Aeshna cyanea and *A. juncea*, new for the fauna of Macedonia (Odonata: Aeshnidae)

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Abstract

At the elevated wetland Begovo Pole near the village of Gorno Jabolčište (Mt. Jakupica, central Macedonia, 1980 m a.s.l.), two adult males of *Aeshna juncea* and an emerging male of *Aeshna cyanea* were recorded on 13-vii-2008. Additionally, a dozen males of *A. cyanea* were recorded at lake Lokuv near the village of Trebište (Mt. Dešat, W Macedonia, 1560 m a.s.l.) on 07-viii-2008. The occurrence of both species in the Balkans and south-eastern Europe is outlined and a short zoogeographical discussion is provided.

Zusammenfassung

Aeshna cyanea und *A. juncea*, neu für die Fauna Mazedoniens (Odonata: Aeshnidae) — In 'Begovo Pole', einem hochgelegenen Feuchtgebiet in der Nähe des Dorfes Gorno Jabolčište im Jakupica-Gebirge in Zentral-Mazedonien, 1980 m üNN, wurden am 13.07.2008 zwei adulte Männchen von *Aeshna juncea* und ein schlüpfendes Männchen von *Aeshna cyanea* gefunden. Zusätzlich wurden an dem 'Lokuv-See' in der Nähe des Dorfes Trebište im Dešat-Gebirge im westlichen Mazedonien, 1560 m üNN, am 07.08.2008 noch ein Dutzend Männchen von *A. cyanea* beobachtet. Die Verbreitung der beiden Arten auf der Balkanhalbinsel und in Südost-Europa wird umrissen und eine kurze zoogeographische Diskussion angefügt.

Introduction

The dragonfly fauna of the Republic of Macedonia is only fragmentarily known. According to PETERS & HACKETHAL (1986) who gave a useful overview of existing odonatological information at that time, 52 species were known for the country.

Macedonia is a mountainous country and although elevated wetlands are not in abundance, there are numerous smaller habitats, which due to elevation and general appearance would qualify as suitable for interesting species of dragonflies.

After almost two decades of a field work "vacuum", in summer 2008 we decided to carry out dragonfly surveys in different habitats throughout Macedonia, in order

to start filling numerous gaps in the knowledge of the dragonfly fauna of that part of the Balkan Peninsula. First results of our studies, bringing two expected, but still officially new species for the fauna of Macedonia, are presented below.

Results

During a brief visit to the elevated wetland 'Begovo Pole', 5 km west of the village of Gorno Jabolčište, on Mt. Jakupica, central Macedonia (1980 m a.s.l.; 41˚43' 23"N, 21˚25'30"E) on 13-vii-2008 we encountered both *Aeshna cyanea* and *A. juncea*. Two adult males of *A. juncea* were captured while patrolling along small pools and subsequently identified (Fig. 3). Additionally a photo of an emerging male had been taken, which later was determined to pertain to *Aeshna cyanea*.

'Begovo Pole' is a high mountain karst plateau situated among several peaks higher than 2000 m, including the summit of Mt. Jakupica (Solunska Glava, 2538 m a.s.l.). Its size is about 4 km^2, the ground is covered by morainic material and partially by see clay and clay sands. Two small streams are slowly meandering on the plateau and are joined in a sinkhole on the south of the plateau. During our visit, the occurrence of numerous small pools gave a special appearance to this locality (Fig. 1). Some of the pools were without any water vegetation, and some were overgrown with *Equisetum* sp. The prevailing plant community was Caricetum macedonicae, without any *Sphagnum*. The surroundings of the wetland were covered by the community Deltoideo-Nardetum.

Figure 1: View of the 'Begovo Pole' wetland, habitat of *Aeshna cyanea* and *A. juncea* on Mt. Jakupica in central Macedonia in July 2008. — Abbildung 1: Blick auf das Feuchtgebiet 'Begovo Pole', Lebensraum von *Aeshna cyanea* und *A. juncea* im Jakupica-Gebirge in Zentral-Mazedonien im Juli 2008. (Photo: BM).

Additionally, on 07-viii-2008 twelve males of *A. cyanea* were recorded at the 'Lokuv Lake' near the village of Trebište, on Mt. Dešat in western Macedonia (1560 m a.s.l.; 41˚38'06"N, 20˚34'00"E). Lokuv represents a 4000 m^2 depression in the middle of a beech forest, where the waters from the surrounding slopes converge. The water from the lake outflows underground and by evaporation. Summer water temperatures reach 25˚C, and in the winter the lake almost completely freezes. During our visit the water was dark, and dense shore vegetation consisted also of *Sphagnum* sp., *Menyanthes trifoliata*, *Potamogeton* sp. etc.

Discussion

Our contribution adds *Aeshna cyanea* and *A. juncea* to the list of dragonfly fauna of Macedonia. Although rare in southern Europe and the Balkans, their occurrence in Macedonia had been expected. In order to present the wider perspective of both species' occurrence in this part of Europe, an overview of all published faunistic information is presented in the following lines lines and in Figure 2.

The west-Palaearctic *A. cyanea* is distributed across all Europe but becomes scarcer towards the Ural and southern Europe (Dijkstra 2006). In the southeastern part of its range it is one of the commonest dragonflies in Slovenia (Kotarac 1997), and as in central Europe, it inhabits a wide array of habitats. In northern Croatia the situation is similar, however, in eastern parts of the country it becomes scarcer, with only few literature records (Koča 1925, Rössler 1900). It is interesting to note that *A. cyanea* has also been recorded on the northern Adriatic islands Cres (Franković 1997) and Krk where it is common (Olias & Serbedija 1998: 93). Further to the south along the Adriatic coast in Dalmatia it is apparently very rare. Although there are no literature data for this part of Croatia, the unpublished records of M. Franković (pers. comm.) show that it is common in a variety of small cattle pools dispersed in the hinterland of Dubrovnik. Also old records from Bosnia and Herzegovina listed by Adamović (1948) allow the speculation that *A. cyanea* is not very rare in this country, especially if the general paucity of odonatological data from that part of the Balkans is taken into consideration. In Montenegro, Dumont (1977), Adamović et al. (1996), Gligorović et al. (2007) and Jović et al. (2008) list only seven mainly mountainous locations. In Albania, the species has been recorded only by Dumont et al. (1993) and remains known from a single locality in the north-east. The species is rare in Serbia (Anđus 1992), where the literature records are known only from Belgrade and the vicinity of Negotin in the eastern part of the country. Records of *A. cyanea* exist from western and southwestern Bulgaria, mainly in Rila and Western Rhodopes Mts. (Marinov 2000, 2007). Despite a fair odonatological coverage of Greece, records of *A. cyanea* from there are very few (Lopau & Wendler 1995). Widely isolated and very surprising, however, is a record of the species from Rhodes (Lopau 2000); according to Kalkman (2006: 41) *A. cyanea* has not been found in the south of Turkey, although it is not uncommon in the mountains of the northern part of the country.

Most of the records of *A. cyanea* from the Balkans do not contain detailed information on its habitat; however, it seems that it predominantly inhabits different types of pools and lakes at higher altitudes, but is also found in springs. In Macedonia, the current knowledge of its distribution is preliminary at best, especially considering that the above mentioned habitats are not so rare in the mountains.

From a zoogeographical point of view *Aeshna juncea* can be classified as a holarctic faunal element, distributed from Eurasia to North America. The southern border of its European range runs over the southern Alps in France, northern Italy, Austria, and Slovenia. There are some southwestern disjunctions in the mountains of northern Spain and central Portugal, while the southeastern disjunctions are scattered across the mountains of the Balkan peninsula in Bosnia and Herzegovina, Serbia, Montenegro, Macedonia, Bulgaria, and Romania (DIJKSTRA 2006).

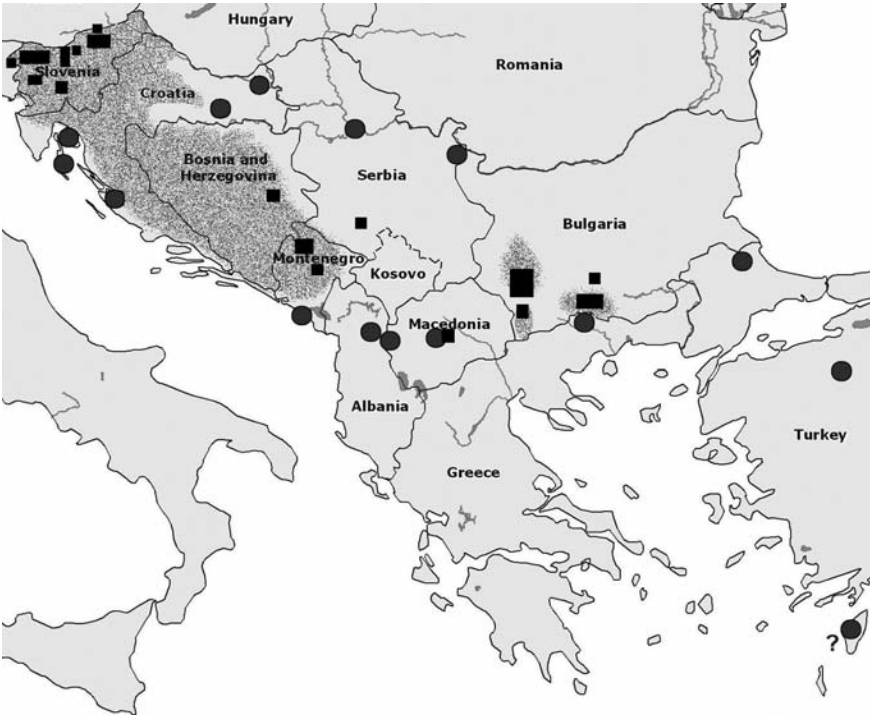

Figure 2: The occurrence of *Aeshna cyanea* (grey dots and grey shading) and *A. juncea* (black squares) in the Balkans. Italy, Austria, Hungary and Romania are not considered. — Abbildung 2: Die Verbreitung von *Aeshna cyanea* (graue Kreise und graue Schattierung) und *A. juncea* (schwarze Quadrate) auf der Balkanhalbinsel. Italien, Österreich, Ungarn und Rumänien sind nicht berücksichtigt.

Focusing on relict populations of *A. juncea* in the Balkans, it is noteworthy that, southwards of strong populations in the Julian Alps and on Pohorje Mts. in northern Slovenia, including a small population on the Bloke Plateau in southern Slovenia, there is a huge gap in the known range of the species. This extends along the Velebit Mts. in Croatia to the south-east as far as central Bosnia. Despite active search the species has not been found in Croatia yet, likely due to the dry karst nature and rather low altitude of Croatian mountains, which thus lack the appropriate habitat (M. Franković pers. comm.). Further south, two records from Treskavica Mt. in central Bosnia and Herzegovina, just south of Sarajevo, were reported by ADAMOVIĆ (1948). In northern Montenegro *A. juncea* was recorded by ADAMOVIĆ et al. (1996) from three mountain lakes in the Durmitor National Park and is also known from Mt. Sinjavina in the central part of the country (JOVIĆ et al. 2008). In south-western Serbia the species was found on the elevated lake Daićsko jezero on Mt. Golija (ADAMOVIĆ 1949; 1990). Further to the east there are some records of *A. juncea* from south-western Bulgaria, mainly from high elevation lakes of Rila and Western Rhodopes Mts. (MARINOV 2000; 2007). Further south in Greece, as well as west of Macedonia in Albania, *A. juncea* has not been recorded yet (LOPAU & WENDLER 1995; DUMONT et al. 1993). In the context of Greece it is worth mentioning that the record of *A. juncea* from northeastern Greece by PETKOV (1921) was subsequently corrected by BESCHOVSKI (1993) as pertaining to *A. mixta*. In a following article by the same author, however, *A. juncea* is erroneously listed as also occurring in Greece (BESCHOVSKI 1994).

The new Macedonian record (Fig. 3) from an elevated wetland fits well into the overall habitat picture known already from Montenegro and Bulgaria. Since similar habitats are present in some other places in Macedonia, new records of *A. juncea* can still be expected. The same goes for the mountains of north-eastern Albania, where at least close to the Macedonian border some seemingly promising habitats exist. The discovery of the species in Greece, somewhere on the mountainous border with Macedonia or Bulgaria is not impossible but would demand quite a sophisticated search. Hopefully, someone will take over this pleasant challenge in the near future.

In conclusion, it is worth stressing that with new field records in different countries the picture of both species' distribution in south-eastern Europe has become much clearer in recent years. It is obvious that the present situation has its roots in the periglacial and postglacial colonisation of the Balkans by the Odonata. Hence, new records can not be interpreted as recent expansions of species ranges, but as long surviving relict disjunctions, undiscovered solely because of the extremely low activity of odonatologists. More odonatological work is urgently needed in this part of Europe, particularly in poorly accessible and widely scattered elevated habitats.

Figure 3: A male *Aeshna juncea* at 'Begovo Pole', 13-vii-2008. — Abbildung 3: Ein Männchen von *Aeshna juncea* bei 'Begovo Pole', 13.07.2008. Photo: NM.

Acknowledgements

The authors are grateful to Dr. Matija Franković (Zagreb, Croatia) for his valuable comments on the situation regarding the distribution of both species in Croatia, and to Marko Olias (Freiberg, Germany) for critically reading the manuscript. Dr. Matjaž Kuntner (Ljubljana, Slovenia) kindly corrected the English language of the manuscript.

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Manuskripteingang: 21. Oktober 2008