

SURVEY OF THE GENUS *PHYTOMYZA* FALLEN, 1810 (DIPTERA: AGROMYZIDAE) OF IRAQ

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ABSTRACT

The aim of this study to survey the leaf miner *Phytomyza* Fallen of Iraq, many leaf plants which infested by leaf miners were collected from several regions of Iraq. The paper showed there are four species of this genus during the work: *Phytomyza horticola* Gourear, 1840; *Ph. atricornis* Meigen, 1838; *Ph. rufipes* Meigen, 1830; *Ph. ranunculi* (Schrank, 1803)

Key words: Leaf miners, Agromyzidae, plantshosts, *Phytomyza*, Iraq fauna

INTRODUCTION

Agromyzidae is commonly referred to as the leaf –miners, for the feeding habit of larvae, most of which are leaf miners on various plants, some of them are stem borer of galls maker. The family is widely distributed through the world but with significantly less species in the southern hemisphere than in the temperate areas of the Palaearctic and Nearctic regions, then was studied in different region of the world, (Spencer, 1961, 1963, 1972 and 1973).

A worldwide family of approximate 3000 species belonging to 30 genera about 1165 species (Shahreki *et al* 2012), small, some with wing length. The maximum size is 6.5 mm. Most species are in the range of 2 to 3 mm.

Adults agromyzids can be recognized by the distinctive sclerotization of head. The upper part of frons, above the ptilinal suture is lightly sclerotized and lacks setae, while the lower part of frons and the dorsal area of head tends to be much more heavily sclerotized and setaceous. Thus the frontal vita often forms a distinctive patch on the head different in color and texture to the rest of head and it has 1-7 frontal bristles so the vibrissae are present. Compound eyes are usually oval and fairly small although in some species they are larger and more circular. The wings are usually hyaline although those of a few tropical species have darker markings. Costal break present at the apex of subcostal vein; cell cup small, first anal vein not reached wing margin; pre genital sclerites of male with a simple (fused) tergal complex (tergites 6-8) with only two spiracles between tergites 5 and the genital segment; and anterior part of abdominal segment 7 in female forming an oviscap, (Hennig, 1958; Curran, 1965; Oldryd, 1970; Borrer and White, 1970; Spencer, 1972, 1987; Unwin, 1981; Scudder and Canning, 2006).

Phytomyza is beyond to subfamily Phytomyziinae which diagnosed by subcostal vein becoming a fold distally and ending in costal vein separately and based of R1 (first radial vein), (Spencer, 1961, 1963, 1972, 1973) and it is the largest genus of agromyzid flies which includes over 530 species (Winker *et al*, 2009).

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Typically agromyzid larvae are cylindrical in shape, tapering interiorly; with projections bearing the anterior and posterior spiracles, the former positioned on the dorsal surface of the prothorax, the latter backwardly directed at the rear; prominent, strongly sclerotised mouthparts, the mandibles with its longitudinal axis at oblique or right angles to the rest of the cephalopharyngeal skeleton and usually bearing two or more pairs of equally sized teeth, directed anteriorly, the ventral cornua (the posteriorly directed “arms”) commonly shorter than the dorsal ones (Spencer, 1972).

Adults of *Phytomyza* species are distinguishable from other Agromyzidae by the combination of the following morphological characters: fronto-orbital setae proclinate, costa extending only to the vein R_{4+5} and cross vein *dm-cu* usually absent (Spencer and Steskal, 1986; Spencer, 1987). In addition, the medial vein (M) is usually much weaker than branches of the radial vein (R), adding to the distinctive appearance.

In Iraq the genus was announced at (Al-azawi 1967 and 1971; El-Haidari *et al.* 1972; Al-Ali, 1977; Mekhlif and Abdul-Rassoul, 2002).

MATERIAL AND METHODS

Many infested leaf of plants were collected from different region of Iraq (25-50) leaves per each plants. The leaf plants are of many plant families such as Solanaceae, Cucurbitae, Cruciferae, Leguminosae, and weeds Compositae species from the provinces: Baghdad, (Abu – Ghraib, Bab Al—Muadham, Al-Kadhumyia), Kerbala, Nejef, and Basrah (Abu Al Khaseeb, Al – Buradheiyia), during February to May, (2012, 2013), but on October (2012) from north of Iraq, Duhok. The infested leaves were collected and brought to the laboratory, then kept in Petri dishes at room temperature, the dishes were numbered, the date and locality were recorded. After 21-30 days the adult flies were emerged. The adults were collected by sweeping net from the field of alfalfa and different weeds.

The flies were diagnosed by using identification keys by (Spencer. 1961, 1972 and 1973).

RESULTS AND DISCUSSION

This study is showed four species of *Phytomyza* they are: *Ph. horticola* Goureau, 1840; *Ph. atricornis* Meigen 1838; *Ph. rufipes* Meigen, 1830; *Ph. ranunculi* (Schrank, 1803)

The larvae feed mostly in the upper part of the leaf, mining through the green palisade tissue. Mines are usually off-white, with trails of brass appearing as broken black strips along their length. Repeated convolutions in the same small part of the leaf will often result in discoloration of the mine with dampened black and dried brown areas appearing, usually as the result of plant-induced reactions to the leaf miner, but the young larvae of *Ph. rufipes* makes a true mine towards the nearest vein and then feeds inside this downward the midribs and petiole where the main feeding takes place. Table (1) showed some host plants of *Phytomyza* spp.

Phytomyza horticola is widely distributed and it has more than 40 hosts thus it is economically pest, (Spencer, 1973; Mecklif and Abdul- rassoul 2002). It caused damage to cultivated crops and vegetables. The other species showed lower economic importance on plants.

Phytomyza atricornis: is widely distributed in but lesser than *Ph. horticola*.

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Phytomyza rapa: its particularly infested the family Crucifereae in different regions (Spencer,1973).

Phytomyza ranunculus: it has special host from the family Ranunculacea. (Pakalniškis, 2004)

Table (1):Showed leaf miners *Phytomyza* Falle'n spp. and their hosts in Iraq.

Leaf miners <i>Phytomyza</i>	Hosts	Locality	Date of collection
<i>Ph. horticola</i>	<i>Brassicae rapa</i> <i>Citrus vulgaris</i> <i>Mentha</i> sp. <i>Pisum sativum</i> <i>Trifolium veryandium</i> <i>Lycopersicum esculentum</i> <i>Cucurbita moschata</i>	Baghdad,Basra, Kerbala, Nejif Baghdad,Kerbala Baghdad, Nejif Nejif Baghdad Duhok	February Feb. -March Feb- March February Feb. April October
<i>Ph. atricornis</i>	<i>Medicago sativa</i> <i>Pisum sativum</i> <i>Helianth annuus</i> <i>Melilotis indicus</i> <i>Brassicae rapa</i>	Baghdad Basra, Kerbala, Baghdad Baghdad Baghdad Baghdad	March- May March April Feb.-April March
<i>Ph. Rufipes</i>	<i>Brassicae oleracea</i> var <i>botrylis</i> <i>Brassicae oleracea</i> var <i>capitata</i> <i>Brassicae rapa</i>	Baghdad, Kerbala Baghdad, Kerbala Baghdad, Nejif Kerbala, Basra	Feb. - April March, February
<i>Ph.ranunculi</i>	<i>Anemon cornaria</i> <i>Ranunculus</i> sp.	Baghdad Baghdad,	April April

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Bull. Iraq Nat. Hist. Mus.
(2013)12 (3): 67-71

مسح لانواع الجنس *Phytomyza* Fallén, 1810 في العراق

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الخلاصة

الهدف من البحث هو مسح لانواع الجنس *Phytomyza* Fallén في العراق. جمعت العديد من الاوراق النباتية المصابة بهذا الحفار لمناطق مختلفة من العراق، و من خلال البحث وجدت الانواع التالية:

Phytomyza horticola Goureau, 1840; *Ph. atricornis* Meigen 1838; *ph. rufipes* Meigen, 1830; *Ph. ranunculi* (Schrank, 1803).