

First records of *Erythromma lindenii* (Selys, 1840) from Hungary (Odonata: Coenagrionidae)

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Abstract. The first records of *Erythromma lindenii* from Hungary are presented. In 2014 larvae, exuviae, and adults of *E. lindenii* were collected along running waters in the Kis-Sárrét area, located in the southeastern part of the country. The current knowledge of *E. lindenii* in Hungary is summarized and notes on the habitat of the species are provided.

Key words. Dragonfly, damselfly, Zygoptera, distribution, expansion, habitat, Kis-Sárrét region

Introduction

Erythromma lindenii has a holomediterranean distribution (GRAND & BOUDOT 2006: 84; cf. BOUDOT et al. 2009: 61) and during recent decades has expanded its range northwards (e.g., DIJKSTRA 2006; DE KNIJF & ANSELIN 2010; GOFFART 2010; TERMAAT et al. 2010). The species generally can be found in various types of natural and artificial running and standing waters usually characterized by a slow current or ground water influence, and typically with dense aquatic vegetation (HUNGER 1998; DIJKSTRA 2006; KOCH 2010).

The Odonata fauna of Hungary is rather well known. However, nearly four decades have elapsed since the last checklist was compiled (DÉVAI 1978). This checklist, which contained 65 species, needs revision due to taxonomical and nomenclatural changes; for example, clarification of the taxonomical status of certain species, e.g., *Lestes parvidens* (OLIAS 2005; GYULAVÁRI et al. 2011), or *Somatochlora meridionalis* (e.g., WILDERMUTH 2006). Despite intensive nationwide surveys (e.g., KOVÁCS et al. 2004, 2006; MÜLLER et al. 2006; KOVÁCS & AMBRUS 2010), no dragonfly species new for the Hungarian fauna has been found for many years. Apart from Slovakia during recent decades, *E. lindenii* has been recorded from all adjacent countries, however, which is why the species was certainly to be expected to also occur in Hungary.

Study area and methods

In 2014 collections were carried out to reveal the scarcely known Odonata fauna of the Kis-Sárrét area (Békés county, southeastern Hungary). This area is located in the eastern part of the Hungarian Lowlands ecoregion according to ILLIES (1978). The Kis-Sárrét is fairly rich in various types of aquatic habitats, such as marshes, lakes, rivers, small watercourses, and channels, providing a heterogeneous landscape of odonate habitats. Collections were made at slow-flowing waters, typically

with dense riparian/emergent (*Glyceria* sp., *Phragmites australis*, *Sparganium* sp.) and/or submerged (*Potamogeton* sp., *Myriophyllum* sp., *Ceratophyllum* sp.) vegetation (Fig. 1).

Adults were captured by hand net and exuviae were searched for along the bank. Larvae were collected with a standard pond net (mesh size 0.5 mm) in the submerged or emergent vegetation. The field guide by DIJKSTRA & LEWINGTON (2006) was used to identify adults, while larvae and exuviae were identified using keys and descriptions by ASKEW (2004) and GERKEN & STERNBERG (1999).

List of collecting sites

(1) Sebes-Körös, Körösnagyharsány (47°00'53"N, 21°38'00"E, 93 m a.s.l.) 14-vi-2014. (2) Sebes-Körös, Biharugra (47°00'01"N, 21°34'10"E, 91 m a.s.l.), 14-vi-2014. (3) Sebes-Körös, Körösújfalú (46°58'36"N, 21°24'28"E, 88 m a.s.l.), 14-vi-2014. (4) Sebes-Körös, Vésztő (46°58'43"N, 21°16'58"E, 84 m a.s.l.) 14-vi-2014. (5) Holt-Sebes-Körös, Körösnagyharsány (47°00'41"N, 21°37'41"E, 91 m a.s.l.), 17-iv-2014, 23-vi-2014. (6) Holt-Sebes-Körös, Komádi (46°57'06"N, 21°29'58"E, 89 m a.s.l.), 17-iv-2014. (7) Köles-ér, Sarkadkeresztúr (46°49'31"N, 21°25'03"E, 85 m a.s.l.), 24-vi-2014.



Fig. 1. Habitats of *Erythromma lindenii* in the Kis-Sárrét area, southeastern Hungary. A: Sebes-Körös (loc. 2), B: Köles-ér (loc. 7), C: Holt-Sebes-Körös (loc. 5), D: Holt-Sebes-Körös (loc. 6). Photos: AM

Results

Adults (cf. Fig. 2), larvae and exuviae of *E. lindenii* were found at seven sites in the Kis-Sárrét region, representing the first records of the species for Hungary. Besides the collected specimens listed below, on 23-vi-2014 at loc. 5 ca 40 additional adults were observed, some of which exhibited reproductive activity including tandem linkage and oviposition. Data were collected by the authors if not indicated otherwise.

(1) 24 exuviae. (2) 1♂ adult, 2 exuviae. (3) 1 exuvia. (4) 1 exuvia. (5) 2♂ 1♀ adults, 3 larvae. Leg. AM, AF, Pál Boda, Zoltán Csabai, Tibor Danyik. (6) 1 larva. Leg. AM, AF, Zoltán Csabai, Tibor Danyik. (7) 1♂ adult. Leg. AM, AF, Pál Boda, Zoltán Csabai.

Discussion

Discoveries of *E. lindenii* in Hungary fill a gap in its European distribution with sites situated approximately 190 km north-west from the nearest known locality at the foothills of the Romanian Retezat Mountains (MANCI 2012). In view of the records of this species close to the Hungarian border from the Austrian side of the Lake Neusiedl/Fertő (HÜBNER 1984), from the north-east of Slovenia (BOUDOT et al. 2009) and from the Croatian Turopolje region (VILENICA et al. 2011), the species



Fig. 2. Male of *Erythromma lindenii*. Holt-Sebes-Körös, Hungary (23-vi-2014). Photo: Tamás Deli

might have been expected to be first discovered in western Hungary. Its first national occurrence in eastern Hungary appears to be thus rather surprising. According to our results which included evidence of reproduction at almost all sites, *E. lindenii* seems to be well established in the area, suggesting that it has already been present in the region for some time. Interestingly, it had not been found in the course of collecting activities carried out in the same area in the 1990s (e.g., AMBRUS et al. 1998; JUHÁSZ et al. 1998; OLAJOS et al. 1998).

Erythromma lindenii is well known for its ability to quickly colonise artificial water bodies such as gravel pits and channels (cf. HUNGER 1998; MÜLLER 2004; DIJKSTRA 2006; JOVIĆ 2009; JOVIĆ et al. 2009). Typically, loc. 5, where *E. lindenii* was found in especially high abundance, was a channel with very slow-flowing, periodically almost standing water with a completely concreted channel-bed. Aquatic vegetation was absent but patches of *Phragmites australis* and some terrestrial plant species formed riparian vegetation along the banks (Fig. 1D).

As in the case of several other species with similar ability, which in recent decades showed positive population trends and range expansions in Europe, it therefore can be assumed that our Hungarian findings were also mainly due to a combination of increasing research activity on the one hand and an increasing number of suitable man-made water bodies on the other (cf. OBREGÓN-ROMERO et al. 2013; BOUDOT 2014; STILLE et al. 2014; UBONI et al. 2015). Moreover, the influence of climate change on the range expansion of *E. lindenii* cannot be excluded (cf. CONZE et al. 2010; DE KNIJF & ANSELIN 2010; GOFFART 2010; ROSSET & OERTLI 2011).

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