

## NEW RECORDS FOR THE CROATIAN CADDISFLY (TRICHOPTERA, INSECTA) FAUNA FROM THE PLITVICE LAKES NATIONAL PARK

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*Apatania muliebris* and *Hydroptila rheni* were recorded in Croatia for the first time. Both species were collected in the Plitvice Lakes National Park using emergence traps: *A. muliebris* at the spring of the Bijela rijeka River and *H. rheni* at the Korana River. These records significantly contribute to data on the caddisfly fauna of Croatia, and in addition extend our knowledge on the distribution and ecology of these species.

**Key words:** *Apatania muliebris*, *Hydroptila rheni*, caddisflies, fauna

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Vrste *Apatania muliebris* i *Hydroptila rheni* zabilježene su prvi put u Hrvatskoj. Obje su prikupljene u Nacionalnom parku Plitvička jezera uz pomoć emergencijskih klopki. Vrsta *A. muliebris* prikupljena je na izvoru Bijele rijeke, a vrsta *H. rheni* na postaji na rijeci Korani. Ovi podaci predstavljaju značajan doprinos poznavanju faune tulara Hrvatske, ali i općenito znanju o rasprostranjenosti i ekologiji ovih dviju vrsta.

**Ključne riječi:** *Apatania muliebris*, *Hydroptila rheni*, tulari, fauna

### Introduction

Considerable progress has been made in the study of caddisfly fauna and its ecology in Croatia in recent years (e.g. Ćuk & Vučković, 2009, 2010; Kučinić, 2002, Kučinić et al. 2011; Previšić et al., 2007a, 2007b, 2010; Vučković et al., 2006). With respect to caddisfly faunistics (e.g. Kučinić 2002; Previšić et al., 2010; Šemnički et al., 2011) and ecology (e.g. Previšić et al., 2007a; Šemnički et al., 2012) the Plitvice Lakes National Park is one of the areas that have been systematically studied. A variety of habitats were investigated, and different methods were applied over more than ten

years of research (e.g. Kučinić, 2002; Previšić et al., 2010; Šemnički et al., 2012), however, each study still results in new faunistic records for the National Park area, and often for Croatia.

## Materials and Methods

Pyramid-type emergence traps were operated in the Plitvice Lakes National Park at 13 sites covering different habitats from 2008–2010. Sampling was conducted monthly as described in Previšić et al. (2007a) and Ivković et al. (2012). The collected material was preserved in 80% ethanol. Identification of the collected individuals was based on the Atlas of European Trichoptera (Malicky, 2004).

## Results and Discussion

*Apatania muliebris* McLACHLAN, 1866 was collected at the spring of the Bijela rijeka River, in the Plitvice Lakes National Park, Croatia (Geographic position: N 44°50'05'', E 15°33'43'', 720 m asl; Figs. 1 & 2a). Three females were collected in April and one in May of 2008; five females were collected in April and three in May of 2009; and three females were collected in April and three in May of 2010. Therefore, a total of 18 individuals of *A. muliebris* were collected over a three-year period and only females were recorded, which is consistent with its known parthenogenetic life cycle (Malicky, 2004; Waringer & Graf, 2011).

The distribution of *A. muliebris* covers Central and Northern Europe, with the Alps (ecoregion ER4; sensu Illies 1978) being the southernmost part of its range (Graf et al., 2008; Graf & Schmidt-Kloiber, 2011). The current finding of this species in the Plitvice Lakes National Park thus represents the first record of this species for Croatia, but also for the Dinaric Western Balkan ecoregion (ER5; sensu Illies, 1978), and represents its most southeasterly distribution point (Graf et al., 2008; Graf & Schmidt-Kloiber, 2011).

*A. muliebris* was collected at the spring of the Bijela rijeka River, an unshaded spring with a relatively low and constant water temperature all year round (ranging from 7.3 °C to 7.8 °C; Ivković et al., 2012). This is in accordance with the habitat requirements of this species, a coldwater stenotherm, typically inhabiting the creanal zone of running waters (Graf et al., 2008; Graf & Schmidt-Kloiber, 2011). Since its larvae are grazers, it prefers unshaded springs where a higher density of periphyton can develop (Mackay & Wiggins, 1979; Wiberg-Larsen, 2000; Graf et al., 2008). Over a three-year collecting period, *A. muliebris* was only collected in spring (i.e. in April and May), thus its emergence period recorded in our study is generally shorter than in Central Europe (Graf et al., 2008; Graf & Schmidt-Kloiber, 2011; Tobias & Tobias, 1981; Waringer & Graf, 2011).

*Hydroptila rheni* Ris, 1896 was collected at the Korana River, a site approximately 3 km downstream of the Plitvice Lakes (Geographic position: N 44°55'33'', E 15°37'09'', 390 m asl, Figs. 1 & 2b). Only a single male was collected in August 2008.



**Figure 1.** Map of study area showing the location of sampling sites in the Plitvice Lakes National Park, Croatia (modified from Previšić et al., 2007a); BR – spring of the Bijela rijeka River and KS – Korana River.

The range of *H. rheni* covers Central Europe, i.e. ecoregions ER4 (the Alps) and ER8 (Western Highlands; Graf et al., 2008; Graf & Schmidt-Kloiber, 2011). Thus, the finding of this species in the Plitvice Lakes National Park also represents the first record for Croatia and the ER5 ecoregion, and its most southeasterly distribution point (Graf et al., 2008; Graf & Schmidt-Kloiber, 2011).



**Figure 2.** Sampling sites in the Plitvice Lakes National Park; a) spring of the Bijela rijeka River where *Apatania muliebris* was collected; and b) Korana River where *Hydroptila rheni* was collected.

Regarding the ecology of *H. rheni*, only limited data are available (Graf et al., 2008; Graf & Schmidt-Kloiber, 2011). It typically occurs in potamal sections of running waters and prefers algae as a substrate (Graf et al., 2008; Graf & Schmidt-Kloiber, 2011). Here, however, it was collected in a rhithral zone of a stream that usually dries out in the summer months. Moreover, a high abundance of hydroptilid larvae was previously recorded in this section of the Korana River (Kerovec et al., 2007), possibly due to the well-developed moss cover. Hydroptilid larvae gene-

rally prefer macrophyte-rich waters (Waringer & Graf, 2011); hence this site apparently represents an appropriate habitat, regardless of the longitudinal zonation.

Records of *A. muliebris* and *H. rheni* in the Plitvice Lakes National Park represent a valuable contribution to data on the Croatian caddisfly fauna, but also extend our knowledge on the distribution and ecology of these species.

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