



Survey and faunistic studies on moths and butterflies in New Valley Governorate, Egypt.

1. Butterflies

Salem, M.M.; Mahmoud, Y.H. Henaish and Al-Azab, S.A.

Plant Protection Research Institute, Agricultural Research Center, Dokki, Giza, Egypt.

ARTICLE INFO

Article History

Received: 5 / 11 / 2019

Accepted: 13 / 12 / 2019

Keywords

Survey, moths and butterflies, New Valley Oases, taxonomy and Egypt.

Abstract:

A survey of moths and butterflies together with faunistic studies were carried out in Dakhla, Kharga and Baris Oases in New Valley Governorate using light traps and sweeping nets during a period covered two years, 2017 - 2018. As for the butterflies, the survey revealed the presence of 24 species in 20 genera belonging to 5 families (Danaiidae, Hesperidae, Lycaenidae, Nymphalidae and Pieridae). The largest number of species was belonged to family Lycaenidae (eleven species), followed by family Pieridae (six species). Kharga Oasis was found to be the richest in species (21 species). Three species were found most common in the area of study, these are: *Danaus chrysippus* (L.) (Lepidoptera: Nymphalidae), *Colotis chrysonome* (Klug) and *Pieris rapae* (L.) (Lepidoptera: Pieridae), eight species were found in fair numbers and thirteen species are to be rare. Taxonomic notes with common names, synonyms and notes on the distribution, habitats and host plants for each species are given. Occurrence and distribution in the zoogeographical zones of Egypt are also pointed.

Introduction

Butterflies are popular everywhere and there are over 19000 butterfly species are known in the world. The name "butterfly" is believed to have originated from a member of the family Pieridae, the brimstone, *Gonepteryx rhamni* (L.) (Lepidoptera: Pieridae), which was called the "butter-coloured fly" by early British naturalists. Butterflies are often polymorphic and many species make use of camouflage, mimicry and aposematism to evade their predators.

Some migrate over long distances. Some species are pests, others are pollinating agents of some plants, while others live as mutualists in association with ants (Larsen, 1994).

Knowledge about Egypt's butterflies has progressed slowly and there have been only three major reviews (Andres and Seitz, 1923; Wiltshire, 1948 and Larsen, 1990) to-date and little else has been published over a half century ago. According to Gilbert and Zalut (2007), there are 63 species of butterflies

recorded from Egypt, two of them are endemic to Egypt. Benyamini (1984) surveyed the butterflies of Sinai Peninsula. El Moursy (1996) in the work "Biological diversity of Egypt" listed the butterflies of Egypt together with their distribution. Mabrouk (2003) presented a comprehensive list of Egyptian Lepidoptera including the butterflies. Mahbob and Mahmoud (2013) listed the insect fauna of Kharga Oasis, New Valley, Egypt. Salem (2017) presented a comprehensive checklist of insects recorded in Egypt including the butterflies.

As for the New Valley, most of the faunistic work on butterflies was no more than mere, fragment and scattered work such as Ibrahim, 1934; Wiltshire, 1948 and Al-Gamal *et al.*, 2001. On account of the scarcity of knowledge and to overcome the lack of information regarding the fauna of the butterflies in the New Valley, the present work is to be presented. It is hoped to be of assistance for more detailed and prospective studies.

Materials and methods

The present work was carried out at the New Valley Governorate using light traps and sweeping net during two years (2017-2018) and covered the following areas in the New Valley Governorate: Dakhla, Kharga and Baris Oases. The surveyed areas were cultivated with variable field crops, vegetables and fruit trees. Captured insects were sorted out into species, identified and recorded then listed in alphabetical order according to families, genera and species. Data are presented here showing the recent scientific names and position of the species together with their collecting area, state of abundance (Common, fair

and rare) and their distribution in the geographical regions in Egypt.

Common names, synonyms, taxonomic notes and notes on the distribution, habitats and host plants for each species are given. Occurrence and distribution in the zoogeographical zones of Egypt are also pointed. Identification of species with updates of nomenclature and species status were carried out in the Insect Identification and Classification Department (IICD) in the Plant Protection Research Institute (PPRI), Agricultural Research Center (ARC), Egypt.

Results and discussion

The present survey resulting 24 species belonging to 20 genera of five families of butterflies (Danaiidae, Hesperidae, Lycaenidae, Nymphalidae and Pieridae). Table (1) below indicate that, family Lycaenidae is represented by eleven species, Pieridae six species, Hesperidae and Nymphalidae each is represented by three species and Danaiidae by only one species. The largest number of species was collected from Kharga Oasis (21 species), followed by Dakhla Oasis (16 species) and then Baris Oasis (13 species). It was also found that, six species were collected from all the surveyed localities, these are: *Tarucus balkanicus*, *T. rosaceus* (Lycaenidae); *Cynthia cardui*, *Vanessa atalanta* (Nymphalidae), *Colotis chrysonome* and *Pontia glauconome* (Pieridae). Four species, each was collected from three localities, seven species, each was collected from two localities and five species, each was collected from only one locality.

Table (1): List of butterflies in the New Valley Oases, together with their abundancy and distribution in Egypt.

Taxa	Surveyed zones in the New Valley Oasis			Abundancy	Distribution in ecological zones of Egypt						
	Dakhla	Kharga	Baris		N. coast	W. desert	Lower Egypt	Upper Egypt	E. desert	Gebel Elba	Sinai
Fam. Danaidae											
<i>Danaus chrysippus</i> (Linn.)	*	*		+++	*	*	*	*	*	*	*
Fam. Hesperidae											
<i>Borbo barbonica</i> Lederer		*		+		X	*	*	*		*
<i>Gegenes nostrodomus</i> Fab.	*	*		+		X	*	*			*
<i>Gomalia elma</i> (Trimen)		*		+	*	*	*	*	*	*	*
Fam. Lycaenidae											
<i>Deudorix livia</i> (Klug)		*		++		X	*	*		*	
<i>Freyeria trochylus</i> Freyer	*	*		+	*	X	*	*	*		*
<i>Iolana alferii</i> Wiltshier	*			+		X	*		*	*	*
<i>Lampides boeticus</i> (Linn.)	*	*	*	++	*	*	*	*			*
<i>Leptotes piriouthus</i> (Linnaeus)	*	*		+	*	X	*	*			*
<i>Lycaena phlaeas</i> Linnaeus		*	*	+		X	*	*			*
<i>Lycaena thersamon omphali</i> Klug	*	*	*	++	*	X	*	*		*	*
<i>Polyommatus Icarus zelleri</i> Verity	*			+		X	*	*			*
<i>Tarucus balkanicus</i> Freyer	*	*	*	++	*	*	*	*			*
<i>Tarucus rosaceus</i> Astant	*	*	*	+	*	X	*	*			*
<i>Zizeeria karsandra</i> (Moore)		*	*	++		*	*	*			*
Fam. Nymphalidae											
<i>Cynthia cardui</i> (Linnaeus)	*	*	*	++	*	*	*	*	*	*	*
<i>Melitaea deserticola</i> Oberthür		*		+		*					
<i>Vanessa atalanta</i> (Linnaeus)	*	*	*	+	*	*	*	*			*
Fam. Pieridae											
<i>Colias croceus</i> (Geoffroy)	*	*		++	*	*	*	*	*	*	*
<i>Colotis chrysonome</i> Klug	*	*	*	+++		X	*				
<i>Colotis protomeadia</i> Klug			*	+		X	*				*
<i>Pieris rapae</i> (Linnaeus)	*	*	*	+++	*	*	*	*	*		*
<i>Pontia daplidice</i> Linnaeus		*	*	+	*	X	*	*			*
<i>Pontia glauconome</i> Klug	*	*	*	++	*	X	*	*	*		*
Total 5 fam., 24 sp., 20 gen.	16	21	13		14	24	23	20	9	7	21

+++ Common ++ Fair + Rare x Present record E. Eastern N. North W. Western

The table also indicated that, three species were found to be most common in the area of study, these are: *Danaus chrysippus* (Nymphalidae), *Colotis chrysonome* and *Pieris rapae* (Pieridae). Eight species were found in considerable numbers (more than 3 individuals) and thirteen species are to be rare (less than 3 individuals). On the other hand and according to the records of distribution

for the mentioned species in the geographical regions in Egypt, it is noticed that, fourteen species were recorded from the coastal region, ten species previously recorded, in addition to fourteen species recorded in the present work from the Western Desert, twenty three species from lower Egypt, twenty species from Upper Egypt, nine species from Eastern Desert, seven species from Gebel Elba and twenty

one species from Sinai peninsula. It is found also that, four species are found inhabiting all the geographical regions in Egypt, these are: *Danaus chrysippus* (Danaiidae), *Gomalia elma* (Hesperiidae), *Cynthia cardui* (Nymphalidae) and *Colias croceus* (Pieridae). Four species are recorded from six regions, eight species from five regions, five species from four regions, only one species from three regions and other one species from two regions and only one species, *Melitaea deserticola* (Nymphalidae) from only one region that is previously recorded from the Western Desert.

Families, genera and species of butterflies in New Valley Governorate , Egypt

1.Family: Danaiidae (Milkweed butterflies):

A small family of large tropical butterflies, some of 300 species of Danaiidae exist worldwide. Most of them are found in tropical Asia and Africa and are diverse in the Neotropics. Some are restricted to Australia and the Oriental region. The monarch butterfly is by far the most famous, being one of the most recognizable butterflies. Milkweed butterflies are now classified as the subfamily Danainae within the family Nymphalidae; however, the previous family name Danaiidae is still used. They lay their eggs on various milkweeds on which their larvae (caterpillars) feed. Danaiidae is represented in Egypt by two species within one genus. It is recorded here by one species.

1.1. *Danaus chrysippus* (Linnaeus)

Common name: Tiger milkweed butterfly, plain tiger and African queen

Local distribution: Fayoum, Al Arish (North Sinai), Kharga Oasis, Dakhla Oasis, Baris Oasis, El-Baharia Oasis (W. Desert), Alexandria, Nubaryia (Behaira), Fayed (Ismailia), Belbis, Al

Kanater (Qalubiya), Giza, Seds (Kafr El-Skeikh) and Matrouh.

Geographic distribution: Wide spread in Asia, Australia and Africa

Recorded hosts: Host plants are from several families, most importantly Asclepiadoideae (Apocynaceae). Adults obtain nectar from various flowering plants.

Habitats: It prefers arid, open areas, and is most often found in a variety of habitats including deserts, mountains, deciduous forests, and human-tended gardens in cities and parks. It is comfortable at altitudes ranging from sea level to around 1,500 m (5,000 ft.)

Remarks: A 3500-year-old Egyptian fresco in Luxor features the oldest known illustration of this species. Strong fliers from dawn to dusk. Flight period from June to September.

2. Family: Hesperidae (Skippers):

Butterflies of family Hesperidae, were previously placed in a separate superfamily, Hesperioidea; however, the most recent taxonomy places the family in the superfamily Papilionoidea. They are named for their quick, darting flight habits. More than 3500 species of skippers are recognized and they occur worldwide, but with the greatest diversity in the Neotropical regions of Central and South America. They are now classified in the following subfamilies: Coeliadinae, Euschemoninae, Eudaminae, Pyrginae, Heteropterinae, Hesperinae, Megathyminae and Trapezitinae.

The family is represented in Egypt by 13 species within 7 genera. It is recorded here by three species.

2.1. *Borbo borbonica* (Boisduval)

Common name: The borbo skipper and Zeller's skipper or olive haired swift.

Local distribution: Fayoum, Al Arish, Rafah (N. Sinai), Saint Kathrine (South Sinai), Nobaryia (Behaira), Fayed (Ismailia) and El-Baharia Oasis (Western Desert).

Geographic distribution: It is found along the southern coasts of the Mediterranean Sea, but mainly in Syria, Arabia, North Africa, Middle East, Sub-Saharan Africa, including Mauritania, Senegal, Gambia, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Northern Nigeria, Zambia, Mozambique, Zimbabwe, Northern Botswana, Northern Namibia, South Africa, Swaziland, Madagascar, Reunion, Rodrigues and Mauritius.

Recorded hosts: *Leersia oryzoides*, *Sorghum halepense*, *Panicum*, *Ehrharta erecta*, *Oryza*, *Pennisetum* and *Zea mays*.

Habitats: Associated with the banks of slow moving rivers and damp areas in lowlands.

Remarks: Adults are on wing from September to October.

2.2. *Gegenes nostrodomus* Fabricius

Common name: The dingy swift, light pygmy skipper and Mediterranean skipper

Local distribution: Al Kanater, Belbais (Qalubiya), Fayoum and El tur (S. Sinai), Kharga Oasis, Dakhla Oasis, Bahariya Oasis (W. Desert), Giza and Aswan.

Geographic distribution: It is found from the Mediterranean Sea (South Europe, North Africa) through Anatolia to Turkestan (Western Asia) and India.

Recorded hosts: The larvae feed on various grasses, including Gramineae, *Aeluropus* (in the Sinai Desert) and *Aerulopus* and *Panicum* species. It is pest on Maize.

Habitats: It is found in dry places.

Remarks: Adults are on wing from May to October in multiple generations.

2.3. *Gomalia elma* (Trimen)

Common name: The marbled skipper, African marbled skipper, the African Mallow skipper and Green-marbled skipper or sandman.

Local distribution: All over Egypt's geographical regions

Geographic distribution: It is found in Africa in the Cape region, Orange Free State, Botswana, Zimbabwe, Mozambique, Benin, Burkina Faso, Gambia, Ghana, Guinea, Ivory Coast, Kenya, Namibia, Nigeria, Senegal, Sierra Leone, South Africa, Togo, Zambia, and parts of Asiaranges from Saudi Arabia, Oman; Yemen; Sri Lanka and India.

Recorded hosts: *Malvaceae: Abutilon indicum*, *Abutilon mauritianum*, *Abutilon intermedium*, *Abutilon sonneratianum*, *Croton gratissimus*, *Sida cordifolia* and *Wissadula rostrata*

Habitats: Savannah

Remarks: Flight period: All year in warmer areas and from August to April in colder parts. Males establish territories in clearings and along paths in the bush. They often use several perching spots within the territory that they are defending.

3. Family: Lycaenidae (gossamer-winged butterflies):

This family is known as blues, coppers and hairstreaks. Lycaenidae is the second-largest family of butterflies (behind Nymphalidae, brush-footed butterflies), with over 6,000 species worldwide, whose members are also called gossamer-winged butterflies. They constitute about 30% of the known butterfly species.

The family is traditionally divided into the subfamilies of the blues (Polyommatainae), the coppers (Lycaeninae), the hairstreaks (Theclinae) and the harvesters (Miletinae).

Lycaenids are diverse in their food habits and apart from phytophagy, some of them are entomophagous feeding on aphids, scale insects, and ant larvae. Some lycaenids even exploit their association with ants by inducing ants to feed them by regurgitation, a process called trophallaxis. Not all lycaenid butterflies need ants, but about 75% of

species associate with ants, a relationship called myrmecophily. These associations can be mutualistic, parasitic or predatory depending on the species.

The family is represented in Egypt by 36 species within 20 genera. It is recorded here by eleven species.

3.1. *Deudorix livia* (Klug)

Common name: The pomegranate butterfly or the pomegranate playboy

Local distribution: Al Kanater (Qalubiya), Fayoum, Al Arish (N. Sinai), St. Kathrine (S. Sinai), Kharga Oasis, Dakhla Oasis, Bahariya Oasis (W. Desert), Burg Al Arab (Alexandria), W. El Natroun (Behaira), Fayed (Ismailia) and Aswan.

Geographic distribution: It is found in Senegal, Gambia, Burkina Faso, Cameroon, Chad, Sudan, Uganda, Kenya, Tanzania, Somalia, Djibouti, Yemen, Saudi Arabia, United Arab Emirates, Oman, Algeria, Egypt and the eastern Mediterranean, including Greece.

Recorded hosts: The larvae feed on *Punica granatum*, *Eriobotrya japonica*, *Acacia*, *Phoenix*, *Allium*, *Psidium*, *Gardenia* and *Lycopersicum* species.

Habitats: The habitat consists of savanna, including arid savanna.

Remarks: It is a somewhat migratory species. Dangerous pest.

3.2. *Freyeria trochylus* (Freyer)

Common name: The grass jewel.

Local distribution: Fayoum, Kharga Oasis, Dakhla Oasis (W. Desert), Rafah, Zaranik (N. Sinai), Tur Sinai (S. Sinai) and Fayed (Ismailia).

Geographic distribution: Found in Africa, Arabia (United Arab Emirates, Oman, Saudi Arabia), southern Europe, India and southern Asia. In Europe, only from a few areas of Greece and several of the Greek islands.

Recorded hosts: *Heliotropium strigosum* and *Goniogyna hirta*.

Habitats: Hot dry rocky grassy ground with sparse grasses. Disturbed ground

and edges of cultivation. Attracted to flowers which in summer at least are commoner nearer water sources, ditches or roadside drains.

Remarks: From March to October in a number of broods.

3.3. *Iolana alferii* Wiltshire

Common name: The burning bush blue

Local distribution: Al Arish (N. Sinai), Wadi-el-Rabaa (S. Sinai), Al Kanater, Belbais (Qalubiya), Nobariya, W. El Natroun (Behaira), Seds (Kafr El Skeikh), Gabal Elba (Red Sea) and Bahariya Oasis (W. Desert).

Geographic distribution: Egypt and Israel.

Recorded hosts: *Colutea istria* (Leguminosae).

Habitats: Ravines, bounded by relatively steep banks and high steeps.

Remarks: Resident in Egypt. Powerful fast flying along cliff faces and places near the host plants, flying during February-April, and September.

3.4. *Lampides boeticus* (Linnaeus)

Common name: The legumes butterfly and the pea blue or long-tailed blue.

Local distribution: Al Kanater (Qalubiya), Fayoum, Al Arish, Rafah (N. Sinai), Kharga Oasis, Dakhla Oasis (W. Desert), Burg Al Arab (Alexandria) and Helwan (Cairo).

Geographic distribution: Cosmopolitan. This species can be found in Europe, Africa, South and Southeast Asia and Australia.

Recorded hosts: Clover, cow pea, peas, cassia and sesban (*Medicago*, *Crotalaria*, *Polygala*, *Sutherlandia*, *Dolichos*, *Cytisus*, *Spartium* and *Lathyrus* species. It has also been recorded on *Crotalaria pallida*.

Habitats: This species inhabits the edge of forests, mountain meadows and hot flowery places at an elevation up to 2,700 metres above sea level.

Remarks: Strong migrants. The larvae feed on flowers, seeds and pods of many Fabaceae species. It is minor pest.

3.5. *Leptotes pirithous* (Linnaeus)

Common name: The Lang's short-tailed blue or common zebra blue

Local distribution: Al Kanater (Qalubiya), St. Kathrine (S. Sinai), Rafah (N. Sinai), Alexandria, W. El Natroun (Behaira), Seds (Kafr El Skeikh), Aswan, Baris Oasis and Dakhla Oasis (W. Desert).

Geographic distribution: Southern Europe (Spain, France and Italy), along the Mediterranean coast, in Asia Minor up to the Himalayas, and in most of Africa and Madagascar.

Recorded hosts: Found on sespan, millet and clover, feed on the flowers and fruits of Fabaceae, Rosaceae and Plumbaginaceae species, including *Plumbago capensis*, *Indigofera*, *Rynchosia*, *Vigna*, *Burkea*, *Mundulea*, *Melilotus*, *Crataegus*, *Quercus suber*, *Medicago sativa*, *Trifolium alexandrinum*, *Arachis hypogaea*, *Lythrum*, *Calluna*, *Genista*, *Dorycnium*, *Lythrum salicaria*, *Calluna vulgaris*, *Onobrychis viciifolia*, *Ulex* and *Melilotus alba*.

Habitats: This species prefers varied wasteland, cultivated areas and gardens.

Remarks: These butterflies fly from February to November depending on the location. They are regular migrants.

3.6. *Lycaena phlaeas* Linnaeus

Common name: The small copper and American copper or common copper

Local distribution: Al Kanater (Qalubiya), Fayoum, Rafah (N. Sinai), Kharga Oasis, Baris Oasis (W. Desert), Nobariya, Wadi El Natroun (Behaira), Giza and Assiut.

Geographic distribution: The small copper is a very widespread and common across Europe, almost all of Europe including sub-arctic areas of Scandinavia, and across temperate Asia, as far east as Japan, North America, occurring in Canada, the eastern United States, the Canary Isles and also found from the Atlas - mountains and north African grasslands, in North Africa

south through to Ethiopia, Kenya and Malawi.

Recorded hosts: Buckwheat (Polygonaceae) family including sheep sorrel (*Rumex acetosella*), curled dock (*Rumex crispus*) and *Oxyria digyna*.

Habitats: The small copper occurs in many different habitats including heaths, chalk and limestone grasslands, sand dunes, cliff tops, woodland rides and clearings, hay meadows, pastures and almost anywhere else where the larval food plants grow.

Remarks: They usually breed in sheltered hollows, or at the bottom of sunny slopes, where vegetation is sparse, and areas of bare ground are available for basking. The species overwinters as a caterpillar. Both sexes are subject to variation regarding the size of the black spots on the forewings. Flight period from April to September.

3.7. *Lycaena thersamon* Klug

Common name: The lesser fiery copper

Local distribution: Al Kanater, Belbais (Qalubiya), Fayoum, Al Arish (N. Sinai), Kharga Oasis, Dakhla Oasis, Baris Oasis (W. Desert), Alexandria, Burg Al Arab, Nobariya, Wadi El Natroun (Behaira), Seds (Kafr El Skeikh) and Gabal Elba (Red Sea).

Geographic distribution: It is found from Eastern Europe, Italy and South-East Europe to Mongolia and North-Western China.

Recorded hosts: *Eryngium creticum* (Umbelliferae), *Rumex cyprius*, *Polygonum* spp. and *Sarothamnus* (Polygonaceae).

Habitats: Dry grasslands

Remarks: The butterfly flies from March to October depending on the location, form in April and May and again as omphale from July onward, flying on dry sunny hillsides, not being rare at their flight-places.

3.8. *Polyommatus icarus zelleri* Verity

Common name: The common blue butterfly

Local distribution: Al Kanater (Qalubiya), Fayoum, Tur Sinai (S. Sinai), Bahariya Oasis and Dakhla Oasis (W. Desert).

Geographic distribution: The common blue butterfly is found in Europe, North Africa, the Canary Islands, and temperate Asia to Northern China. Recently it was discovered in Quebec and Canada. It is widespread in the British Isles.

Recorded hosts: Family Leguminosae (bean family). Recorded food plants are *Lathyrus* species, *Vicia* species, *Vicia cracca*, *Oxytropis campestris*, bird's foot trefoil (*Lotus corniculatus*), *Oxytropis pyrenaica*, *Astragalus aristatus*, *Astragalus onobrychis*, *Astragalus pinetorum*, black medick (*Medicago lupulina*), *Medicago romanica*, *Medicago falcata*, common restharrow (*Ononis repens*), wild thyme (*Thymus serpyllum*), lesser trefoil (*Trifolium dubium*), *Trifolium pratense* and white clover (*Trifolium repens*).

Habitats: Meadows, coastal dunes, woodland clearings, heathlands, sand dunes, and under cliffs and also many man-made habitats, anywhere their food plants are found. These butterflies inhabit flowery or grassy places, warm and cool, open or wooded areas and at all altitudes up to high alpine meadows at an elevation of 0–2,700 metres above sea level. It mostly resides on chalk or limestone grassland.

Remarks: Resident in Egypt, flight period from April to July, rare species.

3.9. *Tarucus balkanicus* Freyer

Common name: the Balkan Pierrot or little tiger blue and Little Tiger Pierrot.

Local distribution: Al Kanater, Belbais (Qalubiya), Fayoum, Al Arish (N. Sinai), Kharga Oasis, Dakhla Oasis, El-Baharia Oasis (W. Desert), Burg Al Arab (Alexandria), Giza and Assiut.

Geographic distribution: Mauritania, Niger, Sudan, Uganda, Saudi Arabia, the United Arab Emirates, Oman, North

Africa, the Balkans, western Asia, parts of central Asia and India.

Recorded hosts: *Ziziphus spina - christi* (Rhmanaceae).

Habitats: Very arid savanna and desert areas near host plant.

Remarks: Vagrant, Flying period from March to October.

3.10. *Tarucus rosacea* (Austaut)

Common name: The Mediterranean Pierrot or Mediterranean tiger blue

Local distribution: Fayoum, Al Arish (N. Sinai), Kharga Oasis, Dakhla Oasis, Baris Oasis, El-Baharia Oasis (W. Desert), St. Kathrine (S. Sinai), Matrouh, Nobaryia and Seds (Kafr El Skeikh).

Geographic distribution: From Sahel to North West India.

Recorded hosts: *Ziziphus spina - christi* (Rhmanaceae).

Habitats: Occurs wherever its food plants occur.

Remarks: Flight period from February to October.

3.11. *Zizeeria karsandra* (Moore)

Common name: The dark grass blue.

Local distribution: Al Kanater (Qalubiya), Fayoum, Al Arish (N. Sinai), Baris Oasis, El-Baharia Oasis (W. Desert) and Nobariya (Behaira).

Geographic distribution: From the Southern Mediterranean, in a broad band to India, Sri Lanka, Burma, Thailand, Malaysia, Yunnan, Indonesia, the Philippines, United Arab Emirates, Saudi Arabia and Oman, New Guinea and Northern and Eastern Australia.

Recorded hosts: Leguminous plants, alfalfa and Tribulus.

Habitats: Cultivated and Oasis habitats.

Remarks: Flight period from March up to November, Resident in Egypt.

4. Family: Nymphalidae (brush-footed butterflies):

The Nymphalidae are the largest family of butterflies with more than 6,000 species distributed throughout most of the world, belonging to the

superfamily Papilionoidea. These are usually medium-sized to large butterflies. Most species have a reduced pair of forelegs and many hold their colourful wings flat when resting. They are also called four-footed butterflies, because they are known to stand on only four legs while the other two are curled up. Many species are brightly coloured and include popular species such as the emperors, monarch butterfly, admirals, tortoiseshells, and fritillaries. However, the under wings are, in contrast, often dull and in some species look remarkably like dead leaves, or are much paler, producing a cryptic effect that helps the butterflies blend into their surroundings. It is represented in Egypt by 9 species within 5 genera. It is recorded here by three species.

4.1. *Cynthia cardui* (Linnaeus)

Common name: The painted lady.

Local distribution: Al Kanater (Qalubiyah), Fayoum, Alexandria, W. El Natroun (Behaira), Fayed (Ismailia), Giza, Seds (Kafr El Skeikh), Al Arish, Rafah (N. Sinai), Kharga Oasis, Dakhla Oasis, Bahariya Oasis and Baris Oasis (W. Desert).

Geographic distribution: Widespread and Holarctic.

Recorded hosts: Artichoke, *Helianthus* and *Mulva*. It has a wide range of host plants.

Habitats: Occurs in any areas with flowers.

Remarks: Migrant species, not resident in Egypt. flight period from February until November. Pests on Malvaceae.

4.2. *Melitaea deserticola* Oberthür

Common name: The desert fritillary.

Local distribution: Northern Egypt, Sinai.

Geographic distribution: It is found in North Africa (Morocco, Algeria, Libya and Egypt), Lebanon, Israel, Jordan, Saudi Arabia and Yemen.

Recorded hosts: The larvae feed on *Linaria aegyptiaca*, *Plantago media*,

Anarrhinum fruticosum and *Anarrhinum* species and other Scrophulariaceae.

Habitats: Desert Wadis.

Remarks: Flight period from May to September. Resident in Egypt.

4.3. *Vanessa atalanta* (Linnaeus)

Common name: The red admiral.

Local distribution: Al Kanater (Qalubiyah), Fayoum, Al Arish, Zaranick (N. Sinai), El Tur (S. Sinai), Kharga Oasis, Dakhla Oasis, Bahariya Oasis, Baris (W. Desert), W. El Natroun and Nubaria (Behaira).

Geographic distribution: The red admiral is widely distributed across temperate regions of North Africa, the Americas, Europe, Asia and the Caribbean.

Recorded hosts: The red admiral's main host plant, stinging nettle (*Urtica dioica*), false nettle (*Boehmeria cylindrica*), often feeding on the flowers of ivy on sunny days. The adult butterfly drinks from flowering plants like Buddleia and overripe fruit.

Habitats: Typically found in moist woodlands.

Remarks: Red admirals are territorial. It is known as an unusually people-friendly butterfly, often landing on and using humans as perches. The butterfly flies on sunny winter days, especially in southern Europe. It resides in warmer areas, but migrates north in spring and sometimes again in autumn.

5. Family: Pieridae (Cabbage butterflies):

The Pieridae are a large family of butterflies with about 76 genera containing about 1,100 species, mostly from tropical Africa and tropical Asia with some varieties in the more northern regions of North America. Most pierid butterflies are white, yellow, or orange in coloration, often with black spots. The sexes usually differ, often in the pattern or number of the black markings. They are notorious agricultural pests.

Males of many species exhibit gregarious mud-puddling behavior when they may imbibe salts from moist soils. The Pieridae are generally divided into these four subfamilies: Dismorphiinae (mostly Neotropical; this group includes several mimetic species. The host plants are in the family Fabaceae), Pierinae (whites, yellows, and orange-tips; many of these species are strongly migratory. Host plants are in the families Capparidaceae, Brassicaceae, Santalaceae, and Loranthaceae), Coliadinae (sulphurs or yellows; many of these species are sexually dimorphic. Some, such as *Colias*, have wing patterns that are visible only under ultraviolet) and Seudopontiinae (includes only the genus *Pseudopontia*, with the sole species in this subfamily, *Pseudopontia paradoxa*, which is endemic to West Africa).

It is represented in Egypt by 27 species within 10 genera. It is recorded here by six species.

5.1. *Colias croceus* (Geoffroy)

Common name: Clouded yellow butterfly.

Local distribution: All over Egypt.

Geographic distribution: One of the most-widespread species in Europe. The common clouded yellow's breeding range is North Africa and southern Europe and eastwards through Turkey into the Middle East but it occurs throughout much of Europe as a summer migrant. In Asia, its range extends into central Siberia in the north and barely into India in the south; it is not found in Central Asia.

Recorded hosts: Mainly alfalfa with *Tephrosia purpurea* and *Astragalus* spp.

Habitats: Live in any open cultivated areas in the countryside, including downland, coastal cliffs and fields containing the caterpillar's host plants, at an elevation up to 1,600 metres above sea level.

Remarks: A truly migratory European butterfly, this species is famous for occasional mass migrations and subsequent breeding. Resident in Egypt. Flight period from April till November.

5.2. *Colotis chrysonome* Klug

Common name: The golden Arab tip

Local distribution: Gebel Elba (Red Sea), Kharga Oasis, Dakhla Oasis, Baharyia Oasis, Baris Oasis (W. Desert), Giza, W. El Natroun (Behaira), Belbais (Qalubiyah) and Seds (Kafr El Skeikh).

Geographic distribution: Mauritania, northern Senegal, Mali, Burkina Faso, Nigeria, Niger, the central and eastern part of the Sahara, Sudan, Ethiopia, Somalia, southern Arabia, northern Uganda, Kenya, northern Tanzania, Israel and Jordan.

Recorded hosts: *Maerua crassifolia* (Capparaceae).

Habitats: The habitat consists of arid savanna.

Remarks: Resident in Egypt, but very rare species. Flight period April and June.

5.3. *Colotis protomedia* (Klug)

Common name: The yellow splendour tip

Local distribution: Al Arish (N. Sinai), W. El Natroun (Behaira) and Baharyia Oasis (W. Desert).

Geographic distribution: It is found in north-eastern Nigeria, northern Cameroon, Chad, southern Sudan, northern Uganda, Ethiopia, Somalia, south-western Saudi Arabia, Yemen, Kenya, Tanzania and the Democratic Republic of the Congo.

Recorded hosts: *Maerua* species (Capparaceae).

Habitats: The habitat consists of dry savannah.

Remarks: Adults have a fast flight. They are attracted to flowers, especially those of *Maerua* species.

5.4. *Pieris rapae* (L.)

Common name: Cabbage butterfly, the small white, the small cabbage white, white butterfly

Local distribution: All over Egypt

Geographic distribution: Cosmopolitan. It is widespread and is believed to have originated in Europe or Asia. It is also found in North Africa and has been accidentally introduced to North America, Bermuda, Australia and New Zealand.

Recorded hosts: herb Cruciferae – *Arabis glabra*, *Armoracia laphthifolia*, *Armoracia aquatica*, *Barbarea vulgaris*, *Barbarea orthoceras*, *Barbarea verna*, *Brassica oleracea*, *Brassica rapa*, *Brassica caulorapa*, *Brassica napus*, *Brassica juncea*, *Brassica hirta*, *Brassica nigra*, *Brassica tula*, *Cardaria draba*, *Capsella bursa-pastoris*, *Dentaria diphylla*, *Descurainia Sophia*, *Eruca sativa*, *Erysimum perenne*, *Lobularia maritima*, *Lunaria annua*, *Matthiola incana*, *Nasturtium officinale*, *Raphanus sativus*, *Raphanus raphanistrum*, *Rorippa curvisiliqua*, *Rorippa islandica*, *Sisymbrium irio*, *Sisymbrium altissimum*, *Sisymbrium officinale*, *Streptanthus tortuosus*, *Thlaspi arvense*; Capparidaceae: *Cleome serrulata*, *CapBaris sandwichiana* and Tropaeolaceae: *Tropaeolum majus*; Resedaceae: *Reseda odorata*.

Habitats: The species can be found in any open area with diverse plant association. It can be seen usually in towns, but also in natural habitats, mostly in valley bottoms.

Remarks: The caterpillar of this species is seen as a pest for commercial agriculture. Often referred to as the "imported cabbageworm" they are a serious pest to cabbage and other mustard family crops.

5.5. *Pontia daplidice* L.

Common name: The bath white

Local distribution: Aswan, Kharga Oasis, Baris Oasis (W. Desert), Al Kanater (Qalubiya) and Fayoum.

Geographic distribution: Palearctic region. It is common in central and Southern Europe, Asia Minor, Persia and Afghanistan. In Central Asia, the Bath white ranges from Baluchistan, Peshawar, Chitral, Kashmir and along the Himalayas right across the Central Himalayas up to Darjeeling. The butterfly appears to be extending its range westwards along the Himalayas.

Recorded hosts: family Brassicaceae and vary according to locality. They include tower mustard (*Arabis glabra*) and sea rocket (*Cakile maritima*).

Habitats: It is usually found on dry slopes and rough ground with little vegetation. The butterfly lives in the Mediterranean coastal dunes, on rocky, hot slopes.

Remarks: migrating northwards in the summer. In Central Asia.

5.6. *Pontia glauconome* Klug

Common name: the desert white or desert bath white.

Local distribution: Fayoum, Al Arish (N. Sinai), Kharga Oasis, Dakhla Oasis, Bairs Oasis, El-Baharia Oasis (W. Desert), El Tur (S. Sinai), Alexandria, Nubaria (Behaira), Fayed (Ismailia), Belbis (Qalubiya), Giza, Seds (Kafr El Skeikh) and Assuit.

Geographic distribution: Mauritania, Senegal, Gambia, Niger, Chad, Sudan, Ethiopia, Somalia, Kenya, Arabia, Egypt, the Middle East, Pakistan, Afghanistan, the southern part of the former Soviet Union, Uzbekistan, Tajikistan and Turkmenistan.

Recorded hosts: *Epicastrum arabicum*, *Zilla spinosa*, *Caylusia*, *Dipterygium*, *Erucastrum*, *Moracandia*, *Diplotaxis*, *Cleome arabica* and *Ochradenus baccatus* and *Reseda*.

Habitats: The habitat consists of sub-deserts.

Remarks: Adults are on wing from March to October or from April to

November in three to four generations per year. The pupae have a facultative diapause of at least four years. Resident in Egypt.

References

- Andres, A. and Seitz, A. (1923):** Die Lepidopteren fauna Aegyptens. *Senckenbergiana*, 5: 1-54.
- Andres, A. and Seitz, A. (1923):** Die Lepidopteren fauna Aegyptens. *Senckenbergiana*, 6: 1-83.
- Andres, A. and Seitz, A. (1923):** Die Lepidopteren fauna Aegyptens. *Senckenbergiana*, 7(1/2): 54-61.
- Al-Gamal, M.M.; Salem, M.M. and Sayed, A.A. (2001):** Detective survey for the insect fauna of the New Valley, Egypt. *Proceedings of Efflatoun's Conf. of Entomology 1st*, 185 – 198.
- Benyamini, D. (1984):** The butterflies of Sinai Peninsula (Lep. Rhopalocera). *Nota Lepidopterologica*, 7(4): 309-321.
- El Moursy, A. A. (1996):** Biological diversity of Egypt (Insecta). The United Nations Envir. Programme Egypt. Envir. affairs Agency (National biodiversity unit) GF/6105-92-02-2205, 1-7.
- Gilbert, F. and Zalat, S. (2007):** Butterflies of Egypt. Al-Kelma Press, Giza, Egypt. pp 183.
- Ibrahim, A.M. (1934):** Egyptian Lepidoptera fauna. Unpublished Report, Soc. Entomol., Egypt.
- Larsen, T. B. (1990):** The butterflies of Egypt. Publ. American Univ. press in Cairo, Dar El Kutub, No. 8854/89. Appolo Books, Svenborg, Denmark.
- Larsen, T. B. (1994):** Butterflies of Egypt. *Saudi Aramco World*, 45 (5): 24–27.
- Mabrouk, A. A. (2003):** Ecological and taxonomic studies on some Lepidoptera from Egypt with reference to the family Noctuidae. Ph.D. Thesis, Fac. Sci., Cairo University.
- Mahbob, M.A. and Mahmoud, H.H. (2013):** The first report of preliminary list of the insect fauna of the El-kharaga city, New Valley, Egypt. *J. Ecol. Nat. Environ.*, 5(7):125-132.
- Salem, M.M. (2017):** The insect fauna of Egypt “A comprehensive checklist of insects recorded in Egypt”. Lambert Acad. Publ. (Int. Book Market Service Ltd.), pp691.
- Wiltshire, E.P. (1948):** The Lepidoptera of the kingdom of Egypt. *Bull. Soc. Fouad 1er d'Entom.*, 32: 203-294.