

**First record of larvae of *Cordulegaster heros* (Odonata: Cordulegastridae)
in the Czech Republic**

První nález larev *Cordulegaster heros* (Odonata: Cordulegastridae) v České republice

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Abstract. Two larvae of *Cordulegaster heros* (Theischinger, 1979) were found on 15th October 2011 at locality Kudlovice village – the Kudlovický potok stream and Jankovice village – the Jankovický potok stream on the southern slopes of the Chřiby Hills in the Czech Republic. The finding of larvae shows the permanent occurrence of species in the Czech Republic.

INTRODUCTION

Cordulegaster heros (Theischinger, 1979) is in the centre of faunistic-ecological investigation in last years (cf. KOTARAC 1997; BOUDOT 2001; BEDJANIČ & ŠALAMUN 2003; BLAŠKOVÍČ et al. 2003; HOLUŠA 2005, 2007a, b, 2009; KOTARAC et al. 2006; TÓTH 2006; JANSKÝ & DAVID 2008; SCHWEIGHOFER 2008; CSORDÁS et al. 2009; HOLUŠA & KÚDELA 2010; STAUFER & HOLUŠA 2010).

Cordulegaster heros was described by THEISCHINGER (1979) with place of type material – Niederösterreich (Andrä vor dem Hagnethal) in central Europe. *C. heros* occurs in a part of the Eastern Mediterranean – the Balkan Peninsula (including Greece, Macedonia, Montenegro, Albania, Croatia, Slovenia, Serbia, Bosnia and Herzegovina, Bulgaria, eastern Italy and Romania) up to the central Europe – foothills of the Alps in the eastern Austria and foothills of the Carpathians Mts. (BOUDOT 2001; VAN PELT 2006; BOUDOT et al. 2009). In Austria the species occurs in the southwestern Waldviertel (district Melk) at its northwestern area border (RAAB et al. 2006; SCHWEIGHOFER 2008). So far known the northernmost occurrence of permanent populations lies in Slovakia in the Malé Karpaty Mts. and in the Borská nížina Lowland in western part of Slovakia (BLAŠKOVÍČ et al. 2003; JANSKÝ & DAVID 2008; HOLUŠA & KÚDELA 2010), and in central Slovakia in the surroundings of Revúca town (HOLUŠA & KÚDELA 2010). Species was found also in 2009 (one dead female) in the territory of the Czech Republic (STAUFER & HOLUŠA 2010). This record has been absolutely northernmost occurrence so far, however STAUFER & HOLUŠA (2010) „classified“ this records as an occasional „visit“, nevertheless they conceded the potential occurrence of not numerous permanent population.

The species habitats are smaller meandering streams in cultural landscape or in forest complexes (cf. KOTARAC 1997; JANSKÝ & DAVID 2008; HOLUŠA & KÚDELA 2010). The knowledge on occurrence and ecology of this species is very important also from the perspective of its listing among the species requiring protection – Council Directive No. 92/43/EEC. Aim of this paper is to introduce a significant finding as a result of intensive research of *Cordulegaster* species in the Czech and Slovak Republics. Detailed methodology with preliminary evaluation of ecological requirements of *Cordulegaster heros* was published by HOLUŠA (2009).

MATERIAL

One larva of male of *Cordulegaster heros* (Fig. 2) was found on 15th October 2011 in Kudlovice village at the locality of the Kudlovický potok stream (code of grid mapping 6870, 49°10'11''N, 17°25'52''E, 253 m a.s.l) (Fig. 3), second larva of male was found in Jankovice village at the locality of the Jankovický potok stream (6870, 49°09'44''N, 17°22'37''E, 309 m a.s.l) at foothills of the Chřiby Hills in the region of South Moravia. Document specimen is stored in coll. O. Holuša.

Both sites are medium wide streams (width 90-150 cm), with rocky shallow watersheds with alluvial deposits of fine sand. Both sites are surrounded by forests composed of *Alnus glutinosa* (L.) Gaertn., *Fraxinus excelsior* L., *Carpinus betulus* L., *Fagus sylvatica* L. and *Acer pseudoplatanus* L. As regards other species of dragonflies, occurrence of *Calopteryx virgo* (Linnaeus, 1758) larvae was also observed.

REMARKS

The occurrence of species in the Czech Republic has long been presumed (HOLUŠA 2005, 2007a, b). As in Slovakia, the occurrence of species in the Czech Republic has been expected in regions with suitable habitats – i.e. in the belt of regions on the forested southern slopes of the Carpathians Mts., especially regions without interruption of large lowlands. The Chřiby Hills area belongs to the regions with the potential occurrence of species.

Confirmation of occurrence in the Czech Republic is dated in 2009, when was discovered one dead female in the Buchlovický potok stream in Buchlovice village (code of grid mapping 6970) (STAUFER & HOLUŠA 2010) (Fig. 1.). However, extensive contemporary research of watercourses in the Chřiby Hills did not bring positive results. The authors therefore believed that it is just finding a migrant from one of the Slovak populations, nevertheless did not exclude its occurrence and hypothesized the occurrence of very small population (STAUFER & HOLUŠA 2010). The findings „only“ 2 larvae can confirm hypothesis of small populations, because the streams were studied in detail section of 100 m. On the other hand all suitable streams in the Chřiby Hills have been explored.

Characters of sites fully respond current knowledge on the occurrence of the species (KOTARC 1997; RAAB et al. 2006; HOLUŠA & KÚDELA 2010). Both sites are situated in the lowest places of the forested part of the Chřiby Hills – i.e. in the interval of 200-350 m a.s.l. The only lack of observed streams concerned the sediments for the occurrence of larvae. Both streams have relatively less sediments in stream beds and riverbeds are rockier. Because this species is included in the list of species in Council Directive No. 92/43/EEC, the population monitoring is required also in the territory of the Czech Republic, primarily to assess their potential threat.

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REFERENCES

- ASKEW R. R. 1988: The Dragonflies of Europe. Harley Books, Colchester, 291 pp.
- BEDJANIĆ M. & ŠALAMUN A. 2003: Large golden-ringed dragonfly *Cordulegaster heros* Theischinger 1979, new for the fauna of Italy (Odonata: Cordulegastridae). *Natura Sloveniae*, 5(2): 19-29.
- BLAŠKOVIČ T., BULÁNKOVÁ E. & ŠIBL J. 2003: First record of *Cordulegaster heros* ssp. *heros* Theischinger, 1979 (Cordulegastridae, Odonata) from Slovakia. *Biologia (Bratislava)*, 58(2): 293-294.
- BOUDOT J. P. 2001: Les *Cordulegaster* du Paléarctique occidental: identification et répartition (Odonata, Anisoptera, Cordulegastridae). *Martinia* 17: 1-34.
- BOUDOT J. P., KALKMAN V., AZPILICUETA AMORÍN M., BOGDANOVIĆ T., RIVERA A. C., DEGABRIELE G., DOMMANGET J. L., FERREIRA S., GARRIGÓS B., JOVIĆ M., KOTARAC M., LOPAU W., MARINOV M., MIHOKOVIĆ N., RISERVATO E., SAMRAOUI B. & SCHNEIDER W. 2009: Atlas of the Odonata of the Mediterranean and North Africa. *Libellula Supplement* 9: 1-256.
- Council Directive No. 92/43/EEC of 21st May 1992 on the conservation of natural habitats and of wild fauna and flora. Annex II and IV. Animal and Plant species of community interest whose conservation requires the designation of special.
- CSORDÁS L., FERINCZ Á., LÖKKÖS A. & ROZNER G. 2009: New data on the distribution of Large Golden Ringed Dragonfly (*Cordulegaster heros* Theischinger, 1979) (Odonata) in Zselic hills. *Natura Somogyiensis*, 15: 53-56.
- HOLUŠA O. 2005: The occurrence of *Cordulegaster* sp. in the Czech Republic – result of influence of habitat ecological factors in different biogeographical regions. In: CORDERO RIVERA A. (ed.): Program and Abstracts. 4th WDA International Symposium of Odonatology. Pontevedra (Spain), 26-30 July 2005, p. 41.
- HOLUŠA O. 2007a: Notes on the distribution of *Cordulegaster* spp. in Central Europe. In: MARTENS A., SAHLÉN G. & MARAIS E. (eds): Abstracts 5th WDA International Symposium of Odonatology. 16-20 April 2007, Swakopmund, Namibia, p. 34.
- HOLUŠA O. 2007b: *Cordulegaster heros* Theischinger, 1979. In: DOLNÝ A., WALDHAUSER M., HOLUŠA O., BARTA D. & HANEL L. 2007: Vážky České republiky. Ekologie, ochrana a rozšíření. Český svaz ochránců přírody, Vlašim, pp. 632-633.
- HOLUŠA O. 2009: The analysis of the habitat of *Cordulegaster heros* on its northern area border in Slovakia. In: Abstracts. 6th WDA International Congress of Odonatology, Xalapa, Veracruz, Mexico, 7-12 June 2009, p. 17.
- HOLUŠA O. & KÚDELA M. 2010: New records of occurrence of *Cordulegaster heros* Theischinger, 1979 in Slovakia. *Acta Musei Beskidensis*, 2: 75-87.
- JANSKÝ V. & DAVID S. 2008: Výskyt vážky *Cordulegaster heros* ssp. *heros* (Odonata: Cordulegastridae) na Slovensku. *Acta Rerum Naturalium Musei Nationalis Slovaciae*, 54: 61-68.
- KOTARAC M. 1997: Atlas kačjiv pastirjev (Odonata) Slovenije z rdečim seznamom: project Slovenskega odonatološkega društva. Atlas faune et florae Sloveniae 1. Center za kartografijo favne in flore, Miklavž na Dravskem polju, 205 pp.
- KOTARAC M., ŠALAMUN A., GOVEDIČ M. & PODGORELEC M. 2006: Popis velikega studenčarja (*Cordulegaster heros*) s predlogom conacije Natura 2000 območja Goričko (SI3000221). Zasnova conacij izbranih Natura 2000 območij (7174201-01-01-0002) (Phare čezmejno sodelovanje Slovenija-Avstrija 2003). Center za kartografijo favne in flore, Miklavž na Dravskem polju. 31 pp.
- RAAB R., CHOVANEC A. & PENNERSTORFER J. 2006: Libellen Österreichs. Springer, Wien, 345 pp.
- SCHWEIGHOFER W. 2008: Syntopes Vorkommen von *Cordulegaster boltonii* und *C. heros* an einem Bach im westlichen Niederösterreich (Odonata: Cordulegastridae). *Libellula*, 27(1/2): 1-32.
- STAUFER M. & HOLUŠA O. 2010: First record of *Cordulegaster heros* in the Czech Republic, with notes on *Cordulegaster* spp. in southern Moravia (Odonata: Cordulegastridae). *Libellula*, 29(3/4): 197-204.
- THEISCHINGER G. 1979: *Cordulegaster heros* sp. nov. und *Cordulegaster heros pelionensis* ssp. nov., zwei neue Taxa des *Cordulegaster boltoni* (Donovan) – Komplexes aus Europa (Anisoptera: Cordulegastridae). *Odonatologica*, 8(1): 23-38.
- TÓTH S. 2006: A ritka hegyiszitakötő (*Cordulegaster heros* Theischinger, 1979) előfordulása a Zselicben. *Natura Somogyiensis*, 9: 141-144.
- VAN PELT G. J. 2006: *Cordulegaster* Leach, 1815 – Goldenrings. In: DIJKSTRA K-D. B. & LEWINGTON R.: Field guide to the dragonflies of Britain and Europe including western Turkey and north-western Africa. British Wildlife Publishing, Gillingham, pp. 210-221.

SOUHRN

Dne 15.X.2011 byly nalezeny 2 larvy druhu *Cordulegaster heros* na lokalitě Kudlovice – Kudlovický potok a Jankovice – Jankovický potok v oblasti jižních svahů Chřibů v České republice. Obě lokality představují středně široké potoky (šířka 90–150 cm), které jsou mělké s kamenitými koryty a náplavem jemného písku. Obě lokality jsou obklopeny lesními porosty ve složení *Alnus glutinosa*, *Fraxinus excelsior*, *Carpinus betulus*, *Fagus sylvatica* a *Acer pseudoplatanus*.

Výskyt na území ČR byl již delší dobu předpokládán (HOLUŠA 2005, 2007a, b) v oblastech na jižních lesnatých svazích Karpat, podobně jak je tomu na Slovensku.

Potvrzení výskytu na území České republiky je datováno do roku 2009, kdy byla nalezena jedna mrtvá samice v Buchlovicích u Buchlovského potoka (kód síťového mapování 6970) (STAUER & HOLUŠA 2010). Dosavadní rozsáhlý průzkum vod v oblasti Chřibů však nepřinesl pozitivní výsledky. Autoři se tedy domnívali, že se jedná jen o nález migranta z jedné ze slovenských populací, nicméně výskyt nevyloučili a vyslovili hypotézu výskytu velmi málo početných populací (STAUER & HOLUŠA 2010). Zjištění „pouze“ 2 larev tuto hypotézu málo početné populace může potvrzovat, jelikož byly na vodotečích podrobně studovány úseky v délce minimálně 100 m na několika místech a také byly prozkoumány všechny vhodné potoky v oblasti Chřibů.

Charakter lokalit plně odpovídá dosavadním znalostem o výskytu druhu (KOTARAC 1997; RAAB et al. 2006; HOLUŠA & KÚDELA 2010). Obě lokality se nacházejí v nejnižších lesnatých místech Chřibů – tj. v intervalu nadmořské výšky 200–350 m. Jediný nedostatek zjištěných lokalit se týká náplavů pro výskyt larev, jelikož oba potoky mají v korytech relativně méně náplavů a koryto je více kamenité.

Vzhledem k tomu, že se jedná o druh, který je zařazen do seznamu druhů Směrnice č. 92/43/EEC je nutný na území ČR provádět monitoring populací *Cordulegaster heros*, především vyhodnotit jejich potenciální ohrožení.

Fig. 1. Map of known occurrence of *Cordulegaster heros* in the Czech Republic
Obr. 1. Mapa známého rozšíření *Cordulegaster heros* v České republice

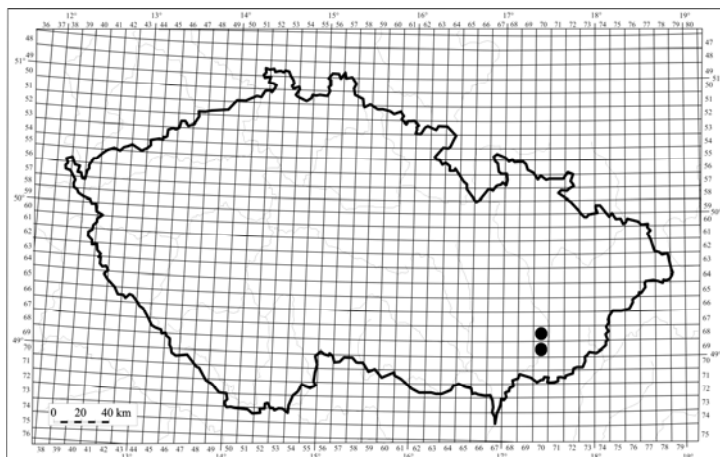


Fig. 2. Larva of male of *Cordulegaster heros* found on 15th October 2011 at the locality of Kudlovice village – the Kudlovický potok stream (photo O. Holuša)

Obr. 2. Larva samce *Cordulegaster heros* nalezena dne 15.X.2011 na lokalitě Kudlovice – Kudlovický potok (foto O. Holuša)



Fig. 3. The locality of Kudlovice village – the Kudlovický potok stream (15th October 2011, photo O. Holuša)

Obr. 3. Lokalita Kudlovice – Kudlovický potok dne 15.X.2011 (foto O. Holuša)

