

CONTRIBUTION TO THE FAUNA OF THE HAWK MOTH FAMILY (LEPIDOPTERA, SPHINGIDAE) IN THE REPUBLIC OF NORTH MACEDONIA

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Analysis of literature data, data from entomological collections in the Museum of Natural History (SKO), Nikola Nežlobinski Museum in Struga (NNS), the Scientific Tobacco Institute in Prilep (STP) and the Faculty of Agricultural Sciences and Food in Skopje (FASF) and our research, showed that the family Sphingidae is well investigated in the Republic of North Macedonia, and represented by 25 species, or 62.5% of the European fauna. The subfamily Macroglossinae is represented by 10 genera and 17 species, the subfamily Smerinthinae is represented by 4 genera and 4 species and the subfamily Sphinginae is represented by 4 genera and 4 species. Three species are reported for the first time for the fauna of North Macedonia: *Hyles gallii* (Rottemburg 1775), *Hyles nicaea* (de Pruner 1798) and *Hyoilicus pinastri* Linnaeus, 1758.

Key words: Sphingae, fauna, check list, North Macedonia

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Analizom literaturnih podataka, podataka iz zbirke Prirodoslovnog muzeja u Skoplju (SKO), Muzeja Nikola Nežlobinski u Strugi (NNS), Znanstvenog duhanskog instituta u Prilepu (STP), Fakulteta za poljoprivredu i hranu u Skoplju (FASF) te vlastitim terenskim istraživanjima, utvrđeno je da je porodica Sphingidae dobro istražena i da je za područje Republike Sjeverna Makedonija utvrđeno 25 vrsta, 62,5% europske faune. Potporodica Macroglossinae zastupljena je s 10 rodova i 17 vrsta, potporodica Smerinthinae s 4 roda i 4 vrste i potporodica Sphinginae s 3 roda i 4 vrste. Pregledom zbirke tri vrste utvrđene su kao nove za faunu Makedonije: *Hyles gallii* (Rottemburg 1775), *Hyles nicaea* (de Pruner 1798) i *Hyoilicus pinastri* Linnaeus, 1758.

Ključne riječi: ljljci, fauna, novi nalazi, popis, Sjeverna Makedonija

INTRODUCTION

The hawk moths (family Sphingidae) are among the largest and most easily recognized Lepidoptera. The family was named in 1802 by French zoologist Pierre Latreille. Sphinxes are medium-sized to large moths with strong and robust bodies and relatively short wings (ROMOSER & STOFFOLANO, 1998), usually with a forewing between 16 to 90 mm. The proboscis is well developed for a lot of species, being sometimes longer than the body (POWELL, 2009), although some have a rudimentary proboscis. Hawk moths are strong fliers, and are among the fastest insects. Most species are nocturnal, but some genera (e.g. *Hemaris*) are active during the day (POWELL, 2009). The coloration of adults and larvae is often polymorphic, e.g., green, yellow, red..., usually with cryptic coloration for protection (POWELL, 2009). The larvae are medium to large in size, and usually with single prominent appendage at the posterior part of body. According to this feature the hornworms is usually name of larvae. The larvae from the family Sphingidae feed on different plant species. Caterpillars of hawk moths are often specialists on feeding on plants with chemical defence like the families: Apocynaceae, Cleraceae, Rubiaceae, Solanaceae, and Violaceae. Most adult hawk moths are well-known flower visitors and feed on nectar (FRANKIE & RHORP, 2009). A lot of species of hawk moths are very important pollinators. Some species are very specific in their visitations to flowers, and others are general in their visitations of flower species. The family is distributed worldwide, present on all continents, except Antarctica, with more than 1450 described species in about 200 genera (VAN NIEUKERKEN *et al.*, 2011).



Fig.1. The Republic of North Macedonia (yellow).

According to literature data the Sphingidae in the Republic of North Macedonia (Fig. 1) have been partially investigated by many foreign scientists who briefly stayed in this country (e.g., THURNER, 1938; DANIEL *et al.*, 1951; DANIEL, 1964; HUEMER *et al.*, 2011). Nevertheless data on the distribution in Macedonia of this family are still missing. Accordingly, in this paper we present: 1. Check-list of family Sphingidae for the Republic of North Macedonia (Fig. 1); 2. Notice of historical review; 3. Data from entomological collections in the Republic of North Macedonia; 4. Distribution of species in Europe; 5. Some biological features of species.

MATERIALS AND METHODS

In this paper we included data from four entomological collections in Macedonia: the Macedonian Museum of Natural History (SKO) has a collection of 334 specimens from the family Sphingidae, the Nikola Nežlobinski Museum in Struga (NNS) has 32 specimens the Scientific Tobacco Institute in Prilep (STP) has 240 specimens and collection of the Faculty of Agricultural Sciences and Food in Skopje (FASF) has 29 specimens, the total number of all specimens of entomological collections being 635. In addition to data from the entomological collections, in this paper we have included main literature data for family Sphingidae fauna in the Republic of North Macedonia (DRENOVSKI, 1930; THURNER, 1938; DANIEL *et al.*, 1951; DANIEL, 1964; ZEČEVIĆ & VAJGAND, 2001; HUEMER *et al.*, 2011; KRPAČ *et al.*, 2013) and our research in past 5 years (2014-2018).

The new material of hawk moths was collected during the last 5 years using various methods like entomological nets, light traps (15W UV - ultraviolet light; 125W UV light with automatic light traps with ether and dark light 15W); and scented traps (ropes soaked in alcohol or vinegar).

The taxonomy of the checklist, systematic arrangement mainly follows ID numbers, distribution data are supplied according to Fauna Europea JONG *et al.* (2014) and FREINA & WITT (1987). Biological features (host plants) for each species are given according ROBINSON *et al.* (2010).

HISTORY OF RESEARCH

The first summary about the hawk moths species (Sphingidae) for Macedonia was given by REBEL (1913), relating to 3 species: *D. porcellus*, *M. stellatarum* and *A. convolvuli*. Then BURESH & ILTZEV (1921) reported 2 species: *H. livornica* and *M. tiliae*. ALBERTI (1922) lists 2 species: *M. stellatarum* and *H. croatica* for the area of Macedonia. DRENOVSKI (1930) published 2 species of hawk moths: *H. livornica* was added to the list and the species *M. stellatarum* confirmed for Macedonia. REBEL & ZERNY (1931) registered 10 species for the territory of Macedonia: *H. tityus*, *H. euphorbiae*, *H. livornica*, *T. alecto* and *A. atropos* are mentioned for the first time for Macedonia. Moreover, they confirm the presence of the species *H. croatica*, *A. convolvuli*, *L. populi*, *M. stellatarum* and *D. porcellus* in Macedonia. THURNER (1938) recorded 14 species for Macedonia. He confirms the presence of five species: *H. croatica*, *L. populi*, *A. convolvuli*, *H. livornica* and *M. stellatarum*. With his research, the list of Macedonian hawk moths increased by 9 species: *D. elpenor*, *D. porcellus*, *H. celerio*, *H. euphorbiae*, *H. vespertilio*, *D. nerii*, *M. quercus*, *M. tiliae* and *S. ocellata*.

After the Second World War DANIEL *et al.* (1951) published data for 12 species of hawk moths. Two species, *H. fuciformis* and *P. proserpina*, are mentioned for the first time in Macedonia and they are also added to the list of hawk moths in Macedonia. KASY (1957) found 1 species *H. croatica* at the locality Treska gorge, Skopje. MICHIELI (1963) at many localities in Macedonia confirmed the presence of 3 Sphingidae species: *H. euphorbiae*, *H. livornica* and *M. stellatarum*. DANIEL (1964), in his book "Fauna of SR Macedonia" summarizes all previously published

literature data for the species of hawk moths (Sphingidae), which were registered for the territory of the Republic of Macedonia. He gives a complete list of 22 species, in which for the first time 4 species are listed: *T. alecto* = *T. alecto cretica*, *R. komarovi*, *S. gorgoniades* and *S. ligustri*. Besides the complete list of species, he gives chorological data for them. MENTZER (1975) notices the new species *S. pfeifferi* from Yugoslavia. SCHEIDER (1984) specifies the species *M. tiliae* for a locality near the village of Katlanovo. BESHKOV (1996) specifies the species *H. euphorbiae* at two localities: Demir Kapija Gorge, Kavadarci and near Ohrid towards Ohrid Lake. HASSLER *et al.* (1988) confirmed the presence of 6 species of Sphingidae in Macedonia: *H. euphorbiae*, *M. stellatarum*, *S. gorgoniades*, *L. populi*, *M. quercus* and *S. ligustri*, quoted for new localities.

At the beginning of the 21st century ZEČEVIĆ & VAJGAND (2001) exploring the Gradojević Collection concluded there were species from the territory of Macedonia: *M. stellatarum* (Kumanovo, June and December; Kriva Palanka, June; Monastery Sveta Petka, July) and *H. euphorbiae* (Kumanovo, May; Kriva Palanka, June; Nižepole, larvae, July). HUEMER *et al.* (2011) confirmed the presence of 8 species of Sphingidae on Mt Korab: *D. porcellus*, *H. euphorbiae*, *H. livornica*, *H. vespertilio*, *M. stellatarum*, *L. populi*, *S. ocellata* and *A. convolvuli*. KRPAČ *et al.* (2013) researching the invertebrate fauna in Mavrovo National Park confirmed the presence of 8 species of Sphingidae: *D. porcellus*, *H. euphorbiae*, *H. livornica*, *H. vespertilio*, *M. stellatarum*, *L. populi*, *S. ocellata* and *A. convolvuli*.

RESULTS AND DISCUSSION

According to Fauna Europea the Sphingidae family in Europe is represented by three subfamilies: Macroglossinae, Smerinthinae and Sphinginae, with 40 species arranged in 20 genera. The subfamily Macroglossinae has 11 genera with 26 species. The subfamily Smerinthinae is represented by 6 genera and 9 species. The subfamily Sphinginae has 3 genera with 5 species.

According to the available literature (e.g. DRENOVSKI, 1930; THURNER, 1938; DANIEL *et al.*, 1951; DANIEL *et al.*, 1964; ZEČEVIĆ & VAJGAND, 2001; HUEMER *et al.*, 2011 and KRPAČ *et al.*, 2013), 22 species that belong to 17 genera and 3 subfamilies are known for Macedonia. From the subfamily Macroglossinae 10 genera with 15 species are confirmed. The subfamily Smerinthinae is represented by 4 genera and 4 species and the subfamily Sphinginae has 3 genera and 3 species. The species with the largest number of data for the Republic of North Macedonia are: *Deilephilla porcellus* L., *Hyles euphorbiae* L., *Hyelis livornica* Esp., *Macroglossum stellatarum* L., *Laothoe populi* L., *Smerinthus ocellata* L. and *Agrius convolvuli* L. The species with the smallest number of data for the Republic of North Macedonia are: *Hemaris fuciformis* L., *Theretra alecto* L., and *Rethera komarovi*.

Processing of the collections Sphingidae in Macedonia and our research in the field showed the presence of three new species for the fauna of Macedonia, which enriches the list of Macedonian hawk moths with: *Hyles gallii* (Rottemburg 1775), *Hyles nicaea* (de Pruner 1798) and *Sphinx pinastri* Linnaeus. *Hyles gallii* is a Palaearctic species distributed in Europe, Asia including the Himalayas and Japan

with the subspecies *nepalensis* Daniel, 1966 (FREINA & WITT, 1987). Forewing of the female is from 64 to 71 mm, of the male from 56 to 66 mm. Flight is in two generations, first from May to July, and second from August to September (FREINA & WITT, 1987). In the Alps *H. galli* is distributed to 2000 m a.s.l. *Hyles nicaea* is distributed in Europe, North Africa and Asia. The forewing of the female is 81 to 89 mm, and of the male 69 to 81 mm. Flight in two generations, spring generation from May to July and summer generation from August to September (FREINA & WITT, 1987). *Sphinx pinastri* is distributed in Europe, north Africa, Asia and North America. The forewing of the female is 65 to 88 mm, and of the male 60 to 75 mm. Flight in two generations, the first from April to July, and the second in August (FREINA & WITT, 1987).

Including all data, entomological collections, literature data and our field research in the last 5 years, 25 species of hawk moths have been recorded in the Republic of North Macedonia, which is about 62% of European fauna.

Check list and chorology of the species of the family Sphingidae in the Republic of North Macedonia

Family Sphingidae

The subfamily Macroglossinae

1. *Hemaris croatica* (Esper, 1800)

Distribution in Europe: Austria, Romania, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Albania, Macedonia, Bulgaria, Greece, Russia, Ukraine and the European part of Turkey.

Literature data: Drenovo, in May and June 1917, on meadows and undeveloped fields often in certain places, as *M. croatica* Esp. in ALBERTI (1922). Drenovo; Kalučkovo, leg. Doflein, as *H. croatica* Esp. in REBEL & ZERNY (1931). Ohrid, mid June, at a certain time of day on flowers a greater number of specimens were observed in THURNER (1938). Kalučkovo, 05.05.1918, 1♂, as *H. croatica*, in DANIEL *et al.* (1951). Treska gorge, Skopje as *M. croaticum* in KASY (1957). Vodno, mid-May, 1955; Treska, Canyon Matka, in late May, 1955 (leg. Daniel, Klimsch, Thurner); Ohrid, mid-June (leg. Thurner); Drenovo, 05-06. (leg. Thurner); Kalučkovo, 05.05.1918, in DANIEL (1964).

Collection data: (SKO) Skopje, Vodno, 10.08.1941, leg. G. Stojanov (1 specimen). STP: Prilep, Mariovo, 05-06.2014, leg V. Krsteska (3 specimens). The collection in SKO has 2 specimens from Croatia, Dalmatia, Zara and 2 specimens without data.

Host plants: *Scabiosa*, *Cephalara* and *Asperula*.

2. *Hemaris fuciformis* (Linnaeus, 1758)

Distribution in Europe: Austria, Belarus, Belgium, Bosnia and Herzegovina, Britain, Bulgaria, Croatia, Czech Republic, Danish mainland, Estonia, Finland, French mainland, Germany, Greek mainland, Hungary, Italian mainland, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Norwegian mainland, Poland,

Portuguese mainland, Romania, Russia, Slovakia, Slovenia, Spanish mainland, Sweden, Switzerland, The Netherlands, Ukraine, Serbia, Kosovo, Vojvodina, Montenegro.

Literature data: Begovo, 27.06.1918, 1800m, as *H. fuciformis* L. in DANIEL *et al.* (1951). Begovo, 27.06.1918, 1800m, leg. Daniel, 1800m, in DANIEL (1964).

Collection data (NNS): Jablanica, 07.1931 (2 specimens).

Host plants: representatives of the genera *Lonicera*, *Deutzia*, *Galium*, *Knautia*, *Symphoricarpos*, *Cephalaria* and *Procera*.

3. *Hemaris tityus* (Linnaeus, 1758)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Britain, Ireland, Belgium, The Netherlands, Luxembourg, Switzerland, Germany, Poland, Estonia, Latvia, Liechtenstein, Lithuania, Belarus, Russia, Ukraine, Moldova, Spain, Portugal, France, Corsica, Italy Austria, Czech Republic, Slovakia, Hungary, Romania, Slovenia, Croatia, Bosnia and Herzegovina, Kosovo, Serbia, Montenegro, Macedonia, Bulgaria and Greece.

Literature data: Korab, 23-31.07.1918, leg. Pentier, Prodota, Zerny; Golešnica mountain (Pepeljak), leg. Doflein, as *H. tityus* L. (*scabiosae* Z.) in REBEL & ZERNY (1931). Crn Vrv, 1♀; Pepeljak, 23.06.1918, 1800-2200m, 2♂♂; Begovo, 27.06.1918, 1800-2500m, 1♂, in DANIEL *et al.* (1951). Crn Vrv, to the end of 07.1939 (leg. Daniel); Treska, Canyon Matka, in the middle of May (leg. Daniel); Golešnica (leg. Doflein); Pepeljak, 23.06.1918, 1800-2200m, 2♂♂; Begovo, 25 and 26.06.1918, 1♂, 1800-2500 m (leg. Daniel) in DANIEL (1964).

Collection data (STP): Prilep, Mariovo, 05-06.2014, leg V. Krsteska (1 specimen). In collection SKO there is 1 specimen from Slovakia: Červená Skala 07.1939, leg. Nezbeda and 3 specimens are without data.

Host plants: genus *Scabiosa*.

4. *Deilephila elpenor* (Linnaeus, 1758)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Britain, Ireland, Estonia, Latvia, Lithuania, France, Corsica, Switzerland, Belgium, The Netherlands, Luxembourg, Germany, Austria, Poland, Portugal, Spain, Italy, Romania, Belarus, Moldova, Russia Ukraine, Czech Republic, Slovakia, Hungary, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Albania, Macedonia, Bulgaria and Greece.

Literature data: Near Ohrid, leg. Bukowski and Thurner; Struga, in June, leg. Silbernagel, as *H. elpenor* L. in THURNER (1938). Ohrid; Struga, as *P. elpenor* L. in DANIEL (1964).

Collection data (SKO): Skopje, train station, 07.07.1942 (1 specimen), leg. K. Tuleshkov; Skopje, 01.09.1942 (1 specimen), leg. G. Stojanov; Prespa Lake, 27.08.1959 (1 specimen) and 28.08.1959 (2 specimens), leg. S. Joksimović and 5 specimens without data. **NNS:** as *Deilephila* sp., Struga, 07.1952 (1 specimen). **STP:** Gevgelija, 19.05.1976, leg. Lj. Janušeska (1 specimen); Gevgelija, 05-06.06.1976, leg. Lj. Janušeska (1 specimen); Gevgelija, 11.06.1976, leg. Lj. Janušeska (1 specimen);

Gevgelija, 17.07.1976, leg. Lj. Janušeska (1 specimen) and Gevgelija, 13.07.1976, leg. Lj. Janušeska (2 specimens).

Host plants: representatives of the fam. Onagraceae (*Circaea lutetiana*, *Epilobium angustifolium* and *Epilobium hirsutum*); fam. Rubiaceae (*Galium palustre*).

5. *Deilephilla porcellus* (Linnaeus, 1758)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Britain, Ireland, Switzerland, Belgium, The Netherlands, Luxembourg, France, Corsica, Germany, Poland, Estonia, Latvia, Lithuania, Belarus, Russia, Ukraine, Austria, Italy, Czech Republic, Slovakia, Hungary, Romania, Portugal, Spain, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Albania, Macedonia, Bulgaria and Greece.

Literature data: Pelister, 06.1912, leg. Werner, as *P. porcellus* L. in REBEL (1913). Pelister, leg. Werner, as *P. porcellus* L. in REBEL & ZERNY (1931). Ohrid, May and June.; and a single specimen on Mt Petrinan, June as *M. porcellus* L. in THURNER (1938). Common species at Brodec and Crn Vrv, as *P. porcellus* L. in DANIEL *et al.* (1951). Brodec and Crn Vrv, 07.1939; Treska gorge, to the end of 05.1955, 1♂, (leg. Daniel); Ohrid and Mt Petrina; Pelister; Drenovo, 07.06.-09.07.1955, common species (leg. Daniel) as *P. porcellus* L. in DANIEL (1964). Korab, Kobilino Pole, 28.07.2011, 2080-2180m, col. Huemer, in HUEMER *et al.* (2011). Korab. Kobilino Pole, Korab Lake, 29.07.2011, 2200m, in KRPAČ *et al.* (2013).

Collection data (SKO): Skopje, Gorno Vodno, 20.05.1959 (3 specimens), leg. S. Joksimović; Skopje, Gorno Vodno, 20.05.1959 (1 specimen), leg. J. Kuševski; Mavrovo, 02.07.1975 (4 specimens), leg. J. Čingovski; Mavrovo, 06.07.1988 (1 specimen), leg. V. Krpač; Skopje, v. Sušica, 22-24.05.1990 (2 specimens); leg. V. Krpač; Šar Planina, s. Nerašte, a basin at Vratnička in the Vardar River, 14.05.2016 (1 specimen), leg. V. Krpač and R. Zekiri; Osogovski mountain, the source of the Stranička River, 30.06.2017 (3 specimens), 1824 m a. s. l., leg. J. Hinic. **STP:** Prilep 18.05.1974, leg. Lj. Janušeska (1 specimen); Prilep 15.08.1972, leg. Lj. Janušeska (1 specimen); Gevgelija, 07-08.07.1976, leg. Lj. Janušeska (4 specimens); Prilep 03.06.1963, leg. Lj. Janušeska (2 specimens); Prilep, 05.05.1973, leg. Lj. Janušeska (1 specimen); Gevgelija, 05.17.1972, leg. Lj. Janušeska (1 specimen); Gevgelija, 07.07.1976, leg. Lj. Janušeska (1 specimen); Prilep 07.03.1976, leg. Lj. Janušeska (1 specimen); Prilep 06.06.1973, leg. Lj. Janušeska (1 specimen); Prilep 25.08.1971, leg. Lj. Janušeska (3 specimens); Prilep 28.05.1974, leg. Lj. Janušeska (3 specimens); Mt Jablanica, v. Drenok, 02.06.2017, 1080 m a.s.l., 1♂ 1♀, N 41°23'28.5" E 20°33'35", leg V. Krpač; Šar Planina, Popova Šapka, 08.06.2018, 1745 m a.s.l., 5♂♀, N 41°00'57.2" E 20°52'52.2", leg. V. Krpač; Šar Planina, Popova Šapka, 17.06.2018, 1745 m a.s.l., 5♂♀, N 41°00'57.2" E 20°52'52.2", leg V. Krpač; Jablanica mountain, v. Drenok, Karaula, 01.-02.07.2018, 1179 m a.s.l. (4 specimens), N 41°23'53.7" E 20°33'22.0", leg V. Krpač & R. Zeqiri; Suva Gora, v. Oraović, 12. 07.2018, 708 m a.s.l. (2 specimens), N 41°94'11.97" E 21°20'95.57", leg R. Zeqiri; besides material from Macedonia in the collection **SKO** there is 1 specimen from Slovakia, Červena Skala, 00.07.1939, leg. Nezbeda; and 2 specimens without data.

Host plants: representatives of the fam. Onagraceae (*Epilobium*); Rubiaceae (*Galium*) and Lythraceae (*Lythrum salicaria*).

Note: *D. porcellus* L. is an extremely variable species. Much of this variation appears to be environmentally induced, specimens from cooler, wetter areas tending to be pink, whereas those from hotter, drier regions tend to be brown (form *suellus*). Specimens from localities with intermediate conditions show a range of pinkish-brown forms, many of which have been described as subspecies. However, they are best treated as ecological forms. In Macedonia it is observed in 2 generations.

6. *Hippotion celerio* (Linnaeus, 1758)

Distribution in Europe: Denmark, Great Britain, Ireland, Belgium, The Netherlands, Luxembourg, Switzerland, France, Corsica, Germany, Poland, Italy, Austria, Portugal, Spain, Czech Republic, Slovakia, Hungary, Romania, Malta, Cyprus, Greece, Bulgaria, Slovenia, Croatia, Bosnia and Herzegovina and Albania.

Literature data: Struga, May, no year (the material is quoted by the Museum "Nezlobinski" in Struga) as *H. celerio* L. in THURNER (1938). Struga, May, no year, in DANIEL (1964).

Collection data (SKO): In collection NNS Struga, May, no year (1 specimen); in collection SKO there is 1 specimen without data.

Host plants: Vitaceae (*Ampelopsis* and *Vitis vinifera*); Onagraceae (*Fuchsia*); Rubiaceae (*Galium verum*) and *Parthenocissus*.

Note: This species was for the first time mentioned by THURNER (1938) by its synonym *H. celerio* L. This species is not sufficiently researched. Besides data from the locality Struga, until now this species is not confirmed for the Republic of Macedonia. *H. celerio* is in group of migrants III, which migrate within their area of occurrence and do not return to the original areas from which they came, i.e. they stay in their destined area (EITSCHBERGER *et al.*, 1991: 26).

7. *Hyles euphorbiae* (Linnaeus, 1758)

Distribution in Europe: Sweden, Finland, Denmark, Switzerland, The Netherlands, Belgium, Poland, Czech Republic, Slovakia, Latvia, Lithuania, Luxembourg, Estonia, Great Britain, Germany, France, Austria, Hungary, Italy, Spain, Portugal, Romania, Belarus, Ukraine, Moldova, Greece, Bulgaria, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Albania, Macedonia, Greece and the European part of Turkey.

Literature data: Area between the Vardar and Dojran Lake, leg. Norton, Delbanty, as *C. euphorbiae* L. in REBEL & ZERNY (1931). Near Ohrid, often, and in the mountains probably common, as *D. euphorbiae* L. in THURNER (1938). Lešok; Brodec and Crn Vrv; Nikolić, 07.1917 and 07.1918 as *C. euphorbiae* L. in DANIEL *et al.* (1951). From lowland to 2200m, from May to September, as *C. euphorbiae* L. in DANIEL (1964). Gostivar; Veles; Prilep (caterpillars) as *C. euphorbiae* L. in MICIELI (1963). 30 km northeast of Prilep, Raec, 07.07.1986, 600m, leg. Hessler, SCHMIDT in HASSLER *et al.* (1988). Demir Kapija Gorge, Kavadarci Region, 21.06.1995 and Galičica Mt, 1400 m, towards Ohrid Lake, 22.06.1995 in BESHKOV (1996). Nižepole (caterpillar), 07. (leg. Gradojević) in ZEČEVIĆ & VAJGAND (2001). Korab, Kobilino Pole, 28.07.2011, 2080-2180m, col. Huemer, in HUEMER *et al.* (2011); Korab, Kobilino Pole, Korab Lake, 29.07.2011, 2200 m, in KRPAČ *et al.* (2013).

Collection data (SKO): Skopje: 31.07.1941 (1 specimen); 12.08.1941 (1 specimen); 23.08.1941 (1 specimen); 27.04.1942 (1 specimen); 28.04.1942 (1 specimen); 31.05.1942 (1 specimen), leg. G. Stojanov; Karađica, v. Crn Vrv, 07.08.1942 (2 specimens), leg. K. Tuleshkov; Skopje, 24.08.1942 (1 specimen); 01.09.1942 (3 specimens); 24.07.1944 (1 specimen), leg. G. Stojanov; Skopje, City Park, 19.06.1945 (1 specimen), leg. K. Bogoevski; Skopje, City Park, 27.07.1946 (3 specimens), leg. K. Bogoevski; Skopje, train station, 21.05.1950 (1 specimen), leg. K. Bogoevski; Skopje, Gorno Vodno, 20.05.1959 (15 specimens), leg. S. Joksimović; Skopje, Gorno Vodno, 20.05.1959 (2 specimens), leg. J. Kuševski; Kavadarci, v. Galište, 11.08.1959 (2 specimens), leg. S. Joksimović; Mavrovo, 02.07.1975 (5 specimens), leg. J. Čingovski; Dojran, 13.04.1989 (1 specimen), leg. V. Krpač; Valandovo, 11.07.1989 (2 specimens), leg. T. Trajkovski; Skopje, v. Sušica, Markov monastery, 22.05.1990 (6 specimens), and 24.05.1990 (1 specimen), leg. V. Krpač; Star Dojran, 26.05.1996 (1 specimen), leg. V. Krpač. **NNS:** Struga, 08.1925 (1 specimen) as *D. euphorbiae* L. **STP:** Prilep, 13.06.1973, leg. Lj. Janušeska (1 specimen); Prilep, 24.07.1976, leg. Lj. Janušeska (1 specimen); Prilep, 15.9.1972, leg. Lj. Janušeska (2 specimens); Gevgelija, 05.19.1986, leg. Lj. Janušeska (1 specimen); Prilep, 26.05.1973, leg. Lj. Janušeska (1 specimen); Prilep, 02.07.1976, leg. Lj. Janušeska (4 specimens) and Prilep, 05.19.1973, leg. Lj. Janušeska (12 specimens). **FASF:** Skopje, v. 'Ržaničino, 15.05.1953 (1 specimen); Skopje, 1955 (1 specimen); Skopje, 1956 (1 specimen); Skopje, 20.09.1957 (1 specimen); Skopje, 1960 (1 specimen); Skopje, 06.01.1961 (1 specimen); Prilep, Varoš, 19.05.2016 (1 specimen) leg. A. Petrevski. Beside specimens from Macedonia in the collection **SKO** has specimens from Bulgaria, Sofia, 08.22.1928 (2 specimens); Bulgaria, Alibotush 03.06.1930 (1 specimen); 08.03.1930 (1 specimen), and 04.08.1930 (1 specimen), leg. K. Drenovski; there are seven specimens without data.

Host plants: Euphorbiaceae (*Euphorbia cyparissias*, *E. esuloides*, *E. esula* and *E. paralias*); Onagraceae; Polygonaceae and Vitaceae.

Note: This species was first noticed by THURNER (1938), as *D. euphorbiae* L. widespread in the environment of Ohrid. It has been counted and is widespread throughout Macedonia. At the localities of Leshok; Brodec and Crn Vrv and especially Nikolić, populations of caterpillars and adult butterflies are met, which according to their sandy colour belong more to the populations that are found in the east (DANIEL *et al.*, 1951). In Macedonia this species appears with 3 generations. Often, and in the mountains probably common. Also the caterpillars are frequently found on *E. esuloides* and *E. esula*. The species also changes strongly here, many animals being heavily coloured red. *H. euphorbiae* is in group of migrants III, which migrate within their area of occurrence and do not return to the original areas from which they came, i.e. they stay in their destination area (EITSCHBERGER *et al.*, 1991: 26).

8. *Hyles gallii* (Rottemburg, 1780)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Britain, Ireland, France, Corsica, Switzerland, Belgium, The Netherlands, Luxembourg, Germany,

Czech Republic, Slovakia, Poland, Austria, Hungary, Romania, Moldova, Estonia, Latvia, Lithuania, Ukraine, Belarus, Russia, Spain, Italy, Slovenia, Montenegro, Serbia, Kosovo, Bulgaria and Greece.

Literature data: No data.

Collection data (SKO): Skopje, Katlanovo, 26.03.1990 (1 specimen), leg. V. Krpač; Šar Planina, Popova Šapka, leg. V. Krpač; Šar planina, Popova Šapka, N 41°00'57.2" E 20°52'52.2", 21.08.2018, 1745 m a.s.l. (1 specimen), leg. V. Krpač. Beside Macedonian material in the collection **SKO** there are specimens from: Kosovo, Peć, Klina, 17.05.2015 (1 specimen), leg. R. Zekiri; Slovakia, Červená Skala, 22.07.1936 (1 specimen), leg. Nezbeda and 1 specimen without data.

Host plants: Rubiaceae (*Epilobium* and *Fuchsia*) Rubiaceae (*Galium mollugo* and *Galium verum*) Betulaceae (*Betula pendula*). Also records from *Acalypha*, *Euphorbia*, *Geranium*, *Impatiens*, *Malus*, *Plantago*, *Portulaca*, *Rosa*, *Rumex*, *Salix*, *Spiraea*, *Syringa* and *Vitis*.

Note: For this species there is no reference data. *H. gallii* Rott. is a new species for the fauna of hawk moths in Macedonia. In our research this species was found at the locality Katlanovo and Šar planina Mt., Popova Šapka. It is insufficiently researched; each subsequent report will clarify the picture of its expansion and the size of the population in Macedonia. *H. gallii* is in group of migrants III, which migrate within their area of occurrence and do not return to the original areas from which they came, i.e. they stay in their destination area (EITSCHBERGER *et al.*, 1991: 26).

9. *Hyles livornica* (Esper, 1780)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Britain, Ireland, Estonia, Latvia, Lithuania, France, Corsica, Belgium, The Netherlands, Luxembourg, Switzerland, Austria, Germany, Czech Republic, Slovakia, Poland, Hungary, Romania, Belarus, Russia, Ukraine Portugal, Spain, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Albania, Macedonia, Greece, Cyprus, European part of Turkey and Malta.

Literature data: Kožuf Mt, pic Laha (2180 m) 19.07.1918 as *D. livornica* Esp. in BURESCH & ILTZEV (1921). Galičica, v. Konjsko, 1917, leg. Drenowski, as *D. lineata* (F) var. *livornica* Esp. in DRENOWSKI (1930). Galičica, (Dren.) as *D. lineata* (F) var. *livornica* Esp. in REBEL & ZERNY (1931). Numerous specimens in July and August, in a light trap near Ohrid, Petrina and Jablanica Mt (the material is quoted by the Nezlobinski Museum in Struga) as *D. livornica* Esp. in THURNER (1938). Common species on v. Brodec, Crn Vrv and Pelister, as *C. lineata livornica* Esp. in DANIEL *et al.* (1951). Brodec and Crn Vrv, from the middle to the end of July, often seen at 1200-1600 m (leg. Daniel); Popova Šapka, 1800 m, in a light trap as *C. lineata livornica* Esp. in MICHELI (1963). Popova Šapka, in middle of August, 1800m, leg. Michieli; Petrina, Ohrid, Jablanica Mt and Drenovo, 20.06 until 07.09.1956, recorded in a large number of specimens; Galičica, leg. Drenowski, as *C. lineata livornica* Esp. in DANIEL (1964). Korab, Kobilino Pole, 28.07.2011, 2080-2180m, col. Huemer; Korab Mt, 02.08.2011, from 2325 to 2400 m, col. Huemer, in HUEMER *et*

al. (2011). Mt Korab, Kobilino Pole, Korab Lake, 29.07.2011, 2200 m; Mt Korab, 02.08.2011, 2400 m, in KRPAČ *et al.* (2013).

Collection data (SKO): Skopje, 06.07.1942 (1 specimen), leg. G. Stojanov; Prilep, 31.07.1942 (1 specimen), leg. G. Stojanov; Skopje, 24.08.1942 (1 specimen), leg. G. Stojanov; Skopje, Zelenikovo, 06.05.1943 (1 specimen), leg. G. Stojanov; Skopje, 24.07.1943 (1 specimen), leg. K. Bogoevski; Skopje, 09.08.1943 (2 specimens), leg. G. Stojanov; Skopje, City Park, 27.07.1946 (1 specimen), leg. K. Bogoevski; Prilep, v. Oreovec, 16.05.1958 (2 specimens), leg. D. Simova; Skopje, Gorno Vodno, 20.05.1959 (1 specimen), leg. S. Joksimović; Mavrovo, 02.07.1975 (1 specimen), leg. J. Čingovski; Skopje, Katlanovo, 13.04.1982 (1 specimen), leg. P. Schieder; Ohrid, 10.08.1988 (1 specimen), leg. T. Ivanovski; Mavrovo, 12.08.1990 (1 specimen), leg. V. Krpač; Ohrid, 27.07.1986 (3 specimens), leg. B. Mihajlova. **NNS:** Jablanica, 07.1931 (2 specimens); Struga 06.1952 (1 specimen) as *Deilephila lineata*. **STP:** Prilep, 27.09.1996, leg. Lj. Janušeska (2 specimens); Gevgelija, 05.05.1976, leg. Lj. Janušeska (1 specimen); Prilep, 17.08.1972, leg. Lj. Janušeska (1 specimen); Prilep, 15.04.1972, leg. Lj. Janušeska (1 specimen); Prilep, 17.05.1972, leg. Lj. Janušeska (1 specimen); Prilep, 03.06.1963, leg. Lj. Janušeska (1 specimen); Prilep, 05.06.1973, leg. Lj. Janušeska (7 specimens); Gevgelija, 04.30.1976, leg. Lj. Janušeska (1 specimen); Prilep, 26.05.1973, leg. Lj. Janušeska (1 specimen); Gevgelija, 06.19.1976, leg. Lj. Janušeska (1 specimen); Prilep, 26.05.1973, leg. Lj. Janušeska (1 specimen); Prilep, 26.05.1973, leg. Lj. Janušeska (1 specimen); Gevgelija, 19.06.1976, leg. Lj. Janušeska (1 specimen), Gevgelija, 06.03.1976, leg. Lj. Janušeska (1 specimen); Prilep, 02.07.1976, leg. Lj. Janušeska (2 specimens); Bat 26.04.1973, leg. Lj. Janušeska (1 specimen); Prilep, 19.05.1973, leg. Lj. Janušeska (1 specimen); Prilep, 27.7.1976, leg. Lj. Janušeska (2 specimens) and Gevgelija, 05.04.1976, leg. Lj. Janušeska (1 specimen). **FASF:** Skopsko (1 specimen); Mavrovo, v. Galičnik, 05.05.1957 (1 specimen). In the museum collection **SKO** besides material of Macedonia has more specimens from Bulgaria, Alibotush, 02.08.1902 (1 specimen); Alibotush, 25-30.08.1928 (1 specimen); Alibotush, 01.08.1930 (1 specimen); Alibotush, 02.08.1930 (2 specimens); and three specimens without data.

Host plants: Onagraceae (*Fuchsia*); Polygonaceae (*Rumex*, *Polygonum*); Asphodelaceae (*Asphodelus*); Rubiaceae (*Galium*) and Vitaceae (*Vitis vinifera*).

Note: This species has a wide distribution in Europe and Macedonia. In the reference data some of its synonyms are given. DRENOWSKI (1930) was the first to register this species as *D. lineata* (F) var. *livornica* Esp. DANIEL *et al.* (1951) cited it as a subspecies as *C. lineata livornica* Esp. *H. livornica* is in the group of migrants III, which migrate within their area of occurrence and do not return to the original areas from which they came, i.e. they stay in their destination area (EITSCHBERGER *et al.*, 1991: 26).

10. *Hyles nicaea* (de Prunner 1798)

Distribution in Europe: Portugal, Spain, France, Corsica, Italy, UK, Albania, Greece, Bulgaria and Ukraine.

Literature data: No data.

Collection data SKO: Skopje, v. Kučkovo, 07.06.1985 (1 specimen), leg. B. Mihajlova. **(STP):** Prilep, 18.6.1959, leg. Lj. Janušeska (2 specimens); Prilep, 04.07.1972, leg. Lj. Janušeska (1 specimen); Prilep, 06.07.1972, leg. Lj. Janušeska (1 specimen); Prilep, 15.08.1972, leg. Lj. Janušeska (1 specimen); Prilep, 17.08.1972, leg. Lj. Janušeska (1 specimen); Prilep, 05.05.1973, leg. Lj. Janušeska (1 specimen); Gevgelija, 03.06.1976, leg. Lj. Janušeska (1 specimen); Prilep, 07.27.1976, leg. Lj. Janušeska (2 specimens); Prilep, 17.08.1976, leg. Lj. Janušeska (1 specimen) and Prilep, Mariovo, May-June 2014, leg. V. Krsteska (2 specimens), Jablanica mountain, v. Drenok, 02.06.2017, 1080 m a.s.l., 1♂, N 41°23'28.5" E 20°33'35" (1 specimen), leg V. Krpáč.

Host plants: Euphorbiaceae (*Euphorbia esula*) and Scrophulariaceae (*Linaria vulgaris*)

Note: *H. nicaea* (de Prun.) is a new species which has not been registered for the fauna of Macedonia. Future data will complement the picture of the distribution of this species in Macedonia.

11. *Hyles vespertilio* (Esper, 1780)

Distribution in Europe: France, Germany, Austria, Switzerland, Hungary, Greece, Bulgaria, Romania, Hungary, Ukraine, Italy, Albania and Croatia.

Literature data: Ohrid, individual specimens, August in a light trap (leg. Thurner) as *D. vespertilio* Esp. in THURNER (1938). Ohrid, in early August, population of this species is numerous, as *C. vespertilio* Esp. in DANIEL (1964). Valley of r. Radhika, 10 km north-east of Sveta Voda, 01.08.2011, from 1290 to 1340m, col. Huemer, in HUEMER et al. (2011); Sveta Voda, 03.08.2011, 1300m, in KRPAČ et al. (2013).

Collection data SKO: Mavrovo, v. Lazaropole, 03.07.1995 (2 specimens), leg. V. Krpáč and there are 3 specimens without data. **FA SF:** Prilep, Varoš, 19.05.2016 (2 specimens, 1♂ and 1♀), leg. A. Petrevski.

Host plants: species of *Epilobium*, especially *E. dodonaei*, *E. rosmarinifolium* and *E. tetragonum*, species of *Oenothera*, occasionally *Galium* spp.

Note: This species was registered in Macedonia for the first time as *D. vespertilio* Esp., in light trap at locality near Ohrid, with individual specimens, leg. Thurner, in THURNER (1938). According to DANIEL (1964) in early August, the populations of this species are numerous.

12. *Theretra alecto* (Linnaeus, 1758)

Distribution in Europe: Romania, the European part of Turkey, Cyprus, Bulgaria, Greece and Macedonia.

Literature data: Veles, (Bur.) in REBEL & ZERNY (1931). Veles, leg. Buresch, as. *T. alecto cretica* Bsd. in DANIEL (1964).

Collection data (SKO): Demir Kapija, 21.08.1942 (1 specimen), leg. K. Tuleshkov. Beside material from Macedonia in the collection **SKO** there is material from Bulgaria, Petrich, 00.05.1933 (1 specimen), leg. K. Drenovski and 1 specimen is without data.

Host plants: Theaceae (*Camellia sinensis*); Actinidiaceae (*Saurauia*); Dilleniaceae (*Dillenia* and *Tetracera*); Leeaceae; Rubiaceae (*Rubia* and *Psychotria*); Vitaceae (*Vitis*, *Parthenocissus*, *Cissus* and *Leea*).

Note: This species is rare and limited in distribution in Europe. Macedonia is the easternmost point of the area of this Asia Minor species. According to KITCHING & CADIOU (2000) the subspecies status is misplaced.

13. *Daphnis nerii* (Linnaeus, 1758)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Estonia, Latvia, Lithuania, Belarus, Russia, Ukraine, Great Britain, Ireland, Belgium, The Netherlands, Luxembourg, Switzerland, France, Corsica, Germany, Poland, Austria, Czech Republic, Slovakia, Romania, Hungary Portugal, Spain, Italy, Malta, Cyprus, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Albania, Macedonia, Bulgaria, Greece and the European part of Turkey.

Literature data: Struga, July, no year; Ohrid, 1936, leg. Thurner, in THURNER (1938). Ohrid, 1♀; Struga, July, no year (leg. Thurner) as *D. nerii* L. in DANIEL (1964).

Collection data (NNS): as *D. nerii* L., Struga, 07.1925 (1 specimen); Struga, 08.1948 (2 specimens). **STP:** Prilep, 21.06.1972, leg. Lj. Janušeska (1 specimen). The museum collection **SKO** contains specimens from Croatia, Dubrovnik, 18.08.1933 (1 specimen), and 3 specimens without data.

Host plants: Apocynaceae (*Vinca minor*); Leguminosae (*Senna siamea*); Sterculiaceae (*Theobroma cacao*); Apocynaceae (*Nerium oleander*) and Apocynaceae (*Tabernaemontana*).

Note: This species is in group of migrants III, which migrate within their area of occurrence and do not return to the original areas from which they came, i.e. they stay in their destination area (EITSCHBERGER *et al.*, 1991: 26).

14. *Macroglossum stellatarum* (Linnaeus, 1758)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Britain, Ireland, Switzerland, Belgium, The Netherlands, Luxembourg, Estonia, Latvia, Lithuania, France, Corsica, Germany, Austria, Czech Republic, Slovakia, Poland, Hungary, Italy, Greece, Cyprus, Malta the European part of Turkey, Portugal, Spain, Romania, Belarus, Ukraine, Russia, Moldova, Bulgaria, Albania, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo and Macedonia.

Literature data: Macedonia, Pelister, 06.1912, leg. Werner, in REBEL (1913). Drenovo, from late March to mid-May and again isolated specimen from the end of June, 1917, the spring butterflies were common along rocky creeks and in rocky mountain slopes, in ALBERTI (1922). Galichica with Konjsko, 1917, leg. Drenovski, in DRENOVSKI (1930). Ohrid, 13.07, leg Ebner; Galičica, leg Drenowski, in Macedonia common, in REBEL & ZERNY (1931). Near Ohrid, mid-June, swarming on flowers during the day in THURNER (1938). At Ohrid several times a day on flowers, also at Struga (leg. Silbernagel, Museum in Struga). By day in Struga, leg. Silbernagel (the material is quoted by Museum "Nezlobinski" in Struga) in THURNER (1938). Observed in all investigated localities, in DANIEL *et al.* (1951). Widely distributed

species in Macedonia, from March to October, in DANIEL (1964). On all localities frequently, in MICHELI (1963). 30 km northeast of Prilep, Raec, 07.07.1986, 600m, leg. Hassler, Schmidt, in HASSLER *et al.* (1988). Kumanovo, June and December; Kriva Palanka, June; Monastery of Sveta Petka, July (leg. Gradojević) in ZEČEVIĆ & VAJGAND (2001). Korab, Kobilino Pole, 28.07.2011, 2080-2180m, col. Huemer; Valley River. Radhika, 10 km north-east of Sveta Voda, 01.08.2011, from 1290 to 1340 m, col. Huemer, in HUEMER *et al.* (2011). Korab, Kobilino Pole, Korab Lake, 29.07.2011, 2200 m; Sveta Voda, 03.08.2011, 1300m, in KRPAČ *et al.* (2013).

Collection data (SKO): Skopje, Treska River, 05.06.1941 (1 specimen), leg. K. Tuleshkov; Skopje, Vodno, 10.08.1941 (1 specimen), leg. G. Stojanov, 15.08.1941 (1 specimen), leg. K. Bogoevski; Skopje, 20.08.1941 (1 specimen), leg. G. Stojanov, Skopje, Treska River, 28.09.1941 (1 specimen), leg. G. Stojanov; Skopje, v. Dračevo, 04.06.1942 (1 specimen), leg. G. Stojanov; Skopje, Treska River, 12.07.1942 (1 specimen), leg. G. Stojanov; Skopje, v. Bojane, 19.07.1942 (1 specimen), leg. K. Bogoevski; Skopje, 28.12.1942 (1 specimen), leg. K. Tuleshkov; Skopje, Matka, 14.06.1946 (1 specimen), leg. K. Bogoevski; Ohrid, St. Naum, 21.07.1945 (2 specimens), leg. P. Ikonov; Skopje, City Park, 27.07.1946 (1 specimen), leg. K. Bogoevski; Skopje, Matka, 30.03.1959 (1 specimen), leg. S. Joksimović; Mavrovo, 24.06.1970, (1 specimen), leg. J. Čingovski; Valandovo, 24.04.1971 (1 specimen), leg. J. Čingovski; Skopje, ??.06.1973 (2 specimens), leg. J. Čingovski; Demir Hisar, v. Sopotnica, 18.05.1974 (1 specimen), leg. J. Čingovski; Skopje, ??.09.1974 (1 specimen), leg. J. Čingovski; Gevgelija, v. Furka, 06.06.1975 (1 specimen), leg. J. Čingovski; Skopje, Kitka, 19.06.1975 (1 specimen), leg. J. Čingovski; Skopje, Zelenikovo, 02.07.1975 (3 specimens), J. Čingovski; Kriva Palanka, v. Konjari, 09.17.1975 (1 specimen), J. Čingovski; Kičevo, v. Cer, 04.07.1982 (1 specimen), J. Čingovski; Skopje, 12.02.1985 (1 specimen), leg. N. Topukova; Kičevo, v. Belica, 11.06.1985 (1 specimen), leg. N. Topukova; Skopje, 02.06.1986 (1 specimen), leg. N. Topukova; Karadjica, 18.09.1987 (1 specimen), leg. V. Krpač; Mavrovo, 06.07.1988 (2 specimens), leg. V. Krpač; Jakupica, 17.06.1988 (1 specimen), leg. V. Krpač; Dojran, 13.04.1989 (2 specimens), leg. V. Krpač; Skopje, 15.11.1991 (1 specimen), leg. N. Topukova; Mavrovo, 26.07.1994 (1 specimen), leg. V. Krpač; Skopje, 25.05.1986 (1 specimen), leg. V. Krpač; Monastery St. Jovan Bigorski, 01.07.2000 (1 specimen), leg. M. Ivanov; Skopje, v. Breznica, 04.07.2000 (1 specimen), leg. M. Ivanov; Skopje, Natural History Museum, 06.07.2001 (1 specimen), leg. M. Ivanov; Skopje, Natural History Museum, 25.12.2002 (1 specimen), leg. M. Ivanov; Mavrovo, Pilana, 11.08.2004 (1 specimen), leg. V. Krpač, Karpoš, 21.09.2014, (2 specimens), leg. M. Ivanov; Mt Žeden, V. Kopanica, 08.06.2015 (1 specimen), leg. Zekiri; Žeden Mt., V. Kopanica, 16.08.2015 (3 specimens), leg. Zekiri; Žeden mt., V. Kopanica, 05.09.2015 (4 specimens), leg. Zekiri; Šar Planina, Popova Šapka, 15.09.2015 (1 specimen), leg. Zekiri; Skopje, v. Govrlevo, 19.09.2015 (1 specimen), leg. M. Ivanov; Dojransko Ezero, Star Dojran, 17.10.2015 (1 specimen), leg. V. Krpač and R. Zekiri; Šar Planina, Popova Šapka, Ceripašina, 28.07.2016 (4 specimens), leg. R. Zekiri; Popova Šapka, Bačilo, 28.07.2016 (2 specimens), leg. R. Zekiri; Šar Planina, Popova Šapka, 02.10.2016 (1 specimen), leg. V. Krpač.

Collection data: NNS: Struga, 07.1925 (3 specimens); Struga 09.1952 (2 specimens). STP: Prilep, 27.09.1996, leg. Lj. Janušeska (1 specimen); Prilep, 14.4.1967, leg. Lj. Janušeska (2 specimens); Gevgelija, 06.18.1976, leg. Lj. Janušeska (1 specimen) and Prilep, Mariovo, May – June, 2014, leg. V. Krsteska (3 specimens). FASF: Skopsko, (5 specimens). Beside specimens from Macedonia in the collection FASF there are 2 specimens from Serbia, Mt Zlatar, 16.07.1947 (1 specimen), leg. Ing. Vasić and Zegra, 1958 (1 specimen), 1 specimen from Austria, Vienna, and 1 specimen without data.

Host plants: Rubiaceae (*Galium aparine*, *G. mollugo*, *G. verum*, *G. aparine* and *Rubia peregrina*).

Note: This species is widespread and very common in Macedonia. Notable for its characteristic flying in place, feeds on nectar from flowers. *M. stellatarum* is in group of migrants III, which migrate within their area of occurrence and do not return to the original areas from which they came, i.e. they stay in their destination area (EITSCHBERGER *et al.*, 1991: 26).

15. *Proserpinus proserpina* (Pallas, 1772)

Distribution in Europe: Denmark, Great Britain, Switzerland, Belgium, The Netherlands, Luxembourg, France, Corsica, Germany, Austria, Czech Republic, Slovakia, Poland, Belarus, Latvia, Russia, Ukraine, Hungary, Romania, Portugal, Spain, Italy, Slovenia, Croatia, Montenegro, Serbia, Kosovo, Albania, Macedonia, Bulgaria, Greece and the European part of Turkey.

Literature data: Nikolić, 04.06.1917, 1♀, in DANIEL *et al.* (1951) and DANIEL (1964).

Collection data (STP): Prilep, 15.09.1974, leg. Lj. Janušeska (3 specimens); Prilep, 09.05.1973, leg. Lj. Janušeska (3 specimens) and Prilep, 23.06.1973, leg. Lj. Janušeska (1 specimen). Collection SKO has specimens from Bulgaria, Varna, 14.07.1934 (2 specimens); Syria, Ekbes, Marz (2 specimens) and 2 specimens without data.

Host plants: Onagraceae (*Oenothera* and *Epilobium parviflorum*); Lythraceae (*Lythrum*).

Note: *P. proserpina* - Willowherb Hawkmoth, compiled by the World Conservation Monitoring Centre is on the 1994 IUCN Red List of Threatened Animals in Category, V (Vulnerable) in List, 1: 186.

16. *Rethera komarovi* (Christoph, 1885) *drilon* Rebel & Zerny, 1932

Distribution in Europe: Albania, Bulgaria and Greece.

Literature data: Drenovo, in late May to early June, 1956, 5♂ ♂; mid-May, 1957, 1♂, (leg. Daniel, Kasy, Klimsch, Thurner) in DANIEL (1964).

Collection data (SKO, NNS and STP): no samples of *R. komarovi* Chri.

Host plants: *Euphorbia*.

Note: In Fauna Europaea for this species there is no data for Macedonia. According to literature data it was found in Macedonia at the locality Drenovo in DANIEL (1964) as a subspecies *Rethera komarovi drilon* Rebel & Zerny, 1932 in DANIEL (1964).

17. *Sphingonaepiopsis gorgoniades gorgoniades* (Hübner, 1819)

Distribution in Europe: Croatia, Romania, Albania, Macedonia, Greece, Bulgaria, Russia and Ukraine.

Literature data: Matka near Skopje, 24.07.1971 in MENTZER (1975). Treska, Canyon Matka, 26.06.1955 (leg. Diehl) sub. *S. gorgon* Esper, 1804, in DANIEL (1964). 30 km northeast of Prilep, Raec, 07.07.1986, 600m, leg. Hessler, Schmidt, sub. *S. pfeifferi* Zerny, in HASSLER *et al.* (1988).

Collection data (SKO): Žeden Mountain, V. Kopanica, 15.08.2017, 610m (1 specimen), leg R. Zeqiri; Skopje Matka Lake, 07.07.1988, 481 m a.s.l., 1♂, N 41°56'54.8" E 21°18'06.4", leg. M. Černila.

Host plants: Rubiaceae. *Galium*, particularly *Galium verum*.

Note: In Fauna Europaea (2010), Version 2.4. <http://www.faunaeur.org>, this species is specified for Macedonia with its valid name *S. gorgoniades* Hbn. Taxa in literature data for Macedonia: sub. *S. gorgon* Esp. in DANIEL (1964) is a junior homonym of basic *Sphinx gorgon* Cramer in 1777 (specifically *Enyo gorgon*). Synonym *Proserpinus gorgoniades* Hbn. is equal to *S. gorgoniades* Hbn. Said taxon of HASSLER *et al.* (1988) is misidentified (sub. *S. pfeifferi* Zerny, since in Macedonia it meets subspecies *S. gorgoniades gorgoniades* Hbn. while the subspecies *S. gorgoniades pfeifferi* Zerny) is seen from South Lebanon and Turkey, through Iraq and Iran in Afghanistan (Fauna Europaea 2010).

The subfamily Smerinthinae

18. *Laothoe populi* (Linnaeus, 1758)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Britain, Ireland, France, Corsica, Switzerland, Belgium, The Netherlands, Luxembourg, Germany, Poland, Czech Republic, Slovakia, Austria, Latvia, Lithuania, Hungary, Romania, Moldova, Belarus, Estonia, Russia, Ukraine, Portugal, northern Spain, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Albania, Macedonia, Bulgaria, Greece and the European part of Turkey.

Literature data: Macedonia, as *A. populi* L. in REBEL & ZERNY (1931). Individually in a light trap at Ohrid, Petrina Mountain and Struga (leg. Silbernagel) as *S. populi* L. in THURNER (1938). Skopje, 24.05.1918, 1♂ and 29.08.1917, 1♂, as *A. populi* L. f. *pallida* Tutt. in DANIEL *et al.* (1951). Skopje 29.08.1917, 1♀, and 24.05.1918, 1♀, leg. Daniel; Ohrid Pl. Petrina, 10.08.1955, 1♀, 800m, leg. Kasy; Struga (leg. Thurner) as *A. populi* L. ab. *Philipponi* in DANIEL (1964). 30 km northeast of Prilep, Raec, 07.07.1986, 600m, leg. Hessler, Schmidt, in HASSLER *et al.* (1988). Valley of r. Radika, 10 km north-east of Sveta Voda, 01.08.2011, 1290-1340m, col. Huemer, in HUEMER *et al.* (2011); Korab, Kobilino Pole, Korab lake, 29.07.2011, 2200m; Sveta Voda, 02.08.2011, 1290-1340m, in KRPAČ *et al.* (2013).

Collection data (SKO): Prespa Lake, 08.28.1959, (1 specimen), S. Joksimović; Ohrid, 12.08.1966 (1 specimen), J. Čingovski; surroundings of Štip, 13.04.1973, (1 specimen), J. Čingovski. **(NNS):** as *S. populi* (*L. populi*) Struga, 06.1932 (2 specimens); Struga, 10.1921 (2 specimens); Struga, 08.1952 (2 specimens). **STP:** Prilep, 04.1974, leg. Lj. Janušeska (2 specimens); Gevgelija, 05.14.1976, leg. Lj. Janušeska (1 specimen); Prilep, 24.07.1976, leg. Lj. Janušeska (1 specimen); Prilep, 28.06.1973, leg. Lj. Janušeska (1 specimen); Prilep, 22.06.1972, leg. Lj. Janušeska (4

specimens); Prilep, 22.07.1974, leg. Lj. Janušeska (1 specimen); Resen, 06.03.1977, leg. Lj. Janušeska (2 specimens); Prilep, 15.04.1972, leg. Lj. Janušeska (1 specimen); Prilep, 13.5.1974, leg. Lj. Janušeska (2 specimens); Prilep, 14.5.1974, leg. Lj. Janušeska (2 specimens); Prilep, 17.08.1976, leg. Lj. Janušeska (1 specimen); Prilep, 01.08.1973, leg. Lj. Janušeska (6 specimens); Prilep, 20.06.1973, leg. Lj. Janušeska (1 specimen); Prilep, 23.06.1976, leg. Lj. Janušeska (1 specimen); Prilep, 10.5.1973, leg. Lj. Janušeska (2 specimens); Prilep, 05.05.1973, leg. Lj. Janušeska (1 specimen); Gevgelija, 05.16.1976, leg. Lj. Janušeska (1 specimen); Gevgelija, 07.27.1976, leg. Lj. Janušeska (1 specimen); Prilep, 27.06.1973, leg. Lj. Janušeska (1 specimen); Prilep, 03.07.1976, leg. Lj. Janušeska (1 specimen); Prilep, 03.05.1975, leg. Lj. Janušeska (1 specimen); Prilep, 06.06.1973, leg. Lj. Janušeska, (1 specimen); Prilep, 05.06.1974, leg. Lj. Janušeska (1 specimen); Prilep, 05.10.1973, leg. Lj. Janušeska (1 specimen) and Prilep, 01.04.1974 (1 specimen). **FASt**: Skopje, 1960 (1 specimen). Beside material from Macedonia in collection **SKO** there are specimens from the Czech Republic, Zatisi, 05.12.1933 (1 specimen), J. Gempele; Czech Bojo, ???.193? (1 specimen), leg. Nezbeda; and 10 specimens which are without data. Austria, Nord Titol, Branderbertal, 23.07.1988 (1♂ specimen), leg. Ploesel.

Host plants: Salicaceae (*Salix* and *Populus tremula*); Ulmaceae (*Ulmus*); Betulaceae (*Betula* and *Alnus*); Oleaceae (*Fraxinus*); Fagaceae (*Quercus*); Rosaceae (*Rosa*, *Crataegus*, *Cotoneaster* and *Malus*) and Lauraceae (*Laurus*).

19. *Marumba quercus* (Denis & Schiffermüller, 1775)

Distribution in Europe: France, Corsica, Germany, Austria, Switzerland, Czech Republic, Slovakia, Hungary, Romania, Moldova, Belarus, Russia, Ukraine, Spain, Portugal, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Albania, Macedonia Bulgaria and Greece.

Literature data: Lešok; Nikolić, 30.06.1918, 1♂, in (DANIEL *et al.* 1951). Individually in a light trap at Ohrid. 06.1935, (leg. Bukowky, Wolfschläger, Silbernagel, Thurner) as *S. quercus* Schiff. in THURNER (1938). Lowlands in the late May to the beginning of August, in DANIEL (1964). V. Trojaci, 04.07.1987, 400 m, leg. Feil, in HASSLER *et al.* (1988).

Collection data (SKO): Skopje, Vodno, 20.06.1942 (1 specimen), leg. K. Tuleshkov; Bitola, Kajmakčalan v. Skočivir, 20.06.1984 (1 specimen), leg. B. Mihajlova; Ohrid, Lagadin, 30.06.2002 (1 specimen), leg. O. Popovska; Prespa Lake, Oteševo, 24.06.2003 (1 specimen), leg. Krpač. **NNS:** as *S. quercus* Schiff. Struga, 07.1952 (2 specimens) and 3 specimens are without data. **STP:** Prilep, 19.06.1972, leg. Lj. Janušeska (1 specimen); Gevgelija, 05.05.1976, leg. Lj. Janušeska (2 specimens); Prilep, 17.08.1976, leg. Lj. Janušeska (1 specimen); Gevgelija, 16.05.1976, leg. Lj. Janušeska (5 specimens); Prilep, 27.06.1973, leg. Lj. Janušeska (1 specimen); Gevgelija, 06.19.1976, leg. Lj. Janušeska (2 specimens) and Prilep, 07.03.1976, leg. Lj. Janušeska (1 specimen).

Host plants: Fagaceae (*Quercus suber*, *Q. ilex*, *Q. coccifera*, *Q. pubescens* and *Q. cerris*).

20. *Mimas tiliae* (Linnaeus, 1758)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Britain, Ireland, France, Corsica, Germany, Austria, Switzerland, Belgium, The Netherlands, Luxembourg, Czech Republic, Slovakia, Poland, Hungary, Romania, Moldova, Belarus, Estonia, Latvia, Lithuania, Russia Ukraine, Spain, Portugal, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Macedonia, Bulgaria, Greece and the European part of Turkey.

Literature data: Skopje, 19.06.1917, in BURESCH & ILTZEV (1921); specimen of ab. *brunnensis* Stgr. from Ohrid collected by Bukowsky in THURNER (1938). 1♂ of ab. *brunnescens* Stgr., collected by Bukowski, at one locality near Ohrid; Lešok, 1♂, f. *brunnescens* Stgr., DANIEL et al. (1951). Canyon of Treska River, Matka, 05.1955, leg. Daniel, 1♀; Lešok, July, 1♂; Ohrid, 1 specimen, leg. Bukuwky, in DANIEL (1964); Katlanovo, May, 2♂♂, leg. Scheider, as *M. tiliae tiliae* (L.) in SCHEIDER (1984: 25).

Collection data (SKO): Skopje, Treska River, 06.07.1942 (1 specimen), leg. G. Stojanov; Skopje, v. Kučkovo, 03.07.1976 (1 specimen), leg. J. Cingovski; Skopje, Katlanovo, 13.04.1982 (1 specimen), leg. P. Schieder; Bitola, v. Skočivir, Kajmakčalan, 20.06.1984 (1 specimen), leg. B. Mihajlova; Skopje, 20.05.1985 (1 specimen), leg. N. Topukova. **NNS:** Struga, 09.1952 (1 specimen). **STP:** Gevgelija, 07.17.1976, leg. Lj. Janušeska (1 specimen); Prilep, 06.20.1973, leg. Lj. Janušeska (1 specimen); Prilep, 23.06.1976, leg. Lj. Janušeska (1 specimen); Gevgelija, 04.30.1976, leg. Lj. Janušeska (1 specimen); Prilep, 27.06.1973, leg. Lj. Janušeska (1 specimen) and Gevgelija, 06.09.1976, leg. Lj. Janušeska (1 specimen); Jablanica mountain, v. Drenok, 02.06.2017, 1080 m a.s.l., 1♂, N 41°23'28.5" E 20°33'35", leg V. Krpáč. Beside material from Macedonia in the collection **SKO** there are records and specimens from other countries: Germany, Ostreusse, Levenhagen ??, 05.1913 (1 specimen); Czech Republic, Uhrineves, 19.11.1932 (1 specimen), leg. J. Gemperle; Czech Republic, Uhrineves, 12.11.1932 (1 specimen), leg. J. Gemperle; and 7 specimens without data.

Host plants: Tiliaceae (*Tilia*); Ulmaceae (*Ulmus*); Betulaceae (*Betula pendula*, *Corylus avellana*, *Alnus*); Moraceae (*Morus*); Rosaceae (*Sorbus aucuparia*, *Malus*, *Prunus*); Fagaceae (*Quercus*, *Castanea sativa*); Aceraceae (*Acer pseudoplatanus*); Juglandaceae (*Juglans regia*); Oleaceae (*Fraxinus*) and Sapindaceae (*Aesculus hippocastanum*).

21. *Smerinthus ocellata* (Linnaeus, 1758)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Britain, Ireland, France, Corsica, Switzerland, Belgium, Holland Luxembourg, Germany, Austria, Czech Republic, Slovakia, Poland, Belarus, Estonia, Lithuania, Latvia, Russia, Ukraine, Hungary, Romania, Moldova, Spain, Portugal, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Macedonia, Bulgaria, Greece and the European part of Turkey.

Literature data: Struga, July (the material is quoted by the Nezlobinski Museum in Struga), in THURNER (1938). Vratnica, in late June to early July, leg. Daniel, 1♂; Struga; Drenovo, to the end of July, 1958 and 07.08.1961, 2♂♂, (leg. Thurner) in DANIEL (1964). Valley of the Radika, 10 km north-east of Sveta Voda, 01.08.2011,

from 1290 to 1340m, col. Huemer, in HUEMER *et al.* (2011). Sveta Voda, 01.8.2011, 1300 m, in KRPAČ *et al.* (2013).

Collection data (SKO): Skopje, 19.06.1942 (1 specimen), leg. K. Tuleshkov; Skopje, Matka, 09.05.1943 (1 specimen), leg. G. Stojanov; v. Lazaropole, 03.07.1995 (1 specimen), leg. V. Krpač. (NNS): Struga, 06.1931 (2 specimens); Struga, 07.1931 (2 specimens). (STP): Prilep, April, 1974, leg. Lj. Janušeska (1 specimen); Prilep, 17.5.1974, leg. Lj. Janušeska (2 specimens); Prilep, 18.5.1974, leg. Lj. Janušeska (2 specimens); Prilep, 14.05.1976, leg. Lj. Janušeska (1 specimen); Prilep, 27.05.1973, leg. Lj. Janušeska (1 specimen); Prilep, 13.6.1973, leg. Lj. Janušeska (2 specimens); Prilep, 22.6.1973, leg. Lj. Janušeska (2 specimens); Prilep, 07.08.1972, leg. Lj. Janušeska (1 specimen); Prilep, 03.07.1972, leg. Lj. Janušeska (1 specimen); Gevgelija, 04.09.1976, leg. Lj. Janušeska (1 specimen); Prilep, 13.5.1974, leg. Lj. Janušeska (2 specimens); Prilep, 06.20.1973, leg. Lj. Janušeska (6 specimens); Prilep, 20.06.1972, leg. Lj. Janušeska (4 specimens); Prilep, 15.07.1972, leg. Lj. Janušeska (1 specimen); Prilep, 04.05.1973, leg. Lj. Janušeska (3 specimens); Prilep, 05.06.1973, leg. Lj. Janušeska (2 specimens); Prilep, 09.05.1973, leg. Lj. Janušeska (4 specimens); Gevgelija, 06.22.1976, leg. Lj. Janušeska (1 specimen); Prilep, 30.07.1976, leg. Lj. Janušeska (10 specimens); Prilep, 03.05.1973, leg. Lj. Janušeska (1 specimen); Prilep, 25.05.1973, leg. Lj. Janušeska (1 specimen); Prilep, 24.05.1973, leg. Lj. Janušeska (1 specimen); Prilep, 23.5.1973, leg. Lj. Janušeska (2 specimens); Prilep, 18.5.1973, leg. Lj. Janušeska (2 specimens); Prilep, 22.04.1962, leg. Lj. Janušeska (1 specimen); Prilep, 05.09.1974, leg. Lj. Janušeska (3 specimens); Prilep, 14.05.1973, leg. Lj. Janušeska (1 specimen) and Prilep, 05.15.1973, leg. Lj. Janušeska (1 specimen). **FASF:** Skopje, Kisela Voda, 05.05.1962 (1 specimen); Prilep, Varoš, 19.05.2016, leg. A. Petrevski. In the collection **SKO** there is material from the Czech Republic, Prague, 18.07.1932 (1 specimen), leg. Nezbeda; and 7 specimens without data.

Host plants: Salicaceae (*Populus*, *Salix repens*); Rosaceae (*Malus sylvestris*, *Malus pumila*, *Prunus persica* and *Pyrus*) Betulaceae (*Betula*, *Alnus*); Oleaceae (*Ligustrum vulgare*); Malvaceae (*Tilia*) and Adoxaceae (*Viburnum*).

The subfamily Sphinginae

22. *Acherontia atropos* (Linnaeus, 1758)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Britain, Ireland, France, Corsica, Belgium, The Netherlands, Luxembourg, Germany, Austria, Hungary, Romania, Moldova, Czech Republic, Slovakia, Poland, Estonia, Lithuania, Latvia, Belarus, Russia, Ukraine, Portugal, Spain, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Albania, Macedonia, Bulgaria, Greece, Cyprus, Malta and the European part of Turkey.

Literature data: a hill close to Dojran (leg. Norton, Delbanly, Mace) in REBEL & ZERNY (1931). Veles, 10.09.1917, 1 ♀, in DANIEL *et al.* (1951). Macedonia, in DANIEL (1964).

Collection data (SKO): Skopje, Yaya Pasha Mosque, 01.09.1999 (1 specimen), leg. M. I. Gluvić; Skopje, Municipality of Centar, 12.06.2005 (1 specimen), leg. B.

Kuzevska; Skopje, v. Pripor, 08.10.2009 (1 specimen), leg. D. Cvetanov; Skopje, Airport, 16.09.2010, (1 specimen), leg. J. Popovska; Skopje, v. Vizbegovo, 15.11.2011 (1 specimen), leg. B. Mihajlova; Skopje, v. Orman, 30.11.1992 (1 specimen), leg. I. Georgiev; Demir Kapija, 03.03.1995 (2 specimens), leg. E. Stojkoska and 3 specimens without data. **NNS**: Struga, 08.1956 (1 specimen); Struga, 15.10.1994 (1 specimen) and 1 specimen without data. **STP**: Prilep, 13.06.1973, leg. Lj. Janušeska (1 specimen); Prilep, 22.07.1974, leg. Lj. Janušeska (1 specimen).

Host plants: Oleaceae (*Lycium barbarum*, *L. vulgare*, *Olea europaea*, *Jasminum*, *Fraxinus*); Solanaceae (*Hyoscyamus*, *Solanum tuberosum*, *S. dulcamara*, *S. melongena*, *Lycium europeum*, *L. barbarum*, *Nicotiana tabacum*, *Atropa belladonna*, *Datura stramonium*); Caprifoliaceae (*Symphoricarpos albus*); Lamiaceae (*Vitex agnus-castus*); Amaranthaceae (*Beta vulgaris*); Apocynaceae (*Nerium oleander*); Cannabaceae (*Cannabis sativa*); Bignoniaceae (*Tecomaria capensis*); Rosaceae (*Malus pumila* and *Pyrus communis*); Lamiales (*Buddleja*): Adoxaceae (*Sambucus*) and many other plants.

Note: Species was found in individual specimens which fly in late autumn. It appears in one generation. *A. atropos* is a seasonal migrant of the 1st order. Populations of this species at specific times during the year leave their breeding grounds and travel to specific areas (seasonal areas), but their offspring migrate back to the original breeding areas to reproduce (EITSCHBERGER *et al.*, 1991: 24).

23. *Agrius convolvuli* (Linnaeus, 1758)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Great Britain, Switzerland, Belgium, The Netherlands, Luxembourg, France, Corsica, Germany, Austria, Czech Republic, Slovakia, Poland, Hungary, Romania, Moldova, Belarus, Estonia, Lithuania, Latvia, Russia, Ukraine Portugal, Spain, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Albania, Macedonia, Bulgaria, Greece, Cyprus, Malta and the European part of Turkey.

Literature data: This species was registered for the first time from the locality Pelister, 06.1912, leg. Werner, as *P. convolvuli* L. in REBEL (1913). Galičica, as *P. convolvuli* L. in DRENOWSKI (1930). Galičica; Bitola, leg. Dimitrof, as *H. convolvuli* L. in REBEL & ZERNY (1931). Near Ohrid in September, leg. Wolforschlager; Struga, Jun (the material is quoted by the Nezlobinski Museum in Struga); Galičica, leg. Drenowski, as *P. convolvuli* Linnaeus, 1758, in THURNER, 1938). Drenovo, beginning of June 1956, 1♀ (leg. Daniel) as *H. convolvuli* L. in DANIEL (1964). Korab, Kobilino Pole, 28.07.2011, 2080-2180m, col. Huemer; Korab, 02.8.2011, from 2325 to 2400m, col. Huemer, in HUEMER *et al.* (2011). Korab, Kobilino Pole, Korab Lake, 29.07.2011, 2200m, Korab, 02.8.2011, 2400 m, in KRPAČ *et al.* (2013).

Collection data (SKO): Demir Kapija, 21.08.1942 (3 specimens), leg. K. Tuleshkov; Skopje, 22.06.1943 (1 specimen), leg. K. Tuleshkov; Skopje, City Park, 19.06.1945 (1 specimen), leg. K. Bogoevski; Skopje, Gorno Vodno, 20.05.1959 (1 specimen), leg. S. Joksimović; Skopje, 09.09.1982 (2 specimens), leg. N. Topukova; Skopje, 05.05.1985 (1 specimen), leg. K. Mihajlov; Skopje, 08.09.1985 (1 specimen), leg. N. Topukova; Skopje, 22.06.1987 (1 specimen), leg. V. Krpáč; Skopje, 08.08.1987 (1 specimen), leg.

K. Mihajlov; Ohrid, 10.08.1988 (1 specimen), leg. T. Ivanovski; Skopje, 01.09.1991 (1 specimen), leg. N. Topukova; Skopje, 08.20.1994 (3 specimens), leg. N. Topukova; Demir Kapija, 03.03.1995 (1 specimen), leg. E. Stojkoska; Skopje, 28.07.1996 (1 specimen), leg. V. Krpač; Skopje, Natural History Museum, 01.10.1997 (1 specimen), leg. A. Ololovski; Prespa Lake, Oteševo, 24.06.2003 (2 specimens), leg. V. Krpač; Korab, Kobilino Pole, Korab lake, 28.07.2011 (1 specimen), leg. V. Krpač; Karađica, Mountain Lodge Karađica, 21.05.2016 (2 specimens), leg. V. Krpač and R. Zekiri; Skopje; v. Down Nerezi, 20.07.2017 (1♂ specimen), leg. N. Stefanovska; Skopje; v. Down Nerezi, 16.08.2017 (1♀ specimen), leg. N. Stefanovska; Šar Planina, Karanikoličko Lake, 04.08.2017, 2♂♂, N 42°04'24.7" E 20°47'32.5", 2200 m a.s.l., leg. V. Krpač & N. Beadini; Skopje, v. Vlae, 05.09.2017, 1♂, leg. M. Krpač and material from Bulgaria, Sofia, 20.08.1928 (1 specimen); 08.22.1928 (1 specimen); 08.30.1928 (1 specimen); 02.09.1928 (2 specimens); Bulgaria, Vitosha, 09.02.1928 (1 specimen); leg. K. Drenovski; Bulgaria, Sofia, 03.09.1928 (1 specimen); 09.04.1928 (1 specimen); and has 2 specimens without data. **STP:** Prilep, 28.06.1973, leg. Lj. Janušeska (1 specimen); Prilep, 27.07.1978, leg. Lj. Janušeska (1 specimen).
Host plants: Convolvulaceae (*Convolvulus arvensis*, *Calystegia sepium*, *C. soldanella* and *Ipomoea*); Fabaceae (*Phaseolus*); Asteraceae (*Chrysanthemum* and *Helianthus*) and Polygonaceae (*Rumex*).

Note: A widespread species throughout Europe. In Macedonia was recorded at twilight in a group, feeding on nectar of *Convolvulus* sp. *A. convolvuli* is a seasonal migrant of 1st order. Populations of this species at specific times during the year leave their breeding grounds and travel to specific areas (seasonal areas), but their offspring migrate back to the original breeding areas to reproduce (EITSCHBERGER *et al.*, 1991: 24).

24. *Sphinx ligustri* Linnaeus, 1758

Distribution in Europe: Norway, Sweden, Finland, Denmark, Britain, Ireland, Switzerland, Belgium, The Netherlands, Luxembourg, Czech Republic, Slovakia, France, Corsica, Germany, Poland, Belarus, Estonia, Lithuania, Latvia, West Russia, Ukraine, Austria, Hungary, Romania Moldova, Portugal, Spain, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo, Albania, Macedonia, Bulgaria and Greece.

Literature data: Treska River, Canyon Matka, in late May 1955 (2 specimens ♀, ♂), leg. Daniel; Drenovo, early June and July, 1955 (leg. Daniel, Klimsch, Thurner) in DANIEL (1964). 30km northeast of Prilep, Raec, 07.07.1986, 600m, leg. Hessler, Schmidt, in HASSLER *et al.* (1988).

Collection data (SKO): Skopje, Treska River, 14.05.1942 (1 specimen), leg. G. Stojanov; Skopje, City Park, 19.11.1945 (1 specimen), leg. K. Bogoevski; Skopje, Gorno Vodno, 20.05.1959 (1 specimen), leg. S. Joksimović; Skopje, Gorno Vodno, 20.05.1959 (1 specimen), leg. J. Kuševski; Mavrovo, 02.07.1975 (1 specimen), leg. J. Čingovski; Berovo, 10.07.1978 (1 specimen), leg. J. Čingovski; Skopje, 04.09.1983 (1 specimen), leg. B. Mihajlova; Skopje, 01.09.1985 (1 specimen), leg. N. Topukova; Žeden mt., v. Bojane, Ramnište, 01.08.2016 (1 specimen), leg. V.

Krpáč and R. Zekiri. **STP**: Prilep, 20-21.06.1972, leg. Lj. Janušeska (1 specimen); Prilep, 15.07.1972, leg. Lj. Janušeska (1 specimen); Prilep, 27.08.1972, leg. Lj. Janušeska (1 specimen); Prilep, 13.06.1973, leg. Lj. Janušeska (1 specimen); Prilep, 25.06.1973, leg. Lj. Janušeska (2 specimens); Prilep, 16.08.1973, leg. Lj. Janušeska (1 specimen); Prilep, 12.06.1974, leg. Lj. Janušeska (1 specimen); Prilep, 19.05.1976, leg. Lj. Janušeska (1 specimen); Prilep, 02.07.1976, leg. Lj. Janušeska (1 specimen); Prilep, 17.08.1976, leg. Lj. Janušeska (1 specimen). **FASF**: Skopsko (1 specimen). Beside material from Macedonia in the collection **SKO** there is material from the Czech Republic, Cihogon, 06.18.1939 (1 specimen), leg. Nezbeda; and 7 specimens without data.

Host plants: Rosaceae (*Malus pumila*); Oleaceae (*Ligustrum vulgare*, *L. ovalifolium*, *Fraxinus excelsior*, *F. viridis*, *F. ornus* and *Syringa vulgaris*); Rosaceae (*Malus pumila*); Adoxaceae (*Viburnum opulus*); Rosaceae (*Spiraea media*, *S. salicifolia*, *S. trilobata*) and Aquifoliaceae (*Ilex aquifolium*).

25. *Hyloicus pinastri* (Linnaeus, 1758)

Distribution in Europe: Norway, Sweden, Finland, Denmark, Great Britain, Switzerland, Belgium, The Netherlands, Luxembourg, France, Corsica, Germany, Poland, Czech Republic, Slovakia, Austria, Hungary, Romania, Moldova, Belarus, Estonia, Lithuania, Latvia, Russia, Ukraine Italy, Slovenia, Croatia, Montenegro, Serbia, Kosovo, Albania, Greece and Bulgaria.

Literature data: No data.

Collection data (SKO): Skopje, 01.09.1991 (1 specimen), leg. N. Topukova; Mavrovo, 02.07.1975 (1 specimen), leg. J. Čingovski. **NNS**: Struga, 06.1925 (1 specimen). **STP**: Prilep, 06.09.1972, leg. Lj. Janušeska (1 specimen). **FASF**: Skopsko (2 specimens). In the museum collection **SKO** there is also material from Bulgaria, Alibotush 01.08.1930 (1 specimen); Czech Republic, Kutna Hora, 12.07.1934 (1 specimen); Czech Republic, Bojov, ??, ??, 193? (1 specimen) and 3 specimens without data.

Host plants: *Pinus* (especially *Pinus sylvestris*), *Picea*, *Larix decidua*, *Cedrus*.

Note: This species until now has not been registered for the Republic of Macedonia. Data given by DANIEL (1964) refers to Pirin Macedonia (Bulgaria, Alibotush). *H. pinastri* is a dismigrator that belongs to group IV; species suspected of being migratory, distribution expanders, tending towards population swings and hence population spread. Behaviour tends to be of irregular nature. The breeding area is left, due to various factors, and another area is reached without any particular aim (EITSCHBERGER et al., 1991: 27).

CONCLUSION

Research into literature data, data from museum collections (**SKO**, **NNS**, **STP**, **FASF**) and our 5 years of research in the field have shown that the family of hawk moths (Sphingidae) is well investigated in qualitative terms; if we take into account the numerical representation of the Macedonian fauna species, compared with Europe, out of the 40 known species in Europe, Macedonia has confirmed

25 species of hawk moths, or 62.5% of total number of Sphingidae in Europe. The hawk moth family in the Republic of Macedonia is represented in three subfamilies: Macroglossinae, Smerinthinae and Sphinginae. Macroglossinae are represented by 10 genera and 17 species; Smerinthinae by 4 genera and 4 species and Sphinginae by 4 genera and 4 species. In an overview of collections, three species were found as new for the fauna of Macedonia: *Hyles gallii* (Rottemburg, 1775), *Hyles nicaea* (De Pruner, 1798) and *Hyloicus pinastris* Linnaeus, 1758. The species *Acherontia Atropos* (Linnaeus, 1758) and *Agrius convolvuli* (Linnaeus, 1758) are seasonal migrants of the 1st order. Species *Hippotion celerio* (Linnaeus, 1758), *Hyles euphorbiae* (Linnaeus, 1758), *Hyles gallii* (Rottemburg, 1775), *Hyles livornica* (Esper, 1780), *Daphnis nerii* (Linnaeus, 1758) and *Macroglossum stellatarum* (Linnaeus, 1758) are in group III migrants. *H. pinastris* is a dismigrator and belongs to group IV.

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