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ORIGINAL ARTICLE

Survey of the genus *Liriomyza* Mik. (Diptera : Agromyzidae) of Iraq

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ABSTRACT
The aim of this study to survey the leaf miner *Liriomyza* Mik. of Iraq , many leaf plants which infested by leaf miners were collected from several regions of Iraq . Date and locality of collecting , emerge of miners were recorded .
Key words : Leaf miners , Agromyzidae , plants , hosts , *Liriomyza* , Iraq fauna

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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 loss species in the southern hemisphere than in the temperate areas of the Palaearctic and Nearctic regions [1], then was studied in different region of the world,[2,3] .

A worldwide family of approximate 2,500 species . The species are small, some with wing length. The maximum size is 6.5 mm. Most species are in the range of 2-3mm.

Adults agromyzids can be recognized by the distinctive sclerotization of the 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 makings. Costal break present at the apex of subcostal vein; cell cup small, first anal vein not reached wing margin; pre genital sclerites female 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 oviscape, [1,4,5,6,7, 8, 9,10].

The genus *Liriomyza* Mik. contains more than 370 species which are widely distributed in the New and Old Worlds [11,12], but most occur naturally in temperate regions . It is one of the most important leaf miners which has several polyphagus species and its larvae attracted the economic plants and this pest can impact crops in at least six ways : vectoring disease, destroying young seedlings , causing reductions in crop yields, causing sun burning of fruits , reducing the aesthetic value of ornamental plants and causing problems for plant quarantine[13,14,], some of *Liriomyza* spp. were also reported to be causing damage to cultivated flowers and vegetables [15].

Liriomyza is beyond to subfamily Phytomyzinae which diagnosed by subcostal vein becoming a fold distally and ending in costal vein separately and based of R1 (first radial vein) [1, 2, 3].

Typically agromyzids 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 sclerotized 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.[1].

Adults of *Liriomyza* species are small, between 1-3mm in length , The fronto-orbital setulae reclinate; usually with a dark pre-scutellar area concolorous with the scutum, rarely yellow; scutellum yellow in

most species, rarely dark ; costa extends to vein M1; discal cell small; dm-cu cross vein present in most species; stridulating organ present in males (a "scraper", a chitinized ridge on the hind-femora, and a "file", a line of low chitinized scales on the connecting membrane between the abdominal tergites and sternites).

MATERIAL AND METHODS

Many infested leaf of plants were collected from different region of Iraq (50 -100 leaves per each plants). The leaf plants are of alfalfa ,cucumber, and weeds Compositae species from the provinces: Baghdad ,(Abu – Ghraib , Bab Al—Muadham , Al-Kadhumyia), Kerbela , Nejef, and Basrah (Abu Al Khaseeb, Al – Buradheiaya), during February to may, but on October 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 flies were left the leaf as adult. The adults collected also by swap net from the field of alfalfa and different weeds.

The flies were diagnosed by using identification keys by[1,2,3, 16,17,18].

RESULTS

This study showed six species are :*Liriomyza brassichae* (Riley), *L. bryoniae* (Kaltenbach), *L. congesta* (Becer), *L. sitrigata* (Meigen), *L. sativae* Blanchard and *Lirio*myza sp.

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 frass 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. The typical appearances of mines are: A more loosely, irregular sepriten mine *L. bryoniae* and *L. sativae*, Mine closely following the main vein toward (and occasionally into) the petiole *L. sitrigata* Larvae exit the fully developed mines in order to pupariate (usually in the soil, sometimes on the surface of the leaf). The leaf miners, hosts and locality of them are showed in table(1).The result showed that *L. brassicae* has more hosts than the others April is the most suitable month for leaf miner, that due to the climate and abundance of plants, this result compared with [19,20], he recorded *L. congesta* was dominants as leaf miners on different kinds of plants .

Table 1 :Showed leaf miners *Liriomyza* species and their hosts

Leaf miners	Hosts	Locality	Date of collection
L. brassicae	*Medicago sativa*	Baghdad, Basrah, Kerbela, Nejef	Feb.-May
	Pistum sativum	Baghdad, Kerbela	Feb. March
	Brassicae rapa	Baghdad, Nejef	Feb.
	Lens esculata	Nejef	Feb.
	Phaseolus mango	Baghdad	March
	Dolicha sesquipedialis	Baghdad	April
L. bryoniae	*Pisum sativum*	Baghdad	April
	Cucuribta maxima	Kerbela, Baghdad	March
	Cucumus sativus	Baghdad	March
	Cucumis melo	Baghdad	May
	Citrullus vulgaris	Baghdad	April
	Melilotis indicus	Baghdad	March , April
L. congesta	*Pisum sativum*	Baghdad, Kerbela	May
	Brassica rapa	Baghdad,	February
	Medicago sativa	Baghdad, Basrah,	Feb. - May
	Ruphanus sativus	Baghdad, Kerbela	April
	Melilotis indicus	Baghdad, Nejef, Kerbela, Basrah	March, April
L. sitrigata	*Pisum sativum*	Baghdad	April
	Ruphus sativus	Baghdad, Kerbela	April
	Brassicae rapa	Baghdad, Nejef	April
L .sativa	*Cucuribta moschata*	Duhok, north Iraq	October
	Melilotis indicus	Baghdad	April
Liriomyza sp.	Weeds of Compositae	Baghdad,	Feb.-May

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