

## BALKAN GOLDENRING, *CORDULEGASTER HEROS* THEISCHINGER, 1979 (ODONATA: CORDULEGASTRIDAE), A NEW SPECIES OF ODONATA IN THE FAUNA OF BOSNIA AND HERZEGOVINA

SABINA SUĆESKA\* and JESENKO KARAČIĆ

University of Sarajevo, Faculty of Sciences, Department for Biology, Zmaja od Bosne 33-35,  
71000 Sarajevo, Bosnia and Herzegovina

\* E-mail: ssuceska@hotmail.com

### Abstract

In this paper the first data on Balkan goldenring (*Cordulegaster heros* Theischinger, 1979) recorded in Bosnia and Herzegovina are presented. The research into the biodiversity of Odonata was conducted in an area of Boračko Lake during 2011. From 11th July to 29th August 2011, the authors collected five male individuals of *C. heros*.

KEY WORDS: dragonfly, Odonata, Cordulegastroidea, Cordulegastriidae, *Cordulegaster heros*, Bosnia and Herzegovina

### Introduction

The most recent review of faunistical data of Odonata in Bosnia and Herzegovina contains 57 species on Odonata in Bosnia and Herzegovina (JOVIĆ *et al.*, 2010). In this review, authors expected *Cordulegaster heros* Theischinger, 1979 to be recorded in Bosnia and Herzegovina. The species was recorded in all of the neighbouring countries of the central and western Balkans (BOUDOT *et al.*, 2009). "Suitable habitats are positively present in hilly and mountainous parts of Bosnia and Herzegovina so it is expected that future investigation will show the presence of *Cordulegaster heros* Theischinger, 1979 in the territory of this country" (JOVIĆ *et al.*, 2010). Although expected in the territory of Bosnia and Herzegovina, the records of *C. heros* were never before made public.

The general distribution of this species includes the region of South-East Europe where this species is endemic. Variation in the populations of the species *Cordulegaster heros* is manifested as two subspecies, differing only in the size of the black bar on the frons in males, which in ssp. *heros* from Austria, Slovenia,

Hungary and Serbia is at most vaguely indicated, but in ssp. *pelionensis* from Greece, Albania and Bulgaria (DIJKSTRA & LEWINGTON, 2006) is a distinctly rectangular bar.

## Material and Methods

The research into the biodiversity of Odonata was conducted in the area of Boračko Lake (43° 33' 3" N, 18° 2' 7" E) during 2011. Five males of the species *Cordulegaster heros* Theischinger, 1979 (Figs. 1 & 2) were collected on 11<sup>th</sup> July, 13<sup>th</sup> August and 29<sup>th</sup> August 2011, using an entomological net (with telescopic handle and folding ring with a diameter of,  $\Phi$ , 60 cm). The sample was stored in a plastic box filled with 96% Etyl-alcohol. The preparation was done in the Laboratory for Biosystematics of Invertebrata, Hydrobiology and Evolutional Entomology, Department of Biology, Faculty of Science and Mathematics in Sarajevo. The authors used a standard entomological method (the samples were placed in their natural position on the wooden frame and fixed with entomological pins).

Boračko Lake is a glacier lake situated on the northeast side of the Prenj Mountain facing northwest and southeast. It is surrounded by the Crna Gora pick (1343-1595 m a.s.l.) on the west side, Tranjina pick (1055 m a.s.l.) on the east, Kosuta field on the southeast (490 m a.s.l.), and Krstac Hill on the north (750-800 m a.s.l.). The land around Boračko Lake is made of dolomites and dolomites limestone due to the still ongoing karstic process. Boračko Lake is not one of the mountain lakes of the Dinaric Alps as it is placed at only 402 meters above mean sea level (MIHIĆ, 1984).

The determination of the material was carried out according to data by DIJKSTRA & LEWINGTON (2006). The photographs were taken using several technical accessories: the habitat was photographed using a Sony (5,1 Mpixels) digital camera, and the prepared material was photographed using a Canon EOS 5D (50mm and 25mm + flash ring) digital camera.

## Results and Discussion

The area near Boračko Lake was examined in July and August 2011, in daylight from 10:00 a.m. to 04:00 p.m. The examination was done in the broader area around Boračko Lake.

The five samples were caught in the area of the local creek called Boračka River that streams from the northeast side into Boračko Lake (Figs. 3, 4 & 5). The sample was caught while flying 1.5 meters above the water of the Boračka River. The waters of Boračko Lake and the Boračka River are of the oligotrophic type with decreased value of the oxygen saturation (TROŽIĆ – BOROVIĆ, 2003). The Boračka River is situated on a rocky karstic-dolomites base that is surrounded by the lush vegetation of *Quercus-Fagetum* that makes the approach difficult for sampling.

During the research 25 species were found and identified; the most interesting among them is *Cordulegaster heros* Theischinger, 1979, which was previously never recorded in Bosnia and Herzegovina.

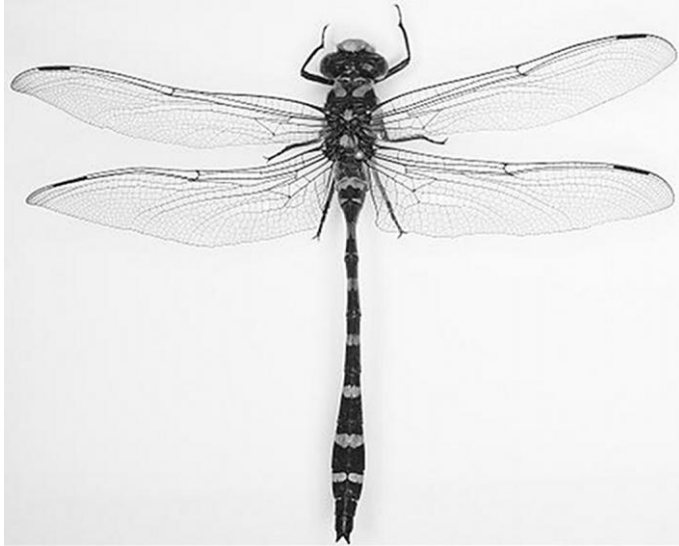


Figure 1. *Cordulegaster heros* Theischinger, 1979, male specimen, Boračko Lake (collected on 11.06.2011, leg. et det. S. Sućeska)

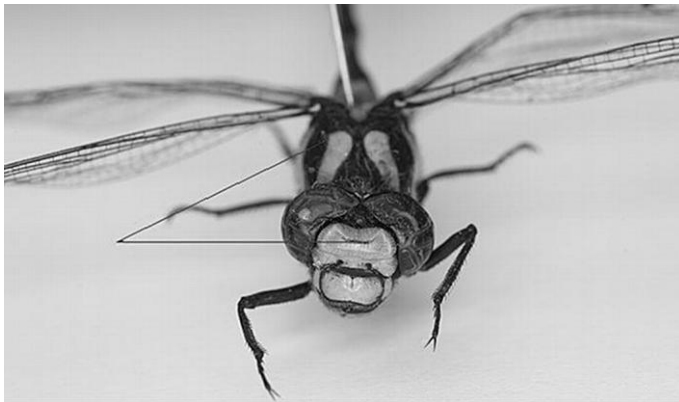


Figure 2. Characters of colour pattern: small black bar on front and outer corners of antehumeral stripes angular.

Below is the list of Odonata found at Boračko Lake and the surrounding area during the research:

Family Calopterygidae

*Calopteryx virgo* (Linnaeus, 1758)

*Calopteryx splendens* (Harris, 1780)

Family Lestidae

*Sympecma fusca* (Vander Linden, 1820)

Family Coenagrionidae

*Ischnura elegans* (Vander Linden, 1820)

*Ischnura pumilio* (Charpentier, 1825)

*Enallagma cyathigerum* (Charpentier, 1840)

*Coenagrion puella* (Linnaeus, 1758)

*Pyrrhosoma nymphula* (Sulzer, 1776)

*Ceriagrion tenellum* (de Villers, 1786)

Family Platycnemididae

*Platycnemis pennipes* (Pallas, 1771)

Family Aeshnidae

*Aeshna mixta* Latreille, 1805

*Aeshna cyanea* (Müller, 1764)

*Aeshna isoceles* (Müller, 1767)

*Anax imperator* Leach, 1815

Family Gomphidae

*Gomphus vugatissimus* (Linnaeus, 1758)

*Onychogomphus forcipatus* (Linnaeus, 1758)

Family Cordulegastridae

*Cordulegaster heros* Theischinger, 1979

*Cordulegaster bidentata* Selys, 1843

Family Corduliidae

*Cordulia aenea* (Linnaeus, 1758)

Family Libellulidae

*Libellula depressa* Linnaeus, 1758

*Libellula fulva* Müller, 1764

*Orthetrum cancellatum* (Linnaeus, 1758)

*Orthetrum coerulescens* (Fabricius, 1798)

*Sympetrum striolatum* (Charpentier, 1840)

*Sympetrum meridionale* (Selys, 1841)

The finding of *C. heros* was expected in Bosnia and Herzegovina as this species is widely present in the Balkan region (Jović *et al.*, 2010). Further examination on Odonata should ensure more data on the presence of the *Cordulegaster heros* Theischinger, 1979 in this country.



Figures 3 & 4. Habitat of the species *Cordulegaster heros* Theischinger, 1979 on the Boračka River (photo: J. Karačić)



Figure 5. Relative location of the findings of the species *Cordulegaster heros* on the map of Bosnia and Herzegovina.

## References

- ADAMOVIĆ, Ž., 1948. La liste de la collection des Odonates du Musee d'Etat a Sarajevo. Godišnjak biološkog instituta u Sarajevu, 1(1): 79-94. [in Serbian, with French s.]
- ADAMOVIĆ, Ž., ANĐUS, LJ. & MIHAJLOVIĆ, LJ., 1996. Odonata (Insecta). In: Karaman G. (ed.): The Fauna of Durmitor, Vol. 5. The Montenegrin Academy of Sciences and Arts, Titograd, pp: 43-80.
- BEDJANIĆ, M., MICEVSKI, N. & MICEVSKI, B., 2008. On the dragonfly collection in the Natural History Museum in Struga, Macedonia (Insecta: Odonata). Biologica Macedonica, 61: 97-105.
- BELANČIĆ, A., BOGDANOVIĆ, T., FRANKOVIĆ, M., LJUŠTINA, M., MIHOKOVIĆ, N. & VITAS, B., 2008. Red data book of dragonflies of Croatia. Ministry of Culture and State Institute for Nature Protection of the Republic of Croatia, Zagreb, 132 pp. [in Croatian, with English s.]
- BESCHOVSKI, V., 1960. Odonata from the Bulgarian Black Sea coast. Bulletin de l'Institut de zoologie et musée, 15: 115-129. [in Bulgarian]

- BOUDOT, J.-P., KALKMAN, V.J., AZPILICUETA AMORIN, M., BOGDANOVIĆ, T., CORDERO RIVERA, A., DEGABRIELE, G., DOMMANGUET, J.-L., FERREIRA, S., GARRIGOS, 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, 256 pp.
- BUKVIĆ, V., 1988. Fauna of dragonflies (Odonata, Insecta) of the Neretva Delta. Diplom work (manuscr.), University of Zagreb, Faculty of sciences and Mathematics, Department of Biology, 41pp. [in Croatian, with English s.]
- DIJKSTRA, K.-D., B. & LEWINGTON, R., 2006. Field Guide to the Dragonflies of Britain and Europe. British Wildlife Publishing, Dorset, 320 pp.
- DUMONT, H.J., 1977. Sur une collection d'Odonates de Yougoslavie, avec notes sur la faune des territoires adjacents de Roumanie et de Bulgarie. *Bull. Ann. Soc. r. belge Ent.*, 113: 187-209.
- JOVIĆ, M., 2008. Report on Adriatic Montenegro 2007 project - Odonata. IDF Report, 15: 1-25.
- JOVIĆ, M., GLIGOROVIĆ, B. & STANKOVIĆ, M., 2010. Review of faunistical data of Odonata in Bosnia and Herzegovina. *Acta entomologica serbica*, 15(1): 7-27.
- KALKMAN, V., BOUDOT, J.-P., BERNARD, R., CONZE, K., DE KNIJF, G., DYATLOVA, E., FERRERIA, S., JOVIĆ, M., OTT, J., RISERVATO, E. & SAHLEN, G., 2010. European Red List of Dragonflies. Publications Office of the European Union, Luxembourg, 28 pp.
- KLAPALEK, F., 1898. Notes on Neuroptera and Pseudoneuroptera collected in Bosnia and Herzegovina. *Věstník České Akademie císaře Fantiška Josefa pro vědy, slovesnost a umění*, 7(2): 126-134. [in Czech]
- LELO, S., 2011. Revised systematic list of dragonflies, Odonata, of Bosnia and Herzegovina. *In: Lelo, S. (ed.), Fauna Bosne i Hercegovine – Biosistematski prijedlogi. 6-7. izmijenjeno i dopunjeno interno izdanje Udruženja za inventarizaciju i zaštitu životinja, Ilijaš, Kanton Sarajevo*, pp. 76-78. [in Bosnian]
- MCLACHLAN, R., 1898. On Neuroptera collected by Mr. Malcolm Burr in Wallachia, Bosnia, Herzegovina, in July and August 1898. *Entomologists Monthly Magazine*, Ser. 2, Vol. 19 (Vol. 34): 248-249.
- MIHIĆ, L.J., 1985. Neretva (Prenj, Čvrstica, Čabulja, Vran, Ljubuša, Raduša, Makljen, Crvanj): Nature – Man – History. *Skupština Opštine Mostar, Mostar*, 973: 139-228. [in Bosnian]
- PUSCHING, R., 1896. Bericht über die Reise des naturwissenschaftlichen Vereines a. d. U. W. nach Bosnien, der Herzegovina und Dalmatien. *Mitt. Naturw. Ver. Univ. Wien*, pp.: 33-54.
- TROŽIĆ-BOROVAC, S., 2003. Ecological study of Boračko Lake: Physical and chemical characteristics Boračko Lake waters. *Centar za ihtiologiju i ribarstvo, Prirodno-matematički fakultet, Sarajevo*, 26 pp. [in Bosnian]

**CORDULEGASTER HEROS THEISCHINGER, 1979 (ODONATA:  
CORDULEGASTRIDAE), NOVA VRSTA ODONATA  
У ФАУНИ БОСНЕ И ХЕРЦЕГОВИНЕ**

САБИНА СУЋЕСКА И ЈЕСЕНКО КАРАЧИЋ

**Извод**

Истраживањем биодиверзитета Odonata на подручју шире околине Борачког језера, које је вршено током 2011. године, пронађено је и идентификовано 25 врста вилиних коњица. Међу сакупљеним вилиним коњицима констатована је врста *Cordulegaster heros* Theischinger, 1979, која је нова за босанскохерцеговачку фауну вилиних коњица. Аутори су сакупили 5 јединки (мужјаци) на подручју Борачког потока који се улијева у Борачко језеро.

Received October 7th, 2011  
Accepted December 14th, 2011