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New Record of Liriomyza trifolii (Burgess, 1880) (Diptera; Agromyzidae) in Baghdad, Iraq.

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ABSTRACT

This study was conducted to evaluate the leaf miner *Liriomyza* spp. in fieldsof Agriculture Collage, University of Baghdad. Infested leaves were collected weekly during 2015 – 2016, then brought to laboratory and kept under lab temperature until the leaf miner adults were emerging. *Liriomyza trifolii* (Burgess, 1880) was recorded as a new record for Iraqi fauna. The pests were found infected *Abelmoschuses culentus*, *Vigna* spp and *Ricinus communis.*

Keywords: Liriomyza trifolii, Agromyzidae

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INTRODUCTION

The Agromyzidae family is a large and diverse family of flies composed exclusively of phytophagous species. Their host-plants range from wild to cultivated species, thus consist of important pests group in agriculture. Family is widely distributed through the world in southern hemisphere than in temperate areas of Palaearctic and Nearctic regions (Spencer, 1972) it studies in different region of the world (Spencer, 1961, 1963).

A worldwide family has about 2,500 species, small insects, some with wing length of 1 mm. The maximum size is 6.5 mm. Most species are in the range of 2 to 3mm. Agromyzid adults can be diagnosed by the distinctive sclerotization of head. Top upper section of frons, above ptilinal suture (known as frontal vitta) is lightly sclerotized and lacks setae, while lower section of the frons and the dorsal region of the head tends to be much more heavily sclerotized and setaceous. Thus, the frontal vitta often forms a distinctive patch on the head, different in colour and texture from the rest of the head. The compound eyes are usually oval and fairly small, although in some species, they are larger and more circular.

The wings are usually diaphanous. Moreover, there are some tropical species have darker markings. A some species, including most species *Agromyza* spp., are capable of stridulation, owning a "file" on the first part of the abdomen segment and a "scraper" on the hind femur (Wikipedia, 2015).

The family of Agromyzidae is subdivided in two sub families (Agromyzinae and Phytomyzinae). In the sub family Agromyzinae the subcostal is fully developed and joins vein R1before this reaches the costa most species are large and stout, with Estimated length of the wing almost 3 mm, and the costa generally extends strongly to vein M1+2. In the larvae phase exist is a third, upper arm of the cephalo-pharyngeal skeleton.

Phytomyzinae diagnosed by subcostal vein is greatly reduced, frequently being little more than a fold running parallel to first radial vein (R1) and joining costa independently; in several genera costa is reduced and terminates at the apex of vein R4+5. The largest species in family occur in primitive genus, *Phytobia* Lioy, 1864, but many species are smaller, more slender and even minute, with wing length of less than 2 mm. The cephalopharyngeal skeleton of larva has only two arms (Spencer, 1977; 1989 and 1990).

Liriomyza, consist of about 376 species (Spencer, 1987; EPPO, 2005), but in Iraq showed such as: (Al Ali, 1977; Al-Azzawi, 1980; Abdul-Rassoul and Al- Saffar, 2013).

The punctures that it causes by females through the feeding and oviposition processes can led to a stippled appearance on foliage, mostly at the leaf tip and along the leaf margins (Parrella, *et al.*, 1981). In addition to, the major form of damage is the mining of leaves by larvae, which results in destruction of leaf mesophyll. The mine becomes noticeable after three to four days from ovi position and appear larger in size as the larva matures. Often, The pattern of mining is irregular. Both leaf mining and stippling can greatly lower the level of photosynthesis in the infected plant. Extensive mining also causes premature leaf drop, which can lead to lack of shading and sun light that scald of fruit. Wounding of the foliage also allows entry of bacterial and fungal diseases in to plant.

The host plants of *Liriomyza trifolii* is highly polyphagous and has been recorded from 25 families (Spencer, 1990). The More crops that are attack by this insect are celery, beans, chrysanthemum, gerbera, cucumber, gypsophila, lettuce, onion, tomato and potato (Spencer, 1989).

The biology of *L. trifolii* eggs are inserted just below the leaf surface. The number of eggs laid differs according to host plant and temperature. *L. trifolii* mature females each laid 25 eggs in celery plant at 15°C and 400 eggs at temperatures around 30°C. One female of *L. trifolii* laid 493 eggs in peas crop (Poe, 1981).

Eggs hatch in 2-5 days according to temperature. The duration of larval development as well differs with temperature and host plant but is generally 4-7 days at mean temperatures above 24°C (Harris and Tate, 1933). In Phaseolus, at a constant 30°C *L. trifolii* larvae complete development in 4 days and at 20°C within 7 days (Poe, 1981).

The insect *L. trifolii* pupariates externally, either on the foliage or in the soil just beneath the surface.

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It has also been Notes to pupariate in the leaf of, for example, onion and lucerne (Harris and Tate, 1933; Webster and Parks, 1913). Pupariation is adversely Influenced by increase humidity and drought.

Adult emergence of *Liriomyza* species occurs 7-14 days after pupariation, (Leibee, 1982). Mating Occur immediately after 24h than the emergence and a single mating (Parrella *et al.*, 1981).

American Serpentine Leaf miner

The economic importance of pests, and its presence newly in the study are in Baghdad, this study was conducted which include the description and diagnosis.

MATERIALS AND METHODS

Many infested of leaf were collected from oil castor plant *Ricinus communis*, *Abelmoschuses culntus* and *Vigna* spp from AL-Jadyria / University of Baghdad,Which attacked by pest *Liriomyza trifolii*, during 1/10/2015 to30/1/2016, brought to the laboratory and kept in petri dishes at room temperature, the microscopic examination carry out a daily to monitor the emergence of adult. After 10-20 days, the flies were left the leaf as adult and which keptin gelatinized capsules in order to the Iraq Natural History Research Center and Museum for diagnosis them(Spencer,1961, Spencer,1963 and Spencer,1972,Shiao, *et al.*, 1991; Shiao, 2004 and Anderson *et al.*, 2008).

RESULTS AND DISCUSSION

The study explained that the eggs of *L. trifolii* off white and half diaphanous, eggs are Length 0.2-0.3 mm x Width 0.1-0.15 mm (Figure1). Describes distinguishing features of the larvae (Figure2).

L. trifolii larva is up to 3 mm long, Larva is a legless larva with no discrete head capsule, transparent when newly hatched but colouring up to a yellow-orange in later phases and puparia have a pair of rearward spiracles ending in three cone-like appendages Pupaisa changeable colour pale yellow-orange, blackout to golden-brown, with oval shape and somewhat flattened ventral side, Length 1.3-2.3 xWidth 0.5-0.75 mm, The puparium has rearward spiracles on a marked pronounced conical projection, each with three featured bulbs, two of which are elongate. Pupariation occurs outside the leaf, in the soil under the plant (Figure3).

Fig 1: Eggs of *L. trifolii*

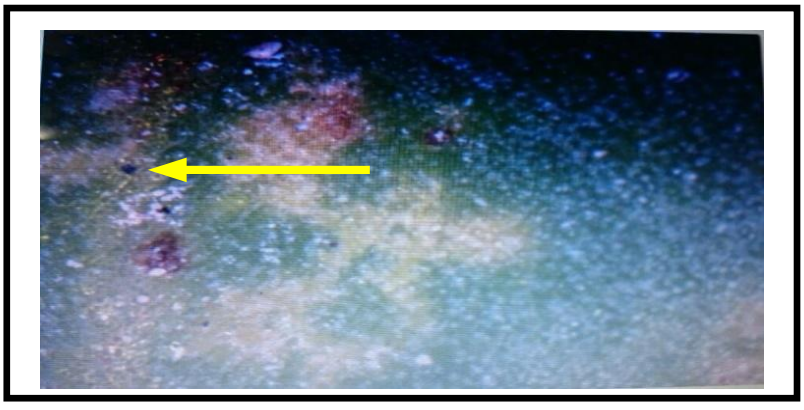

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Fig 2: Larvae of L. trifolii

Fig 3: Pupa of L. trifolii E

Fig 4: Head of *L. trifolii*

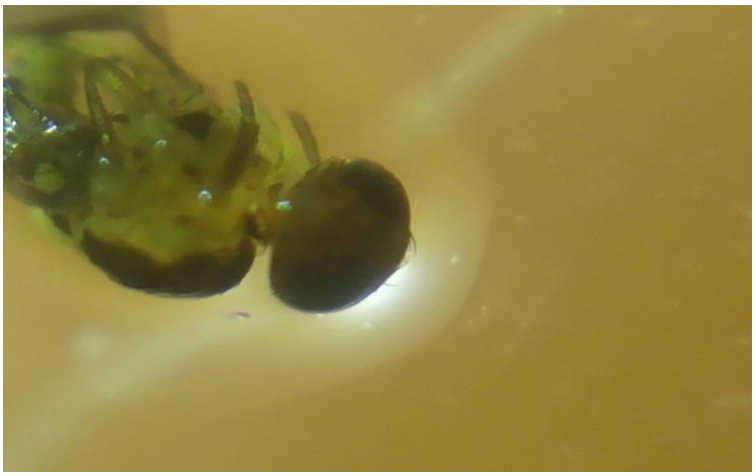

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Figure 5

Fig 6: Adult of *L. trifolii*

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Fig 7: Wing of L. trifolii

Head contains, the frons which projects very slightly above the eye, is just less than 1.5 times from the width of the eye (viewed from above (visible from the top). There are two equal superior orbital setae and two internal orbital setae (the lower one weaker). The orbital setulae are sparse and reclinate. The jowls are deep (almost 0.33 times the height of the eye at the rear); the cheeks form a clear ring under the eye. The third antennal segment is small, round and marked pubescent, but not excessively so (external vertical rough and inner vertical coarseare both on a yellow ground) (Figure 4).

Mesonotum, acrostical bristles happen irregularly in 3-4 rows on the front, decline to two rows behind. There is a conspicuous yellow patch at each hind-corner. The pleura are yellow color; the meso- and sterno- pleura have variable Black marking (Figure 5).

Adult of *L. trifolii*is very small in volume: (1-1.3 mm)from body length, up to (1.7 mm) in female with wingsA length (1.3-1.7 mm). The mesonotum is grey-black color with a yellow blotch at the hind-corners. The scutellum is bright yellow color; the face, frons and third antennal segment are bright yellow. Male and *female L. trifolii* are generally identical in morphological (Figure 6). Wing, length 1.3 -1.7 mm, discal cell small. The last section is M<(sub)3+4> from 3-4 times the length of the penultimate one (Figure 7).

Host Plants

L. trifolii were found infested the leaves of *Ricinus communis*, *Abelmoschuses culntus* and *Vigna* spp.

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