

***CALIAESCHNA MICROSTIGMA* (SCHNEIDER 1845) (RE)DISCOVERED
IN SERBIA (ODONATA: AESHNIDAE)**Aleksandar ĐUKIĆ^{1,2*}, Isidora BOLESNIKOV^{1,2}¹HabiProt, Janka Čmelika 28a 3/25, 21000 Novi Sad, Serbia²Scientific Research Society of Biology and Ecology Students “Josif Pančić”,
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Abstract – The distribution of *Caliaeschna microstigma* (Schneider 1845) in Europe is restricted mostly to the Balkans. As its populations have been declining over the past years, the species is classified as Near Threatened (NT) in the European and Mediterranean Red Lists. In Serbia, this species was reported earlier, but the data is incomplete. Precise location and the description of the record is missing. During the field trip in July 2018 in Pčinja River Valley (Southern Serbia) two individuals of *C. microstigma* were recorded. Based on this study, further faunistic research should be carried out in southern parts of the country to map the present distribution of this rheophile species and to take the most effective management measures for its conservation.

KEY WORDS: Conservation, *Caliaeschna microstigma*, dragonflies, Pčinja River Valley, Serbia

Izvešček – PONOVRNO ODKRITJE BLEDEGA VETRNJAKA *CALIAESCHNA MICROSTIGMA* (SCHNEIDER 1845) V SRBIJI (ODONATA: AESHNIDAE)

Bledi vetrnjak *Caliaeschna microstigma* (Schneider 1845) je v Evropi razširjen skoraj izključno na Balkanskem polotoku. Ker populacije te vrste upadajo, je vrsta uvrščena na evropski in sredozemski rdeči seznam, na oba s statusom potencialne ogroženosti ('Near Threatened', NT). Za Srbijo obstaja starejši podatek o prisotnosti bledega vetrnjaka, a je pomanjkljiv, kajti ni bilo sporočene natančne lokacije najdbe. Na terenski odpravi julija 2018 v dolino reke Pčinje (južna Srbija) smo zabeležili dva osebka bledega vetrnjaka. Za natančno poznavanje razširjenosti te reofilne vrste in pripravo načrta njenega ohranjanja so potrebne nadaljnje favnistične raziskave, predvsem v južnih predelih Srbije.

KLJUČNE BESEDE: varstvo, *Caliaeschna microstigma*, kačji pastirji, dolina reke Pčinje, Srbija

Introduction

In the last decade, great progress has been made in studying dragonflies in Serbia (e.g. Jović et al. 2010, Kulić et al. 2013, Rajkov et al. 2015, Vinko et al. 2016), but this group of insects is still insufficiently explored in the country. Although a certain number of papers on Serbian dragonfly fauna was published, the majority includes a smaller part of the country territory as well as a smaller part of the field season. For many species data is scarce and the records are sporadic (e.g. Jović et al. 2009). Therefore, the distribution of a large number of species in Serbia is poorly known and it can be assumed to be much wider than we know today.

In Serbia no national Red list exists (Boudot & Kalkman 2015), although seven dragonfly species are protected (Službeni glasnik Republike Srbije 5/2010). Jović (2013) listed 67 dragonfly species in the Serbian fauna, four of which require further research that will confirm the accuracy of the previous literature sources and were therefore not included in the Atlas of the European dragonflies and damselflies (Boudot & Kalkman 2015). One of these species is *Caliaeschna microstigma* (Schneider 1845). It develops in cold and fast flowing, well oxygenated running waters, which are at least partly shaded, with stony, pebble or gravel substrate. These are usually brooks, streams or small rivers (with width mostly 0.5–2 m), majority lacking aquatic vascular plants, where pools of calm water provide refuges for the larvae (Kovács & Murányi 2013, Kalkman & Jović 2015). Elevation of the habitats is from sea level up to 1,500 m a.s.l. (Shkëmbi et al. 2018). The larvae live among submerged moss, leaf litter, roots or under stones when other substrates are absent (Dijkstra & Lewington 2006). Larval development of this semivoltine species usually takes three years (Kovács & Murányi 2013). In Serbian language, the species is called ‘*primorski plemić*’ (Jović 2013).

Without any political suggestion, in this paper we exclude Kosovo as a part of Serbia.

Landscape of outstanding features “Pčinja River Valley” is an area comprising 2,606 ha, located in the south of Serbia, on the border with the Republic of North Macedonia. It is a landscape with exceptional biogeographical characteristics (Avramović et al. 2005). Pčinja River Valley is located in the transitional area in the climatic and vegetational terms, which makes it prone to degradation and susceptible to anthropogenic influences (Mišić 1981). The climate of this area is a mixture of continental and Mediterranean and as such has influenced the development of specific heterogeneous vegetation. These two factors defined the unusual fauna structure in this area.

Caliaeschna microstigma was previously reported from Serbia (Karaman 1979), but without a precise description of the record. In this article we present the first detailed record of *C. microstigma* for the country.

Material and methods

During the study we visited the Landscape of outstanding features “Pčinja River Valley” (Loc. 1) as well as the surrounding localities (Loc. 2–4) in order to clarify

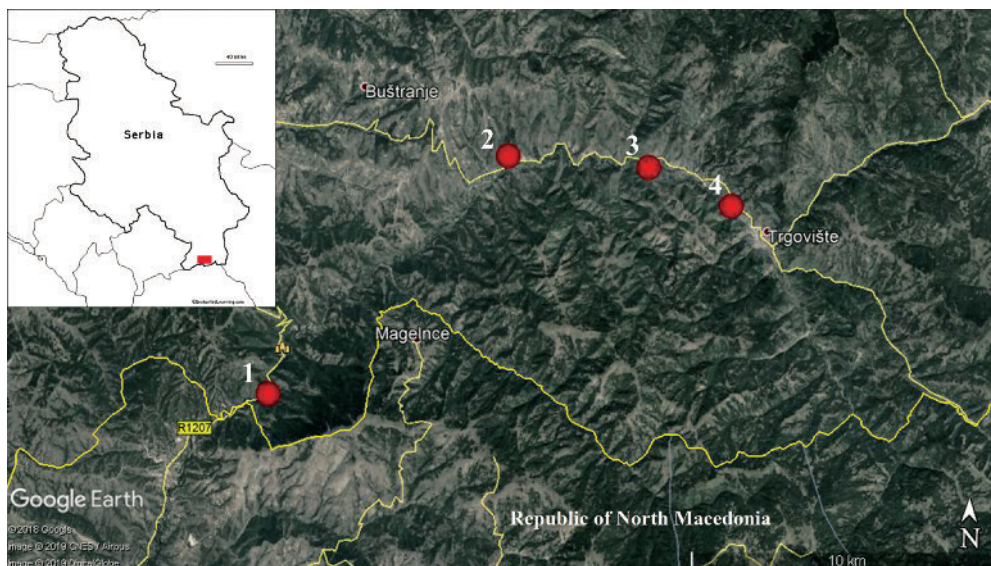


Fig. 1: Map of studied sites in the Pčinja region, south Serbia.

the status of *C. microstigma* in Serbia (Fig. 1). In the period from 20 to 22 July 2018 four sites were visited (Tab. 1) with only adult dragonflies identified. Three localities (Loc. 1, 3, 4) are different sites of Pčinja River, while one (Loc. 2) is a stream that is a tributary of the Pčinja River.

One male specimen of *C. microstigma* is stored in the entomological collection of the Natural History Museum in Belgrade.

Table 1: List of investigated sites from Fig. 1.

no. Loc.	Locality	Coordinates(l at./lon.)	alt. (m)	date	no. of dragonfly taxa
1	Prohor Pčinjski monastery (Pčinja River)	42°18'59.0"N 21°53'29.3"E	629	20.07.2018, 21.07.2018	1
2	Šaprance (stream)	42°23'11.67"N 21°58'55.71"E	561	21.07.2018, 22.07.2018	7
3	Šajince (Pčinja River)	42°23'02.9"N 22°02'02.8"E	572	21.07.2018	1
4	Trgovište (Pčinja River)	42°22'31.1"N 22°03'53.9"E	606	21.07.2018	3

Results

Altogether eight dragonfly taxa were identified (Tab. 2).

During the visit to Šaprance (Loc. 2), two adult males of *C. microstigma* were recorded (Fig. 2).

Table 2: List of recorded dragonfly species per locality from Tab. 1.

Species	Loc. 1	Loc. 2	Loc. 3	Loc. 4
<i>Calopteryx virgo</i> (Linnaeus 1758)	-	+	-	+
<i>Platycnemis pennipes</i> (Pallas 1771)	-	+	+	+
<i>Caliaeschna microstigma</i> (Schneider 1845)	-	+	-	-
<i>Cordulegaster bidentata</i> Selys 1843	-	+	-	-
<i>Cordulegaster</i> sp.	+	-	-	-
<i>Somatochlora meridionalis</i> Nielsen 1935	-	+	-	-
<i>Orthetrum coerulescens</i> (Linnaeus 1758)	-	+	-	-
<i>Orthetrum brunneum</i> (Fonscolombe 1837)	-	+	-	+

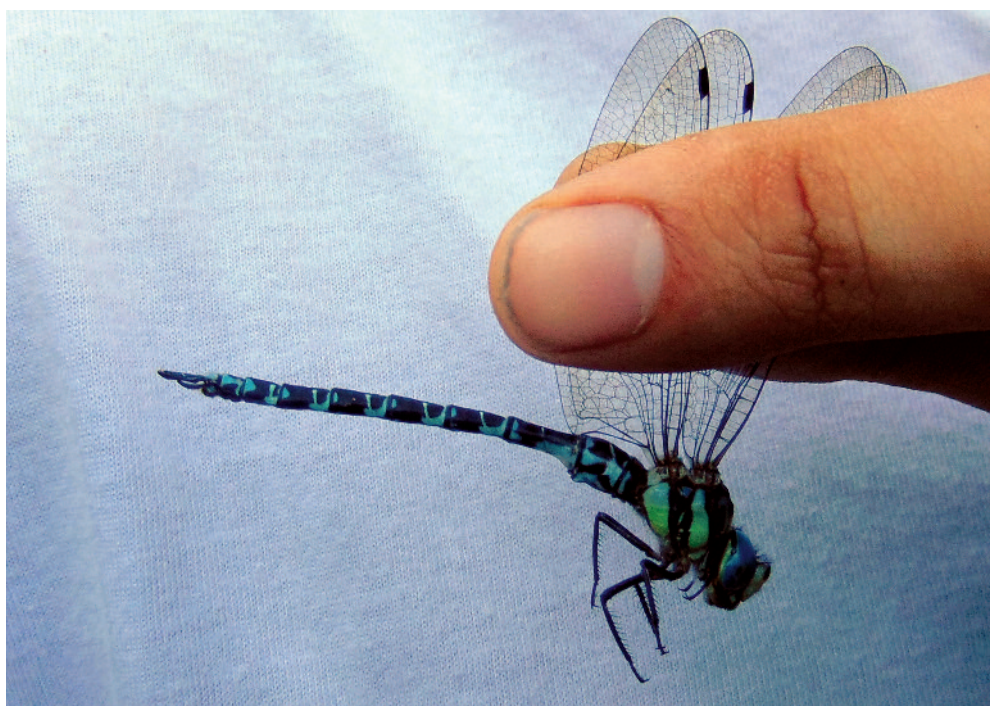


Fig. 2: *Caliaeschna microstigma* (Schneider 1845), adult male from Loc. 2, deposited in the entomological collection of the Natural History Museum in Belgrade (photo: Milan Đurić, 21-VII-2018).

Discussion

Two adult males of *Caliaeschna microstigma* were observed on 21 July 2018 in the late afternoon (18:00 PM), patrolling low above the water, matching the description of this crepuscular animal (Dijkstra & Lewington 2006). Recorded territorial behaviour as well as the appropriate habitat in form of a smaller slow flowing stream, in shade with dense surrounding vegetation indicates that reproduction is possible on the site. Further studies should be carried out in order to determine the reproduction status of this species. The site was also visited in the morning hours (10:00 AM) on 22 July 2018, when no individual of this species was recorded.

The species recorded in sympatry with *C. microstigma* were expected based on quotations (Kovács & Murányi 2013). *Caliaeschna microstigma* was often observed with *Cordulegaster* spp. and *Calopteryx* spp. (Kulijer et al. 2012, De Knijf et al. 2013), in our case with locally abundant *C. bidentata* and *C. virgo*.

The distribution of *C. microstigma* in Europe is restricted to the Balkans, Cyprus and the Aegean Islands (Kalkman & Jović 2015). This rheophile species is not uncommon in large parts of the eastern Mediterranean, but often occurs in low densities (Kalkman & Jović 2015). Individuals of *C. microstigma* are recorded in almost every country of the Balkan Peninsula (Adamović 1948, Bedjanić et al. 2008, Beschovski & Marinov 2007, Buczyński et al. 2013, Daraž 2009, De Knijf et al. 2013, Hostnik 2018, Kalkman 2000, Kovács & Murányi 2013, Kulijer et al. 2012, 2013, Lopau 2010, Puschnig 1926, Murányi 2007, Murányi & Kovács 2013, Shkëmbi et al. 2018, Vinko 2012, 2018, Vinko et al. 2017, 2018), while localities in Croatia (Belančić et al. 2008, Vilenica et al. 2014, Kotarac et al. 2016) represent north-westernmost border of the species areal (Kalkman & Jović 2015). This being considered, the presence of *C. microstigma* in the south of Serbia was expected.

Caliaeschna microstigma is classified as Near Threatened (NT) in the Mediterranean and the European Red Lists (Riservato et al. 2009, Kalkman et al. 2010). Kalkman et al. (2018) proposed *C. microstigma* to be included in the EU Habitat Directive (Council Directive 92/43/EEC) as its populations are declining and the species is likely to qualify as threatened in the European Red List in the future. Furthermore, decrease in quality of running waters throughout its area of distribution is present. As the range of *C. microstigma* is confined to cold streams and small rivers, the climate change will have a major impact on the species due to habitat degradation (Boudot et al. 2009). Therefore, the conservation of Pčinja River Valley is extremely important in order to protect the population of *C. microstigma* in Serbia. Further faunistic studies, focused also on dragonfly larvae and exuviae, should be carried out, especially in the southern parts of the country, to map the present distribution of this species and to take the most effective management measures for its conservation.

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References

- Adamović Ž.**, 1948: List of the Odonata collection of the State Museum in Sarajevo. *Godišnjak biološkog instituta u Sarajevu* 1(1): 79–94. (in Serbian with French summary)
- Avramović D., Zlatković B., Randelović N.**, 2005: Zaštićena prirodna dobra jugoistočne Srbije. *In: Proceeding of 8th Symposium on flora of Southeastern Serbia and Neighbouring Regions*. Niš: Department for Biology and Ecology of The Faculty of Sciences and Mathematics University of Niš & Biological society "Dr Sava Petrović", pp. 223–227.
- Bedjanić M., Micevski N., Micevski B.**, 2008: On the dragonfly collection in the natural history museum in Struga, Macedonia (Insecta: Odonata). *Biologica Macedonica* 61: 97–105.
- Belančić A., Bogdanović T., Franković M., Ljuština M., Mihoković N., Vitas B.**, 2008: *Crvena knjiga vretenaca Hrvatske*. Državni zavod za zaštitu prirode, Republika Hrvatska, 132 pp. (in Croatian)
- Beschovski V., Marinov, M.**, 2007: Fauna, Ecology, and Zoogeography of Dragonflies (Insecta: Odonata) of Bulgaria. *In: Fet V., Popov A. (Eds.), Biogeography and Ecology of Bulgaria*. Dordrecht: Springer, pp. 199–231.
- Boudot J.P., Kalkman V.J.**, 2015: *Atlas of the European dragonflies and damselflies*. KNNV publishing, The Netherlands, 381 pp.
- Boudot J.P., Kalkman J.V., Amorín A.M., Bogdanović T., Cordero-Rivera A., Degabriele G., Dommanget L.J., Ferreira S., Garrigós B., Jović M.**, 2009: Odonata of the Mediterranean and North Africa. *Libellula Supplement* 9: 1–256.
- Buczyński P., Zawal A., Stępień E., Buczyńska E., Pešić V.**, 2013: Contribution to the knowledge of dragonflies (Odonata) of Montenegro, with the first record of *Ophiogomphus cecilia* (Fourcroy, 1785). *Annales Universitatis Mariae Curie-Skłodowska* 68(2): 57–71.
- Daraž B.**, 2009: New data on dragonflies (Odonata) of northeasternmost Bulgaria. *Odonatrixo* 5(2): 55–64.
- De Knijf G., Vanappelghem C., Demolder, H.**, 2013: Odonata from Montenegro, with notes on taxonomy, regional diversity and conservation. *Odonatologica* 42(1): 1–29.
- Dijkstra K.D.B., Lewington, R.**, 2006: *Field Guide to the Dragonflies of Britain and Europe*. British Wildlife Publishing, Milton Stour (UK), 320 pp.
- Hostnik M.**, 2018: Ekosistemi Balkana 2018 – Kosovo (27. april – 5. maj 2018). *Erjavecia* 33: 16–19. (in Slovene)
- Jović M.**, 2013: A proposal of Serbian names for dragonfly species (Insecta: Odonata) of the Balkan Peninsula, with the checklist of Odonata of Serbia. *Acta entomologica Serbica* 18(1/2): 1–10.

- Jović M., Andjus L.J., Santovac S.,** 2009: New data on some rare and poorly known Odonata species in Serbia. *Bulletin of the Natural History Museum Belgrade* 2: 95–108.
- Jović M., Stanković M., Andus Lj.,** 2010: *Aeshna grandis* (Linnaeus 1758) – a new species in serbian fauna (Odonata: Aeshnidae). *Bulletin of the Natural History Museum in Belgrade* 3: 137–140.
- Kalkman V.J.,** 2000: Records on the dragonfly fauna of northwestern Albania. *Libellula* 19(1–2): 107–111.
- Kalkman J.V., Boudot J.P., Bernard R., Conze K.J., De Knijf G., Dyatlova E., Ferreira S., Jović M., Ott J., Riservato E., Sahlén G.,** 2010: *European Red List of Dragonflies*. Publications Office of the European Union, Luxembourg, 28 pp.
- Kalkman V.J., Jović M.,** 2015: *Caliaeschna microstigma* (Schneider, 1845). In: Boudot J.P., Kalkman V.J. (Eds.), *Atlas of the European dragonflies and damselflies*. The Netherlands: KNNV publishing, pp. 184–185.
- Kalkman J.V., Boudot J.P., Bernard R., De Knijf G., Shuling F., Termaat T.,** 2018: Diversity and conservation of European dragonflies and damselflies (Odonata). *Hydrobiologia* 811: 269–282.
- Karaman B.,** 1979: *Ecological faunal research of Odonata fauna of SR Macedonia*. PhD Thesis (manusc.) Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu, 153 pp. (in Serbian)
- Kotarac M., Šalamun A., Vilenica M.,** 2016: *Field research and laboratory processing for collecting new inventory data for taxonomic groups: Actinopterygii and Cephalaspidomorphi, Amphibia and Reptilia, Aves, Chiroptera, Decapoda, Lepidoptera, Odonata, Plecoptera, Trichoptera*. *EU Natura 2000 Integration Project (IBRD No. 8021-HR) Final report for the taxonomic group Odonata*, 39 pp.
- Kovács T., Murányi D.,** 2013: Larval data of *Caliaeschna microstigma* (Schneider, 1845) from the Balkan Peninsula, with contributions to its biology (Odonata: Aeshnidae). *Folia Historico Naturalia Musei Matraensis* 37: 21–28.
- Kulić L., Erić K., Gajić M.,** 2013: *Cordulegaster insignis* Schneider, 1845 (Odonata: Cordulegastridae) the first record from Serbia over a century later. *Bulletin of the Natural History Museum in Belgrade* 6: 65–69.
- Kulijer D., Vinko D., Billqvist M., Mekkes J.J.,** 2012: Contribution to the knowledge of the Odonata fauna of Bosnia and Herzegovina – Results of the ECOO 2012. *Natura Sloveniae* 14(2): 23–38.
- Kulijer D., De Knijf G., Franković M.,** 2013: Review of the Odonata of Bosnia and Herzegovina. *Odonatologica* 42(2): 109–123.
- Lopau W.,** 2010: Studien zur Libellenfauna Griechenlands IV. *Libellula Supplement* 10: 5–260. (in German)
- Mišić V.,** 1981: *The forest vegetation in gorges and canyons in Eastern Serbia*. Institut za biološka istraživanja „Siniša Stanković“. Posebno izdanje. Beograd, 327 pp. (in Serbian)

- Murányi D.**, 2007: Contribution to the Odonata fauna of Albania. *Folia Entomologica Hungarica* 68: 41–53.
- Murányi D., Kovács T.**, 2013: Contribution to the Odonata fauna of Albania and Montenegro. *Folia Historico Naturalia Musei Matraensis* 37: 29–41.
- Puschnig R.**, 1926: Albanische Libellen. *Konowia* 5: 211–217. (in German)
- Rajkov S., Vinko D., Arandjelović A.**, 2015: Faunistic results from the 2nd Balkan Odonatological Meeting – BOOM 2012, Serbia. *Natura Sloveniae* 17(2): 67–76.
- Riservato E., Boudot J.P., Ferreira S., Jović M., Kalkman J.V., Schneider W., Samraoui B., Cuttelod A.**, 2009: *The status and distribution of dragonflies of the Mediterranean Basin*. IUCN, Gland, Switzerland and Malaga, Spain, vii + 33 pp.
- Shkëmbi E., Gerken B., Pepa B., Kiçaj H., Misja K., Paparisto A.**, 2018: Contribution to the knowledge of Odonata from Vjosa catchment. *Acta ZooBot Austria* 155: 239–250.
- Vilenica M., Kulijer D., Gligorović B.**, 2014: New data on distribution and threats to the populations of *Caliaeschna microstigma* at the north-western edge of its range. Conference Paper. In: ECOO 2014, 3rd European Congress on Odonatology. Abstract book. Montpellier, pp. 31.
- Vinko D.**, 2012: Report of the odonatological group. In: Borko Š. (Ed.), Ekosistemi Jadrana – Makedonija 2010. Ljubljana: Društvo študentov biologije, pp. 10–16. (in Slovene)
- Vinko D.**, 2018: Leto 2018 kot začetek sodobnega proučevanja kačjih pastirjev Kosova in BOOM 2018 – Kosovo. *Erjavecija* 33: 27–36. (in Slovene)
- Vinko D., Kulić L., Gajič M.**, 2016: BOOM 2016 – 6th Balkan Odonatological Meeting – 6. Mednarodno srečanje odonatologov Balkana, Jugovzhodna Srbija, 5.–12. avgust 2016. *Erjavecija* 31: 13–22. (in Slovene)
- Vinko D., Kulijer D., Rimcheska B., Brauner O.**, 2017: Faunistic results from the 5th Balkan odonatological meeting – BOOM 2015, Republic of Macedonia. *Acta entomologica Slovenica* 25(1): 89–114.
- Vinko D., Kulijer D., Zhushi Etemi F., Hostnik M., Šalamun, A.**, 2018: First checklist of Odonata from Kosovo. In: Podlesnik J., Klokočovnik V. (Eds.), Book of Abstracts, Fifth Slovenian Entomological Symposium with International Attendance, dedicated to Academician Prof. Dr. Matija Gogala on the Occasion of his 80th Birthday and 50th Anniversary of the Death of Prof. Dr. Štefan Michieli, Maribor, 21st and 22nd September 2018. Maribor: Univerzitetna založba Univerze v Mariboru, pp. 33.

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