New records of *Coenagrion armatum* in Schleswig-Holstein (Odonata: Coenagrionidae)

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Abstract

In early May 2008 a short survey was carried out to search for *Coenagrion armatum* in Schleswig-Holstein, Germany. On 06-v-2008, we found the species at two localities: Möwensee near Süderlügum, and Jardelunder Moor on the German-Danish border. Some details are provided on composition and structure of the vegetation. It is stated that *C. armatum* has always been present in Schleswig-Holstein but has largely been overlooked in the past years.

Zusammenfassung

Neue Nachweise von *Coenagrion armatum* in Schleswig-Holstein (Odonata: Coenagrionidae) — Anfang Mai 2008 wurde in Schleswig-Holstein eine gezielte Suche nach *Coenagrion armatum* durchgeführt. Am 06.05.2008 fanden wir die Art an zwei Gewässerkomplexen, dem NSG Möwensee bei Süderlügum und dem NSG Jardelunder Moor an der Grenze zu Dänemark. Hinweise zur Struktur und Zusammensetzung der Vegetation der Gewässer werden gegeben und mit anderen nordwesteuropäischen Fundorten verglichen. Wir gehen davon aus, dass *C. armatum* in Schleswig-Holstein kontinuierlich vorkam, jedoch in den letzten Jahren weitgehend übersehen wurde.

Introduction

The distributional range of *Coenagrion armatum* (Fig. 1) stretches from Great Britain to Kamchatka in Siberia. In Europe the most important areas are located in southeastern Scandinavia, several eastern European countries, and Russia. The distribution reaches its southern limit in Armenia (Dijkstra 2006). In northwestern Europe *C. armatum* is a rare damselfly. In Norway, Sweden and Poland the distribution is patchy, the species is often scarce, but several large populations are still present (Olsvik & Dolmen 1992, Sahlén 1996, Buczyński 2000). In the United Kingdom the species is regarded as extinct today, and was only known from Sutton Broad and Stalham Broad in Norfolk. However, at the be-

ginning of the 20th century it was common at Stalham Broad and collected in large numbers (Porritt 1910). In the Netherlands the species was regarded as extinct from 1956 onwards, and was found again in 1999 (van der Heijden 2000). At the moment stable populations are present in a peat marsh called 'The Weerribben' (Bouwman & Ruiter 2004). A similar situation exists in Denmark, where records of two new populations of *C. armatum* have been taken from 2005 onwards (Fugleognatur 2008). Hence, it is very likely that the species was simply overlooked in these countries. Because of its secretive behaviour and a short and early season flight period it is easy to overlook *C. armatum* during the usual monitoring routine of Odonata. In the Netherlands the flight period of *C. armatum* is extremely short, starting the last week of April and ending before June (Bouwman et al. 2008).

In Germany *C. armatum* is a Red List species in the category 'critically endangered' (Ott & Piper 1998). However, the species was probably not rare in northern Germany at the beginning of the 20th century. Schmidt (1978) gives several localities with records up to the early 1970s, in the north of the country, especially in northern Schleswig-Holstein. More recent records from Schleswig-Hostein are sightings at Hauke-Haien Koog (Kelm 1983) and near Gudow (Adomssent 1994). The species could not be relocated at the last site in the years after the discovery in 1988 (Brock et. al. 1997). Hence, for approximately two decades no indications had been published on the species' presence in Germany. The last German record known to us was from 2002 when J. Kählert (pers. comm.) had found several individuals near Süderlügum. In consequence, in early May 2008 we decided to visit some of the previous sites of the species in northern Schleswig-Holstein, in order to find *C. armatum* there.

Figure 1: Male *Coenagrion armatum* in the Möwensee Nature Reserve near Süderlügum, Schleswig-Holstein, Germany (17-v-2008). — Abbildung 1: Männchen von *Coenagrion armatum* im NSG Möwensee bei Süderlügum, Schleswig-Holstein (17.05.2008). Photo: Jens Kählert.

Localities and records

On 6 May 2008 we rediscovered *Coenagrion armatum* at two localities with previous records of the species.

Möwensee near Süderlügum (54°52'N, 08°55'E, 14 m a.s.l.)
The Möwensee Nature Reserve (Fig. 2) is a shallow lake on sandy soil, for a large part surrounded by pine forest, but on the south side a small dry heath replaces the trees. The population size was large: we counted more than 1000 individuals. The majority of the damselflies were present in two distinctive vegetation types on the southeastern shore of the lake. We found approximately 750 individuals in vegetation dominated by *Juncus effusus* and *Myrica gale* with a high coverage of *Sphagnum cuspidatum*. The clumps of *J. effusus* were drowned, creating a dense emergent helophyte vegetation. The second site with a concentration of *C. armatum* – approximately 50 individuals and a few exuviae – was characterised by a more open and sparse vegetation dominated by *Menyanthes trifoliata*, *S. cuspidatum* and *Potentilla palustris*. Judging from the vegetation, the lake is largely fed by rain water, but a local groundwater system is present to maintain a certain level of buffering capacity. Other Odonata species present at Möwensee were *Coenagrion pulchellum* (50 individuals), *Enallagma cyathigerum* (3), *Pyrrhosoma nymphula* (250), *Leucorrhinia rubicunda* (100), and *Libellula quadrimaculata* (5).

Figure 2: Habitat of *Coenagrion armatum* in the Möwensee Nature Reserve near Süderlügum, Schleswig-Holstein, Germany (06-v-2008). — Abbildung 2: Lebensraum von *Coenagrion armatum* im NSG Möwensee bei Süderlügum, Schleswig-Holstein (06.05.2008). Photo: RK

Jardelunder Moor (54°49'N, 09°11' E, 32 m a.s.l.)
Jardelunder Moor is the German part of the Frøslev-Jardelunder Moor, a 275 ha raised bog and a nature reserve, which is located on the border with Denmark and contains several open waters. We only visited the German part, where we found *C. armatum* at two sites (Fig. 3). In both habitats the vegetation was dominated by *J. effusus*, *Molinia caerulea* and *S. cuspidatum*. The water was probably acid, although the presence of *Carex rostrata*, *Peucedanum palustre* and *Typha latifolia* at one site indicated a small amount of local ground water feeding. Other species present at this site were *P. nymphula* (165), *Cordulia aenea* (1), *L. rubicunda* (130), and *L. quadrimaculata* (10).

Discussion

Both waters found to be colonised by *Coenagrion armatum* did not give a very special impression, and in northwestern Europe these types of water are common in peat moors. At both sites, the water was knee deep and most individuals were found between stems of *Juncus effusus*. A comparison of Dutch, Swedish and Norwegian populations of *C. armatum* showed that the vegetation structure is a key factor: the species only occurs in rather dense emergent helophyte vege-

Figure 3: Habitat of *Coenagrion armatum* in the Jardelunder Moor Nature Reserve, Schleswig-Holstein, Germany (07-v-2007). — Abbildung 3: Lebensraum von *Coenagrion armatum* im NSG Jardelunder Moor, Schleswig-Holstein (07.05.2007). Photo: JB

tations in rather shallow water (KETELAAR 2001). In all populations, the vegetation is dominated by *Carex* sp., *Phragmites australis*, *Typha* sp. or *Equisetum fluviatile*. Although the presence of *J. effusus* at both German sites can be judged as an indication for disturbance, its specific vegetation structures here create an almost perfect habitat for *C. armatum*.

SCHMIDT (1978) gave a survey of several locations with records of *C. armatum* in the north of Schleswig-Holstein from the 1960s and early 1970s, including the two sites where we detected the species. He visited some of these sites again in 1977 and 1978, without success. This breakdown was probably caused by the extremely dry summers of 1975 and 1976 (SCHMIDT 1978). Because of the drought, the shoreline vegetation became dry and minimised the amount of suitable reproduction habitat. The decline of other species like *Sympecma paedisca* in the Netherlands during this period was probably also related to these dry summers (KETELAAR et al. 2008). However, it seems unlikely that *C. armatum* disappeared from these locations completely. More likely it was affected very badly during these hot summers, which probably caused the populations to fall to very low numbers. When the habitat became more suitable in the following years the species benefited and numbers increased again. Because of their inconspicuous behaviour and the extremely short flight-period *C. armatum* was probably largely overlooked. During a more intense survey in 2008 more than ten other localities colonised by *C. armatum* were found in Schleswig-Holstein (Ch. Winkler pers. comm.). In conclusion, the species is probably not as rare in the region as was previously assumed.

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