Record a new species of cucurbit fly *Dacus ciliatus*, loew (Diptera: Tephritidae) in Kurdistan Region, Iraq

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Abstract. Samples of Cucurbit fly (*Dacus ciliates*, Loew) were collected from the fields of many village for three province Duhok, Erbil and Sulaimaniyah /Kurdistan region, Iraq during period 15/9-1/12/2017. Samples were collected during morning continued to the afternoon on squash fields. Morphological features of the species were illustrated. The *Dacus ciliates* specimens recorded for the first time in Iraq, as a new genus and species.

Keywords: Diptera, Tephritidae, fruit flies, Cucurbit fly, Iraq, new record.

1. Introduction
The dipteran family Tephritidae, commonly known as fruit flies, includes some of the most biologically interesting and agriculturally important species of flies. Several Tephritids have been the subject of seminal studies on behavior, ecology, sexual selection, speciation, and evolutionary biology [5][6][8][12][13][14][15][17][18][23][26]. There are 450 genera and 4,300 described species within Tephritidae worldwide, making it one of the largest families within Diptera [25]. About half of the species within the family are frugivorous; however, the larvae of many species develop in flowers of Asteraceae, and others are associated with flowers of various plant families or their larvae are miners, borers, or gall makers of various plant organs. From an agricultural standpoint, the genera *Anastrepha*, *Bactrocera*, *Ceratitis*, *Dacus*, and *Rhagoletis* are the most important economically because many species in these genera are serious pests of fruit [30]. *Bactrocera*, *Ceratitis*, and *Dacus* are members of the tribe Dacini (Trypetinae), which includes 40 genera and 1,000 described species [25]. Three subtribes are currently recognized within Dacini: Ceratitidina (198 species), *Dacina* (723 species), and Gastrozonina (112 species).

Also the Dacine fruit fly fauna of the Indian subcontinent has received attention by taxonomists in recent years [7][9][10][11], with 84 species recorded from the region (excluding Sri Lanka): 58 species in India, 44 in Bhutan, 8 in Nepal, and 11 in Pakistan. The first annotated checklist of 15 species known to occur in Bangladesh was recently published [21], based on surveys initiated in early 2013 and reviewing known literature.

The lesser pumpkin fly, *Dacus ciliates* (Loew), is also known as the Ethiopian fruit fly and the cucurbit fly. It is one of several fruit flies found in Africa and Asia, which could become serious pests of Florida agricultural crops if introduced in to this state. This species has not been intercepted in the United States.

Throughout a large part of Africa and India this fruit fly is a common pest of cucurbits, heavy infestations of cucurbits by *D. ciliates* have been reported in Egypt and in South Africa. *Dacus ciliates* first were reported in India in 1914 and was collected first from Ombo, Upper-Egypt, in February 1953. *Dacusciliatus* occurs throughout most of eastern, southern, and central Africa, Malagasy
Republic (Madagascar), Mauritius and Reunion Islands, the Arabian Peninsula, Pakistan, India, Bangladesh, and Sri Lanka [29].

Before this study, little information was available on the Tephritid flies of this region. [31], reported the field efficacy of insecticides against larvae of *Musca domestica*. [1], reported new record of Mediterranean fruit fly in Iraq. [28], studied the biological aspects of Mediterranean fruit fly *Ceratitis capitata* (Weid.) (Diptera: Tephritidae) on Tangerine Citrus reticulate (enther). [2], reported Muscid flies from Iraq. [3], evaluation of Ceranock attract and kill system to control Mediterranean fruit fly (*Ceratitis capitata*) in citrus orchards of Iraq. [19], study of genetic polymorphism in the Mitochondrial DNA of the Mediterranean fruit fly *Ceratitis capitata* (Wiedemann, 1824). [16], mentioned the geographical distributions of Mediterranean fruit fly *Ceratitis capitata* (Wiedeman) (Diptera: Tephritidae) and its management in Iraq. [20], studied the current status of population density of Mediterranean fruit fly in fruit orchards in central Iraq. [28], Evaluation the efficiency of luring food and colored traps in attracting Mediterranean fruit fly *Ceratitis capitata* in Kurdistan region, a little information was available on the Tephritid flies of this region.

2. Materials and methods

*First: Survey*

- Selected orchards in the three governorates (Duhok, Erbil, and Sulaimaniyah) in Kurdistan region of Iraq. Figure. 1 Selected available orchards in

![Map of selected orchards](image)

*Figure 1. Shows the survey areas, the sampling location*

*Second: Samples Collecting*

- Received available samples of *Dacus ciliates* that had been collected from cucurbit field weekly during period of pest activity in many villages, Kurdistan region, Iraq.
- Using the plastic containers for collecting the samples by hand and net.
- Affected fruits collected from cucurbit field.

*Third: Preservation*
• The fruit fly specimens were kept in the freezing for storage and then pinning them on insect pins.

**Fourth: Morphological study of sample**

• Genex a binocular Olympus microscope S/N: GX03207, 220V. 50/60HZ was used to describe the samples.
• USBmicroscopecamera1x~80x, 320x photo: 1600x1200 pixels, BMP, JPEG were used for taking the photos.
• The fruit fly specimens (Figure. 2) were identified according to key of the species *Dacus ciliates* (Diptera: Tephritidae: Dacinae) by [21].

3. Results:

**Description:**

*Adult.* The body is semi-oval peaked toward the posterior part, length is 4-5 mm and width is 2-2.5 mm, yellow head with brown thorax and abdomen. The legs are yellow in color, accepted with [4] [22] [24]. Figure. 2, 3

![Figure 2](image_url)  **Figure 2.** Adult (female)  ![Figure 3](image_url)  **Figure 3.** Adult (male)

*Head.* Globular shaped, yellow in color, width and length approximately (1.457mm.) and (1.106mm.) respectively, vertex broad flat toward the back, frons consists of palate peaked from the front and a broad toward the back, with black spot between compound eyes and two long black setae in each side. Compound eyes oval-shaped, large with a dark greenish to olive color separating from each other, with many facets called (Ommatidia) on the surface. Genae is a small plate integrated with frons and clypeus exist between fronto-clypeus sclerite. The Mouth parts sponging type consists of rostrum, Hustullum and oral disk, with two black spot above the mouth parts between compound eyes in each side. Figure. 4, 5
Antennae. Aristate type consists of three parts escape, pedicel and flagellum, flagellum largest part oval-shaped, with high-fork consists of dens hairs on each side on surface and two long hair from each side of flagellum. Figure 6

Thorax. Pro-thorax tightness compressed below the meso-thorax with two big yellow oval convex spot on each side, Meso-thorax large with two yellow large rectangles on each side. Meta-thorax composed of the meta-scutelum, scutum and scutellum, the end of posterior part of meso-thorax large yellow rectangle with two long setae at the end, with many of the short medium densities, yellow hairs on the surface and number of long prominent black thorns. Figure 7

Legs. Predominantly yellow in color darkened to brown at the junction between femur and tibia, and tarsal segments are 5 (tarsal formulation are (5, 5, 5)), use for walking on the soft surface, with a short bristle yellow hairs on the legs surface, with a long spur on the end of tibia. Figure 8
Figure 8. Leg

Wings. Meso-thorax contains a pair of transparent membranous wings ornamented with expand anterior dark-brown band, costal band narrow, wing span approximately (1.5–15 mm.) while the length approximately (4 mm.). Wing veins are illustrated as in Figure 9.

Figure 9. Wing

Abdomen. The dorsal surface of the abdomen visible pour tergite, the first and the second tergites are rectangular, large in size and are almost equally and larger than the third and fourth tergites. The third tergum almost triangular shaped, while the fourth semi-triangular peaked toward the back. Fifth abdominal sternite appears on the ventral surface. On the second sternum there is a row of setae on each side and many of short yellow hairs on the sternum and tergum of the abdomen, with white band on the abdomen (on the first tergum), the long of female ovipositor is approximately 2.409 mm.

Figure 10. Female’s abdomen  Figure 11. Male’s abdomen
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