



First Morphological Identification of *Delia Platura* on Cucumber from Thi-Qar Province Southern of Iraq

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Abstract

The bean seed fly, *Delia platura* (Meigen) (Diptera: Anthomyiidae), have been collected and described for the first time on cucumber from Thi-Qar province. The male and female of the fly was identified by the accurate taxonomical key based on the morphological diagnostic characteristic such as the ratio of length to width of larvae and pupae and Adult, the length and types of hairs on the legs, were photoed and identified in current study.

Keywords: *Delia*, Thi-Qar, Cucumber, Been seed fly.

التشخيص المورفولوجي الأول لذبابة بذور الفاصولياء (Meigen) *Delia Platura* على محصول الخيار في محافظة ذي قار جنوبي العراق

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الخلاصة

جمعت عينات ذبابة بذور الفاصولياء (*Delia platura* (Meigen) (Diptera: Anthomyiidae) وصفت لأول مرة على محصول الخيار في محافظة ذي قار جنوبي العراق. شخّصت ذكور وإناث الحشرة باستعمال المفاتيح التصنيفية المعتمدة التي تستند على الصفات التشخيصية المظهرية كنسبة طول إلى عرض البرقات والعذارى والبالغات و طول الشعيرات وأنواعها على الأرجل. وصورت الأجزاء التصنيفية المهمة لغرض التصنيف.

1. Introduction

The bean seed fly, *Delia platura* (Meigen) (Diptera: Anthomyiidae), is a polyphagous insect and an important global pest in cropping systems. The larvae mine and attack germinating seeds of many legumes, cereals, tubers, and tobacco. The host range of *D. platura* includes nearly 50 species of plants. Furthermore, it can also develop in organic matter of wet soils. This organic matter may be the main larval food source when no germinated seeds are available [9], [10].



Delia larvae cause significant losses to economic crops including *Brassica napus* Linnaeus (Brassicaceae) by feeding on the root tissues, which is negatively affecting on the survival of the plant [11].

According to CABI, 2019 [12], *D.platura* originated from Europe and has a global distribution as it occurs in nearly all continents and climatic zones. *D. platura* is the most distributed Anthomyiidae. occurring in all continents except Antarctica. First reported in Germany, and now it's spread all over the United States, including Alaska and Hawaii, and Southern Canada [13]. It is a major pest in north and south America as well as in Europe and is found commonly in Japan, India, Australia, Northern Africa, and New Zealand.

reported that seedcorn maggots injures newly planted seeds by feeding on the contents of the seeds, often leaving seed empty and preventing germination. Seedlings that germinate despite the damage are long, with few leaves, and die before maturation. Occasionally, seedcorn maggots tunnel within seedling stems and germinating seeds [9]. Although usually no more than 2% of the seedlings are infested by this pest, 30% to 60% plant loss may occur in the field. Reduction of healthy plant can be seen within a week after plant germination. Seedcorn maggot-induced damage is facilitated by early planting dates, heavy canopy, and cool-wet weather [13].

It is an important pest of germinating soybeans and corn. It also attacks a wide range of field crops including beans (*Phaseolus* spp.), peas (*Pisum* spp.), and vegetable such as cucumber (*Cucumissativus*), melon (*Cucumismelo*), onion (*Allium cape*), pepper (*Capsicum annum*), potato (*Solanum tuberosum*), and other vegetables [8], [14], [15].

Due to the importance of the Diptera order, especially the Anthomyiidae family, and its impact on the Cucumber family, it causes huge economic losses estimated [16], To reduce its impact, many different studies were conducted in integrated management and control, and a survey and diagnosis of many species belonging to this order[5] , [6] were conducted In addition, a survey of insects associated with the Cucurbitaceae family was conducted by [15], [17].

2. Material and Methods

The study was conducted for January to April 2023, and the insect larvae were collected from the fields planted with cucumber and from the seedlings of the plant in particular in Al-Gharaf fields Coordinates of the sampling location relative to latitude and longitude (31 17 39 81 N: 46 15 41 100 E). Two collecting methods have been used in the current study:

The first method: included the direct hand collection of the larval stage from infected seedlings, then they were incubated at 10-15 co in the laboratory of insects / college of agriculture / sumer university until adults emergence.

The second method: The direct collection of insect adults by using a yellow sticky traps with (18 × 12 cm), and then adults were removed from sticky cards by using petroleum ether. The samples then were preserved in ethanol 70%.

The collected specimens are identified morphologically by Assistant Professor Hana Hani Al-Saffar at the Iraqi Research Center and Natural History Museum, Baghdad University, based on the accurate taxonomic keys [18]. The species specific of the insect parts are photographed by Canon camera installed on dissecting microscope.



Results and discussion

The results showed that the larvae of this pest is a small maggot, yellowish white to dirty yellow, legless, and about 4.5-5.2 mm in length and width in their later stages. Seed corn maggots have three larval stages mature larvae pupate in the first 2-3 inches of soil surface. (fig.1,a)

The pupae colour is dark brown and less than 4.2-4.75 mm long. They are approximately three times as long as wide (fig, 2), these results are agreed with Gesell (2000) [13], who reported that the puparia are 3/16–1/4 in. (0.48–0.64 cm) in long, dark brown to black, barrel shaped, and found in the soil near roots. The pupal stage lasts from 7-20 days, depending on temperature. The adults are brownish-grey flies resembling house flies, with three stripes on their back. They are half the size of a house fly *Musca Domestica* approximately 3/16–1/4 in. (0.48–0.64 cm) in These results are consistent with the findings of Gill and others [10] (fig.1).

The main diagnostic characteristics of this species showed that the first flagellomere length to width is 2.3:1. Pedicel with two longer bristles and a few very short ones. Third flagellomere with hairs the same length as the arista; second flagellomere bare. Hairs on arista shorter than the width of the third flagellomere at the base. Acrostichals in two rows, relatively weak with those just in front of the scutellum only slightly longer than the others. Brown line between the rows.

Upper squama: transparent with a cream shortly ciliate border. Lower squama about half as long , completely hidden underneath.

Front leg: Coxa with bristles on the front surface only. Femur with a complete row of poster dorsal bristles and somewhat longer poster ventral bristles; a few weaker anteroventral bristles near the base (fig3).

Tibia with one poster ventral at about half way and a long preapical dorsal along with shorter poster ventral and anterodorsally.

Middle leg: Femora with several anteroventrals near the base and a more complete row of stronger posteroventral bristles; row of weak anterodorsal bristles. Tibia with one anterodorsal between half and two-thirds and two posteroventral, bristles; ventral, anterodorsal and dorsal preapicals. First segment of the tarsus with a row of curved bristles along the dorsal surface.

Hind leg: femora with nine anterodorsal bristles towards the tip and a row of shorter anteroventral bristles in the apical two-thirds that swing more onto the anterior surface towards the tip. Posterodorsal and posteroventral rows of shorter bristles are present. Tibia with two anteroventral bristles complete row of 18 posteroventral hair-like, bristles and 3 longer posterodorsal bristles + a long preapical [19].

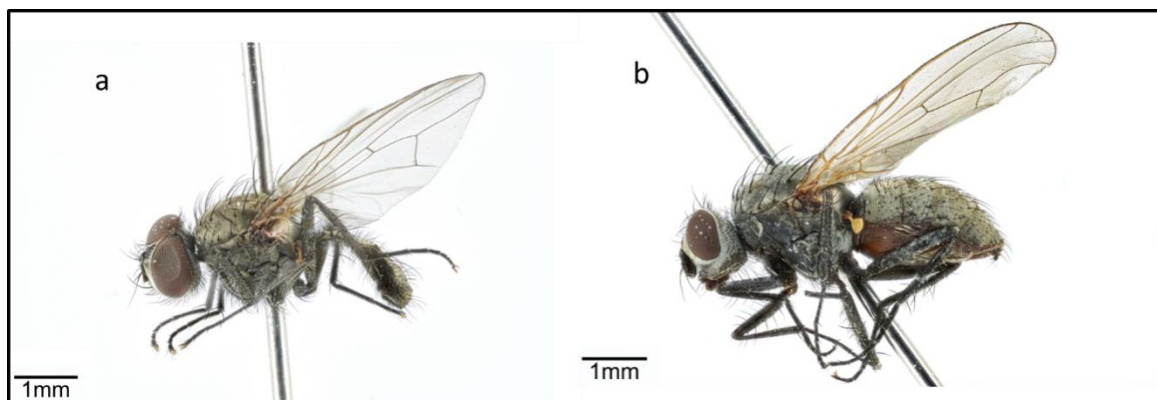


Figure -1 Adult stage of *Delia platura* (lateral view) a-male b- female

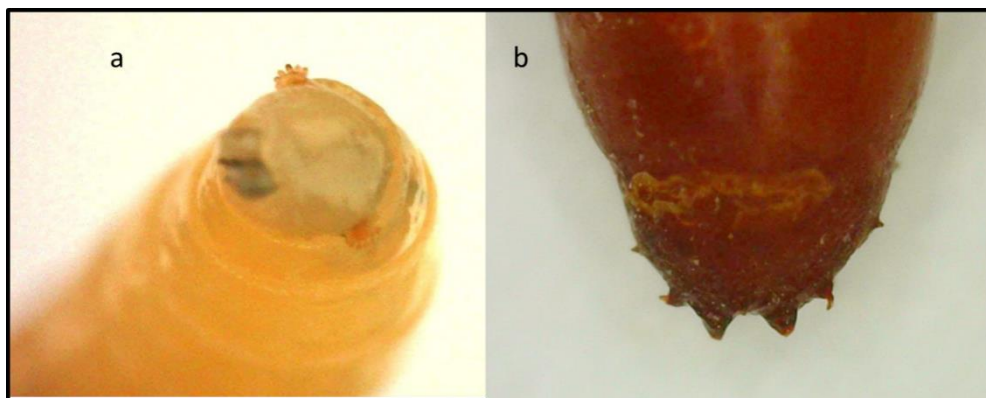


Figure -2 a: Larva of *Delia platura* b: pupa of *Delia platura*.

3. **Distribution:** [11], [20], [1] [21], [2], [3], [4], [22], [17] ...

4. Conclusions

It is concluded from this study that *Delia platura* is the first species recorded in Iraq on cucumbers and is described for the first time according to the main diagnostic characteristics of species belonging to the genus *Delia*. It is possible to benefit from this type in identifying genera and other species close to them diagnostically and benefit from this study in finding therapeutic and preventive methods against this insect.

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