The bee flies (Diptera: Bombyliidae) of Jordan

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Abstract: Weekly field trips to collect bee flies were conducted from October 2001 to November 2002. More than 870 specimens from 72 localities were collected. Specimens of Bombyliidae collected previously from Jordan and preserved in the University of Jordan Insects Museum as well as other Jordanian collections were also studied. The specimens were found to belong to 132 species in 41 genera and eight subfamilies. Of these, 124 species are recorded for the first time. The number of specimens examined and collecting sites and dates in Jordan is provided for each species followed by remarks.

Key words: bee flies, Bombyliidae, Jordan.

Introduction

Bombyliidae or bee flies are world wide in distribution. Nearly 4500 species are known, distributed among 16 subfamilies (EVENHUIS & GREATHEAD 1999).

Many bee flies can be recognised by their woolly covering of hairs and their long snout up to 10 mm (BODENHEIMER 1935). They have attractively patterned wings and brightly coloured bodies. They are more abundant in arid and semi arid regions (HULL 1973). They are mostly medium to large insects (1-20 mm). The adults are mostly strong fliers, except for small or minute species and Usiinae, which are encountered resting inside flowers (GREATHEAD & EVENHUIS 1997).

Adult bee flies are often the major pollinators of many flowering plants, especially those occurring in the more desertic regions of our planet. Recent studies have shown that some plants depend on bee flies for pollination so that the survival of some endangered plant species may depend on preserving their bee flies pollinators (EVENHUIS & GREATHEAD 1999). Immatures are parasitoids or hyperparasitoids on several orders of insects such as Lepidoptera, Orthoptera, Hymenoptera, Diptera, Coleoptera, Neuroptera and Blattaria (DU MERLE 1975, YEATES & GREATHEAD 1997). Some species are important as natural enemies of major pests including locust, grasshoppers, armyworms, nettle caterpillars and tsetse flies. Others develop in nests of solitary wasps and bees, and they are occasionally considered to be pests when they kill the larvae of bees being bred as pollinators for crops such as alfalfa in United States (EVENHUIS & GREATHEAD 1999).

There are no known publications on the Bombyliidae of Jordan except that of (EVENHUIS & GREATHEAD 1999) who listed the following 14 species; *Anastoechus exalbidus* (WIEDEMANN), *A. nivifrons* WALKER, *A. trisignatus* (PORTSCHINSKY), *Bombylisoma flavibarbum* LOEW, *Bombylius aregentifacies* AUSTEN, *Chalcochiton argyrocephalus* MACQUART, *Cytherea aureus* FABRICIUS, *C. albolineata* BEZZI, *C. barbara* SACK, *C. delicata* (BECKER), *C. dispar* (LOEW), *C. nucleorum* (BECKER), *Spogostylum ocyale* (WIEDEMANN), *Caecanthrax arabicus* (MACQUART). However, several studies were conducted on the Bombyliidae of the Middle East. From Palestine, BODENHEIMER (1937) listed 72 species in 4 subfamilies. AUSTEN (1937) recorded 128 species in 31 genera and provided keys to subfamilies, genera and species in addition to the description of some new species. Many new records, including new species, were published by ZAITZEV (1995, 1996, 1997, 1998, 1999). From Arabia, GREAT-

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Table 1: Collecting sites and their coordinates

Coordinate	Collecting sites	Coordinate	Collecting sites
32°14'N-35°48'E	Dibbin	32°03'N-35°52'E	Abu Nusayr
32°08'N-35°45'E	Eastern Bayudah	29°37'N-35°33'E	Ad Disah
31°23'N-35°40'E	Faqu'a	32°18'N-35°43'E	Ajlun
31°02'N-35°28'E	Ghawr As Safi	32°40'N-35°37'E	Al Adasiyah
32°05'N-35°39'E	Hummrit As Sahin	32°07'N-35°39'E	Al Aridah
31°59'N-35°41'E	Ira	31°52'N-36°50'E	Al Azraq
32°33'N-35°51'E	Irbid	31°26'N-35°41'E	Al Badhiyah
32°17'N-35°54'E	Jarash	31°53'N-35°46'E	Al Bahhath
32°36'N-35°43'E	Kafr Asad	32°04'N-35°51'E	Al Baqa'a
32°04'N-35°42'E	Kafr Huda	32°38'N-35°43'E	Al Baqurah
32°22'N-35°55'E	Kafr Khal	32°03'N-37°08'E	Al Buqei'wiya
32°12'N-35°36'E	King Talal Dam	32°01'N-35°46'E	Al Fuhays
32°18'N-35°42'E	Kufrinjah	30°59'N-35°24'E	Al Ghawr
32°16'N-35°36'E	Kurayyimah	32°29'N-35°52'E	Al Husson
31°41'N-35°42'E	Ma'ain	32°01'N-35°52'E	Al Jubayhah
30°12'N-35°44'E	Ma'an	31°52'N-35°38'E	Al Kafrayn
31°43'N-35°48'E	Madaba	32°12'N-35°41'E	Al Karak
31°59'N-35°45'E	Mahis	32°21'N-36°12'E	Al Mafraq
31°59'N-35°59'E	Marka	32°42'N-35°41'E	Al Mukhaybah al Fawqa
32°39'N-35°48'E	Muzyrib	32°39'N-35°40'E	Al Mukhaybah at Tahta
32°17'N-35°50'E	Nahlah	31°48'N-35°47'E	Al Mushaqqar
31°52'N-35°50'E	Na'or	31°46'N-36°13'E	Al Muwaqqar
30°19'N-35°29'E	Petra	31°39'N-35°43'E	Al Wala
32°14'N-35°42'E	Rajib	31°57'N-35°56'E	Amman
30°57'N-35°37'E	Rihab	31°16'N-35°40'E	Ar Rabbah
29°35'N-35°26'E	Rum	32°30'N-36°04'E	Ar Ramtha
32°11'N-35°37'E	Ruwayhat al Ghawr	32°06'N-35°47'E	Ar Rumaymin
32°27'N-36°14'E	Sama As Sarhan	32°09'N-35°49'E	Ar Rumman
31°59'N-35°59'E	Sayl Az Zarqa	30°41'N-35°34'E	Ar Rummanah
32°02'N-35°50'E	Suwaylih	32°11'N-37°06'E	As Safawi
31°46'N-35°36'E	Suwaymah	32°03'N-35°44'E	As Salt
32°27'N-35°37'E	Tabaqt fahl	32°35'N-35°59'E	Ash Shajarah
32°39'N-35°40'E	Um Qays	30°30'N-35°31'E	Ash Shawbak
32°30'N-37°17'E	Wadi al Hashad	31°50'N-36°49'E	Ash Shumary Reserve
31°51'N-36°48'E	Wadi ar Ratam	31°54'N-35°38'E	Ash Shunah
32°23'N-35°35'E	Wadi al Yabis	32°08'N-36°04'E	As Sukhnah
31°57'N-35°49'E	Wadi as Sir	30°50'N-35°36'E	At Tafilah
31°10'N-35°32'E	Wadi Marsad	32°36'N-35°56'E	Ayn Almuallaqah
32°01'N-35°35'E	Wadi Shu'ayb	32°43'N-35°47'E	Ayn Aqraba
31°24'N-35°43'E	Wadi Shuqayq	32°35'N-35°57'E	Ayn esh Shallaleh
32°10'N-35°43'E	Western Bayudah	32°05'N-36°06'E	Az Zarqa
32°01'N-36°00'E	Yajuz	31°12'N-35°40'E	Badhan
31°59'N-35°42'E	Yarqa	32°26'N-35°44'E	Birqish
32°31'N-35°50'E	Zabdah	30°41'N-35°37'E	Dana
32°33'N-35°48'E	Zahar	32°15'N-36°49'E	Dayr al Kahf
32°06'N-35°45'E	Zai	32°05'N-35°36'E	Dayr Alla
32°26'N-35°46'E	Zubiya	31°36'N-35°33'E	Dead Sea

HEAD (1980b) recorded 118 species, 13 of them were new to science. In 1988, he added 29 species and 2 subspecies; two of them were described as new species. In addition, he provided identification keys to subfamilies, genera and species. AL-HOUTY (1989) listed 13 species from Al-Kuwait. From Egypt, EL-HAWAGRY (1998) described two new species of *Anthrax*, in (2001) he recorded four species of *Xeramoeba*, one species of them was new to science (EL-HAWAGRY 2001) and in 2002 he described three new species (EL-HAWAGRY 2002). EL-HAWAGRY et al. (2000) recorded 31 species of Anthracinae; two species of them were described as new species to science. From Oman, GREATHEAD (1980a) recorded 38 species including a new genus and 4 new species.

Since there are no known studies about the Bombyliidae of Jordan, this study was conducted to identify species collected previously from Jordan and kept in the University of Jordan Insect Museum (UJIM) and other available specimens in Jordanian collections. Additional specimens were collected for one year from different parts in Jordan by conducting weekly or biweekly field trips. This paper is based on an article which is going to be published in the journal Zootaxa.

Materials and Methods

Weekly field trips were conducted to different locations in Jordan from October 2001 to November 2002. Adult bee flies were collected by sweeping nets. In addition to the collected specimens, additional materials of Bombyliidae were examined from three Jordanian collections: Al Al-Bayt University Collection, Al Balqa'a Applied University Collection, and Natural History Museum at Al Yarmouk University. The first two museums contained specimens collected previously by Prof. Ahmad Katbeh and his team, while the last collection was collected by Mr. Suhail Ismael, the museum curator.

All the collected specimens were kept in the UJIM. Some specimens were kept in Dr. Greathead's collection, Imperial College, London, who helped in the identification or confirmation of identified species. The distribution of species in Jordan is mentioned in the material examined section for each species. Localities are presented in alphabetical order. Names of sites were according to Gazetteer of Jordan (ANONYMUS 1990). The sites and their coordinates are given in Table 1. Dates within each locality are

arranged chronologically. The number of specimens examined or collected is given between brackets after the dates. Unless otherwise mentioned, the specimens are deposited at the UJIM.

Results

Species List

The following 132 species of Bombyliidae are recorded in this study. These belong to 41 genera in 8 subfamilies.

Subfamily Usiinae Becker

Tribe Apolysini Evenhuis

Apolysis sp. 1

Tribe Usiini Becker

Usia ignorata Becker 1906
Usia aenea (Rossi 1794)
Usia bicolor Macquart 1855
Parageron gratus (Loew 1856)
Parageron sp. 1
Parageron sp. 2

Subfamily Toxophorinae Schiner

Tribe Toxophorini Schiner

Toxophora fasciculata (Villersi 1789)

Tribe Gerontini Hesse

Geron mystacinus Bezzi 1924
Geron olivieri Macquart 1840
Geron erythropus Bezzi 1925
Geron smirnovi Zaitzev 1978
Geron krymensis Paramonov 1929

Subfamily Phthiriinae Becker

Tribe Phthiriini Becker

Phthiria sp. 1

Subfamily Bombyliinae Latreille

Tribe Conophorini Becker

Conophorus glaucescens (Loew 1863)
Conophorus nobilis (Loew 1873)
Legnotomyia trichorhoea (Loew 1855)
Legnotomyia cineracea Austen 1937

Tribe Bombyliini Latreille

Systoechus longirostris Becker 1916
Bombylella atra (Scopoli 1763)
Bombylella simulans (Austen 1937)
Bombomyia discoidea (Fabricius 1794)
Bombomyia stictica (Fabricius 1794)
Bombylius fuscus Fabricius 1781
Bombylius medius Linnaeus 1758
Bombylius trichurus Pallas 1818
Bombylius fimbriatus Meigen 1820
Bombylius major Linnaeus 1758
Bombylius modestus Loew 1873
Bombylius pumilus Meigen 1820
Bombylius fulvescens Wiedemann 1820
Bombylius canescens Mikan 1796
Bombylius mendax Austen 1937
Bombylius cinerascens Mikan 1796
Bombylius posticus Fabricius 1805.
Bombylius (Zephyrectes) quadrifarius Loew 1855
Dischistus syriacus (Villeneuve 1912)
Neobombylodes giganteus (Villeneuve 1920)
Anastoechus trisignatus (Portschinsky 1881)
Anastoechus bahirae Becker 1915
Anastoechus nitidulus (Fabricius 1794)
Anastoechus exalbidus (Wiedemann 1820)

Subfamily Ecliminae Hall

Eclimus gracilis Loew 1844

Subfamily Cythereinae Becker

Callostoma fascipenne Macquart 1840
Cytherea obscura Fabricius 1794
Cytherea aureus Fabricius 1794
Cytherea fenestrata (Loew 1873)
Cytherea nucleorum (Becker 1902)
Cytherea delicata (Becker 1906)
Cytherea dispar (Loew 1873)
Chalcochiton speciosus (Loew 1844)
Chalcochiton pallasi (Loew 1856)
Chalcochiton syriacus (Loew 1869)
Amictus obliquenotatus Austen 1937
Amictus validus Loew 1869
Amictus sp. near *tigrinus* Austen 1937
Amictus sp. near *zinamominus* Becker 1906
Amictus virgatus Austen 1937
Amictus sp. near *pictus* Loew 1869

Subfamily Lomatiinae Schiner

Tribe lomatiini Schiner

Lomatia abbreviata Villeneuve 1911
Lomatia polyzona Loew 1869
Lomatia tysiphone Loew 1860

Subfamily Anthracinae Latreille

Tribe Aphoebantini Becker

Cononedys stenura (Loew 1871)
Cononedys inornata (Greathead 1967)

Tribe Prorostomatini Hull

Stomylomyia europaea (Loew 1869)
Plesiocera algira Macquart 1840

Tribe Xeramoebini Hull

Desmatoneura sp. 1
Xeramoeba semirufa (Sack 1909)
Xeramoeba sabulonis (Becker 1906)
Xeramoeba salwae El Hawagry 2001
Petrorossia hespera (Rossi 1790)
Petrorossia letho (Wiedemann 1828)
Petrorossia albula Zaitzev 1962
Pipunculopsis stackelbergi Zaitzev 2000
Pipunculopsis sp. 1

Tribe Anthracini Latreille

Spogostylum sordidum Sack 1909
Spogostylum ocyale (Wiedemann 1828)
Spogostylum griseipenne (Macquart 1850)
Spogostylum sp. 1
Spogostylum nitidum Austen 1937
Spogostylum perpusillum Austen 1937
Spogostylum candidum (Sack 1909)
Spogostylum isis (Meigen 1820)
Anthrax virgo Egger 1859
Anthrax dentata (Becker 1906)
Anthrax aethiops (Fabricius 1781)
Anthrax greatheadi El Hawagry 1998
Anthrax sticticus Klug 1832
Anthrax niger (Austen 1937)
Anthrax candidapex (Austen 1937)

Tribe Villini Hull

Oestranthrax brunnescens (Loew 1857)
Oestranthrax sp. near *alfierii* Paramonov 1931
Oestranthrax sp. near *pallifrons* Bezzi 1926
Villa ixion (Fabricius 1794)
Villa sp. near *laevis* Becker 1915
Villa insignis Austen 1937
Villa atricauda Austen 1937
Villa sp. near *stenozona* (Loew 1869)
Villa niphobleta (Loew 1869)
Villa bivirgata Austen 1937
Villa sp. 1
Villa fasciculata Becker 1916
Hemipenthes velutina (Meigen 1820)
Caecanthrax arabicus (Macquart 1840)
Thyridanthrax lotus (Loew 1869)
Thyridanthrax perspicillaris ssp. *perspicillaris* (Loew 1869)
Thyridanthrax perspicillaris ssp. *idolus* Hesse 1956
Thyridanthrax polyphemus (Wiedemann 1819)
Thyridanthrax sp. near *griseolus* (Klug 1832)
Thyridanthrax incanus (Klug 1832)
Thyridanthrax elegans (Wiedemann 1818)
Pachyanthrax fulvifacies (Austen 1937)
Pachyanthrax telamon (Loew 1869)
? *Pachyanthrax nimrodicus* Zaitzev 1998
Exhyalanthrax afer (Fabricius 1794)
Exhyalanthrax melanchlaenus (Loew 1869)
Exhyalanthrax contrarius (Becker 1916)
Exhyalanthrax muscarius (Pallas 1818)
Veribubo anus (Wiedemann 1828)
Veribubo saffra Greathead 1981
Veribubo misellus (Loew 1869)

Tribe Exoprosopini Becker

Micomitra iris (Loew 1869)
Micomitra sp. near *chrystallina* (Bezzi 1924)
Heteralonia (*Zygodipla*) *singularis* (Macquart 1840)
Heteralonia (*Zygodipla*) *bagdadensis* (Macquart 1840)
Heteralonia (*Zygodipla*) *hermani* (Francois 1967)
Heteralonia (*Zygodipla*) *mucorea* (Klug 1832)
Heteralonia (*Acrodisca*) *suffusa* (Klug 1832)
Heteralonia (*Homolonia*) *megerlei* (Meigen 1820)
Exoprosopa pandora (Fabricius 1805)
Exoprosopa minos (Meigen 1804)
Exoprosopa rivularis (Meigen 1818)
Exoprosopa sp. near *pusilla* Macquart 1840

Subfamily Usiinae

Tribe Apolysini Evenhuis

Apolysis sp. 1 (Fig. 1a)

Material: One specimen: Ayn Aqraba 25.III.02 (1 ♀). Sweeping vegetation.

Apolysis is poorly known genus and more material of both sexes is required for identification. Our specimen is black.

Tribe Usiini Becker

Usia ignorata Becker 1906 (Fig. 1b)

Material: 34 specimens: Al Aridah 4.III.02 (6♂♂+6 ♀♀) from Pink Flax flowers; Dayr Alla

18.II.02 (5 ♀♀), 21.II.90 (1 ♀), 27.III.02 (7 ♀♀ +7♂♂); Sayl Al Karak 1.IV.02 (1 ♀); Tabaqt fahl 7.III.84 (1♂).

Distribution: Afrotropical: Sudan. Palaearctic: Algeria, Egypt, Palestine, Morocco, Spain, Syria, and Tunisia.

Usia ignorata is small black shiny bee fly. It appears to be common in Jordan Valley. Many specimens were collected from the flowers of Pink Flax, *Linum pubescens* BANKS & SOL (Linaceae).

Usia aenea (ROSSI 1794) (Fig. 1c)

Material: 140 specimens: Al Aridah 4.III.02 (10 ♀♀ +2♂♂), from Pink Flax flowers; Al Jubayhah 26.III.94 (1 ♀); 3.IV.88 (1 ♀); Al Mukhybah Al Fawqa 9.III.02 (37 ♀♀ +48♂♂), 11.III.02 (2 ♀♀), from Pink and Blue Flax flowers; Al Mukhybah At Tahta 11.III.02 (2 ♀♀ +3♂♂), from Pink Flax flowers; Aqraba 25.III.02 (4 ♀♀ +4♂♂), Ar Rumman 11.IV.88 (1 ♀), 6.V.02 (1♂); As Salt 13.IV.02 (1 ♀ +12♂♂), 16.IV.02 (4 ♀♀ +5♂♂), from Pink Flax flowers; Irbid 25.III.02 (1 ♀); Wadi Shu'ayb 28.I.95 (1 ♀).

Distribution: Palaearctic: Algeria, Austria, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Iran, Italy, Morocco, Portugal, Slovakia, Slovenia, Spain, Switzerland, Turkey.

It is common in the highlands and Jordan Valley. Many specimens were picked by hand from the flowers of Pink Flax, *Linum pubescens* BANKS & SOL. at sunset in As Salt. It was also collected from Blue Flax, *Linum peyronii* POST (Linaceae).

Usia bicolor MACQUART 1855 (Fig. 1d)

Material: 64 specimens: Aira 21.III.94 (1 ♀); Al Jubayhah 25.IV.96 (1 ♀); Al Mukhybah Al Fawqa 9.III.02 (2 ♀♀ +3♂♂); Al Mukhybah At Tahta 11.III.02 (1♂+1 ♀); Ayn Aqraba 25.III.02 (2 ♀♀ +2♂♂); Ar Rumman 6.V.02 (1♂); As Salt 13.IV.02 (30 ♀♀ +14♂♂); 16.IV.02 (3 ♀♀ + 2♂♂); Zai 1.V.93 (1♂).

Distribution: Palaearctic: Bosnia-Hercegovina, Croatia, Egypt, Greece, Italy, Kyrgyz Republic, Lebanon, Palestine, Slovenia, Syria, Tajikistan, Turkey, Turkmenistan, Uzbekistan, Yugoslavia.

It is a common species of this genus coexisting with other two species in the highland and Jordan Valley. It is the smallest species among Jordanian Bombyliidae (1,7-3,5 mm). Many specimens were picked by hand from the flowers of Pink Flax, *Linum pubescens* BANKS & SOL. at sunset in As Salt and from Blue flax *Linum peyronii* POST.

Parageron gratus (LOEW 1856) (Fig. 1e)

Material: 42 specimens: Al Jubayhah 7.III.81 (2♂♂+3 ♀♀); Al Mafraq 19.III.01 (1 ♀); Dayr Alla 18.II.02 (4 ♀♀), 4.III.02 (17 ♀♀), 27.III.02 (15 ♀♀).

Distribution: Palaearctic: Canary Is, Egypt, Italy, Morocco, Spain.

It appears to be a common beefly. It was collected from the flowers of Palestine chamomile, *Anthemis palestina* REUT. (Compositae) and Poppy *Papaver syriacum* BOISS. & BLANCHE (Papaveraceae). Colour of mesonotum of available specimens is usually with 2 black stripes or may be entirely black.

Parageron sp. 1 (Fig. 1f)

Material: One specimen: Al Jubayhah 7.III.81 (1♂).

Our 4 mm long specimen differs from *P. gratus* by having the eyes in contact for the length of ocellar tubercle (less than the length in *P. gratus*), black hair fringe behind eyes (white in *P. gratus*), broad black stripes on mesonotum (narrow in *P. gratus*). Other characters are similar to *P. gratus*.

Parageron sp. 2 (Fig. 1g)

Material: One specimen: Al Aridah 4.III.02 (1♂).

This specimen is similar to the above species but its eyes are in contact for twice the length of the ocellar tubercle. It was collected from Palestine chamomile, *Anthemis palestina* REUT. (Compositae).

Subfamily Toxophorinae SCHINER

Tribe Toxophorini SCHINER

Toxophora fasciculata (VILLERS 1789) (Fig. 1h)

Material: Two specimens: Al Mafraq 29.IV.01 (1 ♀) (Al Al Bayt University); Al Mukhaybah al Fawqa 31.VII.02 (1 ♀) flying.

Distribution: Afrotropical: Sudan. Palaearctic: Algeria, Armenia, Austria, Azerbaijan, Bulgaria, Croatia, Cyprus, Czech Republic, Egypt, France, Germany,

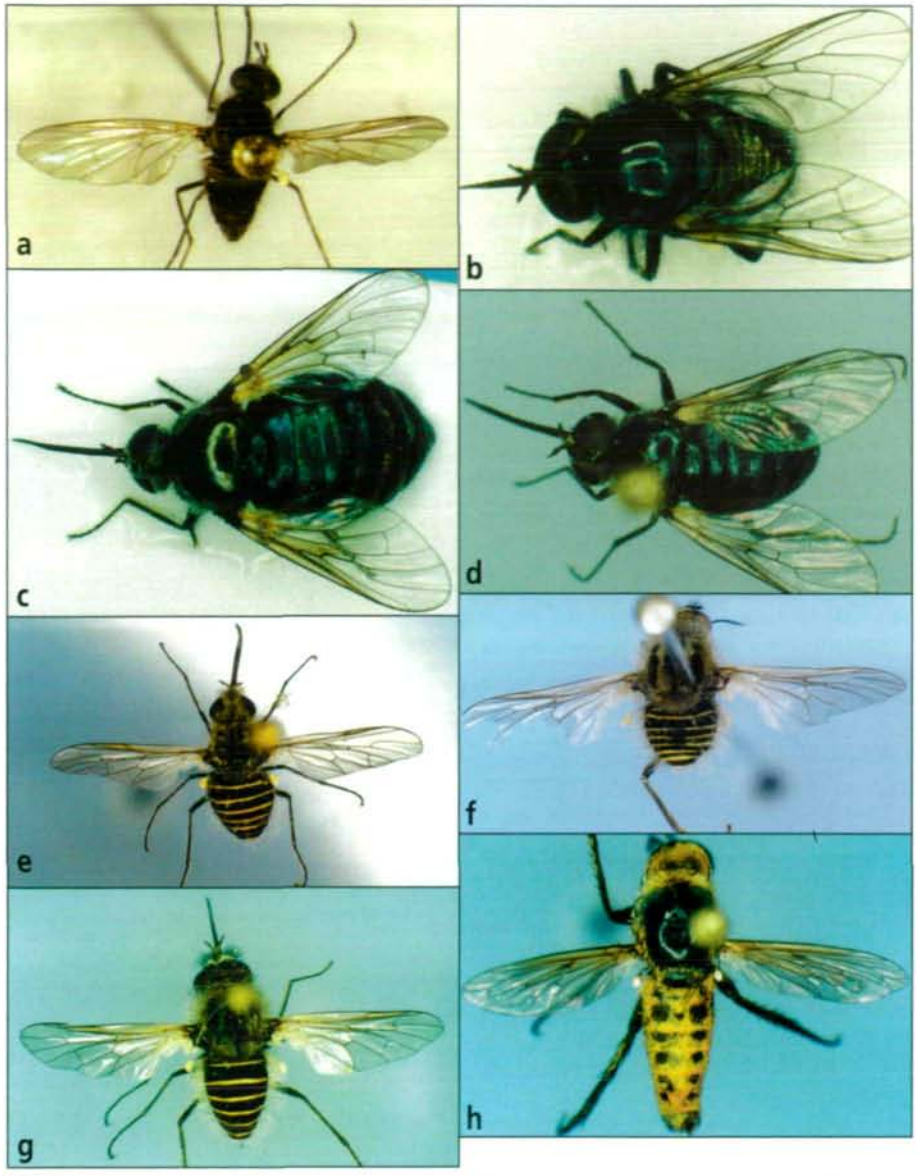

Fig. 1:
a: *Apolysis* sp. 1
b: *Usia ignorata*
c: *Usia aenea*
d: *Usia bicolor*
e: *Parageron gratus*
f: *Parageron* sp. 1
g: *Parageron* sp. 2
h: *Toxophora fasciculata*

Greece, Gruzia, Hungary, Iran, Italy, Kazakhstan, Kyrgyz Republic, Lebanon, Libya, Moldova, Morocco, Palestine, Romania, Russia, Slovakia, Slovenia, Spain, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan.

It appears to be a rare species. The two specimens were collected near water. This species is easily identified among the Jordanian Bombyliidae by its well-developed pronotum and long antenna. It is a parasite of *Eumenes pompiformis* (FABRICIUS) (Eumenidae) DU MERLE (1975).

Tribe Gerontini HESSE

Geron mystacinus BEZZI 1924 (Fig. 2a)

Material: Two specimens: Irbid, Busailah 2.IV.94 (2♂♂).

Distribution: Palaearctic: Palestine, Spain, Syria.

The males of this species are characterised by the black hairs on the face, while the females have white hairs and can be confused with *Geron krymensis* or *Geron intonsus* (GREATHEAD 2001).

Geron olivieri MACQUART 1840

Material: 10 specimens: Al Kafrayn 16.XI.95 (1♂); As Salt 2.IX.02 (6♂♂) flying; Yajuz 14.X.02 (1♂+1♀) flying; Az Zrqa 13.X.1995 (1♀).

Distribution: Palaearctic: Cyprus, Greece, Iran, Italy, Lebanon, Palestine, Romania, Saudi Arabia, Syria, Turkey, Ukraine.

Geron erythropus BEZZI 1925 (Fig. 2b)

Material: Two specimens: Amman 21.IX.81 (1♀) (Al Yarmouk University); As Salt 1.VII.93 (1♂).

Distribution: Palaearctic: Egypt.

The above female may be the undescribed female of this species. The size, colour, and pale legs are the same as the male. It has been reared from *Palpita unionalis* HÜBNER (Pyralidae) (YEATES & GREATHEAD 1997).

Geron smirnovi ZAITZEV 1978 (Fig. 2c)

Material: One specimen: Zahar 17.VI.02 (1♂).

Distribution: Palaearctic: Greece, Tajikistan, Turkmenistan.

This species collected from Blue weed *Echium judaeum* LACAITA (Boraginaceae).

Geron krymensis PARAMONOV 1929 (Fig. 2d,e)

Material: 17 specimens: Ash Shajarah 22.VII.02 (4♀♀). As Salt 13.VIII.93 (1♀); Dibbin 13.V.02 (10♀♀); Jarash 15.IV.02 (1♀); Hummrit As Sahin 3.VI.02 (1♀).

Distribution: Palaearctic: Algeria, Armenia, Austria, Azerbaijan, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, France, Greece, Gruzia, Hungary, Iran, Italy, Lebanon, Kyrgyz Republic, Macedonia, Moldova, Palestine, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Syria, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan, Yugoslavia.

It was collected from *Carthamus persicus* WILLD (Compositae), with *Amictus validus* LOEW.

Subfamily Phthiriinae BECKER

Tribe Phthiriini BECKER

Phthiria sp. 1

Material: One specimen: As Salt 7.X.02 (1 ♀).

This specimen cannot be identified to the species because it was partially damaged.

Subfamily Bombyliinae LATREILLE

Tribe Conophorini BECKER

Conophorus glaucescens (LOEW 1863) (Fig. 2f)

Material: Five specimens: Wadi Shu'ayb, unknown date (1 ♀); Yarqa 9.III.98 (4♂♂).

Distribution: Palaearctic: Albania, Armenia, Azerbaijan, Bulgaria, Croatia, Greece, Gruzia, Italy, Moldova, Palestine, Russia, Turkey, Ukraine, Yugoslavia.

This species can be easily recognised among the Jordanian *Conophorus* by having 3 submarginal cells.

Conophorus nobilis (LOEW 1873) (Fig. 2g)

Material: Five specimens: Al Jubayhah 23.IV.78 (1♂); Al Mujib, Faqu'a 18.III.02 (1♂) on ground; An Nu'ayyimah 11.V.83 (1♂+1 ♀); Dibbin 1.V.93 (1♂).

Distribution: Palaearctic: Armenia, Azerbaijan, Gruzia, Iran, Russia, Turkey, Turkmenistan.

All specimens of this species differ from ENGEL's (1937) description in having some fine black hairs among the golden hair at the apex of the abdomen.

Legnotomyia trichorhoea (LOEW 1855) (Fig. 2h)

Material: Four specimens: Ajlun 5.V.83 (1♂); Jarash 25.IV.85 (1 ♀); Muzayrib 24.IV.95 (1♂); Unknown data (1♂).

Distribution: Palaearctic: Greece, Iraq, Italy, Macedonia, Palestine, Syria, Yugoslavia.

This species has antennal pedicel with a projection in males while the female's pedicel has no projection. Its spherical abdomen banded with yellow stripes against the black abdomen makes it difficult to be confused with any other species of Bombyliidae in Jordan.

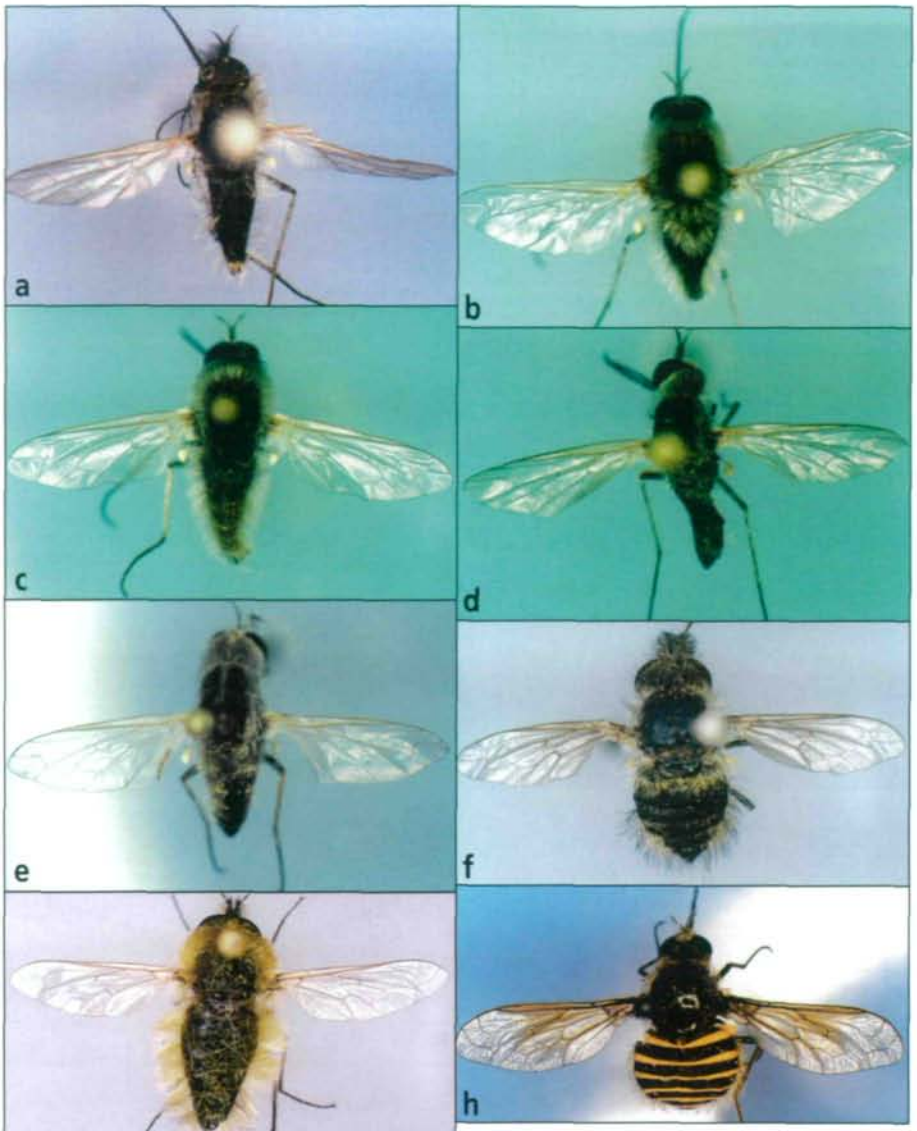

Fig. 2:
a: *Geron mystacinus*
b: *Geron erythropus*
c: *Geron smirnovi*
d, e: *Geron krymensis*
f: *Conophorus glaucescens*
g: *Conophorus nobilis*
h: *Legnotomyia trichorhoea.*

Legnotomyia cineracea AUSTEN 1937 (Fig. 3a)

Material: Three specimens: Abu Nusayr 3.VII.02 (1♂) flying; Ayn Almuallaqah 28.V.01 (1♂); Az Zarqa 5.VII.92 (1 ♀).

Distribution: Palaearctic: Palestine, Saudi Arabia.

Its antennae and abdomen are similar to the above species except that the abdomen brownish instead of black and the yellow bands are narrower.

Tribe Bombyliini LATREILLE

Systoechus longirostris BECKER 1916 (Fig. 3b)

Material: 10 specimens: Hummrit As Sahin 22.IV.02 (1 ♀+6♂♂), 3.VI.02 (1 ♀); Dana, Ar Rummanah 28.IX.02 (2 ♀♀).

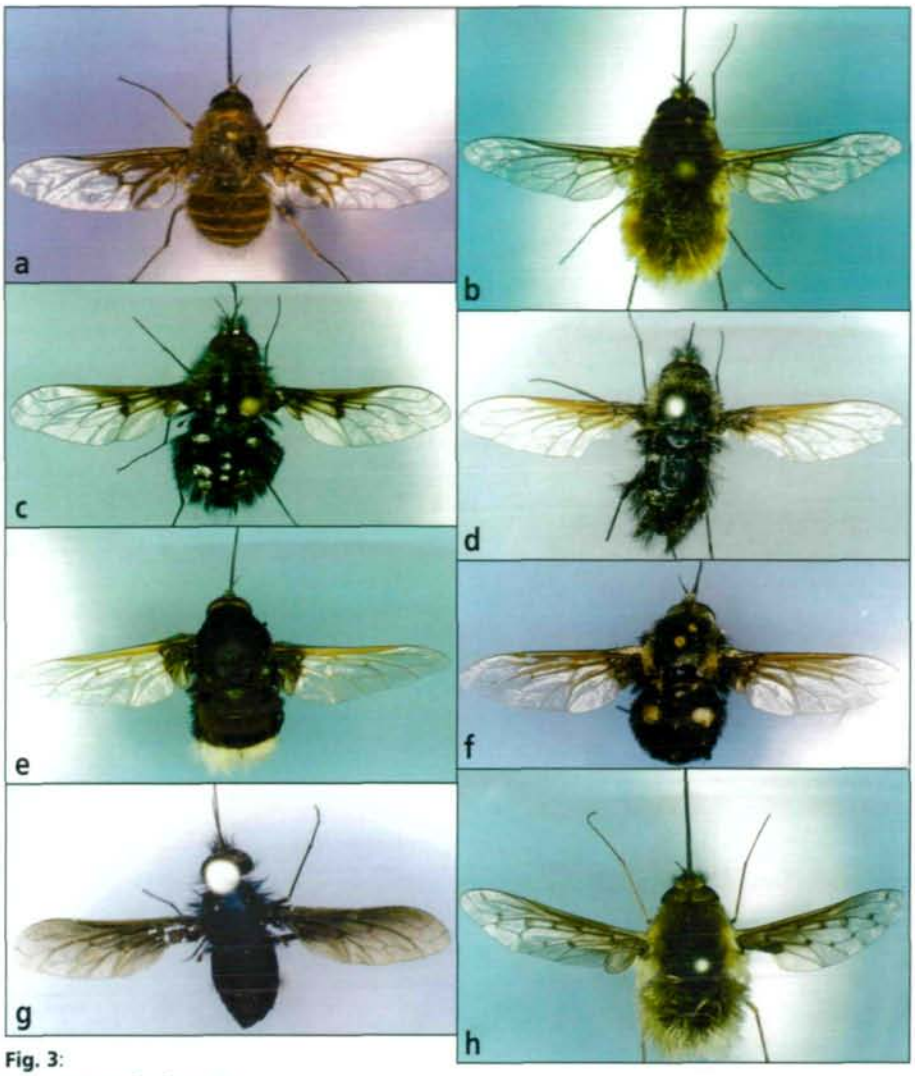

Fig. 3:
a: *Legnotomyia cineracea*
b: *Systoechus longirostris*
c: *Bombylella atra*
d: *Bombylella simulans*
e: *Bombomyia discoidea*
f: *Bombomyia stictica*
g: *Bombylius (Bombylius) fuscus*
h: *Bombylius (Bombylius) medius*

Distribution: Palaearctic: Armenia, Azerbaijan, Bosnia-Herzegovina, Bulgaria, Croatia, France, Germany, Greece, Gruzia, Iran, Italy, Kazakhstan, Macedonia, Moldova, Portugal, Russia, Slovenia, Spain, Ukraine, Yugoslavia.

This species has yellowish hairs and its wing pattern is sexually dimorphic, females with hyaline wings and males with brown infuscation at base. It is very conspicuous during hovering in the field.

Bombylella atra (Scopoli 1763) (Fig. 3c)

Material: 40 specimens: Al Aridah 29.III.81 (1♂); Al Karak 1.IV.02 (2♂♂); Al Mshar'a 28.II.93 (1♀) (Al Yarmouk University), 2.IV.87 (1♀); Al Mujib Reserve 13.III.02 (2♂♂); Al Mukhaybah al Fawqa 9.III.02 (4♀♀+5♂♂); Ar Rumaymin 4.V.93 (1♀); Ruwayhat al Ghawr 15.III.99 (1♀); As Sukhnah 28.IV.74 (2♂♂); Badhan 1.IV.02 (1♂); Dayr Alla 31.III.74 (1♀), 8.IV.74 (1♂), 7.VII.89 (1♂); Jarash 2.IV.01 (5♀♀+2♂♂) (Al Al Bayt University), 12.IV.80 (2♂♂); Kurayyimah 8.IV.74 (1♀+1♂); Muzayrib 24.IV.87 (1♀) *Anthemis palestina*, 24.X.95 (1♀), unknown data (1♂) (Al Yarmouk University); Na'or 16.IV.74 (1♂+1♀).

Distribution: Palaearctic: Albania, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia-Hercegovina, Bulgaria, Croatia, Czech Republic, Egypt, Estonia, France, Gibraltar, Greece, Gruzia, Hungary, Iran, Italy, Kazakhstan, Kuwait, Kyrgyz Republic, Latvia, Lebanon, Lithuania, Macedonia, Malta, Oman, Palestine, Poland, Romania, Russia, Saudi Arabia, Slovakia, Slovenia, Spain, Switzerland, Syria, Tajikistan, Turkey, Turkmenistan, Ukraine, United Arab Emirates, Uzbekistan, Yugoslavia.

It appears to be common in Jordan during spring season. Hairs on the lateral sides of first abdominal tergite could be white or black.

Bombylella simulans (Austen 1937) (Fig. 3d)

Material: Two specimens: Ar Rumaymin 17.IV.86 (1♂); Muzayrib 24.IV.95 (1♂) on *Anthimus palestina* Reut. (Compositae).

Distribution: Palaearctic: Lebanon, Palestine.

This species seems to be less common than *B. atra*. This species was collected from Palestine chamomile *Anthemis palestina* Reut. (Compositae).

Bombomyia discoidea (Fabricius 1794) (Fig. 3e)

Material: Two specimens: Ghawr As Safi 3.XI.81 (1♀); Tabaqt Fahl 10.X.99 (1♂).

Distribution: Afrotropical: Botswana, Burundi, Chad, Congo, Eritrea, Ethiopia, Gambia, Ghana, Kenya, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Senegal, South Africa, Swaziland, Tanzania, Togo, Uganda, Yemen, Zambia, Zimbabwe. Palaearctic: Algeria, Armenia, Austria, Azerbaijan, China, Cyprus, Egypt, France, Greece, Gruzia, Hungary, Iran, Italy, Kazakhstan, Kyrgyz Republic, Lebanon, Moldova, Mongolia, Morocco, Oman, Palestine, Russia, Spain, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan.

It is characterised by white hairs at distal extremity of the abdomen. Austen

(1937) mentioned that this species was seen feeding on or poising above white flowers of *Heliotropium villosum* WILLA (Boraginaceae). Our female specimens have grey pubescence on the head and thorax, while in the specimens from Oman, the grey colour is completely replaced by orange brown pubescence (GREATHEAD 1980a).

Bombomyia stictica (FABRICIUS 1794) (Fig. 3f)

Material: Four specimens: As Salt 21.4.74 (1 ♀); Dayr Alla 6.V.74 (1 ♀); Kafr Asad 9.IV.01 (1♂); Wadi Shu'ayb 24.IV.97 (1♂).

Distribution: Palaearctic: Afghanistan, Albania, Algeria, Armenia, Austria, Azerbaijan, Czech Republic, Egypt, France, Germany, Greece, Gruzia, Hungary, Iran, Iraq, Italy, Kazakhstan, Kuwait, Kyrgyz Republic, Lebanon, Libya, Moldova, Morocco, Palestine, Poland, Portugal, Romania, Russia, Slovakia, Spain, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, United Arab Emirates.

This species characterised by two rows of white spots on the underside of the abdomen.

Bombylius (*Bombylius*) *fuscus* FABRICIUS 1781(Fig. 3g)

Material: Two specimens: Ayn Almuallaqah 3.III.97 (1♂); unknown location and date (1♂).

Distribution: Palaearctic: Armenia, Azerbaijan, Egypt, Greece, Gruzia, Iran, Iraq, Italy, Palestine, Portugal, Spain, Turkmenistan.

It seems to be a rare species in Jordan. It can be recognised by the completely black body without any white or pale marks, also by having completely black infuscated wings.

Bombylius (*Bombylius*) *medius* LINNAEUS 1758 (Fig. 3h)

Material: 85 specimens: Al Badhiyah 13.III.02 (2 ♀♀); Al Jubayhah 6.II.95 (4♂♂), 9.II.95 (1♂), 22.II.93 (1♂), 23.II.81 (2 ♀♀ +1♂), 27.II.90 (1♂), 3.III.90 (1♂), 3.III.02 (1♂), 5.III.95 (1 ♀), 7.III.8 (1♂), 10.III.90 (1♂), 14.III.90 (1♂), 17.III.89 (2 ♀♀), 19.III.94 (1 ♀ +1♂) on grasses, 21.III.89 (1♂), 22.III.89 (2♂♂), 22.III.95 (1♂), 23.III.94 (3♂♂), 25.III.74 (1 ♀), 27.III.89 (1♂), 27.III.97 (2 ♀♀), 4.IV.87 (1♂), 11.IV.? (1♂), 13.IV.97 (1♂), 21.IV.90 (1♂), 13.V.74 (1 ♀), 7.IX.81 (1 ♀), Unknown data (1 ♀); Al Mashr'a 31.I.87 (1♂); Al Mujib Reserve, Faqu'a 18.III.02 (2 ♀♀); Al Mushaqqar 14.V.90 (1♂+1 ♀); Amman 22.II.94 (1 ♀), 12.III.96 (1♂), 19.III.93 (1♂), 20.III.96 (1 ♀), 7.IV.97 (1 ♀); Ayn Aqraba 25.III.02 (1 ♀); As Salt 25.III.98 (1♂); At Tafilah 7.IV.97 (1 ♀); Dayr Alla 14.II.90 (2♂♂), 23.II.81 (2♂♂), 18.III.74 (2 ♀♀), 19.III.74 (2 ♀♀); Dead Sea 29.IV.94 (1 ♀); Hummrit As Sahin 12.II.01 (1♂) (Al Balqa University), 13.II.01 (1 ♀) (Al Balqa University), 19.II.00 (1♂+1 ♀) (Al Balqa University), 6.III.00 (1♂) (Al Balqa University); 20.III.00 (1 ♀) (Al Balqa University), 23.III.00 (2 ♀♀) (Al Balqa University), 27.III.00 (1♂) (Al Balqa University); Jarash 27.II.01 (1 ♀), 11.IV.88 (1♂); Rajib 18.IV.00 (1 ♀); Suwaylih 1.III.85 (1 ♀), 2.III.97 (1♂), 21.III.93 (1 ♀); Wadi As Sir 27.III.97 (1 ♀), 6.V.84 (1♂), Unknown data (4♂♂+2 ♀♀).

Distribution: Palaearctic: Afghanistan, Albania, Algeria, Armenia, Azerbaijan, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Egypt, Estonia, France, Germany, Gibraltar, Greece, Gruzia, Hungary, Iran, Iraq, Italy, Kazakhstan, Kyrgyz Republic, Latvia, Lebanon, Libya, Lithuania, Macedonia, Malta, Moldova, Morocco, Netherlands, Palestine, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan, Yugoslavia.

B. medius is very common in Jordan. Large numbers were collected during March and April. This species exhibits variation in length ranging from 7,2-11,3 mm, and in the amount and extent of black hairs on the body. However, it can be easily recognised by the pattern of its spotted wings. There is one record from the nest of an *Andrena* sp. (Andrenidae) (DU MERLE 1975).

Bombylius (*Bombylius*) *trichurus* PALLAS 1818 (Fig. 4a)

Material: Two specimens: As Salt 19.IV.00 (1♂); Al Jubayhah 10.IV.79 (1♂).

Distribution: Afrotropical: Yemen. Palaearctic: Albania, Armenia, Austria, Azerbaijan, Bulgaria, Croatia, Cyprus, Czech Republic, France, Greece, Gruzia, Hungary, Iran, Italy, Lebanon, Macedonia, Moldova, Oman, Palestine, Poland, Romania, Russia, Saudi Arabia, Slovakia, Spain, Syria, Turkey, Turkmenistan, Ukraine.

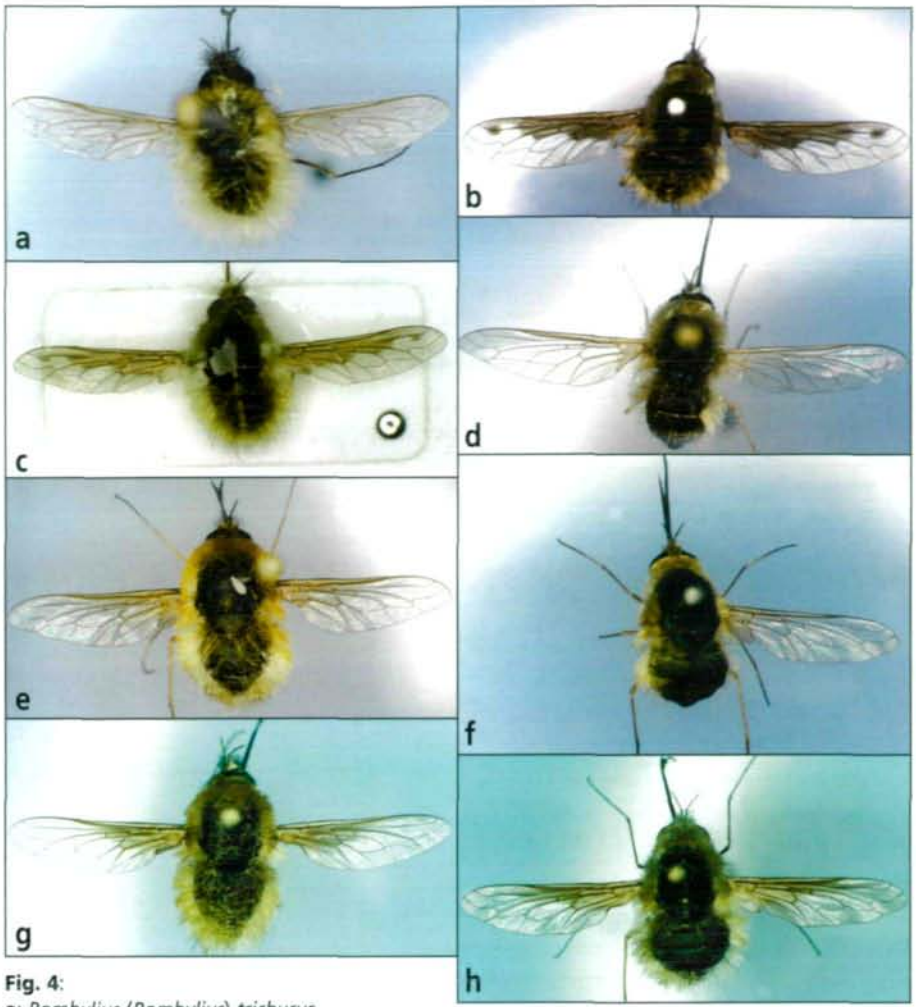

Fig. 4:
a: *Bombylius* (*Bombylius*) *trichurus*
b: *Bombylius* (*Bombylius*) *fimbriatus*
c: *Bombylius* (*Bombylius*) *major*
d: *Bombylius* (*Bombylius*) *modestus*
e: *Bombylius* (*Bombylius*) *pumilus*
f: *Bombylius* (*Bombylius*) *fulvescens*
g: *Bombylius* (*Bombylius*) *canescens*
h: *Bombylius* (*Bombylius*) *mendax*

This species seems to be rare in Jordan. The black hairs on the underside of abdomen can easily separate this species from similar ones in Jordan that have pale hairs. It has been reared from *Evylaeus nigripes* (LEPELETIER) (DU MERLE 1975).

Bombylius (*Bombylius*) *fimbriatus* MEIGEN 1820 (Fig. 4b)

Material: 40 specimens: Al Jubayhah 3.III.02 (1♂), 15.III.99 (1♀), 19.III.93 (1♀), 19.III.98 (1♂), 22.III.95 (2♂♂+1♀), 30.III.93 (1♂), 1.IV.82 (1♂), 2.IV.97 (2♂♂), 3.IV.93 (1♂), 4.IV.98 (1♂), 6.IV.99 (1♂), 14.IV.74 (1♂), 15.IV.75 (1♀), 19.IV.98 (1♂), 25.IV.93 (1♂); 1.V.? (1♂), 2.V.98 (1♂+1♀), 3.V.98 (1♀); Amman 3.IV.90 (1♀); Ayn Aqraba 25.III.02 (2♀♀+2♂♂); Ayn Almuallaqah 3.IV.97 (1♂); Dana 4.IV.94 (1♂); Dayr Alla 23.III.88 (1♂), 20.IV.98 (1♂), 22.IV.84 (1♂); Irbid 24.III.84 (1♀) (Al Yarmouk University); Marka 8.IV.94 (1♀); Tabaqt fahl 22.III.00 (1♂); Wadi Shu'ayb 1.V.97 (1♂); Zai 1.V. 93 (1♀); Unknown data (2♂♂+1♀).

Distribution: Palaearctic: Afghanistan, Armenia, Austria, Azerbaijan, Belarus, Belgium, Cyprus, Czech Republic, Egypt, Estonia, France, Germany, Greece, Gruzia, Hungary, Iran, Italy, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Morocco, Palestine, Poland, Romania, Russia, Slovakia, Spain, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan, Yugoslavia.

B. fimbriatus is a common species in Jordan. Its wing pattern has a sharp fore border and transparent area in the marginal cell. It is very close to *B. major* but the latter lacks the transparent area in the marginal cell.

Bombylius (*Bombylius*) *major* LINNAEUS 1758 (Fig. 4c)

Material: Two specimens: Al Jubayhah 22.IV.97 (1♂); Amman 24.II.95 (1♀) collected from almond flowers.

Distribution: Nearctic: Canada, USA, Mexico. Oriental: Bangladesh, India, Nepal, Pakistan, and Thailand. Palaearctic: Albania, Algeria, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, China, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Gruzia, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea, Latvia, Libya, Lithuania, Luxembourg, Malta, Macedonia, Moldova, Mongolia, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Tunisia, Turkey, Turkmenistan, United Kingdom, Uzbekistan, Yugoslavia.

This species seems to be a rare species in Jordan. In the United States, it is very abundant on plum trees and on *Cardamine bulbosa* (SCHREB). The immature stages attack *Andrena* spp. (Andrenidae) and *Halictus* (Halictidae) (DU MERLE 1975, YEATES & GREATHEAD 1997).

Bombylius (*Bombylius*) *modestus* LOEW 1873 (Fig. 4d)

Material: Seven specimens: Al Mujib 24.III.99 (1♀), 3.V.99 (1♀); Ar Rumman 6.V.02 (1♂+1♀) on the ground; Ayn esh Shallaleh 24.VI.02 (1♂) flying; Na'or 5.VIII.02 (1♀) on the ground; Unknown data (1♀).

Distribution: Afrotropical: Ethiopia, Sudan, Yemen. Oriental: Pakistan, Palaearctic: Afghanistan, Armenia, Azerbaijan, Cyprus, Egypt, Greece, Gruzia, Iran, Italy, Kazakhstan, Macedonia, Russia, Saudi Arabia, Tajikistan, Turkmenistan, Uzbekistan, Yugoslavia.

Only the males of this species have white scales at apex of abdomen, while in *B. posticus* both sexes have such scales.

Bombylius (Bombylius) pumilus Meigen 1820 (Fig. 4e)

Material: Four specimens: Al Mukhaybah al Fawqa 9.III.02 (1♂); Jarash 12.IV.80 (1♂); Muzayrib 24.IV.95 (1♂); Unknown data (1♂).

Distribution: Afrotropical: Yemen. Palaearctic: Albania, Algeria, Armenia, Azerbaijan, Egypt, France, Germany, Greece, Gruzia, Hungary, Iran, Iraq, Italy, Kuwait, Lebanon, Macedonia, Moldova, Oman, Palestine, Poland, Portugal, Romania, Russia, Saudi Arabia, Spain, Syria, Turkey, Ukraine, United Arab Emirates.

This species has the shortest proboscis among all Jordanian *Bombylius*. The wing patterns are sexually dimorphic; females with hyaline wings and males with basal infuscation.

Bombylius (Bombylius) fulvescens Wiedemann 1820 (Fig. 4f)

Material: Two specimens: As Salt 31.V.93 (1♀); Dayr Alla 8.IV.74 (1♂).

Distribution: Palaearctic: Albania, Armenia, Austria, Azerbaijan, Bosnia-Herzegovina, Bulgaria, China, Croatia, Czech Republic, Greece, Gruzia, Hungary, Iran, Iraq, Italy, Kazakhstan, Macedonia, Malta, Moldova, Palestine, Poland, Portugal, Romania, Russia, Saudi Arabia, Slovakia, Slovenia, Spain, Switzerland, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan, Yugoslavia.

It is very similar to *B. pumilus* but it can be distinguished from it by its longer proboscis.

Bombylius (Bombylius) canescens Mikan 1796 (Fig. 4g)

Material: 24 specimens: Al Jubayhah 23.II.95 (1♀+1♂); 19.III.94 (1♀+1♂); 22.III.95 (1♂); Al Mashari'a 1.III.83 (1♂); Al Mukhaybah al Fawqa 9.III.02 (8♀♀+4♂♂); Ayn Aqraba 25.III.02 (2♀♀+1♂); As Salt 5.III.74 (1♀); Dayr Alla 5.IV.98 (1♀); Jarash 15.IV.02 (1♀).

Distribution: Palaearctic: Albania, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia-Hercegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, France, Germany, Greece, Gruzia, Hungary, Ireland, Italy, Latvia, Libya, Lithuania, Malta, Moldova, Netherlands, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Switzerland, Syria, Turkey, Turkmenistan, United Kingdom, Ukraine, Yugoslavia.

Bombylius canescens appears to be common during spring season where many specimens were collected in March. This species has been reared from nests of *Odynerus reniformis* (Gmelin) (Eumenidae), also several species of Halictidae (du Merle 1975).

Bombylius (Bombylius) mendax Austen 1937 (Fig. 4h)

Material: 22 specimens: Al Jubayhah 3.III.02 (1♂), 8.III.89 (1♂), 22.III.95 (1♂), 23.III.94 (3♂♂), 8.IV.93 (1♂), 15.VII.97 (1♂); As Sukhnah 1.IV.? (1♂); Ayn Almuallaqah 3.IV.94 (1♂); Dana 4.IV.94 (3♂♂); Dayr Alla 14.II.90 (1♂); Irbid 6.III.84 (1♂) (Al Yarmouk University); Jarash 7.III.90 (2♂♂+1♀); Sayl Al Karak 1.IV.02 (1♀); Wadi As Sir 21.III.96 (1♂), 27.III.97 (1♀); Yajuz 5.IV.88 (1♂).

Distribution: Palaearctic: Palestine.

Bombylius mendax is known so far from Jordan and Palestine, which appears native to this area. The black hairs along notopleura distinguish this species from *B. canescens*, and presence of black hairs on the postocular margin distinguish it from *B. cinerascens*.

Bombylius (Bombylius) cinerascens Mikan 1796 (Fig. 5a)

Material: 11 specimens: Al Jubayhah 17.III.95 (1♂), 10.IV.79 (1♀), 23.IV.90 (1♂); Al Mukhaybah al Fawqa 9.III.02 (3♀♀); Ayn Aqraba 25.III.02 (1♂); As Salt 24.IV.94 (1♀); As Sukhnah 10.IV.79 (1♀); Ayn esh Shallaleh 20.IV.98 (1♂); Dayr Alla 8.IV.74 (1♀).

Distribution: Palaearctic: Albania, Armenia, Austria, Azerbaijan, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Egypt, France, Germany, Greece, Gruzia, Hungary, Italy, Macedonia,

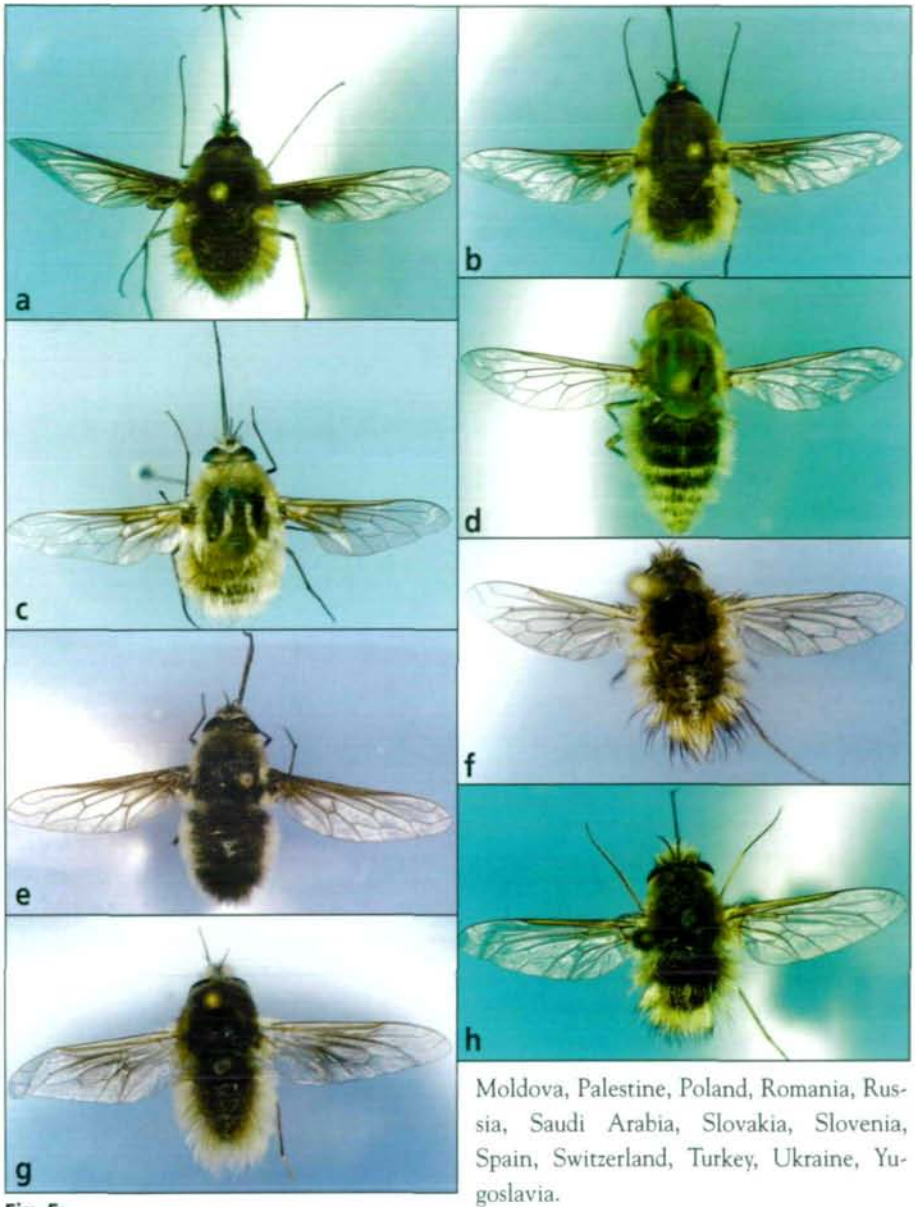

Fig. 5:
a: *Bombylius (Bombylius) cinerascens*
b: *Bombylius (Bombylius) posticus*
c: *Bombylius (Zephyrectes) quadrifarius*
d: *Dischistus syriacus*
e: *Neobombylodes giganteus*
f: *Anastoechus trisignatus*
g: *Anastoechus bahirae*
h: *Anastoechus nitidulus*

Moldova, Palestine, Poland, Romania, Russia, Saudi Arabia, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukraine, Yugoslavia.

This species seems to be less common than *B. canescens* and *B. mendax* since few specimens were collected. These three species are very similar in general appearance, but *B. cinerascens* lacks black hairs on the postocular margin. The wings pattern is sexually dimorphic. The wing base is mummy-brown in males and light sepia-coloured in females.

Bombylius (Bombylius) posticus Fabricius 1805 (Fig. 5b)

Material: Six specimens: Al Jubayhah 8.V.84 (1♂); Al Wala 8.IV.02 (1 ♀ +4♂♂).

Distribution: Palaearctic: Afghanistan, Albania, Algeria, Armenia, Austria, Azerbaijan, Belgium, Bosnia-Hercegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Egypt, France, Germany, Gibraltar, Greece, Gruzia, Hungary, Iran, Iraq, Italy, Kazakhstan, Macedonia, Moldova, Morocco, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Switzerland, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine.

The white scales at apex of abdomen may be difficult to see when the specimens are in good condition (with many hairs) (Austen 1937). The larvae were found parasitising *Panurgus dentipes* Latreille and *P. calcaratus* (Scopoli) (Andrenidae) and also *Evylaeus nigripes* Lepeletier (Halictidae) (du Merle 1975).

Bombylius (Zephyrectes) quadrifarius Loew 1855 (Fig. 5c)

Material: Four specimens: Al Mafraq 19.III.01 (1♂); Al Mujib 13.III.02 (2 ♀♀ +1♂).

Distribution: Palaearctic: Albania, Armenia, Azerbaijan, Bulgaria, China, Czech Republic, Greece, Gruzia, Hungary, Iran, Italy, Macedonia, Moldova, Palestine, Romania, Russia, Slovakia, Tajikistan, Turkey, Ukraine, Yugoslavia.

This species has two longitudinal stripes formed by white hairs on the mesonotum, and transverse bands formed by white hairs at the posterior margin of abdominal tergites. Wings are sexually dimorphic; females have hyaline ones and males with basal infuscation.

Dischistus syriacus (Villeneuve 1912) (Fig. 5d)

Material: 23 specimens: Al Adasiyah 11.VII.94 (1♂); Al Aridah 29.III.81 (1♂); Al Ghawr 5.III.78 (1♂); As Sukhnah 28.IV.74 (2♂♂); Ayn Aqraba 29.IV.02 (1♂+1 ♀); Ayn Qantarh 16.V.87 (1♂) (Al Yarmouk University); Dayr Alla 19.III.78 (1♂), 27.III.74 (1 ♀), 31.III.74 (1 ♀); Hummrit As Sahin 3.VI.02 (1 ♀); Jarash 22.IV.81 (1♂), 6.V.02 (2♂♂+1 ♀); Kafr Asad 9.IV.01 (1 ♀) (Al Al Bayt University); Wadi Al Arab 3.V.82 (2♂♂) (Al Yarmouk University); Wadi Shu'ayb ?.V.97 (2 ♀♀), Unknown data (2♂♂).

Distribution: Palaearctic: Lebanon, Palestine.

Dischistus syriacus appears to be a native species in the Eastern Mediterranean. It is a

common species in Jordan. It is sexually dimorphic; males have whitish hairs while females have yellowish hairs.

Neobombylodes giganteus (Villeneuve 1920) (Fig. 5e)

Material: Seven specimens: Al Aridah 18.III.79 (3 ♀♀); Al Mujib 18.III.02 (2♂♂); Dayr Alla 31.III.74 (1♂); Hummrit As Sahin 26.III.00 (1 ♀).

Distribution: Palaearctic: Algeria, Egypt, Libya.

This robust species is sexually dimorphic; males have elongate oval abdomen while females have short spherical abdomen.

Anastoechus trisignatus (Portschinsky 1881) (Fig. 5f)

Material: One specimen: Yajuz 14.X.02 (1 ♀) on the ground.

Distribution: Afrotropical: Sudan, Yemen. Palaearctic: Algeria, Armenia, Azerbaijan, Bosnia-Herzegovina, Croatia, Egypt, Greece, Gruzia, Italy, Jordan, Kuwait, Lebanon, Libya, Macedonia, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Slovenia, Syria, Tunisia, Yugoslavia.

This species is easily recognised by a longitudinal median stripe of oppressed scales on the body. This species was recorded previously from Jordan (Evenhuis & Greathead 1999).

Anastoechus bahirae Becker 1915 (Fig. 5g)

Material: 12 specimens: Al Muwaqqar 16.IX.02 (10 ♀♀), 7.X.02 (1 ♀); Dana, Ar Rummanah 28.IX.02 (1♂).

Distribution: Afrotropical: Kenya, Sudan. Palaearctic: Algeria, Egypt, Libya, Palestine, Saudi Arabia, Spain, Syria, Tunisia.

It seems to be common in the desertic regions of Jordan. It was collected from *Polygonum equisetiforme* Sibth (Polygonaceae).

Anastoechus nitidulus (Fabricius 1794) (Fig. 5h)

Material: 41 specimens: Al Muwaqqar 7.X.02 (6♂♂+13 ♀♀); Ar Rummanah 28.IX.02 (2♂♂+2 ♀♀); Dana 23.III.95 (1♂+1 ♀); Rum 30.III.00 (1 ♀), Um Ishrin 31.III.00 (2♂♂), 1.IV.00 (2♂♂+1 ♀); Wadi An Nawatif 27.IX.02 (1♂+3 ♀♀); Wadi shuqayq 24.IX.02 (3♂♂+1 ♀); Unknown data (2♂♂).

Distribution: Palaearctic: Afghanistan, Austria, Belgium, Bosnia-Herzegovina, Bulgaria, China, Croatia, France, Germany, Greece, Hungary, Iran, Italy, Japan, Kazakhstan, Kyrgyz Republic, Macedonia, Mongolia, Portugal, Romania, Russia, Slovenia, Spain, Slovakia, Turkey.

It appears to be common in dry regions of Jordan. It was collected from *Lactuca orientalis* Boiss (Compositae) and *Polygonum equisetiforme* Sibth (Polygonaceae). The larvae of this species were reared from *Locusta migratoria* (Linnaeus) and other species of Acrididae (du Merle 1975).

Anastoechus exalbidus (Wiedemann 1820) (Fig. 6a)

Material: Five specimens: Rum, Um Ishrin Grid 87 31.III.00 (2 ♀♀), Wadi Marsad 27.III.00 (2 ♀♀), 1.IV.00 (1 ♀) (Al Al Bayt University).

Distribution: Afrotropical: Sudan, Yemen. Palaearctic: Algeria, Armenia, Azerbaijan, Egypt, France, Gruzia, Italy, Jordan, Kuwait, Lebanon, Oman, Palestine, Portugal, Saudi Arabia, Spain, Syria, Tunisia, Yugoslavia.

It is common in desertic regions of Jordan. It was previously recorded from Jordan (Evenhuis & Greathead 1999).

Subfamily Ecliminae Hall

Eclimus gracilis Loew 1844 (Fig. 6b)

Material: One specimen: Kufrinjah, unknown date and month. 99 (1♂).

Distribution: Palaearctic: France; Greece, Italy, Libya, Macedonia, Morocco, Palestine, Turkey, Yugoslavia.

This species seems to be a rare species. It is black with an extremely narrow body. The head is semibilobate but there is no concavity. It is almost mosquito like in appearance except for the spotted wings.

Subfamily Cythereinae Becker

Callostoma fascipenne Macquart 1840 (Fig. 6c)

Material: Eight specimens: Al Aridah 4.V.81 (1 ♀+1♂); Al Balqa University 28.III.01

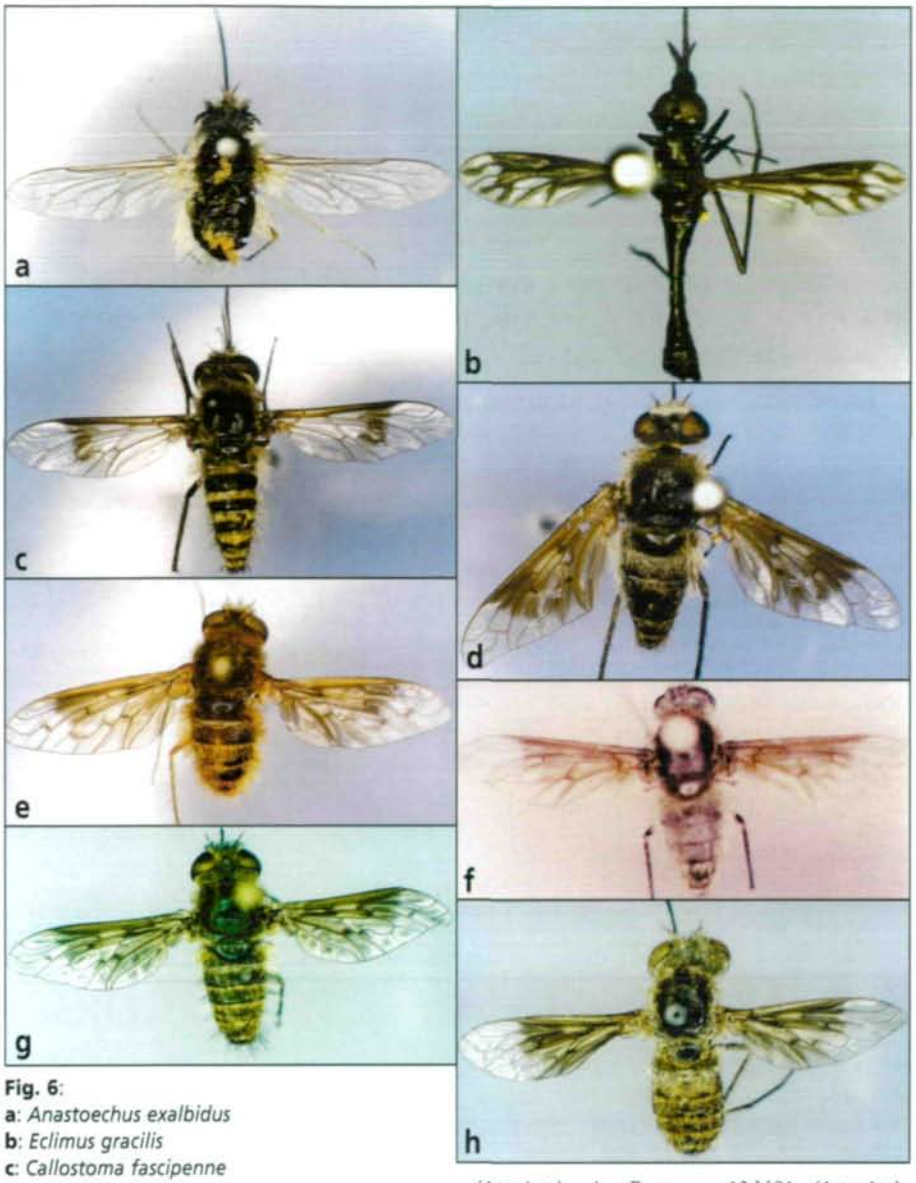

Fig. 6:
a: *Anastoechus exalbidus*
b: *Eclimus gracilis*
c: *Callostoma fascipenne*
d: *Cytherea obscura*
e: *Cytherea aureus*
f: *Cytherea fenestrata*
g: *Cytherea nucleorum*
h: *Cytherea delicata*

(1♂+1♀); Ar Rumman 13.V.91 (1♀+1♂), 6.VI.88 (1♂); Jarash 1.VI.80 (1♀).

Distribution: Palaearctic: Afghanistan, Armenia, Azerbaijan, Greece, Gruzia, Iran, Italy, Macedonia, Palestine, Turkey, Turkmenistan, Uzbekistan, Yugoslavia.

Adults of this species suck the nectar of flowers especially of the Pink Scabious and Thistle (AUSTEN 1937). The larvae of these flies are important consumers of egg pods of locusts (Acrididae) (AUSTEN 1937, DU MERLE 1975).

Cytherea obscura FABRICIUS 1794 (Fig. 6d)

Material: Three specimens: Al Jubayhah 13.V.74 (1♂); Ar Rumman 18.V.01 (1♂); Nahlah 9.VII.74 (1♀).

Distribution: Palaearctic: Albania, Armenia, Austria, Azerbaijan, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, France, Greece, Gruzia, Iran, Italy, Lebanon, Macedonia, Moldova, Morocco, Palestine, Portugal, Russia, Slovakia, Slovenia, Spain, Syria, Tajikistan, Turkey, Turkmenistan, Ukraine, Yugoslavia.

This species exhibits unstable venation in some specimens, some have a supernumerary anterior transverse veins in each wing (AUSTEN 1937). It is recorded as a predator on the eggs of *Calliptamus italicus* (LINNAEUS) and *Dociostaurus maroccanus* (THUNBERG) (DU MERLE 1975).

Cytherea aureus FABRICIUS 1794 (Fig. 6e)

Material: Three specimens: Dayr Alla 8.IV.74 (1♂+1♀); Al Mujib 13.III.02 (1♂).

Distribution: Palaearctic: Algeria, Egypt, Italy, Jordan, Libya, Morocco, Palestine, Tunisia.

This species is readily recognisable owing to its unusual brownish yellow tawny colour; and the black hairs are confined to ocellar tubercle (AUSTEN 1937). It was recorded from Jordan previously (EVENHUIS & GREATHEAD 1999).

Cytherea fenestrata (LOEW 1873) (Fig. 6f)

Material: Nine specimens: Al Jubayhah 13.V.74 (1♀), 23.V.92 (1♀); Amman 15.V.97 (1♂), 16.V.78 (1♀); Dayr Alla 8.IV.74 (1♀); Hummrit As Sahin 21.III.01 (1♂), 21.IV.00 (1♀) (Al Balqa University); Wadi Shu'ayb 14.IV.? (1♀); unknown data (1♀).

Distribution: Afrotropical: Yemen. Palaearctic: Egypt, Kuwait, Morocco, Oman, Saudi Arabia, Syria, Tajikistan, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan.

This species is separated by the heavy black bristles on the abdomen from *C. barbara*, which has pale bristles.

Cytherea nucleorum (BECKER 1902) (Fig. 6g)

Material: Five specimens: Al Mujib Natural Reserve 13.III.02 (4♂♂); Dayr Alla 19.III.74 (1♀).

Distribution: Palaearctic: Egypt, Jordan, Kuwait, Libya, Palestine, Saudi Arabia, Syria.

This species is characterised by the mottled wings. It was collected from the ground surface. It was recorded from Jordan previously (EVENHUIS & GREATHEAD 1999).

Cytherea delicata (BECKER 1906) (Fig. 6h)

Material: One specimen: Al Bahhath 20.V.02 (1 ♀).

Distribution: Afrotropical: Yemen. Palaearctic: Algeria, Egypt, Iran, Jordan, Kuwait, Morocco, Oman, Palestine, Saudi Arabia, Tunisia, Turkey, United Arab Emirates.

This species characterised by coarse, broad linear and truncate scales, thick sparse bristles, and by the white scales on the pleura. It was recorded from Jordan previously (EVENHUIS & GREATHEAD 1999).

Cytherea dispar (LOEW 1873) (Fig. 7a)

Material: Nine specimens: Al Jubayhah 3.V.92 (1♂), 12.V.02 (1♂); Al Mujib, Faqu'a 18.III.02 (1 ♀); Al Wala 8.IV.02 (1♂); As Sukhnah 28.IV.74 (2♂♂+1 ♀); Dayr Alla 19.III.74 (1♂); Yajuz 28.IV.74 (1♂).

Distribution: Palaearctic: Afghanistan, Algeria, Armenia, Azerbaijan, Gruzia, Iran, Jordan, Kyrgyz Republic, Morocco, Tajikistan, Tunisia, Turkey, Turkmenistan, Uzbekistan.

This species was recorded previously from Jordan (EVENHUIS & GREATHEAD 1999).

Chalcochiton speciosus (LOEW 1844) (Fig. 7b)

Material: Eight specimens: Al Aridah 4.III.02 (2 ♀♀); Al Mujib 18.III.02 (1♂); Ayn Aqraba 25.III.02 (1♂+2 ♀♀); Jarash 15.IV.02 (1♂); Wadi Shu'ayb 1.V.97 (1♂).

Distribution: Palaearctic: Afghanistan, Iran, Turkey.

Males of this species have dense white scales at all abdominal tergites, while females have white scales confined to 1st tergum and small spots at sides of 2nd, 6th and 7th terga, the remainder is black with bronzy glint.

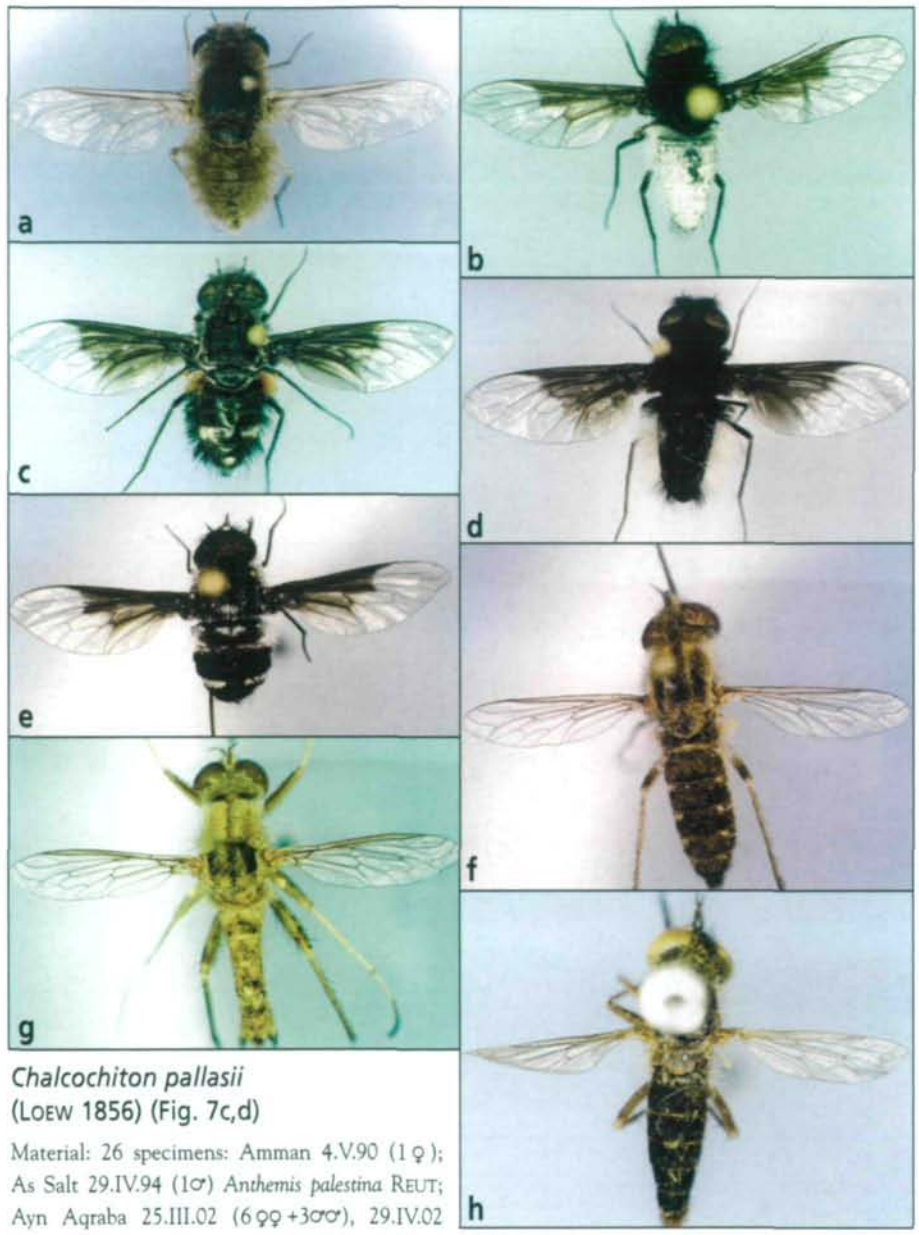

Fig. 7:
a: *Cytherea dispar*
b: *Chalcochiton speciosus*
c,d: *Chalcochiton pallasii*
e: *Chalcochiton syriacus*
f: *Amictus obliquenotatus*
g: *Amictus validus*
h: *Amictus* sp. near *tigrinus*

Chalcochiton pallasii (LOEW 1856) (Fig. 7c,d)

Material: 26 specimens: Amman 4.V.90 (1 ♀); As Salt 29.IV.94 (1♂) *Anthemis palestina* REUT; Ayn Aqraba 25.III.02 (6 ♀♀ +3♂♂), 29.IV.02 (1♂+1 ♀); Ar Rumaymin 17.IV.86 (1 ♀); Dayr Alla 25.III.90 (1♂); Jarash 15.IV.02 (1♂), 25.IV.85 (1♂), 3.V.90 (1♂); Kurayyimah 8.IV.74 (4♂♂); Muzayrib 24.IV.95 (2 ♀♀) *Anthemis palestina* REUT.; Na'or 16.IV.74 (1 ♀); Wadi Shu'ayb 14.IV. ? (1♂).

Distribution: Palaearctic: Armenia, Azerbaijan, Bulgaria, Greece, Gruzia, Iran, Italy, Kyrgyz Republic, Macedonia, Moldova, Morocco, Poland, Romania, Russia, Slovenia, Syria, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

This species is common in the highlands and Jordan Valley. One specimen of this species was collected from *Anthemis palestina* REUT. Females of C. *pallasii* are easily recognised by the orange hairs at the lateral sides

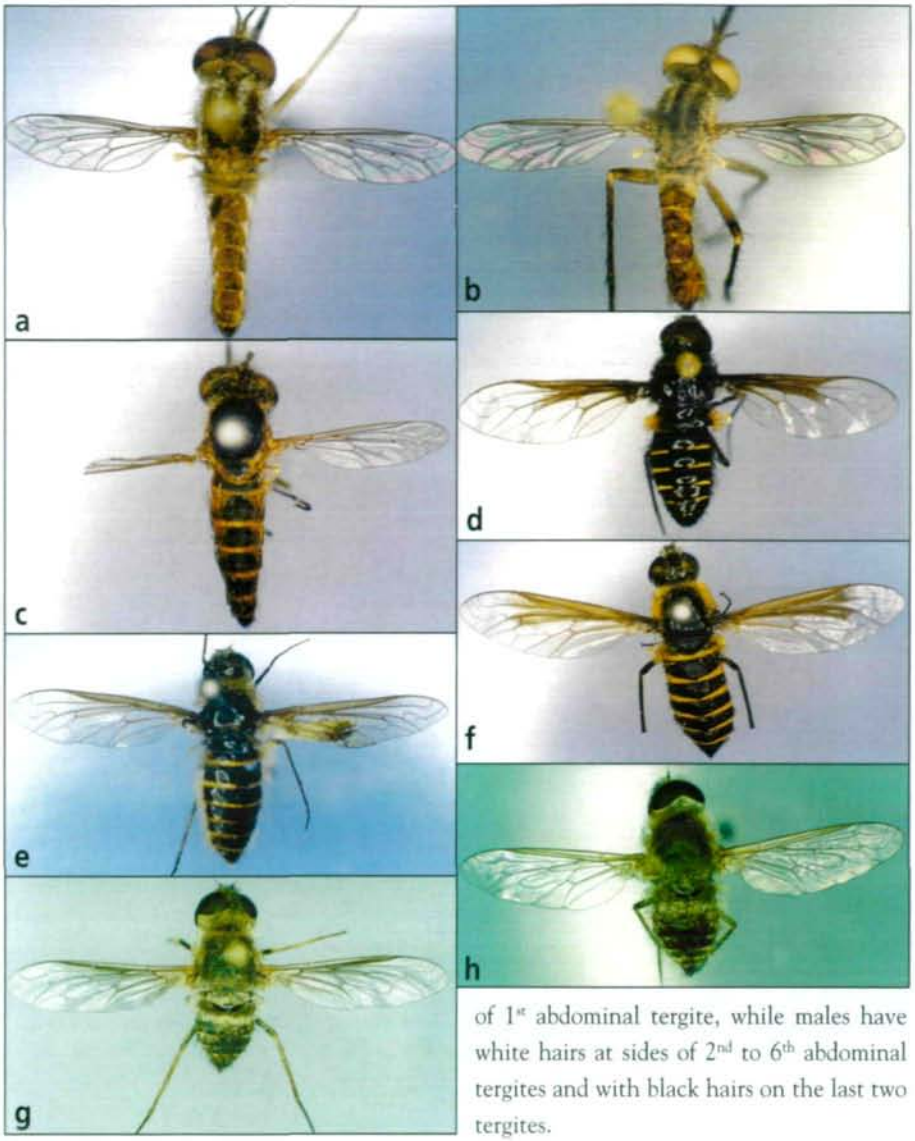

Fig. 8:
a: *Amictus* sp. near *zinamominus*
b: *Amictus virgatus*
c: *Amictus* sp. near *pictus*
d: *Lomatia abbreviata*
e: *Lomatia polyzona*
f: *Lomatia tysiphone*
g: *Cononedys stenura*
h: *Cononedys inornata*

of 1st abdominal tergite, while males have white hairs at sides of 2nd to 6th abdominal tergites and with black hairs on the last two tergites.

Chalcochiton syriacus (Loew 1869) (Fig. 7e)

Material: One specimen: Al Wala 8.IV.02 (1 ♀).

Distribution: Palaearctic: Libya, Palestine, Syria, Turkey.

Amictus obliquenotatus Austen 1937 (Fig. 7f)

Material: 13 specimens: Kufrinjah 27.V.02 (1 ♀); Al Wala 8.IV.02 (1 ♀); Ar Rumman 27.V.02 (1♂+7 ♀♀); Dibbin 13.V.02 (2♂♂+1 ♀).

Distribution: Palaearctic: Palestine.

This species has previously only been recorded from Palestine. It is distinguishable by the ground colour of the body, which is black or blackish brown while other species of Jordanian *Amictus* have yellowish brown.

Amictus validus Loew 1869 (Fig. 7g)

Material: 29 specimens: Al Azraq Natural Reserve 17.V.02 (1 ♀); Ar Ramtha 29.VII.02 (3♂♂+2 ♀♀); Ash Shajarh 22.VII.02 (6 ♀♀ +8♂♂); Western Bayudah 26.VIII.02 (6 ♀♀); West Irbid 17.IV.02 (1 ♀); Zahar 17.VII.02 (2 ♀♀).

Distribution: Palaearctic: Afghanistan, Algeria, Armenia, Azerbaijan, Bulgaria, Cyprus, Egypt, Greece, Gruzia, Iran, Italy, Lebanon, Libya, Macedonia, Moldova, Morocco, Palestine, Romania, Russia, Turkey, Turkmenistan, Ukraine, Yugoslavia.

This species is a common species in the northern mountains of Jordan. It was collected from *Carthamus persicus* Willd (Compositae). Males have a remarkably long bristle on the under side of the frore tarsus just in front of the tip, while in the females there is a pair of bristles, which are longer. Males have dense black hairs surrounding the genitalia which can be easily seen without dissection. This species exhibits variation in the length from 5,9-11,5 mm.

Amictus sp. near *tigrinus* Austen 1937 (Fig. 7h)

Material: One specimen: Al Bahhath 20.V.02 (1 ♀).

Distribution: Palaearctic: Palestine.

It seems to be rare species in Jordan. This species may be looked upon as intermediate (according to the first posterior cell) between *A. virgatus*, which has first posterior cell open and *A. validus*, which has first posterior cell closed and stalked. However, *A. tigrinus* has the first posterior cell closed near the wing margin (Austen 1937). This specimen may be aberrant since it has three submarginal cells in the left wing and four in right wing.

Amictus sp. near *zinamominus* Becker 1906 (Fig. 8a)

Material: Five specimens: Al Wala 8.IV.02 (2 ♀♀ +2♂♂); Zahar 17.VI.02 (1♂).

Distribution: Palaearctic: Algeria, Libya, Tunisia.

This species was described from Algeria and not reported so far further east than Libya. Possibly this is a new species.

Amictus virgatus Austen 1937 (Fig. 8b)

Material: Four specimens: Ar Rumman 6.V.02 (2 ♀♀); Zahar 17.VI.02 (2♂♂).

Distribution: Palaearctic: Afghanistan; Palestine; Turkey.

Amictus sp. near *pictus* Loew 1869 (Fig. 8c)

Material: Two specimens: Hummrit As Sahin 3.VI.02 (1 ♀); Al Mafraq 21.V.01 (1 ♀).

Distribution: Palaearctic: Algeria, Armenia, Azerbaijan, Bosnia-Hercegovina, Bulgaria, Croatia, Greece, Gruzia, Italy, Macedonia, Slovenia, Yugoslavia.

It is the only *Amictus* species in Jordan that has black scales. The specimens are not in sufficiently good condition to allow for positive identification to the specific level.

Subfamily Lomatiinae Schiner

Tribe Lomatiini Schiner

Lomatia abbreviata Villeneuve 1911 (Fig. 8d)

Material: Ten specimens: Al Aridah 18.III.79 (2♂♂), 13.IV.79 (1♂); Hummrit As Sahin 22.IV.02 (1♂); Kafr Asad 9.IV.01 (3 ♀♀) (Al Al Bayt University); Kurayyimah 8.IV.74 (3♂♂).

Distribution: Palaearctic: Algeria, Greece, Italy, Morocco, Palestine, Romania, Spain, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan.

This species is distinguished from other *Lomatia* in Jordan by black hairs on male's body and by the orange lateral extremity of the female's 2nd abdominal tergite.

Lomatia polyzona Loew 1869 (Fig. 8e)

Material: Seven specimens: Al Jubayhah 23.V.92 (1 ♀); Al Mushaqqar 28.V.90 (1 ♀); Amman 12.VI.78 (1 ♀); Dayr Alla 25.V.74 (1 ♀); Irbid 6.V.86 (2 ♀♀); Marj Al Hamam 15.IV.98 (1 ♀).

Distribution: Palaearctic: Albania, Armenia, Azerbaijan, Greece, Gruzia, Italy, Macedonia, Romania, Syria, Turkey, Yugoslavia.

The yellow bands in this species are uniform in width while the other *Lomatia* species known from Jordan has interrupted bands.

Lomatia tysiphone Loew 1860 (Fig. 8f)

Material: Ten specimens: Al Jubayhah 13.V.74 (1♂), 22.V.88 (3♂♂), 23.V.92 (1♂); Amman 7.IV.96 (1♂); Birqish 14.V.01 (1 ♀) (Al Al Bayt University); Jarash 12.V.83 (1♂); Rihaab 7.V.01 (1 ♀+1♂) (Al Al Bayt University).

Distribution: Palaearctic: Albania, Algeria, Armenia, Azerbaijan, Bulgaria, France, Gibraltar, Greece, Gruzia, Hungary, Italy, Libya, Macedonia, Moldova, Palestine, Romania, Russia, Spain, Syria, Turkey, Turkmenistan, Ukraine, Yugoslavia.

The yellow bands on abdominal tergites in both sexes are interrupted in the middle.

Subfamily Anthracinae Latreille

Tribe Aphoebantini Becker

Cononedys stenura (Loew 1871) (Fig. 8g)

Material: Ten specimens: Al Jubayhah 11.VI.79 (1 ♀), 13.VI.93 (1♂); Ar Rumaymin 3.VII.02 (5♂♂+1 ♀); Ayn esh Shallaleh 16.V97 (1♂); Mahis 15.VII.02 (1♂).

Distribution: Oriental: Pakistan. Palaearctic: Palestine, Tajikistan, Turkmenistan, Uzbekistan.

Cononedys inornata (Greathead 1967) (Fig. 8h)

Material: Four specimens: Dana 23.IX.02 (2 ♀♀ +1♂). Al Muwaqqar 7.X.02 (1 ♀) *Polygonum argenstavum* Sibth.

Distribution: Palaearctic: Eritrea, Saudi Arabia.

Tribe Prorostomatini Hull

Stomylomyia europaea (Loew 1869) (Fig. 9a)

Material: Three specimens: Ayn Aqraba 29.IV.02 (2 ♀♀); Hummrit As Sahin 3.VI.02 (1 ♀).

Distribution: Palaearctic: Afghanistan, Albania, Armenia, Azerbaijan, Egypt, France, Greece, Gruzia, Hungary, Iran, Italy, Macedonia, Moldova, Palestine, Romania, Russia, Turkey, Ukraine, Yugoslavia.

Jordanian specimens vary in having mostly yellow legs and all bristles on the thorax in front of wings are pale. This species is difficult to see in the field since its colour resembles the ground colour. It has great variation in size (Austen 1937).

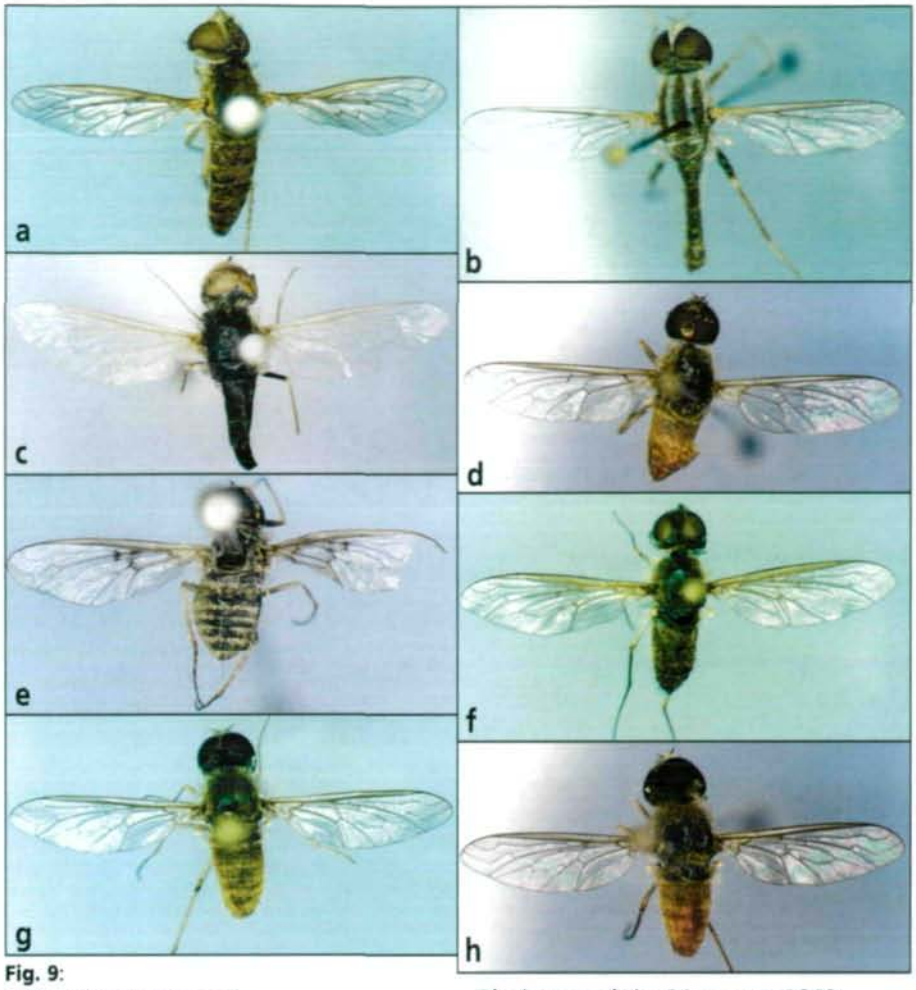

Fig. 9:
a: *Stomylomyia europaea*
b: *Plesiocera algira*
c: *Desmatoneura* sp. 1
d: *Xeramoeba semirufa*
e: *Xeramoeba sabulonis*
f: *Petrorossia hespera*
g: *Petrorossia letho*
h: *Petrorossia albula*

Plesiocera algira Macquart 1840 (Fig. 9b)

Material: Four specimens: Al Bahhath 20.V.02 (1♂+1♀); Ma'ain 5.VIII.02 (1♀); Western Bayudah 26.VIII.02 (1♀).

Distribution: Palaearctic: Algeria, Italy, Lebanon, Palestine, Spain, Syria, Tunisia.

This species was collected flying near ground surface between vegetation.

Tribe Xeramoebini Hull

Desmatoneura sp. 1 (Fig. 9c)

Material: One specimen: Ad Disah 20.VII.96 (1♂).

The frons and face of this species is orange with gold scaling. Dr. Greathead examined one specimen with such characters from Oman among a series originally identified by him as *D. sica*.

Xeramoeba semirufa (Sack 1909) (Fig. 9d)

Material: One specimen: Ash Shajarah 2.VI.02 (1♂).

Distribution: Oriental: Pakistan. Palaearctic: Afghanistan, Egypt, Iran, Saudi Arabia.

Xeramoeba sabulonis (Becker 1906) (Fig. 9e)

Material: Five specimens: Al Bahhath 20.V.02 (2♀♀); Dana 23.IX.02 (1♀); Hummrit As Sahin 3.VI.02 (1♀); 22.IV.02 (1♀).

Distribution: Afrotropical: Sudan. Palaearctic: Algeria, Egypt, Greece, Macedonia, Palestine, Tunisia, Turkey, Yugoslavia.

Xeramoeba salwae El Hawagry 2001

Material: Two specimens: Al Bahhath 20.V.02 (1♀+1♂).

Distribution: Palaearctic: Egypt.

Petrorossia hespera (Rossi 1790) (Fig. 9f)

Material: 19 specimens: Al Badhyah 25.IX.02 (1♀); Al Husson 19.VIII.02 (1♂); Al Mukhaybah al Fawqa 31.VII.02 (1♂); Al Mujib 3.V.99 (1♂); Al Muwaqqar 16.IX.02 (1♀); Ayn Aqraba 29.IV.02 (2♀♀+2♂♂); Ar Rumaymin 17.IV.86 (1♀+1♂); Ash Shajarah 22.VII.02 (1♂); Ash Shawbak 7.VIII.02 (1♀); As Salt 2.IX.02 (1♂); Hummrit As Sahin 22.IX.02 (1♀); Ma'ain 5.VIII.02 (2♀♀+1♂); Western Bayudah 26.VIII.02 (1♀).

Distribution: Palaearctic: Algeria, Armenia, Austria, Azerbaijan, Bosnia-Hercegovina, Bulgaria, Canary Is, Croatia, Egypt, France, Greece, Gruzia, Italy, Kyrgyz Republic, Libya, Macedonia, Malta, Moldova, Morocco, Palestine, Portugal, Romania, Russia, Spain, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan, Yugoslavia.

It appears to be common in the highlands and the Jordan Valley. It has been reared from the nests of several species of sphecid wasps (du Merle 1975).

Petrorossia letho (Wiedemann 1828) (Fig. 9g)

Material: 15 specimens: Al Jubayhah 3.IX.02 (1♀+1♂); Ash Shumari 23.VII.02 (6♀♀+4♂♂) *Retma raetam* (Forssk) (Leguminosae); Al Mujib 24.IX.02 (1♂); Wadi Shuqayq 24.IX.02 (1♀+1♂) on *Verthemia iphionoides*.

Distribution: Afrotropical: Benin, Chad, Eritrea, Ethiopia, Kenya, Somalia,

Sudan. Palaearctic: Afghanistan, Algeria, Austria, Bosnia-Hercegovina, Bulgaria, Croatia, Egypt, France, Iran, Italy, Libya, Macedonia, Russia, Saudi Arabia, Slovenia, Spain, Tajikistan, Turkey, Turkmenistan, Uzbekistan, Yugoslavia.

It was collected from white broom *Retma raetam* (FORSK.) (Leguminosae).

Petrorossia albula ZAITZEV 1962 (Fig. 9h)

Material: Five specimens: Al Mukhaybah al Fawqa 31.IX.02 (2 ♀♀ +2♂♂); Sama As Sarhan 29.VII.02 (1 ♀).

Distribution: Afrotropical: Benin, Ghana, Kenya, Nigeria. Palaearctic: Algeria, Armenia, Azerbaijan, Gruzia, Kazakhstan, Kyrgyz Republic, Mongolia, Morocco, Saudi Arabia, Tajikistan, Turkmenistan, United Arab Emirates, Uzbekistan.

It was collected from white broom *Retma raetam* (FORSK.) (Leguminosae).

Pipunculopsis stackelbergi ZAITZEV 2000 (Fig. 10a)

Material: Four specimens: As Safawi 14.VIII.02 (4♂♂).

Distribution: Palaearctic: Palestine.

It was found only so far from the Eastern Desert of Jordan.

Pipunculopsis sp. 1 (Fig. 10b)

Material: One specimen: As Safawi 14.VIII.02 (1 ♀).

This species is found only so far from the Eastern Desert of Jordan.

Tribe Anthracini LATREILLE

Spogostylum sordidum SACK 1909 (Fig. 10c)

Material: Four specimens: Al Muwaqqar 7.X.02 (1♂+1 ♀) Mating; Dayr Alla 5.X.95 (1♂); As Safawi 13.VIII.02 (1 ♀).

Distribution: Palaearctic: Afghanistan, Egypt, Iran, Oman, Saudi Arabia, Tajikistan, Turkmenistan, Uzbekistan.

This species is a large robust species, completely black, but the females have white spots on 6th and 7th abdominal tergites.

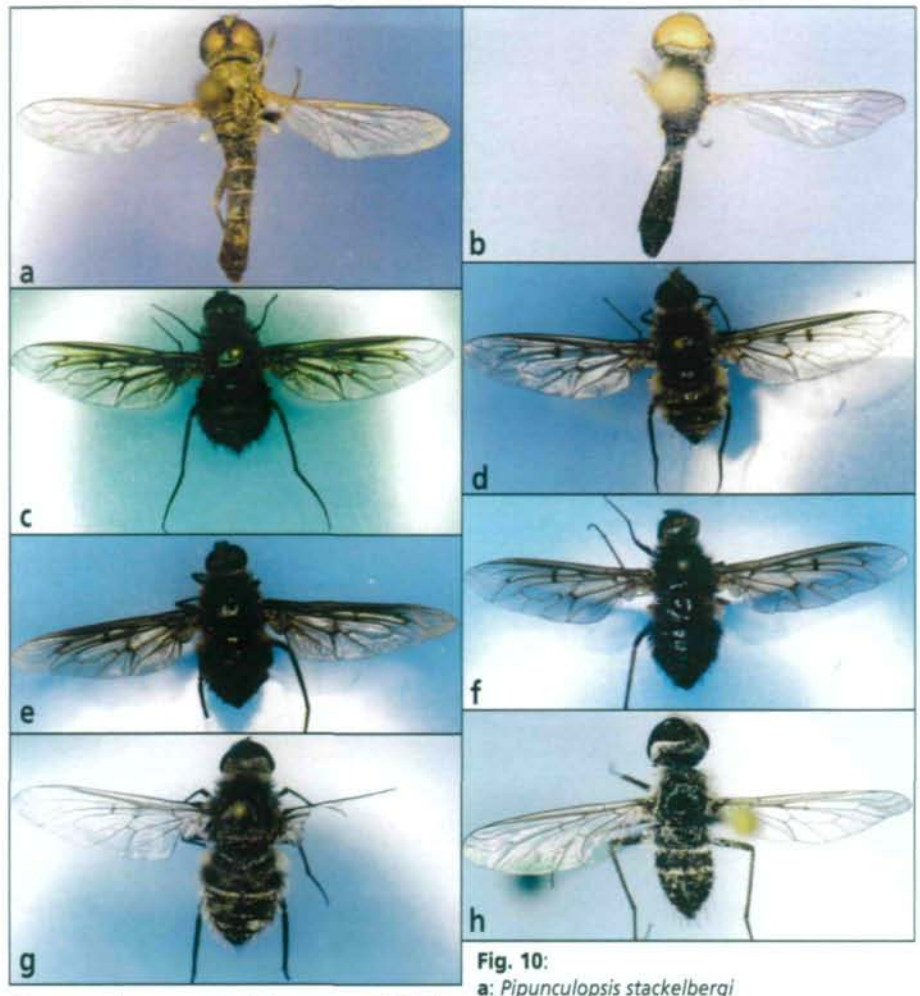

Fig. 10:
a: *Pipunculopsis stackelbergi*
b: *Pipunculopsis* sp. 1
c: *Spogostylum sordidum*
d: *Spogostylum ocyale*
e: *Spogostylum griseipenne*
f: *Spogostylum* sp. 1
g: *Spogostylum nitidum*
h: *Spogostylum perpusillum*

Spogostylum ocyale (WIEDEMANN 1828) (Fig. 10d)

Material: 11 specimens: Al Jubayhah 5.X.95 (1 ♀), 23.X.96 (1 ♀); Amman 6.VIII.97 (1 ♀), 25.XII.98 (1♂); As Salt 3.IX.93 (1♂); Dana, An Nawatif 27.IX.02 (2♂♂+1 ♀); Dayr Alla 20.VII.94 (1♂) Light trap; Petra ?.IV.95 (1 ♀); Wadi Shua'yb 26.VIII.96 (1♂).

Distribution: Afrotropical: Somalia, Sudan, Yemen. Palaearctic: Egypt, Iran, Jordan, Libya, Oman, Palestine, Saudi Arabia.

This species was recorded from Jordan previously (EVENHUIS & GREATHEAD 1999).

Spogostylum griseipenne (MACQUART 1850) (Fig. 10e)

Material: Three specimens: Ma'an 20.VII.96 (1♂); Irbid 21.IX.95 (1♂); Al Jubayhah unknown date and month. 90 (1?).

Distribution: Afrotropical: Mauritania, Niger. Palaearctic: Egypt, Iraq, Libya, Palestine, Saudi Arabia, Tunisia, United Arab Emirates.

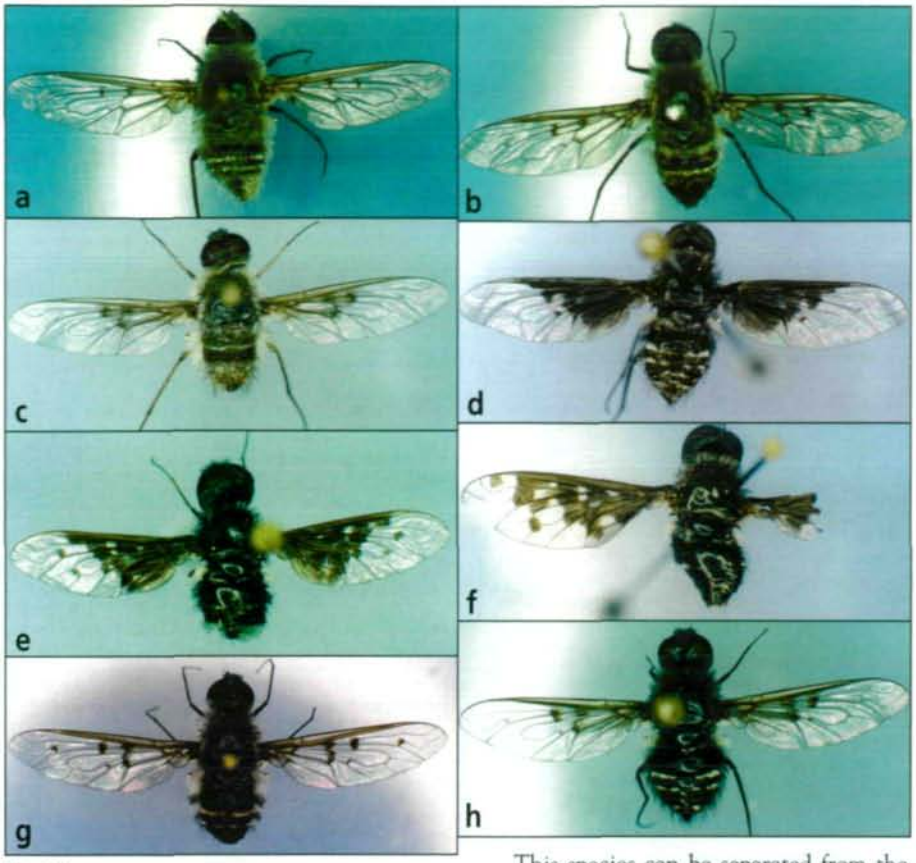

Fig. 11:
a: *Spogostylum candidum*
b: *Spogostylum isis*
c: *Anthrax virgo*
d: *Anthrax dentata*
e: *Anthrax aethiops*
f: *Anthrax greatheadi*
g: *Anthrax sticticus*
h: *Anthrax niger*

This species can be separated from the *Spogostylum ocyale* by its wing pattern (GREATHEAD 2003).

Spogostylum sp. 1 (Fig. 10f)

Material: One specimen: Irbid 28.IX.86 (1 ♀).

This species has completely infuscated wings. It may be a dark form of *S. arenivagum* AUSTEN which in turn may be a synonym of *S. hippolyta* (WIEDEMANN).

Spogostylum nitidum AUSTEN 1937 (Fig. 10g)

Material: One specimen: Al Mujib, Faqu'a 28.IX.02 (1 ♀).

Distribution: Palaearctic: Palestine.

This species seems to be rare in Jordan. It is easily recognised by the yellowish or whitish spots, formed by patches of scales on the dorsum of the abdomen (AUSTEN 1937).

Spogostylum perpusillum AUSTEN 1937 (Fig. 10h)

Material: Three specimens: Ar Rumaymin 3.VII.02 (1♂); Al Bahhath 20.V.02 (1 ♀ +1♂).

Distribution: Palaearctic: Palestine.

Spogostylum candidum (SACK 1909) (Fig. 11a)

Material: Two specimens: Jarash 21.V.00 (1♂); Wadi Shuqayq 24.IX.02 (1♂).

Distribution: Oriental: Pakistan. Palaearctic: Egypt, Iran, Turkey, United Arab Emirates.

The individuals of this species exhibit considerable variation in size, wing venation and colour vestiture (AUSTEN 1937). This species is similar to *S. isis*, but the body is not completely black and the tibia is brown (GREATHEAD 1988). It is distinguished from other similar species by dense white scales at last abdominal tergites.

Spogostylum isis (MEIGEN 1820) (Fig. 11b)

Material: 17 specimens: Ajlun 27.V.02 (1 ♀); Al Jubayhah 28.VI.94 (1♂), 26.VIII.90 (1♂); Al Husson 5.VI.97 (1♂+1 ♀); 17.VI.02 (1♂+1 ♀); Amman 5.VI.97 (2♂♂+1 ♀); Ayn Aqraba 25.III.02 (1 ♀); Ar Rumaymin 3.VII.02 (1 ♀); Ar Rumman 13.V.91 (1♂); Hummrit As Sahin 22.IV.02 (1 ♀); Jarash 6.V.02 (1 ♀); Ma'ain 5.VI-II.02 (1 ♀); Zai 12.VIII.93 (1♂).

Distribution: Afrotropical: Mali. Palaearctic: Algeria, Armenia, Austria, Azerbaijan, Belgium, Croatia, Cyprus, Egypt, France, Greece, Gruzia, Italy, Kazakhstan, Kyrgyz Republic, Libya, Macedonia, Malta, Morocco, Palestine, Portugal, Saudi Arabia, Spain, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Uzbekistan, Yugoslavia.

This species is a common species in Jordan. It has considerable variation in wing venation, colour of vestiture, and in size (4,9-9,6 mm). Immature stages of this species were recorded as predators on egg pods of *Dociostaurus maroccanus* (THUNBERG) (Acrididae) but the correctness of this record is in doubt (YEATES & GREATHEAD 1997).

Anthrax virgo EGGER 1859 (Fig. 11c)

Material: 14 specimens: Aira 15.VII.02 (1 ♀); Ajlun 27.V.02 (1♂+1 ♀); Ar Rumman 6.V.02 (1 ♀); Ash Shawbak 7.VIII.02 (1♂+1 ♀); Ash Shunah 15.IX.87 (1 ♀); Dayr Alla 25.V.74 (1♂); Dibbin 13.V.02 (1♂+2 ♀♀); Jarash 8.V.02 (1♂); Kafr Huda 2.IX.02 (1♂); Mahis 15.VIII.02 (1♂).

Distribution: Palaearctic: Albania, Algeria, Armenia, Austria, Azerbaijan, Bulgar-

ia, Croatia, France, Greece, Gruzia, Hungary, Italy, Libya, Malta, Morocco, Palestine, Saudi Arabia, Spain, Tunisia, Turkey.

This species is common in Jordan. It is characterised by the absence of scales on the body and by the absence of recurrent appendices to veins in the wings, and by presence of hairs instead of scales on the body. It has been reared from *Anthocopa* spp. (Megachilidae) (DU MERLE 1975).

Anthrax dentata (BECKER 1906) (Fig. 11d)

Material: One specimen: Dayr Alla 13.XI.02 (1 ♀).

Distribution: Afrotropical: Aldabra, Chad, Eritrea, Kenya, Tanzania, Yemen. Palaearctic: Algeria, Egypt, Hungary, Italy, Libya, Malta, Morocco, Palestine, Saudi Arabia, Spain, Tunisia.

This species seems to be a rare species in Jordan.

Anthrax aethiops (FABRICIUS 1781) (Fig. 11e)

Material: Three specimens: Ayn esh Shallaleh 24.VI.02 (1♂); Hummrit As Sahin 22.IV.02 (1♂); Khdair 30.VIII.81 (1♂) (Al Yarmouk University).

Distribution: Palaearctic: Algeria, Armenia, Austria, Azerbaijan, Bosnia-Hercegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Egypt, France, Germany, Greece, Gruzia, Hungary, Iran, Italy, Kyrgyz Republic, Libya, Morocco, Palestine, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Switzerland, Tajikistan, Tunisia, Turkmenistan, Ukraine, Uzbekistan.

This species is recognisable by the broad scales at the tip of its abdomen. AUSTEN (1937) mentioned that a male hatched from a nest of *Osmia pallicornis* FRIESE (Megachilidae) in Egypt and it has also been reared from other Megachilidae (DU MERLE 1975).

Anthrax greatheadi EL HAWAGRY 1998 (Fig. 11f)

Material: Two specimens: Ar Rumman 6.V.02 (1♂); As Salt 28.V.93 (1♂).

Distribution: Palaearctic: Egypt.

This species seems to be a rare species in Jordan.

Anthrax sticticus KLUG 1832 (Fig. 11g)

Material: Three specimens: As Salt 1.IX.93 (1 ♀); Wadi Shuqayq 24.IX.02 (2♂♂).

Distribution: Afrotropical: Chad, Eritrea, Guinea-Bissau, Nigeria, Senegal. Palaearctic: Afghanistan, Armenia, Azerbaijan, Cyprus, Greece, Gruzia, Iran, Italy, Kyrgyz Republic, Macedonia, Oman, Palestine, Syria, Tajikistan, Turkey, Turkmenistan, Uzbekistan, Yugoslavia.

This species is characterised by presence of more than three spots on the wings. GREATHEAD (1967) suggested that this species is a parasite of mud dauber wasps (Sphecidae) (EL-HAWAGRY et al. 2000) and has also been reared from megachilid bees (DU MERLE 1975).

Anthrax niger (AUSTEN 1937) (Fig. 11h)

Material: Two Specimens: Dead Sea 30.X.02 (1 ♀) during flying; Wadi Shuqayq 24.IX.02 (1 ♀) on the ground.

Distribution: Palaearctic: Palestine.

It is almost uniformly black coloration of the hairy covering of the body, combined with the presence of only two dark flecks in each wing; prevent this species from being confused with other species recorded in Jordan.

Anthrax candidapex (AUSTEN 1937) (Fig. 12a)

Material: Four specimens: Al Wala 8.IV.02 (1♂); Al Mujib 13.III.02 (1♂); Hummrit As Sahin 22.IV.02 (2♂♂).

Distribution: Palaearctic: Palestine.

The dense white scales at the end of abdomen distinguish *A. candidapex* from similar *Anthrax* ssp. in *Anthrax* of Jordan.

Tribe Villini HULL

Oestranthrax brunnescens (LOEW 1857) (Fig. 12b)

Material: One specimen: Dana, Wadi An Nawatif 27.IX.02 (1 ♀).

Distribution: Palaearctic: Egypt, Kyrgyz Republic, Palestine, Syria, Tajikistan, Turkmenistan, Uzbekistan.

This species seems to be rare in Jordan.

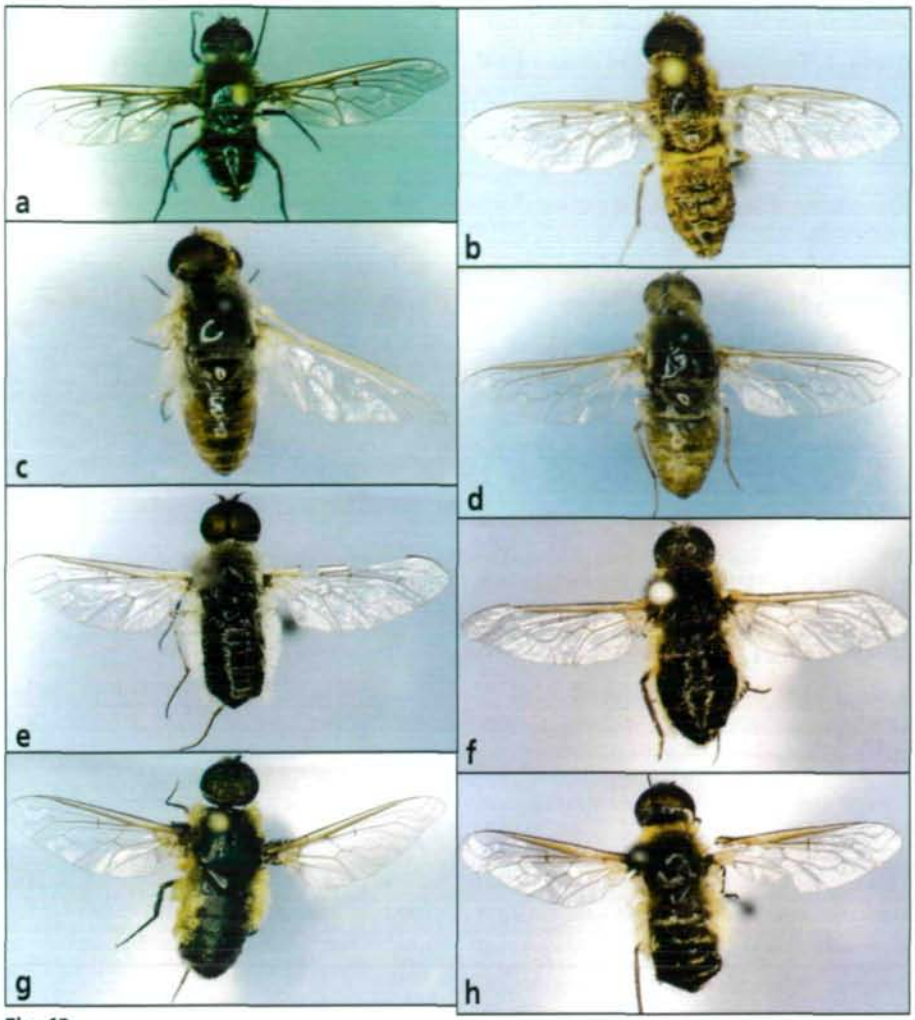

Fig. 12:
a: *Anthrax candidapex*
b: *Oestranthrax brunnescens*
c: *Oestranthrax* sp. near *alfierii*
d: *Oestranthrax* sp. near *pallifrons*
e: *Villa ixion*
f: *Villa* sp. near *laevis*
g: *Villa insignis*
h: *Villa atricauda*

Oestranthrax sp. near *alfierii* Paramonov 1931 (Fig. 12c)

Material: One specimen: Wadi Al Arab (1♂).

Distribution: Palaearctic: Egypt.

It appears to be rare in Jordan. The only specimen was collected buried in the sand under *Retma raetam* (Forsk).

Oestranthrax sp. near *pallifrons* Bezzi 1926 (Fig. 12d)

Material: One specimen: Al Mafraq 10.V.95 (1♂).

Distribution: Palaearctic: Libya, Spain.

The Jordanian specimen fits the female description of this species, but it does not have brown infuscation in the costal cell. While the male is not described yet, it may be the undescribed male of this species.

Villa ixion (Fabricius 1794) (Fig. 12e)

Material: Three specimens: Al Mushaqqar 28.V.90 (1♂); Al Mafraq, Rihaab 7.V.01 (1♂); Wadi Shuqayq 24.IX.02 (1♂).

Distribution: Palaearctic: Armenia, Austria, Azerbaijan, Bulgaria, Croatia, Cyprus, Czech Republic, Egypt, France, Greece, Gruzia, Hungary, Iran, Italy, Libya, Moldova, Morocco, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Turkey, Switzerland, Ukraine.

The development of white or silver scales on the apical abdominal terga of males of this species is variable, but all have identical genitalia. This species is characterised by having white hairs only surrounding the abdomen.

Villa sp. near *laevis* Becker 1915 (Fig. 12f)

Material: Three specimens: Al Jubayhah 1.VI.88 (1♀); Kafr Huda 2.IX.02 (1♀+1♂).

Distribution: Palaearctic: Egypt, Morocco, Tunisia.

The scales on abdomen of the available specimens were not well preserved which made it difficult to confirm the identification.

Villa insignis Austen 1937 (Fig. 12g)

Material: One specimen. No data, (1♂).

Distribution: Palaearctic: Palestine, Syria.

This species has distinctive yellow hairs and scales on the abdomen.

Villa atricauda Austen 1937 (Fig. 12h)

Material: Two specimens: Ar Rumaymin 3.VII.02 (1♀); Zahar 17.VI.02 (1♂).

Distribution: Palaearctic: Palestine, Syria.

This species was described from females only. The undescribed male Jordanian specimen agrees with the description of the female but has silver patagium.

Villa sp. near *stenozona* (Loew 1869) (Fig. 13a)

Material: Two specimens: As Salt 28.VIII.93 (1♂), 12.IX.93 (1♂).

Distribution: Palaearctic: Algeria, Egypt, France, Greece, Italy, Turkey, Yugoslavia.

Jordanian specimens differ in having white hairs and scales on all sternites while

these are black on apical segment of *V. stenozona*.

Villa niphobleta (Loew 1869) (Fig. 13b)

Material: Four specimens: Al Mafraq 27.IX.95 (1 ♀); Al Mujib 3.V.99 (1 ♀); Amman 15.V.97 (1 ♀); Hummrit As Sahin 3.VI.02 (1 ♀).

Distribution: Palaearctic: Afghanistan, Algeria, Armenia, Azerbaijan, Bulgaria, Cyprus, France, Greece, Gruzia, Italy, Kyrgyz Republic, Morocco, Romania, Russia, Spain, Tajikistan, Tunisia, Turkey, Turkmenia, Uzbekistan, Yugoslavia.

Villa bivirgata Austen 1937 (Fig. 13c)

Material: 37 specimens: Ajlun 22.X.92 (1♂); Al Husson 17.VI.02 (1 ♀); Al Jubayhah 22.VII.92 (1♂), 29.X.89 (1 ♀), unknown date and month 1995 (1♂); Al Muwaqqar 7.X.02 (3 ♀♀); Al Mukhaybah al Fawqa 21.X.02 (2 ♀♀); Amman 27.IX.78 (1 ♀); Ar Ramtha 29.VII.02 (2 ♀♀); Ash Shajarah 22.VII.02 (1 ♀); Ash Shawbak 7.VIII.02 (3 ♀♀ +2♂♂); Ayn Almuallaqah 28.V.01 (1 ♀ +3♂♂) (Al Al Bayt University); Dana, Wadi Ar Rummanah 28.IX.02 (1 ♀); Hummrit As Sahin 22.VI.02 (1 ♀); Irbid 19.VII.75 (1 ♀); Kafr Asad 9.IV.01 (1 ♀) (Al Al Bayt University); Sama As Sarhan 29.VII.02 (1♂), unknown data (1♂); Wadi Ar Rayyan 8.X.02 (1♂+4 ♀♀); Yajuz 14.X.02 (2 ♀♀ +1♂).

Distribution: Afrotropical; Yemen. Palaearctic: Palestine, Saudi Arabia, Syria.

This species is very common species in Jordan. It was collected from *Polygonum equisetiforme* Sibth (Polygonaceae). Scales of this species drop quickly during handling.

Villa sp. 1 (Fig. 13d)

Material: Nine specimens: Al Muwaqqar 21.X.02 (8 ♀♀ +1♂).

The collected specimens of this species are smaller in size (6-8 mm long) compared to *V. bivirgata*. It was collected from *Polygonum equisetiforme* Sibth (Polygonaceae).

Villa fasciculata Becker 1916

Material: One specimen: Wadi As Sayr 3.II.95 (1 ♀).

Distribution: Palaearctic: Cyprus, France, Greece, Hungary, Italy, Moldova, Russia, Spain, Ukraine.

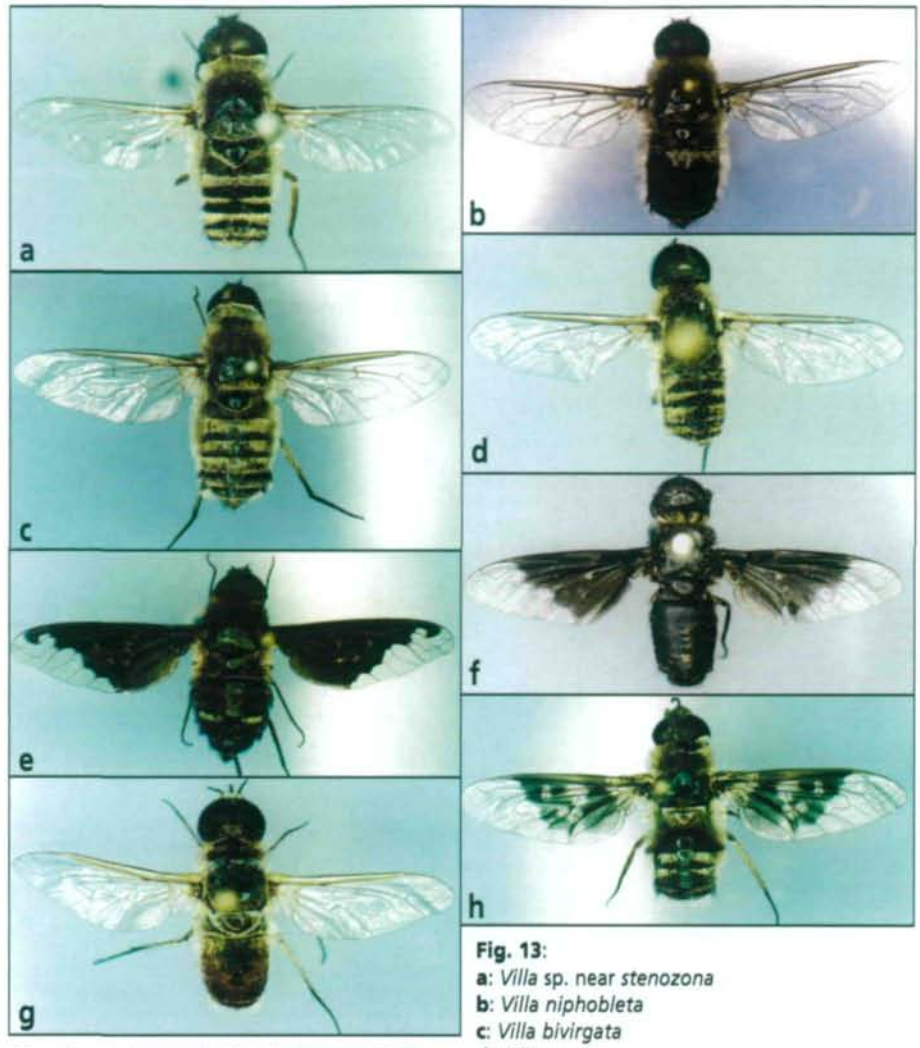

Fig. 13:
a: *Villa* sp. near *stenozona*
b: *Villa niphobleta*
c: *Villa bivirgata*
d: *Villa* sp. 1
e: *Hemipenthes velutina*
f: *Caecanthrax arabicus*
g: *Thyridanthrax lotus*
h: *Thyridanthrax perspicillaris* ssp. *perspicillaris*

Hemipenthes velutina (Meigen 1820) (Fig. 13e)

Material: 28 specimens: Abu Nussayr 17.XII.98 (1 ♀); Al Fuhays 19.IV.89 (1♂); Al Husson 16.IV.02 (1♂); Al Jubayhah 21.IV.91 (1♂), 2.V.77 (1♂), 2.V.02 (1 ♀), 3.V.88 (1♂), 5.V.77 (1 ♀), 12.V.92 (1 ♀), 13.V.74 (1♂), 15.V.98 (1 ♀), 22.VII.93 (1 ♀); Al Mujib 24.IX.02 (2♂♂) on *Acacia* sp.; Al wala 8.IV.02 (1 ♀ +1♂); Amman 11.V.92 (1♂); Ar Raddas 22.IX.02 (1 ♀) on *Acacia* sp.; Ar Rumman 22.IV.83 (1 ♀); As Salt 26.VII.78 (1♂); Jarash 15.IV.02 (1 ♀), 12.IV.80 (1 ♀); Madaba 3.V.75 (1 ♀); Mahis 16.IV.02 (1♂); Rum 10.III.00 (1 ♀); Wadi Shuqayq 24.IX.02 (2 ♀♀); Western Bayudah 26.VIII.02 (1 ♀).

Distribution: Oriental: Pakistan. Palaearctic: Albania, Algeria, Armenia, Austria, Azerbaijan, Belgium, Bosnia-Hercegovina, Bulgaria, China, Croatia, Cyprus, Czech Republic, Egypt, France, Germany, Greece, Gruzia, Hungary, Iran, Italy, Lebanon, Macedonia, Moldova, Mongolia, Morocco, Palestine, Poland, Portugal, Romania, Russia,

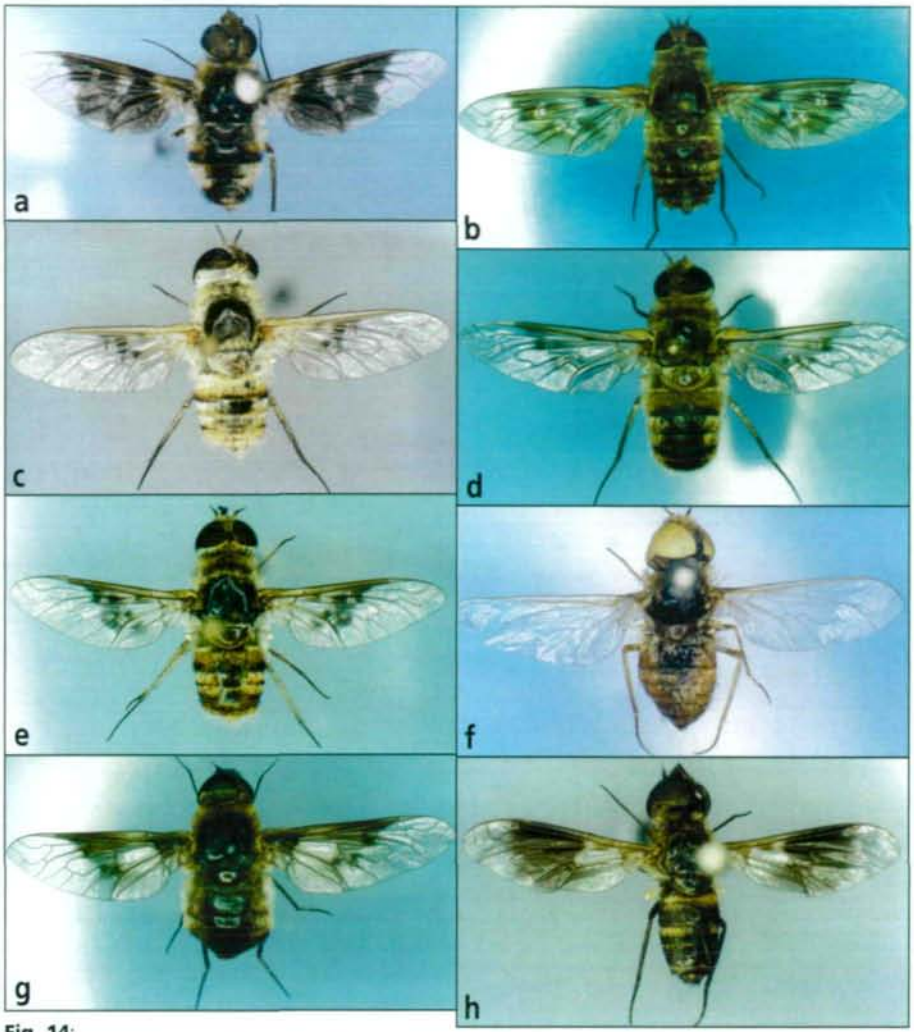

Fig. 14:
a: *Thyridanthrax perspicillaris* ssp. *idolus*
b: *Thyridanthrax polyphemus*
c: *Thyridanthrax* sp. near *griseolus*
d: *Thyridanthrax incanus*
e: *Thyridanthrax elegans*
f: *Pachyanthrax fulvifacies*
g: *Pachyanthrax telamon*
h: ? *Pachyanthrax nimrodicus*

Slovakia, Slovenia, Spain, Switzerland, Syria, Tunisia, Turkey, Turkmenistan, Ukraine, Yugoslavia.

This species is common in Jordan. It was collected from *Acacia* (Leguminosae). It is a hyperparasitoid of the pupae of the dipterous and hymenopterous parasitoids *Thaumetopoea pityocampa* (DENIS & SCHIFFERMÜLLER) (Thaumetopoeidae) (DU MERLE 1975).

Caecanthrax arabicus (MACQUART 1840) (Fig. 13f)

Material: Two specimens: Al Bahhath 20.V.02 (1 ♀); unknown data (1♂).

Distribution: Oriental: Pakistan. Palaearctic: Afghanistan, Armenia, Azerbaijan, France, Greece, Gruzia, Iran, Italy, Jordan, Kyrgyz Republic, Saudi Arabia, Tajikistan, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan, Yugoslavia.

It was recorded previously from Jordan (EVENHUIS & GREATHEAD 1999).

Thyridanthrax lotus (LOEW 1869) (Fig. 13g)

Material: 28 specimens: Abu Nussayr 3.VII.02 (2 ♀♀ +1♂); Aira 15.VII.02 (1♂); Al Husson 17.VI.02 (2 ♀♀); Al Muwaqqar 16.IX.02 (4 ♀♀); 7.X.02 (2 ♀♀); Ar Ramtha 29.VII.02 (1 ♀); Ash Shajarah 22.VII.02 (2♂♂); Ash Shawbak 7.VIII.02 (1 ♀ +1♂); Kafr Khal 22.VII.02 (3 ♀♀); Ma'ain 5.VIII.02 (5 ♀♀); Muzayrib 31.VII.02 (1 ♀); Sama As Sarhan 29.VII.02 (2 ♀♀).

Distribution: Palaearctic: Afghanistan, Armenia, Azerbaijan, Cyprus, Egypt, Greece, Gruzia, Iran, Italy, Kazakhstan, Kyrgyz Republic, Spain, Tajikistan, Turkey, Turkmenistan, Uzbekistan.

This species is a common species in Jordan. It is unusual for *Thyridanthrax* to have completely hyaline wings. Sama As Sarhan specimens differ in having the dorsal surface of thorax and abdomen with yellow-brown scales and shiny bristles and are smaller size than most *T. lotus* individuals.

Thyridanthrax perspicillaris ssp. *perspicillaris* (LOEW 1869) (Fig. 13h)

Material: 24 specimens: Al Jubayhah 11.V.94 (1 ♀), 22.V.92 (1 ♀), 19.VII.93 (1♂), 31.VII.90 (1♂), 6.VIII.90 (1 ♀), 16.IX.90 (2♂♂), 17.IX.90 (1♂), 18.IX.90 (1♂), 23.IX.90 (1♂), 24.IX.90 (1 ♀ +1♂), 26.IX.89 (1 ♀ +1♂); Al Mafraq, Um Bottema 8.X.93 (1 ♀); Ash Shawbak 7.VIII.02 (3 ♀♀ +2♂♂); Jarash 8.IV.96 (1 ♀); Ma'ain 5.VIII.02 (1♂); Tabaqt Fahl 10.X.99 (1 ♀); Wadi al Arab Dam 9.IX.99 (1♂) (Al Balqa University).

Distribution: Afrotropical: Eritrea, Ethiopia, Gambia, Ghana, Mali, Mauritania, South Africa, Sudan. Oriental: Pakistan. Palaearctic: Afghanistan, Albania, Armenia, Austria, Azerbaijan, Bulgaria, Croatia, Cyprus, Egypt, France, Germany, Greece, Gruzia, Iran, Iraq, Italy, Kazakhstan, Kyrgyz Republic, Libya, Morocco, Mongolia, Palestine, Romania, Russia, Saudi Arabia, Spain, Tajikistan, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan, Yugoslavia.

This subspecies is a very common subspecies in Jordan. It has 2 submarginal cells while the following subspecies has 3 submarginal cells.

Thyridanthrax perspicillaris ssp. *idolus* HESSE 1956 (Fig. 14a)

Material: One specimen: Tabaqt Fahl 10.X.99 (1 ♀) (Al Balqa University).

Distribution: Afrotropical: Botswana, Eritrea, Ethiopia, Kenya, Mali, Namibia, South Africa, Uganda, Yemen, Zimbabwe. Palaearctic: Saudi Arabia.

This subspecies has 3 submarginal cells, which distinguish it from the above subspecies.

Thyridanthrax polyphemus (WIEDEMANN 1819) (Fig. 14b)

Material: 31 specimens: Al Husson 17.VI.02 (2 ♀♀), 19.VIII.02 (1 ♀); Al Muwaqqar 27.IX.95 (2 ♀♀ +2♂♂) (Al Al Bayt University), 16.IX.02 (1 ♀), 5.IX.95 (1♂) (Al Al Bayt University), 30.IX.95 (1♂); Amman 5.V.95 (1♂), unknown data (1?); Ar Rumman 6.V.02 (1 ♀); Ash Shajarah 22.VII.02 (1 ♀); Hummrit As Sahin 25.X.01 (1 ♀) (Al Balqa University); Khdier 25.II.82 (1 ♀) (Al Yarmouk University); Kafr Khal 22.VII.02 (8 ♀♀ +1♂); Ma'ain 5.VIII.02 (1♂); Um Bottema 8.X.93 (1 ♀), 10.X.95 (3♂♂); Amman 15.VII.95 (1♂).

Distribution: Palaearctic: Armenia, Azerbaijan, France, Greece, Gruzia, Iran, Italy, Libya, Malta, Morocco, Palestine, Portugal, Spain, Syria, Tunisia, Turkey, Turkmenistan, Uzbekistan, Yugoslavia.

This species is a very common species in Jordan.

Thyridanthrax sp. near *griseolus* (KLUG 1832) (Fig. 14c)

Material: Two specimens: Wadi Shu'ayb 15.VII.02 (1 ♀); Al Mukhaybah al Fawqa 31.VII.02 (1 ♀).

Distribution: Palaearctic: Egypt, Iran, Lebanon, Libya, Saudi Arabia, Tunisia.

Male specimens are needed to make a reliable identification of the species.

Thyridanthrax incanus (KLUG 1832) (Fig. 14d)

Material: 49 specimens: Aira 15.VII.02 (1♂), Al Ghawr 3.V.96 (1♂), Al Husson 17.VI.02 (1 ♀), Al Jubayhah 3.IX.90 (1 ♀), 22.V.74 (1 ♀); Al Muwaqqar 22.VII.95 (2 ♀♀) (Al Al Bayt University), 5.IX.95 (2 ♀♀)(Al Al Bayt University); Al Mushaqqar · 16.IX.02 (2 ♀♀); Ar Ramtha 29.VII.02 (1 ♀); Ar Rumaymin 8.VIII.90 (1 ♀ +1♂), 3.VII.02 (1♂); Ash Shajarah 22.VII.02 (1 ♀ +1♂); Ash Shawbak 7.VIII.02 (6 ♀♀ +4♂♂), 4.IV.89 (1♂); As Safawi 13.VIII.02 (1♂); As Salt 26.VII.94 (1?); Hummrit As Sahin 22.IV.02 (2 ♀♀); Irbid 4.IX.88 (1 ♀); Kafr Khal 22.VII.02 (1♂); Ma'ain 5.VIII.02 (1 ♀); Muzayrib 31.VII.02 (2 ♀♀); Om As Summaq 19.X.92 (1?); Sama As Sarhan 29.VII.02 (5 ♀♀ +1♂); Zai 8.VIII.90 (1 ♀); unknown data (1?) (Al Balqa University); unknown data (1?) (Al Yarmouk University).

Distribution: Oriental: Pakistan. Palaearctic: Afghanistan, Algeria, Armenia, Azerbaijan, Cyprus, Egypt, France, Greece, Gruzia, Iran, Italy, Lebanon, Libya, Macedonia, Morocco, Palestine, Syria, Tunisia, Turkey, Turkmenistan, Yugoslavia.

It is a common species in Jordan. It was collected from Bishop's Weed, *Ammi majus* L. (Umbelliferae).

Thyridanthrax elegans (WIEDEMANN 1818) (Fig. 14e)

Material: 24 specimens: Aira 15.VII.02 (1 ♀ +1♂); Al Azraq Natural Reserve 20.V.02 (1 ♀); Al Muwaqqar 16.IX.02 (3 ♀♀), 27.IX.95 (1 ♀) (Al Al Bayt Univ.); Al Mushaqqar 16.IX.02 (3♂♂); Ash Shajarah 22.VII.02 (1 ♀); Ash Shawbak 7.VIII.02 (1♂); As Salt 2.IX.02 (1♂); Eastern Bayudah 26.VIII.02 (1 ♀ +1♂); Kafr Huda 2.IX.02 (2♂♂); Na'or 5.VIII.02 (2 ♀♀ +1♂); Ma'ain 5.VIII.02 (2 ♀♀); Muzayrib 31.VII.02 (1 ♀); Zai 3.VII.02 (1♂).

Distribution: Palaearctic: Armenia, Austria, Azerbaijan, Bosnia-Hercegovina, Bulgaria, Croatia, Cyprus, Egypt, France, Greece, Gruzia, Iran, Italy, Kazakhstan, Kyrgyz Republic, Lebanon, Libya, Malta, Moldova, Mongolia, Morocco, Poland, Portugal, Russia, Spain, Syria, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan, Yugoslavia.

T. elegans is a common species collected from the yellow *Heliotropium digynum* (FÖRSKAL) (Boraginaceae).

Pachyanthrax fulvifacies (AUSTEN 1937) (Fig. 14f)

Material: One specimen: Ad Disah 20.VII.96 (1♂).

Distribution: Palaearctic: Palestine.

This species appears to be endemic in Palestine and Jordan so far.

Pachyanthrax telamon (LOEW 1869) (Fig. 14g)

Material: 24 specimens: Al Arida 4.V.81 (2♂♂); Al Husson 17.VI.02 (3♂♂); Amman 15.IV.90

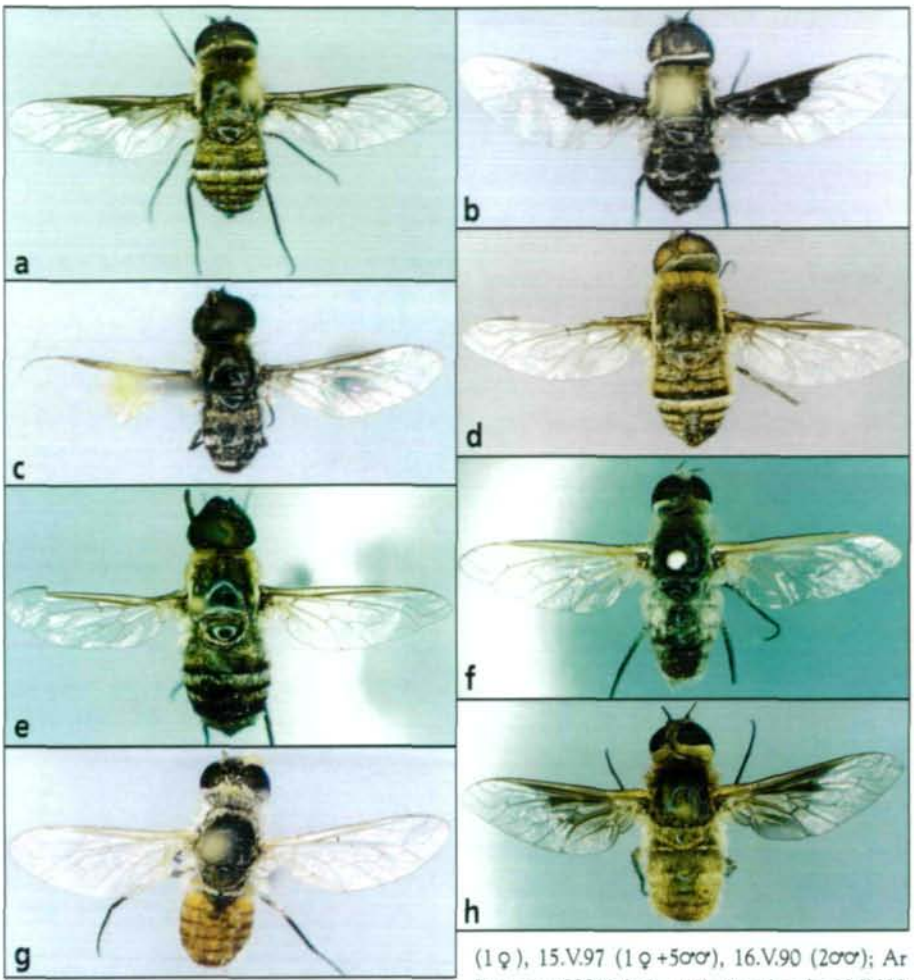

Fig. 15:
a: *Exhyalanthrax afer*
b: *Exhyalanthrax melanchlaenus*
c: *Exhyalanthrax contrarius*
d,e: *Exhyalanthrax muscarius*
f: *Veribubo anus*
g: *Veribubo saffra*
h: *Veribubo misellus*

(1 ♀), 15.V.97 (1 ♀ +5♂♂), 16.V.90 (2♂♂); Ar Rumman 6.V.02 (1 ♀ +1♂); Ayn Aqraba 29.IV.02 (1♂); Dibbin 13.V.02 (1♂); Hummrit As Sahin 3.VI.02 (1♂); Jarash 12.V.83 (1 ♀); Kafr Asad 9.IV.01 (2♂♂) (Al Al Bayt University); Rihaab 7.V.01 (1♂) (Al Al Bayt University); Wadi al Arab 16.IV.01 (1♂) (Al Al Bayt University).

Distribution: Palaearctic: Armenia, Azerbaijan, Cyprus, France, Greece, Gruzia, Iran, Italy, Kyrgyz Republic, Palestine, Syria, Tajikistan, Turkey, Turkmenistan, Uzbekistan, Yugoslavia.

It is a common species in Jordan.

? *Pachyanthrax nimrodicus* Zaitzev 1998 (Fig. 14h)

Material: One specimen: Zubia 8.VII.02 (1 ♀).

Distribution: Palaearctic: Palestine.

This species was described from a single female specimen collected in Palestine. It has the head as *Exhyalanthrax*, the body black with brownish yellow scaling on mesonotum, 1st tergite and base of 2nd and 3rd. R_{2+3} with angular dip before apical bend. Wings infuscated in middle from the base of dm to bifurcation of R_4. Antenna and wings as figures in Zaitzev (1998). The Jordanian specimen differs in having 1st posterior cell open while it is closed on the wing margin in the Palestinian specimen. Examination of male genitalia is required for generic allocation but it is definitely not a *Pachyanthrax* and possibly it is a new genus (Greathead in litt.).

Exhyalanthrax afer (Fabricius 1794) (Fig. 15a)

Material: 13 specimens: Ajloun 27.V.02 (1 ♀); Al Jubayhah 22.V.79 (1 ♀); Al Muwaqqar 16.IX.02 (1 ♀); Al Wala 8.IV.02 (1 ♀); Ayn Aqraba 29.IV.02 (1 ♀); As Salt 2.IX.02 (1 ♀); Dana 23.IX.02 (1 ♀); Dayr Alla 8.IV.74 (1 ♀); Hummrit As Sahin 3.VI.02 (2 ♀♀), 22.VI.02 (1 ♀); Kafr Huda 2.IX.02 (1 ♀); Khdair 6.IX.81 (1 ♀) (Al Yarmouk University).

Distribution: Afrotropical: Chad, Eritrea, Ghana, Kenya, Yemen. Oriental: Pakistan. Palaearctic: Afghanistan, Armenia, Austria, Azerbaijan, Belgium, Bulgaria, China, Croatia, Cyprus, Czech Republic, Denmark, Egypt, France, Germany, Gibraltar, Greece, Gruzia, Hungary, Iran, Italy, Kazakhstan, Kyrgyz Republic, Libya, Macedonia, Malta, Mongolia, Morocco, Netherlands, Oman, Palestine, Poland, Portugal, Romania, Russia, Saudi Arabia, Slovakia, Slovenia, Spain, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, United Arab Emirates, Uzbekistan, Yugoslavia.

E. afer is a common species in Jordan. It is very close to *E. melanchlaenus* except for wing pattern, which does not exceed distal extremity of 2nd basal cell while it exceeds the distal extremity of this cell in *E. melanchlaenus*. It is a hyperparasitoid of the pupae of the dipterous and hymenopterous parasitoids *Thaumetopoea pityocampa* (Denis & Schiffermüller) (Thaumetopoeidae) but it is also a parasitoid in the puparia of muscoid flies (du Merle 1975).

Exhyalanthrax melanchlaenus (Loew 1869) (Fig. 15b)

Material: Six specimens: Ajloun 27.V.02 (1♂); Amman 13.IV.9? (1 ♀); Wadi An Nawatif 27.IX.02 (2 ♀♀); Zai 3.VII.02 (1♂+1 ♀).

Distribution: Palaearctic: Armenia, Azerbaijan, Cyprus, Greece, Gruzia, Italy, Palestine, Portugal, Spain, Syria, Turkey.

This species is similar to *E. afer* but the wing pattern exceeds the 2nd basal cell and has entirely black hair on the pleura.

Exhyalanthrax contrarius (Becker 1916) (Fig. 15c)

Material: One specimen: Kafr Huda 2.IX.02 (1♂).

Distribution: Palaearctic: Croatia, Greece, Italy.

It is the only species with completely hyaline wings among the Jordanian species of this genus. It is similar to *E. perpusillus* (Austen) but has different pattern of abdominal scales.

Exhyalanthrax muscarius (Pallas 1818) (Fig. 15d,e)

Material: 16 specimens: Al Bahhath 20.V.02 (1♂+2♀♀); Al Jubayhah 1.X.91 (1♂); 13.V.79 (1♂), 9.X.02 (1♂); Ayn Aqraba 25.III.02 (1♂); As Salt 2.IX.02 (1♂); Dana 23.IX.02 (1♂); Dibbin 13.V.02 (1♀+1♂); Kafr Huda 2.IX.02 (2♂♂); Ma'ain 5.VIII.02 (1♂); Yajuz 14.X.02 (1♀); Zai 22.VIII.93 (1♂).

Distribution: Oriental: Pakistan. Palaearctic: Afghanistan, Armenia, Austria, Azerbaijan, Croatia, Egypt, France, Germany, Gibraltar, Greece, Gruzia, Hungary, Iran, Italy, Kyrgyz Republic, , Moldova, Poland, Portugal, Romania, Russia, Slovenia, Spain, Switzerland, Macedonia Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan, Yugoslavia.

This species has a wide range in length (2,9-7,6 mm).

Veribubo anus (Wiedemann 1828) (Fig. 15f)

Material: Four specimens: Hummrit As Sahin 22.IV.02 (4♀♀).

Distribution: Afrotropical: Sudan. Palaearctic: Egypt, Libya, Saudi Arabia, Tunisia, United Arab Emirates.

Jordanian specimens have hyaline wings instead of milky wings, which are known to occur in specimens collected from other countries.

Veribubo saffra Greathead 1981 (Fig. 15g)

Material: One specimen: Al Muwaqqar 16.IX.02 (1♂).

Distribution: Palaearctic: Saudi Arabia.

This species appears to be a desertic species.

Veribubo misellus (Loew 1869) (Fig. 15h)

Material: Four specimens: Kafr Huda 2.IX.02 (3♀♀+1♂).

Distribution: Palaearctic: Armenia, Azerbaijan, Egypt, Greece, Gruzia, Iran, Italy, Kyrgyz Republic, Libya, Tajikistan, Turkmenistan, Uzbekistan, Yugoslavia.

The length range of this species is 5,5-8,5 mm.

Tribe Exoprosopini Becker

Micomitra iris (Loew 1869) (Fig. 16a)

Material: One specimen: Unknown data (1♀).

Distribution: Palaearctic: Armenia, Austria, Azerbaijan, Bulgaria, Croatia, France, Greece, Gruzia, Iran, Italy, Kazakhstan, Kyrgyz Republic, Moldova, Palestine, Romania, Russia, Spain, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan.

Micomitra sp. near *chrystallina* (Bezzi 1924) (Fig. 16b)

Material: One specimen: Al Mujib 28.IV.99 (1♀).

Distribution: Afrotropical: Somalia, Yemen. Palaearctic: Saudi Arabia.

Micomitra chrystallina has black hairs on the prosternum unlike M. *iris* and M. *stupida* (Rossi).

Heteralonia (*Zygodipla*) *singularis* (Macquart 1840) (Fig. 16c)

Material: One specimen: Jabir As Sarhan 21.V.01 (1♀).

Distribution: Afrotropical: Yemen. Palaearctic: Egypt, Libya, Morocco, Oman, Palestine, Saudi Arabia, United Arab Emirates.

This species appears to be a rare species. It is the only Jordanian species which has a supernumerary cross vein in r_5 cell.

Heteralonia (*Zygodipla*) *bagdadensis* (Macquart 1840) (Fig. 16d)

Material: Five specimens: Ayn esh Shallaleh 21.V.01 (1♂) (Al Al Bayt University); Sumayya

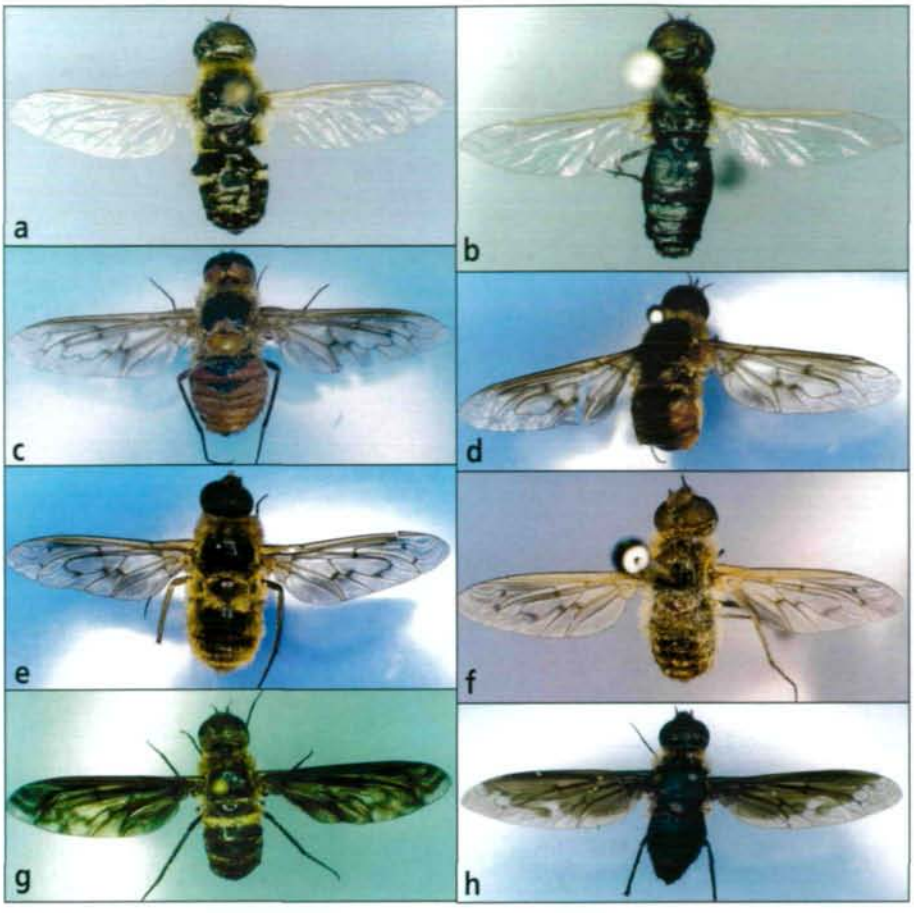

Fig. 16:
a: *Micomitra iris*
b: *Micomitra* sp. near *chrystallina*
c: *Heteralonia* (*Zygodipla*) *singularis*
d: *Heteralonia* (*Zygodipla*) *bagdadensis*
e: *Heteralonia* (*Zygodipla*) *hermani*
f: *Heteralonia* (*Zygodipla*) *mucorea*
g: *Heteralonia* (*Acrodisca*) *suffusa*
h: *Heteralonia* (*Homolonia*) *megerlei*

As Sarhan 28.V.01 (3 ♀♀) (Al Al Bayt University); Unknown data (1♂).

Distribution: Palaearctic: Armenia, Azerbaijan, Iran, Iraq, Mongolia, Oman, Palestine, Saudi Arabia, United Arab Emirates.

This species is characterised by the r_5 cell, which closes far from the wing margin.

Heteralonia (*Zygodipla*) *hermani* (Francois 1967) (Fig. 16e)

Material: Five specimens: Ayn esh Shallaleh 21.V.01 (3 ♀♀ +1♂) (Al Al Bayt University); Sumayya As Sarhan 28.V.01 (1 ♀).

Distribution: Palaearctic: Palestine.

Heteralonia (*Zygodipla*) *mucorea* (Klug 1832) (Fig. 16f)

Material: Four specimens: Wadi Rum 24.IV.00 (1 ♀), 28.IV.00 (1 ♀ +1♂), 11.V.00 (1 ♀).

Distribution: Palaearctic: Afghanistan, Algeria, Egypt, Iran, Kuwait, Kyrgyz Republic, Oman, Saudi Arabia, Syria, Tajikistan, Tunisia, Turkmenistan, United Arab Emirates, Uzbekistan.

This species appears to occur in desertic regions of Jordan. One specimen was collected from a vinegar pit fall trap near *Anabasis* sp.

Heteralonia (*Acrodisca*) *suffusa* (Klug 1832) (Fig. 16g)

Material: 50 specimens: Al Jubayhah 5.VIII.90 (1 ♀), 6.VIII.90 (1♂), unknown data (1 ♀); Ar Rumaymin 3.VI.02 (1♂+2 ♀♀), 8.VIII.90 (1 ♀); Ash Shajarah 22.VII.02 (6 ♀♀ +3♂♂); Ash Shawbak 4.III. 94 (4♂♂), 7.VIII.02 (1 ♀); As Salt 1.VIII.02 (1♂), 18.VIII.93 (1 ♀); Ayn Almuallaqah 11.VI.01 (2♂♂) (Al Al Bayt University); Eastern Bayudah 26.VIII.02 (2 ♀♀); Irbid 27.XII.98 (1♂); Kafr Khal 31.VII.02 (3 ♀♀); Ma'ain 5.VIII.02 (1 ♀); Mahis 15.VII.02 (1♂); Muzayrib 31.VII.02 (2 ♀♀ +5♂♂); Na'or 5.VII.02 (2 ♀♀); Wadi Shua'yb 27.VIII.90 (1 ♀), 26.IX.93 (1 ♀); Wadi esh Shallaleh 21.V.01 (2 ♀♀) (Al Al Bayt University), 16.VI.97 (1 ♀); Western Bayudah 26.VIII.02 (1♂); Zai 22.VII.93 (1♂); 19.VII.93 (1♂).

Distribution: Afrotropical: Kenya, Somalia. Palaearctic: Afghanistan, Armenia, Azerbaijan, Cyprus, Greece, Gruzia, Iran, Italy, Kazakhstan, Moldova, Palestine, Russia, Saudi Arabia, Syria, Tunisia, Turkey, Ukraine, Yugoslavia.

H. suffusa is very common during summer in Jordan except in desertic regions. It is easily recognized in the field, flying near ground surface. It has completely infuscated wings ranging from brown to black.

Heteralonia (*Homolonia*) *megerlei* (Meigen 1820) (Fig. 16h)

Material: Two specimens: Ayn esh Shallaleh 21.V.01 (1 ♀); Wadi Shu'ayb 10.III.84 (1 ♀).

Distribution: Afrotropical: Chad, Gambia, Ghana, Mauritania, Niger, Nigeria, Senegal, Sudan, Yemen. Oriental: Pakistan. Palaearctic: Albania, Armenia, Austria, Azerbaijan, Bulgaria, Croatia, Cyprus, Egypt, France, Greece, Gruzia, Iran, Italy, Kazakhstan, Kyrgyz Republic, Libya, Macedonia, Malta, Moldova, Oman, Palestine, Romania, Russia, Saudi Arabia, Slovenia, Switzerland, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, United Arab Emirates, Uzbekistan, Yugoslavia.

The wing pattern is variable in extent and intensity.

Exoprosopa pandora (Fabricius 1805) (Fig. 17a)

Material: 18 specimens: Al Ghawr 3.V.93 (1 ♀); Ar Rumman 13.V.91 (1 ♀), 18.V.00 (1 ♀), 6.VI.88 (1♂); Ash Shawbak 7.VIII.02 (1 ♀ +1♂); Rihaab 7.V.01 (8 ♀♀ +2♂♂) (Al Al Bayt University); Yajuz 5.V.95 (1♂), unknown data (1♂).

Distribution: Palaearctic: Algeria, Croatia, Egypt, France, Greece, Iran, Italy, Libya, Macedonia, Morocco, Palestine, Slovenia, Turkey, Yugoslavia.

This species varies in the length from 6,4 to 10,4 mm.

Exoprosopa minos (Meigen 1804) (Fig. 17b)

Material: One specimen: Al Bahhath 20.V.02 (1 ♀).

Distribution: Palaearctic: Algeria, Armenia, Austria, Azerbaijan, Croatia, Czech Republic, Egypt, France, Germany, Greece, Gruzia, Hungary, Iran, Italy, Kazakhstan, Kyrgyz Republic, Lebanon, Libya, Moldova, Morocco, Palestine, Poland, Romania, Russia, Slovakia, Spain, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan.

This species seems to be rare in Jordan.

Exoprosopa rivularis (Meigen 1818) (Fig. 17c)

Material: 33 specimens: Aira 15.VII.02 (1 ♀); Al Jubayhah 9.IX.02 (1♂); Al Mukhaybah Al Fawqa 31.VII.02 (1♂), Ar Ramtha 29.VII.02 (2♂♂), Ar Rumman 6.V.02 (1 ♀); Ar Rumaymin 3.VII.02 (1 ♀ +1♂); Ash Shajarah 22.VII.02 (4♂♂); Ash Shawbak 7.VIII.02 (2♂♂); Ayn Almuallaqah 11.VI.01 (1 ♀) (Al Al Bayt University); Ayn esh Shallaleh 16.VI.97 (2 ♀♀ +2♂♂), 24.VI.02 (1♂); Dayr Alla 18.XI.74 (1 ♀ +1♂); Hummrit As Sahin 3.VI.02 (1♂); Kafr Khal 22.VII.02 (1 ♀ +1♂); Ma'ain 5.VIII.02 (3 ♀♀ +3♂♂); Na'or 5.VIII.02 (1♂); Wadi Shua'yeb 27.VIII.90 (1♂).

Distribution: Palaearctic: Armenia, Austria, Azerbaijan, Croatia, France, Gruzia, Iran, Italy, Kyrgyz Republic, Libya, Macedonia, Mongolia, Morocco, Palestine, Portugal, Saudi Arabia, Slovenia, Spain, Tajikistan, Turkey, Turkmenistan, Uzbekistan, Yugoslavia.

This species is a very common in Jordan during summer except in desertic areas. Females are variable in the intensity of wing patterns.

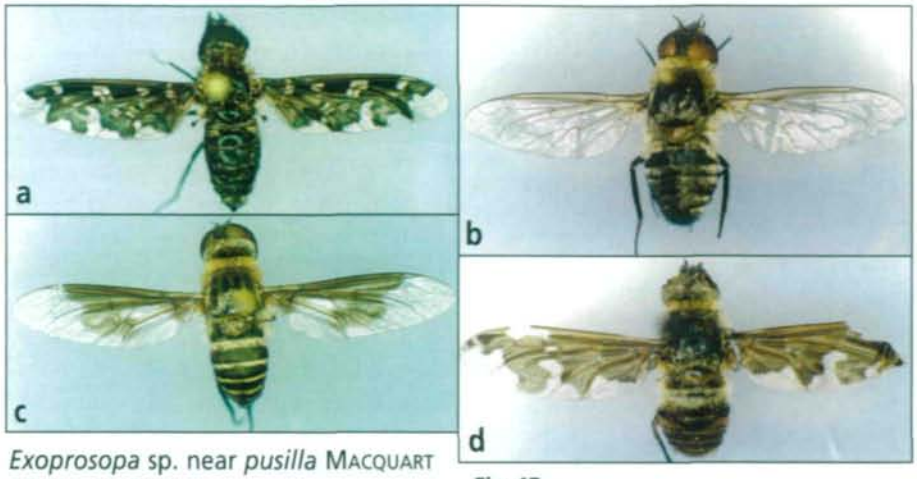

Fig. 17:
a: *Exoprosopa pandora*
b: *Exoprosopa minos*
c: *Exoprosopa rivularis*
d:*Exoprosopa* sp. near *pusilla*

Exoprosopa sp. near *pusilla* Macquart 1840 (Fig. 17d)

Material: Two specimens: Amman 9.V.84 (2 ♀♀).

Distribution: Afrotropical: Chad, Ethiopia, Gambia, Ghana, Guinea-Bissau, Ivory Coast, Kenya, Nigeria, Senegal, Uganda, Yemen. Palaearctic: Saudi Arabia.

Jordanian specimens of this species have a more extensive wing patterns compared to *E. pusilla* reaching the apex of the wings on the fore margin, and clear area in middle of discal cell is much narrower. Also it has white scales band at base of 2nd tergite.

Discussion

This is the first study of the Bombyliidae of Jordan. A total of 132 species of Bombyliidae are recorded, 124 of them for the first time. Evenhuis & Greathead (1999) recorded 14 species, eight of them were also recorded in this study, however, six of them were not found during our collection trips. These are: *Anastoechus nivifrons* (Walker), *Bombylisoma flavibarbum* (Loew), *Bombylius argentifacies* Austen, *Chalcochiton argyrocephalus* (Macquart), *Cytherea albolineata* (Bezzi), and *Cytherea barbara* Sack. Therefor, the species known to occur in Jordan are currently 138. They belong to eight subfamilies. The largest subfamily is Anthracinae, which includes 70 species in six tribes and 20 genera. The Bombyliinae includes 28 species in two tribes and nine genera. The Cytherereinae include 16 species in four genera. The Usiinae includes four identified species and three unidentified species in two tribes and three genera. The Toxophorinae includes six species in two tribes and two genera. The Lomatiinae includes three species in one

tribe and one genus. The smallest subfamilies according to the number of species are Ecliminae with one species and Phthirinae with one unidentified species.

The large number of genera with a small average number of species recorded in this study (3,1 species per genus) probably reflects the great diversity in climatic conditions and phytogeographical regions in our area which include: the North Mediterranean zone, the Southern Mediterranean zone, the Irano Turanian belt surrounding the Mediterranean zone, the North Jordan Valley, the Eastern Desert, and the Southern Desert. The largest genus is *Bombylius* with 13 species, followed by *Villa* with nine species, *Spogostylum* with eight species, *Anthrax* with seven species, *Cytherea*, *Amictus*, *Thyridanthrax* and *Heteralonia* each with six species, *Geron* with five species, *Exoprosopa*, *Anastoechus* and *Exhyalanthrax* each with four species, *Usia*, *Parageron*, *Chalcochiton*, *Lomatia*, *Petrorossia*, *Oestranthrax*, *Pachyanthrax* and *Veribubo* each with three species. The other genera each have only one or two species.

From a zoogeographic point of view, the known Jordanian Bombyliidae are mostly Palaearctic (86 species, 69,4 %). Twenty-six species (21 %) occur in the Palaearctic and Afrotropical regions. Seven species (5,65%) are distributed in the Palaearctic and the Oriental regions. Only four species (3,2 %) (*Bombylius modestus*, *Heteralonia megerlei*, *Exhyalanthrax afer* and *Thyridanthrax perspicillaris*) are distributed in the Palaearctic, the Afrotropical and the Oriental regions. One species (0,81%), *Bombylius major*, is widely distributed in the Palaearctic, the Nearctic and the Oriental regions.

Most species were collected from the ground surface since the Bombyliidae spend most of the time basking on rocks, bare ground and dry vegetation or searching for hosts for oviposition. Few species of Bombyliidae were collected from plants during feeding. However, all specimens of *Usia* and *Parageron* were collected from flowers because these flies are weak fliers compared to other species and they rest inside the flowers during feeding. The plants on which the bee flies were observed to feed belong to seven families; *Echium judaeum* LACAITA and *Heliotropium digynum* (FÖRSKAL) (Boraginaceae), *Anthemis palaestina* REUTER, *Lactuca orientalis* BOISS, *Verthimia iphionoides* BOISS & BLANCHE, *Carthamus persicus* WILLD (Compositae), *Acacia* sp. and *Retma raetam* (FÖRSK.) (Leguminosae), *Linum pubescens* BANKS & SOL. and *Linum peyronii* POST (Linaceae), *Ammi majus* L. (Umbelliferae), *Papaver syriacum* BOISS & BLANCHE (Papaveraceae) and *Polygonum equisetiforme* SIBTH (Polygonaceae).

Grasshoppers, wasps and bees appear to be the known hosts of the Jordanian immature Bombyliidae.

According to the collecting dates (Table 2), it appears that most of 'Homeophthalmae' appear earlier in the season (23 species in March and 25 species in April), while most of the 'Tomophthalmae' group appear later (48 species in May). The lowest numbers of specimens were collected in January where only one specimen of *Usia aenea* was collected. In December, three specimens from Anthracinae (one of *Spogostylum ocyale*, one of *Heteralonia suffusa* and one of *Hemipenthis velutina*) were collected. More specimens were collected from the 'Tomophthalmae' (737) than from the 'Homeophthalmae' (674) (Table 3).

Some species are common in Jordan such as *Usia aenea*, *U. bicolor*, *Bombylius medius*, *B. fimbriatus*, *Heteralonia suffusa*, *Thyridanthrax incanus*, *T. polyphemus*, and *Hemipenthes velutina*. BODENHEIMER (1935) recorded similar results, he considered that *Bombylius*, *Exoprosopa* (including what is known now as *Exoprosopa*, *Heteralonia*, *Micomitra*, *Pachyanthrax*), *Anthrax* and *Usia* the most common genera in Palestine. Other species so far, are rare such as *Desmatoneura* sp., *Toxophora fasciculata*, *Caecanthrax arabicus*, *Micomitra* ssp., *Oestranthrax* ssp., and *Eclimus gracilis*. However, further collecting may prove their occurrence in greater numbers.

The species list of Bombyliidae of Jordan is far from complete. More species are expected to be found after further extensive collecting for a longer period of time. For example, in the neighbouring Palestine, (AUSTEN 1937) recorded 128 species and ZAITZEV (1995, 1996, 1997, 1998 1999) added new records raising the number of species to 229. Of these, 153 species are not yet recorded in Jordan. And there are 41

species recorded from Jordan not yet recorded in Palestine. From Arabia, 137 species were recorded (GREATHEAD 1980b, 1988) many of them are not known to occur in Jordan so far. In particular more species of the subfamily Phthiriinae are expected to occur in Jordan, since only one species is recorded in this study while 8 species have been recorded from Palestine.

In addition to the identified species, there are 8 unidentified species belonging to *Apolysis* (1 species), *Parageron* (2 species), *Phthiria* (1 species), *Spogostylum* (1 species), *Villa* (1 species), *Desmatoneura* (1 species), and *Pipunculopsis* (1 species). There were some difficulties in the identification of species belonging to *Parageron*. This genus needs revision because in the past new species have been described that were found later to be variants of the same species. In addition, it was difficult to identify species of *Apolysis*, *Geron* and *Petrorossia*. Species of these genera have few external characters and need the examination of male and female genitalia for correct identification.

This study can be considered as a base line for further studies on the Bombyliidae of Jordan. More species are expected to be collected. Studies on the distribution, adult and immature hosts, biology and ecology of most species need to be done.

Table 2: Number of species collected from the 'Homeophthalmae' and the 'Tomophthalmae' in each month of the year.

	Month											
Group	1	2	3	4	5	6	7	8	9	10	11	12
Species No. of 'Homeophthalmae'	1	7	23	25	15	5	6	3	6	7	2	0
Species No. of 'Tomophthalmae'	0	1	16	29	48	23	25	23	33	11	2	3
Total	1	8	39	54	63	28	31	26	39	18	4	3

Table 3: Number of specimens collected from the 'Homeophthalmae' and the 'Tomophthalmae' in each month of the year.

	Month											
Group	1	2	3	4	5	6	7	8	9	10	11	12
Specimens No. of 'Homeophthalmae'	1	35	336	177	45	5	10	3	33	27	2	0
Specimens No. of 'Tomophthalmae'	0	1	40	88	152	52	142	105	100	45	9	3
Total	1	36	376	265	197	57	152	108	133	72	11	3

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Zusammenfassung

Die Hummelschweber (Diptera: Bombyliidae) Jordaniens. Zwischen Oktober 2001 und November 2002 wurden wöchentliche Aufsammlungen von Hummelschwebern durchgeführt und dabei mehr als 870 Belege an 72 Fundorten gesammelt. In der Studie wurden auch früher gesammelte Belege von Hummelschwebern aus der Insektensammlung der Universität von Jordanien und aus anderen jordanischen Sammlungen berücksichtigt. Die Belege repräsentieren 132 Arten in 41 Gattungen und 8 Unterfamilien. Davon wurden 124 Arten erstmals in Jordanien nachgewiesen. Für jede Art werden Anzahl der untersuchten Belege, Aufsammlungsorte und -zeiten in Jordanien sowie Anmerkungen angeführt.

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