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The first systematic survey of the dragonfly fauna of Kosovo

Damjan Vinko¹, Dejan Kulijer^{1,2}, Ferdije Zhushi Etemi^{3*}, Maja Hostnik¹ & Ali Šalamun^{1,4}

¹ Slovene Dragonfly Society, Verovškova 56, 1000 Ljubljana, Slovenia

² National Museum of Bosnia and Herzegovina, Zmaja od Bosne 3,
71 000 Sarajevo, Bosnia and Herzegovina

³ Faculty of Mathematics and Natural Sciences, University of Prishtina "Hasan
Prishtina", George Bush 5, Prishtinë 10000, Kosovo

⁴ Centre for Cartography of Fauna and Flora, Antoličičeva 1, 2204 Miklavž na
Dravskem polju, Slovenia

* Email: ferdije.zhushi@uni-pr.edu

Abstract

This paper presents the faunistic results of three short field excursions conducted in spring and early summer of 2018 in Kosovo, considering dragonfly fauna one of the most understudied countries of Europe. This study presents first systematic dragonfly research in Kosovo. Within a total of 13 field days between end of April and end of June 2018, 60 sites were surveyed and 44 dragonfly species were found. Significant results include the first documented report of 15 species for Kosovo. New data on several other species with a broader European concern or generally rare on the West Balkan peninsula, i.e. *Coenagrion ornatum*, *Anax ephippiger*, *Calliaeschna microstigma*, *Cordulegaster heros*, *C. bidentata*, *Somatochlora flavomaculata*, and *Sympetrum flaveolum*, are also presented. The overview of all visited sites is included. Altogether, 47 dragonfly species are now reported for Kosovo.

Key words: dragonflies, Odonata, Kosovo, Balkan, first records

Introduction

The dragonfly fauna of Kosovo (Insecta: Odonata) is not sufficiently known in comparison with central and western European countries, even to other parts of the West Balkan Peninsula, where interest in dragonflies is increasing in recent years —mostly because of the establishment of the Balkan Odonatological Meeting (Jović 2011, Vinko et al. 2016, 2017). For Kosovo, the Atlas of the European dragonflies and damselflies (Boudot & Kalkman 2015) reports 22 dragonfly species, with less than 50 data altogether and the majority of records collected prior to the 1990s, which proves significant lack of knowledge of the dragonfly fauna of Kosovo (Fig. 1). All data published in the Mediterranean Atlas (Boudot et al. 2009) were also included in the European Atlas. Additionally, Mužinić & Rašajski (1992), Zhushi-Etemi (2005) and Hoxha (2010) report nine species from Kosovo which were not included in the European Atlas (Boudot &

Kalkman 2015). Among species not included in the European Atlas is also *Leucorrhinia albifrons* (Burmeister 1839) (Zhushi-Etemi 2005) – we believe that its larva was misidentified as the species does not occur in southeast Europe (Boudot & Kalkman 2015). Therefore, we omit this species. Furthermore, a record of *Chalcolestes viridis* (Vander Linden 1825) from 2011 and of *Caliaeschna microstigma* (Schneider 1845) from 2014 were found in online database for mapping and monitoring biodiversity of Serbia – BioRas (2018). Kosovo's biodiversity is conserved in 116 protected areas, including two national parks and eleven nature reserves (Veselaj & Mustafa 2015). As of today, no dragonfly species is protected in Kosovo. The review of a list of dragonfly species for Kosovo is in preparation. Official languages in Kosovo are Albanian and Serbian, in some municipalities also Turkish, Bosnian, Gorani and Romani are recognised as regional languages. In Albanian language odonates are called pilivesa and in Serbian vilinski konjic.

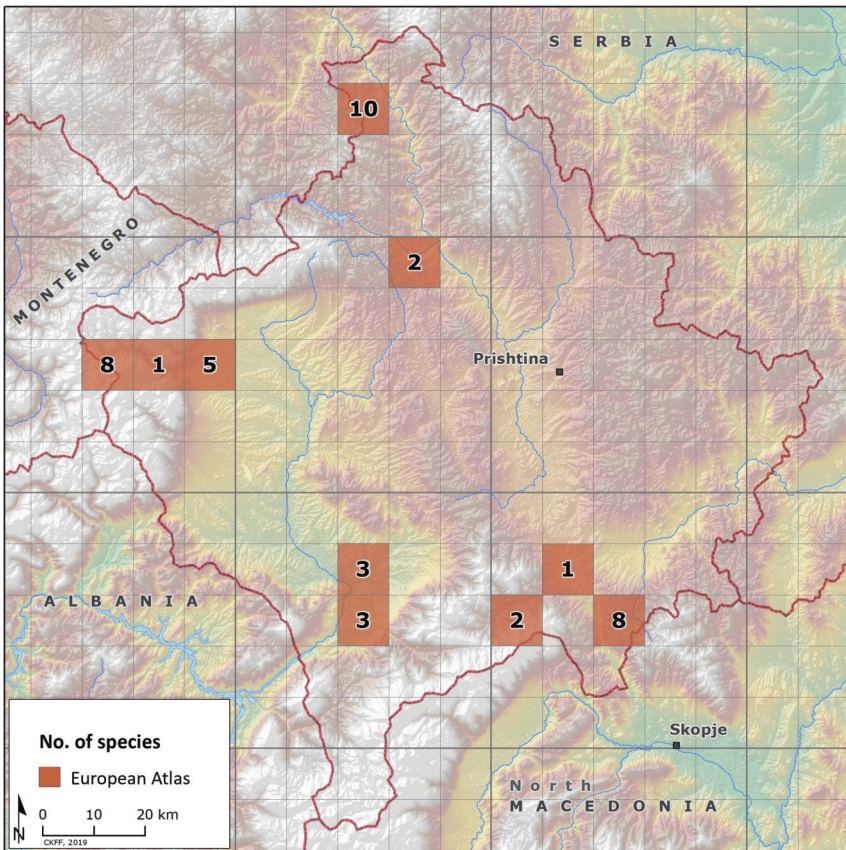


Figure 1. Number of dragonfly species per UTM 10x10 recorded from the Atlas of the European dragonflies and damselflies (Boudot & Kalkman 2015).

The goal of this survey was to collect data on all dragonfly species and their habitats in Kosovo, as well as to determine presence and distribution of species of conservation concern that supported work on the Red book of fauna of Kosovo (Ibrahimi et al. 2019).

Material and Methods

Kosovo is located in the western part of the Balkan Peninsula. It is characterised by a variety of habitats including high mountains with several peaks above 2,600 m a.s.l. and numerous mountain lakes and ponds in high altitudes. Forests are widespread in Kosovo and cover at least 39 % of the territory.

Odonates were surveyed during three short excursions in 2018 during 13 field days which were suitable for the field work: 1) 28th April to 4th May; 2) 24th to 27th May;

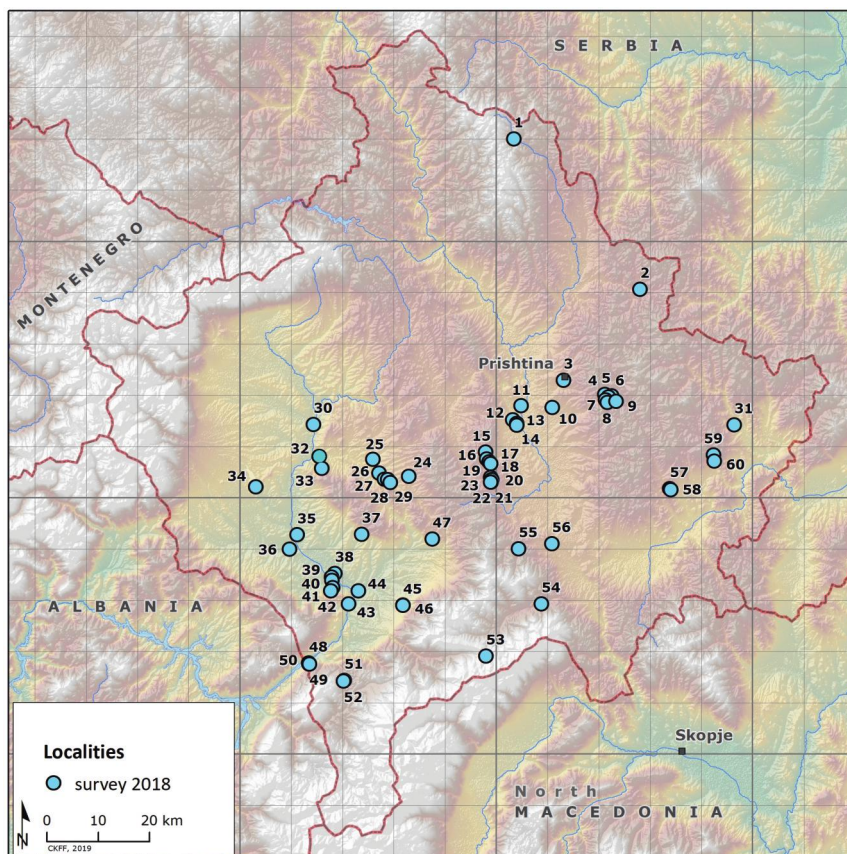


Figure 2: Geographical position of investigated localities during our survey in Kosovo. The numbers correspond to the list of localities in Table. 1.

3) 24th to 26th June. The first field trip was organized as a part of a student camp held by the Biological Student's Society of Slovenia (Hostnik 2018), both others were conducted by the first three authors. Cold and rainy weather did not allow us to visit some other areas of Kosovo, particularly at the end of June.

Tab. 1: The list of the localities investigated during this survey. For each locality, geographical coordinates, altitudes and survey dates are given. The table also shows the number of species recorded at each locality.

No.	nearby city / village	exact locality	coordinates (lat./lon.)	date	alt. (m)	No of dragon-fly taxa
1.	Brecë	Llap River NW of Brecë (Brece) Village	43°04'58", 21°02'32"	24.05.2018	905	2
2.	Batlava	Batlavë Lake (Batlavsko) at Orlan (Orlane) Village	42°49'05", 21°20'34"	24.05.2018	640	2
3.	Prishtinë	Xhorxh Bush Street, N of Mother Teresa Cathedral	42°39'31", 21°09'37"	25.06.2018	592	1
4.	Badovc	streamlet Kozarnik S of Bear sanctuary Prishtina, N of Badovci (Badovac) Lake, S of Novo Sellë (Novo Selo)	42°38'01", 21°15'31"	27.05.2018	683	6
5.	Badovc	Mramorska River, inflow river at NE Badovci (Badovac) Lake	42°37'51", 21°16'29"	27.05.2018	654	8
6.	Badovc	Badovci (Badovac) Lake, NE part	42°37'45", 21°16'02"	27.05.2018	653	17
7.	Badovc	Badovci (Badovac) Lake, S of the road Prishtinë-Gjilan at Androvačka River	42°37'26", 21°15'37"	24.06.2018	656	8
8.	Badovc	Androvačka River S of Badovci (Badovac) Lake	42°37'09", 21°15'52"	24.06.2018	675	1
9.	Badovc	Kisura River SE of Badovci (Badovac) Lake at the road Prishtinë-Gjilan, NW of Slivovo Village at Villa Natyra	42°37'17", 21°17'08"	27.05.2018	674	3
10.	Çagllavicë	Gračanica River and a pond W of Çagllavicë (Caglavica) Village, near the hospital Otrila	42°36'39", 21°07'59"	24.06.2018	565	12
11.	Vragoli	Drenica River N of Vragoli (Vragolija) Village	42°36'50", 21°03'33"	26.05.2018	538	3
12.	Henc	channel and a small pond in Henc (Ence) Village	42°35'22", 21°02'22"	27.05.2018	539	2
13.	Henc	channel S of Henc (Ence) Village	42°34'59", 21°02'56"	27.05.2018	538	8
14.	Henc	wetland S of Henc (Ence) Village	42°34'46", 21°02'56"	27.05.2018	538	21
15.	Vërshëvc	Park Blinajë, the second lake on the N side of the Park	42°31'56", 20°58'30"	26.06.2018	710	14
16.	Vërshëvc	Park Blinajë, the first lake on the N side of the Park	42°31'13", 20°58'40"	26.06.2018	660	15
17.	Vërshëvc	Park Blinajë, meadow and a stream along the road on the N side of the Park	42°30'55", 20°59'02"	26.06.2018	640	5
18.	Vërshëvc	Park Blinajë, the first lake, at the entrance of the Park	42°30'44", 20°59'12"	26.06.2018	625	13

No.	nearby city / village	exact locality	coordinates (lat./lon.)	date	alt. (m)	No of dragon-fly taxa
19.	Vërshëvc	Park Blinajë, stream and meadows on the S side of the Park	42°29'17", 20°59'14"	26.06.2018	705– 730	13
20.	Vërshëvc	Park Blinajë, the second lake on the S side of the Park	42°29'03", 20°59'23"	26.06.2018	733	13
21.	Vërshëvc	Park Blinajë, the last (third) lake on the S side of the Park	42°28'50", 20°59'17"	26.06.2018	760	13
22.	Vërshëvc	Park Blinajë, pond above (SW) the last (third) lake on the S side of the Park	42°28'47", 20°59'15"	26.06.2018	765	8
23.	Vërshëvc	Park Blinajë, stream above (S) the pond above (SE) the last (third) lake on the S side of the Park	42°28'46", 20°59'14"	26.06.2018	770	1
24.	Malishevë	pond at highway	42°29'23", 20°47'33"	26.05.2018	587	10
25.	Malishevë	stream on the road to Mirusha (Miruša) Lake, S of Vlaski Drenovac	42°31'09", 20°42'25"	26.05.2018	506	8
26.	Malishevë	Mirusha (Miruša) Lake	42°29'42", 20°43'18"	01.05.2018, 26.05.2018	508	16
27.	Malishevë	Mirusha (Miruša) River and its channel W of Malishevë (Maleševo) city	42°29'05", 20°44'07"	26.05.2018	521	8
28.	Malishevë	Malishevë (Maleševo) city centre	42°29'03", 20°44'33"	26.05.2018	524	1
29.	Malishevë	parking at shopping centre in Malishevë (Maleševo) city	42°28'43", 20°44'55"	26.05.2018	525	1
30.	Zajm	gravel ponds SW of confluence of Drini i Bardhë (Beli Drin) and Bistrica e Pejës (Peçka Bistrica) rivers S of Zajm (Zajmovo) Village	42°34'49", 20°33'55"	26.05.2018	366	12
31.	Zajm	Drini i Bardhë (Beli Drin) River S of Zajm (Zajmovo) Village	42°34'44", 21°33'56"	26.05.2018	366	4
32.	Llapçevë	Mirusha (Miruša) river at Mirusha (Miruša) Waterfalls	42°31'26", 20°34'48"	01.05.2018, 25.06.2018	395	8
33.	Llapçevë	streamlet in Llapçevë (Lapçevo) Village	42°30'12", 20°35'10"	25.06.2018	531	5
34.	Radoniaq	gravel pit S of Radoniaq (Radonjičko) Lake	42°28'13", 20°25'46"	01.05.2018	470	6
35.	Radostë	pond W of Radostë (Radoste) Village	42°23'10", 20°31'41"	30.04.2018	324	5
36.	Radostë	oxbow lake on the left bank of Erenik River, N of Bishtazhin (Bištražin) Village	42°21'38", 20°30'37"	29.04.2018	322	3
37.	Hoçë e Madhe	Hoçica Stream in NE Hoçë e Madhe (Velika Hoça) Village, S of St. Jovan Monastery	42°23'16", 20°40'51"	28.04.2018	435	1
38.	Krusha e Madhe	Hoçanska River	42°19'08", 20°37'04"	28.04.2018	307	3
39.	Krusha e Madhe	gravel pits on the left bank of Drini i Bardhë (Beli Drin) River, at the end of Hoçanska River	42°18'45", 20°36'37"	28.04.2018	306	3

No.	nearby city / village	exact locality	coordinates (lat./lon.)	date	alt. (m)	No of dragon-fly taxa
40.	Krusha e Madhe	Gravel pits on the left bank of Drini i Bardhë (Bell Drin) River	42°18'23", 20°36'41"	28.04.2018	302	9
41.	Zym	stream in Lukinë (Lukanja) Village	42°17'38", 20°36'48"	29.04.2018	335	3
42.	Zym	Jezero Lake S of Lukinë (Lukanja) Village	42°17'16", 20°36'32"	29.04.2018	516	6
43.	Zym	the right bank of Drini i Bardhë (Bell Drin) River, E of Gjonaj (Donaj) Village	42°15'55", 20°39'05"	03.05.2018	295	1
44.	Piranë	Topluha (Topluga) River in Piranë (Pirane) Village	42°17'18", 20°40'26"	29.04.2018	299	4
45.	Korishë	channel left from the road at Greikoc (Grejkovačka reka) Stream	42°15'48", 20°46'47"	30.04.2018	420	2
46.	Korishë	Greikoc (Grejkovačka reka) Stream	42°15'46", 20°46'46"	30.04.2018	420	6
47.	Suharekë	accumulation lake SE of Slapuzhan (Slapužane) Village, E of the highway Prizren-Prishtinë	42°22'47", 20°50'54"	30.04.2018	485	4
48.	Vërmicë	Vërmicë (Vrbnica) Lake	42°09'39", 20°33'26"	25.05.2018	290	3
49.	Vërmicë	pond near Vërmicë (Vrbnica) Lake	42°09'34", 20°33'29"	25.05.2018	305	12
50.	Vërmicë	stream E of Vërmicë (Vrbnica) Lake	42°09'33", 20°33'32"	25.05.2018	310	3
51.	Breznë	Breznë (Brezničko) Lake	42°07'51", 20°38'28"	04.05.2018, 25.06.2018	939	6
52.	Breznë	outflow stream SE of Breznë (Brezničko) Lake	42°07'46", 20°38'24"	25.06.2018	938	5
53.	Prevallë	Bištrica e Prizrenit Stream E of Prevallë (Prevalac) Village	42°10'27", 20°58'34"	25.05.2018	1.400	2
54.	Gërlicë e Epërme	Lepenci River and its streamlet near W of Brod Village	42°15'57", 21°06'26"	25.05.2018	705	1
55.	Nerodime e Epërme	confluence of Mala and Velika reka Rivers upstream of Nerodime Village	42°21'45", 21°03'10"	25.05.2018	673	4
56.	Ferizaj	Nerodime (Nerodimka) River at river bifurcation	42°22'17", 21°07'56"	25.05.2018	585	1
57.	Livoq i Epërm	Morava e jugut River (Livočka River) – small tributary of the Morava e Binçes River, inflow river of the Livoqi (Livočko) Lake	42°28'03", 21°24'41"	24.06.2018	566	10
58.	Livoq i Epërm	Livoqi (Livočko) Lake	42°27'55", 21°24'53"	24.06.2018	565	15
59.	Përlepticë	Përlepticë (Prilepničko) Lake	42°31'35", 21°31'00"	24.06.2018	623	1
60.	Përlepticë	Përlepnica (Prilepnica) River S of Përlepticë (Prilepničko) Lake	42°30'55", 21°31'04"	24.06.2018	550	1

Data were collected mainly in the central and southern part of Kosovo where we visited six out of seven districts in Kosovo. The selection of localities was based on the likelihood to find the most interesting species and to present the diversity of species and habitats of Kosovo. In total, dragonflies were mapped at 60 localities (Fig. 2, Tab. 1). Both lotic (from streamlets to medium size rivers) and lentic (ponds, mountain lakes) waters, as well as artificial habitats (fishponds, gravel pits, water reservoirs and canals) were investigated. The dragonfly fauna of most sites was investigated for the first time. We used standard odonatological field work methods, including visual observation and determination, catching specimens with a net, photographing etc. We searched for imagines (adults) at all sites. Imagines were identified on site. Sampling for larvae and exuviae was done occasionally, mostly at rivers and streams. Voucher samples were deposited with the 3rd author.

During the survey, special effort was taken to confirm the presence of species of broader European conservation concern (species listed in the Annexes of the EU Habitats Directive and species listed as threatened in the European Red List of dragonflies). As the dragonfly fauna of Kosovo is largely unknown (Fig. 1), we included in this report all of our observations, including single observations of species in urban areas.

Results

Altogether, 391 records for 44 species were collected at 60 sites (Fig. 3). The list of recorded species with locality numbers where they were observed is presented in Table 2.

Noteworthy results are new records of several species of European or regional conservation concern: *Coenagrion ornatum* (Selys 1850), *Caliaeschna microstigma* (Schneider 1845), *Cordulegaster bidentata* Selys 1843 and *Cordulegaster heros* Theischinger 1979. In terms of species diversity, the following areas showed high biodiversity: Blinajë Hunting Reserve (Loc. 15–23) with 32 species, wetland S of Henc Village (Loc. 12–14) with 22 species and Badovci (Badovac) Lake (Loc. 4–7) with 23 species. More than ten species were recorded at 13 sites (Tab. 2), out of which six are in Park Blinajë (Tab. 1).

The most frequent species were *Ischnura elegans* (Vander Linden 1820) (32 sites), *Coenagrion puella* (Linnaeus 1758) (31), *Libellula depressa* Linnaeus 1758 (31) and *Platycnemis pennipes* (Pallas 1771) (30), all found at 50 % or more of all investigated sites (Tab. 2). At more than a third of all investigated sites *Anax imperator* Leach 1815 was recorded (22 sites). Seven species were observed at only one locality (Tab. 2).

Apart from dragonflies some other interesting animal species were observed during the study. Among them are *Lucanus cervus* (Linnaeus 1758) (Loc. 32), *Lycaena dispar* (Haworth 1802) (Loc. 8 & 51), *Euplagia quadripunctaria* (Poda 1761) (Loc. 9), *Lissostriton vulgaris* (Linnaeus 1758) (Loc. 32), *Emys orbicularis* (Linnaeus 1758) (Loc. 51), *Natrix natrix* (Linnaeus 1758) (Loc. 4).

Overview of surveyed localities and observed dragonfly species

Abbreviations used: Loc. – locality(ies), ♂ – male(s), ♀ – female(s), MA – mature adult(s), Juv/Ten – juvenile(s)/teneral(s), Lar – larva(e), Ex – exuvium(ae), Cop – copula(e)/tandem(s), Ovip – ovipositing.

Table 2: Checklist of dragonfly species recorded during this survey. References for observation sites are given. The locality numbers correspond to the list of localities in Table 1. Species listed in the European Red list of Dragonflies (Kalkman et al. 2010) as Near Threatened are printed in bold letters, while species from Annexes of EU Habitat Directive (Council Directive 92/43/EEC) are marked with *. Species' status in the Mediterranean Red list (Riservato et al. 2009) as Vulnerable or Near Threatened are written in superscript.

Species	Locality numbers
LESTIDAE	
1. <i>Lestes barbarus</i> (Fabricius 1798)	14, 15, 20, 24, 51
2. <i>Lestes dryas</i> Kirby 1890	15, 20, 33
3. <i>Lestes virens vestalis</i> (Charpentier 1825)	15
4. <i>Sympecma fusca</i> (Vander Linden 1820)	6, 7, 10, 14, 18, 30, 40, 49, 58
CALOPTERYGIDAE	
5. <i>Calopteryx virgo</i> (Linnaeus 1758)	5, 6, 8, 9, 16, 18, 19, 25, 30, 31, 32, 44, 46, 50, 55, 56
6. <i>Calopteryx splendens</i> (Harris 1782)	9, 11, 13, 25, 26, 27, 28, 30, 31, 32, 38, 44, 46, 52, 57
PLATYCNEMIDIDAE	
7. <i>Platycnemis pennipes</i> (Pallas 1771)	5, 6, 9, 11, 13, 14, 15, 16, 18, 19, 20, 21, 22, 25, 26, 27, 29, 30, 32, 34, 35, 36, 40, 47, 51, 52, 57, 58, 59, 60
COENAGRIONIDAE	
8. <i>Coenagrion ornatum</i> (Selys 1850) *^{NT}	4
9. <i>Coenagrion puella</i> (Linnaeus 1758)	4, 5, 6, 7, 10, 14, 15, 16, 18, 19, 20, 21, 22, 24, 25, 26, 27, 30, 33, 34, 35, 39, 40, 42, 44, 45, 49, 51, 52, 57, 58
10. <i>Coenagrion scitulum</i> (Rambur 1842)	5, 10, 14, 15, 26
11. <i>Enallagma cyathigerum</i> (Charpentier 1840)	6, 10, 14, 15, 20, 24
12. <i>Erythromma lindenii</i> (Selys 1840)	5, 6, 10, 14, 21, 26, 32
13. <i>Erythromma viridulum</i> (Charpentier 1840)	58
14. <i>Ischnura elegans</i> (Vander Linden 1820)	2, 4, 6, 7, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 24, 25, 26, 27, 30, 34, 35, 38, 40, 42, 47, 49, 51, 52, 57, 58
15. <i>Ischnura pumilio</i> (Charpentier 1825)	4, 6, 7, 24, 33, 49, 57, 58
16. <i>Pyrrhosoma nymphula</i> (Sulzer 1776)	4, 5, 21, 30, 36, 45, 46
AESHNIDAE	
17. <i>Aeshna affinis</i> Vander Linden 1820	3, 16, 17, 19
18. <i>Aeshna cyanea</i> (Müller 1764)	15, 16, 18, 20, 21, 22
19. <i>Aeshna isoceles</i> (Müller 1767)	14, 18, 26, 58
20. <i>Aeshna mixta</i> Latreille 1805	17, 19
21. <i>Anax ephippiger</i> (Burmeister 1839)	6, 18
22. <i>Anax imperator</i> Leach 1815	6, 7, 10, 13, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 30, 34, 40, 42, 48, 49, 51, 58
23. <i>Anax parthenope</i> (Selys 1839)	14, 16, 18, 26
24. <i>Callaeschna microstigma</i> (Schneider 1845)^{NT}	32, 46, 49, 50

Species	Locality numbers
GOMPHIDAE	
25. <i>Gomphus vulgatissimus</i> Linnaeus 1758	1, 6, 14, 27, 31, 32, 44
26. <i>Onychogomphus forcipatus</i> (Linnaeus 1758)	5, 6, 19, 31, 32, 46
CORDULEGASTRIDAE	
27. <i>Cordulegaster bidentata</i> Selys 1843 ^{NT}	23, 37, 46, 50, 53, 54
28. <i>Cordulegaster heros</i> Theischinger 1979 ^{*vu}	1
<i>Cordulegaster</i> sp.	19
CORDULIIDAE	
29. <i>Cordulia aenea</i> (Linnaeus 1758) ^{NT}	6, 14, 15, 16, 18, 19, 20, 21, 22, 26, 30, 34, 40, 47, 49, 51, 52
30. <i>Somatochlora flavomaculata</i> (Vander Linden 1825)	17
31. <i>Somatochlora meridionalis</i> Nielsen 1935	2, 21, 32
LIBELLULIDAE	
32. <i>Crocothemis erythraea</i> (Brullé 1832)	14, 26, 30, 42, 49, 58
33. <i>Libellula depressa</i> Linnaeus 1758	4, 5, 6, 10, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 30, 33, 35, 36, 38, 39, 40, 41, 47, 48, 49, 53, 55
34. <i>Libellula fulva</i> (Müller 1764)	10, 14, 25, 26, 27, 30, 49, 58
35. <i>Libellula quadrimaculata</i> Linnaeus 1758	20
36. <i>Orthetrum albistylum</i> (Selys 1848)	6, 10, 13, 14, 16, 18, 20, 21, 22, 26, 35, 40, 43, 57, 58
37. <i>Orthetrum brunneum</i> (Fonscolombe 1837)	7, 10, 13, 14, 24, 27, 49, 55, 57, 58
38. <i>Orthetrum cancellatum</i> (Linnaeus 1758)	6, 10, 13, 14, 15, 21, 24, 26, 41, 42, 57, 58
39. <i>Orthetrum coerulescens</i> (Fabricius 1798)	15, 16, 55, 57, 58
40. <i>Sympetrum flaveolum</i> (Linnaeus 1758)	7, 16, 19
41. <i>Sympetrum fonscolombii</i> (Selys 1840)	6, 14, 24, 26, 34, 39, 40, 41, 42, 48, 49
42. <i>Sympetrum meridionale</i> (Selys 1841)	16, 19
43. <i>Sympetrum sanguineum</i> (Müller 1764)	7, 14, 15, 16, 17, 19, 20, 21, 57, 58
44. <i>Sympetrum striolatum</i> (Charpentier 1840)	33

Loc. 1: Llap River NW of Breçë (Breçe) Village (Fig. 4).

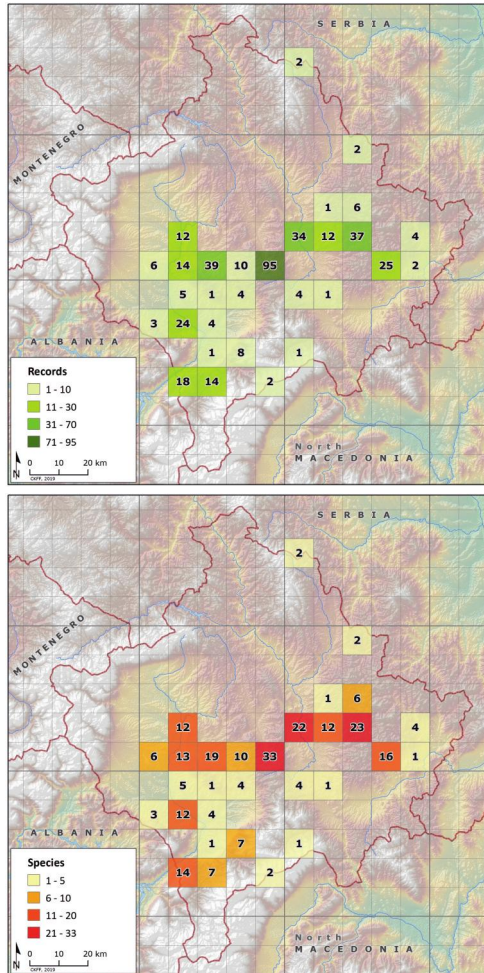
Small fast flow Llap River with two small streamlets app. 3 km upstream from Breçë Village, at the slopes of the Kopaonik Mt. (Fig. 4). At the time of our visit the river carried much water. Both species were recorded at the river.

24.05.2018: *Gomphus vulgatissimus*: 2 ♂♂; *Cordulegaster heros*: 1 Lar

Loc. 2: Batllavë Lake (Batlavsko) at Orlan (Orlane)Village (Fig. 5).

At the time of the visit it was rainy and we only inspected small eastern parts of the lake at Orlan Village. At the visited site the lake was flooding meadow vegetation

Figure 3: UTM map of dragonfly records collected in the survey (right), with the number of species per UTM 10x10 square (below).



(Fig. 5). The lake has steep margins in the west, while the eastern part of the lake where Batlava River is flowing into the Lake has more gentle margins with some fragments of marshy vegetation. Batllavë Lake is one of the largest artificial lakes in Kosovo, used also for tourism.

24.05.2018: *Ischnura elegans*: 15 MA; *Somatochlora meridionalis*: 2 Ex

Loc. 3: Xhorxh Bush Street, N of Mother Teresa Cathedral.

The only specimen of this locality – *Aeshna affinis* Vander Linden, 1820– was observed flying in the Prishtina city center near Mother Teresa Cathedral. We did not see any freshwater habitat in the area.

25.06.2018: *Aeshna affinis*: 1 ♂



Figure 4: Llap River (above) and one of streamlets (left) at Loc. 1.



Figure 5: Batllavë Lake at the place where Batlava River is flowing into the Lake (Loc. 2).

Loc. 4: streamlet Kozarnik S of Bear Sanctuary Prishtina, N of Badovci (Badovac) Lake, S of Novo Sellë (Novo Selo) (Fig. 6).

A small, partly dry (at the time of visit) streamlet that almost inconspicuously flows down the slope from Bear Sanctuary Prishtina and disappears not far from the north-eastern part of the Badovci Lake (Fig. 6). Most specimens were found in a small depression where shallow water was covering wet meadow vegetation.

27.05.2018: *Ischnura elegans*: 2 MA; *Ischnura pumilio*: 10 MA; *Coenagrion puella*: 1 ♂; *Coenagrion ornatum*: 10 ♂♂, 1 ♀; *Pyrrhosoma nymphula*: 3 ♂♂, 1 Ovip Cop; *Libellula depressa*: 5 ♂♂



Figure 6: streamlet Kozarnik (Loc. 4).

Loc. 5: Mramorska River, inflow river at NE Badovci (Badovac) Lake (Fig. 7)

A small, shallow and significantly polluted river flowing into the lake from its east side (Fig. 7).

27.05.2018: *Calopteryx virgo*: 5 ♂♂, 1 ♀; *Coenagrion puella*: <10 MA; *Coenagrion scitulum*: 1 ♀; *Erythromma lindenii*: 1 ♂; *Pyrrhosoma nymphula*: 2 ♂♂; *Platycnemis pennipes*: 10 MA; *Onychogomphus forcipatus*: 1 Lar; *Libellula depressa*: 10 MA



Figure 7: Mramorska River (Loc. 5).

Loc. 6: Badovci (Badovac) Lake (NE part) (Fig. 8).

NE part of the Badovci Lake with shallow water. It is a shallow part of the lake that dries out at the time of lower water level. At the time of the visit the water level was high with some macrophytic vegetation emerging from the water (Fig. 8).

27.05.2018: *Calopteryx virgo*: 1 ♂; *Sympecma fusca*: 10's MA; *Ischnura elegans*: <10 MA; *Ischnura pumilio*: 10's MA; *Enallagma cyathigerum*: 5 MA; *Coenagrion puella*: <10 MA; *Erythromma lindenii*: <10 MA, 1 Cop; *Platycnemis pennipes*: 3 MA; *Anax imperator*: 5 ♂♂; *Anax ephippiger*: 2 ♂♂; *Cordulia aenea*: 1 ♂; *Gomphus vulgatissimus*: 3 ♂♂; *Onychogomphus forcipatus*: 1 ♂; *Orthetrum cancellatum*: <10 MA; *Orthetrum albistylum*: <10 MA; *Libellula depressa*: 10's MA; *Sympetrum fonscolombii*: 10's MA



Figure 8: NE part of Badovci (Badovac) Lake (Loc. 6).

Loc. 7: Badovci (Badovac) Lake, S of the road Prishtinë-Gjilan at Androvačka River.

A small bay of the Badovci Lake at the mouth of Androvačka stream on the SE side of the lake (Fig. 9). The margins were mostly overgrown with willow bushes (Fig. 9).

24.06.2018: *Sympecma fusca*: 50 MA; *Ischnura elegans*: 3 MA; *Ischnura pumilio*: 1 ♂, 30 Juv/Ten; *Coenagrion puella*: 2 ♂♂; *Anax imperator*: 1 ♂; *Orthetrum brunneum*: 1 ♀; *Sympetrum sanguineum*: 2 MA; *Sympetrum flaveolum*: 1 ♀



Figure 9: Badovci (Badovac) Lake at the mouth of Androvačka stream (Loc. 7).



Figure 10: Androvačka River (Loc. 8).

Loc. 8: Androvačka River S of Badovci (Badovac) Lake (Fig. 10).

A stream flowing through meadows, overgrown with bushes and trees that cover the stream almost completely (Fig. 10).

24.06.2018: *Calopteryx virgo*: 5 ♂♂, 2 ♀♀

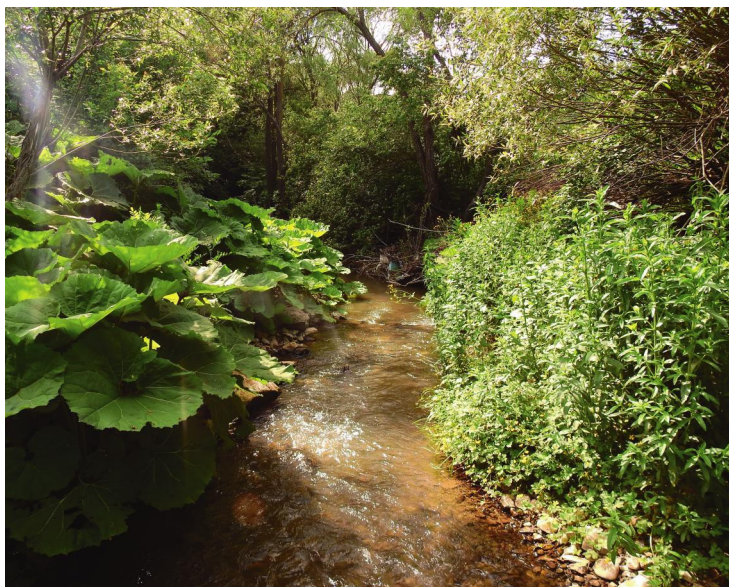


Figure 11:
Klisura Ri-
ver (Loc. 9).

Loc. 9: Klisura River SE of Badovci (Badovac) Lake at the road Prishtinë-Gjilan, NW of Slivovo Village, at Villa Natyra (Fig. 11).

A small River flowing along the road towards Badovci Lake (Fig. 11). Steep slopes along both sides of the river and except for some smaller segments the vegetation is mostly covering the river.

27.05.2018: *Calopteryx virgo*: 10's MA; *Calopteryx splendens*: 1 ♂; *Platycnemis pennipes*: 5 MA



Figure 12: Gračanica River (above) and a pond (below) W of Çagllavicë Village (Loc. 10).

Loc. 10: Gračanica River and a pond W of Çagllavicë Village (near the hospital Otrila).

Artificial pond near Çagllavicë Village, south of Prishtina, with its inflow by Gračanica River (Fig. 12). The pond was created in 2014 by deposition of soil that blocked the waterflow and formed an embarkment. A stripe of macrophytes (mainly *Typha* sp.) is developed along the margins of the pond (Fig. 12).

24.06.2018: *Sympecma fusca*: 2 ♂♂; *Ischnura elegans*: 5 MA; *Enallagma cyathigerum*: 2 ♂♂; *Coenagrion puella*: 10 ♂♂; *Coenagrion scitulum*: 1 ♂; *Erythromma lindenii*: 2 ♂♂; *Anax imperator*: 1 ♂; *Orthetrum cancellatum*: 4 ♂♂, 1 ♀; *Orthetrum albistylum*: 2 ♂♂, 1 Cop; 1 Ovip ♀; *Orthetrum brunneum*: 1 ♂, 1 ♀; *Libellula depressa*: 3 ♂♂; *Libellula fulva*: 2 ♂♂

Loc. 11: Drenica River N of Vragoli (Vragolija) Village (Fig. 13).

Drenica River at the northern edge of Vragoli Village (Fig. 13). A small and polluted river cut deeply into the soil with steep slopes. It was visited in late afternoon resulting in a small number of recorded species.

26.05.2018: *Calopteryx splendens*: 10's MA; *Ischnura elegans*: 5 MA; *Platycnemis pennipes*: 10's MA, <10 Juv/Ten



Loc. 12: channel and a small pond in Henc Village.

A small channel going through the village and forming a shallow muddy pond in the village. Inspected only while passing through the village.

27.05.2018: *Ischnura elegans*: 1 MA; *Libellula depressa*: 2 ♂♂

Loc. 13: channel S of Henc Village (Fig. 14).

A channel with water from wetland reservoirs (Fig. 14).

27.05.2018: *Calopteryx splendens*: 4 ♂♂; *Ischnura elegans*: <10 MA; *Platycnemis pennipes*: <10 MA; *Anax imperator*: 2 ♂♂; *Orthetrum cancellatum*: 1 ♂; *Orthetrum albistylum*: 3 ♂♂; *Orthetrum brunneum*: 1 ♀; *Libellula depressa*: 2 ♂♂

Figure 13: Drenica River (Loc. 11).



Figure 14: channel S of Henc Village (Loc. 13).



Figure 15: One of the two large water reservoirs of the Henc Fishponds (above) and one of several small and shallow ponds in the vicinity of the reservoirs (right) (Loc. 14).

Loc. 14: wetland S of Henc Village (Fig. 15).

Two large water reservoirs of the Henc Fishponds that are surrounded by dense reed bed along the margins, with only small parts of the margins accessible (Fig. 15, above). Also, several small and almost dry ponds with shallow water and macrophytic vegetation are present (Fig. 15, right).

27.05.2018: *Lestes barbarus*: 1 ♂, 5 Juv/Ten; *Sympecma fusca*: 7 MA; *Ischnura elegans*: 100's MA, 10's Cop, 10's Ovip Cop; *Enallagma cyathigerum*: 100's MA, 10's Cop; *Coenagrion puella*: 10 MA; *Coenagrion scitulum*: 10 MA; *Erythromma lindenii*: 3 ♂♂; *Platycnemis pennipes*: 5 MA; *Anax imperator*: 3 ♂♂; *Anax parthenope*: 10's MA, 2 Cop, 1 Ovip ♀; *Aeshna isoceles*: 2 MA; *Gomphus vulgatissimus*: 1 ♂; *Cordulia aenea*: 1 ♂; *Orthetrum cancellatum*: 10's MA, <10 Cop, 10 Juv/Ten; *Orthetrum albistylum*: 10's MA, <10 Cop, <10 Ovip ♀; *Orthetrum brunneum*: 1 ♀; *Libellula depressa*: 10 ♂♂, 2 ♀♀; *Libellula fulva*: 3 ♂♂; *Crocothemis erythraea*: 1 ♂; *Sympetrum sanguineum*: 10 Juv/Ten; *Sympetrum fonscolombii*: 10's MA, <10 Cop, <10 Ovip Cop

Loc. 15: Park Blinajë, the second lake on the N side of the Park (Fig. 16).

Blinajë Hunting Reserve occupies hilly area covered with forest app. 10 km west of Lipjan Town. Several small lakes and ponds are formed along the streams flowing through the valley. The banks of this lake are mostly overgrown with broadleaved forest, except for the NE side where rich macrophyte vegetation is present (Fig. 16) and where most species were observed.

26.06.2018: *Lestes virens*: 1 ♂, 1 ♀; *Lestes barbarus*: 1 ♀; *Lestes dryas*: 3 ♂♂; *Ischnura elegans*: <10 MA; *Enallagma cyathigerum*: 1 ♂, 1 ♀; *Coenagrion puella*: 3 ♂♂; *Coenagrion scitulum*: 1 ♂; *Platycnemis pennipes*: 10's MA; *Anax imperator*: 1 ♂; *Aeshna cyanea*: 1 ♀; *Cordulia aenea*: 3 ♂♂; *Orthetrum cancellatum*: 2 ♂♂; *Orthetrum coerulescens*: 1 ♂; *Sympetrum sanguineum*: 2 ♂♂, 1 ♀



Figure 16: The second lake on the N side of the Park Blinajë (Loc. 15).

Loc. 16: Park Blinajë, the first lake on the N side of the Park (Fig. 17).

The lake in the lower part of stream in the northern part of the Park (Fig. 17). The most abundant macrophyte and riparian shrubland vegetation is present along the northern side of the lake along the inflow of the stream. This part is probably temporarily flooded at times of higher water level of the lake and stream.

26.06.2018: *Calopteryx virgo*: 3 ♂♂, 2 ♀♀; *Ischnura elegans*: <10 MA; *Coenagrion puella*: <10 MA; *Platycnemis pennipes*: 10's MA; *Anax imperator*: 1 ♂, 1 Ovip ♀; *Anax parthenope*: 1 ♂; *Aeshna affinis*: 1 ♀; *Aeshna cyanea*: 1 ♀; *Cordulia aenea*: 2 MA; *Orthetrum albistylum*: 1 ♂, 2 ♀♀; *Orthetrum coerulescens*: 1 ♂; *Libellula depressa*: 1 ♂; *Sympetrum sanguineum*: 2 ♂♂; *Sympetrum meridionale*: 1 ♀; *Sympetrum flaveolum*: 1 ♂



Figure 17: the first lake on the N side of the Blinajë Park (Loc. 16).

Loc. 17: Park Blinajë, meadow and a stream along the road on the N side of the Park (Fig. 18).

Meadows along the road and the lower part of the stream just several hundred meters before the Park entrance and the conjunction with the stream from the south-western part of the Park (Fig. 18). The meadows along streams and roads in the park, surrounded by forest, are hunting grounds for dragonflies from ponds and lakes in the park.

26.06.2018: *Aeshna mixta*: 1 ♂; *Aeshna affinis*: 1 ♀, 3 MA; *Somatochlora flavomaculata*: 1 MA; *Libellula depressa*: 1 ♂; *Sympetrum sanguineum*: 1 ♂



Figure 18: meadow and a stream along the road on the N side of the Blinajë Park (Loc. 17).



Figure 19: the first lake at the entrance of Park Blinajë (Loc. 18).

Loc. 18: Park Blinajë, the first lake, at the entrance of the Park (Fig. 19).

It is the lake in the lowest part of the stream flowing from the SW of the Blinajë Park (Fig. 19). The banks are completely overgrown with dense broadleaved forest, floating vegetation covers most of the water surface, while a large patch of *Typha* sp. grows on the western part of the lake.

26.06.2018: *Calopteryx virgo*: 5 ♂♂, 5 ♀♀; *Sympecma fusca*: 1 ♀; *Ischnura elegans*: >10 MA; *Coenagrion puella*: 5 ♂♂; *Platycnemis pennipes*: 10's MA; *Anax imperator*: 2 ♂♂, 1 ♀; *Anax parthenope*: 1 ♂; *Anax ephippiger*: 1 ♂; *Aeshna isocetes*: 2 ♂♂; *Aeshna cyanea*: 1 ♂, 2 ♀♀; *Cordulia aenea*: 10 MA; *Orthetrum albistylum*: 1 ♂; *Libellula depressa*: 1 ♂

Loc. 19: Park Blinajë, stream and meadows on the S side of the Park (Fig. 20).

A small stream flowing from south along the road and through the valley surrounded with hills covered with forest (Fig. 20). The river bed is cut into the ground, surrounded by tall herbs and shrubs, and partly flowing through forest patches. The dragonflies were recorded along the stream or on the grasslands.

26.06.2018: *Calopteryx virgo*: 1 ♂, 2 ♀♀; *Ischnura elegans*: 10's MA; *Coenagrion puella*: 1 ♂; *Platycnemis pennipes*: <10 MA; *Aeshna mixta*: 1 ♂; *Aeshna affinis*: 3 ♀♀; *Onychogomphus forcipatus*: 1 ♂; *Cordulia aenea*: 1 ♂; *Cordulegaster* sp.: 1 MA; *Libellula depressa*: 1 ♂; *Sympetrum sanguineum*: 1 ♂; *Sympetrum meridionale*: 1 ♂; *Sympetrum flaveolum*: 1 ♂

Loc. 20: Park Blinajë, the second lake on the S side of the Park (Fig. 21).

One of the larger lakes in the Park located in its south part (Fig. 21). Western and eastern margins of the lake are covered by forest, while rich marshland vegetation is developed on its south side where the stream enters the lake.

26.06.2018: *Lestes barbarus*: 1 ♂; *Lestes dryas*: 1 ♀; *Ischnura elegans*: 10's MA; *Enallagma cyathigerum*: 1 ♂; *Coenagrion puella*: 10's MA; *Platycnemis pennipes*: 10's MA; *Anax imperator*: 1 ♂; *Aeshna cyanea*: 1 ♂; *Cordulia aenea*: 1 ♂; *Orthetrum albistylum*: 1 ♂; *Libellula quadrimaculata*: 2 ♂♂; *Libellula depressa*: 1 ♀; *Sympetrum sanguineum*: 2 ♂♂, 1 ♀



Figure 20: stream on the S side of the Blinajë Park (Loc. 19).



Figure 21: the second lake on the S side of the Park Blinajë (Loc. 20).



Figure 22: the third lake on the S side of the Park Blinajë (Loc. 21).

Loc. 21: Park Blinajë, the last (third) lake on the S side of the Park (Fig. 22).

The southernmost lake in the Park with forest vegetation along its east and west side, while other two banks on the sides of stream inflow and outflow have narrow stripes of marshland vegetation (Fig. 22). The water surface is partly covered by floating vegetation (*Potamogeton* sp.).

26.06.2018: *Ischnura elegans*: 10's MA; *Coenagrion puella*: 10's MA; *Erythromma lindenii*: 1 ♂; *Pyrrhosoma nymphula*: 1 ♂; *Platycnemis pennipes*: 100's MA; *Anax imperator*: 1 Ovip ♀; *Aeshna cyanea*: 2 ♀♀; *Cordulia aenea*: 2 ♂♂; *Somatochlora meridionalis*: 1 ♂; *Orthetrum cancellatum*: 1 ♂; *Orthetrum albistylum*: 1 ♂, 2 ♀♀; *Libellula depressa*: 1 ♂; *Sympetrum sanguineum*: 1 ♂

Loc. 22: Park Blinajë, pond above (SW) the last (third) lake on the S side of the Park. A small and shallow pond in the forest (Fig. 23).

26.06.2018: *Ischnura elegans*: <10 MA; *Coenagrion puella*: <10 MA; *Platycnemis pennipes*: <10 MA; *Anax imperator*: 1 ♀; *Aeshna cyanea*: 1 ♂, 2 ♀♀; *Cordulia aenea*: 2 ♂♂; *Orthetrum albistylum*: 1 ♀; *Libellula depressa*: 2 ♂♂



Figure 23: a pond SW of the third lake on the S side of the Park Blinajë (Loc. 22).

Loc. 23: Park Blinajë, stream above (S) the pond above (SE) the last (third) lake on the S side of the Park (Fig. 24).

A small muddy forest creek flowing through dense broadleaved forest that completely overgrows it (Fig. 24). Branches of felled trees are present along and in the stream.

26.06.2018: *Cordulegaster bidentata*: 2 ♂♂, 4 Lar



Figure 24: a stream SE of the third lake on the S side of the Park Blinajë (Loc. 23).



Figure 25: a pond along the highway Prishtina–Prizren (Loc. 24).

Loc. 24: pond at highway Prishtina–Prizren (Fig. 25).

Large, shallow and richly vegetated artificial pond along the highway Prishtina–Prizren (Fig. 25). The pond is probably feed by rain water from the highway. A lot of plastic waste is present in the pond.

26.05.2018: *Lestes barbarus*: 2 Juv/Ten; *Ischnura elegans*: 10's MA; *Ischnura pumilio*: <10 MA; *Enallagma cyathigerum*: 2 ♂♂; *Coenagrion puella*: 10's MA; *Anax imperator*: 6 ♂♂, 1 ♀; *Orthetrum cancellatum*: 2 ♂♂; *Orthetrum brunneum*: 2 ♀♀; *Libellula depressa*: 10's MA; *Sympetrum fonscolombii*: 10 ♂♂: 1 ♀

Loc. 25: stream on the road to Mirusha (Miruša) Lake, S of Vlaski Drenovac (Fig. 26).

Several 100 m's of polluted stream and some pools of water with a lot of waste (Fig. 26). Along the whole stretch the stream is extremely polluted, disturbed and full of garbage.

26.05.2018: *Calopteryx virgo*: 2 ♂♂; *Calopteryx splendens*: 10 ♂♂: 10 ♀♀, 1 Cop; *Ischnura elegans*: 3 MA; *Coenagrion puella*: 10 ♂♂, 2 ♀♀, 2 Cop; *Platycnemis pennipes*: 1 ♂, 5 ♀♀; *Anax imperator*: 2 ♂♂; *Libellula depressa*: 15 ♂♂, 2 ♀♀; *Libellula fulva*: 5 ♂♂



Figure 26: stream on the road to Mirusha (Miruša) Lake, S of Vlaski Drenovac (Loc. 25).

Loc. 26: Mirusha (Miruša) Lake (Fig. 27).

An artificial lake created on Mirusha River app. 2 km NW from Malishevë City (Fig. 27). We investigated the southern side of the lake that includes two out of three arms of the lake. Most of the bank is steep with only fragments with macrophyte vegetation. Pollution and waste is also visible in the lake.

01.05.2018: *Ischnura elegans*: 2 ♂♂; *Platycnemis pennipes*: 3 ♂♂; *Libellula depressa*: 1 ♂; *Libellula fulva*: 1 Ex; *Orthetrum cancellatum*: 1 Ex

26.05.2018: *Calopteryx splendens*: 2 ♂♂; *Ischnura elegans*: 10's MA, <10 Cop, <10 Juv/Ten; *Coenagrion puella*: 10's MA, <10 Cop, <10 Ovip Cop; *Coenagrion scitulum*: 1 Cop; *Erythromma lindenii*: 2 ♂♂; *Platycnemis pennipes*: 10's MA, <10 Cop, <10 Juv/Ten; *Anax imperator*: 10 ♂♂, 1 Ovip ♀; 5 Ex; *Anax parthenope*: 3 ♂♂; *Aeshna isocetes*: 3 MA; *Cordulia aenea*: 3 ♂♂, 1 Ex; *Orthetrum cancellatum*: 10's MA, <10 Cop, <10 Juv/Ten; *Orthetrum albistylum*: 10's MA, <10 Cop, 1 Ovip ♀; *Libellula depressa*: 5 ♂♂; *Libellula fulva*: 10's MA, <10 Cop; *Sympetrum fonscolombii*: 1 ♂, 1 Juv/Ten ♀; *Crocothemis erythraea*: 1 Ex



Figure 27: Mirusha (Miruša) Lake (Loc. 26).

Loc. 27: Mirusha (Miruša) River and its channel W of Malishevë (Fig. 28).

Mostly canalized Mirusha River downstream from Malishevë city with some riparian tree vegetation present in the lower part of the stretch (Fig. 28). Most of this stretch is a concrete channel. Some tall macrophyte vegetation is present in the canalized part that has deeper water. Pollution and waste are also visible.

26.05.2018: *Calopteryx splendens*: 100's MA; *Ischnura elegans*: 5 MA; *Coenagrion puella*: 1 Cop; *Platycnemis pennipes*: 10's MA, <10 Cop; *Gomphus vulgatissimus*: 4 ♂♂; *Orthetrum brunneum*: 1 ♂; *Libellula depressa*: 3 ♂♂; *Libellula fulva*: 4 ♂♂

Loc. 28: Malishevë city centre.

A single individual was seen flying along the main street in the city center of Malishevë.

26.05.2018: *Calopteryx splendens*: 1 ♂

Loc. 29: parking at shopping centre in Malishevë.

One single copula was recorded at the parking lot at the outskirts of the Malishevë city.

26.05.2018: *Platycnemis pennipes*: 1 Cop



Figure 28: Mirusha (Miruša) River W of Malishevë (Loc. 27).



Figure 29: gravel ponds SW of confluence of Drini i Bardhë (Beli Drin) and Bistrica e Pejës (Pećka Bistrica) rivers (Loc. 30).

Loc. 30: gravel ponds SW of confluence of Drini i Bardhë (Beli Drin) and Bistrica e Pejës (Pećka Bistrica) rivers S of Zajm village (Fig. 29).

Several gravel ponds app. 200 m downstream from the confluence of Drini i Bardhë and Bistrica e Pejës rivers (Fig. 29). The ponds are mainly small and shallow, largely overgrown with riparian bushes and trees and surrounded by pastures. Located on the left bank and close to the Drini i Bardhë River with which they are connected by a small water flow and probably flooded regularly at the time of high-water levels. The larger ponds have well developed macrophyte vegetations, while smaller ones mostly dry out during summer season.

26.05.2018: *Calopteryx virgo*: 5 ♂♂, 2 ♀♀; *Calopteryx splendens*: 4 ♂♂; *Sympecma fusca*: 1 ♂; *Ichnura elegans*: <10 MA, <10 Juv/Ten; *Coenagrion puella*: 10's MA, 10's Juv/Ten, 10's Cop, 10's Ovip Cop; *Pyrrhosoma nymphula*: 10's MA, 10's Cop, 10's Ovip Cop; *Platycnemis pennipes*: 10's MA, 10's Juv/Ten, 10's Cop; *Anax imperator*: 3 ♂♂; *Cordulia aenea*: 5 ♂♂, 1 Ovip ♀; *Libellula depressa*: 10 ♂♂, <10 Juv/Ten; *Libellula fulva*: 10's MA, 1 Juv/Ten, 1 Cop; *Crocothemis erythraea*: 3 ♂♂, 1 Ovip ♀

Loc. 31: Drini i Bardhë (Beli Drin) River S of Zajm village (Fig. 30).

The right bank of the Drini i Bardhë River south of gravel ponds (Loc. 30). Riparian trees and bushes grow along both sides of the river (Fig. 30). At the time of visit the river seemed to be at its high-water level. Erosion of the right river bank was observed at the part where riparian vegetation was cut.

26.05.2018: *Calopteryx virgo*: 10 MA; *Calopteryx splendens*: 10's MA, 3 Cop; *Gomphus vulgatissimus*: 1 ♂, 1 ♀; *Onychogomphus forcipatus*: 3 ♂♂



Figure 30: Drini i Bardhë (Beli Drin) River S of Zajm village (Loc. 31).

Loc. 32: Mirusha (Miruša) River at Mirusha (Miruša) Waterfalls (Fig. 31).

Mirusha River from the water pool below the waterfalls at the end of the river canyon and an app. 400 m long stretch of the river downstream (Fig. 31). Both sides of the river are overgrown with riparian trees. From the water pool below the waterfall several fast-flowing branches of the river go over small cascades for app. 250 m and then join in one deeper and slower flowing water course.

01.05.2018: *Calopteryx virgo*: 1 ♂, 1 ♀

25.06.2018: *Calopteryx virgo*: 100's MA; *Calopteryx splendens*: 100's MA; *Erythromma lindenii*: 5 ♂♂; *Platycnemis pennipes*: 100's MA, 10's Cop; *Caliaeschna microstigma*: 2 ♂♂, 2 ♀♀; *Gomphus vulgatissimus*: 4 ♂♂; *Onychogomphus forcipatus*: 4 ♂♂; *Somatochlora meridionalis*: 1 ♂

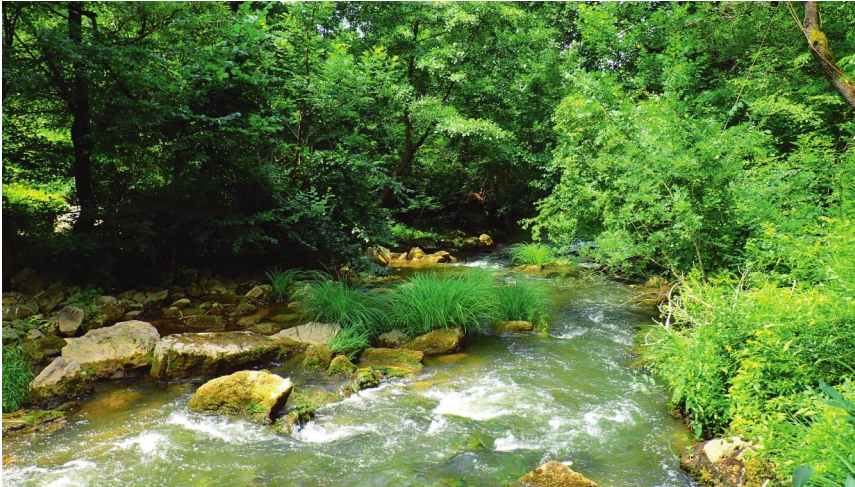
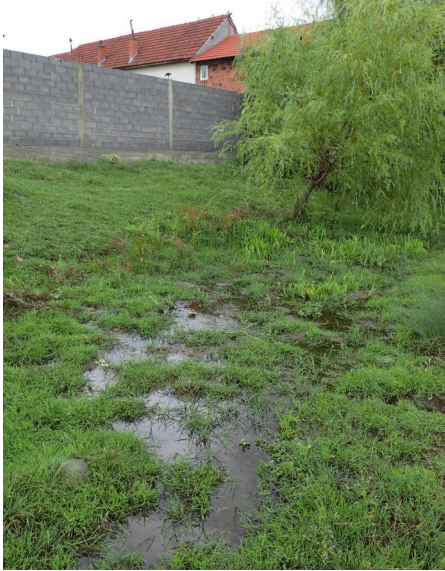


Figure 31: Mirusha (Miruša) River (above) and waterfalls (below) (Loc. 32).



Loc. 33: streamlet in Lapčevo Village (Fig. 32).

A small streamlet at the crossroad at the fringe of Lapčevo Village (Fig. 32). It flows down the slope covered by pastures and farmland. It significantly polluted and physically altered by livestock. At the flat areas along the stream water spreads around forming small patches of wet ground with some hygrophilous vegetation.

25.06.2018: *Lestes dryas*: 1 ♀ Juv/Ten; *Ischnura pumilio*: 1 ♂; *Coenagrion puella*: 1 ♂; *Libellula depressa*: 2 ♂♂; *Sympetrum striolatum*: 10 Juv/Ten

Figure 32: streamlet in Lapčevo Village (Loc. 33).

Loc. 34: gravel pit S of Radonijqi (Radonjičko) Lake (Fig. 33).

Small pond with rich submerged vegetation (Fig. 33). There are some bushes around the margins and stony shorelines along the nearby walking path.

01.05.2018: *Ischnura elegans*: 3 ♂♂, 1 ♀; *Coenagrion puella*: 5 ♂♂, 2 Cop; *Platycnemis pennipes*: 3 Juv/Ten; *Anax imperator*: 1 ♂; *Cordulia aenea*: 2 ♂♂; *Sympetrum fonscolombii*: 5 ♂♂, 3 Cop, 3 Ovip

Loc. 35: pond W of Radostë (Radoste) Village (Fig. 34).

Large artificial pond near Radostë village (Fig. 34). At the time of visit the water was high and the shoreline rich in bushes, terrestrial weeds and *Typha* sp. There is a large flooded meadow near the pond with some "windows" filled with water.

30.04.2018: *Ischnura elegans*: 10's MA, 10 Cop; *Coenagrion puella*: 3 ♂♂; *Platycnemis pennipes*: 1 ♂; *Orthetrum albistylum*: 2 Juv/Ten ♂; *Libellula depressa*: 10 ♂♂, 2 ♀♀

Loc. 36: oxbow lake on the left bank of Erenik River, N of Bishtazhin (Bištražin) Village.

Small oxbow lake near the Bishtazhin bridge where Erenik River widens and slows down (Fig. 35). The oxbow lake is surrounded by trees which contribute to the deposited organic material. The surface of the lake was at the time of our visit covered in leaves from nearby trees (Fig. 35).

29.04.2018: *Pyrrhosoma nymphula*: 5 MA; *Platycnemis pennipes*: 1 ♂; *Libellula depressa*: 2 ♂♂



Figure 33: gravel pit S of Radoniqi (Radonjičko) Lake (Loc. 34).



Figure 34: pond W of Radostë (Radoste) Village (Loc. 35).

Loc. 37: Hočica Stream in NE Hoçe e Madhe Village (Velika Hoča), S of St. Jovan Monastery (Fig. 36).

Fast flowing stream that widens and is shallower at this location. There are trees along the left bank and almost no vegetation on the other side (Fig. 36).

28.04.2018: *Cordulegaster bidentata*: 3 Ex



Figure 35: oxbow lake on the left bank of Erenik River (Loc. 36).



Figure 36: Hočica Stream in NE Hoče e Madhe Village (Velika Hoča) (Loc. 37).



Figure 37: Hočanska River (Loc. 38).

Loc. 38: Hočanska River (Fig. 37).

Small stream with muddy sediment and overgrown with emergent water plants (Fig. 37). Water was strongly polluted by slurry at the time of visit.

28.04.2018: *Calopteryx splendens*: 5 MA; *Ischnura elegans*: 2 ♂♂, 1 ♀; *Libellula depressa*: 1 ♀



Figure 38: Gravel pits on the left bank of Drini i Bardhë (Beli Drin) River (Loc. 40).

Loc. 39: gravel pits on the left bank of Drini i Bardhë (Beli Drin) River, at the end of Ho-
čanska River.

Ponds, poor in riparian and aquatic vegetation.

28.04.2018: *Coenagrion puella*: 5 ♂♂; *Libellula depressa*: 2 ♂♂; *Sympetrum fons-
colombii*: 1 ♂

Loc. 40: Gravel pits on the left bank of Drini i Bardhë (Beli Drin) River (Fig. 38).

Gravel pits in different succession phases, mostly rich in riparian vegetation (Fig. 38).

28.04.2018: *Sympecma fusca*: 1 Cop; *Ischnura elegans*: 10's MA, 10 Cop; *Coen-
agrion puella*: 10's MA; *Platycnemis pennipes*: 10's MA, 5 Cop; *Anax imperator*:
5 Lar; *Cordulia aenea*: 5 ♂♂; *Orthetrum albistylum*: 2 ♂♂; *Libellula depressa*: 2 ♂♂,
1 ♀; *Sympetrum fonscolombii*: 1 Lar

Loc. 41: stream in Lukinë (Lukanja) Village.

Small stream starting with its spring. The riverbed of the stream was remodelled so
it can serve as a livestock watering point.

29.04.2018: *Orthetrum cancellatum*: 1 ♂; *Libellula depressa*: 5 ♂♂; *Sympetrum fons-
colombii*: 1 ♀

Loc. 42: Jezero Lake S of Lukinë (Lukanja) Village (Fig. 39).

Small pond in the middle of the forest which serves as a watering point for the
livestock (Fig. 39). There are some emerging plants growing on one side of the
pond. The water is strongly polluted by livestock, there were also a lot of leeches
and tubifex worms present at the time of visit.



Figure 39: Jezero Lake S of Lukinë (Lukanja) Village (Loc. 42).

29.04.2018: *Ischnura elegans*: 5 ♂♂, 2 MA, 1 Cop; *Coenagrion puella*: 1 ♂; *Anax imperator*: 3 Lar; *Crocothemis erythraea*: 1 Lar; *Orthetrum cancellatum*: 1 Lar; *Sympetrum fonscolombii*: 1 ♂

Loc. 43: the right bank of Drini i Bardhë (Beli Drin) River, E of Gjonaj (Đonaj) Village.

One of the side branches of Drini i Bardhë River where the river flows more slowly.

03.05.2018: *Orthetrum albistylum*: 1 Lar

Loc. 44: Toplluha (Topluga) River in Piranë (Pirane) Village (Fig. 40).

River rich in riparian vegetation except for a segment flowing through the village where one side of the bank is strongly eroded (Fig. 40). On this side of the bank a lot of construction material was deposited.

29.04.2018: *Calopteryx virgo*: 2 ♂♂, 1 ♀; *Calopteryx splendens*: 2 ♂♂, 3 ♀♀; *Coenagrion puella*: 1 ♂; *Gomphus vulgatissimus*: 5 ♂♂



Figure 40: Toplluha (Topluga) River in Piranë (Pirane) Village (Loc. 44).

Loc. 45: channel left from the road at Greikoc (Grejkovačka reka) Stream.

Channel next to the road overgrown with vegetation, mostly *Typha* sp., and dried up at the time of visit.

30.04.2018: *Coenagrion puella*: 1 ♀; *Pyrrhosoma nymphula*: 1 ♂



Figure 41: Greikoc (Grejkovačka reka) Stream (Loc. 46).



Figure 42: accumulation lake SE of Sllapuzhan (Slapuzhane) Village (Loc. 47).

Loc. 46: Greikoc (Grejkovalčka reka) Stream (Fig. 41).

Fast flowing stream with some sewage shafts from nearby houses (Fig. 41). The river banks are rich in vegetation which mostly consists of bushes. There was also a lot of garbage present in the stream at the time of visit.

30.04.2018: *Calopteryx virgo*: 2 ♂♂; *Calopteryx splendens*: 1 ♂, 1 ♀; *Pyrrhosoma nymphula*: 1 ♀; *Calliaeschna microstigma*: 1 Lar, 1 Ex; *Onychogomphus forcipatus*: 4 Lar; *Cordulegaster bidentata*: 1 Lar

Loc. 47: accumulation lake SE of Slapuzhan (Slapužane) Village, E of the highway Prizren-Prishtinë (Fig. 42).

Purpose of this artificially made lake was probably to drain water from a nearby highway (Fig. 42). There was no riparian vegetation present at the time of visit.

30.04.2018: *Ischnura elegans*: 4 ♂♂; *Platycnemis pennipes*: 10 MA; *Cordulia aenea*: 1 ♂; *Libellula depressa*: 1 ♂

Loc. 48: Vërmicë (Vrbnica) Lake (Fig. 43).

Large accumulation lake created recently on Drini i Bardhë River as a cross-boarder lake shared between Kosovo and Albania, app. 13 km SW of Prizren. The survey site is located at the NE side of the lake near the highway app. 1 km from the Albanian border (Fig. 43). The lake margins are covered with plastics and the riparian vegetation is missing as the water level is oscillating throughout the season.

25.05.2018: *Anax imperator*: 10 MA; *Libellula depressa*: 5 MA, 1 Juv/Ten; *Symptetrum fonscolombii*: 10's MA, 3 Cop



Figure 43: Vërmicë (Vrbnica) Lake (Loc. 48).

Loc. 49: pond near Vërmicë (Vrbnica) Lake (Fig. 44).

Temporary shallow pond on the pasture below the road embankment that was built for access to the highway (Fig. 44). The pond is fed by a stream flowing from hills at the south of the lake. This pond probably forms seasonally due to narrow water passage under the embankment that is insufficient for the stream at times of high-water level.

25.05.2018: *Sympecma fusca*: 1 MA; *Ischnura elegans*: 10's MA, <10 Cop; *Ischnura pumilio*: 1 ♂; *Coenagrion puella*: 10's MA, <10 Cop; *Anax imperator*: 10's MA, 1 Ovip ♀; *Caliaeschna microstigma*: 1 ♂; *Cordulia aenea*: 1 ♂; *Libellula depressa*: 10's ♂♂, 1 ♀; *Libellula fulva*: 2 ♂♂; *Orthetrum brunneum*: 1 Juv/Ten ♂; *Sympetrum fonscolombii*: 10's MA, 10's Cop, <10 Ovip Cop; *Crocothemis erythraea*: 3 ♂♂



Figure 44: pond near Vërmicë (Vrbnica) Lake (Loc. 49).



Figure 45: stream E of Vërmicë (Vrbnica) Lake (Loc. 50).

Loc. 50: stream E of Věrmicě (Vrbnica) Lake (Fig. 45).

A small stream surrounded by a narrow strip of riparian vegetation, flowing through the pastures on the slopes near Věrmicě Village. Dragonflies were recorded at a small open pool of water (Fig. 45) in its lower part.

25.05.2018: *Calopteryx virgo*: 1 ♂; *Calliaeschna microstigma*: 1 Lar, 1 Ex; *Cordulegaster bidentata*: 1 ♂, 1 Ovip ♀

Loc. 51: Brezně (Brezničko) Lake (Fig. 46).

A small (app. 2 ha) natural mountain lake in a valley near Brezna Village at the foothills of Koritnik Mt. (Fig. 46). The Lake was on half of its banks significantly degraded recently when picnic places and an embarkment completely destroyed a large part of the lake shore (Fig. 46: below). Well-developed, diverse and abundant water and riparian vegetation is still present on its eastern side. During the time of our visit in June, cold and cloudy weather influenced the dragonfly diversity at the lake.

04.05.2018: *Ischnura elegans*: 10's MA; *Coenagrion puella*: 10 ♂♂; 5 ♀♀; 2 Cop; *Cordulia aenea*: 5 ♂♂, 10 MA, 10's Ex

25.06.2018: *Lestes barbarus*: 2 ♂♂; *Ischnura elegans*: 10's MA; *Coenagrion puella*: 10's MA; *Platycnemis pennipes*: <10 MA; *Anax imperator*: 1 ♂; *Cordulia aenea*: 2 ♂♂, 1 ♀



Figure. 46: Brezně (Brezničko) Lake (Loc. 51).



Loc. 52: outflow stream SE of Breznë (Brezničko) Lake (Fig. 47).

An outflow of the Breznë Lake that seems to go into the sink hole some 500 m from the lake (Fig. 47). The stream is overgrown with trees and bushes, except for a small segment where this vegetation was cut down and the access road constructed over the stream.

25.06.2018: *Calopteryx splendens*: 1 ♂; *Ischnura elegans*: <10 MA; *Coenagrion puella*: 10's MA; *Platycnemis pennipes*: <10 MA; *Cordulia aenea*: 1 ♂

Figure 47: outflow stream SE of Breznë (Brezničko) Lake (Loc. 52).



Figure 48: Bistrica e Prizrenit Stream E of Prevallë (Prevalac) Village (Loc. 53).

Loc. 53: Bistrica e Prizrenit Stream E of Prevallë (Prevalac) Village (Fig. 48).

A small streamlet flowing down the open mountain slope in the Sharr Mt. National Park (Fig. 48). The slope is surrounded mainly by beach forest. At some parts the streamlet spills into the surrounding area forming wider areas of wet ground. Also, a lot of plastic waste is present at some parts as this is also a picnic site during the summer.

25.05.2018: *Cordulegaster bidentata*: 1 Lar; *Libellula depressa*: 1 ♂

Loc. 54: Lepenci River and its streamlet near W of Brod Village (Fig. 49).

A small stream flows and spills in the riparian woodland close to the Lepenci River (Fig. 49).

25.05.2018: *Cordulegaster bidentata*: 1 ♂, 15 Lar



Figure 49: Streamlet near Lepenci River and Brod Village (Loc. 54).

Loc. 55: confluence of Reka e vogel and Reka e madhe (Mala and Velika reka) rivers upstream of Nerodime Village (Fig. 50).

The fast-flowing courses of rivers at their confluence with some tall herb and shrub vegetation (Fig. 50). Several specimens of *L. depressa* were observed flying above two abandoned swimming pools near the confluence.

25.05.2018: *Calopteryx virgo*: 10 ♂♂, 4 ♀♀; *Orthetrum coerulescens*: 1 ♂; *Orthetrum brunneum*: 1 Juv/Ten ♀; *Libellula depressa*: 10 ♂♂



Figure 50: confluence of Reka e vogel (above) and Reka e madhe (below) rivers upstream of Nerodime Village (Loc. 55).

Loc. 56: Nerodime (Nerodimka) River at river bifurcation (Fig. 51).

A 150 m stretch of canalized Nerodime River at the outskirts of Ferizaj City (Fig. 51). The margins are mostly overgrown with shrubs or cleared from vegetation. The water is significantly polluted.

25.05.2018: *Calopteryx virgo*: 4 ♂♂, 2 ♀♀

Loc. 57: Morava e jugut River (Livočka River) – small tributary of the Morava e Binçes River, inflow river of the Livoqi (Livočko) Lake (Fig. 52).

A 500 m stretch of the river above the Livoqi Lake was inspected (Fig. 52). The river is significantly polluted and a lot of solid waste is observed on its banks and in the river. Only a small part with preserved riparian vegetation is present in the upper part of this stretch.

24.06.2018: *Calopteryx splendens*: 3 ♂♂, 2 ♀♀; *Ischnura elegans*: 10 MA; *Ischnura pumilio*: 5 MA; *Coenagrion puella*: 3 ♂♂; *Platycnemis pennipes*: 10's MA; *Orthetrum cancellatum*: 1 ♂; *Orthetrum albistylum*: 2 ♂♂; *Orthetrum coerulescens*: 2 ♂♂, 1 ♀; *Orthetrum brunneum*: 5 ♂♂, 10's Juv/Ten; *Sympetrum sanguineum*: 1 ♂

Loc. 58: Livoqi (Livočko) Lake (Fig. 53).

Artificial lake used as fishing and picnic place with a narrow strip of riparian vegetation along its margins (Fig. 53).

24.06.2018: *Sympecma fusca*: 1 ♂; *Ischnura elegans*: 10's MA; *Ischnura pumilio*: 10 MA; *Coenagrion puella*: 10 ♂♂, 1 ♀; *Erythromma viridulum*: 1 Cop; *Platycnemis pennipes*: 10's MA, <10 Cop; *Anax imperator*: 1 ♂, 1 Ovip ♀; *Aeshna isoceles*: 1 MA; *Orthetrum cancellatum*: 1 Juv/Ten; *Orthetrum albistylum*: 5 ♂♂, 5 ♀♀; *Orthetrum coerulescens*: 5 Juv / Ten; *Orthetrum brunneum*: 1 ♂, 10 Juv/Ten; *Libellula fulva*: 2 ♂♂; *Sympetrum sanguineum*: 1 ♀, 2 ♂♂ Juv/Ten; *Crocothemis erythraea*: 2 ♂♂



Figure 51: Nerodime (Nerodimka) River at river bifurcation (Loc. 56).



Figure 52: Morava e jugut River (Livočka River), a small tributary of the Morava e Binçes River, inflow river of the Livoqi (Livočko) Lake (Loc. 57).



Figure 53: Livoqi (Livočko) Lake (Loc. 58).



Figure. 54: Përlepnicë (Prilepničko) Lake (Loc. 59).

Loc. 59: Përlepticë (Prilepničko) Lake (Fig. 54).

Large artificial lake app. 7 km NE of Gjiilan characterized by steep banks and strong oscillation of water level resulting in a lack of characteristic riparian vegetation (Fig. 54). At the water maximum in the reservoir the trees growing on the slopes of surrounding hills cover the lake shores whereas during low water level the banks are muddy and rocky and the vegetation is largely missing. The lake margins are mostly inaccessible, except for a small segment on its eastern side with a gentle slope that is used as picnic and fishing area, but also lacks riparian vegetation. During the visit in the afternoon of a partly cloudy and windy day only one dragonfly was observed in the vegetation along the road above the lake.

24.06.2018: *Platycnemis pennipes*: 1 ♀

Loc. 60: Përlepnica (Prilepnica) River S of Përlepticë (Prilepničko) Lake (Fig. 55).

Nice stream (outflow of Përlepticë Lake) flowing along the road at entrance of Përlepnica Village (Fig. 55). In late afternoon only one single dragonfly was recorded along the 100 m stretch.

24.06.2018: *Platycnemis pennipes*: 1 ♀



Figure 55: Përlepnica (Prilepnica) River S of Përlepticë (Prilepničko) Lake (Loc. 60).

Discussion

Considering the number of collected records (391) and the number of surveyed localities (60) we conclude that our spring and early summer survey was successful, although rainy and cold spring days were the reason that prevented us from visiting some other parts of Kosovo. This also applies to the species from high mountain habitats, as these were mostly under snow at this time of the year. In both cases interesting species can be expected, including species adapted to more harsh climate conditions in higher altitude habitats (e.g. *Coenagrion hastulatum* (Charpentier 1825), *Somatochlora metallica* (Vander Linden 1825) or *Leucorrhinia dubia* (Vander Linden 1825) that are particularly rare and of special conservation concern in the Balkans. Future investigation will certainly add more species to the dragonfly fauna and expand the knowledge of their distribution in Kosovo. Our records represent a valuable contribution to the knowledge of the distribution of many species of dragonflies in Kosovo and the Balkan Peninsula which is still poorly investigated.

In general, most recorded species are common in the Balkans (Boudot & Kalkman 2015).

Species recorded at most sites, *C. puella*, *I. elegans*, *P. pennipes* and *L. depressa*, are generalist species that are tolerant to higher levels of habitat degradation and pollution and able to colonise newly created habitats. The majority of 60 sites are man-made or significantly altered natural habitats. Some of them are hardly suitable for significant dragonfly communities, like Përlepnicë (Prilepničko) Lake, while some others, like small lakes in Blinajë Park, have rich and diverse dragonfly communities that are probably a result of the protection of this area that is not open to public or under anthropogenic pressure. Although artificial, as they are "left to nature" Blinajë Park lakes have abundant and diverse vegetation.

Coenagrion ornatum, a species of European conservation concern, was recorded at streamlet Kozarnik near Badovci (Badovac) Lake, although not many potentially suitable localities for the species were visited during this survey. We believe the species is wider present in Kosovo as it was also recorded in the far northern part of its range (Boudot & Kalkman 2015). Additional surveys focused on *C. ornatum* should be carried out.

Caliaeschna microstigma, a species of regional conservation concern, was discovered at four new sites: at Mirusha (Miruša) river at Mirusha (Miruša) Waterfalls, Greikoc (Grejkovačka reka) Stream and twice near Vërmicë (Vrbnica) Lake. At two sites we also proved a successful reproduction. Kalkman et al. (2018) proposed this species 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.

Cordulegaster heros, another species of European conservation concern, was found at Llap River in North Kosovo. Additional sites potentially suitable for the species were inspected, but it was not found. Nevertheless, based on the visited habitats we expect that the species has a much wider distribution in Kosovo. At one site flying *Cordulegaster* sp. individuals were observed, but could not be identified to the species level.

Some of the species were either missed, e.g. *C. viridis* (Vander Linden 1825), *Lestes sponsa* (Hansemann 1823), *Erythromma najas* (Hansemann 1823), *Brachytron pratense*

(Müller 1764), or under-recorded due to the early time of the study, i.e. some typical summer species like *Erythromma viridulum* (Charpentier 1840) and *Sympetrum striolatum* (Charpentier 1840) which are a widespread species in the West Balkan Peninsula (Boudot & Kalkman 2015) but during this survey were found only at one site (Tab. 2).

One of the aims of the paper was to contribute to dragonfly protection with submitting our data for the Red book of Fauna of Kosovo (Ibrahimi et al. 2019).

Among the recorded species *C. ornatum*, *C. microstigma*, *C. heros* and *C. bidentata* are included in the European Red List of Dragonflies (Kalkman et al. 2010) as Near Threatened (NT) species. In the Mediterranean Red list (Riservato et al. 2009) *C. ornatum*, *C. microstigma*, *Cordulia aenea* (Linnaeus 1758), *C. bidentata* are listed as Near Threatened species and *C. heros* as Vulnerable (VU). Two species, *C. ornatum* and *C. heros*, are protected by the European Habitats Directive (Council Directive 92/43/EEC), Annexes II (C.o.) II and IV (C.h.).

According to previous reports (Boudot & Kalkman 2015, Mužinić & Rašajski 1992, Zhushi-Etemi 2005, Hoxha 2010, BioRas 2018) our survey yielded first records for the territory of Kosovo for 15 species, while for several species with low number of known records for Kosovo our survey adds new localities and extends their known range in the Balkans. Species reported for the first time for Kosovo are: *Lestes virens* (Charpentier 1825), *Sympecma fusca* (Vander Linden 1820), *Coenagrion scitulum* (Rambur 1842), *Erythromma lindenii* (Selys 1840), *Aeshna isoceles* (Müller 1767), *Aeshna mixta* Latreille 1805, *Anax ephippiger* (Burmeister 1839), *Anax parthenope* (Selys 1839), *C. aenea*, *Somatochlora flavomaculata* (Vander Linden 1825), *Somatochlora meridionalis* Nielsen 1935, *Sympetrum flaveolum* (Linnaeus 1758), *Sympetrum fonscolombii* (Selys 1840), *Sympetrum meridionale* (Selys 1841) and *S. striolatum*. Three species previously known from Kosovo (Boudot & Kalkman 2015, BioRas 2018), *C. viridis*, *Coenagrion pulchellum* (Vander Linden 1823) and *Aeshna juncea* (Linnaeus 1758), were not found during this study. For *A. juncea* the most probable reason is that the high mountain habitats were not surveyed, *C. viridis* was missed due to the early time of the study, while *C. pulchellum* is widespread but scattered and only locally abundant (Boudot & Kalkman 2015). Altogether 47 dragonfly species are now reported for Kosovo.

Conclusions

The faunistic results of this first systematic survey improve the knowledge of the dragonfly fauna of Kosovo significantly. As there is a huge gap of knowledge about the dragonfly fauna of Kosovo, no deep discussions can be made for species' distribution or their frequency. In many aspects, Kosovo is still an uncharted territory and certainly holds many important new discoveries. We hope that our manuscript will contribute to more systematic research of dragonflies in Kosovo and hopefully also to the conservation of its rich flora and fauna.

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While preparing the manuscript authors should consider that, although the journal gives some freedom in the style and arrangements of the sections, the editors would like to see the following clearly defined sections: Title (with authors names, physical and e-mail addresses), Abstract, Introduction, Material & Methods, Results, Discussion, Acknowledgments and References. This is a widely used scheme by scientists that everyone should be familiar with. No further instructions are given here, but every author should check the style of the journal.

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Reference cited in the text should read as follows: Tillyard (1924), (Tillyard 1924), Swezey & Williams (1942).

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Swezey, O. & F. Williams, 1942. Dragonflies of Guam. Bernice P. Bishop Museum Bulletin 172: 3-6.

Tillyard, R., 1924. The dragonflies (Order Odonata) of Fiji, with special reference to a collection made by Mr. H.W. Simmonds, F.E.S., on the Island of Viti Levu. Transactions of the Entomological Society London 1923 III-IV: 305-346.

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The manuscript should end with a list of captions to the figures and tables. The latter should be submitted separately from the text preferably as graphics made using one of the Microsoft Office products or as a high resolution picture saved as a .jpg .tif or .ps file. Pictures should be at least 11 cm wide and with a minimum 300 dpi resolution, better 360 dpi. Line drawings and graphics could have 1200 dpi for better details. If you compose many pictures to one figure, please submit the original files as well. Please leave some space in the upper left corner of each picture, to insert a letter (a, b, c...) later. Hand-made drawings should be scanned and submitted electronically. Printed figures sent by the post could be damaged, in which case authors will be asked to resubmit them.

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