New data of the Odonata order in the Narew National Park

Nowe dane o ważkach (Odonata) Narwiańskiego Parku Narodowego

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Introduction

In the Narew National Park (NNP) area, not many studies have been carried out. The first dragonflies' inventory in the NNP was conducted during the year 1992. In this work were mainly considered adult dragonflies' but leaving larvae and exuvia were sporadically captured and registered (Bystrowski 1992). The second inventory was conducted not only in the NNP area but in all Podlasie Province from June to July 1998. Of the 36 inventory sites, five were located in the Park. Exuvia, immature and adult dragonflies were surveyed (Jödicke 1999). The third inventory was realised in July 2002. In this research leaving larvae, exuvia and adults were considered (Buczyńska et al. 2007). The two last inventories were made in 2009. The first one toke place in the Rynki area from 25th April to 21st August. In this work only adult individuals were considered (Kamocki et al. 2009). The second one, my work, is described further.

Study area, material and methods

The dragonfly's inventory was conducted in the NNP and its buffer zone. Six areas were visited from 30th June and 9th October 2009. These areas were chosen in order to represent different hydrological characteristics. At each place, GPS coordinates were registered and adult odonates were surveyed.

Area A1:

– Situated along the first 60 m of the Kurowo touristic pathway, in an arm of the Kurówka River;
– The flow is always predictable near the junction arm-main river channel but in the river arm the water is mainly still, however some very slow flow sometimes occurs;
– UTM-grid coordinates are: FD28.

Area A2:

– Situated in the last branch of the same pathway, in Kurowo, which takes us near to the Kurówka River;
– A considerable flow. A considerable flow exists in this part of the Kurówka River, but areas with slow flow occur near the river banks;
– UTM-grid coordinates are: FD28.

Area A3:

– Situated in the surroundings of a drainage channel, near the old mill, in Kurowo;
– No flow is predictable;
– UTM-grid coordinates are: FD28.

Area A4:

– Situated in a small pond near Bieńdziuga;
– UTM-grid coordinates are: 28FD.

Area A5:

– Situated in the Kurówka River Bridge near Bieńdziuga;
– The left side, downstream area of the bridge, where adult dragonflies were sampled, is an open water river area where the flow is predictable only the bridge piers;
– UTM-grid coordinates are: FD28.

Area A6:

– Situated in the vicinity of a small pond in the end of the Uhowo village;
– Approximately 50 m from the main river channel, and some temporary water pools

are present as well;
– UTM-grid coordinates are: FD27.

Each of these areas was visited at least three times (some areas were visited more than others due to their location) during the entire observation period, but not periodically. The areas were visited between 10.30 and 15.00.

For each area the number of observed species was counted and the number of flying individuals per species was estimated.

The number of flying individuals per species is given by the codes A, B, C, D and E. Each represents a certain number or numeric interval of individuals: A – 1, B – 1-3, C – 3-5, D – 5-8, E – >8. Species abundance was classified as: rare – present in 1 or in 2 inventarisation areas; common – present in 3 or in 4 inventarisation areas and abundant – present in 5 or 6 inventarisation areas.

The four inventories above were also analyzed. (Bystrowski 1992, Jödicke 1999, Buczyńska et al. 2007 and Kamocki et al. 2009) and the differences in their recorded species.

Results

During my inventory, 22 species, 12 from the suborder Zygoptera and 10 from the suborder Anisoptera, were observed in the 6 considered areas (Tab. 1). Only 3 species were present in all areas, 1 species was present in 5 areas, 4 species were present in 4 areas, 1 species was present in 3 areas, 6 species were present in 2 areas and 7 species were present in only 1 area. According to species abundance, 13 species (59%) were classified as rare, 5 species (23%) were classified as common and 4 species (18%) were classified as abundant. The area number 1 was where the highest number of species was observed – 17 species, in the area number five – 10 species were registered, in areas number two and four – nine species while in areas number 3 and 6 the lowest number of species was registered, 8. The data ispresent in table 1.

Now, gathering the data from the 5 inventarisation works which were carried out in the NNP and its buffer zone area, a total of 44 species were recorded (60% of the Polish Odonata fauna). From the Suborder Zygoptera 16 species, representing 62% of the Polish Zygoptera fauna, were recorded. From the Suborder Anisoptera 28 species, representing 60% of the Anisoptera fauna of Poland, were recorded (Bystrowski 1992, Jödicke 1999, Buczyńska et al. 2007, Kamocki et al. 2009, Bernard et al. 2009).

Discussion

According to the description of habitats made for each species in Bernard et al. (2009) and in Dijkstra (2006) all the species that I found during my inventory seem to be in agreement with these species habitat reports. The species *Calopteryx splendens* confirms the strong dispersive tendencies into standing waters described in the "A distribution atlas of dragonflies (Odonata) in Poland" (Bernard et al. 2009), due to the fact that it was present in area number 2, where no flow was predictable. A higher number of species was observed in river habitats (areas 1, 2 and 5) than in ponds (areas 3 and 6) or artificial channels (area 3).

During the first inventarization work, a total of 23 species were discovered (Bystrowski 1992). In 1998, 21 species were reported (Jödicke 1999). In 2002, when the third inventarization was done a total of 36 species were reported (Buczyńska et al. 2007). In 2009, the inventarization work which was realized in the Rynki area, resulted in the documentation of 23 species (Kamocki et al. 2009). In 1998, four species were reported for the first time (*Platycnemis pennipes*, *Anax imperator*, *Libellula*

Tab. 1. Estimated number of flying individuals per species in each area: A – 1, B – 1-3, C – 3-5, D – 5-8, E – >8. * This species was photographed in the beginning of the season (21 of May) between area 1 and 2, before this inventarisation work started, the reason why there is no estimated number of individuals per area.

Tab. 1. Szacunkowa liczba osobników gatunku latających na powierzchni: A – 1, B – 1-3, C – 3-5, D – 5-8, E – >8. * Gatunek sfotografowany na początku sezonu (21 V) między powierzchniami nr 1 i 2, zanim rozpoczęto inwentaryzację, z tego powodu brak danych o liczbie osobników.

No.	Species – Gatunek	A1	A2	A3	A4	A5	A6
1.	*Calopteryx virgo* (Linnaeus, 1758)	B	D	B		D	
2.	*C. splendens* (Harris, 1782)	B	D	B		D	
3.	*Lestes barbarus* (Fabricius, 1798)						D
4.	*L. virens* (Charpentier, 1825)				A		
5.	*L. dryas* (Kirby, 1890)						E
6.	*L. viridis* (Vander Linden, 1825)	E					
7.	*Ischnura elegans* (Vander Linden, 1820)					C	
8.	*Enallagma cyathigerum* (Charpentier, 1840)	A				A	
9.	*Coenagrion puella* (Linnaeus, 1758)	E	D	C	C	E	D
10.	*C. pulchellum* (Vander Linden, 1825)	E	D	C	C	E	D
11.	*Erythromma najas* (Hansemann, 1823)	A	A				
12.	*Platycnemis pennipe*s (Pallas, 1771)	E	D	C	C	E	D
13.	*Aeshna cyanea* (O.F. Müller, 1764)	A	A				
14.	*A. grandis* (Linnaeus, 1758)	B			A		
15.	*Cordulia aenea* (Linnaeus, 1758)	B					
16.	*Somatochlora flavomaculata* (Vander Linden, 1825)			A			
17.	*S. metallica* (Vander Linden, 1825)	B				C	
18.	*Epitheca bimaculata* (Charpentier, 1825)*	+	+				
19.	*Libellula depressa* (Linnaeus, 1758)	A			B		
20.	*L. fulva* (O. F. Müller, 1764)	E	C			B	
21.	*L. quadrimaculata* (Linnaeus, 1758)	E	C		D	B	D
22.	*Sympetrum flaveolum* (Linnaeus, 1758)	B		C	C		C
23,	*S. sanguineum* (O. F. Müller, 1764)	E		E	D		D

fulva and *Sympetrum vulgatum*). In the second inventarization carried out in the NNP, 2002 (Buczyńska et al. 2007), 10 species were discovered for the first time in the NNP (*Lestes dryas*, *Pyrrhosoma nymphula*, *Erythromma viridulum*, *Aeshna juncea*, *A. cyanea*, *A. affinis*, *A. isoceles*, *Gomphus flavipes*, *Orthetrum albistylum*, *O. brunneum*). This year, 2009, 5 new species were recorded in the NPN. The species *Lestes barbarus* was discovered during my inventarization and by Kamocki et al. (2009). The species *Lestes virens* and *L. viridis* were discovered during my work, while the species *Coenagrion hastulatum*, and *Somatochlora arctica* by Kamocki et al. (2009). The species *Sympetrum*

pedemontanum was only documented in NNP area in 1992 (Bystrowski 1992), due to the fact that after a heavy hailstorm these species populations were heavily reduced (Bystrowski 2003).

During these five inventories two dragonfly species protected by law were discovered. In 1992 (Bystrowski 1992) and in 2002 (Buczyńska et al. 2007) the species *Ophiogomphus cecilia* was recorded, this species is protected by the Network Natura 2000 (Bernard 2004). In 2009, Kamocki et al. (2009) sampled *Somatochlora arctica*; this species is present in the Red list of dragonflies of Poland 2009 with an endangered (EN) status (Bernard et al. 2009).

The species *Lestes barbarus*, *L. virens*, *L. viridis*, *Coenagrion hastulatum*, *Epitheca bimaculata* are present in the NNP area and its buffer zone but this distribution is not yet considered by the "A distribution atlas of dragonflies (Odonata) in Poland" (Bernard et al. 2009). These species were only documented in the NNP after the book has been published.

It's clearly visible that a more detailed inventarization is necessary in the NNP area and its buffer zone; due to the fact that each time a similar work is done new species are found. It is very possible that the NPN dragonflies' fauna is not yet all discovered.

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Summary

In 2009, I conducted an Odonata inventarisation in 6 areas of the Narew National Park, which resulted in the documentation of 23 species. Besides that, I also analysed all the inventarisation works which were done in the Park area, a total of 44 species were until now documented.

Key Words. Odonata, dragonflies, Poland, Narew National Park, new data