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A CONTRIBUTION TO THE KNOWLEDGE OF THE DRAGONFLIES (ODONATA) FROM THE RIVER MORAČA (MONTENEGRO)

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Abstract

Fauna of dragonflies (Odonata) of the Morača River (Montenegro) was studied during 2007 and 2008. Samples were collected in five localities along the river. Examined sites provide specific living conditions of differently adopted species of dragonflies. During the study 934 individuals classified into 35 species were collected. One of them, *Trithemis annulata* (Palisot de Beauvois, 1805), was collected for the first time and thereby confirmed the record of this species for fauna of Odonata in Montenegro.

KEY WORDS: dragonflies, first record, Morača, Montenegro

Introduction

Although the order Odonata is an important group among the insects because of their interesting life cycle and active participation in food chains in fresh water habitats, studies of the Odonata fauna in Montenegro are still not fully completed (ADAMOVIĆ *et al*., 1996; GLIGOROVIĆ *et al*., 2007, 2008, 2009; JOVIĆ *et al*., 2008). The aim of our studies is both to give new insight into the fauna of the country, and to obtain valuable documentation of the occurrence of dragonflies in the previously unstudied area of the Morača River area. In the course of this survey, we detected 35 species.

Material and Methods

In 2007 and 2008, the study of dragonfly fauna from the 5 sampling sites of the Morača River area was carried out at 5 locations along the river, from the upper, through the middle, to the lower course of the river (Tab. I).

Table I. Investigated localities along course of the Morača River

Sites investigated	Geographic coordinates	Altitude
Platije	42º 35' 40.49" N, 19º 21' 51.27" E	127 meters a.s.l.
Bioče	42º 30' 50.91" N, 19º 20' 47.30" E	77 meters a.s.l.
Podgorica	42º 26' 48, 65" N, 19º 15' 35.45" E	43 meters a.s.l.
Vukovci	42º 18' 45.96" N, 19º 12' 14.49" E	10 meters a.s.l.
Manastirski lug	42º 15' 34.58" N, 19º 08' 32.19" E	9 meters a.s.l.

All the specimens were deposited in the collection of the first author. In this study the nomenclature of DIJKSTRA & LEWINGTON (2006) was followed. The composition of the material is given as: (males/females/larvae). Localities are given in a subsequent series from the source of the Morača River to its mouth.

Results

Subordo Zygoptera

Family Calopterygidae

1. *Calopteryx virgo* (Linneaus, 1758)

Material: Platije, 12.05.2007 leg. Gligorović (0/0/2), 27.06.2007 leg. Gligorović (2/1/0), 11.07.2007 leg. Zeković (3/2/1), 14.08.2007 leg. Gligorović (2/1/0); Bioče, 12.05.2007 leg. Gligorović (1/0/0), 27.06.2007 leg. Gligorović (2/1/0), 11.07.2007 leg. Gligorović (2/2/1), 14.08.2007 leg. Gligorović (2/1/0); Podgorica, 27.06.2007 leg. Gligorović (2/1/0), 11.07.2007 leg. Zeković (1/1/1), 14.08.2007 leg. Zeković (1/1/0); Vukovci, 18.05.2008 leg. Gligorović (1/0/0), 24.06.2008 leg. Gligorović (1/1/0), 09.07.2008 leg. Gligorović (2/2/1), 12.08.2008 leg. Gligorović (2/1/0); Manastirski lug,18.05.2008 (1/1/0), 24.06.2008 leg. Gligorović (2/2/0), 09.07.2008 leg. Gligorović (2/1/1), 12.08.2008 leg. Gligorović (1/0/0).

2. *Calopteryx splendens* (Harris, 1780)

Material: Platije, 12.05.2007 leg. Gligorović (0/0/1), 27.06.2007 leg. Gligorović (1/1/0), 11.07.2007 leg. Gligorović (3/2/3), 14.08.2007 leg. Gligorović (1/1/0); Bioče, 12.05.2007 leg. Gligorović (1/0/0), 27.06.2007 leg. Gligorović (2/1/0), 11.07.2007 leg. Zeković (3/3/1), 14.08.2007 leg. Gligorović (2/1/0); Podgorica, 12.05.2007 leg. Gligorović (1/0/0), 27.06.2007 leg. Gligorović (2/1/0), 11.07.2007 leg. Gligorović (2/2/1), 14.08.2007 leg. Gligorović (1/1/0); Vukovci, 18.05.2008 leg. Gligorović (1/0/0), 24.06.2008 leg. Zeković (1/1/0), 09.07.2008 leg. Gligorović (2/1/1), 12.08.2008 leg. Zeković (1/1/0); Manastirski lug,18.05.2008 leg.

Gligorović (1/0/0), 24.06.2008 leg. Gligorović (2/1/0), 09.07.2008 leg. Gligorović (3/1/1), 12.08.2008 leg. Gligorović (1/1/0).

Family Lestidae

3. *Lestes barbarus* (Fabricius, 1798)

Material: Vukovci,18.05.2008 leg. Gligorović (1/0/0), 24.06.2008 leg. Gligorović (3/2/0), 09.07.2008 leg. Gligorović (3/4/0), 12.08.2008 leg. Gligorović (2/1/0); Manastirski lug, 24.06.2008 leg. Gligorović (2/2/0), 09.07.2008 leg. Gligorović (3/3/0), 12.08.2008 leg. Gligorović (3/1/0).

4. *Lestes viridis* (Vander Linden, 1825)

Material: Manastirski lug, 24.06.2008 leg. Gligorović (4/3/0), 09.07.2008 leg. Gligorović (5/5/1), 12.08.2008 leg. Gligorović (4/2/0).

5. *Lestes dryas* Kirby, 1890

Material: Vukovci,18.05.2008 leg. Gligorović (1/0/0), 24.06.2008 leg. Gligorović (2/2/0), 09.07.2008 leg. Gligorović (2/1/0), 12.08.2008 leg. Gligorović (2/1/0); Manastirski lug, 18.05.2008 leg. Gligorović (1/0/0), 24.06.2008 leg. Gligorović (1/1/0), 09.07.2008 leg. Gligorović (3/2/0), 12.08.2008 leg. Gligorović (1/1/0).

Family Coenagrionidae

6. *Coenagrion puella* (Linnaeus, 1758)

Material: Bioče, 27.06.2007 leg. Gligorović (1/0/0), 11.07.2007 leg. Gligorović (2/1/0), 14.08.2007 leg. Zeković (2/2/0); Podgorica, 27.06.2007 leg. Gligorović (1/1/0), 11.07.2007 leg. Gligorović (1/1/0), 14.08.2007 leg. Zeković (2/1/0); Vukovci, 18.05.2008 leg. Gligorović (1/0/0), 24.06.2008 leg. Gligorović (2/0/0), 09.07.2008 leg. Gligorović (2/2/1), 12.08.2008 leg. Gligorović (2/2/0).

7. *Coenagrion ornatum* (Sélys, 1850)

Material: Manastirski lug, 09.07.2008 leg. Gligorović (2/2/0), 12.08.2008 leg. Zeković (2/1/0).

8. *Erythromma najas* (Hansemann, 1823)

Material: Manastirski lug,18.05.2008 leg. Gligorović (2/0/0), 24.06.2008 leg. Zeković (4/4/0), 09.07.2008 leg. Gligorović (4/3/1), 12.08.2008 leg. Gligorović (2/1/0).

9. *Erythromma viridulum* (Charpentier, 1840)

Material: Manastirski lug, 24.06.2008 leg. Gligorović (1/1/0), 09.07.2008 leg. Gligorović (3/3/0), 12.08.2008 leg. Zeković (2/1/0).

10. *Enallgama cyathigerum* (Charpentier, 1840)

Material: Manastirski lug, 24.06.2008 leg. Gligorović (3/2/0), 09.07.2008 leg. Gligorović (4/3/0), 12.08.2008 leg. Gligorović (2/2/0).

11. *Ischnura elegans* (Vander Linden, 1820)

Material: Bioče, 27.06.2007 leg. Gligorović (2/2/0), 11.07.2007 leg. Gligorović (2/1/1), 14.08.2007 leg. Gligorović (1/1/0); Podgorica, 12.05.2007 leg. Gligorović (1/0/0), 27.06.2007 leg. Gligorović (1/2/0), 11.07.2007 leg. Gligorović (2/1/1), 14.08.2007 leg. Zeković (2/1/0); Manastirski lug, 24.06.2008 leg. Gligorović (3/2/0), 09.07.2008 leg. Zeković (3/3/0), 12.08.2008 leg. Gligorović (1/2/0).

Family Platycnemididae

12. *Platycnemis pennipes* (Pallas, 1771)

Material: Vukovci, 24.06.2008 leg. Gligorović (3/4/0), 09.07.2008 leg. Gligorović (5/3/4), 12.08.2008 leg. Zeković (4/3/0); Manastirski lug, 24.06.2008 leg. Gligorović (3/1/0), 09.07.2008 leg. Gligorović (3/4/1), 12.08.2008 leg. Gligorović (3/3/0).

Subordo Anisoptera

Family Aeshnidae

13. *Anax imperator* Leach, 1815

Material: Bioče, 12.05.2007 leg. Gligorović (0/0/2), 27.06.2007 leg. Gligorović (1/0/1), 11.07.2007 leg. Gligorović (2/1/0), 14.08.2007 leg. Gligorović (1/1/0); Vukovci, 24.06.2008 leg. Gligorović (1/1/0), 09.07.2008 leg. Gligorović (1/1/1), 12.08.2008 leg. Gligorović (1/1/0); Manastirski lug, 24.06.2008 leg. Gligorović (2/1/0), 09.07.2008 leg. Gligorović (3/1/2).

14. *Aeshna affinis* Vander Linden, 1820

Material: Podgorica, 12.05.2007 leg. Gligorović (1/0/0), 27.06.2007 leg. Gligorović (1/1/0), 11.07.2007 leg. Gligorović (4/4/0), 14.08.2007 leg. Gligorović (2/2/0); Vukovci, 24.06.2008 leg. Gligorović (2/2/0), 09.07.2008 leg. Gligorović (3/2/1), 12.08.2008 leg. Zeković (1/1/0); Manastirski lug, 18.05.2008 leg. Gligorović (2/0/0), 24.06.2008 leg. Gligorović (2/1/0), 09.07.2008 leg. Zeković (1/1/1), 12.08.2008 leg. Gligorović (1/0/0).

15. *Aeshna mixta* Latreille,1805

Material: Podgorica, 27.06.2007 leg. Gligorović (2/2/0), 11.07.2007 leg. Zeković (2/1/0), 14.08.2007 leg. Gligorović (3/2/0); Manastirski lug,18.05.2008 leg. Gligorović (2/0/0), 24.06.2008 leg. Zeković (2/1/0), 09.07.2008 leg. Gligorović (4/3/0), 12.08.2008 leg. Gligorović (6/5/0).

16. *Brachytron pratense* (Müller, 1764)

Material: Manastirski lug,18.05.2008 leg. Gligorović (1/0/2), 24.06.2008 leg. Gligorović (3/2/0), 09.07.2008 leg. Gligorović (2/2/1).

17. *Caliaeschna microstigma* (Schneider, 1845)

Material: 24.06.2008 leg. Gligorović (2/2/0), 09.07.2008 leg. Gligorović (1/1/0), 12.08.2008 leg. Gligorović (2/1/0).

Family Gomphidae

18. *Gomphus flavipes* (Charpentier, 1825)

Material:Vukovci, 24.06.2008 leg. Gligorović (2/1/0), 09.07.2008 leg. Gligorović (1/1/0), 12.08.2008 leg. Gligorović (2/1/0); Manastirski lug, 24.06.2008 leg. Gligorović (2/2/0), 09.07.2008 leg. Gligorović (3/2/0), 12.08.2008 leg. Gligorović (1/1/0).

19. *Gomphus vulgatissimus* (Linnaeus, 1758)

Several young specimens collected in the area of Manastirski lug and Vukovci have certain characteristics related to color that deviate from the characteristics of the majority of collected specimens, but have other characteristics similar to those of the species *Gomphus schneiderii*. The structure of their genital apparatus, however, fully coincides with that of other specimens.

Material: Bioče12.05.2007 leg. Gligorović (1/1/0), 27.06.2007 leg. Gligorović (2/1/0), 11.07.2007 leg. Zeković (2/1/1), 14.08.2007 leg. Gligorović (2/1/3); Podgorica, 27.06.2007 leg. Gligorović (1/1/0), 11.07.2007 leg. Gligorović (1/2/1), 14.08.2007 leg. Gligorović (1/1/0); Vukovci, 18.05.2008 leg. Gligorović (1/1/1), 24.06.2008 leg. Zeković (1/1/0), 09.07.2008 leg. Gligorović (1/1/2), 12.08.2008 leg. Gligorović (1/1/0); Manastirski lug, 24.06.2008 leg. Gligorović (2/1/0), 09.07.2008 leg. Gligorović (2/1/0), 12.08.2008 leg. Gligorović (2/3/0).

20. *Gomphus schneiderii* Selys, 1850

Vukovci, 18.05.2008 leg. Gligorović (1/1/0), 24.06.2008 leg. Zeković (1/1/0), Manastirski lug, 24.06.2008 leg. Gligorović (1/1/0), 09.07.2008 leg. Gligorović (1/1/0), 12.08.2008 leg. Gligorović (1/0/0).

21. *Onychogomphus forcipatus* (Linnaeus, 1758)

Material: Platije, 27.06.2007 leg. Gligorović (2/1/0), 11.07.2007 leg. Gligorović (3/2/2), 14.08.2007 leg. Zeković (2/2/0); Bioče, 12.05.2007 leg. Gligorović (2/1/0), 27.06.2007 leg. Gligorović (3/2/0), 11.07.2007 leg. Gligorović (1/1/0), 14.08.2007 leg. Gligorović (1/0/0); Podgorica, 12.05.2007 leg. Gligorović (2/0/0), 27.06.2007 leg. Gligorović (1/1/0), 11.07.2007 leg. Gligorović (2/1/2), 14.08.2007 leg. Gligorović (1/1/0).

22. *Lindenia tetraphylla* (Vander Linden, 1825)

Material: Podgorica, 11.07.2007 leg. Gligorović (3/0/0); Vukovci, 09.07.2008 leg. Gligorović (3/0/0), 12.08.2008 leg. Gligorović (2/1/0); Manastirski lug, 09.07.2008 leg. Gligorović (3/3/0), 12.08.2008 leg. Gligorović (4/0/0).

Family Cordulegastridae

23. *Cordulegaster bidentata* Sélys, 1843

Material: Bioče, 24.06.2008 leg. Gligorović (2/1/1), 09.07.2008 leg. Gligorović (1/1/2), 12.08.2008 leg. Gligorović (1/1/0).

Family Corduliidae

24. *Somatochlora meridionalis* Nielsen, 1935

Material: Platije, 27.06.2007 leg. Gligorović (2/0/0), 11.07.2007 leg. Gligorović (1/2/0), 14.08.2007 leg. Gligorović (2/1/0); Bioče, 27.06.2007 leg. Gligorović (2/1/0), 11.07.2007 leg. Gligorović (2/1/1), 14.08.2007 leg. Gligorović (1/1/0); Podgorica, 11.07.2007 leg. Gligorović (3/2/0), 14.08.2007 leg. Gligorović (1/1/0).

Family Libellulidae

25. *Libellula fulva* Müller, 1764

Material: Vukovci, 18.05.2008 leg. Gligorović (3/1/0), 24.06.2008 leg. Gligorović (2/1/0), 09.07.2008 leg. Zeković (2/2/1), 12.08.2008 leg. Gligorović (1/1/0); Manastirski lug, 18.05.2008 leg. Gligorović (2/0/0), 24.06.2008 leg. Gligorović (3/2/0), 09.07.2008 leg. Gligorović (2/1/1), 12.08.2008 leg. Gligorović (2/0/0).

26. *Libelulla depressa* Linnaeus, 1758

Material: Vukovci,18.05.2008 leg. Gligorović (3/2/0), 24.06.2008 leg. Gligorović (4/4/6), 09.07.2008 leg. Zeković (3/3/1), 12.08.2008 leg. Gligorović (3/1/2); Manastirski lug, 18.05.2008 leg. Gligorović (2/0/0), 24.06.2008 leg. Gligorović (2/2/0), 09.07.2008 leg. Gligorović (2/2/1), 12.08.2008 leg. Gligorović (2/2/3).

27. *Crocothemis erythraea* (Brullé, 1823)

Material: Vukovci, 18.05.2008 leg. Gligorović (2/1/0), 24.06.2008 leg. Gligorović (2/2/0), 09.07.2008 leg. Gligorović (2/1/0), 12.08.2008 leg. Gligorović (2/2/0); Manastirski lug, 18.05.2008 leg. Gligorović (1/1/0), 24.06.2008 leg. Gligorović (1/1/0), 09.07.2008 leg. Gligorović (2/2/2), 12.08.2008 leg. Gligorović (3/3/5).

28. *Trithemis annulata* (Palisot de Beauvois, 1805)

Material:Manastirski lug, 24.06.2008 leg. Gligorović (2/0/0), 09.07.2008 leg. Gligorović (2/1/0), 12.08.2008 leg. Gligorović (3/1/0).

29. *Orthetrum cancellatum* (Linnaeus, 1758)

Material: Manastirski lug, 24.06.2008 leg. Gligorović (1/1/0), 09.07.2008 leg. Gligorović (2/2/1), 12.08.2008 leg. Gligorović (4/3/0).

30. *Orthetrum brunneum* (Fonscolombe, 1837)

Material: Manastirski lug,18.05.2008 leg. Gligorović (2/0/0), 24.06.2008 leg. Zeković (2/2/0), 09.07.2008 leg. Gligorović (2/2/3), 12.08.2008 leg. Gligorović (3/3/0).

31. *Orthetrum coerulescens* (Fabricius, 1798)

Material: Podgorica, 27.06.2007 leg. Gligorović (2/2/0), 11.07.2007 leg. Gligorović (4/4/0), 14.08.2007 leg. Gligorović (3/1/0); Vukovci, 24.06.2008 leg. Gligorović (2/2/0), 09.07.2008 leg. Gligorović (1/1/0), 12.08.2008 leg. Gligorović (1/1/0); Manastirski lug, 18.05.2008 leg. Gligorović (3/0/0), 24.06.2008 leg. Gligorović (2/2/0), 09.07.2008 leg. Gligorović (2/3/0), 12.08.2008 leg. Gligorović (2/1/0).

32. *Sympetrum flaveolum* (Linnaeus, 1758)

Material: Bioče, 11.07.2007 leg. Gligorović (4/1/1), 14.08.2007 leg. Zeković (1/1/0); Podgorica, 27.06.2007 leg. Gligorović (1/1/0), 11.07.2007 leg. Gligorović (2/2/0), 14.08.2007 leg. Zeković (2/1/0); Vukovci, 09.07.2008 leg. Gligorović (2/3/0), 12.08.2008 leg. Gligorović (1/2/0);Manastirski lug, 12.08.2008 leg. Gligorović (3/2/0).

33. *Sympetrum meridionale* (Sélys, 1841)

Material: Bioče, 27.06.2007 leg. Gligorović (2/2/0), 11.07.2007 leg. Gligorović (2/2/1), 14.08.2007 leg. Gligorović (1/1/0); Vukovci, 18.05.2008 leg. Gligorović (1/1/0), 24.06.2008 leg. Gligorović (2/3/0), 09.07.2008 leg. Gligorović (5/3/1), 12.08.2008 leg. Gligorović (2/2/0).

34. *Sympetrum sanguineum* (Müller, 1764)

Material: Podgorica, 27.06.2007 leg. Gligorović (2/1/0), 11.07.2007 leg. Gligorović (5/2/0), 14.08.2007 leg. Gligorović (4/1/0).

35. *Sympetrum striolatum* (Charpentier, 1840)

Material: Platije, 14.08.2007 leg. Gligorović (1/0/0); Bioče, 27.06.2007 leg. Gligorović (2/2/0), 11.07.2007 leg. Gligorović (2/2/0), 14.08.2007 leg. Gligorović (2/0/0); Podgorica, 11.07.2007 leg. Gligorović (3/2/0), 14.08.2007 leg. Zeković (1/1/0); Manastirski lug, 18.05.2008 leg. Gligorović (1/1/0), 24.06.2008 leg. Gligorović (1/1/0), 09.07.2008 leg. Gligorović (2/1/0), 12.08.2008 leg. Gligorović (3/1/0).

Discussion

In the freshwater habitats of the Morača River, 35 species of dragonflies (Odonata) belonging to 21 genera and 9 families were recorded. The total number of specimens of dragonflies collected amounts to 934. Of the number of collected specimens and the percentage of the total sample in investigated areas, each of four (4) species - *Calopteryx virgo, Calopteryx splendens, Libelulla depressa*, *Gomphus vulgatissimus* - represents more than 5% of the total number of collected specimens. Each of twenty (20) species - *Lestes barbarus, Lestes viridis, Lestes dryas, Coenagrion puella, Erythromma najas, Ischnura elegans, Platycnemis pennipes, Anax imperator, Aeshna affinis, Aeshna mixta, Somatochlora meridionalis, Libellula fulva, Crocothemis erythraea, Orthetrum brunneum, Orthetrum coerulescens, Sympetrum flaveolum, Sympetrum meridionale, Sympetrum striolatum, Gomphus flavipes, Onychogomphus forcipatus* - present 2-5% of total sample. Each of twelwe (12) species: C*oenagrion ornatum, Erythromma viridulum, Enallgama cyathigerum, Brachytron pratense, Caliaeschna microstigma, Cordulegaster bidentata, Trithemis annulata, Orthetrum cancellatum, Sympetrum sanguineum, Lindenia tetraphylla* and *Gomphus schneideri* - represents less than 2% of the total number of specimens collected in the investigated areas (Tab. II).

Research of fauna of Odonata was done along the Morača River from the flow from the upper through the middle to the lower course of the rivers. The following differences in the number of species along different parts of the flow were noted.

A higher number of species were recorded at the sites at Manastirski lug (30 species). Manastirski lug is an area that covers the mouth of the river to Skadar Lake, where the bottom is sandy, covered mainly with aquatic vegetation, and where the maxmum water temperature in August is 25 °C. The coastal region is covered with hygrophytic vegetation, and the wider area is covered with floods and the community of

floodplain forest. In this area, due to the proximity of the lake and to the favorable conditions for a large number of species of dragonflies, the largest number of species was expected, which was confirmed by the research.

Table II. Number of specimens of certain species in relation to total number of collected specimens in collected sample in the Morača River

Species	Number of collected specimens	Relative abundance %
Calopteryx virgo	56	6.00
Calopteryx splendens	58	6.21
Lestes barbarus	28	3.00
Lestes viridis	24	2.57
Lestes dryas	21	2.25
Coenagrion puella	27	2.89
Coenagrion ornatum	7	0.75
Erythromma najas	21	2.25
Erythromma viridulum	11	1.18
Enallgama cyathigerum	16	1.71
Ischnura elegans	27	2.89
Platycnemis pennipes	46	4.93
Anax imperator	25	2.68
Aeshna afinis	36	3.85
Aeshna mihta	35	3.75
Brachytron pratense	13	1.39
Caeliaeshna microstigma	9	0.96
Gomphus flavipes	19	2.03
Gomphus vulgatissimus	47	5.00
Gomphus schneideri	9	0.96
Onychogomphus forcipatus	37	3.96
Lindenia tetraphylla	18	1.93
Cordulegaster bidentatus	10	1.07
Somatochlora meridionalis	24	2.57
Libellula fulva	27	2.89
Libelulla depressa	52	5.57
Crocothemis erythraea	35	3.75
Trithemis annulata	9	0.96
Orthetrum cancellatum	14	1.50
Orthetrum bruneum	19	2.03
Orthetrum coerulescens	39	4.18
Sympetrum flaveolum	31	3.32
Sympetrum meridionale	31	3.32
Sympetrum sanquineum	15	1.61
Sympetrum striolatum	38	4.07
∑	934	

The following sampling sites are at Vukovci (18 species) located along the lower course of the river 12 kilometers from the mouth of Lake Skadar. In the area of Vukovci the water is slower, the bottom is part pebble part sandy; the vegetation is mainly destroyed by the influence of antropogen, and the water temperature in August is max. 23 °C. According to the type of habitat a higher number of species was expected, but due to habitat degradation, the number of species collected was below the expected. The relatively small number of species in Vukovci which is located in the lower course, where conditions are similar to those at Manastirski lug, was ascribed to anthropogenic harassment, because the area is the location of gravel exploitation.

Along the course of the Morača River at the next sampling site at Podgorica, 14 species were collected. This part of the river belongs to the middle course. Because of its confluence with the Zeta, the river flow in this area is greater. The bottom is gravel, partly sandy. Water temperature at this site in August is max. 22 °C. Aquatic vegetation is present. The anthropogenic influence is very pronounced and is manifested in the disposal of solid and liquid waste. Because the the habitat has been endangered, the number of species is smaller than would be expected considering the diversity of habitats and the adaptability of certain types of Odonata in this type of habitat.

Bioče is located along the middle course of the river. At this locality fifteen (15) species were collected. The river in Bioče is slower, the bottom is gravel, and along the flow are pools with sandy bottoms, followed by rapids. This trend continues to the mouth of the Zeta River in Morača. The maximum water temperature reached there during the time of lowest water level in August is 21 °C. At the lowest water level the plant species Salix sp breaks the flow and causes water to collect in the eddies. The anthropogenic influence is more pronounced than in the upper flow. At this site the expected number of species roughly corresponds to the number collected.

Platije are located on the upper course of the Morača River. In this area seven (7) species were collected. The bottom of the river is rocky, the water velocity is high. The area has a short period of daily insulation; the water temperature is a maximum of 18 °C during the summer period i.e. the lowest water-level period; hydrophytic vegetation is present with Bryophyta, while the vegetation around the water is very rare. Along the flow of the river are rheocrene springs that are a short distance from the river. The anthropogenic influence on this area is minimal. The number of species collected is in accordance with the number expected at this locality.

In future research focus on unexplored and vulnerable habitats of Odonata fauna in Montenegro is needed.

The species *Trithemis annulata* is a new record for the territory of Montenegro. This discovery is very significant because it moves the northwest border range of this species into the Balkan Peninsula. Specimens of this species were collected only at the site Manastirki lug, and because only adults were collected we cannot confirm whether the species breeds there or individuals were found incidentally in the studied area. *Trithemis annulata* was reported for Montenegro by BEDJANIČ & BOGDANOVIĆ (2006), based on an old record of R. SEIDENBUSCH who observed the species in August 1990 at a single locality south of Ulcinj, near the border of Albania. However, according to kind personal communication from R. Seidenbusch, no specimens were collected; hence confirmation is needed (R. SEIDENBUSCH pers. comm). Therefore, *T. annulata* is excluded from the list, although the sand dune landscape near the coast south of Ulcinj with plenty of very interesting freshwater habitats may well offer a suitable habitat for that species. Thus it remains to be confirmed whether the statement of (DIJKSTRA & LEVINGTON 2006) on the expansion of the *T. annulata* range in the Mediterranean also applies to Montenegro (JOVIĆ *et al*., 2008). We expect that detailed studies

on the Bojana River and Skadar Lake will confirm the presence of this species at the other localities as well, and that will determine whether the species breeds in this area.

The species *Calopteryx splendens* is represented with a subspecies of *C. splendens splendens* in the upper and middle course and *C. splendens balcanica* in the lower course of the river.

At the investigated area the species *Platycnemis pennipes* was presented with the subspecies *P. pennipes nitidula*.

The record of the species *Lestes viridis* is important because of the confirmation of known distribution of this species. In the area of Lake Skadar, the presence of this species was confirmed by GLIGOROVIĆ *et al*. (2008). In the area of Skadar Lake the finding of *Lestes parvidens* Artobolevskii, 1929 has not been confirmed. However, the latter species was found in the area of lower Štoj (ADAMOVIĆ, 1996) and Sutomore (JOVIĆ *et al*., 2008), as well as for the area of Adriatic coast (OLIAS *et al*., 2007).

Species *Orthetrum coerulescens* is represented by subspecies *O. coerulescens coerulescens* at the sites of Vukovci and Manastirski lug. At the site in Podgorica subspecies *C. coerulescens anceps* was found. Some individuals have some characteristics of both subspecies. On this basis we believe that they represent a transitional form of one subspecies to another.

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ПРИЛОГ ПОЗНАВАЊУ ФАУНЕ ВИЛИНСКИХ КОЊИЦА (ODONATA) РИЈЕКЕ МОРАЧЕ (ЦРНА ГОРА)

БОГИЋ ГЛИГОРОВИЋ, ВЛАДИМИР ПЕШИЋ и АЛЕКСАНДРА ГЛИГОРОВИЋ

Извод

Фауна вилинских коњица (Odonata) ријеке Мораче истраживана је током 2007. и 2008. године. Прикупљање узорака вршено је на пет локалитета дуж ријечног тока. Истраживани локалитети пружају специфичне услове за живот различито прилагођених врста вилинских коњица. Током истраживања сакупљене су 934 јединке сврстане у 35 врста. Једна од њих *Trithemis annulata* (Palisot de Beauvois, 1805) је први пут прикупљена и тиме потврђен је налаз за фауну Odonata Црне Горе.

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