

## The tribe Anthracini Latreille (Bombyliidae, Diptera) from Egypt

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### ABSTRACT

Synonyms, names of types, global and local distribution and type-localities are given for all recorded species and subspecies of the Egyptian Anthracini. Taxonomic keys to genera and species of these flies are constructed according to the recent taxonomic status. The present study revealed the presence of two genera including 31 species and subspecies under the tribe Anthracini. These species and subspecies are: *Anthrax aethiops bezzii* (Paramonov), *A. aygulus* Fabricius, *A. binotatus* Wiedemann in Meigen, *A. chionanthrax* (Bezzi), *A. dentatus* (Becker), *A. greatheadi* El-Hawagry, *A. lucidus* (Becker), *A. melanista* (Bezzi), *A. moursyi* El-Hawagry, *A. sticticus* Klug, *A. trifasciatus* Meigen, *A. massinissa* Wiedemann, *A. muscaria* Klug, *A. pharaonis* Paramonov, *Spogostylum bisniphas* (Bizzi), *S. candidum* (Sack), *S. efflatouni* (Paramonov), *S. griseipenne* (Macquart), *S. hippolyta* (Wiedemann), *S. isis* (Meigen), *S. niphas* (Hermann), *S. ocyale* (Wiedemann), *S. sordidum* (Sack), *S. tripunctatum* (Wiedemann), *S. ventrale* (Bezzi), *S. volitans* (Wiedemann); in addition to four undescribed species of Efflatoun Bey. This work includes new synonyms, new combinations, new records in the Egyptian fauna, in addition to new designations of lectotypes and paralectotypes in the collection of the Entomological society of Egypt.

**KEYWORDS:** Diptera, Bombyliidae, Anthracini, Taxonomy, Egypt

### INTRODUCTION

Scopoli (1763) based his genus *Anthrax* on a single species, at first believed to be *Musca morio* Linnaeus (1758). It was later shown by Bezzi (1902, 1908) that Scopoli's type-species is actually one of unnamed species of Linnaeus', a species which Linnaeus himself confused with his own *Musca morio*. The unique type-species of *Anthrax* Scopoli, erroneously believed by him to be *Musca morio* Linnaeus, proved to be the species described by Schrank (1781) as *Musca anthrax* Schrank. The diagnostic character of the genus consisted of a tuft or pencil of hairs at the apex of the antennal style, as described by Scopoli (Hull 1973).

Macquart (1840) proposed the name *Spogostylum* based on the non-Palaeartic *mystaceum* which had 3 submarginal cells formed above by extension of the stump vein at base of anterior branch of 3<sup>rd</sup> vein, and with the 3<sup>rd</sup> antennal segment very tightly opposed and joined to the second segment.

Hull (1973) noted that there are some species in the Eurasian area with 3 namely complete submarginal cells demonstrably different from *Spogostylum* Macquart. Furthermore, there is a South American species with submarginal cell divided in quite a different way from that of the Eurasian species (Bezzi 1924). Hull also stated that "apart from the venation of *Anthrax*, sensu lato, a rather creditable attempt has been made to split up this large assemblage on the basis of the form of the second and third antennal segments and their manner of attachment. These two types consist, first, of those species in which the third antennal segment, at its rounded base, projects a little way outward beyond the apex of the

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second segment which correspondingly is little rounded on its outer margins, the two segments not fitting closely together; and second, the group in which these two segments fit closely into one another; this second arrangement is the cup-shaped attachment described by Bezzi, and was considered the basis for the separation of a group of species by both Bezzi and Engel under the name *Spongostylum* (emendation of *Spogostylum* Macquart)". Hull could not support the separation of *Spongostylum* by Bezzi and Engel because inadequate material of Macquart's type-species was available for him; consequently, he preferred to leave *Anthrax* as an unsplit group with many species groups, pending a worldwide study of *Anthrax* Scopoli, in the wide sense.

Apart from the above characters which did not permit separation of *Spongostylum* Macquart by various authors, Theodor (1983) stated that the structure of the aedeagus and the spermathecae differs so markedly from those of *Anthrax* that it seems justified to maintain the genus. He noted that the emendation of *Spogostylum* to *Spongostylum* is correct, and the transliteration of the double gamma into latin is "ng" according to the Code of Zoological Nomenclature. Moreover, he stated that "there is confusion about the type-species of the genus. Macquart mistakenly considered the type-species *mystaceum* as South American. However, Seguy (1938) stated that this species was in fact collected in Sinai; it is most probably *tribunctatum*". But Zaitsev (1989) thought that the emendation of *Spogostylum* to *Spongostylum* is unjustified, and that the type-species of this genus is the non-Palaeartic species *Spogostylum mystaceum* Macquart.

The genera *Anthrax* and *Spogostylum* are not always easy to distinguish and consequently authors vary on the placement of some species (Greathead & Evenhuis 1997).

Theodor (1983) distinguished two groups of Palaeartic *Anthrax* Scopoli based on the structure of the genitalia:

- 1- The *A. anthrax* group, which have the cerci are without a distinct armature of spines. Gonocoxites truncate-triangular. Gonostyli triangular. Aedeagal sheath simple, with hooked apex. Spermathecae with long, club-shaped, tubular capsules. Ejection apparatus very short, weakly sclerotized.
- 2- *A. varius* group in which cerci with a distinct armature of short, black spines. Gonocoxites with broad base and much narrower apical part with a more or less long apical process. Gonostyli of markedly varying form, with distinct specific differences. Aedeagal sheath with complicated apical differentiations. Spermathecae with strongly sclerotized capsules of specific form and a longer, more strongly sclerotized ejection apparatus. However, Theodor himself found some species (as *comatus* & *sticticus*) are apparently transitional forms. The gonocoxites of *sticticus* are the same as in the *anthrax* group, but the spermathecae are the same as in the *varius* group.

Paramonov (1957) also grouped the species of the genus *Spogostylum*, in a broad sense, comprising many species placed now in the genus *Anthrax*; he grouped them according to different morphological characters in addition to few characters of genitalia.

The species grouping is neglected in the present study. It may be made in a future study comprising all Palaeartic anthracine species, not only the Egyptian species.

In 1945, the great Egyptian Dipterist, Efflatoun Bey, published a monumental study of the bee flies of Egypt "A monograph of Egyptian Diptera. Part 6. Family Bombyliidae", which represents only the first half of this treatment of the Bombyliidae (Homeophthalmae). The second half (Tomophthalmae) including tribe Anthracini, has been written but unpublished because of his untimely death. The manuscript and fine colored plates remain unpublished until now. Dr Mahmoud Hafez, Efflatoun's student, told me (personal communication) that there is a great problem concerning the publishing of the manuscript.

The first author of the present study got a copy of the manuscript from Neale Evenhuis (USA) without the figures or the plates. The manuscript is incomplete and needs full revision.

The unpublished study of Efflatoun includes descriptions of some new species belonging to the genus *Anthrax* (sensu lato). These species are coded with numbers in the present study and very short information is given for each, in order to keep the priority of publication for Efflatoun Bey.

The present work aims at studying the systematics of all categories of tribe Anthracini according to the recent taxonomic status, proposing keys for the Egyptian genera and species and designating lectotypes from many syntypes in Egyptian collections.

## MATERIALS AND METHODS

Various localities covering all ecological zones of Egypt were surveyed on different dates in different seasons for the collection of anthracine bee flies. Collections were carried out between 1994 and 1998. A conventional sweep-net was used.

The collected specimens were killed in jars with ethyl acetate. The specimens were removed from the jar shortly after death, and pinned directly in the field so as to maintain their color and texture. These specimens with other museum bee flies kept in the collections were used for the studies. All measurements were taken by using an ocular micrometer. The terminology employed for genitalia follows Yeates (1994) except for the term "aedeagus", which is used instead of basiphallus & distiphallus.

A good deal of information was gathered from museum anthracine specimens kept in four of the main Egyptian collections, namely:

1. Collection of Entomology department, Faculty of Science, Cairo University (Efflatoun's collection) (**EFC**).
  2. Collection of Entomological Society of Egypt (**ESC**).
  3. Collection of the Ministry of Agriculture (**MAC**).
  4. Collection of Entomology Department, Faculty of Science, Ain Shams University (**ASC**).
- In addition to specimens collected by the senior author during the present work (**Magdy Shaban El-Hawagry Collection, MSHC**), many specimens were checked in the Oxford University museum (**OXC**), others from Dr Greathead's collection were also checked (**DGC**).

## RESULTS AND DISCUSSION

### Key to the two genera of Anthracini (after Greathead & Evenhuis 1997)

- Pedicel flattened closely applied to scape and flagellum, sometimes hollowed to receive flagellum; wing without an extensive black basicostal infuscation, clear or spotted, sometimes with a diffuse brownish infuscation at base and along front border; body without predominantly black dense scales lying flat on abdomen -----  
----- *Spogostylum* Macquart
- Pedicel globular or disc-shaped, not moulded to flagellum; wings usually with a more or less extensive infuscation, seldom almost completely hyaline; body with dense scales, lying flat, predominantly black with patches of white or silver scales on abdomen ----- *Anthrax* Scopoli

### Genus *Anthrax* Scopoli

Scopoli, 1763: Entom. Carnicola: 358.

**Type-species:** *Musca morio*: Scopoli, 1763: I.c, not *M. morio* L., 1758: Syst. Nat. Ed. 10, 1: 590 (mon.) [= *anthrax* Schrank, 1781]. A case of misidentified type-species.

*Leucamoeba* Sack, 1909: Abh. Senckenb. Naturforsch. Ges., 30: 520. Type-species: *Bibio aethiops* Fabricius, 1781.

*Chalcamoeba* Sack, 1909: Abh. Senckenb. Naturforsch. Ges., 30: 522. Type-species: *A. virgo* Egger, 1859

### Key to Egyptian species and subspecies of *Anthrax* Scopoli

1. Wing entirely hyaline or very feebly tinged brownish or yellowish about the base and upper border ----- 2
  - Wing with an extensive pattern composed either of a dark blackish brown infuscation on at least the basal third, or with spots on the cross-veins ----- 5
2. Small, plump species; abdominal hairs and bristles exclusively white; last three anal tergites almost entirely covered with white scales except for a narrow mid-dorsal space on each tergite ----- *chionanthrax* Bezzi
  - Medium sized species, less plump; abdominal hairs and bristles predominantly black ----- 3
3. Thorax and abdomen shining black with a distinct bluish luster; corners of 1<sup>st</sup> abdominal tergite with tufts of black hairs; last three tergites with brownish yellow scales on sides ----
  - *melanista* Bezzi
  - Thorax and abdomen shining black without bluish luster or dull black; corners of 1<sup>st</sup> abdominal tergite with tufts of white hairs ----- 4
4. Thorax and abdomen shining black; scales on abdomen mainly silvery white; the exposed processes of gonocoxites with short black macrochetæ; wing hyaline in male, feebly tinged brownish about the base in female ----- *lucidus* Becker
  - Thorax and abdomen dull black; scales on abdomen silvery white and yellowish white, becoming more yellowish at last three tergites; the exposed processes of gonocoxites longer and narrower without short black macrochaetae, wing hyaline in both male and female ----- *moursyi* El-Hawagry
5. Sides of 1<sup>st</sup> abdominal tergite with tufts of black hairs; wing pattern dimidiate with a clear-cut margin and with two small isolated spots on clear area, one on base of R<sub>4</sub> and one on base of 3<sup>rd</sup> posterior cell ----- *aygulus* Fabricius
  - Sides of 1<sup>st</sup> abdominal tergite with tufts of white hairs ----- 6
6. Wing pattern composed of basicostal infuscation or numerous irregular blackish brown confluent spots ----- 7
  - Wing pattern composed of spots on cross-veins and with only costal cell dark ----- *sticticus* Klug
7. Basicostal infuscation cover the entire proximal third, infuscation in 1<sup>st</sup> submarginal cell extends well beyond r-m cross-vein; without dark spot on base of R<sub>4</sub>; gonocoxites with exposed posterior processes ----- 8
  - Confluent spots found on hardly more than the proximal half, leaving the distal portion mostly hyaline; dark spot on base of R<sub>4</sub> confluent with upper dark infuscation; gonocoxites truncate without gonocoxal processes ----- 9
8. Spots on r-m cross-vein continuous with basicostal infuscation ----- *dentatus* (Becker)
  - Spots on r-m cross-vein isolated from the basicostal infuscation by a clear area in r<sub>1</sub> cell -  
----- *trifasciatus* Meigen
9. Apical 3<sup>rd</sup> of r<sub>1</sub> cell entirely hyaline, tergites 6 and 7 almost entirely covered with broad silvery white scales ----- *aethiops bezzii* Paramonov

- Apical 3<sup>rd</sup> of r<sub>1</sub> cell with large spot touching tip of R<sub>1</sub> vein, silvery white scales of 6<sup>th</sup> and 7<sup>th</sup> tergites found on sides only ----- *greatheadi* El-Hawagry

***Anthrax aethiops bezzii* (Paramonov) (Plate 1)**

*Spogostylum aethiops bezzii* Paramonov, 1957.- Eos, 33:143. Type-localities: Mariout, El-Borg, Wadi Hoff (Egypt).

The nominate subspecies, *Anthrax aethiops aethiops* Fabricius was described in 1781 as *Bibio aethiops* from Italy. Five of the Paramonov's syntypes of *bezzii* are present in ESC. We designated a Lectotype and 4 Paralectotypes for the subspecies from this series.

Distribution: It is common on the western mediterranean coast from Alexandria to Salloum. It was also collected from the wadies of eastern desert, South East of Cairo.

Material examined: Type material: Lectotype male, Mariout, 4.v.1924 (Efflatoun); Paralectotypes: 2 females, 2 males, Mariout, 18.iv.1925 (Efflatoun) [ESC]. (new designation). Other material: 1 female, Amria, 7.vii.1927 (Efflatoun); 1 male, Mariout, 23.iii.1927 (Efflatoun); 1 male, Mirsa Matrouh, viii.1930 (Efflatoun) [ESC]. 1 male, Burg, 16.iii.1935 (Efflatoun); 1 female Burg, 22.iv.1950 (Shafik); 1 male Ein Gedeirat, 13.iv.1938 (Shafik); 1 female, Mallaha, Mariout, 16.vi.1929 (Efflatoun); (Efflatoun) [EFC]. 1 female, Mirsa matrouh, 10.ix.1957 (Aly) [ASC]. 1 male, Borg, 20.v.1927, 19.iv.1927 (Kasim); 1 male, 1 female, Mariut, 2.v.1921, 18.iv.1925 (Efflatoun) [MAC]

***Anthrax aygulus* Fabricius (Plate 2)**

*Anthrax aygulus* Fabricius, 1805.- Syst. antl.: 121. Type-locality: Guinea.

*Anthrax biflexa* Loew, 1852. Bericht d. Konigl. Preuss. Akad. D. Wiss: 659 [in Peters, 1862 12]. Type-locality: Mozambique.

One of the undescribed species of Efflatoun (sp. no.1). was found identical with *aygulus*. It was collected from Gebel Elba, the same locality from which *aygulus* was collected.

Additional descriptions: Engel (1932-1937) and Bowden (1964).

Global distribution: Africa outside forest including Egypt; Saudi Arabia, Yemen, China, Japan; Sokotra.

Local distribution: Only two males were collected from Gebel Elba by Efflatoun Bey.

Material examined: 1 male, Gebel Elba, Jan.1933, 1 female, 2.ii.1933 (Efflatoun) [ESC].

***Anthrax binotatus* Wiedemann in Meigen**

*Anthrax binotata* Wiedemann in Meigen, 1820.- Syst.Beschr., 2: 165. Type-locality: Portugal.

*Anthrax subnotatus* Wiedemann in Meigen, 1820.- Syst. Beschr., 2: 166. Type-locality: Portugal

Distribution: Albania, Armenia, Austria, Bosnia, Bulgaria, Croatia, Czech Republic, Egypt, France, Germany, Greece, Hungary, Iran, Israel, Italy, Libya, Morocco, Poland, Portugal, Russia, Slovakia, Spain, Syria, Turkey, Ukraine.

This species is recorded from Egypt but not represented in the Egyptian collections; non, of the collected specimens match its description.

***Anthrax chionanthrax* (Bezzi) (Plate 3)**

*Argyramoeba chionanthrax* Bezzi, 1925.- Bull. Soc. Ent. Egypt, 4: 265. Type-locality: Wadi Um Biar, South Eastern Desert (Egypt).

*Anthrax cairensis* Paramonov, 1936.- Zbirn. Prates Zool. Mus., 16: 10; Paramonov, 1936.- I.c., 18:86. Type-locality: Wadi Hoff (Egypt). [Syn. Nov.]

*Anthrax nanus* Paramonov, 1936.- Zbirn. Prats Zool. Mus., 16:15; Paramonov, 1936.- I.c., 18: 130. Type-localities: 5<sup>th</sup> Tower, Suez Road; 6<sup>th</sup> Tower, Suez Road; Borgash (Egypt). [Syn. Nov.]

Additional descriptions: Engel (1932-1937) and Paramonov (1936, original description of *nanus* and *cairensis*).

Global distribution: Egypt, Israel.

Local distribution: Lower Nile Valley, Eastern Desert and South Sinai.

Syntypes of *chionanthrax* and *nanus* are found in ESC, probably moved to it from MAC. Also the type of *cairensis* is found in EFC. We designated a lectotype for *A. chionanthrax*, and a lectotype and 4 paralectotypes for *nanus*.

The types were examined and found to be almost identical, although the *cairensis* specimens differ in having the dorsum of thorax and abdomen strongly shining, very sparingly pilose, while in *nanus* the pilosity is rather well developed. All other characters are without any doubt identical.

Material examined: Type-material: Lectotype male of *chionanthrax* Bezzi: Wadi Um Biar (Qusir), 17.ii.1924 (Efflatoun). Lectotype male of *nanus* Paramonov: Borgash, 5.vii.1925 (Efflatoun); Paralectotypes 1 male, 1 female, 5<sup>th</sup> tower of Sues Road, 28.iii.1924 (Efflatoun); 1 male, 1 female, 6<sup>th</sup> tower Sues Road, 28.iii.1926 (Efflatoun) [ESC]. (New designation). Other material: 1, male, Abu Rowash, 11.iv.1925 (Efflatoun); 1 female, Mansouriah, 30.viii.1924 (Efflatoun) [ESC]. 1 male, W. Garawi, 25.iii.1932 (Efflatoun); 1 female, W. El-Rahba (Sinai), 24.iv.1940 (Efflatoun), [EFC]. 1 male, 12.iv.1925 (Efflatoun); 1 female, 6<sup>th</sup> Tower, Suez Road, 26.iv.1925 (Efflatoun) [MAC].

#### ***Anthrax dentatus* (Becker) (Plate 4)**

*Argyramoeba dentatus* Becker, 1906.- Z. syst. Hymenopt. Diptero., 6: 148. Type-locality: Tunisia.

*Anthrax efflatouni* Paramonov, 1936.- Zbirn. Prats Zool. Mus., 16:7; Paramonov, 1936: I.c., 18:90. Type locality: Egypt: wadi Um Biar, Quseir [Syn.nov].

Additional description: Engel (1932-1937).

Global distribution: North Africa

Local distribution: Lower Nile Valley, Western Desert, Eastern Desert And Sinai.

This species is closely similar to *A. fuscipennis* (Ricard). Theodor (1983) stated that "the position is particularly complicated in *fuscipennis* group. There are apparently several species with a similar wing pattern. One form has a black plumula, another has a white plumula, but different genitalia were found in specimens with the same plumula in both forms". The specimens of the present species have dark plumula; their male genitalia are similar to *A. fuscipennis*, type 2 (white plumula), illustrated in Theodor's study (1983) while their spermathecae are almost like those of *A. fuscipennis*, type 1 (black plumula) illustrated in Theodor's study.

Greathead (personal communication) found that the material from Sokotra (type-locality of *fuscipennis*) has quite different spermathecae to either of Theodor's species. He suspected that the white plumula species would turn out to be *A. johanni* Zaitsev (= *muscarius* Klug). The black one may turn out to be *dentatus* Becker.

Material examined: 1 male, Abu-Rawash, 16.ix.1924 (Efflatoun); 1 female, Barrage, 10.ix.1922 (Efflatoun); Ezbet Nakhl, 3.v.1922 (Efflatoun); 1 male, Katta, 22.x.1934 (Efflatoun); 1 female, 1 male, W. Garagnyia, 6.viii.1942 (Efflatoun) [ESC]. 1 female, Ezbet Nakhl, 22.iv.1921 (Efflatoun), 1 male, 3.v.1922 (Farang); Fayoum, 30.v.1945 (Shafik), 1 male, 9.iv.1946 (Shafik); Marg, 25.v.1921; 1 male, Ogret El Sheikh, 14.iii.1927 (Farang) [EFC]. 1 male, Embaba, 13.vii.1953 (Aly); 1 female, Pyramids, 16.xi.1951 (Roh) [ASC]. 1 female, Abu-Rowash, 28.ix.1927 (R.M); 1 female, Badrashein, 15.viii.1925 (Kasim); 1 male, Elmansouriah, 30.viii.1924 (R.M); 1 male, Kerdassa, 18.iv.1924 (R.M); 1 female, Nozha, 26.vi.1925 (Qasim) [MAC]. 1 male and 1 female, Kom Osheem, 1.v.1997 (M.El-Hawagry); 2

female, W.Degla, 8.v.1997 (M. El-Hawagry); 1 male, W.El-Arbaein, 21.v.1997 (M. El-Hawagry); 1 female, W.Zaeitar, 24.viii.1996 (M. El-Hawagry) [MSHC].

Material examined from outside Egypt: Sokotra, hadibo Plain, iii.1967 (K.Guichard) [DGC].

#### ***Anthrax greatheadi* El-Hawagry (Plate 5)**

Distribution in Egypt: South Sinai: Serbal, W.El-Arbaein, W. Gebal.

This species has a very characteristic wing pattern not matching any of other description, but its male genitalia and spermathecae resemble those of *Anthrax* sp. no.1 in Theodor (1983).

Type material: Holotype: male: Egypt; South Sinai, Hagar Bardeya; 29.v.1997 (leg: El-Hawagry) [EFC]. Paratypes: 1 female: South Sinai, W.El-Arbaein; 22.v.1997 (leg: El-Hawagry) [EFC]. 1 male: Same data as the preceding specimen. 1 female: South Sinai, Ein Maein El-Roaian; 22.viii.1995 (leg: El-Hawagry) [EFC].

#### ***Anthrax lucidus* (Becker) (Plate 6)**

*Argyramoeba lucidus* Becker, 1902.- Mitt. Zool. Mus. Berl., 2(2): 29. Type-locality: Siala, Fayoum (Egypt).

*Anthrax hassani* Paramonov, 1936.- Zbirn. Prats Zool. Mus., 16: 11. Type-locality: Wadi Um Girfan, Mazghona (Egypt). [syn.nov].

Additional description: Engel (1932-1937).

Global distribution: Egypt, Libya, Tunisia, Israel.

Local distribution: Fayoum, Mazghona, Helwan, South eastern desert, North Galala, South Sinai, North Sinai, Gebel Elba and Dakhla Oasis.

A lectotype for *A hassani* has been designated from a series of syntypes preserved in ESC. A series of specimens including Homeotypes of *A. lucidus* identified by Engel, Efflatoun Bey and John Bowden have been compared with the lectotype of *A. hassani* in ESC and with specimens in Greathead's collection and all were found to be identical, confirmed by Greathead (personal communication).

Material examined: Type-material: Lectotype, female, of *hassani* Paramonov [New designation]: Mazghona, 30.iii.1923 (Efflatoun) [ESC]. Other material: 1 female, Ain Mousa, 16.iii.1925 (Efflatoun); 1 female, Kalamoun (Dakhla), 27.i.1940; 1 male, Shoubra, 22.v.1921 (Efflatoun); 1 female, W. Aschar El-Bahari (Galala), 23.ii.1926 (Efflatoun); 1 male, W. Beida (South Eastern Desert), 2.iii.1928. [ESC]. 1 male, Fayoum, 11.iii.1947 (Shafik); 14.iv.1947 (Shafik); 1 female, Helwan, 5.iii.1935 (Frag); 1 male, Kalamoun (Dakhla), 27.i.1940 (Efflatoun); 1 female, W. Beida (South Eastern Desert), 9.iii.1928 (Tawfik); 1 male, W.El-Lega, 6.ix.1943 (Efflatoun). [EFC]. 2 males, 2 females, Dakhla, 17.iii.1934 (Priesner); 1 female, G. Elba, 8.ii.1933, (Priesner); 1 male, Wadi Garagnyia, 6.viii.1942 (Efflatoun); 1 female, Wadi Um Girfan, 22.iv.1927 (Efflatoun) [MAC]. 1 male, 1 female, W. El-Arbaein, 21-22.v.1997 (M. El-Hawagry); 2 male, 2 female, W. El-Arbaein, 3.vi.1998 (M. El-Hawagry); 1 female, W. Gebal, 20.viii.1995 (M. El-Hawagry) [MSHC].

Material examined outside Egypt: Tunisia: Tuzeur, 24-28.iii.1978 (K. Guichard) [DGC].

#### ***Anthrax melanista* (Bezzi) (Plate 7)**

*Argyramoeba melanista* Bezzi, 1925.- Bull. Soc. Ent. Egypt, 8(1924): 221. Type-localities: Wadi Hoff, Wadi Rishrash (Egypt).

Additional description: Engel (1932-1937).

Distribution: This species is endemic to Eastern Desert and South Sinai in Egypt.

Three syntypes of this species are located in ESC. We designated them as a lectotype and two paralectotypes

Material examined: Type-material: Lectotype, male: W. Hoff, 10.iii.1922 (Efflatoun); Paralectotypes, 1 male & 1 female: W. Rishrash, 3.iii.1922 (Efflatoun) [ESC] (**New designation**). *Other material*: 1 female, W. Dar El-Maskhara, 11.iv.1927 (Efflatoun); 1 male W. Morrah, 1.iii.1925 (Efflatoun); 1 female, W. Um -Elik, 21.iii.1924 (Efflatoun); 2 males, 2 females, W. Zohleiga, 27.iii.1925 (Efflatoun)[ESC]. 1 male W. Dar El-Maskhara, 12.ix.1930 (Tawfik); 1 male, 1 female, W. Garawi, 25.iii.1932 (Efflatoun); 1 male, 1 female, W. Hoff, 4.iv.1930 (Farag); 1 male, 1 female, W. Rishrash, 27.iii.1935 (Efflatoun); 1 male W. Zohleiga, 25-29.iii.1925 (Efflatoun) [EFC]. 1 female, W. Hoff, 8.v.1924 (Efflatoun); 1 male, 1 female, W. Um Elek, 21.iii.1924 (Efflatoun); 1 male, W. Zohleiga, 25-29.iii.1925 (Efflatoun) [MAC].

#### ***Anthrax moursyi* El-Hawagry (Plate 8)**

Distribution in Egypt: South Sinai: Serbal & Wadi El-Arbaein.

This species is very similar to *Anthrax lucidus* (Becker) but its cuticle is dull and the scales differ in color and arrangement, moreover the exposed processes of gonocoxites are longer and narrower and without tufts of short black macrochetae.

Type material: Holotype, male: Egypt; South Sinai, Wadi El-Arbaein; 22.v.1997 (leg: M. El-Hawagry) [EFC]. Paratypes: 1 female: South Sinai, Serbal, W. Abou-Hebeig; 28.v.1997 (leg: M. El-Hawagry) [EFC]. 2 males & 1 female: South Sinai, W. El-Arbaein; 21.v.1997 (leg: M. El-Hawagry) [EFC].

#### ***Anthrax sticticus* Klug (Plates 9) [New record from Egypt]**

*Anthrax stictica* Klug, 1832.- Symb. Descr. Ins., 3: N3, tab. 30, fig. 14. Type-locality: Yemen. *Argyramoeba polystigma* Sack, 1909- Abh. Senckenb. Naturforsch. Ges., 30: 534. Type-localities: Cyprus & Greece & Turkey.

*Spongostylum quinque maculatum* Bezzi, 1924.- Brit. Mus. (Nat. Hist.), London. Typ-locality: Senegal.

Additional description: Engel (1932-1937).

Global distribution: Afghanistan, Armenia, Cyprus, Egypt, Greece, Iran, Israel, Italy, Oman, Syria, Turkey, Turkmenistan, Uzbekistan, Yugoslavia; Chad, Eritrea, Guinea-bissau, Nigeria, Senegal.

Local distribution: South Sinai: W. El-Arbaein, Gabal Moussa.

This is the first time to record this species from Egypt. Some specimens were misidentified as *Anthrax heteropyga* Sack in the Efflatoun's collection [EFC]. Greathead (1967) suggested that this species is a parasite of mud-dauber wasps.

Material examined: 1 male, W. El-Arbaein, 21.v.1997; 1 female, 1 male, 12.vii.1998 (M. El-Hawagry) [MSHC].

#### ***Anthrax trifasciatus* Meigen (Plate 10) [New record from Egypt]**

*Anthrax trifasciata* Meigen, 1804.- Klass. Beschr., 1: 206. Type-locality: Marseille, France.

*Anthrax capitulata* Mulsant, 1852.- Mem. Acad. Sci. Belles-Lett. Lyon, 2:22. Type-Locality: France.

Additional description: Engel (1932-1937).

Global distribution: Afghanistan, Albania, Algeria, Austria, Belgium, Bosnia Bulgaria, Croatia, Egypt, France, Greece, Hungary, Italy, Malta, Morocco, Oman, Spain, Tunisia, Turkey, United Arab Emirates, Yugoslavia; Pakistan.

Local distribution: South Sinai: St. Catherine, Serbal.



Many specimens belonging to this species were misidentified as *A. leucogaster* by Efflatoun Bey in EFC & ESC.

Material examined: 1 male, W Abu-Hbeig, 28.v.1997 (M. El-Hawagry); 2 males, 2 females, 21.v.1997, 1 male, 1 female, W. El-Arbaein, 2.v.1998; 1 male, 1 female, 16.v.1998; 1 male, 4.vi.1998 (M. El-Hawagry); 1 male, W. Garagniya, 24.v.1997 (M. El-Hawagry); 1 male, 1 female, W. Telah, 19.ix.1997 (M. El-Hawagry) [MSHC].

Moreover, three species were described from Egypt by Wiedemann (1828), Klug (1832) and Paramonov (1935). They seem to have been ignored by everyone. There are no specimens representing these species in Egyptian collections. We could not collect any specimens that match the descriptions of these species. Therefore they are not included in the present key of the genus *Anthrax*. The situation of these species was discussed with Dr Greathead. These species are:

- 1- *A. johanni* Zaitsev, 1997 (= *muscarius* Klug, 1832): Zaitsev (1989) stated that this is doubtful species. In 1997, he replaced the name of *muscarius* with *A. johanni* because it is preoccupied by Pallas, 1818. Holotype may be in Berlin.
- 2- *A. massinissa* Wiedemann, 1828: Wiedemann said that has a dimidiate wing pattern, grayish hairs and snow white bands on the abdomen. Syntypes should be in Vienna or Berlin.
- 3- *A. pharaonis* Paramonov, 1935 (key only): Type material was in Ministry of Agriculture, Cairo; removed by John Bowden in 1974 for determination. Paramonov noted that this species resembles those of the genus *Villa*.

### Genus *Spogostylum* Macquart

Macquart, 1840: Dipt. exot., 2(1): 53. Type-species: *Spogostylum mystaceum* Macquart, 1840: I.c.: 53(mon.); not Palaearctic.

*Spogostylum* Agassiz, 1847: 349, unjustified emendation.

*Argyromoeba* Schiner, 1860: Wien. Ent. Mschr., 4: 51. Type-species: *Anthrax tripunctata* Wiedemann in Meigen, 1820: Syst. Besch., 2: 166 (des. Coquillett, 1910: Proc. U. S. natn. Mus., 37:510). *Argyramoeba* Loew, 1869: unjustified emendation.

*Anthracamoeba* Sack, 1909: Abh. Senckenb. Naturforsch. Ges., 30: 515. Type-species: *Anthracamoeba obscurum* Sack, 1909: I.c.: 516 (orig. des.).

*Chrysamoeba* Sack, 1909: Abh. Senckenb. Naturforsch. Ges., 30: 516. Type-species: *Chrysamoeba vulpina* Sack, 1909: I.c.: 517 (orig. des.).

*Aureomoeba* Evenhuis, 1978: Ent. News, 89: 247, new name for *Chrysamoeba* Sack, 1909, a junior homonym of *Chrysamoeba* Klebs, 1892. Type-species: *Chrysamoeba vulpina* Sack, 1909 (aut.).

*Molybdamoeba* Sack, 1909: Abh. Senckenb. Naturforsch. Ges., 30: 519. Type-species: *Anthrax tripunctata* Wiedemann in Meigen, 1820: Syst. Besch., 2: 166 (orig. des.).

*Leucamoeba* Sack, 1909: Abh. Senckenb. Naturforsch. Ges., 30: 520. Type-species: *Bibio aethiops* Fabricius, 1781: species insect., 3: 415 (orig. des.).

*Psamatamoeba* Sack, 1909: Abh. Senckenb. Naturforsch. Ges. 30: 536. Type-species: *Anthrax isis* Meigen, 1820: Syst. Besch., 2: 164 (orig. des.).

*Coniomastix* Enderlein, 1934: Dt. ent. Z., 1933 (2/3): 140. Type-species: *Coniomastix montana* Enderlein, 1934: I.c.: 141 (orig. des.).

### Key to Egyptian species of *Spogostylum* Macquart

1. Three submarginal cells; large species, about 15 mm or slightly more ----- 2
- Two submarginal cells; small to very large species ----- 4
2. Whole wing with dark brown infuscation at fore border becoming gradually pale

- towards the hind margin; a darker spot on the interrarial cross-vein; aedeagal sheath shorter than aedeagus ----- *griseipenne* Macquart
- Wing hyaline except for a diffuse basicostal infuscation and ill-defined brownish spot on cross-veins; dark spot on the interrarial cross-vein very faint or absent -----3
3. Thoracic pleura covered with white hairs, may be mixed with few yellow ones at upper portion; sides of 1<sup>st</sup> abdominal tergite with long yellowish white or pure white hairs; abdominal scales white; aedeagal sheath longer than aedeagus -----  
----- *ocyale* Wiedemann
- Thoracic pleura covered with reddish yellow hairs; sides of 1<sup>st</sup> abdominal tergite with long yellowish brown hairs; abdominal scales yellowish brown; aedeagal sheath shorter than aedeagus ----- *sordidum* Sack
4. Very large flies (more than 15 mm in length); wing distinctly tinged brown throughout with darker borders along veins; abdomen with brownish yellow scales only -----  
----- *hippolyta* Wiedemann
- Large to small flies (less than 13 mm); wing entirely hyaline without dark borders along veins, usually with more or less conspicuous dark markings on base and fore border, and/or few small spots, mainly on cross-veins ----- 5
5. Wing entirely hyaline, or at most with inconspicuous ill-defined brownish or yellowish tinge about the base and fore border, and mainly on cross-veins in form of spots; hairs and/or scaly hairs on sides of 2<sup>nd</sup> to 4<sup>th</sup> tergites white or mixture of white and dark ----  
-----6
- Wing usually with distinct and conspicuous dark brown spots; if spots faint then hairs on sides of 2<sup>nd</sup> to 4<sup>th</sup> tergites all black -----11
6. hairs on frons all white or yellowish white, or mixed with few short black hairs on upper third, usually mixed (mainly at sides) with white scaly hairs; almost devoid of black bristles, and with white to pale yellow scales only on the abdomen ----- 7
- hairs on frons black, usually mixed with white or yellowish white hairs and scales; with black bristles, at least on thoracic margins; black hairs and/or scales usually found on abdomen -----8
7. Medium-sized to small flies (6.5 mm or less); frons devoid of black hairs -----  
----- *niphas* Hermann
- Large flies (up to 10 mm); frons with some short black hairs on upper third -----  
----- *bisniphas* (Bezzi)
8. Tufts of hairs or long scaly hairs on sides of abdomen alternating, white or yellowish and black or brownish black -----9
- No alternating tufts of hairs on sides of abdomen, some long black hairs usually found on sides of 2<sup>nd</sup> tergite but not in form of tufts ----- 10
9. Scales on abdominal tergites yellowish brown; long hairs on sides of last three tergites predominantly white; lower part of face, above peristomal ridge with long white hairs mixed with few black ----- *ventrale* Bezzi
- Scales on abdominal tergites white, mixed with few yellow; long hairs on sides of last three tergites black; lower part of face, above peristomal ridge, with long white hairs only ----- *incisurale* Macquart
10. Last three tergites extensively covered with dense white scales; lower part of face, above peristomal ridge, with long yellowish white hairs only; aedeagus longer than aedeagal sheath ----- *candidum* Sack
- Scales on last three tergites less dense; lower part of face, above peristomal ridge, with some long black hairs mixing the white hairs; aedeagus almost as long as the aedeagal sheath ----- *isis* Meigen

11. Wings with more distinct and conspicuous spots; tufts of hairs on sides of 2<sup>nd</sup> to 4<sup>th</sup> tergites alternating, white and black -----12  
- Wing with at most three brownish flecks which are usually very faint and appearing as blurs and without darker margin on base of r<sub>4</sub>; hairs on sides of 2<sup>nd</sup> to 4<sup>th</sup> tergites all black, not in form of tufts ----- *Spogostylum* sp. (no. 4)
12. Wing with three conspicuous dark spots; tarsal segments of front legs of female broadened; tufts of hairs on sides of 2<sup>nd</sup> and 4<sup>th</sup> tergites mainly black -----  
----- *tripunctatum* Wiedemann  
- Wing with four evident brown spots or flecks, the distal one on rectangular base of r<sub>4</sub>; tufts of hairs on sides of 2<sup>nd</sup> to 4<sup>th</sup> tergites consisting each of black hairs above and white below ----- *Spogostylum* sp. (no. 3)

***Spogostylum bisniphas* (Bezzi) (Plate 17)** [new combination]

*Argyramoeba bisniphas* Bezzi, 1925.- Bull. Soc. Ent. Egypte, 8 (1924): 223. Type-localities: Wadi Hoff and Wadi Garawi (Egypt).

Additional description: Engel (1932-1937).

Distribution: This species seems to be endemic to Eastern Desert in Egypt.

Only four syntypes are found in ESC. A lectotype and three paralectotypes have been designated in ESC. This species comes out in the same couplet as *Argyramoeba niphas* Hermann (now *Spogostylum niphas*) in Bezzi's key (1924).

Material examined: Type material: Lectotype, male, w. Garawi, 21.iv.1923 (Efflatoun); 3 paralectotypes, 1 male, 2 female, W. Garawi, 21.iv.1923 (Efflatoun) [ESC] (**New designation**). Other material: 1 male, W. Garawi, 6.v.1925 (Efflatoun) [ESC]. 1 female, W. Dar El-Maskhara, 12.iv.1930 (Tawfik); 1 male, W. Rishrash, 12-17.vi.1934 (Tawfik); 1 male, W. Um-Girphan, 22.iv.1927 (Efflatoun) [EFC].

***Spogostylum candidum* (Sack) (Plate 11)**

*Psamatamoeba candidum* Sack, 1909.- Abh. Senckenb. Naturforsch. Ges., 30: 538. Type-locality: Persien, Zwischen Podaga und Basman, Kirman (Iran).

Additional description: Engel (1932-1937).

Global distribution: Arabia, Egypt, Iran, Pakistan, Turkey.

Local distribution: Sout and North Sinai; Eastern Desert: the Wadies east of Helwan, Red Sea coast, Sues; Lower Nile Valley: Abu-Rawash & El-Mansouriah.

The individuals of this species exhibit considerable variations in size, wing venation and color of vestiture.

Material examined: 1 male, Fayoum, 16.vi.1947; 1 male, 1 female, Gebel Elba, 15.iii-30.4.1928; 1 male, 1 female, Gebel Mousa, 26.vi.1936; 2 males, 2 females, W. El-Arbaein, 8.ix.1940; 2 male, 2 females, W. Garagnyia, 7.viii.1942 [ESC]. 1 male, Arish, 23.viii.1951 (Shafik); 1 female, Bir Tarfa, 14.iv.1940 (Tawfik); 1 female, Gebel Elba, iii.1929 (Tawfik); 1 female, Rafah, 17.viii.1951 (Shafik); 3 male, 3 female, W. El-Rabba, 21-24.iv.1940 [EFC]. 1 male, Abou Souir, 17.v.1925 (Kasim); 1 female, Arish, 4.ix.1951; 1 female, Genifa, 23.ix.1925 (Kasim); 1 male, W. El Garawi, 13.ix.1926 (Farg); 1 male, W. Firan, 17.v.1934 (Efflatoun); 1 male, W. Um Girfan, 22.v.1927 (Efflatoun) [MAC]. 1 female, El-Zawatin, 24.viii.1996 (M. El-Hawagry); 1 male, 1 female, Hagar Bardyia, 29.v.1997 (M. El-Hawagry); 27.v.1997 (M. El-Hawagry); 1 male W. El-Arbaein, 14.vi.1996 (M. El-Hawagry); 2 males, 2 females, W. El-Arbaein, 22.v.1997 (M. El-Hawagry); 3 males, 3 females, W. El-Arbaein, 21.v.1997 (M. El-Hawagry) [MSHC].

Material examined from outside Egypt: Pakistan: Kalat, 14.vi.1963 (G.B. Popov) [DGC].

***Spogostylum efflatouni* (Paramonov)**

*Spogostylum efflatouni* Paramonov, 1957.- Eos, 33: 147. Type-locality: Wadi Digla (Egypt). *Anthrax sergeiae* Hull, 1973.- Bee-flies of the world: 441 (unnecessary new name for *Spogostylum efflatouni* Paramonov, 1957).

Distribution: Egypt (Eastern Desert).

No specimens representing this species are found in the Egyptian insect collections. The holotype (female) was lost from the Schmalhausen Institute of Zoology, Kiev, Ukraine. The description of this specimen is very incomplete. Paramonov said that it has 3 submarginal cells, whole surface of wing darkened, with three darker spots, haltere yellow, body black with black hairs and macrochetae, hind margins of middle and apical tergites with well developed dark brown scales, length 10 mm. In the Paramonov's key it comes out in the same couplet as *S. ocyale*. This specimen (type) may be a small dark specimen of *S. ocyale*.

***Spogostylum griseipenne* (Macquart) (Plate 12)**

*Exoprosopa griseipenne* Macquart, 1850.- exot., Suppl. 4: 408. Type-locality: Egypt

Global distribution: Arabia, Egypt, Israel.

Local distribution: Western Desert: Wadi El-Natroun & Kharga; Delta; Fayoum.

This species is common in Egypt. In the literature it is the name that should be applied to the *Spogostylum* sp. no. 1 illustrated by Theodor (1983: Figs 598-599) as close to *Spogostylum ocyale* (Wiedemann). Both the apex of the aedeagus and the spermathecae differ in shape from *Spogostylum ocyale*. In addition, the two species can be separated by the absence of an infuscation on the interradiial cross-vein in *S. ocyale* and its presence in *S. griseipenne*. Greathead (personal communication) said that he misidentified *S. griesipenne* as *S. sordidum* in his Arabian paper (Greathead, 1980: fig. 16).

Material examined: 1 male, Fayoum, 16.vi.1941, 1 male, 19.viii.1948, 1 female, 18.vi.1950 (Shafik) [EFC]. 1 male, Ebn Salam (Mansoura), 17.ix.1997 (M.El-Hawagry); 6 males, 6 females, Kharga, 7-8.xi.1997, 1 female, 13.x.1997 (M. El-Hawagry); 1 female, Kom Osheem, 17.x.1996 (M. El-Hawagry) [MSHC].

***Spogostylum hippolyta* (Wiedemann) (Plate 17)**

*Anthrax hippolyta* Wiedemann, 1828.- Aussereurop. Zweifl. Insekt., 1: 283. Type-locality: Sudan "aus Nubien".

*Argyromoeba dedecor* Hermann, 1907.- Z.syst. Hymenopt. Dipterol., 75: 197. Type-locality: Samyrina (Turkey).

Additional description: Engel (1932-1937).

Global distribution: Egypt, Iran, Israel, Libya, Turkey, Ethiopia, Gambia, Guinea, Mali, Mauritania, Senegal, Sudan.

Local distribution: Coastal Strip: Hammam (Mariout), Western Desert: Kharga Oasis, Sinai: Moweillah (North Sinai).

It is similar to *ocyale* in general appearance but easily distinguished by the two submarginal cells of wing and the grayish-tawny vestiture of body. Efflatoun said that *A. hippolyta* has been previously recorded from Egypt (in a very broad sense, including Nubia, the Sudan and Erytrea) as *muscaria* by Klug.

Material examined: 2 males, 1 female, Mariout (Hammam), 23-29.ix.1916 (Efflatoun); 1 female, Moweillah (North Sinai), 15.ix.1924 (Efflatoun); 1 female, Kharga, 18.ix.1918 (Efflatoun). [MAC].

***Spogostylum incisurale* (Macquart) (Plates 18)**

*Anthrax incisurale* Macquart, 1840.- Dipt. exot., 2(1): 57. Type-locality: Du Cap (South Africa).

*Anthrax mixta* Loew, 1860.- Ofver. Kongl. Vet. Akad. Förhandl., XVII: 89. Type-locality: Swakop (Namibia).

Additional description: Engel (1932-1937).

Global distribution: Egypt, South Africa.

Local distribution: Lower Nile Valley: near Cairo; Delta; Eastern Desert: wadies near Cairo; Gebel Elba; Fayoum.

Material examined: 1 female, Abu-Rawash, 27.v.1925, 1 female, 6.vi.1925 (Rohayem); 1 female, Barrage, 8.viii.1934 (Shafik); 1 male, Borgash, 10.ix.1958 (Shafik); 1 female, 27.ix.1924; 1 female, El-Gorani, 21.v.1927 (Rohayem); 1 female, Faraskur, 12.viii.1925 (Tawfik); 1 male, fayoum, 16.v.1952 (Shafik); 1 male [EFC]. 1 female, Kafr Hakim, 20.v.1951 (Rohayem); 1 male, 1 female, G. Asfar, 7.ix.1953 (Aly); 1 female, Mansouriah, 12.v.1951 (Rohayem) [ASC]. 1 male, 1 female, Alexandiya, 2-15.vii.1920 (R.M); 1 male, 2 females, El-Katta, 20.ix.1924 (R.M); 1 male, Faraskur, 12.viii.1925 (R.M); 1 male, Ramleh, 18.vi.1922 (Qasim); 1 female, W. Um Elek, 6.xi.1925 (Frag) [MAC].

Material examined outside Egypt: South Africa: Cape Province, near Fort Brown, 13.ix.1959 (D.J. Greathead) [DGC].

***Spogostylum isis* (Meigen) (Plate 13)**

*Anthrax isis* Meigen, 1820.- Syst. Besch., 2: 164. Type-locality: "Oesterreich".

*Anthrax subnotatum* walker, 1871.- Entomologist, 5: 262. Type-locality: Mount Sinai.

*Anthrax ixion* Meigen, 1820.- Syst. Besch., 2: 164, referring to Megerle's misidentification.

Additional description: Engel (1932-1937).

Global distribution: Algeria, Armenia, Austria, Belgium, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Libya, Morocco, Portugal, Saudi Arabia, Spain, Tunisia, Turkey, Yugoslavia.

Local distribution: Nile Valley and Delta; Eastern Desert; Gebel Elba and South Sinai.

This species is rather similar to *S. candidum* (Sack) but the white scales on three last tergites in *isis* are less extensive and less dense, and the aedeagus is almost as long as the aedeagal sheath.

Material examined: 1 male, Abu-Souer, 17.vi.1926 (Efflatoun); 1 female, Kirdassa, 10.vi.1925 (Efflatoun); 1 male, W. Gharagid, 20.ix.1926 (Efflatoun); 1 male, W. Um-Girfan, 22.iv.1927 (Efflatoun); 1 female, W. Zohleiga, 27.iii.1925 (Efflatoun) [ESC]. 1 male, W. El-Arbaein, 14.v.1996 (M. El-Hawagry); 3 males, 4 females, W. El-Arbaein, 21-25.v.1997 (M. El-Hawagry); 1 female, W. Telah, 4.v.1998 (M. El-Hawagry); 1 male, W. Isla, 30.viii.1998 (M. El-Hawagry) [MSHC].

Material examined outside Egypt: France: Pyrenees Orientale, Elne Plage, 23.viii.1980 (D.J. Greathead) [DGC].

***Spogostylum niphias* (Hermann)**

*Argyromoeba niphias* Hermann, 1907.- Z. syst. Hymenopt. Dipterol., 7: 194. Type-locality: Transkaspien.

Additional description: Engel (1932-1937).

Global distribution: Egypt, Israel, Oman, Saudi Arabia, Turkey, Turkmenistan; Eritrea, Mauritania, Somalia, Yemen; Pakistan.

Local distribution: Eastern Desert: near Cairo; Lower Nile Valley; South Sinai.

This species is rather very similar to *S. bisniphas* (Bezzi) but it is smaller and its head clothed exclusively with yellowish white hairs.

Material examined: 1 male, Barrage, 16.iv.1921 (Efflatoun); 1 female, Mallah East, 3.iv.1926 (Efflatoun); 1 male, W. Garawi, 6.v.1925 (Efflatoun) [ESC]. 1 female, barrage, 11.iv.1929 (Tawfik); 1 male, 1 female, W. Ibtadi, 30.iv.1925 (Efflatoun); 1 male, W. Shallalah, 30.iv.1943 (Efflatoun); 1 male, W. Um-Girfan, 22.iv.1927 (Efflatoun) [EFC]. 1 male, 1 female, Helwan, 6.vi.1997 (M. El-Hawagry) [NSHC].

***Spogostylum ocyale* (Wiedemann) (Plate 14)**

*Anthrax ocyale* Wiedemann, 1828.- Aussereurop. Zweifl. Ins. 1: 285. Type-locality: Sudan.

Addition description: Engel (1932-1937).

Global distribution: Egypt, Iran, Iraq, Israel, Libya, Oman, Saudi Arabia; Mauritania, Niger, Somalia, Sudan, Yemen.

Local distribution: North Coast; Eastern Desert; Western Desert; L. Nile Valley; North Sinai; South Sinai.

It is a large robust species distinguishable from *S. sordidum* (Sack) by the presence of dark spots on the wing but the membrane is clear, while in *S. sordidum* the entire wing membrane infuscated blackish-brown. Male genitalia are also different in the two species. Bezzi (1925) stated that *S. ocyale* was found in Egypt in July and August.

Material examined: 2 male, Arish, 25.viii.1951, 1 female, 23.viii.1951, 1.ix.1951 (Shafik); 1 male, Amria, 10.vii.1934; 1 male, Fayoum, 22.vi.1947, 1 male, 19.ix.1948 (Shafik); 1 female, Ghobbet El-Bous, 22.viii.1929, 1 male, Jun. 1930, 1 female, 18.vi.1931 (Efflatoun) [EFC]. 3 males, 3 females, Nuzha, 1.viii.1921 (Efflatoun); 1 male, Mex, 26.vi.1921 (Efflatoun); 1 female, Bergash, 16.vii.1925 (Efflatoun) [ESC]. 2 males, 2 females, Arish, 25.viii.1951; 1 female, Minya, 27.v.1965 (Rizk); 3 males, 3 females, Nuzha, 30.vii.1924 (Efflatoun); 1 male, Fayoum, 4.x.1962 [MAC]. 1 male, Helwan, 6.vi.1997 (M. El-Hawagry); 1 female, Salloum, 10.ix.1996 (M. El-Hawagry), 1 male, W. El-Natroun, 10.ix.1996 (M. El-Hawagry); 1 female, W. Hoff, 1.viii.1996 (M. El-Hawagry); 1 female, Zalaga (Isla), 30.viii.1996 (M. El-Hawagry) [MSHC].

***Spogostylum sordidum* (Sack) (Plate 15)**

*Spogostylum sordidum* Sack, 1909.- Abh. Senckenb. Naturforsch. Ges., 30: 514. Type-locality: Persien, Deck-I-Pabid (Iran).

*Spogostylum antiopa* Bezzi, 1925.- Bull. Soc. Ent. Egypte, 8(1924): 221. Type-locality: Amrieh, Mariout (Egypt) (Syn. Nov.)

Additional description: Engel (1932-1937).

Global distribution: Afghanistan, Egypt, Iran, Oman, Saudi Arabia, Tajikistan, Turkmenistan, Uzbekistan.

Local distribution: North Coast, From Mariout To Salloum & Eastern Desert, Near Cairo.

The type of *Spogostylum antiopa* was moved to the Entomological Society of Egypt (ESC) from the Ministry of Agriculture (MAC), it is in a good condition. This type was compared with some specimens of *sordidum* identified by Engel (almost Homeotypes) and others identified by John Bowden deposited in ESC and the two species were found identical.

Material examined: 1 male (type of *antiopa*), Mariout, 13.vii, 1914 (Efflatoun); 1 male, 2 females, Ein Moeileh, 12-14.vii.1938 (Efflatoun); 2 females. Mirsa Matrouh, 22-29.viii.1954; 1 female, Salloum, 11.viii.1926 (Efflatoun); 1 male, Arish, 25.viii.1951 (Shafik) [ESC]. 1 male, Nouzha, 30.vii.1924 (Frag); 1 female, W. Hoff, 18.viii.1925; 1 female, W. Digla, 30.ix.1928, 6.viii.1926 (Frag) [MAC].

***Spogostylum tripunctatum* (Wiedemann in Meigen) (Plate 18)**

*Anthrax tripunctata* Wiedemann in Meigen, 1820.- Syst. Besch., 2: 166. Type-locality: Aus der Taurischen halbinsel (Russia).

*Anthrax difficile* Wiedemann in Meigen, 1820.- Syst. Besch., 2: 167. Type-locality: Dalmatien (Croatia).

? *Spogostylum mystaceum* Macquart, 1840.- l.c.: 53. Type-locality: Egypt.

Additional description: Paramonov (1957).

Global distribution: Afghanistan, Algeria, Armenia, Austria, Bosnia, Croatia, Egypt, France, Greece, Israel, Italy, Libya, Malta, Morocco, Russia, Spain, Syria, Turkey, Turkmenistan, Ukraine.

Local distribution: South Sinai; Fayoum; Lower Nile Valley; Upper Nile Valley.

Material examined outside Egypt: Turkey: 55 km N Izmir, 3.vi.1984 (E. Huttinger) [DGC]. Austria & Greece [OXC].

***Spogostylum ventrale* (Bezzi) (Plate 16) [New record from the Egypt]**

*Spogostylum ventrale* Bezzi, 1924- the Bombyliidae of the Ethiopian region: 174. Type-localities: Kenya and Ethiopia.

Global distribution: Egypt, Oman; Eritrea, Ethiopia, Kenya, Yemen.

Local distribution: South Sinai: W. El-Arbaein.

Only one male specimen of this species has been collected from South Sinai, its identification was confirmed by Dr. Greathead. The present species is rather similar to *Spogostylum isis* (Meigen) or *Spogostylum incisurale* (Macquart) but it has more of the legs than just the tibiae pale, and more yellowish brown scales on the dorsal surface (in *isis* they are few or absent); moreover, in *ventrale*, aedeagus is broader and abdomen with tufts of flattened black or dark brown hairs on sides of 2<sup>nd</sup> and 4<sup>th</sup> tergites.

***Spogostylum volitans* (Wiedemann)**

*Anthrax volitans* Wiedemann, 1828.- Aussereurop. Zweifl. Insekt., 1: 566.

Type-localities: Sudan and Egypt.

Distribution: Egypt and Sudan

No specimens representing this species are found in the Egyptian collections. One or two syntypes are preserved in Vienna museum. I could not verify any specimens of this species. Wiedemann said that this species is similar to *Anthrax leucogaster*.

**The unpublished anthracine species of Eflatoun Bey**

The proposed types of these species are preserved in Entomological Society collection (ESC). Eflatoun described all of them under the genus *Anthrax* Scopoli (sensu lato), but we found that only one species of them belongs to genus *Anthrax* (sensu stricto), while the others (3 species) indeed belong to genus *Spogostylum* Macquart. The four species are coded with numbers and very short information is given for each as follows:

***Anthrax* sp. (no. 1)**: Only two males of this species are preserved in ESC. They have been found identical with *Anthrax aygulus* Fabricius but the spot on base of R<sub>4</sub> is inconspicuous and pale brownish. They were collected from Gebel Elba (Wadi Edeib) in the same locality as *aygulus*, in the end of January 1933.

***Spogostylum* sp. (no. 2)**: Only one female (holotype) of this species is preserved in ESC. It is very large robust, bulky rusty-black fly. The present authors think that this specimen is merely a specimen of *Spogostylum ocyale* Wiedemann, but it has some slight differences as slightly

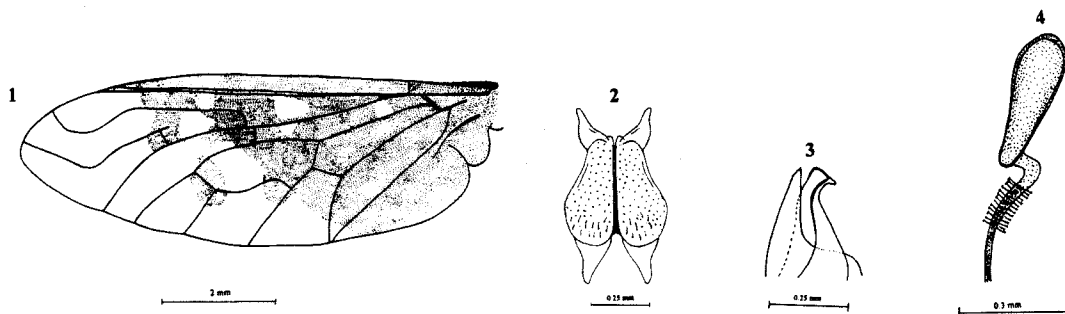
infuscated wing and clay-colored head and thorax. This specimen was captured in the garden belonging to St. Katherine monastery in Wadi Feiran, about half way between the Red sea and monastery, on 25<sup>th</sup> June 1936.

***Spogostylum* sp. (no. 3):** Twenty specimens (8 males and 12 females, including the types) were captured in Wadi El-Rabba, near St. Catherine monastery, in April 1940 and one very large female was collected in wadi El-Arbaein, St. Catherine, in the end of August 1940. They are medium sized to rather large gray and blackish flies, closely allied to *Spogostylum tripunctatum* (Wiedemann in Meigen). They are distinguished by the almost entire absence of design on the feebly but distinctly smoky gray wings which are usually devoid of spots or if the latter are present appearing at most blurred and confluent, present only on the basal half, as well as by the different arrangement of the white scales on dorsum of abdomen, particularly on the three or four keel-shaped (in male) apical tergites and on which the erect hairs are mainly pale brownish or yellowish.

***Spogostylum* sp. (no. 4):** Six males and eight females of this species, including the types, were collected in the wadies near St. Catherine monastery (South Sinai), between June and middle of September 1940-1943 by Efflatoun Bey. Mr. Mostafa Rizk (Entomology Department, Ain Shams University) captured a female specimen of this species from inside a room in the Environmental Research Center in St. Catherine City. These flies are medium-sized gray and black, closely allied to *Spogostylum tripunctatum* (Wiedemann in Meigen), possessing a series of narrow transverse bands of white scales on dorsum of abdomen and with the feebly smoky wings bearing a fourth smaller but always more or less evident mummy-brown fleck on the rectangular base of R<sub>4</sub> which usually does not possess a recurrent appendix in R<sub>3</sub> cell, in addition to the three spots always found in *tripunctatum* and closely allied forms.

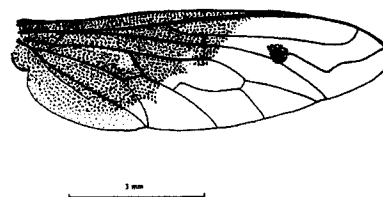
#### Acknowledgments

We are grateful to Dr. David Greathead (Imperial College, Silwood Park, Ascot, UK), Dr. Neale Evenhuis (Bishop Museum, Hawaii, USA) and Dr. Adrian Pont (Hope Museum, Oxford, UK) for the kind help they offered throughout this study.

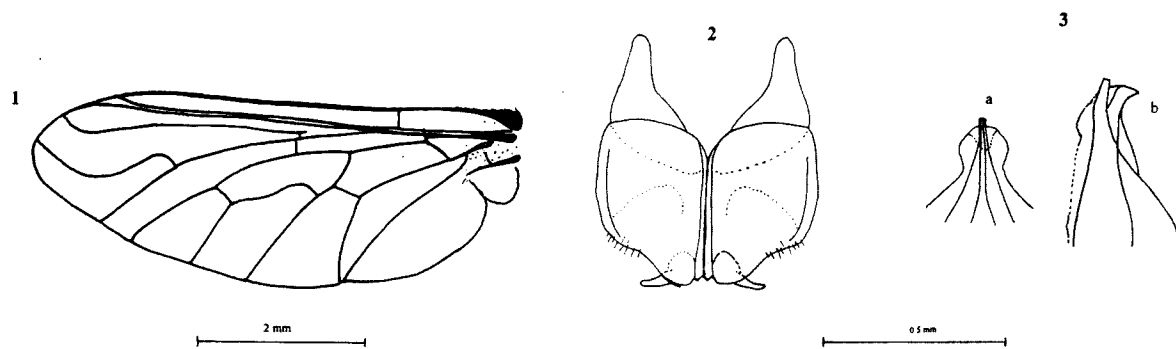


**Plate 1:** *Anthrax aethiops bezzii* Paramonov; 1, wing; 2, gonocoxite; 3, aedeagus (lateral view); 4, spermatheca.

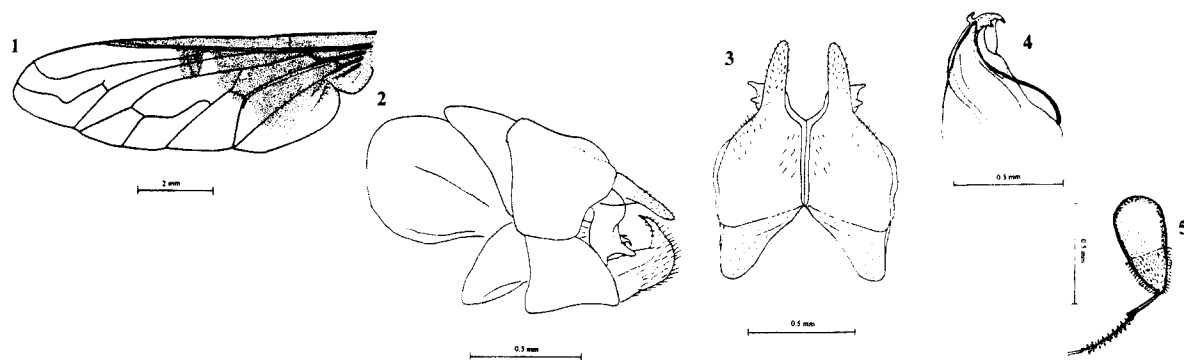
**Plate 2:** *Anthrax aygulus* Fabricius; wing



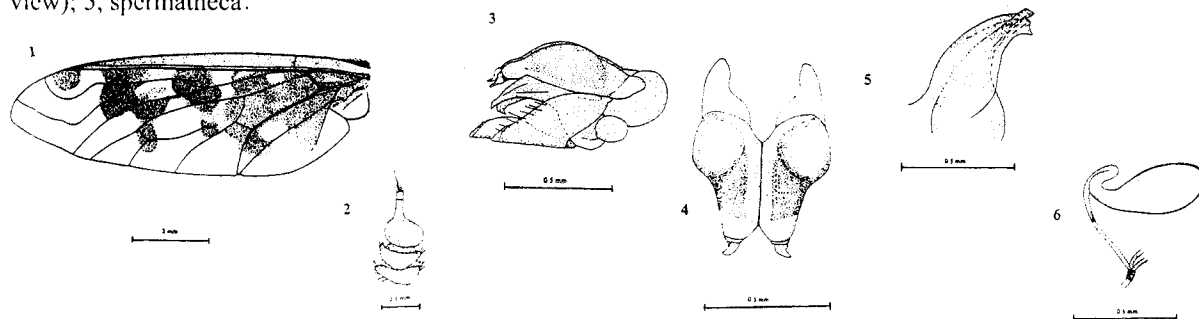




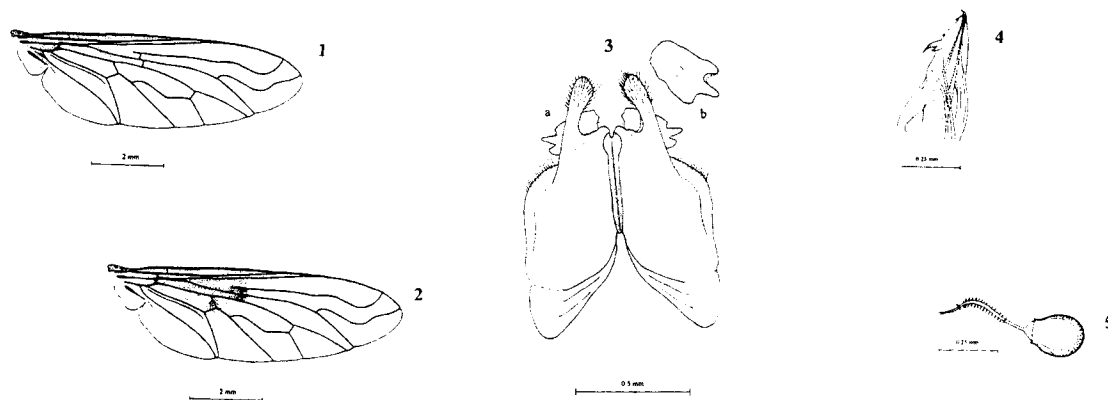
**Plate 3:** *Anthrax chionanthrax* (Bezzi); 1, wing; 2, gonocoxite; 3, a, aedeagus (dorsal tip) b, aedeagus (lateral)



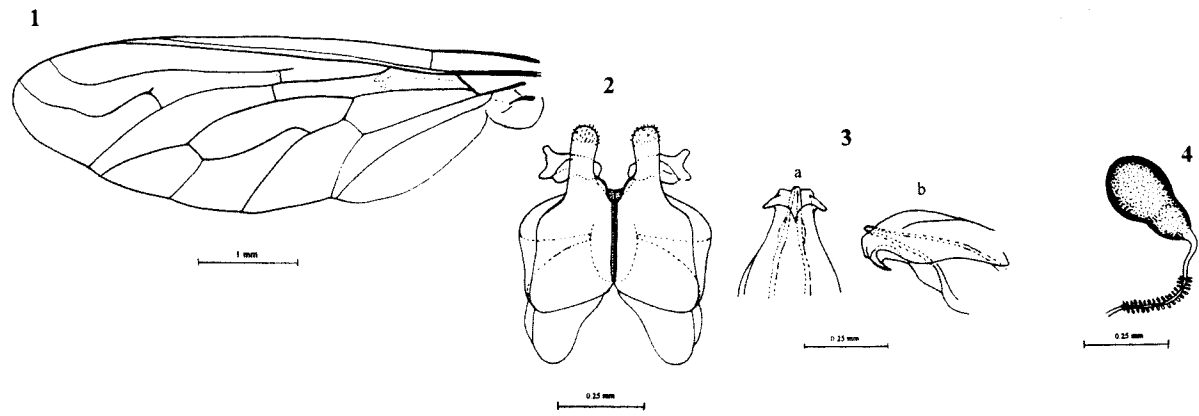
**Plate 4:** *Anthrax dentatus* (Becker); 1, wing; 2, male genitalia (lateral view); 3, gonocoxite; 4, aedeagus (lateral view); 5, spermatheca.



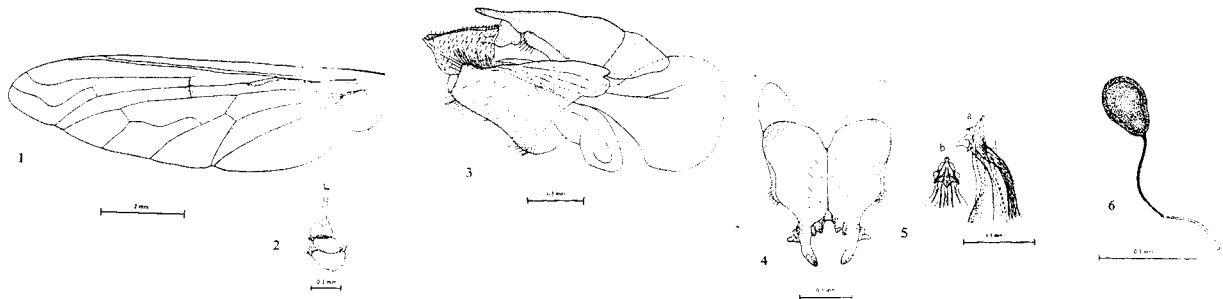
**Plate 5:** *Anthrax greatheadi* El-Hawagry; 1, wing; 2, antenna; 3, male genitalia (lateral view); 4, gonocoxites; 5, aedeagus (lateral view); 6, spermatheca.



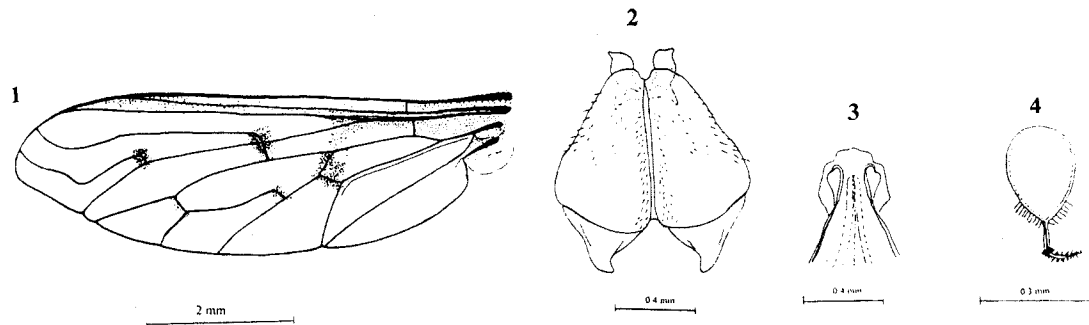
**Plate 6:** *Anthrax lucidus* (Becker); 1, wing of male; 2, wing of female; 3, a, gonocoxite, b, gonostylus; 4, aedeagus (lateral tip); 5, spermatheca.



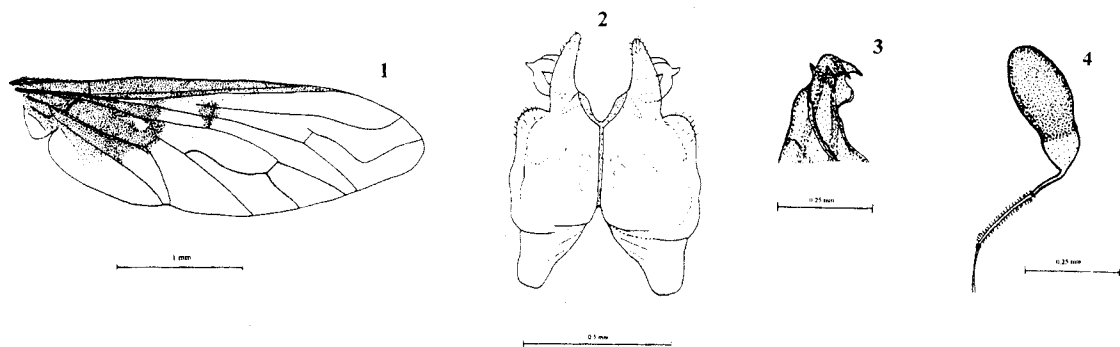
**Plate 7:** *Anthrax melanista* (Bezzi); 1, wing; 2, gonocoxite; 3, aedeagus (a, dorsal tip, b, lateral tip); 4, spermatheca.



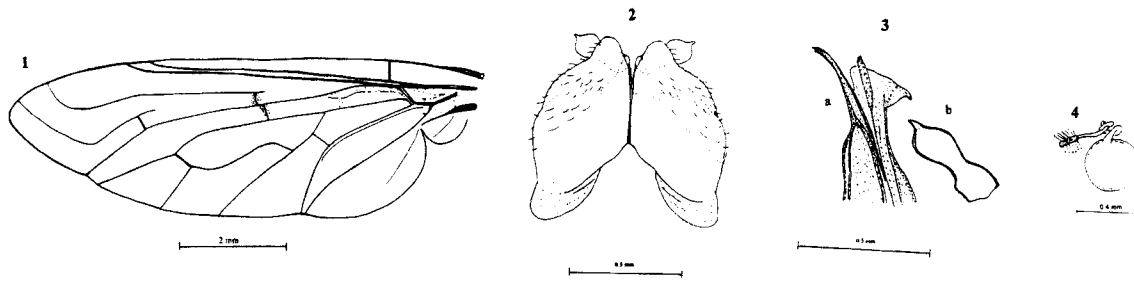
**Plate 8:** *Anthrax moursyi* El-Hawagry; 1, wing; 2, antenna; 3, male genitalia (lateral view); 4, gonocoxites; 5, aedeagus (a, lateral view, b, dorsal tip); 6, spermatheca.



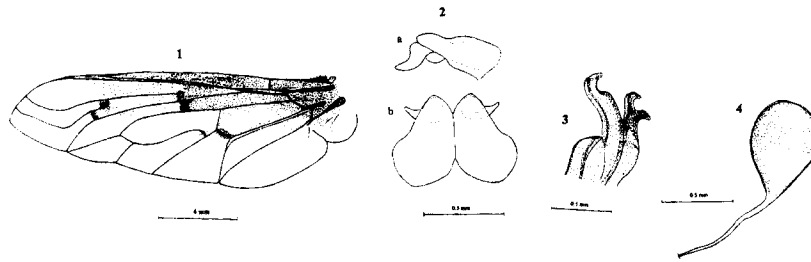
**Plate 9:** *Anthrax sticticus* Klug; 1, wing; 2, gonocoxite; 3, tip of aedeagus; 4, spermatheca.



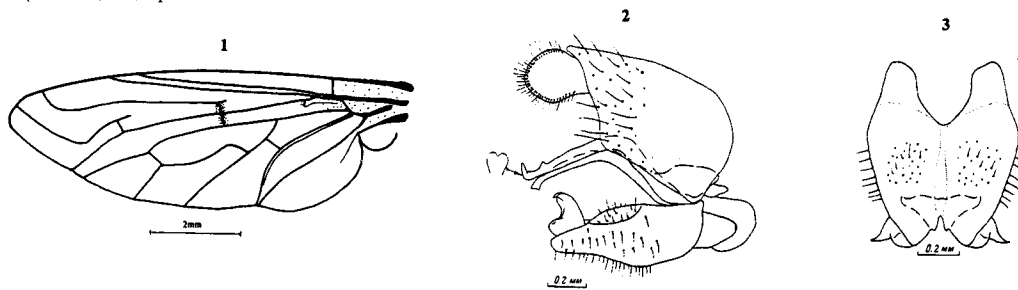
**Plate 10:** *Anthrax trifasciatus* Meigen; 1, wing; 2, gonocoxite; 3, lateral tip of aedeagus; 4, spermatheca.



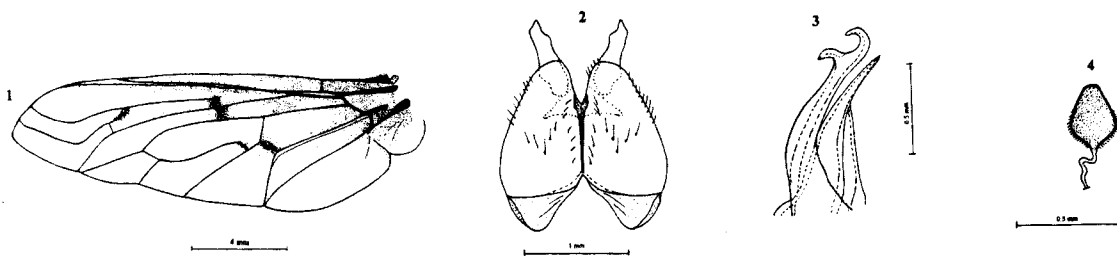
**Plate 11:** *Spogostylum candidum* (Sack); 1, wing; 2, gonocoxites; 3, a, aedeagus (lateral), b, gonostylus; 4, spermatheca.



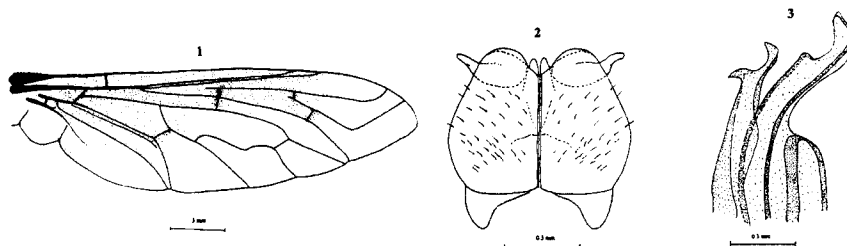
**Plate 12:** *Spogostylum griseipenne* (Macquart); 1, wing; 2, gonocoxites (a, lateral view, b, dorsal view); 3, aedeagus (lateral); 4, spermatheca.



**Plate 13:** *Spogostylum isis* (Meigen); 1, wing; 2, male genitalia; 3, gonocoxites (after Zaitsev 1966).



**Plate 14:** *Spogostylum ocyale* (Wiedemann); 1, wing; 2, gonocoxites; 3, aedeagus (lateral); 4, spermatheca.



**Plate 15:** *Spogostylum sordidum* (Sack), 1, wing; 2, gonocoxites; 3, aedeagus (lateral)

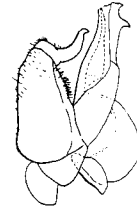


Plate 16: *Spogostylum ventrale* (Bezzi), male genitalia (after Greathead 1967)

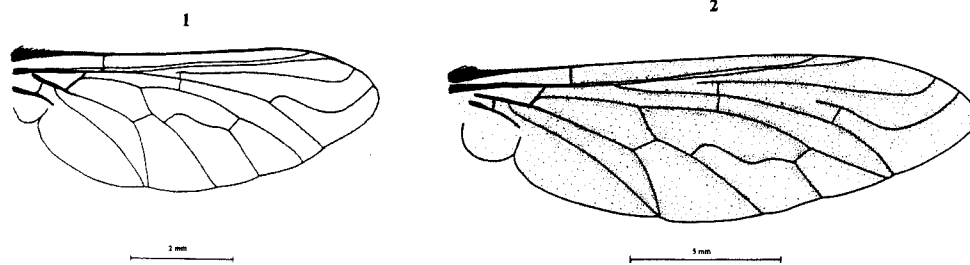


Plate 17: Wings; 1, *Spogostylum bisniphas* (Bezzi); 2, *Spogostylum hippolyta* (Wiedemann)

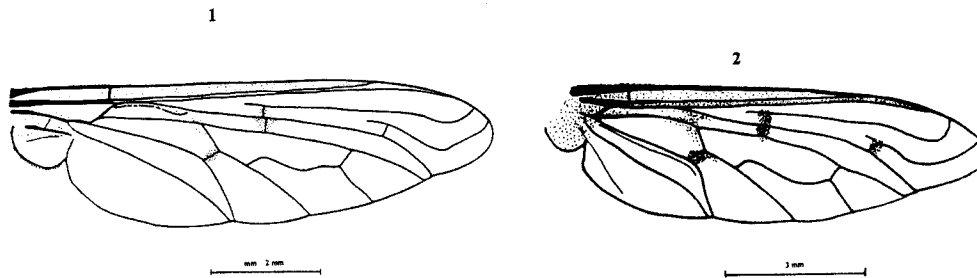


Plate 18: Wings; 1, *Spogostylum incisurale* (Macquart); 2, *Spogostylum tripunctatum* (Wiedemann)

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### الملخص العربي

#### قبيلة أنثراسيني لاترياللي (فصيلة ذباب النحل – رتبة ثنائية الأجنحة) في مصر

مجدى الحواجري<sup>1</sup> ، على على المرسى<sup>1</sup> ، فرانسيس جليبرت<sup>2</sup> ، سامى زلط<sup>3</sup>

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أوضحت الدراسة أن قبيلة أنثراسيني والتابعة لفصيلة ذباب النحل (بومبيليدي- رتبة ثنائية الأجنحة) في مصر تشمل عدد 2 جنس (أنثراكس وسبوجوستاليم) وحوالي 31 نوع ونوع، تم عمل المفاتيح التصنيفية الكاملة لتلك الأجناس والأنواع المختلفة طبقاً لأحدث الأوضاع التصنيفية لهم. شملت الدراسة أيضاً إضافة مرادفات جديدة لبعض الأنواع، وتركيبات تصنيفية في الأسماء تعتبر جديدة، وأيضاً تم إضافة عدد من الأنواع الجديدة إلى الفونة الحشرية المصرية، كذلك تم تحديد عدد من الأنماط التصنيفية المتميزة والتي تم حفظها في مجموعة الجمعية المصرية لعلم الحشرات، وكذلك بيان أماكن تواجد الأنماط التصنيفية العالمية لهذه المجموعة. أيضاً تم وصف عدد أربعة أنواع من العينات التي جمعها أفلاطون بيه في السابق والعينات محفوظة بمجموعة جامعة القاهرة. بالإضافة إلى ما سبق فقد تم تناول التوزيع المحلي والعالمي لكل نوع من أنواع ذباب النحل في مصر.