REVISION OF THE FAMILY CHLOROPIDAE (DIPTERA) IN IRAQ

Hanaa H. Al-Saffar
Iraq Natural History Research Center and Museum, University of Baghdad, Baghdad, Iraq
Corresponding author: hanaahani2014@gmail.com

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ABSTRACT
The aim of this study is to survey and make to revision the genera and species of Chloropidae fauna of Iraq. The investigation showed four species belonging four genera, which belongs to two subfamilies, and one unidentified species belonging to the genus Elachiptera Maquart. The specimens were compared with stored insects at Department of Entomology and invertebrates, Iraq Natural History Research Center and Museum.

Key words: Brachycera, Chloropidae, Diptera, Eye fly, Grass fly, Iraq.

INTRODUCTION
The family Chloropidae Schoenher, 1840 (frit flies, grass flies or eye flies) belongs to super family Carnioidea. It has four subfamilies: Chloropinae, Oscinellinae, Rhodesiellinae, and Siphonellpsinae (Brues et al., 1954).

The members of Chloropidae are worldwide distribution or cosmopolitan and are found in all Zoogeographical regions except Antarctica; they are about 3000 described species under 200 genera (Sabrosky, 1989; Canzoneri, et al., 1995; Nartshuk, 2012; Bazyar et al., 2015).

The grass flies are also found in marshes, vegetation areas, forests; the members of the family are phytophagous. Some species as a gall maker of stems likes Lipara lucens Meigen, 1830 on Phragmites australis (Poaceae) are affected on the morphological tissue (Van de Vyvere and De Bruyn, 1988); and many larvae feed and developed flower heads, shoots and seeds of Poaceae and some feed on the stems of cereals, thus affected of economic production (Alford, 1999; Karpa, 2001; Petrova et al., 2013). On the other hand some species as saprophytic which feed on damaged plant tissue by other insects such as Atherigona spp. (Diptera, Muscidae), larvae of lepidopterus stem borer and other arthropods (Von Tschirnhaus, 2002); and as predators of several insects like: aphids, eggs of grasshoppers and nuisance spiders, oothecae of mantids and eggs of Hemiptera (Dawah and Abdullh, 2006).

Some species have medical and veterinary importance (Nikapy et al., 2013) such as eye gnats attracted to human and other mammals where they hover about the face, body orifices and open wounds, such as Liohippelates spp. and so that take part of a mechanical transition of several organisms which cause diseases to humans and livestock animals in North and South America (Bram et al., 2002; Hall and Gerhardt, 2009).
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The oriental eye fly *Siphunculina funicola* Meijere, 1905 is a nuisance to humans and domestic animals which feed on various secretions including eye secretions, mucus membrane, and other moist surfaces of their hosts and carry and transmit fatal pathogens like fungi, viruses and bacteria to humans and other hosts. The eye flies are found aggregating on many hanging substrates like strings, electrical lines and wires, ropes, nest trailing, decorators, cobwebs, clothes hangers, cotton threats which as their medical and forensic importance (Sathe *et al.*, 2014); also there are some chloropid flies as parasites of amphibians (frogs) *Crinia signifera* by *Batrachomyia* sp. (Lemckert, 2000).

The adult of Chloropidae diagnosis by many features such as: small 1-5 mm rarely eight millimeters in length, variable in colors (black, blackish–grayish and bright yellow and black with vittae; head is somewhat angular; ocellar triangular large and conspicuous, shining, postvertical bristles converging, parallel or absent; vibrissae reduced or absent; antennae project and prominent with arista located at basal, dorsal and scarcely terminal, bare, plumose or pubescent. Subcostal vein incomplete, costa broken at near the end of first radial vein (R1); second discal cell and basal cell are united, vein Cu1a slightly sinuate and anal cell wanting. The previous are characters accepted by the authors: Essig (1947), Comstock (1948), Mc Alpine (1958), Curran (1965), Cole (1969), Borror and White (1970), Oldroyd (1970), Unwin (1981), Scudder and Cannings (2006).

MATERIALS AND METHODS

Many specimens of grass flies were collected by sweeping net in various habitats from several regions of Iraq during 2017. Then the flies were killed by freezing for 24 hours; the specimens mounted with insect pins and kept in insect collection boxes till diagnosed.


The specimens were compared with previously identified specimens which had been diagnosed and stored at Department of Entomology and Invertebrates, Iraq Natural History Research Center and Museum, University of Baghdad.

RESULTS AND DISCUSSION

In this study the survey showed four species, four genera and one unidentified species that belong to the genus *Elachiptera* Macquart belonging to two subfamilies Chloropinae and Oscinellinae. The key to identify of subfamilies and genera was constructed, the global distribution of each species was shown in this investigation.

**Key to subfamilies and genera of Chloropidae in this study :**

1- Costa ending between the apices of R4+5 and M1+2; vertical bristles weak or absent.  

.........Subfamily: Chloropinae ......................................................... 2

- Costa extending to apex of M1+2; vertical bristles well developed, the inner weaker than the outer........ Subfamily: Oscinellinae ................................................................. 3

2- Hind femora greatly thickened and tibiae strongly arcuate  

................................................................. Meromyza Meigen.

- Hind femora not thickened and hind tibiae almost or quite straight................................................................. Thaumatomy Zenker.
3- Body shining black; mesonotum with normal shape and depression at the end; all femora black................................................................. Oscinella Becker.

- Body dull black, yellowish – brownish; mesonotum with dark vittae or spots, femora yellow – brownish ............................................................ Elachiptera Macquart.

Family, Chloropidae Schoenher,1840
Synonyms: Chloropidae, Rondani,1856
Oscinidae Fallen, 1820
Mindidae, Paramonov, 1957
Echiniidae, Paramonov, 1961
Siphonellopsidae, Nartshuk, 1987

1. Subfamily: Chloropinae Rondani,1856
Genus: Meromyza Meigen, 1830
Type species: Musca saltarix Linnaeus,1761
Diagnostic characters: Body is elongated, yellowish and greenish in color; head is square shaped with tiny setae; ocellar triangle with black spots; the length of flagellum little longer of broad, mesonotum has black, brownish longitudinal or yellow vittae; veins R2+3 and R4+5 much bent forward.

Meromyza nigriventris Maqurt,1835
Description: The body is elongated, black – brownish color, mesonotum black with two parallel yellow vittae.

Global Distribution: Iraq (El-Haidary et al., 1974); Japan (Kanmiya, 1978); Palearctic region (Nartshuk, 1984); Arabian Peninsula (Deeming and Al-Dhafer, 2012); China (An and Yang, 2005); Romani (Pirvu, 2005); Mediterranean islands (Nartshuk, 2013); Finland (Nartshuk and Kahanpää, 2014); Iran (Rabeih et al., 2012; Khameneh and Khaghaninia, 2016); Uzbekistan (Khamraev and Davenport, 2004); Poland (Beres, 2015) and Turkey (Kubík and Barták, 2017).

Genus: Thaumatomyia Zenker, 1833
Synonyms: Chloropisca Loew., 1866
Pseudochlorops Malloch, 1914
Type species: Thaumatomyia prodigiosa Zenker, 1833
= Chlorops notata Meigen, 1830
Diagnostic characters: body elongated and flattened in both sexes, scutellum flattened on disc, with distinct marginal rim, apical scutellar bristles closely approximated.

Thaumatomyia sulcifrons Becker , 1907
Materials Examined: (4♀♀, 3♂♂): Baghdad, Al Taji, 2♀♀ at 5.X.2017; Al-Najaf, 2♂♂ at 10XI.2017; Wasit, Al-Aziziyah, 2♀♀, ♂ at 5.V.2016.
Description: small flies 4-5mm. yellowish brown in color; head semispherical, arista long, oceller triangle large with small dull spot; mesonotum with three rims, the middle one reaching the interior margin of thorax; scutellum brightening yellow.
Global Distribution: In Iraq (Khalaf, 1963); Arabian Peninsula (Deeming and Al-Dhafer, 2012); Mediterranean islands (Nartshuk, 2013) and Iran (Bazyar et al., 2015 ).
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**Thaumatomyia sp.**


2-Subfamily: Oscinellinae Becker, 1910

**Genus: Oscinella** Becker, 1909

Type species: *Oscinella frit*, Linnaeus, 1758

Diagnostic characters: First basal cell scarcely wider at middle than end.

**Oscinella frit** (Linnaeus, 1758)

Synonyms: *Musca frit* L. 1758

*Oscinella exigua* Collin, 1964

*Oscinella granaria* (Curits, 1846)

*Chlorops aenea*, Roser, 1840

*Hydrellia rufitarsis*, Meigen, 1838


Description: small black fly, legs dull black, tibiae never entirely yellow.

Global Distribution: In Iraq (Hussain, 1963); Europe, Latvia (Karpa, 200; Petrova *et al.*, 2013); Arabian Peninsula (Deeming and Al-Dhafer, 2012); Spain (Nartshuk *et al.*, 2013); Turkey, Iran, Europe, U.S.S.R. (Gentry, 1965); Mediterranean islands (Nartshuk, 2013); Iran (Bazyar *et al.*, 2015).

Genus: *Sabroskyina* Beschovski, 1987

Type species: *Lioscinella mimica* Collin, 1949.

Diagnostic characters: First basal cell of wing is very much broadened at mid-length.

**Sabroskyina aharonii** (Duda, 1933)

Synonyms: *Oscinella aharonii* Duda, 1933 (Sabrosky 1963).

Global Distribution: Iraq (Deeming and Al-Dhafer, 2012); Arabian Peninsula (Deeming and Al-Dhafer, 2012); Turkey (Kubík and Barták, 2017).

Genus: *Elachiptera* Maquart, 1835

Synonyms: *Ceratobarys* Coquillett, 1898

Type species: *Chlorops brevipennis* Meigen

Diagnostic characters: Third antennal segment haired; Scutellum with dorsal surface flat, or trapezoid, the marginal setae arising from more or less distinct tubercles.

**Elachiptera sp.**

Global Distribution: Iraq (Khalaf and Al-Omar, 1974).

LITERATURE CITED


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مراجعة لعائلة ثنائية الاجنحة (Chloropidae) في العراق

هنا هاني الصفار
مركز بحوث و متحف التاريخ الطبيعي / جامعة بغداد، بغداد، العراق

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الخلاصة
هدفت الدراسة لعمل مراجعة أجناس وأنواع عائلة ذباب الحشائش في العراق و أوضحت الدراسة وجود أربعة أنواع تعود لأربعة أجناس و نوع آخر غير معروف يعود إلى الجنس Elachiptera Maquarta والتي تضمنت عويلتين من هذه العائلة.

قورنت العينات مع النماذج الحشرية المحفوظة في قسم الحشرات واللافقاريات/ مركز بحوث و متحف التاريخ الطبيعي العراقي/ جامعة بغداد لغرض تأكيد تشخيصها.