M. sativa* in 20.8.1996 (1 ♀); in Torbalı on *M. sativa* in 28.4.1997 (1 ♀); in Urla on *M. sativa* in 20.8.1996 (1 ♂, 1 ♀) by sweeping.

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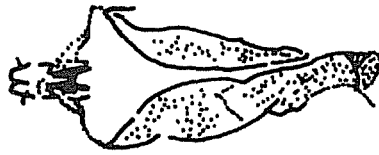


Figure 1. The aedeagus of *Agromyza frontella* (Spencer, 1976).

***Calycomyza*** Hendel, 1931

***Calycomyza humeralis*** (Roser, 1840)

Wing length from 2.0 to 2.3 mm, shining black species. Frons bright yellow, with 2 ors - 2 ori; all antennae black, third segment large, ovoid with distinct angle at upper corner; mesonotum with 3+0 dorsocentral and 4 rows acrostichal bristles; squamae and fringe white.

Aedeagus as in Figure 2.

Distribution: Widespread in Europe also in North America, Argentina, South Africa, India, Australia (Spencer, 1976).

Hosts: The species of Compositae family such as ***Aster***, ***Bellis***, ***Erigeron*** spp. (Spencer, 1976).

In this study, ***C. humeralis*** was found in Bornova on wild Gramineae in 17.7.1996 (1 ♀) and in Urla on wild Gramineae plants in 10.9.1996 (1 ♂, 3 ♀♀) by sweeping.

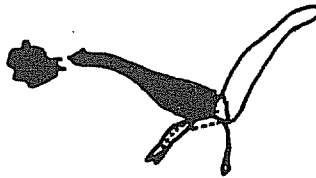


Figure 2. The aedeagus of *Calycomyza humeralis* (Spencer, 1990).

***Chromatomyia*** Hardy, 1849

***Chromatomyia milii*** (Kaltenbach, 1864)

Wing length from 2.0 to 2.9 mm, greyish - black species. Frons varying from bright yellow above through pale brown to dark brown, with 2 ors - 2 ori; third antennal segment small, round and black; mesonotum with 3+1 dorsocentral and irregularly 4 rows acrostichal bristles; squamae grey, margin and fringe brownish-black.

Aedeagus as in Figure 3.

Distribution: Widespread from Morocco through Central and Northern Europe, also in Canada (Spencer, 1976).

Hosts: Gramineae plants (Spencer, 1990).

In this study, *C. milii* was found in Karaburun on *Triticum* sp. in 5.5.1997 (1 ♂) by sweeping.



Figure 3. The aedeagus of *Chromatomyia milii* (Spencer, 1990).

***Liriomyza* Mik, 1894**

***Liriomyza balcanica* (Strobl, 1900)**

Wing length 2.0 mm, shining black species. Frons largely yellow with 2 ors - 2 ori; all antennae yellow, third segment small, round, arista conspicuously long; mesonotum with 3+1 dorsocentral bristles; acrostichal bristles absent; mesopleura largely yellow only small black patch on lower margin.

Aedeagus as in Figure 4a.

Distribution: Widespread in much of Europe (Spencer, 1966).

Hosts: *Euphorbia* spp. such as *E. esula* (Spencer, 1966).

The specimens of *L. balcanica* were collected by Prof. Dr. Hasan Giray in Balçova in 4.5.1979 (3 ♂♂, 9 ♀♀) by sweeping. These unidentified species was identified in this study. But he was not reported its host.

***Liriomyza centaureae* Hering, 1927**

Wing length 1.5 mm, shining black species; frons and all antennae yellow; frons with 1 ors - 2 ori; mesonotum with 3+1 dorsocentral and 4 rows acrostichal bristles; mesopleura largely yellow only small black patch on lower margin.

Aedeagus as in Figure 4b.

Distribution: Widespread in much of Europe (Spencer, 1976).

Hosts: *Centaurea* spp. such as *C. jacea*, *C. montana*, *C. scabiosa* (Spencer, 1966).

In this study, *L. centaureae* was found in Tire on wild Gramineae in 17.7.1996 (1 ♂) by sweeping.

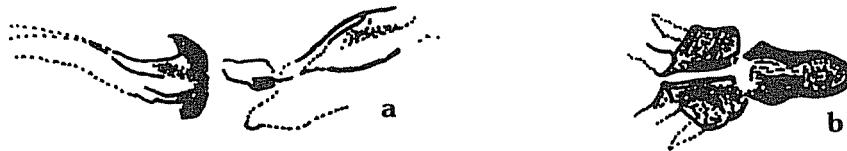


Figure 4. The shapes of aedeagus: a) *Liriomyza balcanica*; b) *L. centaureae* (Spencer, 1990).

**Napomyza** Westwood, 1840

**Napomyza clematidis** (Kaltenbach, 1859)

Wing length from 2.0 to 2.5 mm, mat greyish-black species; frons bright yellow with 2 ors - 1 ori; mesonotum with 3+1 dorsocentral and irregularly 2 rows acrostichal bristles; second cross vein present; mesopleura largely black only upper margin yellow; squamae greyish-white, margin and fringe black.

Aedeagus as in Figure 5a.

Distribution: Africa, Australia, New Zealand and Israel (Spencer, 1990).

Hosts: The species of Ranunculaceae such as **Clematidis** spp. and **Ranunculus** spp. (Spencer, 1990).

In this study, **N. clematidis** was found in Seferihisar on wild gramineous plants in 6.5.1996 (1 ♂); in Karaburun on **Trifolium** sp. in 17.3.1997 (1 ♂) by sweeping.

**Napomyza gymnostoma** (Loew, 1858)

Wing length from 2.8 to 3.5 mm, black species; frons black with 2 ors-3 ori; first and second antennal segments yellow, third black; mesonotum with 3+1 dorsocentral and irregularly 4 rows acrostichal bristles; second cross vein lacking; mesopleura largely black only upper margin yellow; squamae and fringe black.

Aedeagus as in Figure 5b.

Distribution: Austria, Denmark, Germany, Poland, Spain, Sweden (Spencer, 1976; Soos & Papp, 1984).

Hosts: **Allium** spp. (Spencer, 1976).

In this study, **N. gymnostoma** was found in Urla on **Triticum** spp. in 17.3.1997 (1 ♀) by sweeping.

**Napomyza lateralis** (Fallén, 1823)

Wing length from 2.5 to 3.0 mm, greyish-black species; frons bright yellow with 2 ors - 2 ori; all antennal segments black; mesonotum with 3+1 dorsocentral and irregularly 4 rows acrostichal bristles; second cross vein present; squamae and fringe black.

Aedeagus as in Figure 5c.

Distribution: Canada, Denmark, Finland, Germany, Great Britain, Japan, Norway, Spain and Sweden (Spencer, 1972a,b and 1976).

Hosts: The species of Compositae family such as **Anthemis** spp., **Bidens** spp., **Calandula** spp., **Carduus** spp., **Centaurea** spp., **Helichrysum** spp., **Inula** spp., **Lactuca** spp., **Matricaria** spp. and **Silybum** spp. (Spencer, 1976).

In this study, **N. lateralis** was found in Karaburun on **Trifolium** spp. in 17.3.1997 (2 ♂♂, 1 ♀); in same area in 17.3.1997 (1 ♀) by sweeping.



Figure 5. The shapes of aedeagus: a) *Napomyza clematidis*; b) *Napomyza gymnostoma*; c) *Napomyza lateralis* (Spencer, 1990).

***Ophiomyia*** Brasnichnikov, 1897

***Ophiomyia cunctata*** (Hendel, 1920)

Wing length from 2.0 to 2.2 mm, shining black species; frons black with 2 ors-2 ori; all antennal segments black; vibrissal fasciculus and facial keel lacking; mesonotum with 2+0 dorsocentral and 6 rows acrostichal bristles; squamae and fringe black.

Aedeagus as in Figure 6a.

Distribution: Widespread in Europe (Spencer, 1976).

Hosts: *Crepis* spp., *Hypochoeris* spp., *Lapsana* spp., *Mycelis* spp., *Picris* spp., *Sonchus* spp. and *Taraxacum* spp. (Spencer, 1976).

In this study, *O. cunctata* was found in Bornova on *Sonchus* sp. in 15.10.1996 (1 ♂, 2 ♀♀); in Aliaga on *Sonchus* spp. in 6.11.1996 (2 ♂♂) by sweeping.

***Ophiomyia curvipalpis*** (Zetterstedt, 1848)

Wing length from 1.7 to 2.2 mm, shining black species; frons black with 2 ors - 2 ori; all antennal segments black; vibrissal fasciculus and facial keel present; mesonotum with 3+1 dorsocentral and 4 rows acrostichal bristles.

Aedeagus as in Figure 6b.

Distribution: Widespread in Europe (Spencer, 1976).

Hosts: The species of Leguminosae such as *Achillea* spp., *Matricaria* spp. and *Medicago sativa* (Spencer, 1976).

In this study, *O. curvipalpis* was found in Urla on *M. sativa* in 10.9.1996 (1 ♂, 3 ♀♀) by sweeping.

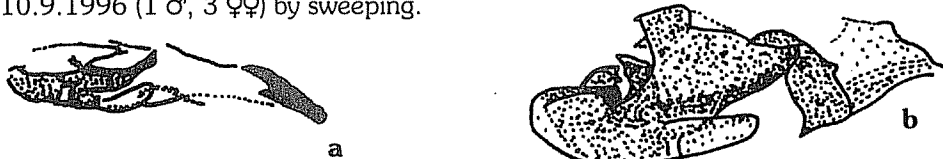


Figure 6. The shapes of aedeagus: a) *Ophiomyia cunctata*; b) *Ophiomyia curvipalpis* (Spencer, 1990).

***Paraphytomyza*** Enderlein, 1936

***Paraphytomyza orphana*** (Hendel, 1920)

Wing length from 2.3. to 2.8 mm, shining black species; frons reddish-orange with 2 ors - 2 ori; all antennal segments black; mesonotum with 3+0 or 2+0 dorsocentral bristles; second cross vein present.

Aedeagus as in Figure 7.

Distribution: Austria, Denmark, Germany and Great Britain (Spencer, 1972a, 1976; Soos & Papp, 1984).

Hosts: ***Gallium*** spp. (Spencer, 1976).

In this study, ***P. orphana*** was found in Ödemiş on ***Triticum*** sp. 10.4.1997 (1 ♂) by sweeping.

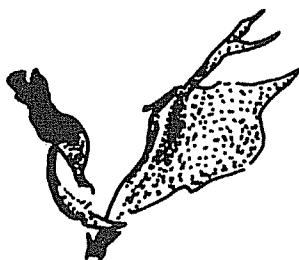


Figure 7. The aedeagus of ***Paraphytomyza orphana*** (Spencer, 1990).

***Phytomyza*** Fallén, 1810

***Phytomyza petoei*** Hering, 1924

Wing length from 1.6 to 2.3 mm, mat greyish black species; frons dark brown with 1 ors - 2 ori; all antennal segments black; mesonotum with 3+1 dorsocentral and 2 rows acrostichal bristles; mesopleura yellow; squamae grey, margin and fringe black.

Aedeagus as in Figure 8a.

Distribution: Denmark, Great Britain, Romania and Balcanian Countries (Spencer, 1972a, 1976; Soos & Papp, 1984).

Hosts: The species of Labiatae such as ***Mentha*** spp. (Spencer, 1990).

In this study, ***P. petoei*** was found in Selçuk on ***Mentha aquatica*** in 21.8.1996 (1 ♂, 2 ♀♀) by rearing from infested leaves.

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

Wing length 2.0 mm, greyish species; frons bright yellow with 2 ors - 1-2 ori; first and second antennal segments yellow, third black and large; mesonotum with 3+1 dorsocentral and irregularly 2 rows acrostichal bristles; mesopleura grey only yellow upper margin; squamae yellow, margin and fringe brownish.

Aedeagus as in Figure 8b.

Distribution: Widespread in Europe from Spain to East Europe, also Alaska, Canada, China, Japan, Russia and U.S.A. (Spencer, 1972a,b; 1976; Soos & Papp, 1984).

Hosts: **Plantago** spp. (Spencer, 1976).

In this study, **P. plantaginis** was found in Menemen on **Medicago sativa** in 7.6.1996 (1 ♂) by sweeping.

**Phytomyza rufescens** Roser, 1840

Wing length from 3.0 to 3.3 mm, yellowish-grey species; frons bright brownish with 2 ors - 1-2 ori; first and second antennal segments yellow third yellowish-brown and round; mesonotum with 3+1 dorsocentral and 2 rows acrostichal bristles; mesopleura yellow.

Aedeagus as in Figure 8c.

Distribution: Austria, Finland, Germany, Great Britain, Norway and Sweden (Spencer, 1976).

Hosts: **Hieracium** spp. such as **H. pilosella** (Spencer, 1976).

In this study, **P. rufescens** was found in Menderes on **Quercus** sp. in 10.2.1997 (1 ♀) by rearing from infested leaves.

**Phytomyza rufipes** Meigen, 1830

Wing length from 2.5 to 3.5 mm, blackish species; frons yellowish - brown with 2 ors - 2-3 ori; third antennal segment yellowish-brown; mesonotum with 3+1 dorsocentral and sparse acrostichal bristles; mesopleura yellow only black lower margin; squamae and fringe pale.

Aedeagus as in Figure 8d.

Distribution: Denmark, Finland, Germany, Great Britain, Spain, Sweden, Yugoslavia also Egypt and Japan (Spencer, 1972a,b, 1976; Soos & Papp, 1984).

Hosts: The species of Crucifera (Spencer, 1990).

In this study, **P. rufipes** was found in Karaburun on **Triticum** sp. in 31.1.1997 (2 ♂♂); in Menemen on **Triticum** sp. in 19.2.1997 (2 ♀♀); in Urla on **Triticum** sp. in 17.3.1997 (4 ♀♀) by sweeping.

**Phytomyza tenella** Meigen, 1830

Wing length from 2.3 to 2.8 mm, mat silverish-grey species; frons yellow with 2 ors - 2 ori; first and second antennal segments yellow, third antennal segment black and large; mesonotum with 3+1 dorsocentral and 2 rows acrostichal bristles; mesopleura black only yellow lower margin; squamae and fringe yellow.

Aedeagus as in Figure 8e.

Distribution: Widespread in Europe such as Great Britain, Scandinavia, Spain and also Canada (Spencer, 1972a,b, 1976; Soos & Papp, 1984).



Hosts: *Pedicularis* spp. (Spencer, 1990).

In this study, *P. tenella* was found in Urla (Balikhova) on *Cynara scolymus* in 10.9.1996 (1 ♂, 2 ♀♀) by rearing from infested leaves.

In this study was first time reported that *P. tenella* is a new pest for the *Cynara scolymus* in the world.

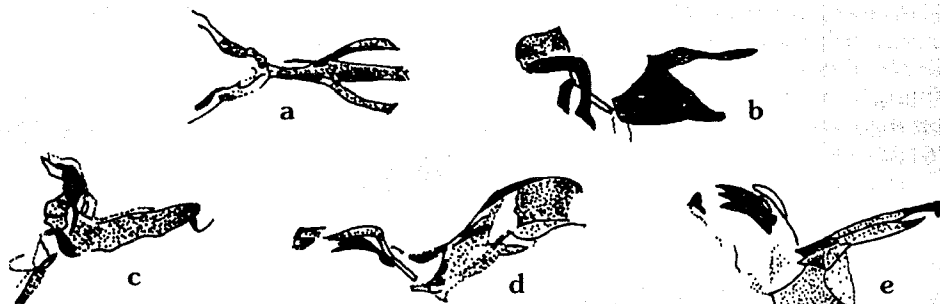


Figure 8. The shapes of aedeagus: a) *Phytomyza petoei*; b) *Phytomyza plantaginis*; c) *Phytomyza rufescens*; d) *Phytomyza rufipes*; e) *Phytomyza tenella* (Spencer, 1990).

#### *Pseudonapomyza* Hendel, 1920

#### *Pseudonapomyza hispanica* Spencer, 1973

Wing length from 1.6 to 1.7 mm, mat black species; frons black with 1 ors - 3-4 ori; all antennal segments black, third antennal segment with distinct angle at upper corner; mesonotum with 3+0 dorsocentral and 4 rows acrostichal bristles; squamae and fringe white.

Aedeagus as in Figure 9.

Distribution: Israel and Spain (Spencer, 1973).

Hosts: *Sorghum halepense* (Spencer, 1973).

In this study, *P. hispanica* was found in Urla on wild gramineous plants in 10.9.1996 (6 ♂♂, 8 ♀♀); in Urla on wild gramineous plants in 30.10.1996 (10 ♂♂, 2 ♀♀) by sweeping.



Figure 9. The aedeagus of *Pseudonapomyza hispanica* (Spencer, 1973).

## Özet

### İzmir İlinden Türkiye galerisinekleri (Diptera: Agromyzidae) faunasına bazı yeni kayıtlar

Bu çalışma İzmir İlinde 1996-1997 yılları arasında gerçekleştirilmiştir. Çalışmada İzmir İli Agromyzidae faunasının ortaya çıkarılması ve bu şekilde ileride yapılacak tarımsal savaş çalışmalarına temel oluşturulması amaçlanmıştır. Hem tarımsal hem de tarımsal olmayan alanlardan toplanan türler şunlardır: *Agromyza frontella* (Rondani, 1875), *Calycomyza humeralis* (Roser, 1840), *Chromatomyia milii* (Kaltenbach, 1864), *Liriomyza balcanica* (Strobl, 1900), *L. centaureae* Hering, 1927, *Napomyza clematidis* (Kaltenbach, 1859), *N. gymnostoma* (Loew, 1858), *N. lateralis* (Fallén, 1823), *Ophiomyia cunctata* (Hendel, 1920), *O. curvipalpis* (Zetterstedt, 1848), *Paraphytomyza orphana* (Hendel, 1920), *Phytomyza petoei* Hering, 1924, *P. plantaginis* Rob.-Desvoidy, 1851, *P. rufescens* Roser, 1840, *Phytomyza rufipes* Meigen, 1830, *P. tenella* Meigen, 1830 ve *Pseudonapomyza hispanica* Spencer, 1973.

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