

Dragonflies (Odonata) of the Poliskyi Nature Reserve, Ukraine

*Lyudmyla Khrokalo*¹ & *Nazar Nazarov*²

1 Institute of Environment & Biotechnologies, National Agricultural University of Ukraine, Geroiv Oborony str.15, Kyiv, Ukraine 03041, lkhrokalo@mail.ru.

2 Poliskyi Nature Reserve, Selezivka village, Ovrutskyi district, Zhytomyrska oblast', 11122, Ukraine

Abstract

Twenty-eight Odonata species were recorded in the Poliskyi Nature Reserve (Zhytomyr oblast', North Ukraine) in 2006 and 2007, 18 of which were reported for the first time from this location. This included such rare species as *Somatochlora arctica* (second record in the Ukraine, first record for 100 years), *Leucorrhinia dubia*, *Leucorrhinia rubicunda* and *Leucorrhinia albifrons*. A breeding site and a dense population of *Nehalennia speciosa* were found in a bog near the river. Zholobnytsya. The record of *Orthetrum coerulescens* is the northernmost in Ukraine.

Introduction

The Poliskyi Nature Reserve is situated in the northern part of the Zhytomyrska Oblast' at the border with Belarus (Fig.1). Its geographical coordinates are 51°31'N 27°56'E (main area); 51°34'N 28°05'E (northern area near the river Zholobnytsya). The reserve covers 2,145 ha and includes the territory of the Selezivka, Kopysha and Perga forests. It is a typical wetland complex situated in one of the most extensive bog and swamp areas of Europe – Polissia. The area includes mires and bogs (called "Miroshi") and transitional mires and fens in floodplains of the small rivers Zholobnytsya and Bolotnytsya. Bogs are oligotrophic and represented by pine-*Sphagnum* communities, transitional wetlands by mesotrophic pine-birch and bush-sedge-*Sphagnum* communities. Fens are represented by eutrophic reed, sedge, and forest communities (Targonsky et al.,



2005). In 2004 the Poliskyi Nature Reserve was designated a wetland area of international importance in Ramsar List.

The first data on the Odonata of Poliskyi reserve were reported by V. Nadvorny during his entomological field work in 1976 and 1988. As a result, 14 Odonata species and information on their habitat preferences, distribution and flight season were revealed (Nadvorny 1996). Later, Ye. Vorobyov reported one new species for the reserve (Vorobyov 2005).

Methods

In August 2006 and May and June 2007 dragonflies were collected in the eastern part of Poliskyi Nature Reserve, in the Selezivka forest (Fig.1). Clearings and roads in the forest were surveyed as well as mires, oligotrophic and mesotrophic peat bogs and flood-plains of the rivers Zholobnytsya and Bolotnytsia.

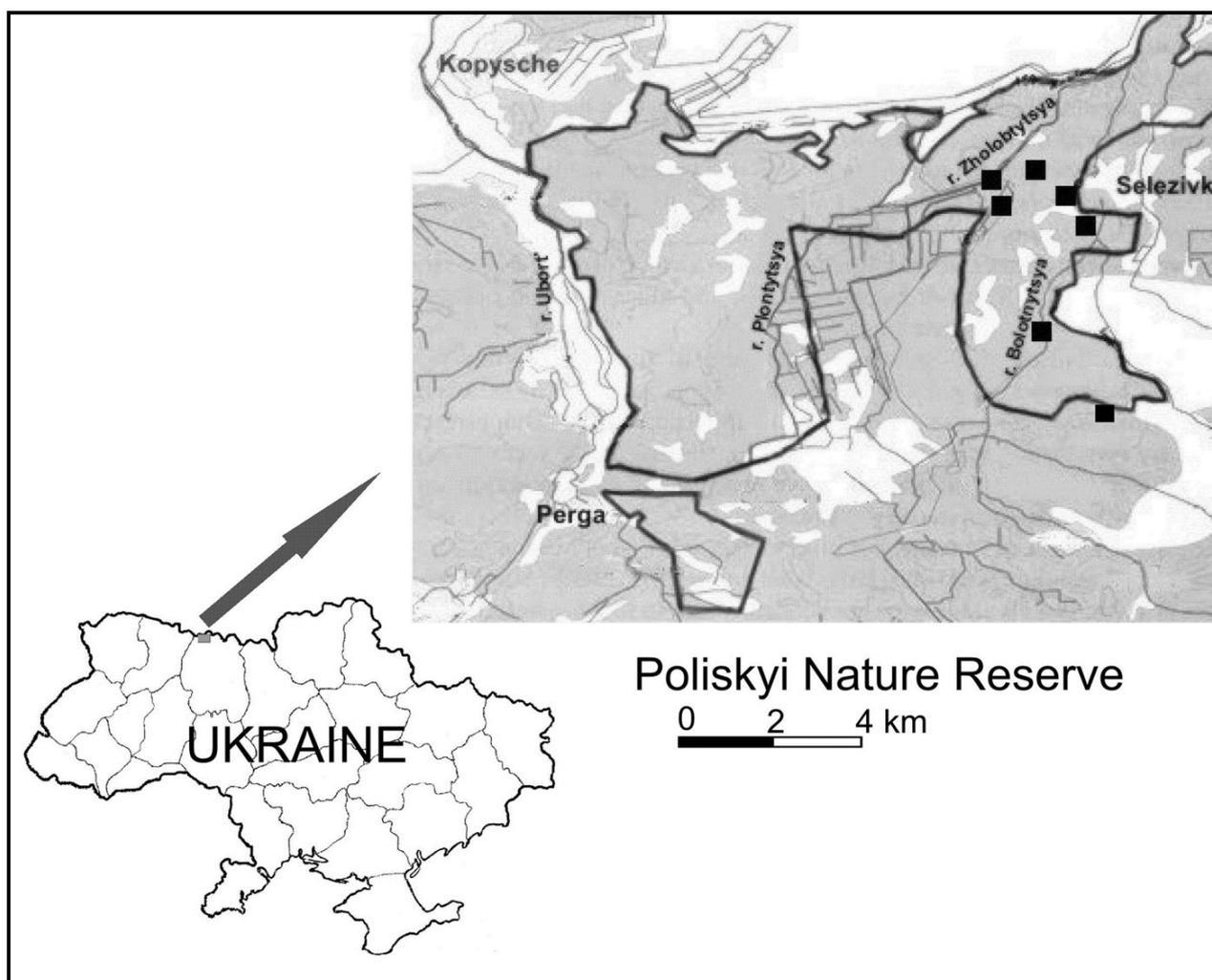


Figure 1: Map of the Poliskyi Nature Reserve. Black squares indicate the collection areas.



Figure 2: Forest vegetation of mires.



Vaccinium myrtillus, a considerable part of the mires is overgrown with *Betula pubescens* and *Alnus glutinosa*, occasionally with *Populus tremula*, *Pinus sylvestris* (Fig. 2), or green and *Sphagnum* mosses (Fig. 3), bushes of *Salix lapponum*, *S. myrtilloides* and *S. rosmarinifolia*. In some places *Oxycoccus palustris* and cotton-grass *Eriophorum vaginatum* occur (Fig. 4). Plant communities mainly consisting of *Nymphaea candida* and *Nuphar lutea* occur in open water places (Fig. 5).

Figure 3: *Sphagnum* bog.





Figure 4: Dwarf shrubs and bog cotton of mires.



Figure 5: Emergent and floating vegetation in rivers.

Results and discussion

Below a check list of dragonflies recorded in Poliskyi Nature Reserve is given and discussed. Numbers of males and females in the text refer to the number of individuals collected.



Calopteryx splendens (Harris, 1782)

Previous records: rare in lotic water in June-August (Nadvorny 1996).

Our data: r. Bolotnytsya, 6.08.2006, 2 males; r. Zolobnytsya, 14.08.2006, 1 male; 12.06.2007, 2 males, 1 female.

Calopteryx virgo (Linnaeus, 1758)

Previous records: rare in r. Bolotnytsya and common in the brooks of the Horodets forest (area in southeastern environs of reserve) (Vorobyov 2005).

Our data: roads in forest, 23.05.2007, 4 males, 2 females; r. Bolotnytsya, 03.08.2006, 2 males; 09.08.2006, 1 male; 11.08.2006, 1 male, 1 female; 05.06.2007, 2 males; Zholobnytsya melioration system, bank of canal, 10.08.2006, 3 males; r. Zholobnytsya, 12.06.2007, abundant adults.

Species is included to Red Data Book of Ukraine (1994), category III "Rare".

Sympecma fusca (Vander Linden, 1820)

Previous records: common in July-August (Nadvorny 1996).

Sympecma paedisca (Brauer, 1877)

Our data: r. Bolontytsya, 9.08.2006, 1 male.

This red listed species is declining in Europe (IUCN, 1998).

Lestes virens (Charpentier, 1825)

Previous records: common everywhere in June-August (Nadvorny 1996).

Our data: r. Bolotnytsya, 9.08.2006, 1 male.

Lestes sponsa (Hansemann, 1823)

Previous records: common everywhere in June-August (Nadvorny 1996).

Our data: r. Bolotnytsya, 9.08.2006, 2 males, 2 females; bog around r. Zholobnytsya, 1 female.

Lestes dryas Kirby, 1890

Previous records: common everywhere in July-August (Nadvorny 1996).

Platychemis pennipes (Pallas, 1771)

Previous records: common in valleys of rivers in June-July (Nadvorny 1996).

Our data: r. Zholobnytsya, 12.06.2007 common species.

Enallagma cyathigerum (Charpentier, 1840)

Previous records: common in lakes, bogs, canals and ponds in June-July (Nadvorny 1996).



Coenagrion lunulatum (Charpentier, 1840)

Previous records: common everywhere in May-July (Nadvorny 1996).

Despite Nadvorny's record the situation remains unclear because there is currently no dense population of this species known in Ukraine and was nowhere regarded as "common" in Ukraine (Gorb et al. 2000) or Europe (Dijkstra & Lewington 2006). Perhaps the species identity refers to *C. hastulatum* which looks similar and was more frequently observed (see below).

Coenagrion puella (Linnaeus, 1758)

Previous records: common everywhere in July-August (Nadvorny 1996).

Our data: Drainage ditches along the road, puddles, r. Zholobnytsya, bog around r. Zholobnytsya, pond near r. Bolotnytsya, 12.-13.06.2007 common species.

Coenagrion pulchellum (Vander Linden, 1825)

Previous records: common everywhere in July-August (Nadvorny, 1996).

Our data: drains and puddles along the road, r. Zholobnytsya, bog on r. Zholobnytsya, 12-13.06.2007, abundant species. Surroundings of the reserve, Bigun forest, lake, 11.05.2007, 6 males, 15 females.

Coenagrion hastulatum (Charpentier, 1825)

Our data: puddles along the road, lakes in forest, r. Zholobnytsya, bog around r. Zholobnytsya, 14.05.2007, 23.05.2007, 12-13.06.2007 not abundant.

Surroundings of reserve, lake in the Bigun forest, 11.05.2007, 4 males, 3 females.

Erythromma najas (Hansemann, 1823)

Our data: pond around r. Bolotnytsya, 12.06.2007, common. Surroundings of reserve, lake in the Bigun forest, 11.05.2007, 1 female.

Nehalennia speciosa (Charpentier, 1840)

Our data: around r. Zholobnytsya (Fig. 6), 13.07.2007, (51°31'10"N 28°03'50"E): bog with open water surface, abundant sedges, *Carex spp.* and surrounded by *Betula pubescens*, *Pinus silvestris* and *Picea abies*. *Sphagnum* was rather scattered.





Figure 6: Bog around the river Zholobnytsya: likely breeding site of *Nehalennia speciosa*.

N. speciosa is a rare and declining species in Europe and in need of strong protection (Bernard & Wildermuth 2005). Old records were known for Ukraine from the beginning of the 20th century, mainly in the north and western parts and one record from the south (Gorb et al. 2000). Since 1950 only individual specimens were found in northern Ukraine (Volynska and Chernihiv oblast') and some data need confirmation (Bernard & Wildermuth 2005).

The habitat looked similar to those described as breeding sites of *N. speciosa* in the literature (Bernard & Wildermuth 2005). In addition, we found more than 20 individuals during one day of observation. This suggests this nature reserve is a breeding site of *N. speciosa*. Therefore, the reserve is very important for Ukrainian odonatology because the ecology of that species can be studied here. It also provides protection and allows the possible introduction of this species to appropriate habitats.

Aeshna isosceles (Müller, 1767)

Previous records: rare at bogs, rivers, lakes in July-August (Nadvorny 1996).



Aeshna cyanea (Müller, 1764)

Our data: glade in forest, 11.08.2006, 2 males, 14.08.2006, 1 female; puddles in sandy pits, 12.06.2007, larvae; 1 male.

Anax imperator Leach, 1815

Our data: pond around r. Bolotnytsya, 13.06.2007, 1 male, 1 female. The species is included in the Red Data Book of Ukraine (1994), category III "Rare".

Cordulia aenea (Linnaeus, 1758)

Previous records: common everywhere in May-August (Nadvorny 1996).

Our data: glade, edges of forest, road, 21.05.2007, 1 male, 1 female; drainage ditches near the road, 12.06.2007, exuviae, 1 male. Surroundings of reserve, Bigun forest, glade, 11.05.2007, 1 female.

Somatochlora metallica (Vander Linden, 1825)

Our data: r. Zholobnytsya, 14.08.2006, 1 male; meadow near the village Selezivka (directorate of reserve) 12.06.2007, 2 males, 1 female; bog on r. Zholobnytsya, 13.06.2007, common species, 1 male, 1 female.

Somatochlora flavomaculata (Vander Linden, 1825)

Our data: meadow near the village Selezivka 12.06.2007, common species, 6 males, 1 female; road in forest, 12.06.2007, 2 females; bog on r. Zholobnytsya, 13.06.2007, common species, 2 males, 1 female.

Somatochlora arctica (Zetterstedt, 1840)

Our data: meadow near the village Selezivka 12-13.06.2007, 2 females.

This is the second record of this species in the Ukraine. The first one was from the surroundings of Novohrad-Volynsky in 1909: 22.05 – 1 female, 27.05. – 1 female, 02.06. – 1 female (Solodovnikov 1927). This area is situated 100 km to the SW from the present one.

S. arctica breeds in *Sphagnum* bogs at localities of the same latitude in Eastern Poland (e.g. Bernard et al. 2002; Buczyński et al. 2004) and in the Pripjat National Park in Belarus (Dijkstra & Koese 2001). Similar habitats and thus potential sites for larval development may, therefore, be found within the boundaries of the Poliskyi reserve.

Libellula quadrimaculata Linnaeus, 1758

Previous records: abundant everywhere in May-August (Nadvorny 1996).

Our data: glades, edges of forest, roads, lakes, pond on river Bolotnytsya, bog



around r. Zholobnytsya, 12-13.05.2007, common and abundant near water, exuviae 2 males, 5 females.

Libellula fulva (Müller, 1764)

Our data: dry *Sphagnum* mire, 12.06.2007, 2 males; bog near r. Zholobnytsya, 13.06.2007, common.

Orthetrum cancellatum (Linnaeus, 1758)

Our data: pond around r. Bolotnytsya, 13.06.2007, 1 female.

Orthetrum coerulescens (Fabricius, 1798) *ssp. anceps*

Our data: dry *Sphagnum* mire, 12.06.2007, 1 male, 2 females; r. Bolotnytsya, 13.06.2007, 2 females.

This is the northernmost record for Ukraine. Previously it was found in western (Ivano-Frankivsk, Lviv and Zakarpats'ka oblast'), eastern (Donetsk and Lugansk oblast') and southern (Odessa and Mykolaiv oblast') regions and was abundant in Crimea (Gorb et al. 2000; Sheshurak 2001; Martynov & Martynov 2004; Dyatlova 2006; Matushkina 2006; Khrokalo & Prokopov 2005).

Sympetrum flaveolum (Linnaeus, 1758)

Previous records: common everywhere in July-August (Nadvorny 1996).

Our data: road in forest, 1.08.2006, 1 male, r. Bolotnytsya 9.08.2006, 1 female.

Sympetrum danae (Sulzer, 1776)

Our data: r. Bolotnytsya, meadow, 3.08.2006, 1 female, 16.08.2006, 3 males, 1 female; r. Zholobnytsya 14.08.2006, 1 male.

Sympetrum sanguineum (Müller, 1764)

Our data: r. Bolotnytsya, meadow, 1.08.2006, 1 female, 16.08.2006, 2 males; r. Zholobnytsya 14.08.2006, 1 female.

Leucorrhinia dubia (Vander Linden, 1825)

Our data: road in forest, drainage ditches and puddles near the road, glades 12-13.06.2006, abundant, 12 males, 10 females.

This species is rare species in Ukraine. It was found at the beginning of the 20th century in the Kyiv region and in the Carpathian Mountains at an altitude of more than 1500 m a.s.l. (Gorb et al. 2000). Recent records are from the north-eastern Ukraine in Chernihiv (Sheshurak & Khrokalo 2004). and the Sumy oblast' (Khrokalo 2004).



Leucorrhinia rubicunda (Linnaeus, 1758)

Our data: r. Zholobnytsya, 14.05.2007, 2 males, 1 female; drainage ditches and puddles near road in forest, 12.06.2006, 2 females.

This is a rare species in Ukraine. Old records were known from western and northern Ukraine (Gorb et al. 2000). Records in the last decade were from north, northeast and central Ukraine: the northern part of Sumy oblast' (Khrokalo 2004), Chernigiv oblast' (Sheshurak & Khrokalo 2004), Kyiv and Cherkassy oblast' (Matushkina 2006).

Leucorrhinia pectoralis (Charpentier, 1825)

Our data: road in forest, 12.06.2006, 1 male.

The species is declining in Europe (IUCN, 1998). In Ukraine it is registered on most of its territory, except the south and the Crimea peninsula, often common in swamps.

Leucorrhinia albifrons (Burmeister, 1839)

Our data: pond around r. Bolotnytsya, 13.06.2007, 1 male.

The species is declining in Europe (IUCN, 1998). It is rare in Ukraine occurring in northern Ukraine: Kyiv and Volyn' region (Gorb et al. 2000, Khrokalo, unpublished data); and Crimea (Matushkina 2006).

Conclusion

The Poliskyi Nature reserve is important for the protection of dragonflies because out of the 18 species newly recorded here, 2 are included in the Ukrainian Red Data Book and 3 in the European Red Data Book. However, common and sometimes abundant species were also found, especially in the swampy drainage ditches along forest roads (*Libellula quadrimaculata* and *Leucorrhinia dubia*), in the rivers (*Calopteryx virgo*, *Calopteryx splendens*; (rarer than the former), *Platycnemis pennipes* and *Coenagrion hastulatum*) and around ponds (*Anax imperator*, *Erythromma najas*, *Coenagrion puella*, *Coenagrion pulchellum*). Undoubtedly, the most interesting place was the bog of the river Zholobnytsya, inhabited by *Nehalennia speciosa*, *Libellula fulva* and *Somatochlora flavomaculata*. The area of the Polisskyi reserve includes most typical forest Odonata fauna and investigation of this place has to be continued.



Acknowledgements

The authors are grateful to the International Dragonfly Fund for funding the field work in 2007 in the framework of a grant devoted to study the distribution of *C. armatum* in Ukraine.

References

- Bernard, R., Buczyński, P., Tończyk, G. 2002: Present state, threats and conservation of dragonflies (Odonata) in Poland. – *Nature Conservation* 59: 53-71.
- Bernard, R., Wildermuth, H. 2005: *Nehalennia speciosa* (Charpentier, 1840) in Europe: a case of a vanishing relict (Zygoptera: Coenagrionidae). – *Odonatologica* 34 : 335-378.
- Buczyński, P., Tończyk, G., Daraż, B., Djatlova, E., Michalczyk, W., Miszta, A., Szymański, Ja., Szpala, B., Tondys, J. 2004: Ważky zebrane podczas III Ogólnopolskiego Sympozium Odonatologicznego PTE (Zwierzyniec, 15-17.IX.2004). – *Odonatrix* 2 (1): 1-16. (in Polish)
- Dijkstra, K.-D.B.; Lewington, R. 2006: Field guide to the dragonflies of Britain and Europe.- British Wildlife Publishing. 320 pp.
- Dijkstra, K-D.B.; Koese, B. 2001: Dragonflies of Pripyat National Park, Belarus (Odonata). – *Opuscula Zoologica fluminensia* 192: 1-20.
- Dyatlova, E.S. (2006): *Orthetrum coerulescens anceps* (Odonata, Libellulidae) in Odessa and its vicinities (Ukraine). *Vestnik zoologii* 40(3): 275-278.
- Gorb, S. N., Pavlyuk, R. S., Spuris, Z. D. 2000: Babky (Odonata) Ukrainy: faunistychniy oglyag (Odonata of Ukraine: a faunistic overview). – *Vestnik zoologii* 15: 3-155. (in Ukrainian with English summary)
- International Union for the Conservation of Nature (IUCN) 1998. Convention on the conservation of European wild life and natural habitats (Bern, 1979). Kyiv. – 75 pp. (in Ukrainian with English titles).
- Khrokalo, L., 2004: Dragonflies (Insecta, Odonata) of Desnians'ko-Starogutskyi National Nature Park and its environs. - *Zapovidna sprava v Ukraini (Nature Reserves in Ukraine)* 10: 84-86.
- Khrokalo, L.; Prokopov, G. 2005: Notes on Crimean Odonata (Crimea, Ukraine). – Book of abstracts of 4th WDA International Symposium of Odonatology, Pontevedra (Spain): 42.



- Martynov, V., Martynov, A., 2004: Materialy k faune strekoz (Insecta, Odonata) Luganskoy oblasti (Materials to Dragonflies fauna (Insecta, Odonata) of Lugansk district). - Vestnik zoologii 38: 74.
- Matushkina, N., 2006: New records of rare Odonata in Ukraine (Insecta). Proceedings of the Zoological Museum of Kyiv. T. Shevchenko Univ. 4: 155-161.
- Nadvornyy, V., 1996: Vidovoj sostav, rasprostranenie i zhiznedeyatel'nost' nasekomykh v razlichnykh biotsenozakh Poleskogo gosudarstvennogo zapovednika. (Species composition and distribution of insects from different habitat of Polesky State Reserve). - The Kharkov Entomological Society Gazette 4 : 19-64. (in Russian)
- Red data book of Ukraine. 1994. Animal Kindom (Chervona knyha Ukrainy. Tvarynny svit.). Kyiv. Ukrainska Entsiklopedia. 457 pp. (in Ukrainian with English summary)
- Sheshurak, P. 2001: Strekozy (Odonata) Regional'nogo landshaftnogo parka „Granitno-Stepove Pobuzhzhia” (Dragonflies of Regional Landscape park „Granitno-Stepove Pobuzhzhia”). - Vestnik zoologii 35: 22.
- Sheshurak, P. M., Khrokalo, L. 2004: K isucheniyu entomofauny doliny Desny. Strekozy (Odonata) biostatsionara NGPU “Lesnoe ozero” i ego okrestnostey (Chernihovskaya oblast', Ukraina). Materialy naukovykh konferentsii. (Toward the study of entomofauna of Desna river valley. Dragonflies (Odonata) of biology station NPU “Forest Lake” and its environs (Chernihiv region, Ukraine). Transactions of scientific-practical conference), Nizhin: 115-117. (in Russian)
- Solodovnikov, S. V. 1927: Babky (strekavky) Volyni. (Dragonflies of Volyn'). - Visti Kharkivs'kogo sils'kogospodars'kogo instytutu. (News of Kharkiv Agricultural Institute) 8-9: 55-62. (in Ukrainian with German summary)
- Targonsky, P.N., Bumar, G. Y., Bumar, G. V. 2005: Skarby pryrody Polis'kogo krayu (Natural treasures of the Polissia area).- Kyiv. 'Phitosotsiotsentr'. 160 pp. (in Ukrainian).
- Vorobyov, Ye., 2005: Komakhy Polis'kogo pryrodnogo zapovidnyka, scho potrebuyt' okhorony. (Endangered insects of Polissya Nature Reserve). - Zbirnyk naukovykh prats' za materialamy konferentsii “Ridkisini ta znykaiuchi vydy komakh i conceptsii Chervonoj Knygy Ukrainy” (Transact. of conference “Rare and endangered species of insects and conception of Red Data Book of Ukraine): 16-21. (in Ukrainian with English summary)

