Diplacodes lefebvrii in Lésvos, Greece (Odonata: Libellulidae)

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Abstract

We report the first record and breeding record of *Diplacodes lefebvrii* (Rambur) for Lésvos, Greece. On 20 May 2018, a female specimen was photographed and on 9 June 2018, a male captured at a small pond close to the Krionéri riverbed 1.5 km northeast of the Gulf of Kalloní in Lésvos. Exuviae were collected and reproductive behaviour could be observed in the following weeks at the same site.

Zusammenfassung

***Diplacodes lefebvrii* auf Lesbos, Griechenland (Odonata: Libellulidae)** – Wir melden sowohl den Erstnachweis als auch die Entwicklung von *Diplacodes lefebvrii* (Rambur) für Lesbos, Griechenland. An einem kleinen Tümpel nahe des Krionéri-Flussbettes, ca. 1,5 km nordöstlich des Golfs von Kalloní auf Lesbos, wurden am 20. Mai 2018 ein Weibchen fotografiert und am 9. Juni 2018 erstmals ein Männchen gefangen. In den folgenden Wochen wurden am selben Gewässer Exuvien der Art gesammelt und Fortpflanzungsverhalten beobachtet.

Περίληψη

***Diplacodes lefebvrii* στη Λέσβο, Ελλάδα (Odonata: Libellulidae)** – Αναφέρουμε την πρώτη καταγραφή και επιτυχημένη αναπαραγωγή του είδους *Diplacodes lefebvrii* (Rambur) για το νησί της Λέσβου. Στις 20/05/2018 είχαμε την πρώτη φωτογραφία ενός θυλικού και στις 9/06/2018 έγινε η πρώτη αιχμαλώτιση και αναγνώριση ενός αρσενικού, στην περιοχή Κρυονέρι, σε απόσταση 1,5 χιλιομέτρου περίπου βορειανατολικά του κόλπου Καλλονής. Από την περιοχή συλλέχθηκαν και αναγνωρίστηκαν εκδύματα του είδους και έγινε παρατήρηση της αναπαραγωγικής τους συμπεριφοράς.

Introduction

The small libelluid dragonfly *Diplacodes lefebvrii* (Rambur, 1842) is widespread throughout Africa, the Indian Ocean and the Middle East. In Europe, its range

was limited to the southern half of the Iberian Peninsula and Rhodes (Dijkstra & Lewington 2006; Boudot et al. 2009; Wildermuth & Martens 2019). Since 2013, records of the species on several southern Italian islands, including Sardinia and Sicily are increasing (Rattu et al. 2014; Janni et al. 2020). In the eastern Mediterranean, the distribution reaches Cyprus, the Turkish south coast and Rhodes (Boudot et al. 2009; Wildermuth & Martens 2014). We report the first adult as well as breeding record of *D. lefebvrii* for Lésvos, Greece.

Habitat description and methods

Quite in the centre of the Northeast Aegean island Lésvos, the observation site was a small, open perennial pond close to the Krionéri riverbed, 1.5 km NE of the coast of the Gulf of Kalloní at the coordinates 39.18777° N, 26.30861° E (Fig. 1). The pond was about 30 m long and 20 m wide, 30–40 cm deep and fed throughout the year by a strong artesian spring. On its east side it bordered on a pine forest (*Pinus brutia*). The water surface was mostly covered by *Phragmites australis* at the north and east bank and *Juncus acutus* in the centre, furthermore by *Schoenus nigricans*, *Scirpoides holoschoenus* and *Typha dominguensis*, with some patches without emerse vegetation.

Several days in late April and May 2018, UP recorded birds and insects, including Odonata, at the site. She photographed with a LUMIX G5 camera with a tele zoom. AT and PT visited the pond frequently between 31-v-2018 and 14-vii-2018

Figure 1. Breeding habitat of *Diplacodes lefebvrii* beside the Krionéri river, Lésvos, 02-vii-2018. – **Abbildung 1:** Fortpflanzungsgewässer von *Diplacodes lefebvrii* nahe des Flusses Krionéri, Lesbos, 02.07.2018. Photo: AT

to observe damsel- and dragonflies. Starting from 14-vi-2018, *D. lefebvrii* moved into the focus of their investigations. Specimens were caught with a hand net, photographs were taken with digital cameras along with some short films, exuviae were collected.

Results

A single female of *D. lefebvrii* was recorded on 20-v-2018 by UP, it was sitting about 15 m away from the water on the ground in the open area south-west of the pond (Fig. 2). Between 09-vi-2018 and 03-vii-2018, *D. lefebvrii* were documented every day the pond was visited. The sex ratio was biased in favour of males: up to eight males per day, but very few females were found at the site. At a section of the pond where emerse vegetation was available but not dense, around midday males were perching on stems of *Juncus acutus* at a height of 13.8 cm (n=13) over the water surface, keeping even distances between each other. They would fly up when a conspecific male approached, chase it and return to the perch. Copulations were documented between 11:00 and 13:10 h solar time (on 14-vi, 15-vi, 16-vi and 01-vii-2018). Four of five observed copulation wheels sat on stems of

Figure 2. Female of *Diplacodes lefebvrii* near the pond near the river Krionéri, Lésvos, 20-v-2018. – **Abbildung 2:** Weibchen von *Diplacodes lefebvrii* beim Quellteich nahe des Flusses Krionéri, Lesbos, 20.05.2018. Photo: UP

J. acutus close above the water surface and repeatedly changed location (Fig. 4). A female was witnessed ovipositing with rapid dipping movements, when a male seized and copulated with it, followed immediately by ovipositing again. Another time, a female oviposited while being non-contact guarded by a male that hovered over it and attacked an approaching conspecific male. On the stems of *J. acutus*, five exuviae were collected. From 08-vii-2018 on, no *D. lefebvrii* were found any more. UP photographed a single male on a later visit to the site on 10-x-2018.

Figure 3. Male of *Diplacodes lefebvrii* at the pond near the river Krionéri, Lésvos, 14-vi-2018. – **Abbildung 3:** Männchen von *Diplacodes lefebvrii* am Quellteich nahe des Flusses Krionéri, Lesbos, 14.06.2018. Photo: AT

Figure 4. Copulation wheel of *Diplacodes lefebvrii* at the pond near the river Krionéri, Lésvos, 16-vi-2018. – **Abbildung 4:** Paarungsrad von *Diplacodes lefebvrii* am Quellteich nahe des Flusses Krionéri, Lesbos, 16.06.2018. Photo: AT

Along with *D. lefebvrii*, the following odonate species were identified: *Lestes dryas, Ceriagrion georgifreyi, Enallagma cyathigerum, Ischnura elegans*, *Platycnemis pennipes, Anax imperator, Anax parthenope*, *Aeshna isoceles, Crocothemis erythraea, Orthetrum brunneum, Orthetrum cancellatum, Orthetrum coerulescens, Trithemis annulata.*

Discussion

In Greece records of *D. lefebvrii* were limited to Ródos (Rhodes), and even there were very irregular, with the last records in 1993 (McGeeney 1994 in Lopau 2010), despite numerous visits to the Greek islands by odonatologists. The exuviae now found verify the species' successful breeding (at the 'Krionéri pond') on Lésvos. Hence, this constitutes further confirmation of a northward expansion of the distribution range, as predicted by Dijkstra & Lewington (2006) and specifically for the Greek islands by Wildermuth & Martens (2019) and blends in with the series of recent observations in Italy by Rattu et al. (2014) and Janni et al. (2020). The latter two recorded a sex ratio strongly biased in favour of females, which was not the case in Lésvos.

The behavioural observations presented here, although the amount of data is small, match the descriptions from Suhling & Martens (2007) and Wildermuth & Martens (2019). Except at the pond in Lésvos, the males and copulation wheels did not sit on floating algae but on emerse vegetation (*Juncus acutus*), although still close above the water surface. The ecology of larvae is still to be studied, but they appear to co-exist in habitats with larger Anisoptera larvae as well.

The 'Krionéri pond' described here should be of special interest in the Aegean. This locality was inhabited by the very rare odonate *Ceriagrion georgifreyi* (Kappes & Kappes 2017).

Exuviae of *D. lefebvrii* can be identified by the lack of dorsal spines and the small size (shorter than 14 mm, Arlt & Ruddek 1998), although Hagen (1996) warns against relying on body length as an identification trait, since in individual cases, exuvia size can vary considerably. On S8–S9 there are short lateral spines and the hind legs when stretched out should be about as long as the abdomen, which shows an irregular dark pattern (Suhling et al. 2014). In this case, the abdominal patterns were very faint. Seidenbusch & Heidemann (2007: p. 107) provide another feature for identification: »a long, strong seta on the mediobasal surface of each of the two pronotal lobes, close to the median ecdysial line«.

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