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Catalogue of the Syrphidae of Egypt (Diptera)

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Abstract

All known Egyptian taxa of the family Syrphidae (flower flies or hover flies) are systematically catalogued. A total number of 51 species belonging to 22 genera, 7 tribes and 2 subfamilies has been treated, including eight species that are listed as unconfirmed records from Egypt. Data for this study have been compiled from both available literature and specimens collected from different Egyptian localities by the authors or preserved in the main Egyptian insect collections. Old World synonymies, type localities, world distributions by biogeographic realm(s) and country, Egyptian localities and activity periods are provided. Remarks on habitat, habits and biology of particular species are provided as well. Two species, *Melanostoma scalare* (Fabricius) and *Eristalis arbustorum* (Linnaeus) are recorded for the first time from Egypt.

Key words: flower flies, hoverflies, geographical distribution, Egyptian localities, adult activity periods, habitat, feeding habits

Introduction

The family Syrphidae (with more than 6,100 species worldwide) has traditionally been considered to constitute one superfamily, Syrphoidea, together with the family Pipunculidae (Pape *et al*. 2011). However, several large-scale phylogenetic analyses of mainly molecular data have demonstrated that the superfamily Syrphoidea is not recovered as a monophyletic group, because the Pipunculidae is placed as the sister group to the Schizophora, while the Syrphidae are always found to be monophyletic (Wiegmann *et al*. 2011; Young *et al*. 2016; Pauli *et al*. 2018).

Adults of the family Syrphidae, commonly known as flower flies or hoverflies, are among the most abundant and conspicuous flies. They range from 4 mm to over 25 mm in size, and from bright yellow or orange to gray or black in colour, with a few iridescent forms. As their name implies, hoverflies are able to hover motionless in flight or to move in any direction including backwards. As adults, most species visit flowers, which they use as mating sites and to feed on pollen and nectar. They are significant pollinators of many economically important plants, and in some agroecosystems (*e.g.,* orchards) they out-perform native bees in pollinating the crops (Thompson & Vockeroth 1989; Thompson & Rotheray 1998; Speight 2017).

The Syrphidae exhibit diverse larval feeding modes. Larvae of the subfamily Microdontinae are predatory inquilines in ant nests, feeding on ant brood. The subfamily Syrphinae are almost exclusively predators on soft-bodied arthropods (usually aphids), while the subfamily Eristalinae can be saprophagous (most Milesiini), coprophagous (some Rhingiini and Milesiini), phytophagous (most Rhingiini, Merodontini and some Brachyopini), aquatic filter-feeders (mainly Eristalini and some Brachyopini and Milesiini) or specialized inquilines in social insect nests of termites, wasps and bees (Volucellini) (Thompson & Vockeroth 1989; Gilbert *et al.* 1994; Thompson & Rotheray 1998).

Data on the hoverfly fauna of Egypt are relatively old and scattered, and have not been revised for the last 40 years. There is an outdated monograph (Efflatoun 1922) and two studies (Shaumar & Kamal 1977, 1978) that need updating. Steyskal & El-Bialy (1967) listed all known Egyptian species of Diptera, including the family Syrphidae,

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allegedly based on a scattered literature but without naming their source for any particular record. The list included merely the names of the families and their species without citing important taxonomic data.

This study is one in a series of planned studies on different Egyptian dipteran taxa aiming to catalogue the whole order in Egypt.

Material and methods

Data sources. Data for this study have been compiled from specimens collected from different Egyptian localities by the authors, in addition to specimens preserved in the main Egyptian insect collections. A great deal of information, including synonymies and distributional data was obtained from relevant literature.

Study area. As part of the Great Desert Belt, Egypt, the study area, is characterized by a warm and almost rainless climate (El-Hawagry 2017). It is divided into eight ecological zones: the Coastal Strip, Lower Nile Valley & Delta, Upper Nile Valley, Fayoum, Eastern Desert, Western Desert, Sinai, and Gebel Elba (Fig. 1). The fauna of all but one of these zones is mostly affiliated to the Palaearctic Region, but that of Gebel Elba, the southeastern triangle of Egypt, has a greater affiliation to the Afrotropical Region (El-Hawagry & Gilbert 2014).

Sampling and identifications. Some syrphid specimens for the present study were collected irregularly from different localities in Egypt from 1990 to 2017 by the authors, using sweep and aerial nets. The collected specimens were killed in ethyl acetate jars, and were pinned immediately after killing. The collected specimens, as well as those available in Efflatoun's collection (EFC) and the collection of Plant Protection Research Institute (PPDD) were identified using relevant keys (Efflatoun 1922; Shaumar & Kamal 1977; Lyneborg & Barkemeyer 2005; Smit *et al*. 2017) and original descriptions. The collection of the Entomological Society of Egypt, Cairo (ESEC) could not be checked because it has been closed for many years due to unknown reasons.

The nomenclature follows that of the Catalogue of Life (www.catalogueoflife.org) which for the Syrphidae is based on Systema Dipterorum (http://sd.zoobank.org/). It also uses the nomenclature of the Syrphidae Community Website (syrphidae.myspecies.info).

Classification used. The current classification of the family Syrphidae is largely based on the morphology of adults and basically follows that used in the Palaearctic Diptera catalogue (Peck 1988) and the Manual of Palaearctic Diptera (Thompson & Rotheray 1998). Over the last fifty years, the family has been divided into just three subfamilies and fourteen tribes. Here we use some more recent studies for the arrangement of tribes within subfamilies. These studies use molecular characters (*e.g.* Ståhls *et al*. 2003, Mengual *et al*. 2008).

Arrangement of taxa. Subfamilies and tribes are arranged phylogenetically (Skevington & Yeates 2000; Ståhls *et al*. 2003, Mengual *et al*. 2008), while the lower taxa are arranged alphabetically. Synonyms of genera and species are chronologically listed.

Typographical treatment of names. family-group headings are centered and capitalized. Genus-group headings are left-justified and written in bold and capitalized. Species-group headings are left-justified and written in bold. Authorship of genera, subgenera and species are written in lowercase letters. Taxonomically valid genus-group names (senior synonyms) are listed again in bold lowercase letters, and left-justified under the headings, followed by reference to original description including author, year and pages. Taxonomically valid species-group names combined with their original genera (senior synonyms) are listed again in regular lower case letters, and left-justified under the headings followed by reference to original description including author, year, and pages. Type species for all nomenclaturally available genus-group names are given after the reference line, followed by method of their fixation. For each genus and species-group name, associated synonyms in the Old World are listed in a chronological order. They are written in regular lowercase letters, followed by the reference and other data as in senior taxa.

Type localities. Type localities, especially countries and islands, are usually broken down to sublocalities as states, provinces, archipelagos, ecological zones, towns, and villages. These "sublocalities" are placed in parentheses after the main locality, *e.g.,* "Egypt (Sinai)". The sublocalities may be more broken down to "smaller sublocalities". These "smaller sublocalities" are written after a colon following the sublocality, *e.g.,* "Egypt (Sinai: Wadi Firan)".

World distribution. Data onworld distribution are mainly according to Peck (1988), Shah *et al*. (2014) and (Smit *et al*. 2017). The zoogeographical realms used here are Afrotropical, Australasian, Nearctic, Neotropical, Oriental, and Palaearctic. Delimitation of the Afrotropical and Palaearcitc realms are based primarily on the

boundaries used in Crosskey (1980) and Kirk-Spriggs & Sinclair (2017). An exception is Gebel Elba, the southeastern triangle of Egypt, which is considered here as Afrotropical (El-Hawagry & Gilbert 2014; El-Hawagry 2017; El-Hawagry *et al*. 2018).

Egyptian localities and adult activity periods. The distributional data and activity periods of adult syrphid flies in the different ecological zones of Egypt are given. Localities within each ecological zone are arranged alphabetically and written after a colon following the ecological zone, *e.g.*, "Coastal Strip: Alexandria, Cleopatra, Mariout, Ramleh".

The basic sources for this part of the catalogue are data from specimens preserved in Egyptian insect collections and literature records, in addition to specimens observed or/and collected from different Egyptian localities by the authors. Efflatoun (1922, 1925, 1926), Steyskal & El-Bialy (1967) and Shaumar & Kamal (1978) are the main literature used. If the Egyptian localities or adult activity periods were not known, the term "Unknown" is used.

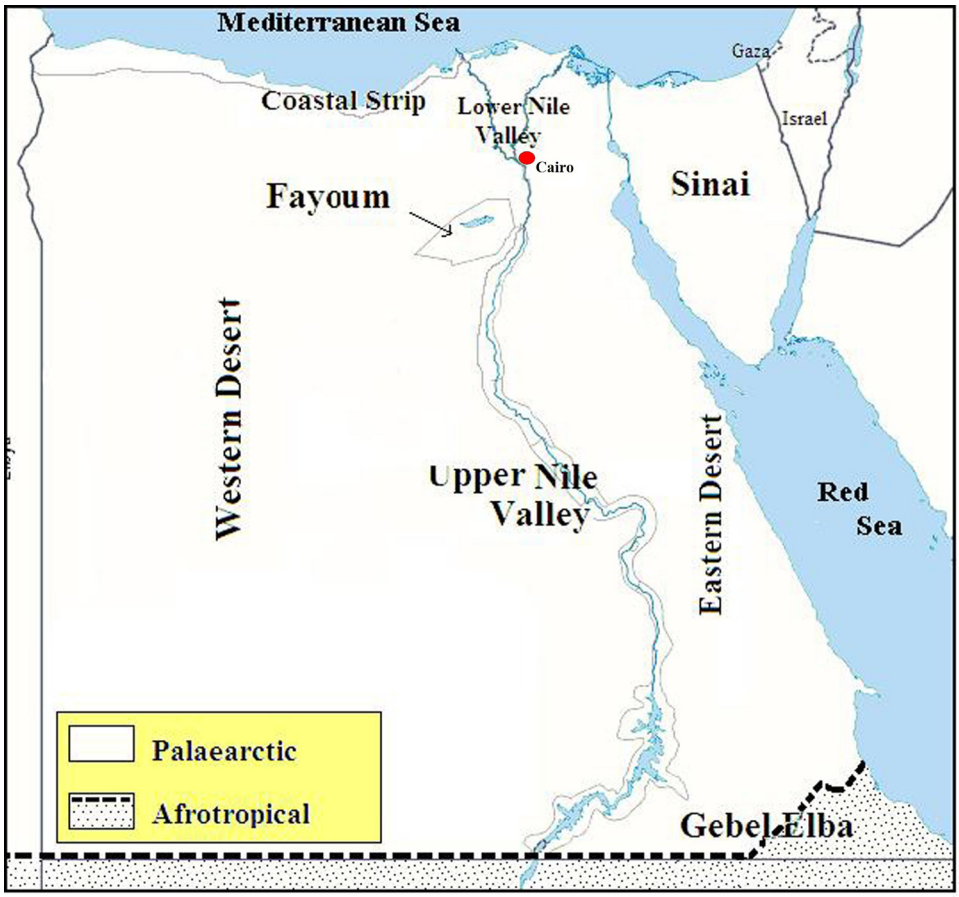

FIGURE 1. Map of Egypt showing the ecological zones (El-Hawagry & Gilbert 2014).

List of abbreviations used throughout the catalogue.

Museum abbreviations:

EFC Collection of Entomology Department, Faculty of Science, Cairo University, Egypt (Efflatoun's collection)
ESEC Collection of Entomological Society of Egypt, Cairo, Egypt
PPDD Collection of Plant Protection Research Institute, Ministry of Agriculture, Dokki, Giza, Egypt

Biogeographic Realm abbreviations:

AF Afrotropical
AU Australasian

NE	Nearctic
NT	Neotropical
OR	Oriental
PA	Palaearctic

Other abbreviations:

I.	Island
ICZN	The International Commission of Zoological Nomenclature
Is.	Islands
m	meter
Mt., Mts.	Mountain, Mountains
N.	North
nr.	near
Nw.	Northwest
S.	South
St.	Saint
UAE	United Arab Emirates
USA	United States of America
USSR	Union of Soviet Socialist Republics (1922–1991)
UK	United Kingdom
var.	variety
W.	West

Results

Catalogue of the Syrphidae of Egypt

Subfamily SYRPHINAE

Tribe BACCHINI

Genus *MELANOSTOMA* Schiner

Melanostoma Schiner, 1860: 213. Type species: *Musca mellina* Linnaeus, 1758, by original designation.

Melanostoma mellinum (Linnaeus, 1758)

Musca mellinum Linnaeus, 1758: 594. Type locality: Sweden (Svecia).
Musca facultas Harris, 1780: 109. Type locality: England.
Syrphus concolor Walker, 1851: 296. Type locality: England.

World distribution: NE: North America from Alaska to Quebec and south to Washington. PA: Afghanistan, Canary Is., ?Egypt, Europe (from Iceland and Fennoscandia south to Iberia and the Mediterranean), Iran, Israel, Japan, Madeira, Mongolia, North Africa , Russia.

Egyptian localities: Unknown.

Activity period in Egypt: Unknown.

Remarks: This is an old record from Egypt by Dirickx (1994), but no such record was listed by Peck (1988) and we are unaware of any such record. On the other hand, the species has been recorded from every other North African country including Libya.

Melanostoma scalare (Fabricius, 1794)

Syrphus scalaris Fabricius, 1794: 308: 308. Type locality: Germany.
Melanostoma ceylonense Meijere, 1911: 348. Type locality: Sri Lanka.
Syrphus gracilis Meigen, 1822: 328. Type locality: Germany.
Syrphus maculosus Meigen, 1822: 330. Type locality: Germany.

Material examined: 2 females, Wadi Itlah (Sinai: St. Katherine), 22 & 23. IV.2012, leg. Norfolk [unpublished thesis of Norfolk (2015)].

World distribution: AF: The eastern part south to Zimbabwe. AU: New Guinea. NE: Canada. OR: Sri Lanka. PA: Widespread.

Egyptian localities: Sinai: St. Katherine (Wadi Itlah) [foraging on *Ochradenus baccatus* and *Eruca sativa*].

Activity period in Egypt: April.

Tribe SYRPHINI

Genus *ALLOBACCHA* Curran

Allobaccha Curran, 1928: 251. Type species: *Baccha rubella* Wulp, 1898, by original designation.
Ptileuria Enderlein,1938: 235. Type species: *Baccha picta* Wiedemann, 1830, by original designation.

Subgenus *ALLOBACCHA* Curran

Allobaccha (*Allobaccha*) *sapphirina* (Wiedemann, 1830)

Baccha sapphirina Wiedemann, 1830: 96. Type locality: East Indies ["Ostindien"].
Baccha flavicornis Loew,1863: 15. Type locality: South Africa.
Baccha punctum Bigot, 1884: 332. Type locality: Senegal.
Pseudodoros psyllidivora Séguy, 1953: 47. Type locality: Ivory Coast.

Material examined: 1 male, Wadi Edeib, G. Elba, 23.1.1929, leg. Efflatoun; 5 males, Wadi Edeib, G. Elba, 23.1.1929, leg. H.C.E. & M.T. [EFC].

World distribution: AF: Widespread, Egypt [as Gebel Elba]. AU: New Guinea. OR: Taiwan.

Egyptian localities: Gebel Elba: Wadi Edeib [as *Baccha sapphirina* in Shaumar & Kamal (1978)].

Activity period in Egypt: January.

Genus *ASARKINA* Macquart

Asarkina Macquart, 1842: 137. Type species: *Scaeva rostrata* Wiedemann, 1824, by monotypy.
Asarcina Agassiz, 1846: 35, unjustified emendation of *Asarkina*.
Ancylosyrphus Bigot, 1882: 78. Type species: *Syrphus salviae* Fabricius, 1794, by original designation.

Subgenus *ASARKINA* Macquart

Asarkina (*Asarkina*) *africana* (Bezzi, 1908)

Asarcina ericetorum var. *africana* Bezzi, 1908: 500. Type localities: Dijbouti & Zaire ["Moschi, Fl. Rau., Mto-ja-Kifaru" & "Obock et Lukungu"].

Material examined: 1 male, Wadi Edeib, 25.11.1929, leg. Efflatoun (specimen published in Shaumar & Kamal (1978)); 2 males, Gebel Elba, I.1933, leg. H.C.E. & M.T. [EFC].

World distribution: AF: Widespread, Egypt [as Gebel Elba]. PA: Egypt.

Egyptian localities: Eastern Desert: Qantara. Gebel Elba: Wadi Edeib. Western Desert: Siwa Oasis [Sources: Shaumar & Kamal (1978) and the examined museum material].

Activity period in Egypt: January & September.

Genus *BETASYRPHUS* Matsumura

Betasyrphus Matsumura *in* Matsumura & Adachi, 1917: 143. Type species: *Syrphus serarius* Wiedemann, 1830, by original designation.

Betasyrphus adligatus (Wiedemann, 1824)

Syrphus adligatus Wiedemann, 1824: 35. Type locality: South Africa (Cape: Cape of Good Hope).
Syrphus adligatus var. *melas* Bezzi, 1915a: 33. Type locality: Kenya.

World distribution: AF: Egypt [as Gebel Elba], Ethiopia, Kenya, Mauritania, South Africa, Tanzania, Yemen.

Egyptian localities: Gebel Elba: Wadi Edeib [as *Syrphus adligatus* in Shaumar & Kamal (1978)].

Activity period in Egypt: January.

Genus *CHRYSOTOXUM* Meigen

Chrysotoxum Meigen, 1803: 275. Type species: *Musca bicincta* Linnaeus, 1758, by subsequent designation of Latreille 1810: 443.

Chrysotoxum parmense Rondani, 1845

Chrysotoxum parmense Rondani, 1845c: 198. Type locality: Italy (Parma).
Chrysotoxum holtzi Becker, 1913: 605. Type locality: Iran.

World distribution: PA: Egypt, France, Greece (including Crete), Iran, Israel, Italy, Lebanon, Spain, Transcaucasia, Turkey.

Egyptian localities: Unknown.

Activity period in Egypt: Unknown.

Remarks: This species was listed as recorded from Egypt by Steyskal & El-Bialy (1967), and mapped by Dirickx (1994), but no specimen or published record supports their assertion. It has apparently been recorded from Israel (Dirickx 1994). Sparsely vegetated, dry, unimproved grassland is a preferred environment for this species (Speight 2017).

Genus *EPISYRPHUS* Matsumura

Episyrphus Matsumura *in* Matsumura & Adachi, 1917: 134. Type species: *Episyrphus fallaciosus* Matsumura, 1917 (= *Episyrphus balteatus* De Geer, 1776), by monotypy.

Subgenus *EPISYRPHUS* Matsumura

Episyrphus (*Episyrphus*) *balteatus* (De Geer, 1776)

Musca balteata De Geer, 1776: 116. Type locality: Sweden.

Musca cannabina Scopoli, 1763: 344. Type locality: Slovenia [as "Carniola"].
Musca palustris Scopoli, 1763: 346. Type locality: Slovenia [as "Carniola"].
Musca scitule Harris, 1780:111. Type locality: England.
Musca scitulus Harris, 1780: 105. Type locality: England.
Musca alternata Schrank, 1781: 448. Type locality: not given (Austria).
Syrphus nectareus Fabricius, 1787: 341. Type locality: Denmark.
Musca elegans Villers, 1789: 464. Type locality: France.
Musca nectarina Gmelin, 1790: 2876. New name for *Syrphus nectareus* Fabricius.
Syrphus pleuralis Thomson, 1869: 497. Type locality: "China".
Syrphus andalusiacus Strobl, 1899: 145. Type locality: Spain (Algeciras).
Episyrphus fallaciosus Matsumura, 1917: pl. VI. Type locality: Japan (Honshu, Kyushu).
Episyrphus hirayamae Matsumura, 1918: 12. Type locality: Japan (Honshu: Tokyo at Komaba).
Syrphus cretensis Becker, 1921: 52. Type locality: Greece (Crete).
Syrphus balteatus var. *proximus* Abréu, 1924: 40. Type locality: Canary Is. (La Palma, en la Dehesa de la Encarnación).
Syrphus balteatus var. *signatus* Abréu, 1924: 41. Type locality: Canary Is. (La Palma).

Material examined: 1 male, Behig, 28.II.1927, leg. Tewfik; 1 male, Maadi, 3.I.1930, leg. Efflatoun; 2 females, Alexandria, Smouha, 21.II.1938, leg. Carneiri [EFC]; 1 female, Kafr Hakim, 17.II.1926; 1 male, Mersa Matrouh, 18.III.1933 [PPDD, specimens published in Shaumar & Kamal (1978)].

World distribution: AU: Australia. OR: Widespread. PA: Widespread.

Egyptian localities: Coastal Strip: Alexandria, Al-Hammam, Behig, Mariout, Mersa Matrouh. Gebel Elba: ?. Lower Nile Valley & Delta: Abu-Rawash, El-Marg, Giza, Kafr Hakim, Kombira, Maadi, Shubra. Sinai: Ein Gedeirat [Sources: as *Syrphus balteatus* in Efflatoun (1922, 1925) and Shaumar & Kamal (1978), in addition to the examined museum material].

Activity period in Egypt: Throughout the year.

Remarks: Adults highly migratory, usually fly within 2m of the ground. Males hover both singly and in groups, at up to 4–5 m. When hovering in groups the individual males maintain a space around themselves, chasing off other males which intrude into that space. They are evidently aware of each other's position however, since when one changes its orientation while hovering, all other members of the hovering group also re-orient themselves to each other. This species usually visits a wide range of white, yellow and pink flowers, from trees to low-growing plants and including nectarless flowers (Alderman 2010, 2012; Speight 2017).In Egypt, the larvae are known to feed on aphids of broad bean (*Vicia faba*) and potato (*Solanum tuberosum*) (Efflatoun 1922).

Genus *EUPEODES* Osten Sacken

Eupeodes Osten Sacken, 1877: 328. Type species: *Eupeodes volucris* Osten Sacken, 1877, by monotypy.

Subgenus *METASYRPHUS* Matsumura *in* Matsumura & Adachi

Metasyrphus Matsumura *in* Matsumura & Adachi, 1917: 147. Type species: *Syrphus corollae* Fabricius, 1794, by original designation.
Posthosyrphus Enderlein, 1938: 240. Type species: *Syrphus americanus* Wiedemann, 1830, by original designation.

Eupeodes (*Metasyrphus*) *corollae* (Fabricius, 1794)

Syrphus corollae Fabricius, 1794: 306. Type locality: Germany (Kilia [= Kiel]).
Musca vorax Geoffroy, 1785: 486. Type locality: France (Paris).
Musca pyrorum Schrank, 1803: 114. Type locality: Germany (Baiern [= Bavaria]).
Scaeva olitoria Fallén, 1817: 43. Type locality: Sweden (Svecia).
Syrphus lacerus Meigen, 1822: 301. Type locality: Austria.
Syrphus crenatus Macquart, 1829: 243. Type locality: France.
Syrphus flaviventris Macquart, 1829: 240. Type locality: France.
Syrphus fulvifrons Macquart, 1829: 240. Type locality: France.

Syrphus nigrifemoratus Macquart, 1829: 241. France.
Syrphus terminalis Wiedemann, 1830: 135. Type locality: Egypt.
Scaeva annularis Curtis, 1837: 252. England. *Nomen Nudum.*
Scaeva octomaculata Curtis, 1837: 219. Type locality: England.
Syrphus disjunctus Macquart, 1842: 148. Type locality: Algeria.
Syrphus algirus Macquart, 1849: 469. Type locality: Algeria.
Syrphus corolloides Macquart, 1850: 460. Type locality: Unknown.
Syrphus dentatus Walker, 1852: 229. Type locality: South Africa.
Syrphus cognatus Loew, 1858: 378. Type locality: South Africa (Eastern Cape [as "Caffraria"]).
Syrphus berber Bigot, 1884: 87. Type locality: Morocco.
Metasyrphus candidus Matsumura, 1918: 17. Japan (Hokkaido).
Metasyrphus libyensis Nayar, 1978: 539. Libya (Benghazi).

Material examined: 4 males & 6 females, St. Catherine, 28.VIII.1996 (El-Hawagry) on *Mentha*; 2 females, Wadi Digla, 2.V.1999 (El-Hawagry) on *Echinops*; 1 male, 3 females, Zaranik, 4.IV.2001 (El-Hawagry) [in personal collection of El-Hawagry].

World distribution: AF: Mauritius, South Africa. OR: India, Pakistan. PA: Afghanistan, Algeria, Austria, Belgium, Canary Is., China, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Iceland, Iran, Iraq, Ireland, Italy, Japan, Kazakhstan, Kyrgyzstan, Latvia, Luxembourg, Madeira, Mongolia, Morocco, Netherlands, Norway, Russia, Slovakia, South Korea, Spain, Sweden, Switzerland, Taiwan, Tunisia, Turkmenistan, Ukraine, United Kingdom, Uzbekistan.

Egyptian localities: A very common species, distributed in all Egyptian ecological zones [Sources: Efflatoun (1922), Shaumar & Kamal (1978) and the examined material collected by the first author].

Activity period in Egypt: Throughout the year.

Remarks: *E. corollae* is one of the commonest of the Egyptian Syrphids (Efflatoun 1922). It prefers grassland, dune systems and dry river beds. It is largely anthropophilic, occurring in most sorts of farmland (including arable crops), suburban gardens, orchards and parks. It settles on low-growing vegetation, and visits the margins of streams, ponds and pools to drink in hot weather. In Europe, it has been recorded on an extensive list of flowers, especially the Umbelliferae (De Buck 1990; Speight 2017).

Eupeodes (*Metasyrphus*) *nuba* (Wiedemann, 1830)

Syrphus nuba Wiedemann, 1830: 136. Type locality: Sudan (Nubia).
Syrphus interrumpens Walker, 1871: 273. Type locality: Egypt (Cairo).
Syrphus rufinasutus Bigot, 1884: 88. Type locality: Morocco.
Didea annandalei Brunetti, 1919: 299. Type locality: Iran (Seistan: Nasratabad).
Syrphus novigradensis Coe, 1960: 73. Type locality: Yugoslavia (Dalmatia [now in Croatia]).

World distribution: AF: Eastern parts of the Afrotropical Region from Eritrea and Ethiopia south to South Africa, Sudan, UAE.OR: India, Nepal. PA: Afghanistan, Armenia, Canary Is., China, Egypt, Iran, Israel, Mediterranean basin (from southern France to Italy (Sicily) and parts of the former Yugoslavia, Crete, Cyprus, Lebanon, Israel, Egypt and Morocco), Mongolia, Morocco, Romania, Switzerland, Syria, Transcaucasia and south-western parts of Asia (Uzbekistan, Kirghizstan, Tajikistan) to Afghanistan and Mongolia.

Egyptian localities: Lower Nile Valley & Delta: Cairo [Walker 1871]. ?Upper Nile Valley: ?Nuba (Shaumar & Kamal 1978).

Activity period in Egypt: April to September.

Remarks: This species usually flies round and over low-growing vegetation, settles on low-growing plants, and visits the yellow flowers of the Compositae (Speight 2017).

Genus *ISCHIODON* Sack

Ischiodon Sack, 1913: 5. Type species: *Ischiodon trochanterica* Sack, 1913 (= *Scaeva scutellaris* Fabricius, 1805), by monotypy.

Ischiodon aegyptius (Wiedemann, 1830)

Syrphus aegyptius Wiedemann, 1830: 133. Type locality: Egypt & Sudan (Nubia).
Musca nigra Forskål, 1775: xxiv. Egypt, Arabia.
Syrphus senegalensis Guérin-Méneville, 1832: pl. 99. Type locality: Senegal.
Sphaerophoria annulipes (Macquart, 1842): 163. Type locality: "Egypt".
Syrphus longicornis Macquart, 1842: 154. Type locality: South Africa.
Syrphus natalensis Macquart, 1846: 262. Type locality: South Africa (Port Natal).
Syrphus felix Walker, 1852: 229. Type locality: Canary Is.
Sphaerophoria pyrrura Bigot, 1884: 99. Type locality: Senegal.
Sphaerophoria borbonica Bigot, 1884: 100. Type locality: Réunion.
Syrphus brachypterus (Thomson, 1869): 496. Type locality: Portugal (Madeira).

Material examined: 2 females, Kirdassa, 3.IV.2002, leg. El-Hawagry; 1 male, 2 females, Gabel Elba, 15.II–31.IV.1923, leg. Tewfik, the same specimen that was published in Shaumar & Kamal (1978); 1 male, Ezbet El-Nakhl, 3.IV.1925, leg. Tewfik; 1 male Ghoubbet El-Boos, VIII. 1929, leg. H.C.E. & M.T.; 1 male, Helwan, 12.IX.1925, leg. Farag; 1 female, Wadi Um Elek, 15.10.1928, leg. Farag [EFC].

World distribution: AF: Widespread. PA: Balearic Is. Canary Is., Egypt, Iran, Madeira, S. Spain, Syria, Italy.

Egyptian localities: Coastal Strip: Alexandria, Cleopatra, El-Dekheila, Mariout. Eastern Desert: Fayed, Ismailiya, Suez Road, Wadies south east of Cairo. Gebel Elba: Wadi Edeib. Lower Nile Valley & Delta: Abu-Rawash, Behaira, Beni Sueif, Cairo, Ezbet El-Nakhl, Faraskour, Gezeirah, Giza, Helwan, Itai El-Baroud, Khanka, Kirdassa, Kombira, El-Mansouriya, Magadla, Pyramids, Shubra, Tisfa, Turah. Sinai: El-Arish, Rafah, Wadi El-Arbaein, Wadi El-Rabba. Upper Nile Valley: Aswan. Western Desert: Kharga Oasis, Siwa Oasis. [Sources: Efflatoun (1922), Shaumar & Kamal (1978) and the examined material collected by the first author].

Activity period in Egypt: Throughout the year.

Remarks: Adults fly low through sparse ground vegetation and settle on flowers of low-growing herbs (Speight 2017).

Genus *MELISCAEVA* Frey

Meliscaeva Frey, 1946: 164 (as subgenus of *Epistrophe* Walker, 1852). Type species: *Scaeva cinctella* Zetterstedt, 1843, by original designation.

Meliscaeva auricollis (Meigen, 1822)

Scaeva auricollis Meigen, 1822: 318. Type locality: Germany.
Syrphus iris Meigen, 1822: 320. Type locality: Germany.
Syrphus modestus Meigen, 1822: 323. Type locality: Austria.
Syrphus macilentus Meigen, 1838: 135. Type locality: Germany.
Scaeva maculicornis Zetterstedt, 1843: 736. Type locality: Sweden.
Syrphus nigritibius Rondani, 1857: 130. Type locality: Italy (Parma).
Scaeva cinctipes Zetterstedt, 1859: 6000. Type locality: Sweden (Scania: Lindholmen).
Syrphus fuscus Palma, 1864: 55. Type locality: Italy (Napoli: Sanseverino).
Syrphus discolor Abréu, 1924: 56. Type locality: Canary Is. (La Palma).
*Syrphus thoracicus*Abréu, 1924: 42. Type locality: Canary Is. (La Palma).

Material examined: 1 female, Mariout, El Burg, 7.VIII.1925. leg. Efflatoun (specimen published in Shaumar & Kamal (1978)) [PPDD].

World distribution: AF: Widespread. PA: Canary Is., Egypt, Europe (Fennoscandia and the Faroes Is. south to Iberia, the Mediterranean (including Cyprus, Malta and Crete); Ireland eastwards through most of Europe into European parts of Russia; Turkey), Israel, Madeira, Morocco, Syria.

Egyptian localities: Coastal Strip: El-Burg, Mariout. Lower Nile Valley & Delta: Shubra. [Sources: as *Syrphus auricollis* in Efflatoun (1922, 1925) and Shaumar & Kamal (1978)].

Activity period in Egypt: August to March.

Remarks: Adults fly around tree foliage, and males hover over tracks etc. at 2–5 m. It visits an extensive list of flowers, especially white flowers of the Umbelliferae, *Euphorbia, Filipendula, Hedera, Rubus, Salix, Sarothamnus* and *Sorbus* (De Buck 1990; Speight 2017). In Egypt, the larvae have been recorded feeding on aphids attacking rose bushes (Efflatoun 1922).

Genus *PSEUDODOROS* Becker

Pseudodoros Becker, 1903: 92. Type species: *Pseudodoros nigricollis* Becker, 1903, by monotypy.
Pseudodorus, (misspelling), Efflatoun (1926: 277).
Dioprosopa Hull, 1949a: 99. Type species: *Syrphus clavatus* Fabricius, 1794, by monotypy.

Pseudodoros nigricollis Becker, 1903

Pseudodoros nigricollis Becker, 1903: 92. Type locality: Egypt (Cairo).
Baccha extranea Bezzi, 1915b: 47. Type locality: Zimbabwe.

Material examined: 1 male, Wadi Charagid, 27.XI.1925, leg. Efflatoun (specimen published in Shaumar & Kamal (1978)); 1 male, Wadi Sayyal, 22.XI.1926, leg. Farag [EFC]; 2 males, 2 females, Wadi Sayyal, 18.I.1926, leg. Farag, specimens published in Efflatoun (1925), and Shaumar & Kamal (1978) [PPDD].

World distribution: AF: Madagascar, South Africa, UAE, Zimbabwe. PA: Cyprus, Egypt, Israel.

Egyptian localities: Coastal Strip: Mariout. Eastern Desert: Wadi Gharagid, Wadies east of Helwan. Lower Nile Valley & Delta: Abu-Rawash, Ezbet El-Nakhl, Gezeireh, Helwan, Rodah, Shubra. Western Desert: Siwa [Sources: Efflatoun (1922, 1925); Shaumar & Kamal (1978), Mengual *et al*. 2018 and the examined museum material].

Activity period in Egypt: September to March.

Remarks: *P. nigricollis* was bred from larvae at Gezeireh feeding on *Aphis pruni* (=*Hyalopterus pruni*) reed-grass (Efflatoun 1922).

Genus *SCAEVA* Fabricius

Scaeva Fabricius, 1805: 248. Type species: *Musca pyrastri* Linnaeus, 1758, by subsequent designation of Curtis, 1834: pl. 509.
Lasiopthicus Rondani, 1845: 459. Type species: *Musca pyrastri* Linnaeus, 1758, by original designation.
Catabomba Osten Sacken, 1877: 326. Type species: *Musca pyrastri* Linnaeus, 1758, by monotypy.

Subgenus *SCAEVA* Fabricius

Scaeva (*Scaeva*) *albmaculata* (Macquart 1842)

Syrphus albomaculatus Macquart, 1842: 146 (86). Type locality: Egypt (Mont Sinai) and Algeria (Alger).
Syrphus seleniticus Macquart, 1842: 304. Type locality: Germany.
Lasiophticus gemellarii Rondani, 1846: 157. Type locality: Italy (Sicily: ad montem Aetnam [= Etna]).
Lasiopticus albomaculatus var. *sulphureus* Sack*in* Visser, *et al*., 1935: 401. Type locality: China (Karakorum Mts.).
Olbiosyrphus scufinus Dzhafarova, 1974: 42. Type locality: Azerbaijan (Agdzhabedi district).

Material examined: 2 females, Wadi El-Natroun, 15.VIII.1994, leg. El-Hawagry; 1 male & 4 females, Fayoum, 17.IV.1924, leg. Efflatoun; 1 female, Fayoum, El Athar, 15.III.1947, leg. Sh. & Roman; 1 female, Helwan, 1.IV.1938, leg. Farag; 1 male, Mariout, 2.V.1921, leg. Efflatoun; 1 female, Ogret El-Sheikh, 21.II.1927, leg. Farag [EFC].

World distribution: AF: Cape Verde Is., Yemen. OR: India, Pakistan. PA: Afghanistan, Algeria, Canary Is., China, Egypt, Europe (widespread), Iran, Kuwait, Lebanon, Madeira, Mongolia, Morocco, Saudi Arabia, Tunisia.

Egyptian localities: Coastal Strip: Alexandria, Mariout. Eastern Desert: Suez Road, Wadies south east of Cairo. Fayoum: El athar, Fayoum City, Tamiya. Lower Nile Valley & Delta: Abu-Rawash, Cairo, El-Marg, El-Menofiya, Ezbet El-Nakhl, Helwan, Kirdassa, Khusous, Maadi, Quisna. Sinai: Ein Gedeirat, Mount Sinai, Wadi El-Arbaein, Wadi El-Rabba, Wadi Garagneyia. Western Desert: Kharga Oasis, Wadi El-Natroun. [Sources: Efflatoun (1922), Shaumar & Kamal (1978), the examined museum material and the examined material collected by the first author].

Activity period in Egypt: Throughout the year.

Remarks: Efflatoun (1922) caught adults of *S. albomaculata* hovering over and around *Iphiona mucronata* and *Zygophyllum coccineum* in Wadi Hoff, at and even after sunset.

Scaeva (*Scaeva*) *pyrastri* (Linnaeus, 1758)

Musca pyrastri Linnaeus, 1758: 594. Type locality: Sweden (Svecia).
Musca rosae De Geer, 1776: 108. Unjustified new name for *Musca pyrastri* Linnaeus.
Musca mellina Harris, 1780: 30. Type locality: England.
Scaeva corrusca Gravenhorst, 1807: 375. Type locality: Germany (not given).
Scaeva affinis Say, 1823: 93. Type locality: USA (Arkansas).
Scaeva unicolor Curtis, 1834: 509. Type locality: Great Britain (England: the neighborhood of London).
Syrphus pyrastri var. *flavoscutellatus* Girschner, 1884: 197. Type locality: Germany (Thüringen).

World distribution: NE: Canada, USA. OR: India, Pakistan. PA: Afghanistan, Algeria, Canary Is., China, Egypt, Europe (widespread), Madeira, Mongolia.

Egyptian localities: Eastern Desert: Wadi Rishrash [Shaumar & Kamal (1978)].

Activity period in Egypt: March.

Remarks: This is a highly mobile species, usually exploiting concentrations of aphids wherever it finds them. Adults are fast fliers, usually within 3m of the ground; they are frequently encountered flying around bushes and shrubs in a slow and purposeful manner, only to speed away after 30 seconds or so. It is to a significant extent anthropophilic, occurring in arable crops, hedgerows, orchards, gardens and conifer plantations. In Europe, it has been recorded visiting an extensive list of flowers, especially the Umbelliferae (De Buck 1990; Speight 2017). In Egypt the larvae were seen feeding ravenously on aphids (Efflatoun 1922).

Genus *SPHAEROPHORIA* Le Peletier & Serville

Sphaerophoria Le Peletier & Serville, 1828: 513 (as subgenus of *Syrphus* Fabricius, 1775). Type species: *Musca scripta* Linnaeus, 1758, by subsequent designation of Rondani, 1845a: 458.
Melithreptus Loew, 1840: 27. Unjustified new name for *Sphaerophoria* Le Peletier & Serville.
Melitrophus Haliday *in* Walker, 1856. New name for *Melithreptus* Loew, 1840, a junior homonym (preoccupied by Vieillot in Aves).
Nesosyrphus Frey, 1945: 60 (as subgenus of *Sphaerophoria* Le Peletier & Serville, 1828). Type species: *Sphaerophoria nigra* Frey, 1945, by original designation.

Subgenus *SPHAEROPHORIA* Le Peletier & Serville

Sphaerophoria (*Sphaerophoria*) *menthastri* (Linnaeus, 1758)

Musca menthastri Linnaeus, 1758: 594. Type locality: Sweden (Svecia).
Syrphus melissae Meigen, 1822: 326. Type locality: Germany (Stolberg nr. Aachen).
Syrphus pictus Meigen, 1822: 326. Type locality: Germany.

World distribution: PA: Azores Is., Canary Is., China, Egypt, Europe (widespread), Japan, Mongolia, Morocco.

Egyptian localities: Lower Nile Valley & Delta: Shubra [Sources: Shaumar & Kamal (1978)].

Activity period in Egypt: June.

Remarks: Given the huge confusion in the application of the name *menthastri*, which has been redefined on the basis of the male genitalia (Dirickx, 1994), it is best to disregard all the older records of this species pending re-examination of the specimens. Thus the status of this species in Egypt must be regarded as doubtful.

Sphaerophoria (*Sphaerophoria*) *rueppellii* (Wiedemann, 1830)

Syrphus rueppellii Wiedemann, 1830: 142. Type locality: Sudan ("Nubien").
Syrphus incertus Wiedemann, 1830: 143. Type locality: Sudan ("Nubien").
Sphaerophoria calceolata Macquart, 1842: 164. Type locality: Egypt.
Sphaerophoria flavicauda Zetterstedt, 1843: 771. Type locality: Sweden (Ostergotland).
Sphaerophoria nitidicollis Zetterstedt, 1849: 3156. Type locality: Sweden and Denmark.
Syrphus oleandri Rondani, 1857: 114. Type locality: Malta.
Sphaerophoria serpilli Rondani, 1857: 116. Type locality: Italy (Parma).
Sphaerophoria pictipes Boheman, 1864: 80. Type locality: Sweden (Malmo).
Ischiodon libycum Nayar, 1978: 413. Type locality: Libya (Almarg).

Material examined: 1 male, Wadi El Lega, 6.XI.1941, leg. Efflatoun (specimen published in Shaumar & Kamal (1978)); 2 males, 1 female, Burg, 10–14.III.1938, leg. H.C.E.; 10 males, 5 females, Fayoum, 20.IV.1945, leg. Shafik; 1 male, Ismailia, 16.V.1925, leg. Tewfik; 1female, Wadi Firan, 16.V.1934, leg. Shafik; 1 male, 3 females, Wadi Rishrash, 29.III.1933, leg. H.C.E.& M.T.; 1 male, 2 females, Wadi Sayyal, 5.IX.1926, leg. Farag; 1 female, Wadi Wirak, N. Galala, 4.IV.1937, leg. Tewfik [EFC]; 1 female, Ramleh, 18.VI.1922, leg. Efflatoun, specimen published in Shaumar & Kamal (1978) [PPDD].

World distribution: AF: Eritrea, Ethiopia, Kenya, South Yemen, Sudan. OR: India. PA: Afghanistan, Algeria, Canary Is., China, Egypt, Europe (widespread), Israel, Korea, Mongolia, Morocco, Syria.

Egyptian localities: Coastal Strip: Alexandria, Cleopatra, El-Burg, Mariout, Ramleh. Eastern Desert: Ismailia, Wadies south east of Cairo. Fayoum: Fayoum City, El-Athar, Tamiyah. Gebel Elba: ?. Lower Nile Valley & Delta: Abu-Rawash, Behaira, Cairo, El-Marg, Ezbet El-Nakhl, Giza, Helwan, Kirdassa, Kombira, Mahmoudia, El-Mansouriya, Shubra, Tura. Sinai: Abu Zneima, Ein Moussa, Wadi El-Lega, Wadi Garagnyia, Wadi Firan. Western Desert: Bahariya Oasis [Sources: Shaumar & Kamal (1978) and the examined museum material].

Activity period in Egypt: Throughout the year.

Sphaerophoria (*Sphaerophoria*) *scripta* (Linnaeus, 1758)

Musca scripta Linnaeus, 1758: 594. Type locality: Sweden (Svecia).
Musca libatrix Scopoli, 1763: 346. Type locality: Slovenia [as "Carniola"].
Musca invisito Harris, 1780: 83. Type locality: England (not given).
Sphaerophoria strigata Staeger, 1845: 362. Type locality: Greenland (not given).
Sphaerophoria scripta var. *scutellata* Portevin, 1909: 25. Type locality: France (Evreux).
Sphaerophoria menthastri var. *violacea* Santos Abréu, 1924: 71. Type locality: Canary Is.
Sphaerophoria brunettii Joseph, 1967: 243. Type locality: India (Srinagar in Kashmir).

Material examined: 1 male, El Marg, 26.III.1921, leg. Efflatoun; 1 female, Wadi Hoff, 14.IV.1921 (specimens published in Efflatoun (1922) and Shaumar & Kamal (1978)) [PPDD]; 1 male, Ezbet El-Nakhl, 12.IV.1943, leg. Shafik; 2 males, 2 females, Ein Gedeirat, 13–22.IV.1938, leg. Shafik; 3 males, 9 females, Wadi El-Lega (S. Sinai) VI–IX.1943, leg. Efflatoun [EFC].

World distribution: NE: ?. OR: India, Kashmir, Nepal. PA: Afghanistan, Algeria, Azores, Canary Is., China, Egypt, Europe (widespread), Greenland, Madera, Mongolia, Morocco, Syria, Tunisia.

Egyptian localities: Coastal Strip: Nuzha. Eastern Desert: Ghoubbet El-Bous, Wadi Hoff. Fayoum: Kom Osheem. Lower Nile Valley & Delta: Abu-Rawash, Behaira, El-Gebel El-Asfar, El-Marg, Ezbet El-Nakhl, Giza, Helwan, Kirdassa, Kombiram, Pyramids, Shubra. Sinai: Gebel Moussa, Ein Gedeirat, Wadi El-Lega. Upper Nile Valley: Isna. Western Desert: Pyramids, Siwa Oasis. [Source: Efflatoun (1922); Shaumar & Kamal (1978) and the examined museum material].

Activity period in Egypt: February to November.

Remarks: Adults fly low through grasses and settle on vegetation, including grass stems. An extensive list of flowers is recorded for visits by this species in Europe, especially white Umbelliferae, *Achillea, Cirsium, Crataegus, Erigeron, Euphorbia, Leontodon,* and *Origanum* (De Buck 1990; Speight 2017).

Tribe PARAGINI

Genus *PARAGUS* Latreille

Paragus Latreille, 1804: 194. Type species: *Syrphus bicolor* Fabricius, 1794, by monotypy.

Subgenus *PANDASYOPTHALMUS* Stuckenberg

Pandasyopthalmus Stuckenberg, 1954a: 100. Type species: *Paragus longiventris* Loew, 1858, by original designation (proposed as a subgenus of *Paragus*).
Pandasyophthalmus, (misspelling), Peck (1988: 78).

Paragus (*Pandasyopthalmus*) *haemorrhous* Meigen, 1822

Paragus haemorrhous Meigen, 1822: 182. Type locality: Austria & France.
Paragus sigillatus Curtis, 1836: 593. Type locality: England (Darent).
Paragus trianguliferus Zetterstedt, 1838: 3. Type locality: Sweden (Novacculum Umenaes).
Paragus substitutus Loew, 1858: 376. Type locality: South Africa (Eastern Cape [as "Caffraria"]).
Paragus tamagawanus Matsumura, 1916: 9. Japan (Honshu: Tamagawa).
Paragus pallipes Matsumura, 1916: 11. Type localities: Russia (Sakhalin) & Japan (Honshu: Tokyo, Towada).
Paragus ogasawarae Matsumura, 1916: 13. Type localities: Japan (Honshu: Iwate).
Paragus coreanus Shiraki, 1930: 250. Type localities: Korea (Koryo, Kongo, Shakuoji).

Material examined: 1 male, Wadi El Zohleiga, 2.V.1925, leg. Efflatoun (specimen published in Shaumar & Kamal (1978)) [EFC]; 1 female, Kafr Hakim, 10.VI.1924, leg. Efflatoun (specimen published in Shaumar & Kamal (1978)) [PPDD].

World distribution: AF: Widespread. NE: N America from the Yukon south to Costa Rica. PA: Afghanistan, Egypt, Europe (Widespread), Israel, Japan, Korea.

Egyptian localities: Coastal Strip: Mariout. Eastern Desert: Suez Road, Wadi Hoff, Wadi Ibtadi, Wadi Rishrash, Wadi Zohleiga. Lower Nile Valley & Delta: Abu-Rawash, El-Mansoura, Ezbet El-Nakhl, Kafr Hakim, Kirdassa, Shubra. [Source: Shaumar & Kamal (1978)].

Activity period in Egypt: March to October.

Remarks: Adults fly low through ground vegetation, with a darting, erratic and weaving flight. Males usually hover close to the ground or close to the foliage of low-growing plants and settles on foliage or the ground. In Europe, this species usually visits the flowers of the Umbelliferae, *Matricaria, Origanum, Polygonum, Potentilla, Solidago* and *Stellaria* (De Buck 1990; Speight 2017).

Paragus (*Pandasyopthalmus*) *tibialis* (Fallén, 1817)

Pipiza tibialis Fallén, 1817: 60. Type locality: Sweden (Vestrogothia).
Paragus zonatus Meigen, 1822: 177. Type locality: Germany (Herzogthum Mts.).
Paragus aeneus Meigen, 1822: 183. Type locality: France.
Paragus obscurus Meigen, 1822: 183. Type locality: France.
Paragus femoratus Meigen, 1822: 184. Type locality: Austria.
Ascia analis Macquart, 1839: 109. Type locality: Canary. Is.
Paragus dispar Schummel, 1841: 163. Type locality: Poland (Lissa, near Wroclaw).
Paragus numidia Macquart, 1849: 471. Type locality: Algeria.
Paragus mundus Wollaston, 1858: 115. Type locality: Portugal (Madeira: Porto Santo).

Orthonevra varipes Bigot, 1880: 150. Type locality: Iran (Northern Iran).
Paragus tibialis var. *meridionalis* Becker, 1921: 4. Type locality: Russia (Krasnoarmeisk, nr. Volgograd).
Paragus mongolicus Kanervo, 1938a: 149. Type locality: Mognolia.

Material examined: 1 female, El-Burg, 8.VII.1934, leg. Efflatoun; 1 male, 1 female, Wadi El-Rabba, Sinai, 26.IV.1946, leg. Efflatoun, specimens published in Shaumar & Kamal (1978); 1 male, Amria, 1.VI.1924, leg. Efflatoun; 1 male, Bir El-Fahm, 26.III.1930, leg. H.C.E. & M.T.; 1 female, Helwan, 28.I.1935, leg. Farag; 1 male, Wadi Hoff, 18.II.1927, leg. Farag [EFC].

World distribution: AF: Namibia, South Africa. NE: Canada, USA. OR: India. PA: Afghanistan, Algeria, British Isles, Canary Is., China, Egypt, Estonia, Finland, Germany, Greece, Iran, Italy, Japan, Kazakhstan, Korea, Lithuania, Madeira, Mongolia, Norway, Poland, Portugal, Spain, Sweden, Tunisia.

Egyptian localities: Coastal Strip: Amria, El-Burg, Mariout, Mersa Matrouh. Eastern Desert: Bir El-Fahm, Ogret El-Sheikh, Suez, Wadi Digla, Wadi Garawi, Wadi Hoff, Wadi Rishrash, Wadi Um Elek, Wadi Zohleiga. Lower Nile Valley & Delta: Abu-Rawash, El-Mansoura, El-Mansouriya, Ezbet El-Nakhl, Helwan, Kafr El-Dems, Kafr Hakim, Kirdassa, Kombira. Sinai: Wadi Gedeirat, Wadi El-Rabba. [Sources: Efflatoun (1922), Shaumar & Kamal (1978) and the examined museum material]

Activity period in Egypt: Throughout the year.

Remarks: This species flies rapidly, zigzagging in and out of low-growing plants in open grassland and heathland, and beside tracks in open woodland. It also visits flowers in these situations, especially flowers of *Potentilla* and *Salix* (Speight 2017).

Subgenus *PARAGUS* Latreille

Paragus (*Paragus*) *azureus* Hull, 1949

Paragus azureus Hull, 1949: 729. Type locality: Yemen (Socotra).
Paragus azureus scrupeus Stuckenberg, 1954b: 406. Type locality: Yemen (South Yemen).

World distribution: AF: Yemen. PA: Egypt (Peck 1988), Israel.

Material examined: 1 male, Wadi Rashid, 24.V.1919, leg. Efflatoun (specimen published in Efflatoun (1922)); 4 males, 2 females, Wadi Edeib, Gebel Elba, 23.I.1929, leg. Efflatoun; 11 males, 3 females, Wadi Edeib, 26.II–7.III.1938, leg. Tewfik; 1 male, Wadi Rishrash, 24.V.1919, leg. Efflatoun [EFC].

Egyptian localities: Eastern Desert: Wadi Askhar, Wadi Geniva, Wadi Hoff, Wadi Rashid, Wadi Rishrash, Wadi Shabek, Wadi Um Girfan. Gebel Elba: Wadi Edeib, Wadi Ehameib [Sources: Efflatoun (1925) and Shaumar & Kamal (1978) (under the name *P. serratus*) and the examined museum material].

Activity period in Egypt: January to May.

Remarks: According to Stuckenberg (1954), the specimens recorded in Egypt by Efflatoun (1925) under the name *Paragus serratus* are actually this species, and all Egyptian records should probably be assigned likewise. *Paragus serratus* is not a North African species at all.

Paragus (*Paragus*) *bicolor* (Fabricius, 1794)

Syrphus bicolor Fabricius, 1794: 297. Type locality: Barbariae [= Nw. Africa].
Musca cruentatus Geoffroy, 1785: 462. Type locality: France (Paris).
Paragus arcuatus Meigen, 1822: 179. Type locality: France (Provence).
Paragus taeniatus Meigen, 1822: 179. Type locality: France (Southern France).
Paragus ater Meigen, 1822: 182. Type locality: France (Carpentras).
Paragus testaceus Meigen, 1822: 180. Type locality: Austria & France (Southern France).
Paragus ruficauda Zetterstedt, 1843: 852. Type locality: Sweden (Scania: Esperöd).
Paragus tacchettii Rondani, 1865: 140. Type locality: Italy (Brescia).

World distribution: AF: Namibia, South Africa. NE: Canada, USA. OR: India (Jammu & Kashmir), Pakistan. PA:

Afghanistan, Algeria, China, Egypt, Europe (from southern Sweden and Denmark south to the Mediterranean, from France eastwards through central and southern Europe), Iran, Tajikistan, Turkmenistan, Mongolia, Morocco, Tunisia.

Egyptian localities: Eastern Desert: Wadi Um Elek [Shaumar & Kamal (1978)].

Activity period in Egypt: June.

Remarks: Adults fly low among ground vegetation and settle on either bare ground or low plants. The flowers visited include: *Euphorbia, Herniaria glabra, Potentilla* and *Solidago* (Speight 2017). Gomes (1981) reared this species from among aphids on *Rumex* in Portugal.

Paragus (*Paragus*) *compeditus* Wiedemann, 1830

Paragus compeditus Wiedemann, 1830: 89. Type locality: Egypt.
Paragus aegyptius Macquart, 1850: 464. Type locality: Egypt.
Paragus nitidissimus Costa, 1878: 15. Type locality: Egypt (Rodha [as "Rhoda"]).

Material examined: 1 male, Siwa Oasis, 2.VIII.1927, leg. Tewfik; 1 male, Ghoubbet El Bous, 26.VI.1929, leg. H.C.E. & M.T. (both specimens published in Shaumar & Kamal (1978)); 1 male, 1 female, Helwan, 3.IV.1934, leg. Farag; 1 female, Wadi Hoff, 4.IV.1930, leg. Farag; 1 female, Wadi Morrah, 23.V.1927, leg. Farag [EFC].

World distribution: AF: Ethiopia, Madagascar, Namibia, Oman, South Africa, UAE. PA: Afghanistan, Armenia, Asiatic Russia, Azerbaijan, China, Crimea, Cyprus, Egypt, Georgia, Iran, Italy, Kazakhstan, Kyrgyzstan, Saudi Arabia, Tajikistan, Turkey, Ukraine, Uzbekistan.

Egyptian localities: Coastal Strip: Alexandria, Cleopatra, Mariout. Eastern Desert: Abu El-Nesour, Ghoubbet El-Bous, Wadi Dar El-Maskhara, Wadi Hoff, Wadi Morrah, Wadi Rishrash. Fayoum: El-Fayoum City, Kom Osheem. Lower Nile Valley & Delta: Abu-Rawash, Borgash, El-Beharia, El-Gabel El-Asfar, El-Marg, Giza, Faraskour, Helwan, Kirdassa, Kombira, Kubba, Maadi, Pyramids, Rhoda (as *nitidissimus* Costa). Upper Nile Valley: Aswan, Isna. Western Desert: Siwa Oasis. [Sources: as *P. aegyptius* in both of Efflatoun (1922) and Shaumar & Kamal (1978), in addition to the examined museum material].

Activity period in Egypt: Throughout the year.

Remarks: Adults of *P. compeditus* fly among vegetation in humid situations (Speight 2017). This species is common and equally abundant throughout the whole length of the Nile Valley, from Aswan down to the Mediterranean Coast as well as in the desert. Its larvae are recorded feeding on aphids in Egypt (Efflatoun 1922).

Paragus (*Paragus*) *strigatus* (Meigen, 1822)

Paragus strigatus Meigen, 1822: 180. Type locality: France ("Carpentras").
Paragus bimaculatus Wiedemann, 1824: 33. Type locality: Morocco (Essaouira).
Paragus algirus Macquart, 1849: 471. Type locality: Algeria ("Environs de Constantine").

World distribution: PA: Algeria, Czech Republic, Egypt, France, Italy, Kyrgyzstan, Mongolia, Morocco, Portugal, Spain, Romania, Tajikistan, former Yugoslavia.

Egyptian localities: Unknown.

Activity period in Egypt: Unknown.

Remarks: This species was listed as recorded from Egypt by Steyskal & El-Bialy (1967) and Dirickx (1994), but no specimens have been found. On distributional grounds, it certainly could occur in Egypt. It usually flies among and through tall ground vegetation (Speight 2017), and visits flowers of the Umbelliferae (Carles-Tolrá, 2006).

Subfamily ERISTALINAE

Tribe CERIOIDINI

Genus *CERIANA* Rafinesque

Ceria Fabricius, 1794: 277. Type species: *Ceria clavicornis* Fabricius, 1794 (= *Musca conopsoides* Linnaeus, 1758), by subsequent designation of Weber, 1795: 161, a junior primary homonym (preoccupied by Scopoli, 1763 in Scatopsidae, Diptera).
Cina Fabricius, 1798: 557. Type species: *Ceria clavicornis* Fabricius, 1794 (= *Musca conopsoides* Linnaeus, 1758), by monotypy.
Ceriana Rafinesque, 1815: 131. New name of *Ceria* Fabricius, 1794.
Tenthredomyia Shannon, 1925: 50. Type species: *Ceriana abbreviata* Loew, 1864, by original designation.
Vespidomyia Shannon, 1925: 52. Type species: *Musca conopsoides* Linnaeus, 1758, by monotypy.
Styloceria Enderlein, 1934: 185. New name of *Ceria* Fabricius, 1794.
Styloceria Enderlein, 1936: 127. Type species: *Musca conopsoides* Linnaeus, 1758, by monotypy, a junior primary homonym (preoccupied by Enderlein, 1934 in Syrphidae).
Hisamatsumyia Shiraki, 1968: 148. Type species: *Hisamatsumyia japonica* Shiraki, 1968, by original designation.

Ceriana vespiformis (Latreille, 1804)

Ceria vespiformis Latreille, 1804: 194. Type locality: Barbaria (Nw. Africa) & Italy.
Ceria scutellata Macquart, 1842: 70. Type locality: Algeria.
Ceria intricata Saunders, 1845: 64. Type locality: Albania.

Material examined: 1 female, 14.IV.1924, leg. Efflatoun; 2 males, 2 females, I.1919, leg. Efflatoun [ESEC].

World distribution: PA: Albania, Algeria, Bosnia and Herzegovina, Croatia, Egypt, France, Germany, Greece, Israel, Italy, Malta, Montenegro, Morocco, Netherlands, Portugal, Serbia, Spain, Tunisia, Turkey.

Egyptian localities: Coastal Strip: Mex. Lower Nile Valley & Delta: Biala, Gezeireh. [Sources: Efflatoun (1922, 1925) and the examined museum material borrowed from ESEC].

Activity period in Egypt: May to August.

Remarks: Efflatoun (1925) bred this species from larvae found in the flowing sap of a diseased white mulberry (*Morus alba*) at Gezeireh. The adult flies fast through more open areas of Mediterranean scrub *vegetation* at up to 1 m from the ground, emitting a very audible, high-pitched whine; it settles on vegetation or on the bare ground surface (Speight 2017).

Tribe EUMERINI

Genus *EUMERUS* Meigen

Eumerus Meigen, 1822: 202. Type species: *Syrphus tricolor* Fabricius, 1798, by subsequent designation of Curtis, 1839: 749.
Citibaena Walker, 1856: 124. Type species: *Citibaena aurata* Walker, 1856, by monotypy.
Citibena Bigot, 1883: 225. Misspelling of *Citibaena* Walker.
Amphoterus Bezzi, 1915b: 116. Type species: *Amphoterus cribratus* Bezzi, 1915, by original designation.
Citabaena Curran, 1938: 7. Misspelling of *Citibaena* Walker.
Paragopsis Matsumura, 1916: 250. Type species: *Paragopsis griseofasciata* Matsumura, 1916, by original designation.

Eumerus amoenus Loew, 1848

Eumerus amoenus Loew, 1848a: 132. Type locality: Italy, Greece, Sicily.

Material examined: 1 female, Kom Oshem, 25.III.2001, leg. El-Hawagry [in personal collection of El-Hawagry]; 1 female, Tisfa, 31.VIII.1929, leg. H.C.E. & M.T., specimen published in Shaumar & Kamal (1978); 1 male, Burg, 7.II.1927, leg. H.C.E & M.T.; 1 female, Helwan, 12.X.1935, leg. Farag; Ismailia, 20.XI.1926, leg. Tewfik [EFC]; 2 males, 1 female, Mariout, El-Burg, 7.III.1925, leg. Efflatoun, specimens published in Shaumar & Kamal (1978) [PPDD].

World distribution: PA: Algeria, Arabian Peninsula, Armenia, Azerbaijan, Azores, Canary Is., Egypt, France, Georgia, Greece, Italy, Mongolia, Morocco, Spain, Russia, Switzerland, Tajikistan, Turkey, former Yugoslavia.

Egyptian localities: Coastal Strip: Abu-Mina, El-Burg, Mariout. Eastern Desert: Suez, Wadi Ibtadi. Fayoum: Kom Oshem. Lower Nile Valley & Delta: Abu-Rawash, Boulaq El-Dakrour, Cairo, El-Katta, El-Mansouriya, Ezbet El-Nakhl, Kafr Hakim, Kirdassa, Kombira, Maadi, Qubba, Shubra, Tisfa. Upper Nile Valley: Komombo. Western Desert: Kharga Oasis. [Sources: Efflatoun (1922), Shaumar & Kamal (1978), the examined museum material and the examined material collected by the first author].

Activity period in Egypt: Throughout the year.

Remarks: *E. amoenus* is often bred fromonion, *Allium cepa* L. (Shaumar & Kamal 1978), where it is regarded as a pest (Gendy 1978). Efflatoun (1922) stated that *E. amoenus* is the commonest species of the genus in Egypt, and may be found from October to June throughout the Nile Valley from the Mediterranean coast to Upper Egypt and in Fayoum. This species flies among low-growing vegetation at up to 1m from the ground, often in partially-shaded conditions. It uses short vegetation on the ground rather than bare soil or stones to settle on (Speight 2017).

Eumerus cistanchei Efflatoun, 1926

Eumerus cistanchei Efflatoun, 1926: 297. Type locality: Egypt (South Galala Plateau: Wadi Araba).

Material examined: 3 females, Wadi Araba, Galala (Em. 18.IV.1926 from *Cistanche lutea* Hoffmg), leg. Efflatoun; 7 males, 1 female, Wadi Digla, 5.IV.1929 (Em. X–XI.1929. from stem of *Cistanche lutea*), leg. Efflatoun [EFC].

World distribution: AF: UAE. PA: Egypt, Israel.

Egyptian localities: Eastern Desert: Galala (Wadi Araba), Wadi Digla, Wadi El-Ghoul. Sinai: Wadi Gedeirat, Wadi Tlah (St. Catherine). Western Desert: Siwa. [Sources: Efflatoun (1926) and Shaumar & Kamal (1978)].

Activity period in Egypt: February to November.

Remarks: Efflatoun (1926) bred this species from larvae infecting the stems of *Cistanche lutea* (= *phelypaea*), a parasite of *Haloxylon schweinfurthii* [= *Hammada elegans*] in Wadi Araba (South Galala Plateau).

Eumerus efflatouni Curran, 1938

Citabaena efflatouni Curran, 1938: 12. Type locality: Egypt (Ezbet El-Nakhl).
Eumerus vestitus Bezzi, 1912: 442. Type locality: Guinea-Bissau. [of Egyptian authors].

Materal examined: 2 males, 2 females, Gebel Elba, I.1930, leg. H.C.E. & M.T [EFC as *E. vestitus*].

World distribution: PA: Egypt, Israel.

Egyptian localities: Coastal Strip: Dekheila, Ibrahemiya, Mariout, Moharam Bey, Ramleh. Eastern Desert: Wadi Hoff. Fayoum: ?. Gebel Elba: ?. Lower Nile Valley & Delta: Abu-Rawash, El-Gebel El-Asfar, El-Marg, Ezbet El-Nakhl, Giza, Kirdassa, Khosous, Kombera, Maadi, Quisna, Shubra. Sinai: Ein Moussa, Moweilleh. [Sources: Curran (1938); Efflatoun (1922) and Shaumar & Kamal (1978), as *E. vestitus* in all].

Activity period in Egypt: Throughout the year.

Remarks: The presence of this species in Egypt was confirmed by Dirickx (1994), who thought that the Afrotropical *vestitus* was clearly a different species. Curran described *efflatouni* from a single male caught near Cairo, and considered all of Efflatoun's specimens of *vestitus* to be his new species. Efflatoun (1922) stated that this species (as *E. vestitus*) is a very interesting fly owing to the fact that it closely mimics the flight of Hymenoptera. It was observed flying above *Polygonum equisetiforme* at El-Marg. He observed that the adult continuously moves and vibrates its wings, it rests on the flowers for a short time and suddenly darts away and sits on the sand and then back again on the flowers, repeating this performance over and over again. The larvae are bred consistently from onions (Gendy, 1978).

Eumerus mucidus Bezzi, 1921

Eumerus mucidus Bezzi, 1921: 16. Type locality: "Tatahonina (Africa sept.?)".
Eumerus muscidus of authors.

Material examined: 2 males, 4 females, Wadi Digla, 5.IV.1929 (Emerged V–VI from stem of *Cistanche lutea*), leg. Efflatoun; 1 male, 1 female, Wadi Araba, Galala, 1.III.1926 (Em. 18.IV.1926 from *Cistanche lutea* Hoffmg), leg. H.C.M. & M.T., specimens published in Efflatoun (1926) and Shaumar & Kamal (1978) [EFC]; 2 males, 2 females, El-Beheira, 4.III.1924, leg. Efflatoun [ESEC].

World distribution: AF: ?. PA: Armenia, Egypt, Israel.

Egyptian localities: Eastern Desert: Galala (Wadi Araba), Wadi Gharba, Wadi Digla. Lower Nile Valley & Delta: Benha, El-Beheira, El-Marg, Ezbet El-Nakhl, Kirdassa, Kombera. Sinai: Ein Gedeiratm Wadi Firan. [Sources: Efflatoun (1926), Shaumar & Kamal (1978) and the examined museum material].

Activity period in Egypt: Throughout the year.

Remarks: Efflatoun (1926) bred this species from larvae infecting the stems of *Cistanche lutea* (= *phelypaea*), a parasite of *Haloxylon schweinfurthii* [= *Hammada elegans*] in Wadi Araba (South Galala Plateau).

Eumerus obliquus (Fabricius, 1805)

Milesia obliqua Fabricius, 1805: 194. Type locality: Ghana (Teshi [as "Guinea"]).
Eumerus cilitarsis Loew, 1848a: 120. Type locality: Austria.

World distribution: AF: widespread. AU: Australia. NT: Brazil (Marinoni *et al*. 2007). PA: Austria, Egypt, Italy.

Egyptian localities: Unknown.

Activity period in Egypt: Unknown.

Remarks: This species was listed as recorded from Egypt by Steyskal & El-Bialy (1967) and Peck (1988), but no specimens or published records have been found. Becker (1902) attributed specimens from northern Egypt to this species, but Bezzi (1912) declared them to be *Eumerus vestitus*, an identification subsequently used by Efflatoun (1922). It must be very doubtfully an Egyptian species. Its larvae feed on rotting vegetation of various kinds, now especially introduced *Opuntia* cactus. It has been reared from a wide range of decaying plants including cut flowers in water and fruits and vegetables (Ricarte *et al*. 2008). It flies fast and low over thinly-vegetated ground, settling on cladodes of *Opuntia*, bare ground and stones in the sun. This species also feeds and drinks from the juice of ripe, fallen fruits of *Opuntia*, which gives the fly's abdomen a bright pink appearance in lateral view, due to the colour of the *Opuntia* juice (Speight 2017).

Eumerus ornatus Meigen, 1822

Eumerus ornatus Meigen, 1822: 205. Type locality: Germany (Aachen & Stolberg).
Eumerus fumipennis Curtis, 1839: pl. 749. Type locality: England. *Nomen Nudum*.
Eumerus leucopyga Becker, 1921: 69. Type locality: France.

World distribution: PA: Europe (southern Sweden south to the Pyrenees and northern Spain; from Britain [southern England] eastwards through central and southern Europe, including Italy [and Sicily], the former Yugoslavia, Romania and Turkey, into European parts of Russia), Egypt.

Egyptian localities: Unknown.

Activity period in Egypt: Unknown.

Remarks: This species was listed as recorded from Egypt by Steyskal & El-Bialy (1967) and Peck (1988), but no specimens or published records have been found.

Genus *MERODON* Meigen

Merodon Meigen,1803: 274. Type species: *Syrphus clavipes* Fabricius, 1781, by subsequent designation of Guérin-Méneville in Bory de Saint-Vincent, 1826: 446.
Lampetia Meigen, 1800: 34. Type species: *Syrphus clavipes* Fabricius, 1781, by subsequent designation of Coquillett, 1910: 557. Suppressed by ICZN, 1963: Opinion 678: 339.

Merodon equestris (Fabricius, 1794)

Syrphus equestris Fabricius, 1794: 292. Type locality: Italy.
Syrphus flavicans Fabricius, 1794: 292. Type locality: Italy.
Eristalis narcissi Fabricius, 1805: 239. Type locality: France.
Eristalis ferrugineus Fabricius, 1805: 240. Type locality: Morocco (Essaouira).
Merodon nobilis Meigen, 1822: 353. Type locality: Type locality: Europe.
Merodon transversalis Wiedemann *in* Meigen, 1822: 354. Type locality: Germany.
Merodon validus Wiedemann *in* Meigen, 1822: 365. Type locality: Germany.
Merodon bulborum Rondani, 1845b: 256. Type locality: Italy.
Merodon tuberculatus Rondani, 1845: 256. Type locality: Italy.
Merodon equestris var. *nigrithorax* Bezzi, 1900: 89. Type locality: Italy.

World distribution: NE: from British Colombia (Canada) south to California (USA) [introduced]. PA: Egypt, Morocco, Europe (Austria, Belgium, Bulgaria, Byelorussia, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Japan, Latvia, Lithuania, Netherlands, Poland, Romania, Russia, Spain, Switzerland, UK, Ukraine, former Yugoslavia).

Egyptian localities: Eastern Desert: Wadi Hoff. Sinai: Ein Gedeirat. [Sources: Shaumar & Kamal 1978].

Activity period in Egypt: May to September.

Remarks: The original distribution of the Narcissus bulb fly has been greatly changed by its association with the worldwide bulb trade. *M. equestris* flies low, with a rapid zigzag flight, among ground vegetation, and frequently settles on bare ground. It usually visits flowers of the Umbelliferae, *Ajuga, Aster, Cirsium, Crepis, Papaver, Ranunculus, Rubus idaeus* and *Senecio* (De Buck 1990).

Tribe ERISTALINI

Subtribe ERISTALINA

Genus *ERISTALINUS* Rondani

Eristalinus Rondani, 1845a: 453 (as a subgenus of *Eristalis* Latreille). Type species: *Musca sepulchralis* Linnaeus, 1758, by subsequent monotypy in Rondani 1857: 38.

Subgenus *ERISTALODES* Mik

Eristalodes Mik, 1897: 114. Type species: *Eristalis taeniops* Wiedemann, 1818, by original designation.

Eristalinus (*Eristalodes*) *taeniops* (Wiedemann, 1818)

Eristalis taeniops Wiedemann, 1818: 42. Type locality: South Africa (Cape).
Helophilus pulchriceps Wiedemann *in* Meigen, 1822. Type locality: Portugal.
Eristalis torridus Walker, 1849: 612. Type locality: Unknown.
Eristalis secretus Walker, 1849: 620. Type locality: Unknown.
Eristalis aegyptius Walker, 1849: 621. Type locality: Egypt.
Eristalis communis Adams, 1905: 162. Type locality: Zimbabwe [as Rhodesia] (Harare).

Eristalis concinna Abréu, 1924: 109. Type locality: Canary Is. (La Palma).
Eristalis completa Abréu, 1924: 110 (as var. of *taeniops*). Type locality: Canary Is. (La Palma).

Material examined: 1 male, 2 females, Wadi Digla, 5.VIII.2001, leg. El-Hawagry; 2 females, Kom Osheem, 2.III.1999, leg. El-Hawagry; 1 male, Abu-Ghalib, 7.VI.2017, leg. El-Hawagry [in personal collection of El-Hawagry].

World distribution: AF: Eastern parts of the Afrotropical Region down to South Africa, UAE, Yemen. NE: USA (California to Florida). OR: India, Nepal, Pakistan. PA: Afghanistan, Canary Is., China, Egypt, Europe (Portugal, Spain and round the Mediterranean basin (southern France including Corsica, Italy including Sardinia and Sicily, parts of the former Yugoslavia, Albania, Romania, Cyprus, Greece (including Crete and Rhodes), Turkey), Lebanon, Iran, Israel, Libya, Morocco, Saudi Arabia, Syria, Transcaucasia, Tunisia.

Egyptian localities: Widespread in Egypt [Sources: Efflatoun (1922), Shaumar & Kamal (1978) and the examined material collected by the first author].

Activity period in Egypt: Throughout the year.

Remarks: *E. taeniops* is one of the commonest and largest of the Egyptian Syrphidae (Efflatoun 1922). Adults come to the edges of small streams to drink during hot weather. They usually visit flowers of *Eryngium, Euphorbia, Hedera, Mentha, Rubus, Senecio* and *Solidago* (Marcos-García 1985; Speight 2017). The rat-tailed larvae feed in water polluted by decaying organic matter, such as sewage treatment ponds (Mahmoud *et al*. 1999).

Subgenus *LATHYROPHTHALMUS* Mik

Lathyrophthalmus Mik, 1897: 114. Type species: *Conops aeneus* Scopoli, 1763, by original designation.
Metalloeristalis Kanervo, 1938b: 43. Type species: *Conops aeneus* Scopoli, 1763, by original designation.
Oreristalis Séguy, 1951: 16. *Nomen nudum*.

Eristalinus (*Lathyrophthalmus*) *aeneus* (Scopoli 1763)

Conops aeneus Scopoli, 1763: 356. Type locality: Slovenia (Idrija [as "circa Idriam"]).
Musca punctata Müller, 1764: 85. Type locality: Denmark (Sjaelland).
Musca leucocephala Gmelin, 1790: 2878. Type locality: Europe.
Musca ochroleuca Gmelin, 1790: 2878. Type locality: Europe.
Musca macrophthalma Preyssler, 1791: 68. Type locality: Bohemia.
Syrphus aeneus Fabricius, 1794: 302. Type locality: Germany.
Eristalis cuprovittatus Wiedemann, 1830: 190. Type locality: North America.
Eristalis taphicus Wiedemann, 1830: 191. Type locality: Egypt.
Conops stygius Newman, 1835: 313. Type locality: England.
Eristalis sincerus Harris, 1841: 409. Type locality: USA (Massachusetts).
Eristalis aenescens Macquart, 1842: 119. Type locality: Unknown.
Eristalis sincerus Walker, 1849: 611. Type locality: USA.
Eristalomyia auricalcica Rondani, 1865: 129. Type locality: Italy (Abruzzi [as "Aprutio"]).
Eristalis concolor Philippi, 1865: 743. Type locality: Chile (Valparaiso).
Lathyrophthalmus nigrolineatus Hervé-Bazin, 1923: 134 (as var. of *Lathyrophthalmus aeneus*). Type locality: Pakistan (Karachi: Maindron).

Material examined: 1 male, 1 female, Wadi Sayyal, 19.XI.1926, leg. Farag; 1 female, Abu Rawash, 15.1.1927, leg. R.M. (all published in Shaumar & Kamal (1978)); Wadi El-Maskhara, 21.II.1927, leg. Farag; 1 male, Wadi Handal, 10.I.1927, leg. Farag [EFC].

World distribution: Cosmopolitan.

Egyptian localities: Coastal Strip: Dekheila. Eastern Desert: Hurgada, Ismailia, Wadi El-Maskhara, Wadi Handal, Wadi Sayial. Lower Nile Valley & Delta: Abu-Rawash, El-Gebel El-Asfar, El-Gemmeiza, El-Marg, Gezeireh, Helwan, Kirdassa, Kombira, Pyramids. [Sources: Efflatoun (1922), Shaumar & Kamal (1978) and the examined museum material].

Activity period in Egypt: Throughout the year.

Remarks: *E. aeneus* is extremely common in Upper as well as Lower Egypt (Efflatoun 1922). It is a distinctly

anthropophilic species, preferring coastal lagoons, ponds, slow-moving rivers, streams and irrigation ditches. Adults fly very fast and low over ground-level vegetation, settling on bare ground and rocks, as well as on vegetation. They visit yellow composites and white umbellifers (De Buck 1990). The rat-tailed larvae filter bacteria from polluted water, particularly brackish water.

Eristalinus (*Lathyrophthalmus*) *aeruginosus* (Collin, 1949)

Eristalis aeruginosus Collin, 1949: 196. Type species: Egypt (Western Desert [as Libyan Desert]: Siwa Oasis, El-Khamsa [as Khamissa]).

World distribution: PA: Egypt.

Egyptian localities: Western Desert: El-Khamsa, Siwa Oasis [Collin 1949].

Activity period in Egypt: April to August.

Remarks: This species was described from Egypt in 1949, but has not been found again.

Eristalinus (*Lathyrophthalmus*) *megacephalus* (Rossi, 1794)

Syrphus megacephalus Rossi, 1794: 63. Type locality: Italy (Toscana [as "Etruria"]).
Eristalis laetus Wiedemann, 1830: 192. Type locality: China.
Eristalis fasciatus Meigen, 1835: 70. Type locality: Germany (Bavaria: Munchen region).
Eristalis fasciatus Meigen, 1838: 143. Type locality: Germany (Bavaria).
Eristalis pallinevris Macquart, 1842: 106. Type locality: India.
Eristalis fasciatus Germar, 1844: pl 23. Type locality: Turkey & southern Europe.
Eristalis quinquevittatus Macquart, 1849: 465. Type locality: Algeria.
Eristalis quinquefasciatus Schiner, 1849: 364. *Nomen nudum* [South Africa].
Eristalis ridens Walker, 1849: 610. Type locality: Albania.
Eristalis obscuritarsis Meijere, 1908: 250. Type locality: Indonesia (Java: Semarang); Malaya; Singapore; India.
Lathyrophthalmus ishigakiensis Shiraki, 1968: 177. Type locality: Japan (Ryukyu Is., Ishigaki Is.).

Material examined: 1 male, Wadi Digla, 1.II.1926, leg. Farag; 1 male, 1 female, Helwan, 2.XII.1934, leg. Shafik [EFC]; 1 male, Wadi El-Natroun, 8.VI.2017, leg. El-Hawagry [in personal collection of El-Hawagry].

World distribution: AF: Cape Verde Is., Madagascar, South Africa, UAE, Yemen. AU: Guam. OR: India, Indonesia (Java), Nepal, Singapore, Sri Lanka, Pakistan. PA: Afghanistan, Algeria, China, Egypt, Europe (southern Spain and coastal parts of Italy round the Mediterranean basin (including islands, *e.g.* Corsica, Malta, Sicily, Crete) to Turkey), Iran, Taiwan.

Egyptian localities: Widespread in Egypt [Sources: Efflatoun (1922), Shaumar & Kamal (1978), the examined museum material and the examined material collected by the first author].

Activity period in Egypt: Throughout the year.

Remarks: *E. megacephalus* is fairly common in Egypt, especially in the two autumn months September and October (Efflatoun 1922). It is a fast-flying species around tall waterside vegetation, and usually visits flowers of the genus *Solidago* (Speight 2017). The rat-tailed larvae filter bacteria from polluted water (Mahmoud *et al*. 1999). Many authors have recorded it under the name *quinquelineatus* Fabricius.

Eristalinus (*Lathyrophthalmus*) *tabanoides* (Jaennicke, 1867)

Eristalis tabanoides Jaennicke, 1867: 402. Type locality: Eritrea [as "Massaua"].
Eristalis punctifer Walker, 1871: 274. Type locality: Djibouti.

World distribution: AF: Djibouti, Eritrea, UAE. PA: Egypt, Israel, Kuwait, Saudi Arabia.

Egyptian localities: Lower Nile Valley & Delta: Cairo, Helwan [Becker (1903) and Efflatoun (1922) as *E. quinquelineatus*].

Activity period in Egypt: Unknown.

Genus *ERISTALIS* Latreille

Tubifera Meigen, 1800: 34. Type species: *Musca tenax* Linnaeus, 1758, by subsequent designation of Coquillett, 1910: 618. Suppressed by ICZN, 1963: Opinion 678: 339 [proposed without included species].
Elophilus Meigen, 1803: 274. Type species: *Musca tenax* Linnaeus, 1758, by subsequent designation of Latreille, 1810: 443.
Eristalis Latreille, 1804: 194. Type species: *Musca tenax* Linnaeus, 1758, by subsequent designation of Curtis ,1832: 432.
Cristalis, (misspelling), Wiedemann, 1828: 10.
Eristaloides Rondani, 1845a: 453. Type species: *Musca tenax* Linnaeus, 1758, by subsequent designation of Coquillett, 1910: 540).
Eristalomya Rondani, 1857: 40. Type species: Type species: *Musca tenax* Linnaeus, 1758, by original designation.
Eriops Lioy, 1864: 743. Type species: Type species: *Musca tenax* Linnaeus, 1758, by subsequent designation of Goffe, 1946: 29, a junior homonym (preoccupied by Klug, 1808 in Hymenoptera).
Eristalomyia Scudder, 1882: 127, emendation of *Eristalomya* Rondani. Unavailable, published in a non-scientific work.

Subgenus *EOSERISTALIS* Kanvero

Eristalis (*Eoseristalis*) *arbustorum* (Linnaeus, 1758)

Musca arbustorum Linnaeus, 1758: 591. Type locality: Sweden.

Material examined: 1 female, St. Katherine, Sinai, 4.VII.2012, leg. Norfolk [unpublished thesis of Norfolk (2015)].

World distribution: NE: Wisconsin to Labrador, s. to Kansas & South Carolina. OR: India. PA: Algeria, Egypt, Europe (Fennoscandia southwards; from Ireland eastwards through much of Europe into Russia and on through Siberia to the Pacific coast (Sakhalin)), Morocco, Tunisia.

Egyptian localities: Sinai: St. Catherine.

Activity period in Egypt: July.

Remarks: Norfolk (2015) found a female specimen of *Eristalis arbustorum* (L.) in St. Catherine, Sinai visiting *Achillea fragrantissima*.

Subgenus *ERISTALIS* Latreille

Eristalis (*Eristalis*) *tenax* Linnaeus, 1758

Musca tenax Linnaeus, 1758: 591. Type locality: Sweden.
Conops vulgaris Scopoli, 1763: 354. Type locality: Slovenia.
Musca porcina De Geer, 1776: 98. Unjustified new name of *tenax.*
Musca apiformis Geoffroy, 1785: 488. Type locality: Sweden.
Eristalis campestris Meigen, 1822: 387. Type locality: Germany & Austria.
Eristalis hortorum Meigen, 1822: 387. Type locality: Germany.
Eristalis sylvaticus Meigen, 1822: 388. Type locality: Austria.
Eristalis vulpinus Meigen, 1822: 388. Type locality: Austria.
Eristalis cognatus Wiedemann, 1824: 37. Type locality: India (Tranquebar).
Eristalis sinensis Wiedemann, 1824: 37. Type locality: China.
Eristalis nili Rondani, 1850: 166. Type locality: Egypt.
Eristalis columbica Macquart, 1855: 108. Type locality: Colombia.
Eristalis ventralis Thomson, 1869: 489. Type locality: China.
Eristalis tenax var. *alpinus* Strobl, 1893: 185. Type locality: Austria.
Eristalis claripes Abréu, 1924: 104. Type locality: Canary Is.

Material examined: 1 male, Arish, 6.V.1934, leg. Shafik;1 female, Ismailia, 7.IV.1926, leg. Tewfik; 1 female, Wadi Rishrash, 21.VI.1932, leg. Tewfik; [EFC].

World distribution: Cosmopolitan, known from all regions except the Antarctic.

Egyptian localities: Coastal Strip: Alexandria, Mariout. Eastern Desert: Ismailiya, Wadi Hoff, Wadi Rishrash.

Fayoum: Fayoum City, Kom Osheem. Lower Nile Valley & Delta: Cairo, El-Gebel El-Asfar, El-Marg, Embaba, Ezbet El-Nakhl, Kombira, Shubra. Sinai: El-Arish. [Sources: Efflatoun 1922, Shaumar & Kamal 1978 and the examined museum material].

Activity period in Egypt: Throughout the year.

Remarks: *E. tenax* is the most widely distributed syrphid in Egypt (Efflatoun 1922). Adults fly up to 5m from ground, spending a considerable amount of time resting on flowers and foliage, and in the evenings can be found sunning on the foliage of bushes and shrubs (Speight 2017). A wide range of flowers is visited by this species, including white, yellow, pink and blue blooms (De Buck, 1990). The rat-tailed larvae filter bacteria from water polluted by decaying organic matter, such as sewage treatment ponds (Aguilera *et al*. 1999).

Subtribe HELOPHILINA

Genus *MESEMBRIUS* Rondani

Mesembrius Rondani, 1857: 50. Type species: *Helophilus peregrines* Loew, 1846, by monotypy.
Prionotomyia Bigot, 1883: 150. Type species: *Prionotomyia tarsatus* Bigot, 1883, by monotypy.
Tityusia Hull, 1937: 118. Type species: *Tityusia regulus* Hull, 1937, by original designation.

Subgenus *MESEMBRIUS* Rondani

Mesembrius (*Mesembrius*) *capensis* (Macquart, 1842)

Helophilus capensis Macquart, 1842: 122. Type locality: South Africa.

Material examined: 1 male, Amria, 10.IV.1932, leg. Priesner; 1 female, Kerdasa, 6.II.1921, leg. Efflatoun; 1 female, Nouzha, 5.VII.1921; 1 female, Nouzha, 9.IX.1924, leg. Efflatoun [EFC].

World distribution: AF: Democratic Republic of Congo, Kenya, Malawi, Uganda. PA: Egypt, Jordan.

Egyptian localities: Coastal Strip: Alexandria, Amria, Burg El-Arab, Nuzha. Fayoum: Fayoum City. Lower Nile Valley & Delta: Cairo, El-Mahmoudiyah, El-Marg, Faraskour, Giza, Helwan, Kirdassa, Pyramids, Toukh. [Sources: Efflatoun (1922), Shaumar & Kamal (1978) and the examined museum material].

Activity period in Egypt: February to November.

Remarks: Efflatoun (1922) found *M. capensis* rather commonly in July, August and September, in wet and boggy places on the edges of El-Mahmoudiyah Canal and Salt Lakes. It seems strange that the European species *Mesembrius peregrinus* (Loew, 1846) has not been recorded anywhere in North Africa, whilst this Afrotropical species extends right up to the Nile Delta and Alexandria (and recently from Jordan). The identification of these specimens needs checking.

Genus *MYATHROPA* Rondani

Myathropa Rondani, 1845a: 453. Type species: *Musca florea* Linnaeus, 1758, by original designation.
Myiatropa, (misspelling), Verrall, 1901: 521.
Myatropa, of authors.
Myiathropa, of authors.

Myathropa florea (Linnaeus, 1758)

Musca florea Linnaeus, 1758: 591. Type locality: Sweden.
Musca ablecta Harris, 1776: 41. Type locality: England.
Musca atropos Schrank, 1776: 94. Type locality: Austria (Linz).
Helophilus bigotii Macquart, 1850: 445. Type locality: Egypt.
Helophilus nigrotarsata Schiner, 1861: 339. Type locality: Austria (Kierling).
Myiathropa florea var. f*lavofemorata* Strobl, 1902: 481. Type locality: Balkans & Austria.

Myiatropa florea var. *nigrofasciata* Becker, 1907: 250. Type locality: Algeria (Algiers).
Eristalomyia auripila Becker, 1921: 53. Type locality: USSR (Caucasia, Stavropol).
Myiatropa florea var. *nigrofemorata* Abréu, 1924: 115. Type locality: Canary Is. (La Palma).
Myiatropa florea var. *pygmaea* Abréu, 1924: 115. Type locality: Canary Is. (La Palma).
Myiatropa florea var. *varifemorata* Abréu, 1924: 115. Type locality: Canary Is. (La Palma).
Myiatropa florea var. *nigrolanata* Frey, 1945: 57. Type locality: Azores Islands (Flores, Ribeira Fazenda).

World distribution: PA: Afghanistan, Algeria, Azores, Canary Is., Egypt, Europe (from Fennoscandia south to Iberia and the Mediterranean; from Ireland eastwards through Eurasia to the Pacific coast).

Egyptian localities: Unknown.

Activity period in Egypt: Unknown.

Remarks: Only very old records appear to be known (Dirickx 1994), although the species clearly is distributed right across North Africa. Adults fly fast, usually at 2m upwards in height. Males circulate at speed, making a highly audible buzzing. Both sexes fly along the margins of streams, settling on stones at the water's edge, often in order to drink. Flowers visited include: White umbellifers, *Convolvulus, Crataegus, Chaerophyllum, Euonymus, Hedera, Rhododendron, Rubus, Solidago, Sorbus* (De Buck 1990; Speight 2017).

Tribe MILESIINI

Genus *SYRITTA* Le Peletier & Serville

Syritta Lepeletier & Serville, 1828: 808. Type species: *Musca pipiens* Linnaeus, 1758, by monotypy.
Coprina Zetterstedt, 1837: 35. Type species: *Musca pipiens* Linnaeus, 1758, by monotypy, a junior homonym (preoccupied by Robineau-Desvoidy, 1830 in Sphaeroceridae, Diptera).
Siritta Rondani, 1873: 293. Misspelling.
Austrosyritta Marnef, 1967: 268. Type species: *Austrosyritta cortesi* Marnef, 1967, by original designation (= *Syritta flaviventris* Macquart, 1842).

Syritta fasciata (Wiedemann, 1830)

Xylota fasciata Wiedemann, 1830: 103. Type locality: Sudan [as "Nubien"].
Syritta abyssinica Rondani, 1873: 282. Type locality: Eritrea (Adi-Caie).
Syritta subtilis Becker, 1903: 89. Type locality: Egypt (Luxor).

Material examined: 3 males, 4 females, Wadi El-Arbaein (St. katherina), 4–5.VIII.1938, leg. H.C.E.; 1 male, 3 females, Wadi El-Lega (S. Sinai), VI–IX.1941, leg. H.C.E. [EFC].

World distribution: AF: Aldabra, Ethiopia, Guinea-Bissau, Kenya, Namibia, South Africa, Sudan, UAE, Yemen. OR: India. PA: Egypt, Iran, Israel, Lebanon.

Egyptian localities: Coastal Strip: El-Dekheila, Ramleh. Eastern Desert: Ismailiya, Serapium, Suez. Gebel Elba: Kansisrob, Wadi Edeib. Lower Nile Valley & Delta: Abu-Rawash, Barrage, El-Gabel El-Asfar, El-Maasara, El-Marg, Ezbet El-Nakhl, Faraskour, Giza, Kirdassa, Kombira, Shubra. Sinai: Wadi El-Arbaein, Wadi El-Lega. Upper Nile Valley: Asswan, Luxor (Efflatoun 1922, Shaumar & Kamal 1978, Lyneborg & Barkemeyer 2005 and the examined museum material).

Activity period in Egypt: Throughout the year.

Remarks: Efflatoun (1922) found this species hovering above *Polygonum equisetiforme* on the edge of a banana plantation at Ramleh.

Syritta flaviventris Macquart, 1842

Syritta flaviventris Macquart, 1842: 135. Type locality: Senegal.
Syritta nigricornis Macquart, 1842: 134. Type locality: Egypt.
Syritta spinigera Loew, 1848b: 331. Type localities: Greece, Italy (Sicily) & Turkey.

Syritta albifacies Bigot, 1859: 439. Type locality: Madagascar.
Syritta aculeipes Schiner, 1868: 367. Type locality: South Africa (Cap).
Syritta spinigerella Thomson, 1869: 502. Type locality: St. Helena.
Syritta armipes Thomson, 1869: 503. Type locality: South Africa (Cap).

Material examined: 1 female, Ein Gedeirat, 13–22.IV.1938, leg. Shafik; 1male, Faraskure, 7.VII.1926, leg. Tewfik; 2 females, Fayoum, 30.IV.1943, leg. Shafik; 1 female, Geneiva, 12.X.1926, leg. Tewfik; 2 males, Helwan, 5.IX.1935, leg. Farag [EFC].

World distribution: AF: Cape Verde Is., Eastern parts of the Afrotropical Region to the southern tip of Africa, Madagascar, Mascarene Is., Mauritius, Reunion, Senegal, St. Helena, South Africa. NE: Mexico, USA (Texas). NT: Argentina, Brazil and Chile. PA: Corsica, Crete, Egypt, Europe (Portugal, Spain and round the Mediterranean from the southern coast of France to Turkey), Greece, Iran, Lebanon, Sardinia, Sicily, Syria.

Egyptian localities: It is a very common species, distributed in all Egyptian ecological zones [Sources: Shaumar & Kamal (1978) and the examined museum material].

Activity period in Egypt: Throughout the year.

Remarks: Adults fly low among sparse vegetation beside water, settling on stones or dried mud. They usually visit yellow composites (Speight 2017). It seems very strange that the extremely common and widespread species *Syritta pipiens* (L.) has been recorded from every North African country except Egypt.

Syritta latitarsata Macquart, 1842

Syritta latitarsata Macquart, 1842: 135. Type locality: Senegal.

World distribution: AF: Namibia, Senegal, UAE, Yemen. OR: Pakistan, PA: Egypt, Israel.

Egyptian localities: Eastern Desert: Fayed (Lyneborg & Barkemeyer 2005). Western Desert: Siwa (Lyneborg & Barkemeyer 2005), Wadi El-Natroun [Shaumar & Kamal 1978].

Activity period in Egypt: March to November.

Unconfirmed species records from Egypt

Asarkina (*Asarkina*) *eremophila* (Loew, 1858) [SYRPHINAE: SYRPHINI]

Asarcina eremophila Loew, 1858: 380. Type locality: Sudan (Nubia).

World distribution: AF: Democratic Republic of Congo, Ethiopia, Kenya, Sudan, Tanzania. PA: ?Egypt.

Egyptian localities: ?Upper Egypt [Loew 1858].

Activity period in Egypt: Unknown.

Remarks: Shaumar & Kamal (1978) listed *Asarcina eremophila* Loew, 1858 as recorded from Egypt based mainly on the fact that "Nubia", the type locality of the species, is a name of a region extending between Egypt and Sudan. We suppose this Afrotropical species was described from Sudan, and not from Egypt.

Syrphus latiusculus Walker, 1871 [SYRPHINAE: SYRPHINI]

Syrphus latiusculus Walker, 1871: 273. Type locality: Egypt (Sinai: Wadi Firan).

World distribution: PA: Egypt.

Egyptian localities: Sinai: Wadi Firan [Walker 1871].

Activity period in Egypt: Unknown.

Remarks: This record is based only on the original description in 1871, and no specimens have been checked thereafter. Peck (1988) listed it as a doubtful species.

Syrphus turbidus Walker, 1871 [SYRPHINAE: SYRPHINI]

Syrphus turbidus Walker, 1871: 274. Type locality: Egypt (Cairo).

World distribution: PA: Egypt.

Egyptian localities: Lower Nile Valley & Delta: Cairo [Walker 1871].

Activity period in Egypt: Unknown.

Remarks: This record is based only on the original description in 1871, and no specimens have been checked thereafter. Peck (1988) listed it as a doubtful species.

Betasyrphus hirticeps (Loew, 1858) [SYRPHINAE: SYRPHINI]

Syrphus hirticeps Loew, 1858: 378. Type locality: Sudan (Nubia).

World distribution: AF: Ethiopia, Kenya, Sudan. PA: ?Egypt.

Egyptian localities: ?Upper Egypt [Loew 1858].

Activity period in Egypt: Unknown.

Remarks: Shaumar & Kamal (1978) listed *Syrphus hirticeps* Loew, 1858 as recorded from Egypt based mainly on the fact that "Nubia", the type locality of the species, is a name of a region extending between Egypt and Sudan. However, no specimens of the species could be found in any Egyptian collection. Accordingly, we think this Afrotropical species was described from Sudan, and not from Egypt.

Orthonevra brevicornis (Loew, 1843) [ERISTALINAE: BRACHYOPINI]

Chrysogaster brevicornis Loew, 1843: 269. Type locality: Poland (Poznan).

World distribution: PA: ?Egypt (Shaumar & Kamal 1978), Europe (Southern Finland and Denmark south to northern France; from England eastwards through parts of central Europe [Netherlands, Belgium, Germany, Poland] into European parts of Russia, the Caucasus and western Siberia).

Egyptian localities: ?Bir Yakub [Shaumar & Kamal 1978].

Activity period in Egypt: March.

Remarks: Shaumar & Kamal (1978) recorded this species for the first time from Egypt based on a specimen collected from Bir Yakub in March 1918. However, we do not know any locality named as "Bir Yakub" in Egypt. It seems to be a Palestinian locality.

Eristalinus sepulchralis (Linnaeus, 1758) [ERISTALINAE: ERISTALINI]

Musca sepulchralis Linnaeus, 1758: 596. Type locality: Sweden.
Musca melanius Harris, 1776: 53. Type locality: England.
Syrphus tristis Fabricius, 1794: 303. Type locality: Germany (Kiel).
Eristalis impunctata Strobl, 1910: 106. Type locality: Austria (Radkersburg).
Eristalinus riki Violovitsh, 1957: 752. Type locality: Russia (Far East: Sakhalin).
Eristalis miki Mutin & Barkalov, 1999: 451. Misspelling of *riki* Violovitsh.

World distribution: OR: India, Pakistan. PA: Afghanistan, China, Egypt, Europe (Fennoscandia south to Iberia and the Mediterranean; from Ireland through most of Europe into Turkey and European parts of Russia; through Siberia to the Pacific coast), Israel, Japan, Jordan, Mongolia, Morocco, Syria.

Egyptian localities: Unknown.

Activity period in Egypt: Unknown.

Remarks: This species was listed as recorded from Egypt by Steyskal & El-Bialy (1967) and Peck (1988), but no specimens or published records have been found. Probably the record is a misidentification.

Eristalis horticola (De Geer, 1776) [ERISTALINAE: ERISTALINI]

Musca horticola De Geer, 1776: 140. Type locality: Sweden.

World distribution: OR: India. PA: Algeria, ?Egypt, Europe (Fennoscandia southwards; from Ireland eastwards through much of Europe into Russia and on through Siberia to the Pacific coast (Sakhalin)), Morocco, Tunisia.

Egyptian localities: Unknown.

Activity period in Egypt: Unknown.

Remarks: *Eristalis horticola* was listed as recorded from Egypt "in the literature" by Steyskal & El-Bialy (1967), repeated by Peck (1988), but no specimens or published records were found in either the Egyptian collections or in the literature listed by Steyskal & El-Bialy. We assume that the name *horticola* was a misidentification, or perhaps simply a mistake.

Eumerus barbarus (Coquebert, 1804) [ERISTALINAE: EUMERINI]

Syrphus barbarus Coquebert, 1804: 117. Type locality: Barbaria [= Nw. Africa].
Eumerus australis Meigen, 1838: 110. Type locality: Spain (Andalusia).
Eumerus iris Loew, 1848a: 118. Type locality: Italy (Sicily: Syracuse).
Eumerus truquii Rondani, 1857: 95. Type locality: Italy (Piemont).

World distribution: PA: Algeria, ?Egypt, France, Libya, Italy, Lebanon, Morocco, Portugal, Spain, Tunisia.

Egyptian localities: Unknown.

Activity period in Egypt: Unknown.

Remarks: *E. barbarus* was listed as recorded from Egypt only by Peck (1988), but the record is not confirmed.

TABLE 1. Number of syrphid taxa treated in the present catalogue of Egypt.

Family	Subfamily	Tribes	Genera	Species	Unconfirmed species
SYRPHIDAE	Syrphinae	3	14	23	4
	Eristalinae	4	8	20	4
Total	2	7	22	43	8

Discussion

Although Egypt is a very large country (one million km², 29th largest amongst the 196 countries of the world), its hoverfly fauna of only 37 confirmed species is very small (Table 2). It is even small in relation to the syrphid fauna of most other North African countries (Table 3, Supplementary material), but that is a reflection of the average rainfall: there is a good correlation between the number of recorded hoverfly species and the average rainfall (Table 3, Supplementary material). Levels of rainfall drop eastwards from Morocco in the west (346 mm per year), and there is a strong gradient in hoverfly species richness from Morocco (131 recorded species) to Egypt (37 spp). This jumps enormously for Israel because of the mesic environments of the northern parts of Israel (102 spp, 435 mm per year). Hoverflies are overwhelmingly species of mesic and wet environments (Rotheray & Gilbert 2011). Thus the low total for Egypt is perhaps to be expected because it is the driest country in the world (FAO 2012).

Only one species may be an endemic: *Eristalinus* (*Lathyrophthalmus*) *aeruginosus* (Collin 1949). This was described as very like a large *E*. (*L.*) *aeneus* but with a rusty-red abdomen, a distinctive species. Three males were caught at Khamissa and Siwa in 1935 on the Armstrong College expedition to Siwa oasis (Collin 1949), but they have never been taken since, and hence almost nothing is known about their distribution or life cycle. This again contrasts strikingly with the fauna of other North African countries, with 14 endemics recorded from Morocco (Table 3, Supplementary material), three from Algeria and two from Tunisia. Of course none of these countries has been intensively surveyed. The most recent efforts have been in Algeria, where despite a total recorded list of 76 species (plus 12 uncertain ones), Haffaressas *et al*. (2017) suggest using unpublished evidence that the total list is now 115 species. Thus a great deal remains to be done.

The listing of both North African (Table 3, Supplementary material) and Egyptian (Table 2) species is dominated by the genera *Eumerus* and *Paragus*, which are very diverse in the Mediterranean and other arid lands (Ricarte *et al*. 2018), but even in these genera the list for Egypt is relatively impoverished. Most of the *Eumerus* species where the larval habitat is known feed on the underground storage organs of plants, especially bulbs, and it is significant that the bulb flora of Egypt is very poor (see Boulos 1999–2005): the rainfall over most of the country is so low that even these species find it too difficult to survive. Presumably originally there may have been such plants in the Nile Valley and Delta, but there is no natural vegetation left after four-and-a-half thousand years of civilization there. Where they have been studied, *Paragus* species have eggs and larvae adapted to live in aphid colonies tended by ants (see Mizuno *et al*. 1997; Gilbert 2005), and ants are very characteristic of arid environments.

The other genus containing a number of species is *Eristalinus*, whose known 'rat-tailed' larvae are aquatic, living in a variety of environments but including the polluted waters associated with humans (Rotheray & Gilbert 2011). In the distant past, their distribution was perhaps more restricted, although there are permanent pools in the oases and also semi-permanent pools in some places in the deserts and mountains where long-term populations of such species can survive. *Eristalinus aeruginosus* may be confined entirely to the isolated oasis of Siwa, but in general the Eristalini are powerful fliers that are able to migrate huge distances (Gatter & Schmid 1990).

There are at least 20 species that have distributions at both ends of North Africa (Morocco and Israel) but are missing from Egypt. Some of these are Palaearctic species with wide distributions, but require reasonable rainfall to generate the habitats they require (for example, *Xylota segnis*). Others are Mediterranean species, such as *Merodon longicornis*, but again presumably rainfall determines the pattern of their distribution. The unpredictable nature of autumn, winter and spring rainfall of deserts produces flushes of annual flowers together with the flowering of perennials, and there are very often aphids and hence aphid predators associated with this vegetative growth. For example, the large flowering spikes of the parasitic plant *Cistanche phelypaea* (Orobanchaceae) are characteristic of the desert after spring rains, and often these are covered with aphids that are exploited by predatory syrphine and coccinellid larvae (F. Gilbert, pers.obs.).

There are six syrphid species (Table 2) whose presence in Egypt is possible or probable, but where specimens labeled as from Egypt are lacking in Egyptian collections, or need to be checked when in the numerous other collections worldwide where they are held. For example, *Chrysotoxum* is a genus better represented in arid environments than elsewhere, and is regularly captured in North African countries—*C. intermedium*is recorded in Algeria, for example (Haffaressas *et al*. 2017). It is entirely possible that at least one *Chrysotoxum* species would occur in Egypt.

A further six species of syrphid are probably not Egyptian (Table 2). Their names have become embedded into the various lists of Egyptian syrphids, and no-one has the evidence to eject them. They include species such as *Betasyrphus hirtipes*, listed as Egyptian on the basis of their type locality being 'Nubia', which might be Egypt, but probably is part of Sudan. *Orthonevra brevicornis* is listed as Egyptian because its type locality (Bir Yakub) was assumed to be in Egypt, but almost certainly is not (more likely somewhere in Palestine).

Finally, inevitably, there is the perennial problem of Walker names. Two are listed as Egyptian species, "*Syrphus" latiusculus* and "*Syrphus*" *turbidus*. Francis Walker was a taxonomist at the British Museum (Natural History) legendary for the damage he did to taxonomy by the huge number of brief and vague species descriptions that he published (see Evenhuis 2008). There is probably little to be gained by trying to understand to what these names refer since in many cases the types have been lost: Peck (1988) listed them as doubtful names.

The most surprising hoverfly in Egypt is the mainly Afrotropical *Pseudodoros nigricollis*, described in 1903 from a male caught in Cairo in 1898. The species is always rare, with a scattering of records in a strange distribution, a straight line down the eastern side of Africa, from Cyprus (van Eck & Makris 2016) and the Golan Heights of Syria south to the Transvaal in South Africa, together with a population in Madagascar (Kassebeer 2000). Now that the New World species of *Pseudodoros* have been separated (into the genus *Dioprosopa*), *P. nigricollis* is the only species in its genus. Recent molecular studies place *Pseudodoros* as the sister of *Ischiodon*, and these sister genera as the sister of *Simosyrphus* (Mengual *et al*. 2018). The larva seems to be specialized on the aphid *Hyalopterus pruni* on *Phragmites* reeds (van Eck & Makris 2016).

TABLE 2. List of treated syrphid species in the present catalogue of Egypt. 'Possible' means that species have become embedded into lists of Egyptian syrphids but no specimens or published records support their assertion; 'Probably not Egyptian' means that species have become embedded into lists of Egyptian syrphids based on probable misidentification or wrong assumption of type locality; 'Name not recognised' means that types have been lost and listed by authors as doubtful names.

Confirmed (*=new to Egypt)	Possible	Probably not Egyptian	Name not recognised
*Melanostoma scalare**	*Melanostoma mellinum*	*Eristalinus sepulchralis*	*"Syrphus" latiusculus*
Allobaccha sapphirina	*Chrysotoxum parmense*	*Eristalis horticola*	*"Syrphus" turbidus*
Asarkina africana	*Paragus strigatus*	*Asarkina eremophila*	
Betasyrphus adligatus	*Eumerus obliquus*	*Betasyrphus hirticeps*	
Chrysotoxum parmense	*Eumerus ornatus*	*Orthonevra brevicornis*	
Episyrphus balteatus	*Myathropa florea*	*Eumerus barbarus*	
Eupeodes corollae			
Eupeodes nuba			
Ischiodon aegyptius			
Meliscaeva auricollis			
Pseudodoros nigricollis			
Scaeva albomaculata			
Scaeva pyrastri			
Sphaerophoria rueppellii			
Sphaerophoria scripta			
Paragus haemorrhous			
Paragus tibialis			
Paragus azureus			
Paragus bicolor			
Paragus compeditus			
Ceriana vespiformis			
Eumerus amoenus			
Eumerus cistanchei			
Eumerus efflatouni			
Eumerus mucidus			
Merodon equestris			
Eristalinus taeniops			
Eristalinus aeneus			
Eristalinus aeruginosus			
Eristalinus megacephalus			
Eristalinus tabanoides			
*Eristalis arbustorum**			
Eristalis tenax			
Mesembrius capensis			
Syritta fasciata			
Syritta flaviventris			
Syritta latitarsata			

Another surprise is the Palaearctic *Melanostoma scalare* on the mountain tops of South Sinai, here recorded for the first time for Egypt. It is either a relict of cooler times, as with so many Egyptian plants (Coals *et al*. 2018),

or a colonist from the north. Its nearest recorded population is in Bulgaria (Peck 1988), but if it occupies only mountaintops further south then it is perhaps not so surprising that it has not been recorded in intermediate places. It has been recorded from Israel (Dirickx 1994), and Jordan (Waitzbauer & Katbeh-Bader 2002). Its congener *M. mellinum* is very variable morphologically, with innumerable synonyms in both Europe and North America - Vockeroth (1992: 158) found it 'notoriously difficult' and eventually decided that all were a single variable species. Recent molecular evidence suggests while *M. scalare* is distinctive, three other species can be distinguished in Northern Europe: *M. mellinum* (L.), *M. certum* Haarto & Ståhls, 2014, and *M. mellarium* (Meigen, 1822) (Haarto & Ståhls 2014). The specimens of *M. scalare*from Sinai look identical to those from Europe.

TABLE 3. The syrphid species recorded from Egypt, other North African countries and some neighbouring countries (see Supplementary material). 'Assessed' means there is no doubt about the identity of the species and the record in the country; 'endemic' means that the species occurs in this country and nowhere else in the world; 'uncertain' means that the identity of the record needs confirmation.

Country	Number of species			Mean rainfall (mm)
	Assessed	Endemic	Uncertain	
Algeria	76	3	12	89
Azores Is.	23	0	0	-
Canary Is.	37	11	0	-
Egypt	42	1	8	45
Israel	102	1	1	435
Jordan	40	0	0	111
Libya	33	0	1	56
Morocco	131	14	11	346
Madeira	31	3	0	-
Tunisia	61	2	6	207

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SUPPLEMENTARY MATERIAL. A list of syrphid species recorded from Egypt, other North African countries and some neighbouring countries. Numbers in the table refer to the following references: (1) Peck (1988); (2) Haffaressas ***et al.*** **(2017); (3) Dirickx (1994); (4) Ricarte & Marcos-García (2017); (5) Burt & Mengual (2019); (6) One or more of the following: Claussen *et al.* (1994), Jentzsch (2014), Kassebeer (1995; 1998a, b, c; 1999a, b, c; 2001; 2002), Smit *et al.* (2004), Waitzbauer & Katbeh-Bader (2002); (7) Present study.**

Species	Algeria	Azores Is.	Canary Is.	Egypt	Israel	Jordan	Libya	Madeira	Morocco	Tunisia	Other countries & Notes
Heringia adpropinquans			3, 5, 6								Endemic
Heringia heringi					3				6		
Heringia senilis					3						
Neocnemodon vitripennis					3						
Pipizella thapsiana									3, 6		Endemic
Pipizella varipes	(3?)										
Triglyphus escalerai									1, 3		Endemic
Triglyphus primus					3						
Baccha elongata		6									
Melanostoma incompletum			3, 5								Endemic
Melanostoma mellinum	1, 2, 3	6	1, 3	(3?)	3	6	3	1, 3, 6	1, 3	3	
Melanostoma scalare	2			7	3	6			3		
Melanostoma wollastoni								6			Endemic
Platycheirus albimanus		3, 6									Lebanon (Kassebeer 1998b)
Platycheirus ambiguus									6		
Platycheirus atlasi									6		Endemic
Platycheirus fulviventris					3						
Platycheirus manicatus									3, 6		
Platycheirus marokkanus									6		Endemic
Platycheirus rosarum		6									
Spazigaster ambulans					3						
Xanthandrus azorensis		1, 3, 6						6			
Xanthandrus babyssa								1, 3, 6			Endemic
Xanthandrus comtus		6							3	3	
Allobaccha sapphirina				7							Afrotropical sp
Asarkina africana				1							Afrotropical sp
Asarkina eremophila				1?							Afrotropical sp

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Species	Algeria	Azores Is.	Canary Is.	Egypt	Israel	Jordan	Libya	Madeira	Morocco	Tunisia	Other countries & Notes
Betasyrphus adligatus				1							Afrotropical sp
Betasyrphus hirticeps				1?							Afrotropical sp
Chrysotoxum bicinctum									1, 3		
Chrysotoxum intermedium	1, 2, 3	6			3				1, 3	1, 3	
Chrysotoxum parmense				(3?)	3						
Chrysotoxum triarcuatum			3, 5								Endemic
Chrysotoxum volaticum	1, 3								1, 3		
Dasysyrphus albostriatus					3				6	3	
Epistrophe eligans	6								6		
Epistrophe melanostoma	2										
Epistrophe ochrostoma	3								(3, 6?)		
Episyrphus balteatus	1, 2	1, 3, 6	1, 3, 5	1, 3	3	6	3	3, 6	3	3	
Eupeodes lapponicus									3		
Eupeodes corollae	1, 2, 3	3, 6	3, 5	1, 3	3	6	3	3, 6	1, 3	1, 3	
Eupeodes latifasciatus					3	6	3		3		
Eupeodes luniger	3		1				3	3, 6	1, 3	1, 3	
Eupeodes nuba			3	1, 3?	3			6	1, 3		
Ischiodon aegyptius			1, 3, 5	1, 3	3	6	3	1, 3, 6	3	3	Jordan
Melangyna cincta							3				
Meliscaeva auricollis	1, 2	3, 6	1, 3, 5	3	3		3	3, 6	1, 3	3	
Meliscaeva cinctella	(3?)								3		
Pseudodoros nigricollis				1, 3	3						Cyprus; Afrotropical sp
Scaeva albomaculata	1, 3, 6		1, 3, 4, 5	1, 3	3	6	3	1, 3, 6	1, 3	1, (3?)	
Scaeva dignota	1, 3				1, 3				3		
Scaeva mecogramma	2								6		
Scaeva pyrastri	1, 2, 3		1, 3, 5	1, 3	3	6	3	1, 3, 6	3	3	
Scaeva selenitica					3	6	3	3, 6	3		
Sphaerophoria nigra		3, 6						6			
Sphaerophoria philanthus		6				6					
Sphaerophoria rueppellii	1, 2, 3	6	1, 3, 5	1, 3	3		3	6	3	3	

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Species	Algeria	Azores Is.	Canary Is.	Egypt	Israel	Jordan	Libya	Madeira	Morocco	Tunisia	Other countries & Notes
Sphaerophoria scripta	2	3, 6	3, 5	3	3	6	(3?)	3, 6	3	3	
Sphaerophoria taeniata			3			6			3		
Syrphus ribesii		6	3		3				6		
Syrphus torvus								6			
Syrphus vitripennis	2				3			3, 6	3		
Xanthogramma evanescens									1, 3		Endemic
Xanthogramma laetus						6					
Xanthogramma marginale	1, 3								1, 3		
Xanthogramma pedissequum					3				3		
Paragus coadunatus	6		3					3, 6	3		
Paragus haemorrhous				1, 3	3		3		3	3	
Paragus tibialis	1, 3		1, 3, 5	1, 3	3	6	3	1	3	1, 3	
Paragus albifrons									3		
Paragus antoinettae					3						*P. bradescui* in Dirickx 1994
Paragus atlasi									3		One site only; endemic
Paragus azureus				1, 3	1, 3						Afrotropical sp
Paragus bicolor	1, 2			1	3				1, 3	1	
Paragus cinctus									3		
Paragus compeditus				1, 3	3	6				3	
Paragus flammeus									3		
Paragus hermonensis					3				3		
Paragus majoranae									3		
Paragus quadrifasciatus	2, 3				3				1, 3	3	
Paragus strigatus	1, 2, 3, 6			1, (3?)	(3?)		3		1, 3	3	
Paragus vandergooti									3		
Ceriana conopsoides									(3?)		Questioned by Kassebeer 1999h
Ceriana vespiformis	1, 2, 3			1, 3					1, 3, 6		
Eumerus afrarius	1, (?)										Perhaps = *E. micans; only a single specimen - endemic*
Eumerus ammophilus						6					

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Continued.

Species	Algeria	Azores Is.	Canary Is.	Egypt	Israel	Jordan	Libya	Madeira	Morocco	Tunisia	Other countries & Notes
Eumerus amoenus	1, 2, 3	1, 3, 6	1, 3, 5	1, 3	3	6	3		1, (3?)	3	
Eumerus barbarus	1, 3, 6			1, (3?)			3		1, 3	1, 3	
Eumerus basalis					3				3		
Eumerus caballeroi									1, 3		
Eumerus canariensis			3, 4								Endemic
Eumerus cistanchei				1, 3	3						
Eumerus clavatus										1, 3	
Eumerus compertus										1, 3	Perhaps = *E. mucidus;* endemic
Eumerus dubius			3								Endemic
Eumerus efflatouni				1, 3	3						Also Cyprus, old record in Syria
Eumerus emarginatus	1, 3										
Eumerus falsus					3						
Eumerus graecus					3						
Eumerus grandis										3	
Eumerus hispidus								6			Previously recorded as *E. pupureus* Macquart
Eumerus interruptus	1, 3										Only a single specimen - endemic
Eumerus kazanovskiae					3						
Eumerus latitarsis			3, 5								Endemic
Eumerus lunatus									1, 3		
Eumerus melotus									1, 3		Only from type locality; no males known; endemic
Eumerus micans	3										"North Africa"
Eumerus mucidus				1, 3	3						
Eumerus nivariae			3								Endemic
Eumerus nudus	1, 3, 6								3	3	
Eumerus obliquus			5	1?				6			Afrotropical sp; some doubt about this record (Dirickx 1994)
Eumerus ornatus	(3?)			1, (3?)					3		

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Species	Algeria	Azores Is.	Canary Is.	Egypt	Israel	Jordan	Libya	Madeira	Morocco	Tunisia	Other countries & Notes
Eumerus palaestinensis					3						
Eumerus pallidifrons					3	6					
Eumerus pulchellus	1, (3?)		1, 4		3				1, (3?)		
Eumerus punctifrons	1, 3				3	6			1, 3	1, 3	
Eumerus purpurariae			3								Endemic
Eumerus purpureus			3, 5								Endemic; one doubtful rec from Libya
Eumerus pusillus	1, 3				3				3	1, 3	
Eumerus richteri					3						
Eumerus rubescens						6					
Eumerus ruficornis	1, (3?)										Lebanon
Eumerus sabulonum	1, (3?)								1, (3?)		
Eumerus santosabreui			3, 5								Endemic
Eumerus sogdianus					3						
Eumerus strigatus		1, 6							1, 3	3	
Eumerus subornatus									3		Only a single specimen; endemic
Eumerus tarsalis	1, (3?)										
Eumerus terminalis			3								Perhaps = *E. pulchellus*
Merodon aberrans									(3?)		
Merodon aeneus	1, 3, 6		5		3	6			1, 3	3	
Merodon albifrons						6	3			3	
Merodon annulatus					3				(3?)		*M. distinctus* Palma 1863 in Dirickx 1994
Merodon armipes	1, (3?)				3						
Merodon arrasus	1, 3								1, 3	3	
Merodon aureus							3			3	
Merodon auripilus	1, 3, 6								1, 3		
Merodon avidus	1, (3?)				3		3		1, 3	1, 3	
Merodon biarcuatus									1, 3		
Merodon caerulescens											"North Africa" but no record in Dirickx 1994

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Species	Algeria	Azores Is.	Canary Is.	Egypt	Israel	Jordan	Libya	Madeira	Morocco	Tunisia	Other countries & Notes
Merodon calcaratus	2										
Merodon caudatus					3						Endemic
Merodon chalybeus	2										
Merodon clavipes	1, 3						3			3	
Merodon constans									3		
Merodon eques	1, 3								1, (3?)	3	
Merodon equestris				1					1, (3?)		
Merodon erivanicus					3						
Merodon escalerai									1, 3		
Merodon femoratus					3						
Merodon flaviventris					3						
Merodon funestus					3		3				
Merodon geniculatus	3				3				3		
Merodon hirsutus						6					
Merodon hirtus					3	6					
Merodon longicornis					3				3		
Merodon maroccanus									1, 3		Endemic
Merodon minutus									1, 3		
Merodon monticolus									6		
Merodon pruni	6				3	6	3		1, 3	3	
Merodon ruficornis									3		
Merodon segetum	1, 3								1, (3?)		
Merodon spicatus							3		1, 3	1, 3	
Merodon stukei										6	
Merodon submetallicus	3								3	3	*M. rufus* Meigen 1838 by Dirickx 1994
Merodon syriacus						6					
Merodon tricinctus					3				3		
Merodon trizonus	1, 3									1, 3	
Merodon trochantericus	6										

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Species	Algeria	Azores Is.	Canary Is.	Egypt	Israel	Jordan	Libya	Madeira	Morocco	Tunisia	Other countries & Notes
Platynochaetus armipes					3		1, 3				
Platynochaetus festae				1?			1, 3				Egyptian rec not mentioned by Dirickx 1994
Platynochaetus macquarti									1		Moroccan rec not found by Dirickx 1994
Platynochaetus rufus	1, 3								3	3	
Platynochaetus setosus	1, 2, 3								13	3	
Brachyopa tristis	6										Endemic
Brachyopa atlantea									6		Endemic
Brachyopa bicolor					3						
Brachyopa quadrimaculosa					3						
Brachyopa tabarkensis	6										Endemic
Cheilosia albitarsis										(3?)	
Cheilosia brunnipennis									3, 6		Recorded as *flavipes* in Dirickx 1994
Cheilosia chrysocoma					3						
Cheilosia griseiventris	1, 2								1, 3		As *C. marokkana* in Dirickx 1994
Cheilosia grossa									6		
Cheilosia laticornis	1, 2, 3				3		3				As *C. latifacies* in Dirickx (1994)
Cheilosia latifrons	6								3, 6		
Cheilosia paralobi	1, 3								3, 6		Recorded as *longula* in Dirickx 1994
Cheilosia parva									6		Endemic
Cheilosia rodgersii	1, 3, 6								3, 6		
Cheilosia rufipes					3				3, 6		Recorded as *soror* in Dirickx 1994
Cheilosia sareptana					3						
Cheilosia scutellata	2				3				3, 6		
Cheilosia sulcifrons					3						
Cheilosia variabilis									6		
Ferdinandea aurea					3						

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Species	Algeria	Azores Is.	Canary Is.	Egypt	Israel	Jordan	Libya	Madeira	Morocco	Tunisia	Other countries & Notes
Ferdinandea fumipennis	2								6	6	Formerly as *F. cuprea*
Pelecocera nigricornis			5								Endemic
Pelecocera nigrifacies			3								Endemic
Volucella inanis									3		
Volucella liquida	1, 2, 3								1, 3		
Volucella pellucens										1, (3?)	
Volucella zonaria					3	6			3	1, (3?)	
Chrysogaster basalis									3		
Chrysogaster parumplicata					3				3		
Chrysogaster solstitialis									1, 3		
Chrysogaster viduata									3		
Ighboulomyia atlasi									6		Endemic
Lejogaster tarsata					3						
Myolepta carthaginiensis										1	Endemic
Myolepta difformis	2								2	2	No North African recs in Dirickx 1994
Myolepta nigritarsis					3						
Myolepta philonis	1, 3								3	3	Four specimens only
Orthonevra elegans									3		
Orthonevra frontalis					3						
Orthonevra insignis					3						
Orthonevra longicornis	1, 3				3				1, 3		
Orthonevra schachti									3		Single male; endemic
Ripponensia splendens	1, 2, 3								1, 3	3	
Neoascia clausseni	2								6	6	
Neoascia podagrica					3			3, 6			*N. podagrica* deleted from Maghreb fauna (Kassebeer 1998b)
Psilota plumbella	1, 3									6	
Psilota toubkalana									6		Endemic
Syritta fasciata				1, 3							Afrotropical sp

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Species	Algeria	Azores Is.	Canary Is.	Egypt	Israel	Jordan	Libya	Madeira	Morocco	Tunisia	Other countries & Notes
Syritta flaviventris	1, 3			1, 3	3	6			3	3	Afrotropical sp
Syritta latitarsata				1, 3							Afrotropical sp
Syritta pipiens	1, 2, 3	3, 6	1, 3, 5		3	6	3	1, 3, 6	1, 3	3	
Anasimyia contracta									6		
Copestylum melleum			4, 5								
Eristalinus sepulchralis				1, (3?)	3	6			3	(3?)	
Eristalinus taeniops	2		3, 4, 5	1, 3	3	6	3		1, 3	3	
Eristalinus aeneus	1, 2, 3	3, 6	1, 3, 4	1, 3	3	6	3	3, 6	1, 3	1, 3	
Eristalinus aeruginosus				1, 3							Endemic
Eristalinus megacephalus	1, 3			1, 3	3	6			1, 3	3	Afrotropical sp
Eristalinus tabanoides				1, 3	3					1	Afrotropical sp; Tunisian rec not mentioned by Dirickx 1994
Eristalis arbustorum	1, 2	1, 3, 6		7	3	6		6	1, 3	3	
Eristalis horticola				1, 3?							
Eristalis nemorum							3				
Eristalis pertinax	2								3	3	*E. similis* Fallén for Algeria by Haffaressas *et al*. 2017
Eristalis pratorum	1, (3?)				3		3		1, 3	3	
Eristalis rupium			4								
Eristalis tenax	2, 3	3, 6	3, 4, 5	3	3	6	3	3, 6	3	3	"North Africa"
Helophilus trivittatus						6			3	3	
Mallota cimbiciformis									3, (6?)		"North Africa"
Mallota dusmeti									6	3	
Mesembrius capensis				1, 3		6					Afrotropical sp
Mesembrius peregrinus					3						
Myathropa florea	1, 3	3, 6	3, 4, 5	(3?)	3	6		6	3	3	
Myathropa usta								1, 3, 6			Endemic; also called mallotiformis Frey
Parhelophilus versicolor					3				3		
Brachypalpus valgus	2				1, 3				6		
Callicera fagesii					3				6		

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Species		Algeria	Azores Is.	Canary Is.	Egypt	Israel	Jordan	Libya	Madeira	Morocco	Tunisia	Other countries & Notes
Callicera rufa						3						
Milesia crabroniformis									3, 6	3		
Milesia semiluctifera						3	6					
Spilomyia maroccana		2, 6								6		
Temnostoma bombylans										1, 3		
Xylota segnis		3	1, 3, 6	1, 3, 5		3			1, 3, 6	3	3	
Pelecocera latifrons						3						
Microdon analis		(1?)										Type locality assumed to be Algeria but an error: no rec in Dirickx 1994
Totals	Assessed	76	23	37	42	102	40	33	31	131	61	
	Endemic	3	0	11	1	1	0	0	3	14	2	
	Uncertain	12	0	0	8	1	0	1	0	11	6	
Mean rainfall (mm)		89			45	435	111	56		346	207	