

NEW DATA ON HOVER-FLIES (DIPTERA: SYRPHIDAE) IN MACEDONIA

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After many years studying hoverflies (Diptera: Syrphidae) throughout Macedonia we have compiled a list of 262 taxa from 69 genera. This comes from reviewing collections in the Macedonian Museum of Natural History – Skopje (SKO) and Department of Biology and Ecology – Novi Sad (DBE), and reviewing all references in the literature to Syrphidae in Macedonia

Thirty eight (38) taxa are now published for the first time in Macedonia: *Chamaesyphus escorialensis* (Strobl, 1909), *Cheilosia frontalis* Loew, 1857, *Cheilosia grisella* (Becker, 1894), *Cheilosia hypena* Becker, 1894, *Cheilosia melanura* Becker, 1894 ssp. *melanura* sensu Vujić, 1996, *Chrysotoxum intermedium* Meigen, 1822, *Criorhina pachymera* Egger, 1858, *Epistrophe grossulariae* (Meigen, 1822), *Eristalinus megacephalus* (Rossi, 1794), *Eristalis jugorum* Egger, 1858, *Eumerus argyropus* Loew, 1848, *Eumerus clavatus* Becker, 1923, *Eumerus sulcitibus* Rondani, 1868, *Eupeodes lapponicus* (Zetterstedt, 1838), *Eupeodes latifasciatus* (Macquart, 1829), *Ferdinanda ruficornis* (Fabricius, 1775), *Helophilus pendulus* (Linnaeus, 1758), *Mallota fuciformis* (Fabricius, 1794), *Megasyrphus erraticus* (Linnaeus, 1758), *Meligramma cingulata* (Egger, 1860), *Meligramma euchroma* (Kowarz, 1885), *Merodon nanus* Sack, 1931, *Microdon miki* Doczkal et Schmid, 1999, *Myolepta obscura* Becher, 1882, *Neoascia meticulosa* (Scopoli, 1763), *Orthonevra frontalis* (Loew, 1843), *Paragus albifrons* (Fallen, 1817), *Paragus constrictus* Šimić, 1986, *Parasyrphus punctulatus* (Verrall, 1873), *Parasyrphus vittiger* (Zetterstedt, 1843), *Pipizella annulata* (Macquart, 1829), *Pipizella speighti* Verlinden, 1999, *Riponnensia longicornis* (Loew, 1843), *Riponnensia morini* Vujic, 1999, *Sphegina clavata* (Scopoli, 1763), *Sphegina elegans* Schummel, 1843, *Spilomyia triangularis* van Steenis, 2000, *Temnostoma meridionale* Krivosheina et Mamayev, 1962.

Fauna, hoverflies, first findings, Macedonia

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Nakon višegodišnjih istraživanja faune muha pršilica (Diptera: Syrphidae) u Makedoniji je utvrđeno 262 taksona iz 69 rodova, a na osnovi pregledanih zbirki Prirodonaučnog muzeja Makedonije - Skopje (SKO) i Zavoda za biologiju i ekologiju - Novi Sad (DBE) te revizije svih literaturnih podataka koji su se odnosili na muhe pršilice s područja Makedonije.

Trideset i osam taksona prvi put je utvrđeno za faunu Makedonije: *Chamaesyrrhus escorialensis* (Strobl, 1909.), *Cheilosia frontalis* Loew, 1857., *Cheilosia grisella* (Becker, 1894.), *Cheilosia hypena* Becker, 1894., *Cheilosia melanura* Becker, 1894. ssp. *melanura* sensu Vujić, 1996., *Chrysotoxum intermedium* Meigen, 1822., *Criorhina pachymera* Egger, 1858., *Epistrophe grossulariae* (Meigen, 1822.), *Eristalinus megacephalus* (Rossi, 1794.), *Eristalis jugorum* Egger, 1858., *Eumerus argyropus* Loew, 1848., *Eumerus clavatus* Becker, 1923., *Eumerus sulcitibus* Rondani, 1868., *Eupeodes lapponicus* (Zetterstedt, 1838.), *Eupeodes latifasciatus* (Macquart, 1829.), *Ferdinanda ruficornis* (Fabricius, 1775.), *Helophilus pendulus* (Linnaeus, 1758.), *Mallota fuciformis* (Fabricius, 1794.), *Megasyrphus erraticus* (Linnaeus, 1758.), *Meligramma cingulata* (Egger, 1860.), *Meligramma euchroma* (Kowarz, 1885.), *Merodon nanus* Sack, 1931., *Microdon miki* Doczkal et Schmid, 1999., *Myolepta obscura* Becher, 1882., *Neoscia meticulousa* (Scopoli, 1763.), *Orthonevra frontalis* (Loew, 1843.), *Paragus albifrons* (Fallen, 1817.), *Paragus constrictus* Šimić, 1986., *Parasyrphus punctulatus* (Verrall, 1873.), *Parasyrphus vittiger* (Zetterstedt, 1843.), *Pipizella annulata* (Macquart, 1829.), *Pipizella speighti* Verlinden, 1999., *Riponnensia longicornis* (Loew, 1843.), *Riponnensia morini* Vujic, 1999., *Sphegina clavata* (Scopoli, 1763.), *Sphegina elegans* Schummel, 1843., *Spilomyia triangularis* van Steenis, 2000., *Temnostoma meridionale* Krivosheina et Mamayev, 1962..

Fauna, muhe pršilice, prvi nalazi, Makedonija

Introduction

Syrphids are a relatively well known group of insects in Macedonia. The first comprehensive list of hoverflies from the territory of Macedonia was published by Glumac (1955). Later, many publications were published with lists of hoverflies in Macedonia: Coe (1960), Glumac (1968), Glumac (1972), Glumac (1976), Šimić (1982), Šimić & Vujić (1984), Šimić (1987), Vujić (1990), Vujić & Radović (1990), Vujić & Milankov (1990), Šimić & Vujić (1990), Hurkmans (1993), Vujić et al. (1993-1994; Vujić & Glumac (1994a), Vujić & Šimić (1994), Vujić

& Claussen (1994), Vujić (1994), Vujić (1995), Radenković et al. (1995), Milan-
kov et al. (1995), Vujić (1996), Vujić & Radenković (1996), Vujić et al. (1996),
Vujić et al. (1997), Vujić (1997), Vujić & Šimić (1998), Vujić et al. (1998), Vujić
(1999b), Vujić & Milanov (1999), Vujić (1999a), Vujić et al. (1999a), Vujić et
al. (1999b), Milanov et al. (2001), Krpač et al. (2001a), Krpač et al. (2001b),
Nielsen (2004), Krpač et al. (2006), Krpač et al. (2009a), Krpač et al. (2009b) and
Krpač et al. (2009c).

This paper presents records of species recorded for the first time in Mace-
donia.

Material and Methods

Research on the syrphid fauna of Macedonia was conducted by collecting
hoverflies annually from 1987 to 2010. During this period, we conducted nu-
merous field trips to various localities, listing all species identified. The research
also included compiling records of specimens contained in the collections of the
Department of Biology and Ecology - Novi Sad (DBE) and from the Macedonian
Museum of Natural History - Skopje (SKO). During this research approximately
7.000 hoverfly specimens from the Republic of Macedonia were critically exa-
mined and determined.

Insects were collected with entomological nets. The laboratory processing
of material (preparation and labeling) was performed by standard methods.
With selected taxa of hoverflies, permanent preparations of male genitalia were
made using standard procedures. These genitalia preparations, a total of 5567,
are kept in the Macedonian Museum of Natural History (SKO). Determinations
were carried out using standard keys (Barkalov & Ståhls, 1997; Coe, 1953; Sack,
1928-32; Stubs & Falk, 1983), and the revision of certain hoverfly genera, on
the basis of numerous publications (Claussen & Doczkal, 1998; Doczkal, 2000;
Dusek & Laska, 1973; Goeldlin, 1989, 1991, Šimić 1987; Verlinden, 1999; Vujić,
1994, 1997, 1999; Vujić & Claussen, 1994, 2000).

Systematics and taxonomy are derived from Speight (2010). Systematics is
based upon the German checklist (Schumann et al., 1999). Indications of hover-
fly distribution in Macedonia, in the references: Glumac (1972), Radenković &
Vujić (1994), Radenković et al. (1995), Speight (2001), Šimić (1987), Šimić &
Vujić (1990), Vujić et al. (1994), Vujić & Milanov (1999), Vujić & Šimić (1994,
1998), Vujić et al. (1996, 1998b) are general, without designated localities (eg.

M, Ma, Mac. Macedonia) and are not included in this paper, because they do not relate to specific records of specimens of the taxa concerned.

Results and Discussion

This review of species is the result of comprehensive research on hoverflies in Macedonia from 1987 through 2010 and has resulted in a list of 262 taxa from 69 genera. This list of species contains species which are new in the Macedonian fauna.

List of species:

1. *Chamaesyphus escorialensis* (Strobl, 1909)

- General distribution: North and Central Norway, Britain (northern Scotland), the European part of Russia (St. Petersburg region), Germany (Bavaria) (Speight, 2010).
- Distribution in south-eastern Europe: Serbia and Greece.
- Distribution in Macedonia: Collection SKO, Pelister, Children's Rec. Centre, 1 ♀, 12.10.1991, (leg. Krpač) Pelister, Children's Rec. Centre, 1 ♀, 10.18.1991, (leg. Krpač).
- Comments: This is one of the rarest species in Europe.

2. *Cheilosia frontalis* Loew, 1857

- General distribution: Fennoscandia and mountainous parts of Europe south to the Pyrenees and northern Spain; from the Ardennes east to the Alps and on into European parts of Russia. (Speight, 2010).
- Distribution in south-eastern Europe: Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia and Bulgaria.
- Distribution in Macedonia: Mavrovo locality is the first location of this species in Macedonia. Collection SKO, Mavrovo, 1 ♀, 27.5.1981, (leg. Čingovski).
- Comments: *Cheilosia frontalis* is present on all massifs in the Balkan Peninsula (Vujić, 1996).

3. *Cheilosia grisella* (Becker, 1894)

- General distribution: Carpathians ("Silesia") and the Alps (France, Germany, Switzerland, Liechtenstein, Austria and northern Italy) south to the former Yugoslavia and the Transcaucasus (Speight, 2010).

- Distribution in south-eastern Europe: Slovenia, Bosnia and Herzegovina, Croatia, Montenegro and Serbia.
- Distribution in Macedonia: Collection SKO; Nidže, Kajmakčalan, on *Ranunculus* sp., 2200 m above sea level., 1♀, 14.06.2002., (leg. Krpač).
- Comments: It is a species from mountainous areas and has been recorded from only one locality in Macedonia.

4. *Cheilosia hypena* Becker, 1894

- General distribution: (France, Spain). Alps (France, Switzerland, Austria), northern Italy, Balkan Peninsula (Speight, 2010).
- Distribution in south-eastern Europe: Slovenia, Croatia and Serbia.
- Distribution in Macedonia: Collection SKO; Pelister, Kopanki, 1♂, 11.07.1991, (leg. Krpač).
- Comments: This species is recorded in Macedonia for the first time. Claussen (in Maibach et al, 1992) states that *C. capitata* Goeldlin (1974) is a junior synonym of *C. hypena*. There is no key in which *C. hypena* is adequately distinguished from related species. Verlinden (1999b) redescribes the species, pointing out that the male has never previously been described and providing detailed information on the separation of this species from *C. frontalis* Loew. He also figures features of the head of male and female *C. hypena*. Goeldlin (1974) mentions some distinguishing features of *C. hypena* (as *C. capitata*) (Speight, 2010).

5. *Cheilosia melanura* Becker, 1894 ssp. *melanura* sensu Vujić, 1996

- General distribution: Carpathians, Schwarzwald, Alps, Balkans and Caucasus mountains; in western Siberia to Cis-Baikal (Vujić, 1996).
- Distribution in south-eastern Europe: Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia and Bulgaria.
- Distribution in Macedonia: Collection SKO; Pelister, Crvena Reka, 1♀, 13.06.1991., (leg. Krpač).
- Comments: This subspecies is recorded for the first time in Macedonia on Pelister mountain at 1000m altitude.

6. *Chrysotoxum intermedium* Meigen, 1822

- General distribution: Belgium, Germany, Poland, Czechoslovakia, France, Switzerland, Hungary, Romania, Portugal, Spain, Italy, South-European part of Russia over Transcaucasus, Kazakhstan to Central Asia (Peck, 1988).

- Distribution in south-eastern Europe: Serbia, Montenegro, Bulgaria, Albania and Greece.
- Distribution in Macedonia: Collection SKO; r. Radika, 1♀, 10.06.1959., (leg. Glumac); Mavrovo, 1♀, 30.08.1969., (leg. Glumac); r. Radika, Lukovo Polje, 1♀, 25.05.1995., (leg. Krpač); r. Radika, Pilana, 1♀, 25.05.1995., (leg. Krpač).
- Comments: This species had not been previously recorded from Macedonia. There is much confusion with valid names of two related taxa, one with a Mediterranean distribution and this one with a Central European range. Sommaggio (2001) tried to apply the name *C. lessonae* Giglio-Tos, 1890 to this taxon without studying the types of *C. intermedium*. The type locality of *C. intermedium* is Germany and Sweden, far from range of these Mediterranean specimens and cannot be applied to this taxon as Sommaggio (2001) proposed.

7. *Criorhina pachymera* Egger, 1858

- General distribution: Netherlands south to northern Spain; Belgium (Ardennes) eastwards through central Europe (Czech Republic, Austria) to Romania. (Speight, 2010).
- Distribution in south-eastern Europe: Bosnia and Herzegovina (Vujić & Milankov, 1990).
- Distribution in Macedonia: Collection SKO; Kožuf, Golema Poljana, 1♀, 18.06.1956, (leg. Bogoevski).
- Comments: No previous records of *Criorhina pachymera* in Macedonia. The only one specimen of this species was collected from the locality of Kožuf at a higher altitude.

8. *Epistrophe grossulariae* (Meigen, 1822)

- General distribution: Fennoscandia south to Spain; from Ireland eastwards through Eurasia to Kamchatka; Italy; the former Yugoslavia and Turkey; across N America from Alaska to Quebec and south to California (Speight, 2010).
- Distribution in south-eastern Europe: Slovenia, Croatia, Montenegro, Serbia and Bulgaria.
- Distribution in Macedonia: Collection SKO; Pelister, Kopanki, 1♀, 11.07.1991, (leg. Krpač).

- Comments: This species is recorded for the first time in Macedonia. Although the habitat of this species is deciduous forest (Speight, 2010), we recorded this species in *Pinus peuce* forest at an altitude of 1600 m.

9. *Eristalinus megacephalus* (Rossi, 1794)

- General distribution: southern Spain and coastal parts of Italy round the Mediterranean basin (including islands, e.g. Corsica, Sicily, Crete) to Turkey and on into Egypt and N Africa; southwards through the Afrotropical region to S Africa (Speight, 2001).
- Distribution in south-eastern Europe: This species on the Balkan Peninsula is known only for Montenegro (Šimić, 1987), Serbia (Šimić & Vujić, 1987).
- Distribution in Macedonia: Collection SKO; Star Dojran, shrubs, on *Xanthium strumarium*, 2♂, 3♀, 24.08.1966., (leg. Glumac); Star Dojran, shrubs, on *Xanthium strumarium*, 1♂, 25.08.1966., (leg. Glumac); Prespansko Lake, Stenje, low in the leaves, 1♀, 26.06.2003., (leg. Krpač).
- Comments: This species is extremely rare on the Balkan Peninsula. In Macedonia it has been recorded for the first time in southern parts in only two localities: Star Dojran and Prespa Lake, Stenje. This species appears in older literature (inc. Peck, 1988) under the name *Eristalinus quinquelineatus* (Fabricius). Dirickx (1998) reviews its confused nomenclatural history (as *Lathrophthalmus megacephalus*), pointing out that the real *E. quinquelineatus* (as *Eristalodes quinquelineatus*) is an Afrotropical species unknown from either Europe or N Africa. The accompanying key will serve to distinguish *E. megacephalus* from other European *Eristalinus* species Speight (2010).

10. *Eristalis jugorum* Egger, 1858

- General distribution: Poland south to the Pyrenees and northern Spain; from Belgium (Ardennes) eastwards through central and southern Europe (northern Italy, the former Yugoslavia, Greece) into European parts of Russia and on as far as the Caucasus, Turkey and Iran (Speight, 2010).
- Distribution in south-eastern Europe: Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Bulgaria and Greece.

- Distribution in Macedonia: Collection SKO; Mavrovo, 1 ♀, 22.06.1975., (leg. Čingovski); Radika River Valley, Pilana, 1 ♂, 06.09.1994., (leg. Krpač); Bistra planina, Carevec, meadow, 1 ♀, 07.06.1996., (leg. Krpač); Pelister, Golema Livada, 1 ♂, 23.08.2001., (leg. Krpač); Pelister, Jorgov Kamen, 1 ♀, 25.08.2001., (leg. Krpač).
- Comments: These are the first records of this species in Macedonia. *Eristalis jugorum* was collected from the localities in the mountains of Macedonia, at an altitude above 650 m.

11. *Eumerus argyropus* Loew, 1848

- General distribution: central and southern Spain, south-west France, Switzerland (Rhône valley), Italy (inc. Sardinia), parts of the former Yugoslavia, Greece (inc. Rhodes), Bulgaria, Romania, Ukraine and the Caucasus mountains, Turkey (Speight, 2010).
- Distribution in south-eastern Europe: Croatia, Montenegro, Serbia, Bulgaria, Greece.
- Distribution in Macedonia: Collection SKO; Prespa Lake, Carina, oak forest, on the flower of *Dianthus* sp., 1 ♀, 24.06.1956., (leg. Glumac); Valley of Stara Reka, wet meadows, on the flower of *Heracleum* sp. and *Chrysanthemum* sp., 1 ♀, 04.06.1960., (leg. Glumac).
- Comments: *Eumerus argyropus* was recorded for the first time in Macedonia, on Prespa Lake localities, Carina and Valley of Stara Reka.

12. *Eumerus clavatus* Becker, 1923

- General distribution: north-east France south to Spain, Germany, Romania (Danube floodplain), the former Yugoslavia, Ukraine and the Caucasus; N. Africa. (Speight, 2010).
- Distribution in south-eastern Europe: Croatia, Serbia and Greece.
- Distribution in Macedonia: Collection SKO; Oteševo, 1 ♀, 28.08.1958., (leg. Glumac).
- Comments: *E. clavatus* is recorded for the first time in Macedonia. The male terminalia are figured by Vujić & Šimić (1998).

13. *Eumerus sulcitibus* Rondani, 1868

- General distribution: Southern Europe, from Spain around the Mediterranean basin to Italy and Montenegro, and Turkey, including the islands, Corsica, Sardinia, Sicily and Crete, in Asia and Azerbaijan (Speight, 2010).
- Distribution in south-eastern Europe: Montenegro and Greece.

- Distribution in Macedonia: Collection SKO; Demir Kapija, valley Božovice, on *Sambucus* sp. and *Euphorbia* sp., 1♀, 05.06.1960., (leg. Glumac).
- Comments: In Macedonia it is rare species, collected for the first time in only one locality in the valley of the Božovica River near Demir Kapija.

14. *Eupeodes lapponicus* (Zetterstedt, 1838)

- General distribution: Fennoscandia south to Spain and the Mediterranean (including Crete); from Britain east through most of Eurasia (including Turkey) to the Pacific coast; Iceland; Greenland; N America from Alaska to California. (Speight, 2010).
- Distribution in south-eastern Europe: Slovenia, Bosnia and Herzegovina, Montenegro, Serbia, Macedonia, Bulgaria and Greece.
- Distribution in Macedonia: Collection SKO; Prespa Lake, Island Golem Grad, on the leaves, 1♂, 26.06.1958., (leg. Glumac); Ogražden, beech forest, on the flowers of *Trolius* sp. and *Sambucus* sp., 1♂, 20.06.1959., (leg. Glumac); Mavrovo, spruce forests on *Crepis* sp., 3♂, 30.08.1959., (leg. Glumac); Mavrovo, 1♂, 03.08.1961., (leg. Glumac); Jakupica, 2♂, 17.06.1988., (leg. Krpač); Golak, 1♂, 01.07.1988., (leg. Krpač); Pelister, 1♀, 19.07.1990., (leg. Krpač); Pelister, Niže Pole, 2♀, 13.06.1991., (leg. Krpač); Bistra planina, Carevec, 1♀, 26.06.1991., (leg. Krpač); Mavrovo, 2♀, 09.07.1991., (leg. Krpač); Pelister, Kopanki, mixed pine-fir forests, 1500-1600 m.n.v., 1♂, 1♀, 19.07.1991., (leg. Krpač); Pelister, Palisnopje, 1750m.n.v., 2♂, 28.07.1992., (leg. Krpač); Radika river, 1♂, 04.07.1995., (leg. Krpač); Mavrovo, 3♂, 05.06.1996., (leg. Krpač); Mavrovo, Dams, 13♂, 05.06.1996., (leg. Krpač); Mavrovo, 17♂, 06.06.1996., (leg. Krpač); Mavrovo, Dams, 2♂, 06.06.1996., (leg. Krpač); Mavrovo, Trnica, 2♂, 06.06.1996., (leg. Krpač); Pelister, Lovačka Kuća, 1♂, 26.08.2001., (leg. Krpač); Pelister, Palisnopje, on the flowers of *Taraxacum officinale*, 2♀, 15.06.2002, (leg. Krpač); Pelister, Caparska Preseka, on *Verbascum longifolium*, 1♀, 15.06.2002, (leg. Krpač); Pelister, Golemo Ezero, 2200 m.n.v., 1♀, 15.06.2002, (leg. Krpač); Pelister, Kopanki, meadow in molika woods, 1♂, 16.06.2002, (leg. Krpač); Osoj planina, over v. Matka, 1♂, 15.06.2004, (leg. Krpač).
- Comments: In Macedonia this species was recorded in the mountains with numbers of specimens both at higher altitudes and also in areas influenced by the Mediterranean climate.

15. *Eupeodes latifasciatus* (Macquart, 1829)

- General distribution: from Iceland and Fennoscandia south to Iberia, the Mediterranean (including Cyprus), N Africa and Turkey; from Ireland eastwards through most of Europe into European parts of Russia; through Siberia from the Urals to the Pacific coast (Sakhalin and Kuril Isles); India; in N America from Alaska south to California and Texas. (Speight, 2001).
- Distribution in south-eastern Europe: Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Macedonia and Bulgaria.
- Distribution in Macedonia: Collection SKO; Karadžica, 1♀, 08.07.1989., (leg. Krpač); Mavrovo, 1♀, 26.07.1994., (leg. Krpač); v. Lazaropole, 1♀, 07.10.1994., (leg. Krpač).
- Comments: *E. latifasciatus* belongs to a group of widespread species, but is rare in Macedonia, and was only recorded from three localities.

16. *Ferdinandea ruficornis* (Fabricius, 1775)

- General distribution: from Denmark (extinct?) south to France (Paris basin) and from Britain (England) eastwards through central (Germany, Poland) and southern Europe (Italy, former Yugoslavia, Romania) into European Russia and the Caucasus and on through Siberia and Uzbekistan to the Pacific; northern China (Speigh, 2010).
- Distribution in south-eastern Europe: Slovenia, Croatia and Serbia.
- Distribution in Macedonia: Collection SKO; Bitola, Streževo, 1♀, 14.04.1980., (leg. Čingovski).
- Comments: In western Europe, at least, the close association apparently existing between this species and the goat moth (*Cossus cossus*) ensures the hoverfly's scarcity, since forestry practice acts to eliminate *Cossus* and the over-mature trees it inhabits. *Cossus* is currently exhibiting a marked decline in much of western Europe and *F.ruficornis* has to be regarded as threatened over much of its European range (Speight, 2010). It is a fairly rare species on the Balkan Peninsula. The only location found in Macedonia was at Streževo.

17. *Helophilus pendulus* (Linnaeus, 1758)

- General distribution: from Iceland and Fennoscandia south to Iberia; from Ireland eastwards through central and southern Eurasia to the Pacific coast; more localised in southern Europe and also in those parts

of western and central Europe where cows are kept penned, rather than being permitted to roam in fields (Speight, 2010).

- Distribution in south-eastern Europe: Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia and Bulgaria.
- Distribution in Macedonia: Collection SKO; Mavrovo, 1♀, 19.05.1977., (leg. Čingovski).
- Comments: This species was recorded for the first time in Macedonia at the Mavrovo locality.

18. *Mallota fuciformis* (Fabricius, 1794)

- General distribution: Germany and Poland south through France to Spain and from Brittany (north-west France) eastwards through central Europe to European parts of Russia. In southern Europe from Spain to the former Yugoslavia and on to northern Iran. Evidently much scarcer now than previously and probably threatened at European level, though not yet regarded as extinct in any European state. (Speight, 2010).
- Distribution in south-eastern Europe: Bosnia and Herzegovina.
- Distribution in Macedonia: Collection DBE; Plačkovica mountain, 1♂, 11.07.1987., (leg. Vujić).
- Comments: *M. fuciformis* is totally unlike *M. cimbiciformis* in appearance, being an almost perfect mimic of a worker of *Bombus pratorum*. Its early flight season must mitigate against capture (Speight, 2010). This is the first, and only known, record of this species in Macedonia, recorded from the Plačkovica mountains.

19. *Megasyrphus erraticus* (Linnaeus, 1758)

- General distribution: Fennoscandia south to the Pyrenees (becomes increanorthern parts of the former Yugoslavia) into European Russia and on through Siberia to the Pacific coast (Sakhalin and Kunashir islands); in N America from Alaska to Mexico (Speight, 2010).
- Distribution in south-eastern Europe: Croatia, Montenegro and Serbia.
- Distribution in Macedonia: Collection SKO; Nidže, over Reder, meadows, on the flower of *Veronica chamaedrys*, 1♀, 14.06.2002., (leg. Krpač).
- Comments: *Megasyrphus erraticus* is quite arare species. This was the first record for Macedonia and it was discovered at higher altitudes on Nidže mountain in old coniferous forest.

20. *Meligramma cingulata* (Egger, 1860)

- General distribution: from northern France (Vosges), Poland and the Czech Republic through the Alps (Switzerland, Austria) and on into the former Yugoslavia; also in the Pyrenees and central Spain. In the Atlantic zone of western France. Lack of records from the Ardennes is surprising. (Speight, 2010).
- Distribution in south-eastern Europe: Montenegro (unpublished) and Serbia.
- Distribution in Macedonia: Collection SKO; Pelister, Kopanki, pine-fir forest, at altitude of 1600m., 1♀, 11.07.1991., (leg. Krpač).
- Comments: This is the first record for this species in Macedonia. A single specimen was caught in *Pinus peuce* forest, above 1600 m.

21. *Meligramma euchroma* (Kowarz, 1885)

- General distribution: northern Fennoscandia south to the Pyrenees and central Spain; from Britain (southern England) eastwards through central Europe into Russia, reaching the Caucasus in the south and eastern Siberia (Yakut) in Asia (Speight, 2010).
- Distribution in south-eastern Europe: Croatia, Montenegro (unpublished.), Serbia, Bulgaria and Greece.
- Distribution in Macedonia: Collection SKO; Krčin planina, 1♀, 25.05.1995., (leg. Krpač).
- Comments: This species has been variously placed either in its own genus, in *Meligramma* or in *Epistrophe*. Speight (2010) mentioned this taxon under genus *Meligramma* and we accepted this classification.

22. *Merodon nanus* Sack, 1931

- General distribution: Bulgaria (?), Caucasus (Georgia, Armenia), Turkey, Iran, Iraq. (Speight, 2010).
- Distribution in south-eastern Europe: Bulgaria (unconfirmed).
- Distribution in Macedonia: Collection SKO; Skopje, v. Breznica, 1♂, 24.05.2003., (leg. Krpač).
- Comments: This is one of the rarest species in Macedonia. Its presence was recorded near the v. Breznica (in the valley of the river Treska).

23. *Microdon miki* Doczkal et Schmid, 1999

- General distribution: Norway, Sweden and Finland; Poland, Belgium (Ardennes), Germany, Czech Republic, northern Italy, Austria,

Hungary, parts of the former Yugoslavia, Romania, the Ukraine and European parts of Russia and on through Siberia to the Pacific coast (Speight, 2010).

- Distribution in south-eastern Europe: Slovenia, Bosnia and Herzegovina and Serbia, as *M. latifrons* (Vujić & Glumac, 1994a; Vujić et al, 1998a); Montenegro, as *M. latifrons* (Šimić et al, 2001).
- Distribution in Macedonia: Collection SKO; Jakupica mountain, 1♂, 17.06.1988., (leg. Krpač).
- Comments: This species has been referred to in most recent literature under the name *Microdon latifrons* **Loew. Doczkal & Schmid (1999) established that *M. latifrons* Loew is a junior synonym of *M. analis* (Macquart) and introduced *M. miki* as a replacement name for *M. latifrons* of authors.** This species had not been previously recorded from Macedonia.

24. *Myolepta obscura* Becher, 1882

- General distribution: from northern France through Germany (extinct?) to Switzerland (extinct?) and on into northern Italy, southern Austria and Romania. This species should be regarded as threatened at the European level (Speight, 2010).
- Distribution in south-eastern Europe: Bosnia and Herzegovina and Serbia.
- Distribution in Macedonia: Collection SKO; Oteševo, shrubs, on *Orlaya grandiflora*, 1♀, 15.06.1959., (leg. Glumac); Bregalnica, river valley, on *Euphorbia* sp., *Pastinaca* sp. and *Orlaya* sp., 1♀, 08.06.1960., (leg. Glumac).
- Comments: *Myolepta obscura* is at risk in the western part of Europe (Speight, 2010). In Macedonia, it was discovered for the first time only at two localities, occurring during early spring within a short flight period.

25. *Neoascia meticulosa* (Scopoli, 1763)

- General distribution: from Fennoscandia south to northern Spain, the Alps and the former Yugoslavia; from Ireland eastwards through northern and central Europe into European parts of Russia; through Siberia to as far as Cis-Baikal (Speight, 2010).
- Distribution in south-eastern Europe: Slovenia, Croatia, Serbia and Bulgaria.

- Distribution in Macedonia: Collection SKO; Radika river, Lukovo Polje, on leaves of *Petasites* sp., 1♂, 1♀, 25.05.1995., (leg. Krpač).
- Comments: *Neoascia meticulosa* is a rare species in Macedonia. It was only recorded from one locality in the upper course of the Radika river.

26. *Orthonevra frontalis* (Loew, 1843)

- General distribution: Poland south to Spain and the Mediterranean; from central France eastwards through central and southern Europe (Italy, Yugoslavia) into Turkey, Iran and European parts of Russia and on through Siberia to the Pacific (Kamchatka); Mongolia (Speight, 2010).
- Distribution in south-eastern Europe: Bosnia and Herzegovina and Serbia.
- Distribution in Macedonia: Collection SKO; Osogovo Monastery, 1♂, 16-23.05.1967., (leg. Čingovski).
- Comments: The only record of *Orthonevra frontalis* in Macedonia is from the locality of Osogovo Monastery.

27. *Paragus albifrons* (Fallen, 1817)

- General distribution: from southern Norway and Denmark south to the Mediterranean; from Britain (southern England) eastwards through central and southern Europe (Italy, the former Yugoslavia, Bulgaria) into European parts of Russia and on to the Pacific; Iran, Afghanistan and Mongolia (Speight, 2010).
- Distribution in south-eastern Europe: Croatia, Montenegro, Serbia, Macedonia and Greece.
- Distribution in Macedonia: Oteševo, 1♂, 27.08.1958., (leg. Glumac).
- Comments: This is the first confirmed record of this species in Macedonia. A specimen from the collection, which was referred to by Glumac (1968) as *P. albifrons*, was subject to critical examination and proved to be *P. majoranae*.

28. *Paragus constrictus* Šimić, 1986

- General distribution: Distribution of this species as yet uncertain, due to confusion with *P. tibialis* (Fall.). So far, known from Ireland, Spain, Germany, the French Alps, Switzerland, Austria, Italy, the former Yugoslavia and Turkey (Speight, 2010).
- Distribution in south-eastern Europe: Bosnia and Herzegovina, Montenegro and Serbia.

- Distribution in Macedonia: published as *P. tibialis* var. *meridionalis* (Glumac, 1968) (in part): Lukićevo, meadows, on the flower of *Orlaya grandiflora*, 1♂, 11.06.1959., (leg. Glumac) (= *P. constrictus*) Collection SKO; Dojran, Kaldrma, 1♂, 21.06.1996., (leg. Krpač).
- Comments: As yet, this species may only be distinguished from *P. tibialis* in the male sex. In both sexes it shares with *P. tibialis* the feature of having entirely pale-haired abdominal tergites, so it is immediately distinguishable from *Phaemorrhous* Mg. However, it is only distinguishable from *P. tibialis* in the shape of the parameres. (Speight, 2010).

29. *Parasyrphus punctulatus* (Verrall, 1873)

- General distribution: from Fennoscandia south to the Pyrenees; from Ireland eastwards through northern and central Europe (plus northern Italy) into European parts of Russia and on through Siberia to the Pacific coast (Japan) (Speight, 2010).
- Distribution in south-eastern Europe: Bosnia and Herzegovina, Montenegro, Serbia and Greece.
- Distribution in Macedonia: published as *S. bucculatus* (Glumac, 1968): Mavrovo, spruce forest, on leaves, 1♂, 09.06.1959., (leg. Glumac) SKO; Mavrovo, stream valley, on leaves, 1♀, 30.05.1960., (leg. Glumac) DBE (= *P. punctulatus*). Collection SKO; Krčin mountain, 1♀, 25.05.1995., (leg. Krpač).
- Comments: This species is recorded only in a few locations on the Balkan Peninsula, in deciduous forests, but also in coniferous forests and plantations of conifers. This species is now confirmed on our having redetermined specimens previously identified as *S. bucculatus*, from the locality of Mavrovo in Macedonia, published by Glumac, (1968). Having critically examined specimens from collections of Glumac (SKO and DBE) we are satisfied that *S. bucculatus* must be excluded from the list of hoverfly fauna in Macedonia.

30. *Parasyrphus vittiger* (Zetterstedt, 1843)

- General distribution: from Fennoscandia south to the Pyrenees and central Spain; from Ireland eastwards through most of Europe into European parts of Russia; from the Urals to central Siberia (Cis-Baikal, Yakutia) (Speight, 2010).
- Distribution in south-eastern Europe: Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Bulgaria and Greece.

- Distribution in Macedonia: Collection SKO; Goten mountain, 1♂, 27.05.1988., (leg. Krpač); Pelister, 1♂, 12.06.1991., (leg. Krpač); Pelister, Kopanki, 1♂, 29.07.1992., (leg. Krpač).
- Comments: It is a new species for Macedonia, located on higher mountains, above 1000 m.

31. *Pipizella annulata* (Macquart, 1829)

- General distribution: from Finland south to southern Portugal and east through central Europe to Hungary and around the Mediterranean to the former Yugoslavia and Turkey (Speight, 2010).
- Distribution in south-eastern Europe: Montenegro, Serbia and Greece.
- Distribution in Macedonia: published as *Heringia virens* (Glumac, 1968:869) (in part): Azajnica, along the Radika river, on *Heracleum sphondylium*, 1♂, 10.06.1959., (leg. Glumac).
- Comments: *Pipizella annulata* is new for Macedonia. This mountain species has previously been recorded in several Balkan Peninsula mountains, at altitudes of 500-2000 m.

32. *Pipizella speighti* Verlinden, 1999

- General distribution: France and Italy (Alps) (Verlinden, 1999a).
- Distribution in south-eastern Europe: Montenegro (Brajović, 2004).
- Distribution in Macedonia: Collection SKO; Bistra mountain, Mladenova Češma, on *Euphorbia* sp., 1♂, 26.06.1991., (leg. Krpač).
- Comments: On the Balkan Peninsula, this species is known only in Montenegro and Macedonia. This is now recorded for the first time and at higher altitudes in Macedonia. Specimens of different populations of *P. speighti* show variation in coloration. *P. speighti* was a few years ago separated from *P. viduata* based upon differences in the structure of the male genitalia. *P. viduata* is found at lower elevations, while *P. speighti* can be found at much higher altitudes in mountain habitats (Vujic, oral report).

33. *Riponnensia longicornis* (Loew, 1843)

- General distribution: Portugal, Spain, southern France (plus Corsica), Sardinia, Sicily, Rhodes, Greece, Bulgaria, Turkey, Israel and N Africa (Algeria, Morocco) (Speight, 2010).
- Distribution in south-eastern Europe: Bulgaria and Greece.
- Distribution in Macedonia: Collection SKO; Gevgelisko, 1♂, 08.04.1957., (leg. Čingovski).

- Comments: *Riponnensia longicornis* may be distinguished from other *Riponnensia* species through its possession of all-black antennae in which the basoflagellomere is more than 4x as long as its maximum depth. This species is recorded from Macedonia for the first time.

34. *Riponnensia morini* Vujic, 1999

- General distribution: Balkan Peninsula (Speight, 2010).
- Distribution in south-eastern Europe: Montenegro, Serbia.
- Distribution in Macedonia: published as *Chrysogaster brevicornis* (Glumac, 1968:862): Collection SKO; Prilep, Sečena Glava, shrubs, on leaves, 1♂, 16.06.1959., (leg. Glumac). (= *R. morini*).
- Comments: A new species for Macedonia. Following a critical examination of the collection referenced in Glumac (1968) we are satisfied that the only specimen of *Chrysogaster brevicornis* reported therein is actually *Riponnensia morini*.

35. *Sphegina clavata* (Scopoli, 1763)

- General distribution: Netherlands, Belgium, France (Paris basin, Vosges, Alps); the Pyrenees and mountainous parts of central Europe; Italy, the former Yugoslavia, Greece (Speight, 2010).
- Distribution in south-eastern Europe: Slovenia, Croatia, Serbia, Bulgaria and Greece.
- Distribution in Macedonia: Collection SKO; Ogražden, beech forest, on flower of *Torilis helvetica* and *Sambucus* sp., 1♀, 20.06.1959., (leg. Glumac).
- Comments: *S. clavata* occurs at lower altitudes in several Balkan Mountains. This is the first record of this species in Macedonia, recorded from only one locality, Ogražden.

36. *Sphegina elegans* Schummel, 1843

- General distribution: from Fennoscandia south to the Pyrenees and Spain; from Ireland eastwards through central and southern Europe (northern Italy, the former Yugoslavia, northern Greece) into European parts of Russia to the Caucasus mountains. Also known from Samos island, in the Mediterranean near the coast of Turkey (Speight, 2010).
- Distribution in south-eastern Europe: Slovenia, Croatia, Serbia, Bulgaria and Greece.
- Distribution in Macedonia: Collection SKO; Ogražden, beech forest, on leaves of *Torilis* sp. and *Sambucus* sp., 2♂, 20.06.1959., (leg. Glumac);

Ogražden, north side, beech forest, on flower of *Anthriscus sylvestris* and on leaves, 5♂, 4♀, 07.06.1960., (leg. Glumac).

- Comments: First record of *Sphegina elegans* in Macedonia.

37. *Spilomyia triangularis* van Steenis, 2000

- General distribution: Alps (France), mountain range in Greece and Turkey (Speight, 2010).
- Distribution in south-eastern Europe: Serbia, Macedonia and south coast of Greece.
- Distribution in Macedonia: published as *Spilomyia manicata* var. *digitata* (Glumac, 1968): Collection SKO; Prespa Lake, Oteševo, meadows, on flower of *Eryngium campestre*, 1♂, 24.08.1958., (leg. Glumac); Oteševo, valley streams, on *Verbascum* sp., 1♂, 27.06.1958., (leg. Glumac); Oteševo, near the hotel, 1♂, 23.08.1958., (leg. et det. Glumac); Oteševo, near the hotel, meadows, on *Rubus* sp., 2♂, 25.08.1958., (leg. Glumac); Prespa Lake, to Carina, meadows, on flower of *Eryngium campestre*, 2♂, 27.08.1958., (leg. Glumac); Oteševo, Carina, meadows, on flower of *Eryngium campestre*, 1♂, 27.08.1958., (leg. Glumac); Oteševo, near the hotel, on flower of *Eryngium campestre*, 1♂, 28.08.1958., (leg. Glumac); Oteševo, meadows, on flower of *Eryngium campestre*, 2♂, 01.09.1959., (leg. Glumac); Strumičko Polje, meadows, on flower of *Eryngium campestre*, 1♀, 26.08.1966., (leg. Glumac); Oteševo, on flower of *Eryngium campestre*, 1♂, 29.08.1966., (leg. Glumac) (= *S. triangularis*), Oteševo.
- Comments: This is a Mediterranean species, recorded for the first time in the southern part of Macedonia. Specimens published as *Spilomyia manicata* var. *digitata* in Glumac (1968) belong to the species *S. triangularis*.

38. *Temnostoma meridionale* Krivosheina et Mamayev, 1962

- General distribution: Finland, Estonia, Latvia, Germany, central and south-west France (including the Pyrenees), the Czech Republic, Romania, the Ukraine, European parts of Russia and the Caucasus (Speight, 2010).
- Distribution in south-eastern Europe: Serbia.
- Distribution in Macedonia: published as *Temnostoma vespiforme* var. *vulgare* (Glumac, 1968) (in part): Collection SKO; Ogražden,

beech forest, on flower of *Torilis helvetica* and *Sambucus* sp., 2♂, 1♀, 20.06.1959., (leg. Glumac); Ogražden, north side, forests, on *Anthriscus sylvestris*, 1♂, 07.06.1960., (leg. Glumac) (= *T. meridionale*).

- Comments: *Temnostoma meridionale* is new for Macedonia. The species is limited in its distribution on the localities with old trees.

Conclusion

After many years studying hoverflies (Diptera: Syrphidae) throughout Macedonia we have compiled a list of 262 taxa from 69 genera. This comes from reviewing collections in the Natural History Museum of Macedonia – Skopje (SKO) and Biology and Ecology Department – Novi Sad (DBE), and reviewing all references in the literature to Syrphidae in Macedonia, as well as our own investigations.

Thirty eight (38) taxa are now published for the first time in Macedonia: *Chamaesyrphus escorialensis* (Strobl, 1909), *Cheilosia frontalis* Loew, 1857, *Cheilosia grisella* (Becker, 1894), *Cheilosia hypena* Becker, 1894, *Cheilosia melanura* Becker, 1894 ssp. *melanura* sensu Vujić, 1996, *Chrysotoxum intermedium* Meigen, 1822, *Criorhina pachymera* Egger, 1858, *Epistrophe grossulariae* (Meigen, 1822), *Eristalinus megacephalus* (Rossi, 1794), *Eristalis jugorum* Egger, 1858, *Eumerus argyropus* Loew, 1848, *Eumerus clavatus* Becker, 1923, *Eumerus sulcatus* Rondani, 1868, *Eupeodes lapponicus* (Zetterstedt, 1838), *Eupeodes latifasciatus* (Macquart, 1829), *Ferdinandea ruficornis* (Fabricius, 1775), *Helophilus pendulus* (Linnaeus, 1758), *Mallota fuciformis* (Fabricius, 1794), *Megasyrphus erraticus* (Linnaeus, 1758), *Meligramma cingulata* (Egger, 1860), *Meligramma euchroma* (Kowarz, 1885), *Merodon nanus* Sack, 1931, *Microdon miki* Doczkal et Schmid, 1999, *Myolepta obscura* Becher, 1882, *Neoascia meticulousa* (Scopoli, 1763), *Orthonevra frontalis* (Loew, 1843), *Paragus albifrons* (Fallen, 1817), *Paragus constrictus* Šimić, 1986, *Parasyrphus punctulatus* (Verrall, 1873), *Parasyrphus vittiger* (Zetterstedt, 1843), *Pipizella annulata* (Macquart, 1829), *Pipizella speighti* Verlinden, 1999, *Riponnensia longicornis* (Loew, 1843), *Riponnensia morini* Vujic, 1999, *Sphegina clavata* (Scopoli, 1763), *Sphegina elegans* Schummel, 1843, *Spilomyia triangularis* van Steenis, 2000, *Temnostoma meridionale* Krivosheina et Mamayev, 1962.

Based on redetermination of specimens in collections (SKO and DBE), we have concluded that, due to previous misidentification, 3 taxa must now be re-

moved from the list of the hoverfly fauna of Macedonia: *Syrphus bucculatus* Rondane, 1857 in Glumac (1968) (= *Parasyrphus punctulatus* (Verrall, 1873); *Chrysogaster brevicornis* Loew, 1843 in Glumac, (1968) (= *Riponnensia morini* Vujic, 1999) and *Temnostoma vespiforme* L. var. *vulgare* Portch., 1886 in Glumac, (1968) (= *Temnostoma meridionale* Krivosheina et Mamayev, 1962).

For the hoverfly fauna of Macedonia, two taxa are listed in the existing literature as their synonyms. These species are: *Syrphoides annulipes* (Zetterstedt, 1838) (= *Megasyrphus erraticus* (Linnaeus, 1758). *Microdon latifrons* Loew, 1856 (= *Microdon miki* Doczkal et Schmid, 1999).

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