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Note on the dragonfly fauna of Moldova – Progress report 2011

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Abstract

New field sampling was carried out in June 2011 in northern Moldova, the most unstudied area in the Republic of Moldova. A total of 19 Odonata species was recorded during a field trip, with *Libellula fulva* and *Gomphus flavipes* new for Moldova. The presence of species of European concern is discussed. Photos of all visited habitats are included. The fauna of Moldova mostly consists of species which are able to survive in biotopes with high anthropogenic pressure.

Key words: Moldova, *Libellula fulva*, *Gomphus flavipes*, anthropogenic pressure on habitats.

Introduction

For a long period, information on the Odonata fauna of Moldova was very scarce. Hence it was our aim to fill this gap of knowledge and likewise to add new data to the map of odonate distribution in Central-Eastern Europe. Odonatological research was carried out in 2005, 2009 (see Dyatlova 2010), and 2011. The fieldwork in 2011 focused on un- or understudied Moldavian regions (see Fig. 1).

Analysis of all known localities of Odonata in Moldova by our data (Dyatlova, 2010) and other sources showed a lack of odonatological studies in the north of the country. For this reason, in 2011 we concentrated our field work on the northern part of Moldova. We investigated 25 nature sites; 22 were visited by us for the first time and 3 of them were revisited since the last fieldwork, described in the previous publication (Dyatlova, 2010). The three sites which were visited in both 2009 and 2011 are numbered as Loc. 27 (current study: Loc 5), 15 (current study: Loc 15) and 6 (current study: Loc 23) in Dyatlova (2010).

The studied region is characterised by the river Reut, a right tributary of Dniester River. In general, this region suffers from extremely intensive agriculture. Most wetlands in the flood plain of the Reut River are dried out. In the river valley people grow fodder crops and vegetables. The Reut is used as resource for irrigation. Waters of the river are heavily polluted by wastewaters.

Results

The 25 studied localities (Loc.) are introduced, and the odonatological results of the survey in June 2011 are presented per locality. *Libellula fulva* and *Gomphus flavipes* were recorded for the first time on the territory of Moldova.

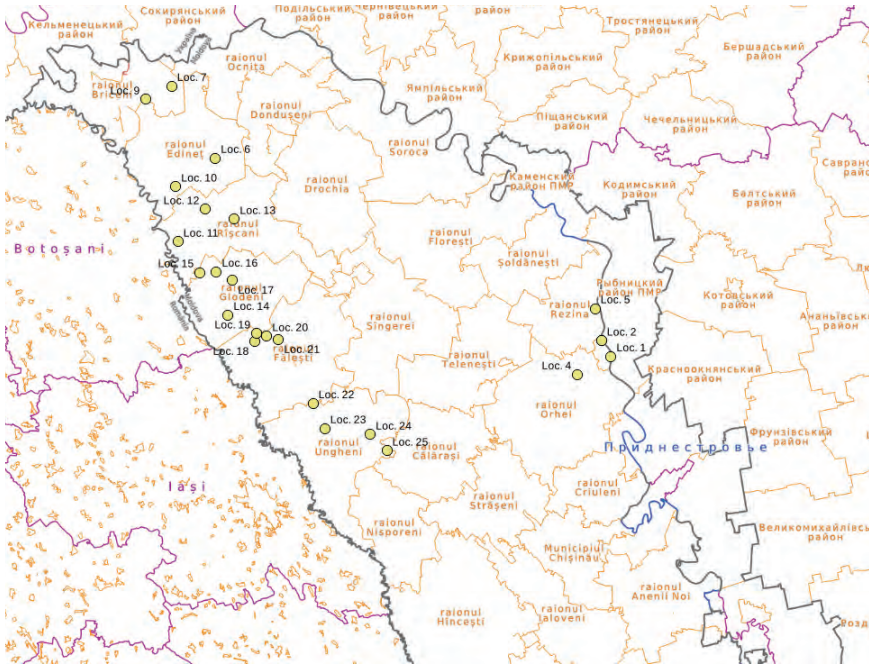


Figure 1. Map of localities where odonatological research was carried out in 2011 (Dyatlova, current research).

Loc. 1: Lalova village, bank of the Dnister River (Fig. 2).

Date of survey: 15.06.2011 (short evening excursion)

Geographic coordinates: N 47°33'54.3" E 029°01'25.8"

Recorded Odonata species:

Ichnura elegans: 5 specimens (1 teneral, 1 copula, 2 ♂♂).

Coenagrion pulchellum: 1 ♂.

Loc. 2: Țipova village, from Țipova monastery a serpentine path down to the Dnister River. A creek (1 m width) with muddy sediment which flows into the Dnister River (Fig. 3a, b).

Date of survey: 16.06.2011

Geographic coordinates: N 47°36'30.4" E 028°59'03.5"

Recorded Odonata species:

Calopteryx splendens: 10 ♂♂, 3 ♀♀.

Platycnemis pennipes: 3 ♀♀.

Ichnura elegans: 8 ♂♂.

Gomphus flavipes: 1 ♂.



Figure 2. The bank of the Dnister River and the adjacent wetlands (Loc. 1).



Figure 3a. Brook near Țipova village (Loc. 2).



Figure 3b. Brook near Țipova village, view from above (Loc. 2).

Loc. 3: Țipova village, (see Loc. 2); near Loc. 2 there is an open bank of Dnister River (Fig. 4a, b).

Date of survey: 16.06.2011

Geographic coordinates: N 47°36'30.4" E 028°59'03.5"

Recorded Odonata species:

Calopteryx splendens: 2 ♂♂.

Ischnura elegans: 2 ♂♂.

Aeshna isoceles: 1 ♂.

Anax parthenope: 1 ♂.

Anax imperator: 1 ♂.

Orthetrum albistylum: 1 ♀ (oviposition), 5 ♂♂.

Libellula fulva: 1 ♂.



Figure 4a. Open bank of Dnister River near Țipova village (Loc. 3).



Figure 4b. View of the Dnister River near Țipova Village.

Loc. 4: Pond in the surroundings of Biești village (Fig. 5).

Date of survey: 16.06.2011

Geographic coordinates: N 47°30'50.6" E 028°53'08.2"

Recorded Odonata species:

Ischnura elegans: tandems, single specimens, very numerous.

Coenagrion puella: 8 ♂♂.

Coenagrion pulchellum: 2 ♂♂.

Aeshna isoceles: 1 ♂.

Anax imperator: 1 ♀ oviposition.

Anax parthenope: 1 ♂.

Sympetrum sanguineum: 2 teneral ♂♂.



Figure 5. Pond near Biești village (Loc. 4).



Figure 6a. Saharna River on the territory of a monastery (Loc. 5).

Loc. 5: This locality was described in Dyatlova (2010) under sample site 27. Sahara village, on the territory of a monastery situated on a rock. Rocky, wooded canyon of Sahara river (with rapids and waterfalls), a tributary of Dnister River (Fig. 5).

Date of survey: 16.06.2011

Geographic coordinates: E 47°41'47.6" E 028°57'30.7"

Recorded Odonata species:

Calopteryx splendens: 1 ♂.



Figure 6b. Cascading waterfalls of Sahara River (Loc. 5).



Figure 6c. Waterfall on the territory of Sahara monastery (Loc. 5).

Loc. 6: Large pond in the surroundings of Chetrosica Veche village (Fig. 7).

Date of survey: 17.06.2011

Geographic coordinates: N 48°06'35.5" E 027°24'05.5"

Recorded Odonata species:

Ischnura pumilio: 1 ♂.

Orthetrum albistylum: 3 ♂♂.

Aeshna isoceles: 2 ♂♂

Anax sp.

Orthetrum brunneum: ♂.

Orthetrum cancellatum: 1 ♀.



Figure 7. A large pond near Chetrosica Veche village (Loc. 6).

Loc. 7: Mărcăuți village, eutrophic pond (Fig. 8).

Date of survey: 17.06.2011

Geographic coordinates: N 48°18'23.4" E 027°13'20.3"

Recorded Odonata species:

Ischnura elegans: 2 ♂♂.

Ischnura pumilio: 10 ♂♂.

Anax parthenope: ♂.

Orthetrum albistylum: 2 ♂♂.



Figure 8. Pond near Mărcăuți Village (Loc. 7).

Loc. 8: Trestieni village, wet meadow along the litoral of the river (Fig. 9).

Date of survey: 17.06.2011

Geographic coordinates: N 48°16'16.5" E 027°06'58.0"

Recorded Odonata species:

Coenagrion puella: numerous.

Ischnura elegans: 5 ♂♂.

Ischnura pumilio: 10 ♂♂.



Figure 9. Wet meadow near Trestieni Village (Loc. 8).

Loc. 9: Trestieni village, bank of the small river (Fig. 10).

Date of survey: 17.06.2011

Geographic coordinates: N 48°16'16.5" E 027°06'58.0" E

Recorded Odonata species:

Ischnura elegans: 1 ♂.

Ischnura pumilio: 1 ♂.

Orthetrum albistylum: 1 ♂.



Figure 10. Bank of a small river near Trestieni (Loc. 9).

Loc. 10: Surroundings of Terebna village, a muddy brook and its neighbouring pastures (Fig. 11).

Date of survey: 18.06.2011

Geographic coordinates: N 48°01'57.6" E 027°14'19.7"

Recorded Odonata species in pastures:

Coenagrion puella: numerous ♂♂.

Ischnura elegans: 5 ♂♂.

Ischnura pumilio: 2 ♂♂.

Orthetrum cancellatum: 1 ♂.

Anax sp.

Orthetrum albistylum: 2 ♀♀ (teneral).

Recorded Odonata species on the brook:

Ischnura pumilio: 3 ♂♂.

Ischnura elegans: 2 ♂♂.

Enallagma cyathigerum: 1 ♂.



Figure 11a. Meadow near the pond in Terebna (Loc. 10).



Figure 11b. Brook near the pond in Terebna (Loc. 10).

Loc. 11: Duruitoarea Nouă village near the large water reservoir “Costești-Stânca” built by impounding the Prut River in 1978 (Fig. 12).

Date of survey: 18.06.2011

Geographic coordinates: N 47°52'52.4" E 027°14'52.3"

Recorded Odonata species:

No Odonata recorded.



Figure 12. Bank of “Costești-Stânca”, a large water reservoir on Prut river (Loc. 11).

Loc. 12: Zăicani, polluted river running through the village (Fig. 13).

Date of survey: 18.06.2011

Geographic coordinates: N 47°58'13.8" E 027°21'30.7"

Recorded Odonata species:

No Odonata recorded



Figure 13. Polluted river in Zăicani (Loc. 12).

Loc. 13: 3.5 km NE from Sturzeny, a fish pond near the forest, the shore is mostly overgrown with reeds (Fig. 14).

Date of survey: 18.06.2011 (short stop "survey")

Geographic coordinates: N 47°56'36.6" E 027°28'46.2"

Recorded Odonata species:

Anax parthenope: 2 ♂♂.



Figure 14. Pond near Sturzeny (Loc. 13).

Loc. 14: A system of ponds within the outskirts of Glodeni city. Exclusively the pond situated most closely to Glodeni was studied (Fig. 15).

Date of survey: 18.06.2011

Geographic coordinates: N 47°40'46.4" E 027°27'13.6"

Recorded Odonata species:

Platycnemis pennipes: 2 ♂♂.

Ischnura elegans: 5 ♂♂, 3 copulae.

Orthetrum cancellatum: numerous ♂♂.



Figure 15. Pond within the outskirts of Glodeni city (Loc. 14).

Loc. 15: This locality was described in Dyatlova (2010) under sample sites 15 and 16. Surroundings of Glodeni (Butești). Small, fast-running brook with rocky bottom. Located near the gorge "Butești" (more accurately it should be called reef "Butești") – a remarkable place in Moldova. The walls of the gorge consist of various geological formations with petrified mollusks, corals, algae and other marine organisms. This is also a tourist attraction with its caves and a nature heritage site of Moldova with many interesting archaeological and paleontological records (Fig. 16).

Date of survey: 18.06.2011

Geographic coordinates: N 47°47'45.3" E 027°20'09.1"

Recorded Odonata species:

While Dyatlova (2010) recorded *Orthetrum brunneum* and *Platycnemis pennipes* at locality 15 in 2009, no dragonflies were observed in 2011. A nearby situated small brook (Fig. 15a) resulted in one male of *I. elegans*.



Figure 16a. Stream in Butești village near the gorge (Loc. 15).



Figure 16b. A small brook nearby a stream (Fig. 15a) in Butești (Loc. 15).

Loc. 16: Surroundings of Hijdieni village, a pond with extensive reedbed (Fig. 17).

Date of survey: 18.06.2011

Geographic coordinates: N 47°47'55.7" E 027°24'14.6"

Recorded Odonata species:

Ischnura elegans: numerous

Erythromma viridulum: numerous in copula

Anax imperator: 2 ♂♂.

Aeshna isoceles: 2 ♂♂.

Orthetrum albistylum: 2 ♂♂, 1 ♀ teneral.



Figure 17. Pond in the surroundings of Hijdieni (Loc. 16).

Loc. 17: Surroundings of Hijdieni village, wetlands on the one side of the road and a stream on the opposite (Fig. 18).

Date of survey: 18.06.2011



Figure 18a. Wetlands in the surroundings of Hijdieni (Loc. 17).



Figure 18b. A brook in the surroundings of Hijdieni (Loc. 17).

Geographic coordinates: N 47°46'31.4" E 027°28'13.1"

Recorded Odonata species:

Brook:

Coenagrion puella: 2 ♂♂, 2 ♀♀.

Ischnura pumilio: 3 ♂♂, 2 ♀♀.

Wetlands:

Ischnura elegans: 3 ♂♂.

Loc. 18: Surroundings of Navyrnets, a brook flowing in a lake, wetlands (Fig. 19).

Date of survey: 19.06.2011

Geographic coordinates: N 47°36'20.4" E 027°33'40.9"

Recorded Odonata species:

On the stream and wetlands:

Ischnura pumilio: 15 ♂♂, 3 ♀♀.

Orthetrum brunneum: 10 ♂♂, 2 copulae.

Libellula fulva: 3 ♂♂, 1 oviposition

On the dry meadow:

Enallagma cyathigerum: 1 copula, 1 ♂.



Figure 19a. Wetlands in the surroundings of Navyrnets (Loc. 18).



Figure 19b. Stream in the surroundings of Navyrnets (Loc. 18).

Loc. 19: Logoffteni, a small polluted running water (Fig. 20).

Date of survey: 19.06.2011

Geographic coordinates: N 47°37'42.0" E 027°34'11.8"

Recorded Odonata species:

No Odonata species observed.



Figure 20. Brook near Logoffteni village (Loc. 19).

Loc. 20: Near Moldovanca lake, a slow running water with muddy sediments (Fig. 21).

Date of survey: 19.06.2011

Geographic coordinates: N 47°37'15.1" E 027°36'38.0"

Recorded Odonata species:

Ischnura pumilio: 4 ♂♂.

Crocothemis erythraea: 1 ♀.

Orthetrum brunneum: 10-15 ♂♂.

Libellula fulva: 3 ♂♂.



Figure 21. Brook near Moldovanca Lake (Loc. 20).

Loc. 21: Surroundings of Pînzăreni, a brook flowing in a pond (Fig. 22).

Date of survey: 19.06.2011

Geographic coordinates: N 47°36'39.1" E 027°39'37.0"

Recorded Odonata species:

Enallagma cyathigerum – 1 copula, 1 ♂.

Ischnura elegans: 1 copula.

Ischnura pumilio: 10 ♂♂.

Orthetrum albistylum: 1 ♂.



Figure 22. Brook in the surroundings of Pînzăreni (Loc. 21).

Loc. 22: Făgădău, a large lake with sandy shores (Fig. 23).

Date of survey: 19.06.2011

Geographic coordinates: N 47°26'05.8" E 027°48'06.7"

Recorded Odonata species:

Ischnura elegans: 2 tandems

Anax parthenope: 2 ♂♂.

Orthetrum cancellatum: 3 ♂♂.



Fig. 23. Lake near Făgădău (Loc. 22).

Loc. 23: This locality was described in Dyatlova (2010) under sample site 6. Surroundings of Grasenî. Lake. Only two dragonfly species were recorded. Overgrazing and water pollution are probably the reason of limited number of species (Fig. 24).

Date of survey: 19.06.2011

Geographic coordinates: N 47°21'51.7" E 027°51'00.9"

Recorded Odonata species:

Ischnura elegans: 7 ♂♂.

Erythromma viridulum: 1 ♂.

Dyatlova (2010) listed seven Odonata species from the same locality (cf. sample site 6) visited in 2009: *Ischnura elegans*, *I. pumilio*, *Sympecma fusca*, *Lestes sponsa*, *L. macrostigma*, *Sympetrum meridionale*, and *S. striolatum*. However, significant water pollution resulting in a rapid overall degradation of this habitat was observed during the current study.



In June 2011, the pond was found heavily anthropogenic impacted and settled by a degraded Odonata fauna of only two species.

Fig. 24a. Lake in the surroundings of Grasenî (Loc. 23).



Fig. 24b. A habitat of *L. macrostigma* in 2009 (photo taken in 2011) (Loc. 23).



Fig. 24c. Grazing on the shore of the lake (Loc. 23).



Figure 25. Wetlands between Cornești and Pojarna villages (Loc. 24).

Loc. 24: Wetlands between Cornești and Pojarna villages (Fig. 25).

Date of survey: 19.06.2011

Geographic coordinates: N 47°20'53.4" E 028°02'12.1"

Recorded Odonata species:

Coenagrion puella: 3 ♂♂.

Ischnura elegans: 1 copula.

Ischnura pumilio: 1 ♂.

Erythromma viridulum: 2 ♂♂.

Anax imperator: 1 ♂.

Libellula fulva: 1 ♂.

Loc. 25: Surroundings of Plaiul Fagului reserve, near Bahmut

Date of survey: 19.06.2011

Geographic coordinates: N 47°18'12.0" E 028°06'16.6"

Recorded Odonata species:

Odonata could not be investigated because of restricted access to the reserve.

The forest is characterised by beech and oak trees. According to the map, the lakes on the territory of the reserve seem to be promising Odonata habitats.

Discussion

The target of this study was to add Odonata records from an understudied region in Moldova. As time and financial resources were limited, only few new records could be contributed. In this study, "summer" species are largely underrepresented.

In general, the research in June 2011 produced in most cases species which are able to cope with high anthropogenic pressure on the habitats. Species restricted to stable undisturbed habitats were very scarce. The region suffers from agriculture with fodder crops and vegetables as the main harvest. Most of the studied sites were heavily polluted by faeces from livestock and wastewaters. People utilise rivers (for example, Reut River) for irrigation which results in drying out of many temporary wetlands in the flood plain of the river. The situation in the Reut River floodplain is alarming with respect to water quality and habitat availability.

Lestes macrostigma, a species of European concern (Kalkman et al. 2010) was not recorded during field work in 2011 but was registered at several sites in Moldova in 2009 (Dyatlova 2010). Future investigations are important to enlarge knowledge of species distribution and conservations status in Moldova. It can be assumed to rediscover *L. macrostigma* at Loc. 23 in the next years.

Another species of European concern (Kalkman et al. 2010, Boudot & Kalkman 2015), *Gomphus flavipes*, was recorded near the stream close to the mouth at Dnister River. As the species is confined to larger lowland rivers, Dnister River is considered the most likely larval habitat of *G. flavipes*.

At Loc. 5 (Saharna village, on the territory of a monastery situated on a rock) there could probably be some habitats suitable for *Cordulegaster* species. Search for larvae in running waters would probably yield new interesting information.

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