

New faunistic records of Hydroptilidae (Insecta, Trichoptera) from the Czech Republic.

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Abstract: Two species, *Orthotrichia angustella* (McLachlan, 1865) and *Oxyethira tristella* Klapálek, 1895, previously considered to be regionally extinct in the Czech Republic, are reported from the Dyje River (South Moravia) as new records for Moravia. *Hydroptila martini* Marshall, 1977 and *Oxyethira falcata* Morton, 1893 endangered species are for the first time recorded from Moravia (incl. Silesia). New faunistic data on rare species *Hydroptila occulta* (Eaton, 1873) and *Hydroptila tineoides* Dalman, 1819 are also provided.

Key words: Hydroptilidae, faunistics, Czech Republic, Moravia, Silesia, *Oxyethira tristella*, *Orthotrichia angustella*, new records, rare species

Introduction

Family Hydroptilidae is the largest caddisfly family in species diversity, with about 2,000 described species, but the smallest in terms of body size (adults body size is about 1.5–5 mm) (Holzenthall *et al.* 2007). Due to the small body size and difficult identification in larval stage, species of this family may be overlooked during routine monitoring and studies. Moreover, relatively little is known about real distribution or abundance, and about ecological requirements of great number of species.

Eight genera and 29 species of this family are known from the territory of the Czech Republic (Chvojka & Komzák 2008; Komzák & Kroča 2011; Chvojka *et al.* 2016). Of these, 6 species are considered to be critically endangered (CR), 7 species endangered (EN) and 1 species vulnerable (VU) according to the Red List of threatened species of the Czech Republic (Chvojka & Komzák 2017). Two species *Oxyethira tristella* and *Orthotrichia angustella* were regarded as regionally extinct (RE) until now. New records of some rare and threatened species of family Hydroptilidae from Moravia (incl. Silesia, the Czech Republic) are presented in this paper.

Material and methods

Adults were collected by sweeping riparian vegetation, by using light or light trap situated near water biotope, or by Malaise traps (Barták's type) placed across the streams. The material was preserved in 70% alcohol and deposited in authors' collections. Locality data are quoted together with grid mapping (in parentheses) which follow Pruner & Mika (1996).

Abbreviations used in the text: S – south; N – north; W – west; E – east; MT – Malaise trap; L – light or light trap; SW – sweeping; CR – critically endangered; EN – endangered; VU – vulnerable; RE – regionally extinct; DD – data deficient; PLA – Protected Landscape Area; NNM – National Nature Monument; NM – Nature Monument; NR – Nature Reserve.

Results and discussion

Hydroptila martini Marshall, 1977

Material examined: Moravice River below Kružberk Reservoir, Kružberk (6171), 49°49'28"N, 17°39'55"E, 400 m a.s.l., 4.viii.2012, 5 ♂♂ 30 ♀♀, L, P. Komzák leg., det. et coll.; Kružberk Reservoir near the dam, Svatoňovice (6171), 49°49'21"N, 17°39'33"E, 430 m a.s.l., 4.viii.2012, 2 ♂♂ 266 ♀♀, L, P. Komzák leg., det. et coll.; cut off stream branch of the Morávka River in Skalická Morávka NNM, NW of Vyšní Lhoty (6376), 49°38'28"N, 18°26'23"E, 362 m a.s.l., 20.vi.–29.ix.2011, 39 ♂♂; 13.vii.–20.x.2013, 25 ♂♂; 21.vi.–28.ix.2015, 48 ♂♂; 26.vii.–20.ix.2017, 32 ♂♂, all MT, J. Kroča leg., det. et coll.

Hydroptila martini was described by Marshall as late as in 1977 and previously it was confused with a closely related species *Hydroptila occulta*. *H. martini* is a European species, known from Ireland to Bosnia (Malicky 1996). In Denmark adults were reared from larvae living in small, slow-flowing streams rich in macrophytes (Wiberg-Larsen & Holm 1999) and from the Island of Gotland (first record in Sweden) it was referred from cool, lime-rich little streams (Gullefors & Johanson 2007). Hohmann (1999) recorded *H. martini* in Germany along an upper stretch of a stream with plenty of macrophytes and considered it to be rheophilic. During the study of caddisflies living on mosses in Italy, *H. martini* was found to live and pupate in mosses covering hygropetric habitats in waterfalls and stones in streams (Cianficcioni *et al.* 2005). In Central Europe *H. martini* is relatively less frequent and this is why it is listed as an endangered species (EN) in some national Red Lists, e.g. in Austria and Hungary (Malicky 2009; Nógrádi & Uherkovich 2002) as well as in the Czech Republic (Chvojka & Komzák 2017). From the territory of the Czech Republic it was published for the first time by Chvojka & Novák (2001) from two spring biotopes in Bohemia and subsequently by Chvojka & Komzák (2006) from two sites in the Kokořínsko PLA. We presume that specimens recently recorded in the vicinity of the Kružberk Reservoir dam originate from the reservoir outlet with cold hypolimnetic water and the occurrence of mosses. In the Morávka River basin, the species was found only by a cut off stream branch saturated by groundwater. The lotic part of this site is strongly covered with mosses, macrophytes dominate in the lentic part (mainly *Callitriche hamulata*) (Fig. 1 and 2).

New species for Moravia (incl. Silesia).

Hydroptila occulta (Eaton, 1873)

Material examined: Slavič stream above Morávka Reservoir, Morávka (6477), 49°35'1"N, 18°33'7"E, 520 m a.s.l., 23.vi.2008, 1 ♂, L, J. Kroča leg. et coll., det. P. Komzák; 22.v.–27.viii.2017, 5 ♂, MT, J. Kroča leg., det. et coll.; Morávka River 1500 m below Morávka Reservoir, Morávka (6477), 49°35'37"N, 18°31'26"E, 461 m a.s.l., 23.vi.2008, 1 ♂, L, J. Kroča leg. et coll., det. P. Komzák; 8.vii.2012, 7 ♂♂, L, J. Kroča leg., det. et coll.; Vysutý potok brook above the confluence with the Morávka River, Morávka (6377), 49°36'44"N, 18°30'6"E, 438 m a.s.l., 15.viii.–19.ix.2017, 4 ♂♂, MT, J. Kroča leg., det. et coll.; Hlucky potok brook above the confluence with the Morávka River, Morávka (6377), 49°36'24"N, 18°30'23"E, 433 m a.s.l., 13.v.–8.ix.2012, 6 ♂♂, MT, J. Kroča leg., det. et coll.; Morávka River NE of Pražmo (6376), 49°36'40"N, 18°29'45"E, 420 m a.s.l., 2.vi.2008, 1 ♂, L, J. Kroča leg. et coll., det. P. Komzák; 8.vii.2012, 6 ♂♂, L, J. Kroča leg., det. et coll.; Kršle NR - springbrook, Vyšní Lhoty (6376), 49°36'55"N, 18°29'32"E, 453 m a.s.l., 12.vi.–15.vii.2012, 2 ♂♂, MT, J. Kroča leg., det. et coll.; cut off stream branch of the Morávka River, Raškovice (6376), 49°37'19"N, 18°28'34"E, 400 m a.s.l., 21.vi.–13.vii.2013, 1 ♂; 22.viii.–12.ix.2015, 2 ♂♂, all MT, J. Kroča leg., det. et coll.; Morávka River in Skalická Morávka NNM, Nižní Lhoty (6376), 49°38'47"N, 18°25'45"E, 353 m a.s.l., 22.viii.2011, 2 ♂♂; 9.vii.2012, 4 ♂♂; 27.vii.2012, 3 ♂♂; 20.vi.2013, 1036 ♂♂; 19.viii.2013, 104 ♂♂, all L, J. Kroča leg., det. et coll.; 26.v.–12.x.2017, 40 ♂♂, MT, J. Kroča leg., det. et coll.; cut off stream branch of the Morávka River in Skalická Morávka NNM, Skalice-Záhoří (6376), 49°38'45"N, 18°25'38"E, 353 m a.s.l., 25.vi.–6.x.2009, 39 ♂♂; 2.vi.–13.ix.2013, 9 ♂♂; 30.v.–13.ix.2015, 12 ♂♂; 17.vi.–20.ix.2017, 18 ♂♂, all MT, J. Kroča leg., det. et coll.; cut off stream branch of the Morávka River in Skalická Morávka NNM, SE of Skalice-Záhoří (6376), 49°38'27"N, 18°26'00"E, 360 m a.s.l., 22.vi.–13.ix.2013, 4 ♂♂; 21.vi.–8.viii.2015, 3 ♂♂; 17.vi.–5.vii.2017, 1 ♂♂, all MT, J. Kroča leg., det. et coll.; cut off stream branch of the Morávka River in Skalická Morávka NNM, NW of Vyšní Lhoty (6376), 49°38'28"N, 18°26'23"E, 362 m a.s.l., 20.vi.–29.ix.2011, 8 ♂♂; 21.vi.–13.ix.2013, 16 ♂♂; 30.v.–18.vii.2015, 6 ♂♂; 5.vii.–20.ix.2017, 4 ♂♂, all MT, J. Kroča leg., det. et coll.; Bahno brook, Raškovice (6376), 49°38'3"N, 18°26'7"E, 370 m a.s.l., 13.v.–7.ix.2012, 7 ♂♂; 22.vi.–13.ix.2013, 19 ♂♂, all MT, J. Kroča leg., det. et coll.;

Bahno brook above Skalice-Záhoří (6376), 49°38'35"N, 18°25'32"E, 358 m a.s.l., 13.v.–7.ix.2012, 5 ♂♂; 27.vii.–13.ix.2013, 3 ♂♂, all MT, J. Kroča leg., det. et coll.; Bahno brook below Skalice-Záhoří (6376), 49°38'54"N, 18°25'29"E, 348 m a.s.l., 13.v.–23.vi.2012, 1 ♂♂; 22.vi.–13.vii.2013, 3 ♂♂, all MT, J. Kroča leg., det. et coll.; Osiník brook above Nošovice (6376), 49°39'10"N, 18°26'17"E, 356 m a.s.l., 22.vi.–13.vii.2013, 1 ♂♂, MT, J. Kroča leg., det. et coll.; Morávka River in Profil Morávky NM, Staré Město (6376), 49°40'7"N, 18°23'16"E, 307 m a.s.l., 7.vii.2013, 12 ♂♂, L, J. Kroča leg., det. et coll.; Kamenec NM, Dobrá (6376), 49°40'35"N, 18°23'40"E, 320 m a.s.l., 12.vi.–18.vi.2016, 2 ♂♂, MT, J. Kroča leg., det. et coll.; Morávka River above the confluence with the Ostravice River, Staré Město (6376), 49°40'20"N, 18°21'32"E, 290 m a.s.l., 7.vii.2013, 17 ♂♂, L, J. Kroča leg., det. et coll.

Hydroptila occulta is widely distributed in Europe and Turkey and also known from Central Asia. It is a rare species in the Czech Republic, firstly recorded by Klapálek (1894, 1901) from Bohemia and rediscovered relatively recently in the Orlice and Velička Rivers (Chvojka *et al.* 2009). In the Czech Republic and some other Central European countries (e.g. Austria and Hungary) *H. occulta* is listed as endangered (EN) in national Red Lists (Chvojka & Komzák 2017; Malicky 2009; Nógrádi & Uherkovich 2002). New data suggest that *H. occulta* is rather common in the Morávka River basin. It was recorded in the whole submontane stretch of the Morávka River, with highest numbers in the Skalická Morávka NNM, and it flies also along most of the tributaries (Kroča 2013, 2016). However, it is unlikely that all these tributaries are inhabited by the species (e.g. Osiník brook, Kršle NR, and Kamenec NM).

Hydroptila tineoides Dalman, 1819

Material examined: Moravice River below Kružberk Reservoir, Kružberk (6171), 49°49'28"N, 17°39'55"E, 400 m a.s.l., 4.viii.2012, 2 ♀♀, L, P. Komzák leg., det. et coll.; Kružberk Reservoir near the dam, Svatoňovice (6171), 49°49'21"N, 17°39'33"E, 430 m a.s.l., 4.viii.2012, 2 ♀♀, L, P. Komzák leg., det. et coll.; Morávka River 1500 m below Morávka Reservoir, Morávka (6477), 49°35'37"N, 18°31'26"E, 461 m a.s.l., 8.vii.2012, 37 ♀♀; 22.viii.2013, 1 ♂ 7 ♀♀, all L, J. Kroča leg., det. et coll.; Vysutý potok brook in Vysutý NM, Morávka (6377), 49°37'22"N, 18°30'18"E, 553 m a.s.l., 26.v.–6.vii.2017, 1 ♂ 1 ♀, MT, J. Kroča leg., det. et coll.; Vysutý potok brook above the confluence with the Morávka River, Morávka (6377), 49°36'44"N, 18°30'6"E, 438 m a.s.l., 16.vi.–27.vii.2017, 3 ♂♂ 10 ♀♀, MT, J. Kroča leg., det. et coll.; Hlucký potok brook above the confluence with the Morávka River, Morávka (6377), 49°36'24"N, 18°30'23"E, 433 m a.s.l., 13.v.–23.vi.2012, 1 ♂, MT, J. Kroča leg., det. et coll.; Morávka River NE of Pražmo (6376), 49°36'40"N, 18°29'45"E, 420 m a.s.l., 8.vii.2012, 64 ♀♀; 22.viii.2013, 35 ♀♀, L, J. Kroča leg., det. et coll.; wetland E of Pražmo (6376), 49°36'24"N, 18°29'50"E, 430 m a.s.l., 26.vii.–14.viii.2017, 1 ♀, MT, J. Kroča leg., det. et coll.; cut off stream branch of the Morávka River, Raškovice (6376), 49°37'19"N, 18°28'34"E, 400 m a.s.l., 1.vi.–21.vi.2013, 1 ♂; 22.viii.–12.ix.2015, 3 ♂♂, all MT, J. Kroča leg., det. et coll.; Morávka River in Skalická Morávka NNM, Nižní Lhoty (6376), 49°38'47"N, 18°25'45"E, 353 m a.s.l., 22.viii.2011, 3 ♂♂ 11 ♀♀; 9.vii.2012, 21 ♀♀; 27.vii.2012, 17 ♂♂ 246 ♀♀; 20.vi.2013, 65 ♂♂ 593 ♀♀; 19.viii.2013, 40 ♂♂ 475 ♀♀, all L, J. Kroča leg., det. et coll.; 11.v.–28.viii.2017, 13 ♂♂ 10 ♀♀, MT, J. Kroča leg., det. et coll.; cut off stream branch of the Morávka River in Skalická Morávka NNM, Skalice-Záhoří (6376), 49°38'45"N, 18°25'38"E, 353 m a.s.l., 12.v.–21.viii.2009, 3 ♂♂ 6 ♀♀; 10.v.–23.viii.2013, 7 ♂; 29.iv.–8.viii.2015, 10 ♂♂ 5 ♀♀; 17.vi.–28.viii.2017, 2 ♂♂ 1 ♀, all MT, J. Kroča leg., det. et coll.; cut off stream branch of the Morávka River in Skalická Morávka NNM, SE of Skalice-Záhoří (6376), 49°38'27"N, 18°26'00"E, 360 m a.s.l., 21.v.–20.vi.2011, 5 ♂♂ 2 ♀♀; 10.v.–23.viii.2013, 3 ♂♂ 4 ♀♀; 17.v.–28.ix.2015, 1 ♂ 4 ♀♀; 26.v.–5.vii.2017, 8 ♂♂ 4 ♀♀, all MT, J. Kroča leg., det. et coll.; cut off stream branch of the Morávka River in Skalická Morávka NNM, NW of Vyšní Lhoty (6376), 49°38'28"N, 18°26'23"E, 362 m a.s.l., 20.v.–4.xi.2011, 265 ♂♂ 415 ♀♀; 9.v.–4.x.2013, 14 ♂♂ 15 ♀♀; 16.v.–28.ix.2015, 29 ♂♂ 26 ♀♀; 26.v.–14.viii.2017, 7 ♂♂ 6 ♀♀, all MT, J. Kroča leg., det. et coll.; Bahno brook, Raškovice (6376), 49°38'3"N, 18°26'7"E, 370 m a.s.l., 9.v.–1.vi.2013, 2 ♂♂, MT, J. Kroča leg., det. et coll.; Bahno brook, Raškovice (6376), 49°38'3"N, 18°26'7"E, 370 m a.s.l., 13.v.–7.ix.2012, 5 ♂♂ 1 ♀; 10.v.–13.ix.2013, 7 ♂♂ 11 ♀♀, all MT, J. Kroča leg., det. et coll.; Bahno brook below Skalice-Záhoří (6376), 49°38'54"N, 18°25'29"E, 348 m a.s.l., 13.v.–10.x.2012, 1 ♂ 4 ♀♀; 27.vii.–23.viii.2013, 1 ♂ 1 ♀, all MT, J. Kroča leg., det. et coll.; Morávka River in Profil Morávky NM, Staré Město (6376), 49°40'7"N, 18°23'16"E, 307 m a.s.l., 7.vii.2013, 1 ♀; 23.viii.2013, 1 ♀, all L, J. Kroča leg., det. et coll.

Hydroptila tineoides is widely distributed from Europe and Turkey to Central Asia but it is very rare in the Czech Republic (CR – Chvojka & Komzák 2017) and considered to be threatened also in some other Central European countries as Austria (EN – Malicky 2009) and Hungary (EN – Nógrádi & Uherkovich 2002). Historically published records are from eastern and central Bohemia from the end of the 19th century (Klapálek 1891, 1892, 1894, 1901).

The species was recently rediscovered by Komzák & Kroča (2011) in the Morávka River and its tributary. New data suggest that *H. tineoides* is a relatively common species in the Morávka River basin. It was recorded in the whole submontane stretch of the Morávka River, with highest numbers in the Skalická Morávka NNM (together with *H. occulta*), and also along some of the tributaries (Kroča 2013). The species was caught also in the Nízký Jeseník Mts. by the Moravice River and Kružberk Reservoir.

***Orthotrichia angustella* (McLachlan, 1865)**

Material examined: Dyje River S of Hevlín (7264), 48°44'41"N, 16°23'07"E, 180 m a.s.l., 8.ix.2017, 16 ♂♂ 5 ♀♀, SW, P. Komzák leg., det. et coll.; Dyje River S of Dyjákovice (7263), 48°44'42"N, 16°18'45"E, 184 m a.s.l., 18.ix.2018, 3 ♂♂ 1 ♀, SW, P. Komzák leg., det. et coll.

Orthotrichia angustella is known from most of Europe and North Africa. It prefers middle and lower stretches of lowland rivers or littoral of stagnant waters (Graf *et al.* 2008). Even in the neighbouring countries there are very few findings of this species. It was published from Austria for the first time also very recently (Graf *et al.* 2017). Nevertheless, Uherkovich & Nógrádi (1999) referred high numbers (subdominant species) of this rare species (endangered in Hungary – Nógrádi & Uherkovich (2002)) captured along an artificial watercourse formed as a result of karst water pumping in the mining area in Central Hungary. *O. angustella* was commonly collected by Klapálek at the end of the 19th century in the vicinity of the Vltava River in Prague and the Elbe near Neratovice (e.g. Klapálek 1891, 1894). Even in the 1930s Mayer (1936) found several males by the pond Loviště near Vodňany. However, since that time this species has been missing (RE - Chvojka & Komzák 2017). The population found in the Dyje River (Fig. 3) is the only known recent occurrence of this species in the Czech Republic.

New species for Moravia.

***Oxyethira tristella* Klapálek, 1895**

Material examined: Dyje River SE of Jevišovka (7164), 48°49'27"N, 16°28'13"E, 175 m a.s.l., 8.ix.2017, 1 ♂, SW, P. Komzák leg., det. et coll.

Oxyethira tristella was described by Klapálek (1895) from the Zlatá stoka channel near Třeboň (Southern Bohemia), where it was very abundant. In the following years the species was collected also at other sites around Třeboň (Klapálek 1897). Since then, it had not been recorded in the territory of the Czech Republic and was therefore considered to be regionally extinct (RE - Chvojka & Komzák 2017). Now it was rediscovered by the Dyje River near the village of Jevišovka. This European species is known from Hungary and Austria to Scandinavia and from the Great Britain and Ireland through Germany to Belarus in the east. However, in surrounding countries the species is quite rare. From Poland it was for the first time reported as late as in 2002 (Wiberg-Larsen & Czachorowski 2002), in Hungary it was firstly reported by Nógrádi (1994), and there is no evidence of its occurrence in Slovakia. The latest, and also the closest from the geographic point of view, is the record from Dürnrohr (near the Danube River) in Lower Austria, which is only the second finding of this species in Austria (Graf *et al.* 2017). *O. tristella* is mostly reported from overgrown slow-flowing or standing waters, which corresponds with the known affinity of the genus to aquatic macrophytes (Graf *et al.* 2008). Such conditions are also in the stretch of the Dyje River near Jevišovka, which has been heavily overgrown by macrophytes in recent years, especially by several species of the genus *Potamogeton* and by *Myriophyllum spicatum*, *Butomus umbellatus*, *Ceratophyllum demersum* etc. (Fig.4).

New species for Moravia.

***Oxyethira falcata* Morton, 1893 EN**

Material examined: Cut off stream branch of the Morávka River in Skalická Morávka NNM, SE of Skalice-Záhoří (6376), 49°38'27"N, 18°26'00"E, 360 m a.s.l., 19.iv.–11.v.2017, 1 ♀♀, MT, J. Kroča leg., det. et coll.; cut off stream branch of the Morávka River in Skalická Morávka NNM, NW of Vyšní Lhoty (6376), 49°38'28"N, 18°26'23"E, 362 m a.s.l., 21.vi.2015–3.i.2016, 35 ♂♂ 158 ♀♀; 26.v.–17.vi.2017, 1 ♂, all MT, J. Kroča leg., det. et coll.

Oxyethira falcata is a widely distributed Eastern and Western Palearctic species that seems to be rather rare in Central Europe. From Germany it was reported by Hohmann (1999), from Austria firstly recorded by Graf *et al.* (1998), recently by Graf *et al.* (2017), and only an old record by Mayer (1937) is known from Slovakia. It seems to be more frequent in Hungary, where the species is considered to be vulnerable (VU) (Nógrádi & Uherkovich 2002). Nevertheless, Uherkovich & Nógrádi (1999) referred high numbers (dominant species) of *O. falcata*, usually uncommon species in Hungary, captured along an artificial watercourse formed as a result of karst water pumping in mining area in Central Hungary. *O. falcata* is listed as data deficient (DD) in Austrian Red List (Malicky 2009) and endangered (EN) in the Czech Republic (Chvojka & Komzák 2017) where it was reported from channels in the vicinity of Třeboň (Southern Bohemia) at the end of the 19th century (Klapálek 1894, 1897) and recently from seepages at post-mining spoil heaps in the Sokolov brown-coal basin (Chvojka 1996, Polášková *et al.* 2017). The species has wide ecological valences in terms of stream zonation (from eucrenal to metarhithral and littoral) and altitude preference (from planar to montane zone) (Graf *et al.* 2008). In the Morávka basin, the species was found in Skalická Morávka NNM by cut off stream branches saturated by groundwater (Fig. 1 and 2). New species for Moravia (incl. Silesia).

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Nové faunistické záznamy z čeledi Hydroptilidae (Insecta, Trichoptera) z území České republiky

Z našeho území je známo 8 rodů a 29 druhů čeledi Hydroptilidae. Znalosti o rozšíření, hojnosti a ekologických nárocích řady druhů jsou však nedostatečné, což může být dáno přehlížením těchto drobných chrostíků (velikost těla dospělců do 5 mm) i obtížnou determinací larev. Tato práce přináší nové údaje o rozšíření některých vzácných druhů z této čeledi na Moravě (včetně Slezska).

Orthotrichia angustella, druh sbíraný na konci 19. století běžně kolem toku Vltavy a Labe a v poslední době považovaný na našem území za vyhynulý, byl znovuobjeven v řece Dyji v oblasti Hevlína a Dyjákovice, což je zároveň první nález na Moravě. Za vyhynulý byl považován i druh *Oxyethira tristella*, který se podařilo zachytit u vodními rostlinami hojně zarostlého úseku Dyje poblíž obce Jevišovice (první nález na Moravě). Poprvé na Moravě (včetně Slezska) byly zjištěny i ohrožené druhy *Oxyethira falcata* a *Hydroptila martini*. Druh *O. falcata*, známý v současnosti v ČR jen z výsypek na Sokolovsku, byl sbírán na odstavených ramenech sycených podzemní vodou v Národní přírodní památce Skalická Morávka. *Hydroptila martini*, druh recentně sbíraný v ČR dosud jen velmi vzácně na prameništích biotopech v Čechách, byl ve velkých počtech chytán na světlo u řeky Moravice a poblíž hráze vodní nádrže Kružberk. Předpokládáme, že obývá řeku Moravici pod nádrží, kde mu vyhovují nízká teplota vypouštěné hypolimnické vody a porosty mechů. Druh byl ve větším počtu sbírán i v NPP Skalická Morávka u odstaveného ramene, syceného podzemní vodou a hojně zarostlého mechy i další vodní vegetací (zejména *Callitriche hamulata*). Byl prokázán poměrně hojný výskyt vzácných druhů *Hydroptila occulta* a *Hydroptila tineoides* v celém podhorském úseku řeky Morávky (s těžištěm výskytu v oblasti NPP Skalická Morávka), kde byl sbírán i podél některých menších přítoků (zde však mohlo jít pouze o zálet z hlavního toku). Druh *H. tineoides* se méně hojně vyskytoval i v okolí řeky Moravice u nádrže Kružberk.



Fig 1: The lotic part of cut off stream branch of the Morávka River in Skalická Morávka NNM, NW of Vyšní Lhoty, site of occurrence *Hydroptila martini*, *H. occulta*, *H. tineoides* and *Oxyethira falcata*. Photo Jiří Kroča.

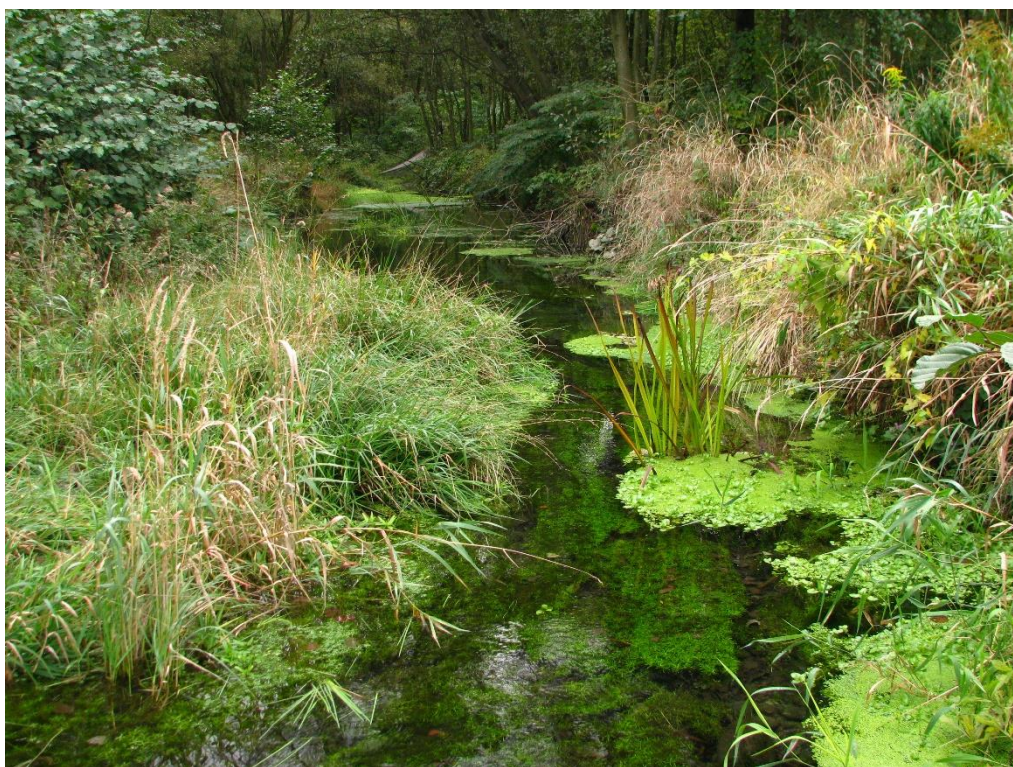


Fig 2: The lentic part of cut off stream branch of the Morávka River in Skalická Morávka NNM, NW of Vyšní Lhoty, site of occurrence *Hydroptila martini*, *H. occulta*, *H. tineoides* and *Oxyethira falcata*. Photo Jiří Kroča.



Fig 3: The stretch of the Dyje River with occurrence of *Orthotrichia angustella*. Photo Stanislav Větríček.



Fig 4: The Dyje River near the village of Jevišovka, where *Oxyethira tristella* was recorded. Photo Petr Komzák.

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