

NEW RECORDS OF HESPERINIDAE AND BIBIONIDAE (INSECTA, DIPTERA) FROM CROATIA

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Skartveit, J., Mikalsen Kvifte, G., Klarić, A. & Håland, Ø.: New records of Hesperinidae and Bibionidae (Insecta, Diptera) from Croatia. *Nat. Croat.*, Vol. 22, No. 1., 29–36, 2013, Zagreb

We review the published records of Hesperinidae and Bibionidae (Diptera) from Croatia and add some new records based on recent, sporadic collecting in the country. The species *Bibio handlirschi* Duda, 1930 and *Bibio reticulatus* Loew, 1846 are recorded for the first time from Croatia. Notes are given on the taxonomy and bionomy of some of the species.

Key words: *Hesperinus*, *Bibio*, *Dilophus*, faunistics

Skartveit, J., Mikalsen Kvifte, G., Klarić, A. & Håland, Ø.: Novi nalazi iz porodica Hesperinidae i Bibionidae (Insecta, Diptera) iz Hrvatske. *Nat. Croat.*, Vol. 22, No. 1., 29–36, 2013, Zagreb

U radu se daje pregled objavljenih nalaza iz porodica Hesperinidae i Bibionidae (Diptera) iz Hrvatske, uz dodatak novih nalaza prikupljenih slučajnim prikupljanjem. Vrste *Bibio handlirschi* Duda, 1930 i *Bibio reticulatus* Loew, 1846 zabilježene su prvi puta za Hrvatsku. Daju se podaci o taksonomiji i životu nekih vrsta.

Ključne riječi: *Hesperinus*, *Bibio*, *Dilophus*, faunistika

INTRODUCTION

With its wide range of habitats, the Balkans an area of high biodiversity and endemism, is considered one of the biodiversity hotspots of Europe (GRIFFITHS *et al.*, 2004; HEWITT, 2011). In particular, Croatia, with its varied topography and wide range of climate and habitat types, is home to a large number of species (JELASKA *et al.*, 2010). The area is famous for its rich fauna of subterranean invertebrates (ZAGMAJSTER *et al.*, 2008) but probably also has a high diversity in other groups. However, many insect groups remain little studied in this area. Bibionid flies are a relatively well-known group for which a substantial amount of faunistic data exists from Europe (see SKARTVEIT, 2011); however very little seems to be published from the countries of the former Yugoslavia. LANGHOFER (1917) published records of some bibionids in his list of Croatian Nematocera, but we have not been able to locate any more recent publications concerning this group. For the family Hesperinidae, the only previous Croatian records were given by PAPP (2010).

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MATERIAL AND METHODS

The new records are based on material collected sporadically mainly in the northern part of Croatia by the authors. The material is preserved in alcohol and will be deposited in the University Museum of Bergen, Norway. The senior author has looked through the collections of the Museum of Natural History, Rijeka, but failed to find any bibionid specimens there. The material was identified with the aid of DUDA (1930) and other sources as noted. Species new to the fauna of Croatia are marked with a *. The name of the counties ('županija') are given in **bold**.

RESULTS

Hesperinidae

The hesperinids are a group of archaic Diptera which are sometimes included in the Bibionidae but they have mostly been treated as a separate family by European authors (e.g. KRIVOSHEINA, 1997). While hesperinids are known from fossils from the Eocene (SKARTVEIT, 2009) and Oligocene (NEL & SKARTVEIT, 2012), they appear always to have been scarce and local flies. While the wing venation is similar to primitive bibionids, these flies are easily recognized by their slender bodies, legs and antennae, and by the dichoptic eyes of the males. The European hesperinids were recently revised by PAPP (2010).

Hesperinus imbecillus (Loew, 1846) (Fig. 1)

Previous records: **Karlovac County**: Jasenak, **Požega-Slavonia County**: Papuk Mts. (above Kutjevo) (both PAPP, 2010).



Fig. 1. *Hesperinus imbecillus*, male, habitus.



Fig. 2. *Bibio handlirschi*, female, habitus.

New record: **Sisak-Moslavina County**, Petrinja, Novo Selište 45°26' N 16°14' E, malaise trap, April 2011, AK & GMK leg., 10 males

PAPP (2010) discussed Croatian populations of this apparently rare and local species from **Karlovac County**: Jasenak and **Požega-Slavonia County**: Papuk Mts. (above Kutjevo). The Petrinja specimens have slightly elongate terminal flagellomeres (mostly 1.5-2 times as long as wide) rather than globular ones which are considered typical for the species by PAPP (2010). In this respect the specimens are more similar to *Hesperinus graecus* Papp, 2010. However, the genitalia fit *H. imbecillus* very well and we believe that the difference in antennal morphology is due to geographical variability of this species, which apparently has small and localized populations. The shape of the terminal flagellomere seems to be of a quite plastic character since there is often a notable difference between the left and right antenna in the same specimen.

Hesperinus species are rarely collected in numbers; this is particularly so for the flightless females. All records are from deciduous forest near streams (PAPP, 2010). The immature stages of *H. imbecillus* are unknown; however the East Asian species *H. rohden-dorfi* has larvae living in submerged, dead wood (KRIVOSHEINA & MAMAEV, 1967), and this may be the case with *H. imbecillus*, too (PAPP, 2010). This is a rare habitat and would explain why the species is so rarely collected. It would also suggest that the species is very vulnerable to destruction of old-growth woodlands since submerged, dead wood is almost exclusively found in such situations.

Bibionidae

No species of Bibionidae have been registered from Croatia in the Fauna Europaea database (SKARTVEIT, 2011), except for *Dilophus bispinosus* Lundström, 1913 which was described partly from Croatian material. Seven species were listed from Croatia by LANGHOFFER (1917) and some older records have been published from localities in the Austro-Hungarian Empire currently in Croatia (STROBL, 1900, 1904; ZERNY, 1916). Most European countries have 15 to 25 species of Bibionidae recorded, and there should be no reason

to expect any fewer in a biologically rich country such as Croatia. Bibionids are rather robust, usually black nematocerans which tend to swarm in large numbers, and they are therefore easily recorded and well represented in most museum collections. The larvae are phytosaprophages and live communally in the soil (SKARTVEIT, 1997). Central European bibionids are best identified by the keys of DUDA (1930), although some changes to the nomenclature have occurred since the publication of these keys.

Genus *Bibio* Geoffroy, 1762

Bibio clavipes Meigen, 1818

Previous record: **Zagreb** (LANGHOFFER, 1917).

This autumn-flying species is common over most of Europe except for the southernmost parts, preferring humid woodlands up to the timberline. In Central Europe, it is usually the only *Bibio* species flying later than August, and easily recognized on account of the long, black legs with swollen hind tarsi in the males.

Bibio femoralis Meigen, 1838

Previous record: **Zadar County**, Zadar (= Zara) (STROBL, 1904).

New record: **Primorje-Gorski Kotar County**, Rijeka, at beach between Rijeka and Opatija, 4. February 1995, ØH leg, 1 male

Bibio femoralis is a fairly uncommon, a Central European species which has previously been recorded in Austria, Hungary, Italy, Greece, Switzerland (HAENNI & OBRECHT, 2001) and recently in France (HAENNI & QUINTIN, 2012). The species seems to fly very early in spring, with records between late January and early April (HAENNI & OBRECHT, 2001). It was redescribed by HAENNI & OBRECHT (2001), and the males are easily recognized on account of the swollen posterior tarsomeres.

**Bibio handlirschi* Duda, 1930 (Fig. 2)

New record: **Sisak-Moslavina County**, Petrinja, Novo Selište, April 2011 AK & GMK leg 9 males 10 females.

This apparently very rare species was described by DUDA (1930) from material collected in Austria in 1902. The species remained obscure, represented by just a handful of old specimens in European collections, until PAPP & HAENNI (2007) redescribed it, adding new records from Hungary and Greece. It remains rare, however, and PAPP & HAENNI could find just 12 specimens in all. The biology of this rare species is not well known, but PAPP & HAENNI (2007) suggest that poplar leaf litter on sandy soil is a common factor for all the known European localities for the species. The Petrinja specimens fit perfectly PAPP & HAENNI's redescription of the species.

Bibio hortulanus (Linnaeus, 1758)

Previous records: **Lika-Senj County**: Senj (LANGHOFFER, 1917), **Zadar County**: Zadar (= Zara) (STROBL, 1904) »Dalmatien« (STROBL, 1900), **Split-Dalmatia County**: Hvar (= Lesina) (STROBL, 1904), **Split-Dalmatia County**: Biševo (= Busi) island (ZERNY, 1916), **Dubrovnik-Neretva County**: Dubrovnik (= Ragusa) (STROBL, 1900)

For some reason this ubiquitous, Mediterranean and Central European species was not present in the samples we examined. It is generally distributed at low altitudes in Europe as far north as southernmost Sweden, also in North Africa and the Middle East.

The species is easily recognized since the females are largely orange-red with dark brown wings. Males are similar to *Bibio marci* but generally smaller, and the pile on the abdominal pleurae is white, not black.

***Bibio johannis* (Linnaeus, 1767)**

Previous record: **Lika-Senj County**: Senj (LANGHOFFER, 1917)

This species occurs most frequently on cultivated land and flies quite early in spring, though not as early as *Bibio femoralis*. It is one of the smallest *Bibio* species and its most conspicuous field identification character is the large and black pterostigma of both sexes, in strong contrast with the lightly fumose wings.

***Bibio marci* (Linnaeus, 1758)**

Previous records: **Zagreb, Lika-Senj County**: Senj (LANGHOFFER, 1917), **Zadar**: Zadar (= Zara) (STROBL, 1904), **Split-Dalmatia**: Hvar (= Lesina) (STROBL, 1904).

New records: **Sisak-Moslavina**, Petrinja, Novo Selište, April 2011 AK & GMK leg. 5 males. **City of Zagreb**, by Šestine, by a stream in a beech forest, 30. April 1994, ØH leg, 1 male. **City of Zagreb**, Rogozova by Sava, 24.-28. April 1994, ØH leg. 1 male 2 females. **City of Zagreb**, in forest towards Medvedgrad, 4. April 1994, ØH leg. 2 males.

This is a common and rather eurytopic European species distributed from the Mediterranean to southern Scandinavia (SKARTVEIT, 2011). It is common in and around deciduous woodlands, also in parks, hedgerows etc. This large, black species which is frequently very abundant in spring is probably the most commonly noted bibionid in Europe, at least by the general public.

***Bibio pomonae* (Fabricius, 1775)**

Previous record: **Lika-Senj County**: Senj (LANGHOFFER, 1917)

New record: **Primorje-Gorski Kotar County**, Veliki Risnjak, near summit 1400 m a.s.l., 9. July 2009, 2 males, JS (photographed, not collected).

A large and conspicuous species which is easily recognizable on account of its bright red femora; otherwise rather similar to *Bibio marci*. In southern Europe this is a montane species.

****Bibio reticulatus* Loew, 1846**

New record: **Sisak-Moslavina County**, Petrinja, Novo Selište, April 2011 AK & GMK leg. 1 female

This is also a relatively uncommon Central and Western European species. It has been previously recorded from Austria but apparently not from Hungary (SKARTVEIT, 2011).

***Bibio varipes* Meigen, 1830**

Previous records: **Lika-Senj County**: Senj (LANGHOFFER, 1917), **Zadar County**: Zadar (= Zara) (STROBL, 1904).

New records: **Primorje-Gorski Kotar County**, Rijeka, park at Krnjevo, 2. May 1995, ØH leg. 1 female. **City of Zagreb**, above Šestine, by a stream in a beech forest, 30. April 1994, ØH leg, 1 male. **City of Zagreb**, Rogozova by Sava, 24.-28. April 1994, ØH leg. 1 female.

This species is common in woodlands in Western and Central Europe (SKARTVEIT, 2011).

Genus *Dilophus* Meigen, 1803

Dilophus bispinosus Lundström, 1913

Previous record: **Split-Dalmatia County**, Hvar (= Lesina), 3 females (LUNDSTRÖM, 1913).

LUNDSTRÖM (1913) gives the locality of his specimens, found in the Hungarian National Museum, as »Dalmatia: Lerina«. We have not been able to locate any place that has been named Lerina in the area and believe it should be »Lesina«, that is, Hvar. This uncommon species has been recorded sporadically throughout the Mediterranean area and Central Europe.

Dilophus febrilis (Linnaeus, 1758)

Previous records: **Primorje-Gorski Kotar County**: Delnice, Bakar, Sušak, **Međimurje County**: Orehovica, **Lika-Senj County**: Senj (all LANGHOFFER, 1917) **Split-Dalmatia County**, Hvar (= Lesina) (STROBL, 1900), **Zadar County**: Zadar (=Zara) (STROBL, 1904).

New record: **City of Zagreb**, by Šestine, by a small stream in a beech forest, 30. April 1994, ØH leg. 1 male.

Recorded from large parts of Europe and also as far east as Iran (SKARTVEIT, unpublished observations). This species is frequently very numerous in grasslands and cultivated land. It has two annual generations, in April-May and in August-September. While *Dilophus* species are often very similar in habitus, females of this species are easily recognized due to their all-black colour.

Dilophus femoratus Meigen, 1804

Previous record: **Split-Dalmatia County**: Hvar (= Lesina) (STROBL, 1904).

STROBL (1904) considered *D. humeralis* a colour morph of *D. femoratus*, and it is not clear if his material was *D. femoratus*, *D. humeralis* or both. In samples from other parts of Europe *D. femoratus* is generally the more numerous of the two by far, and this is most likely the case in Croatia, too.

Dilophus humeralis Zetterstedt, 1850

Previous record: **Split-Dalmatia County**: Hvar (= Lesina) (STROBL, 1900, 1904).

New record: **City of Zagreb**, Rogozova, pan trap at Sava river, 6.-12. March 1994, 1 female, leg. ØH.

The species is known from most parts of Central Europe, but there are no previously confirmed records from Balkan. It is generally rather uncommon (e.g., FREEMAN & LANE, 1985). STROBL (1904) regarded this species as just a coloured variety of *D. femoratus* and he did not discuss the distinguishing characters of the true *D. humeralis* (in particular, the short female head, HAENNI, 1982), so it is not clear if the species recorded by STROBL is a true *D. humeralis* or just a differently coloured *D. femoratus*. STROBL reported the species to be numerous, while *D. humeralis* is otherwise almost never found in large numbers.

Dilophus tenuis Meigen, 1818

Previous record: »Dalmatien«, **Split-Dalmatia County**, Hvar (= Lesina) (STROBL, 1900, as *Dilophus ternatus*)

This distinctive but rather uncommon species has been recorded from Austria, but most of the European records are from south-western Europe.

DISCUSSION

Including the present records, one species of Hesperinidae and 14 Bibionidae have been recorded from Croatia. For comparison, the Fauna Europaea database (SKARTVEIT, 2011) lists 12 species of bibionids from Hungary (the actual number is 20), 15 from the Italian mainland and 23 from Austria. The Croatian fauna is likely to include a few more species than have been recorded. Additional Central European species are likely to be found in the inland plain areas in Slavonia and near Zagreb, while some more Mediterranean species could occur along the Dalmatian coast and in the islands. Most bibionids have their adult flight period in spring (March-May) and should be searched for during this time. The present records are based on a very limited material and more extensive collecting is likely to reveal that most of the species are rather widely distributed within the country. It is noteworthy that the rarely collected species *Bibio femoralis*, *B. handlirschi* and *B. reticulatus* were all present in our small sample of Croatian bibionids. A more thorough investigation of the bibionid flies in this area may reveal that some species that are rare in other parts of Europe may not necessarily be so in the countries of the former Yugoslavia. At present, the bibionids of Slovenia, Serbia, Bosnia-Herzegovina, Montenegro and Macedonia are almost entirely unknown.

ACKNOWLEDGEMENTS

Dr. Marin Kirinčić, Museum of Natural History, Rijeka kindly helped us searching for specimens in the collection under his care.

Received January 11, 2013

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SUMMARY

New records of Hesperinidae and Bibionidae (Insecta, Diptera) from Croatia

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We review the published records of Hesperinidae and Bibionidae (Diptera) from Croatia and add some new records based on recent, sporadic collecting in the country. The following species have been recorded from Croatia: Hesperinidae: *Hesperinus imbecillus*. Bibionidae: *Bibio clavipes*, *B. femoralis*, *B. handlirschi*, *B. hortulanus*, *B. johannis*, *B. marci*, *B. pomonae*, *B. reticulatus*, *B. varipes*, *Dilophus bispinosus*, *D. febrilis*, *D. femoratus*, *D. humeralis*, *D. tenuis*. Several of the species, notably *Bibio handlirschi*, are considered rare in the rest of Europe.