

Catalogue of the family Pipunculidae in Egypt (Diptera: Cyclorrhapha)

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The family Pipunculidae has a potential value for biological pest control, as most pipunculid species are endoparasitoids of the hemipteran suborder Auchenorrhyncha. In the present study, all known Egyptian taxa of the family Pipunculidae (big-headed flies) are systematically catalogued. Old World synonymies, type localities, world distributions by biogeographic realm(s) and country, Egyptian localities and dates of collection are provided. A total number of 24 species belonging to four genera and two tribes has been catalogued.

Key words: big-headed flies, Syrphoidea, distribution, Egyptian localities, dates of collection.

INTRODUCTION

This study is one in a series of planned studies (El-Hawagry 2015, 2017, 2018; El-Hawagry *et al.* 2018) on different Egyptian dipteran families aiming to catalogue the whole order in Egypt.

Pipunculidae (more than 1400 species worldwide) and Syrphidae have traditionally been considered to constitute the superfamily Syrphoidea (Pape *et al.* 2011). However, recent phylogenetic analyses of mainly molecular data have demonstrated that Syrphoidea does not form a monophyletic group, as Pipunculidae were inferred as a sister group to Schizophora (Wiegmann *et al.* 2011; Young *et al.* 2016; Pauli *et al.* 2018).

Adults of the family Pipunculidae, commonly called big-headed flies, are rather small, uniformly dark inconspicuous flies, ranging from 2 mm to 12 mm in length. They occur in all biogeographic regions, and share with syrphid flies the capability of hovering motionless among vegetation, but are less conspicuous because they are almost never seen visiting flowers. They seem to feed exclusively on honeydew, and usually move among the vegetation in search of food sources and mating partners, or for suitable hosts for their parasitic larvae (De Meyer 1996; Kehlmaier 2005).

As larvae, most Pipunculidae are endoparasitoids of the hemipteran suborder Auchenorrhyncha, including Cicadellidae, Cercopidae, Delphacidae, Membracidae, Issidae, Cixiidae, and Flatidae; however, the larvae of *Nephrocerus* are known to develop within adult Tipulidae (Koenig

& Young 2007). So, the family has a potential value for biological pest control (Jervis 1992; Skevington & Marshall 1997).

No comprehensive taxonomic or faunistic studies on the family Pipunculidae have been carried out in Egypt before. Only an outdated list was published by Steyskal & El-Bialy in 1967. They listed all Egyptian species of Diptera, including only 11 pipunculid species, based on scattered literature, but without naming their source for any particular record. The list included merely the names of species within the families without citing important taxonomic data, and there are some taxonomic errors in their list.

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

MATERIAL AND METHODS

Records of pipunculid species in the present catalogue were obtained mainly from the literature, in addition to specimens of only four pipunculid



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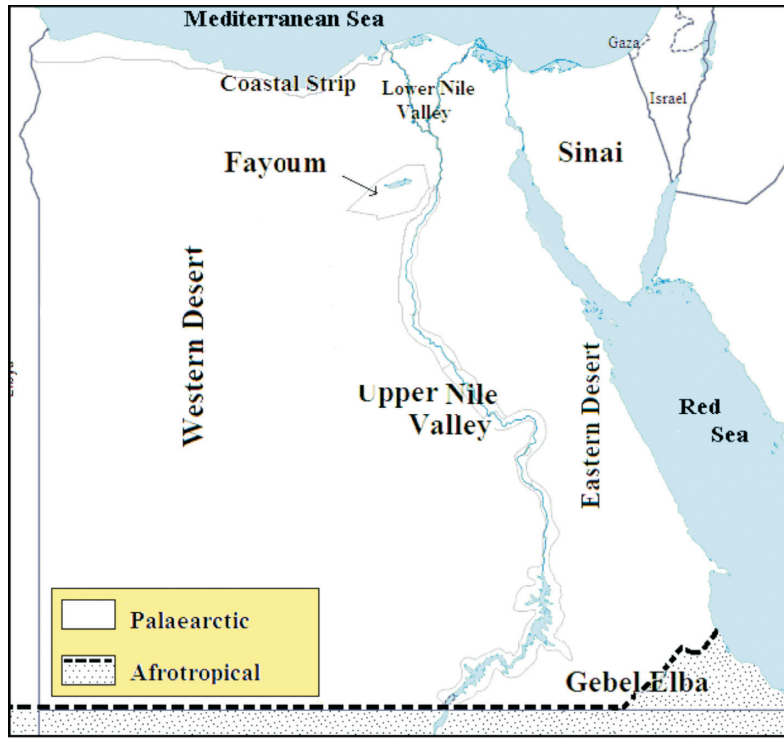


Fig. 1. Map of Egypt showing the ecological zones (El-Hawagry & Gilbert 2014).

species preserved in Efflatoun's collection, Entomology Department, Faculty of Science, Cairo University, Egypt (EFC): *Claraeola conjuncta* (Collin, 1949), *Tomosvaryella frontata* (Becker, 1897), *Tomosvaryella subvirescens* (Loew, 1872) and *Tomosvaryella disjuncta* (Becker, 1900). The identifications of these species have been checked in EFC. A great deal of information, including synonymies and distributional data was obtained from the relevant literature.

The current classification follows that used in the world catalogue of De Meyer 1996, but Skevington & Yeates (2001) and Kehlmaier (2005) were also considered for the Eudorylini.

Scope. This catalogue treats all names of taxa, whether taxonomically valid or invalid, of the family Pipunculidae recorded from Egypt.

Arrangement of taxa. All taxa are arranged alphabetically. Synonyms including all available and unavailable names are chronologically listed.

Typographical treatment of names. Family-group names are left-justified and in capital letters. Genus-group names are left-justified and in uppercase bold italics. Species-group names are left-justified and in bold italics (all but the first

letter in lowercase). Authorities of genera, subgenera and species are in lowercase except the normal first letter in capitals. Taxonomically valid genus-group names (senior synonyms) are listed again in lowercase bold italics except the normal first letter in capitals, and left-justified under the headings, followed (in regular font) by reference to original description including author, year and pages. Taxonomically valid species-group names combined with their original genera (senior synonyms) are left-justified and in capitalised regular italics under the headings, followed by reference to the 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 given in capitalised regular italics, followed by the reference and other data as in senior taxa.

Type localities. Countries and islands of type localities are usually broken down to sublocalities as states, provinces, archipelagos, ecological zones, towns and villages. These 'sublocalities' are placed

in brackets after the main locality, e.g. 'Egypt (Sinai)'. The sublocalities may be further broken down to 'smaller sublocalities'. These 'smaller sublocalities' are written after a colon following the sublocality, e.g. 'Egypt (Sinai: Ofira)'.

Egyptian localities and dates of collection. The Egyptian localities and dates of collection provide a picture of the distribution and activity periods of pipunculid flies in the different ecological zones of Egypt. Localities within each ecological zone are arranged alphabetically and written after a colon following the ecological zone, e.g. 'Sinai: Dahab, Sharm El-Sheikh, St. Catherine, Wadi Kid'.

Data from specimens preserved in EFC and literature records, especially De Meyer (1995, 1996) and Kehlmaier (2005) are the main literature used. If the Egyptian localities or dates of collection are not known, the term 'Unknown' is used.

List of abbreviations used in the catalogue:

EFC	Collection of Entomology Department, Faculty of Science, Cairo University, Egypt (Efflatoun's collection)
I., Is.	Island, Islands
ICZN	The International Commission on Zoological Nomenclature
Mt., Mts.	Mountain, Mountains
St.	Saint
U.S.A.	United States of America

Biogeographic Realm abbreviations used in the catalogue:

AF	Afrotropical
OR	Oriental
PA	Palaeartic

THE CATALOGUE

Family PIPUNCULIDAE – Big-headed flies

Subfamily PIPUNCULINAE

Tribe EUDORYLINI

Genus *CLARAEOLA* Aczél

Claraeola Aczél, 1940: 151. Type species: *Dorylas adventitius* Kertész, 1912, by original designation.

Congomyia Hardy, 1949: 7. Type species: *Congomyia nigripennis* Hardy, 1949, by original designation.

Moriparia Kozánek & Kwon, 1991: 77. Type species: *Moriparia nigripennis* Kozánek & Kwon, 1991, by original designation.

Claraeola conjuncta (Collin, 1949)

Eudorylas conjunctus Collin, 1949: 191. Type locality: Egypt (Helwan).

Distribution. PA: Algeria, Egypt, Iran, Israel, Tunisia.

Egyptian localities. Lower Nile Valley and Delta: Abu-Rawash (EFC), Helwan (Collin 1949), Kerdassa, Marg (EFC). Sinai: Qusaiyema (De Meyer 1995; as *E. pannonicus*), see Kehlmaier (2005).

Dates of collection. March to November.

Genus *CLISTOABDOMINALIS* Skevington

Clistoabdominalis Skevington in Skevington & Yeates, 2001: 435. Type species: *Pipunculus helluo* Perkins, 1905, by original designation.

Remarks. The genus *Clistoabdominalis* Skevington, 2001 was erected as a result of a phylogenetic study on the world Eudorylini (Skevington & Yeates 2001).

Clistoabdominalis nitidifrons (Becker, 1900)

Pipunculus nitidifrons Becker, 1900: 241. Type locality: Egypt (Cairo & Assiout).

Pipunculus confusoides Lamb, 1922: 412. Type locality: Seychelles (Mahé).

Dorylomorpha lini Hardy, 1972: 81. Type locality: Philippines (Palawan: Puerto Princesa).

Distribution. AF: La Réunion I., Seychelles Is. OR: India, Philippines, Taiwan, Thailand. PA: Egypt, Iran, Israel, Japan.

Egyptian localities. Lower Nile Valley and Delta: Cairo (Becker, 1900). Upper Nile Valley: Assiout (Becker, 1900).

Dates of collection. November and December.

Clistoabdominalis ruralis (Meigen, 1824)

Pipunculus ruralis Meigen, 1824: 22. Type locality: Germany (Stolberg).

Pipunculus arimosus Becker, 1900: 221. Type locality: Germany (Dresden).

Distribution. PA: Austria, Belgium, Bulgaria, Czech Republic, Egypt (De Meyer 1996), Germany, Great Britain, Hungary, Iran, Israel, Italy, Latvia, Mongolia, Netherlands, Poland, Slovakia, Switzerland, Tunisia.

Egyptian localities. Sinai: Qusaiyema (De Meyer 1995).

Dates of collection. July.

Clistoabdominalis sinaiensis (De Meyer, 1995)

Eudorylas sinaiensis De Meyer, 1995: 294. Type locality: Egypt (Sinai: Ofira).

Distribution. PA: Egypt, Iran (Kazerani & Kehlmaier 2018).

Egyptian localities. Sinai: Dahab, Ein Qsaib, Ofira (Sharm El-Sheikh), Wadi Kid. [Source for all records: De Meyer (1995)].

Dates of collection. March.

Clistoabdominalis trochanteratus (Becker, 1900)

Pipunculus trochanteratus Becker, 1900: 221.

Type locality: Egypt (Assiout, Luxor).

Distribution. AF: Sudan. AU: Australia. OR: Laos, Thailand. PA: Algeria. Egypt, Japan, Iran, Israel, Turkey (Kehlmaier & Andrade 2016).

Egyptian localities. Upper Nile Valley: Assiout, Luxor (Becker 1900).

Dates of collection. December and February.

Genus *EUDORYLAS* Aczél

Eudorylas Aczél, 1940: 151. Type species: *Pipunculus fuscipes* Zetterstedt, 1844, by subsequent designation (ruling of the ICZN 2002: 143, Opinion 2000, Case 3132).

Metadorylas Rafael, 1987: 35. Type species: *Pipunculus schreiteri* Shannon, 1927, by original designation.

Eudorylas fluviatilis (Becker, 1900)

Pipunculus fluviatilis Becker, 1900: 224. Type locality: Egypt (Assiout).

Distribution. PA: Canary Is., Egypt, Iran, Israel, Russia, Spain, Syria.

Egyptian localities. Upper Nile Valley: Assiout (Becker 1900).

Dates of collection. December.

Tribe TOMOSVARYELLINI

Genus *TOMOSVARYELLA* Aczél

Alloneura Rondani, 1856: 140. Type species: *Pipunculus flavipes* Meigen, 1824, by monotypy. Suppressed by ICZN, 1961: 230 (Opinion 597) [misidentification; = *nomen dubium*].

Tomosvaryella Aczél, 1939: 22. Type species: *Pipunculus sylvoaticus* Meigen, 1824, by original designation.

Tomosvaryella aegyptium Kuznetsov, 1994

Tomosvaryella aegyptium Kuznetsov, 1994: 110.

Type locality: Egypt (Aswan).

Distribution. PA: Egypt.

Egyptian localities. Upper Nile Valley: Aswan (Kuznetsov 1994).

Dates of collection. Unknown.

Tomosvaryella cilifemorata (Becker, 1907)

Pipunculus cilifemorata Becker, 1907: 254. Type locality: Tunisia (Tunis).

Pipunculus argyrostictus Strobl, 1909: 210. Type locality: Spain (Monistrol).

Distribution. PA: Austria, Bulgaria, Egypt, Hungary, Spain, Switzerland, Tunisia.

Egyptian localities. Unknown (see De Meyer 1995: 311, discussion of *T. nigronitida*).

Dates of collection. Unknown.

Tomosvaryella demeyeri Kuznetsov, 1993

Tomosvaryella demeyeri Kuznetsov, 1993: 157.

Type locality: Egypt (Aswan [as Assuan]).

Distribution. PA: Egypt, Iran.

Egyptian localities. Upper Nile Valley: Aswan (Kuznetsov 1993).

Dates of collection. Unknown.

Tomosvaryella dentiterebra (Collin, 1949)

Alloneura dentiterebra Collin, 1949: 187. Type locality: Egypt (Edku Salt Lake).

Distribution. PA: Egypt, Iran (Majnon-Jahromi *et al.* 2017).

Egyptian localities. Coastal Strip: Edku Lake. Fayoum: Qaroun Lake. [Source: Collin (1949)].

Dates of collection. July to September.

Tomosvaryella disjuncta (Becker, 1900)

Pipunculus disjuncta Becker, 1900: 239. Type locality: Egypt (Aswan).

Distribution. PA: Egypt, France (Withers 2006).

Egyptian localities. Upper Nile Valley: Aswan (Becker 1900).

Dates of collection. February.

Tomosvaryella docta De Meyer, 1995

Tomosvaryella docta De Meyer, 1995: 302. Type locality: Egypt (Sinai Mts., St. Catherine [as St. Katharina]).

Distribution. PA: Egypt, Iran, Israel.

Egyptian localities. Sinai: St. Catherine, Sinai Mts., Wadi El-Arbaein (De Meyer 1995).

Dates of collection. July.

Tomosvaryella freidbergi De Meyer, 1995

Tomosvaryella freidbergi De Meyer, 1995: 303.

Type locality: Syria (occupied Golan Heights, Mt. Hermon).

Distribution. PA: reaching from the Mediterranean (Spain, France, Israel, Egypt), through south-east Europe (Hungary) to Central Asia (Kazakhstan, Kyrgyz Republic) (Kehlmaier & Majnon Jahromi 2015).

Egyptian localities. Sinai: St. Catherine, Sinai Mts. (De Meyer 1995).

Dates of collection. July.

Tomosvaryella frontata (Becker, 1897)

Pipunculus frontatus Becker, 1897: 87. Type locality: Roumania (Transsylvania, Sinaja).

Pipunculus ornatipes Becker, 1908: 92. Type locality: Canary Is. (Gran Canaria).

Distribution. PA: Canary Is., Egypt (De Meyer 1996), France, Israel, Italy, Rumania, Tunisia.

Egyptian localities. Coastal Strip: Cleopatra (EFC). Lower Nile Valley and Delta: Kubba (EFC). Also listed by De Meyer (1996) but without providing locality data.

Dates of collection. August to October.

Tomosvaryella glabrum (Adams, 1905)

Pipunculus glabrum Adams, 1905: 165. Type locality: Zimbabwe (Harare).

Tomosvaryella tecta De Meyer, 1993: 91. Type locality: South Africa (Natal: Ndumu Game Reserve).

Distribution. AF: Kenya, South Africa, Zimbabwe. PA: Canary Is., Egypt, Iran, Israel, Palestine, (West Bank), Syria.

Egyptian localities. ?Silvah (exact locality not traceable) (as *T. tecta*, De Meyer 1995).

Dates of collection. November.

Tomosvaryella helwanensis (Collin, 1949)

Dorylomorpha helwanensis Collin, 1949: 189. Type locality: Egypt (Helwan).

Distribution. PA: Egypt, Israel.

Egyptian localities. Lower Nile Valley and Delta: Helwan (Collin 1949). Sinai: Azaima (De Meyer 1995).

Dates of collection. July to November.

Tomosvaryella inopinata De Meyer, 1995

Tomosvaryella inopinata De Meyer, 1995: 306. Type locality: Israel (Giv'at Koah).

Distribution. PA: Egypt, Israel.

Egyptian localities. Sinai: St. Catherine, Sinai Mts. (De Meyer 1995).

Dates of collection. July.

Tomosvaryella mutata (Becker, 1897)

Pipunculus mutatus Becker, 1897: 85. Type locality: Egypt (Upper Egypt [as 'Ober-Aeg.']).

Distribution. PA: Egypt, Hungary, ?Israel, ?Japan, Rumania, Spain, ?Syria.

Egyptian localities. Sinai: St. Catherine (De Meyer 1995). Upper Nile Valley: Assiout (Becker 1897).

Dates of collection. July to December.

Tomosvaryella nodosa De Meyer, 1995

Tomosvaryella nodosa De Meyer, 1995: 311. Type locality: Israel (Elat).

Distribution. PA: Egypt, Iran, Israel.

Egyptian localities. Sinai: Taba (De Meyer 1995).

Dates of collection. April.

Tomosvaryella parakuthyi De Meyer, 1995

Tomosvaryella parakuthyi De Meyer, 1995: 312.

Type locality: Egypt (Sinai: Ofira).

Distribution. PA: Canary Is., Egypt, Iran, Israel, Palestine.

Egyptian localities. Sinai: Dahab, Ofira (Sharm El-Sheikh), St. Catherine, Wadi Kid. [Source: De Meyer (1995)].

Dates of collection. March and July.

Tomosvaryella pilosiventris (Becker, 1900)

Pipunculus pilosiventris Becker, 1900: 236. Type locality: Egypt (Cairo [as 'Kairo'], Assiout, Fayoum [as 'Oase Fayum']).

Distribution. PA: Egypt, Israel.

Egyptian localities. Fayoum: no exact locality (Becker 1900). Lower Nile Valley and Delta: Cairo. Upper Nile Valley: Assiout. [Source: Becker (1900)].

Dates of collection. August to March.

Tomosvaryella pusilla De Meyer, 1995

Tomosvaryella pusilla De Meyer, 1995: 313. Type locality: Israel (Herzliyya).

Distribution. PA: Egypt, Israel.

Egyptian localities. Sinai: Ofira (Sharm El-Sheikh), St. Catherine. [Source: De Meyer (1995)].

Dates of collection. May to July.

Tomosvaryella subvirescens (Loew, 1872)

Pipunculus subvirescens Loew, 1872: 87. Type locality: U.S.A. (Texas).

Distribution. Cosmopolitan.

Egyptian localities. Coastal Strip: Cleopatra (EFC). Sinai: Ofira (Sharm El-Sheikh) (De Meyer 1995).

Dates of collection. February to August.

***Tomosvaryella vicina* (Becker, 1900)**

Pipunculus vicinus Becker, 1900: 238. Type locality: Egypt (Assiout, Luxor).

Distribution. AF: Democratic Republic of Congo, Madagascar. PA: Egypt, Israel.

Egyptian localities. Upper Nile Valley: Assiout, Luxor. [Source: Becker (1900)].

Dates of collection. December to February.

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