

Data to the Ephemeroptera, Odonata and Trichoptera fauna of the Kőszeg Mountains

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ABSTRACT: We present occurrence records of 15 Ephemeroptera, 6 Odonata and 20 Trichoptera species from streams of the Kőszeg Mountains. The most significant species among several rare and endangered ones are *Baetis melanonyx*, *B. niger*, *Ephemerella mucronata*, *Cordulegaster bidentatus*, *C. heros*, *Rhyacophila hirticornis* and *Potamophylax cingulatus*.

Introduction

We carried out faunistical and quantitative surveys of macrozoobenthos assemblages in the streams of the Kőszeg Mountains in 2015. Here we present the results of the faunistical surveys of Ephemeroptera, Odonata and Trichoptera species.

The mayfly fauna of the Gyöngyös and the Szerdahelyi Stream is already well known, but there are only a few records from the inner areas of the Kőszeg Mountains (BAUERNFEIND et al. 2005, KOVÁCS 2005a,b, 2006a,b, 2007b, KOVÁCS et al. 1999). Similarly the Odonata fauna of the Kőszeg Mountains is also well known (AMBRUS & BÁNKUTI 1992, AMBRUS et al. 1992, KOVÁCS et al. 2006, MÜLLER et al. 2006, ROZNER et al. 2010). These mountains are important because *Cordulegaster bidentatus* and *C. heros* co-occur here. The caddisfly fauna is also well-known from light-trap materials (NÓGRÁDI & UHERKOVICS 1989, 1992). However, there are only a limited number of occurrence data of larvae from the creeks and streams of this area (MÓRA et al. 2006).

Material and methods

Qualitative (faunistical) or quantitative sampling was carried out at a total of 12 different stream sections in the Kőszeg Mountains (Table 1). A simple hand net was used for sampling. Qualitative sampling was based on the Q_{BAP} multi-habitat sampling process, which followed the Hungarian National Biodiversity Monitoring Sampling Protocol (www.termeszetvedelem.hu). The aquatic macroinvertebrate specimens collected were preserved in 70% ethanol.

Table 1. The sampling sites and their coordinates

Sampling site locality	WGS84 N	WGS84 E
Bozsok: Bozsoki-patak	47.33230°	16.49050°
Bozsok: Pütyör-forrás	47.33934°	16.46707°
Bozsok: Sötét-völgy, Sötét-ág	47.33719°	16.47527°
Cák: Nagy-erdő, Cáki-patak	47.36080°	16.51095°
Kőszeg: Andalgó, Gyöngyös-patak	47.40475°	16.52393°
Kőszeg: Hármas-patak sidearm	47.38268°	16.46363°
Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section	47.40540°	16.52053°

Sampling site locality	WGS84 N	WGS84 E
Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section	47.40372°	16.52659°
Kőszeg: Stájerházak, Stájer-patak	47.37217°	16.46519°
Kőszegdoroszló: Főhegy, Doroszlói-patak	47.36928°	16.50410°
Velem: Borha-völgy, Kani-patak	47.35514°	16.49054°
Velem: Szerdahelyi-patak	47.36320°	16.56408°

Results and discussion

We obtained a total of 105 records of 41 species (Ephemeroptera, Odonata, Trichoptera) from the Kőszeg Mountains. Seven of the 15 mayfly species found were new to the area. New mayfly species were *Baetis lutheri*, *B. melanonyx*, *B. muticus*, *B. niger*, *Epeorus assimilis*, *Habrophlebia fusca* and *H. lauta*. Some of these species such as *B. lutheri* and *B. muticus* live in high mountains and *B. lutheri* is quite rare in Hungary. The most important result of the survey was the finding of *B. melanonyx* which so far has only been known from some streams of the Mátra Mountains, Hungary (KOVÁCS 2007a). Each of the observed 6 Odonata species was already known from this area. Only the two *Cordulegaster* species were collected from the smaller streams and creeks, while other river-dwelling species were found only in the Gyöngyös stream. The co-occurrence of *Cordulegaster bidentatus* and *Cordulegaster heros* was not observed in our surveys. Most of the 40 caddisfly species detected were already known from this area based on light-trap collections (NÓGRÁDI & UHERKOVICH 1989, 1992). Only *Hydropsyche* cf. *incognita* Pitsch, 1993 can be considered to be a new species of the local caddisfly fauna. However, this species was described shortly after our last survey of imagoes, and the identification of its larva is often ambiguous. Finally, we found larvae of several caddisfly species that are considered “endangered” (*Glossosoma conformis*, *Plectrocnemia geniculata*, *Potamophylax luctuosus*) or “vulnerable” (*Ecclisopteryx madida*, *Odontocerum albicorne*, *Potamophylax cingulatus*) in Hungary (NÓGRÁDI & UHERKOVICH 2002).

In summary, our results suggest that the Kőszeg Mountains, a foothill of the Alps, has a species-rich benthic community that is unique in Hungary, and deserves further study.

List of data

Here we present 105 occurrence data of mayflies, damselflies, dragonflies and caddisflies collected from the streams of the Kőszeg Mountains. Abbreviations of collector names: CsR = Roland Csipkés (number of occurrence data collected: 1), MK = Kristóf Málnás (84), PL = László Polyák (39).

EPHEMEROPTERA

BAETIDAE Leach, 1815

Baetis lutheri Müller-Liebenau, 1967 – Kőszegdoroszló: Főhegy, Doroszlói-patak, 06.05.2015, MK, 3.

Baetis melanonyx (Pictet, 1843) – Kőszeg: Hármás-patak sidearm, 08.05.2015, MK, 7.

Baetis muticus (Linnaeus, 1758) – Kőszeg: Hármás-patak sidearm, 08.05.2015, MK, 15 – Kőszeg: Stájerházak, Stájer-patak, 08.05.2015, MK, 1.

Baetis niger (Linnaeus, 1761) – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 1.

Baetis rhodani (Pictet, 1843) – Bozsok: Bozsoki-patak, 06.05.2015, MK, 49 – Bozsok: Pütyör-forrás, 08.05.2015, MK, 26 – Bozsok: Sötét-völgy, Sötét-ág, 08.05.2015, MK, 44 – Cák: Nagy-erdő, Cáki-patak, 06.05.2015, MK, 9 – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 6 – Kőszeg: Hármás-patak sidearm, 08.05.2015, MK, 3 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 8 – Velem: Borha-völgy, Kani-patak, 06.05.2015, MK, 1 – Velem: Szerdahelyi-patak, 06.05.2015, MK, 26.

HEPTAGENIIDAE Needham, 1901

Heptagenia flava Rostock, 1877 – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 3 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 2.

Heptagenia longicauda (Stephens, 1836) – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 1 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 2 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 3.

Electrogena ujhelyii (Sowa, 1981) – Bozsok: Pütyör-forrás, 08.05.2015, MK, 3 – Bozsok: Sötét-völgy, Sötét-ág, 08.05.2015, MK, 2 – Cák: Nagy-erdő, Cáki-patak, 06.05.2015, MK, 10 – Kőszeg: Hármás-patak sidearm, 08.05.2015, MK, 2 – Kőszeg: Stájerházak, Stájer-patak, 08.05.2015, MK, 17 – Kőszegdoroszló: Főhegy, Doroszlói-patak, 06.05.2015, MK, 3 – Velem: Borha-völgy, Kani-patak, 06.05.2015, MK, 12 – Velem: Szerdahelyi-patak, 06.05.2015, MK, 3.

Epeorus assimilis (Eaton, 1871) – Kőszeg: Hármás-patak sidearm, 08.05.2015, MK, 2.

LEPTOPHLEBIIDAE Banks, 1900

Habroleptoides confusa Sartori et Jacob, 1986 – Cák: Nagy-erdő, Cáki-patak, 06.05.2015, MK, 2 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 1.

Habrophlebia fusca (Curtis, 1834) – Velem: Szerdahelyi-patak, 06.05.2015, MK, 2.

Habrophlebia lauta Eaton, 1884 – Kőszeg: Hármás-patak sidearm, 08.05.2015, MK, 2.

Paraleptophlebia submarginata (Stephens, 1835) – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 2 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 3 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 4.

EPHEMERIDAE Latreille, 1810

Ephemera danica Müller, 1764 – Bozsok: Sötét-völgy, Sötét-ág, 08.05.2015, MK, 1 – Cák: Nagy-erdő, Cáki-patak, 06.05.2015, MK, 2 – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 5 – Kőszeg: Hármás-patak sidearm, 08.05.2015, MK, 8 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 10 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 3 – Kőszegdoroszló: Főhegy, Doroszlói-patak, 06.05.2015, MK, 1.

EPHEMERELLIDAE Klapálek, 1909

Ephemerella mucronata (Bengtsson, 1909) – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 10.

ODONATA

CALOPTERYGIDAE Sélys, 1850

Calopteryx splendens (Harris, 1782) – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 1.

Calopteryx virgo (Linnaeus, 1758) – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 3 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 3 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 1

GOMPHIDAE Rambur, 1842

Gomphus vulgatissimus (Linnaeus, 1758) – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 1 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 1 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 1.

Ophiogomphus cecilia (Fourcroy, 1758) – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, CsR, 1 – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 1 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 1 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 3 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 2.

CORDULEGASTRIDAE Calvert, 1893

Cordulegaster bidentatus Sélys-Longchamps, 1843 – Bozsok: Bozsoki-patak, 06.05.2015, MK, 2 – Velem: Borhavölgy, Kani-patak, 06.05.2015, MK, 1.

Cordulegaster heros Theischinger, 1979 – Cák: Nagy-erdő, Cági-patak, 06.05.2015, MK, 1 – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 1 – Kőszeg: Hármaspatak sidearm, 08.05.2015, MK, 2.

TRICHOPTERA

RHYACOPHILIDAE Stephens, 1836

Rhyacophila hirticornis McLachlan, 1879 – Velem: Szerdahelyi-patak, 06.05.2015, MK, 1.

GLOSSOSOMATIDAE Wallengren, 1891

Glossosoma conformis Neboiss, 1963 – Kőszeg: Hármaspatak sidearm, 08.05.2015, MK, 6.

HYDROPSYCHIDAE Curtis, 1835

Hydropsyche cf. incognita Pitsch, 1993 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 3.

Hydropsyche instabilis (Curtis, 1834) – Kőszeg: Hármaspatak sidearm, 08.05.2015, MK, 2.

POLYCENTROPODIDAE Ulmer, 1903

Plectrocnemia brevis McLachlan, 1871 – Kőszegdoroszló: Főhegy, Doroszlói-patak, 06.05.2015, MK, 1 – Velem: Szerdahelyi-patak, 06.05.2015, MK, 1.

Plectrocnemia conspersa (Curtis, 1834) – Cák: Nagy-erdő, Cági-patak, 06.05.2015, MK, 3 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 1 – Velem: Borhavölgy, Kani-patak, 06.05.2015, MK, 1.

Plectrocnemia geniculata McLachlan, 1871 – Bozsok: Pütyör-forrás, 08.05.2015, MK, 1.

PHILOPOTAMIDAE Stephens, 1829

Philopotamus montanus (Donovan, 1813) – Bozsok: Sötét-völgy, Sötét-ág, 08.05.2015, MK, 1 – Cák: Nagy-erdő, Cági-patak, 06.05.2015, MK, 1 – Kőszeg: Hármaspatak sidearm, 08.05.2015, MK, 25.

Wormaldia occipitalis (Pictet, 1834) – Kőszegdoroszló: Főhegy, Doroszlói-patak, 06.05.2015, MK, 2 – Kőszeg: Stájerházak, Stájer-patak, 08.05.2015, MK, 1.

LIMNephilidae Kolenati, 1848

Anabolia furcata Brauer, 1857 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 1.

Chaetopteryx major McLachlan, 1876 – Bozsok: Pütyör-forrás, 08.05.2015, MK, 7 – Bozsok: Sötét-völgy, Sötét-ág, 08.05.2015, MK, 3.

Ecclisopteryx madida (McLachlan, 1867) – Bozsok: Pütyör-forrás, 08.05.2015, MK, 1 – Bozsok: Sötét-völgy, Sötét-ág, 08.05.2015, MK, 3 – Velem: Szerdahelyi-patak, 06.05.2015, MK, 1.

Halesus digitatus (Schränk, 1781) – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 1 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 1 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 1.

Halesus tessellatus (Rambur, 1842) – Kőszeg: Andalgó, Gyöngyös-patak, 20.04.2015, PL, 4 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 6 – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 9.

Linnephilus rhombicus (Linnaeus, 1758) – Kőszeg: Kálvária-hegy, Gyöngyös-patak, lower section, 20.04.2015, PL, 1.
Potamophylax cingulatus (Stephens, 1837) – Bozsok: Pütyör-forrás, 08.05.2015, MK, 19 – Bozsok: Sötét-völgy, Sötét-ág, 08.05.2015, MK, 6 – Gyöngyös-patak, Kálvária-hegy (Kőszeg), 20.04.2015, PL, 4.
Potamophylax luctuosus (Piller et Mitterpacher, 1783) – Bozsok: Bozsoki-patak, 06.05.2015, MK, 10 – Bozsok: Pütyör-forrás, 08.05.2015, MK, 10 – Bozsok: Sötét-völgy, Sötét-ág, 08.05.2015, MK, 12 – Cák: Nagy-erdő, Cák-patak, 06.05.2015, MK, 7 – Kőszeg: Stájerházak, Stájer-patak, 08.05.2015, MK, 1.
Potamophylax nigricornis (Pictet, 1834) – Kőszegdoroszló: Főhegy, Doroszlói-patak, 06.05.2015, MK, 1.
Potamophylax rotundipennis (Brauer, 1857) – Kőszeg: Kálvária-hegy, Gyöngyös-patak, higher section, 20.04.2015, PL, 1.

ODONTOCERIDAE Wallengren, 1891

Odontocerum albicorne (Scopoli, 1763) – Bozsok: Bozsoki-patak, 06.05.2015, MK, 2 – Bozsok: Pütyör-forrás, 08.05.2015, MK, 14 – Bozsok: Sötét-völgy, Sötét-ág, 08.05.2015, MK, 25 – Cák: Nagy-erdő, Cák-patak, 06.05.2015, MK, 3 – Kőszeg: Hármás-patak sidearm, 08.05.2015, MK, 3 – Kőszegdoroszló: Főhegy, Doroszlói-patak, 06.05.2015, MK, 2 – Velem: Borha-völgy, Kani-patak, 06.05.2015, MK, 2.

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References

- AMBRUS, A. & BÁNKUTI, K. (1992): Adatok a Nyugat-Dunántúl Odonata faunájának ismeretéhez. (Data to the knowledge of Odonata fauna of West-Transdanubia.) – *Folia historico-naturalia Musei Matraensis*, 17: 167–172.
- AMBRUS, A., BÁNKUTI, K. & KOVÁCS, T. (1992): A Kisalföld és a Nyugat-Magyarországi peremvidék odonata faunája. (The Odonata fauna of Kisalföld and the West-Hungarian marginal zone.) – *A Győr-Moson-Sopron megyei múzeumok kiadványa, Győr, Tanulmányok*, 2: 1–81.
- BAUERNFEIND, E., KOVÁCS, T. & AMBRUS, A. (2005): Collection of adult mayflies (Ephemeroptera) of the Mátra Museum, Hungary. – *Folia historico-naturalia Musei Matraensis*, 29: 91–94.
- JAKAB, T. & DÉVAL, GY. (2008): A folyami szitakötők (Odonata: Gomphidae) előfordulása Magyarországon a lárva- és exuviumadatok alapján (The occurrence of the riverine dragonfly-species (Odonata: Gomphidae) in Hungary according to data of larvae and exuviae.) – *Acta Biologica Debrecina, Supplementum Oecologica Hungarica*, 18: 53–65.
- KOVÁCS, T. (2005a): Data to the distribution of four species of Baetis in Hungary, based on larvae (Ephemeroptera: Baetidae). – *Folia historico-naturalia Musei Matraensis*, 29: 95–100.
- KOVÁCS, T. (2005b): Data to the Hungarian mayfly (Ephemeroptera) fauna arising from collectings of larvae III. – *Folia historico-naturalia Musei Matraensis*, 29: 101–110.
- KOVÁCS, T. (2006a): Data to the Hungarian mayfly (Ephemeroptera) fauna arising from collectings of larvae IV. – *Folia historico-naturalia Musei Matraensis*, 30: 143–158.
- KOVÁCS, T. (2006b): Faunistical results of the Ephemeroptera investigations carried out in the frames of the ecological survey of the surface waters of Hungary (ECOSURV) in 2005. – *Folia historico-naturalia Musei Matraensis*, 30: 325–331.
- KOVÁCS, T. (2007a): Re-identification of four mayfly species from Hungary (Ephemeroptera). – *Folia historico-naturalia Musei Matraensis*, 31: 131–132.
- KOVÁCS, T. (2007b): Data to the distribution of three species of Electrogena in Hungary, based on larvae (Ephemeroptera: Heptageniidae). – *Folia historico-naturalia Musei Matraensis*, 31: 133–137.
- KOVÁCS, T., AMBRUS, A. & BÁNKUTI, K. (1999): Data to the Hungarian mayfly (Ephemeroptera) fauna arising from collectings of larvae. – *Folia historico-naturalia Musei Matraensis*, 23: 157–170.
- KOVÁCS, T., AMBRUS, A. & JUHÁSZ, P. (2006): Lárva és exuvium adatok Magyarország Odonata aunájához II. (Larval and exuvial data to the Odonata fauna of Hungary II.) – *Folia historico-naturalia Musei Matraensis* 30: 167–179.
- MÓRA, A., JUHÁSZ, P., KISS, B. & MÜLLER, Z. (2006): Faunistical results of the Trichoptera investigations carried out in the frames of the ecological survey of the surface waters of Hungary (ECOSURV) in 2005. – *Folia historico-naturalia Musei Matraensis*, 30: 359–367.

- MÜLLER, Z., JUHÁSZ, P. & KISS, B. (2006): Faunistical results of the Odonata investigations carried out in the frames of the ecological survey of the surface waters of Hungary (ECOSURV) in 2005. – *Folia historico-naturalia Musei Matraensis*, 30: 333–338.
- NÓGRÁDI, S. & UHERKOVICH, Á. (1989): On the caddisfly fauna of the Kőszeg Mountains, Hungary (Trichoptera). – *A Janus Pannonius Múzeum Évkönyve*, 33(1988): 35–42.
- NÓGRÁDI, S. & UHERKOVICH, Á. (1992): Újabb vizsgálatok a Kőszegi-hegység Trichoptera faunáján. [Recent studies on the Trichoptera fauna on the Kőszeg Mountains.] – *Savaria, A Vas megyei Múzeumok Értesítője*, 20(2): 149–157.
- NÓGRÁDI, S. & UHERKOVICH, Á. (2002): Magyarország tegzesei (Trichoptera). (The Caddisflies of Hungary (Trichoptera).) – *Dunántúli Dolgozatok Természettudományi Sorozat*, 11: 1–386.
- ROZNER, GY., LÖKKÖS, A. & FERINCZ, Á. (2010): Preliminary studies on the distribution of Large Golden Ringed Dragonfly (*Cordulegaster heros* Theischinger, 1979) and Golden Ringed Dragonfly (*Cordulegaster bidentata* Selys, 1843) in the Kőszeg-mountains. – *Folia historico-naturalia Musei Matraensis*, 34: 37–40.

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