

Dragonflies of Moldova: an updated checklist of the Odonatofauna

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article info

key words

Odonata, dragonflies, Moldova, fauna, checklist.

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article history

Submitted: 20.08.2023. Revised: 12.12.2023. Accepted: 30.12.2023

cite as

Dyatlova, O. 2023. Dragonflies of Moldova: an updated checklist of the Odonatofauna. *GEO&BIO*, 25: 134–140. [In English, with Ukrainian summary]

abstract

The present research compiles all known records of dragonflies in Moldova, including Transnistria (from the beginning of the 20th century until present), based on all known literature and other sources, and also the personal observations of the author in 2005, 2009, and 2011. Brief history of Moldovan odonatology is given with the gap of more than 50 years of odonatological studies in Moldova in the middle of the last century. The analysis shows that the checklist of Odonata in Moldova comprises 37 species. The presence of several species in Moldova needs confirmation. The probable absence of *Nehalennia speciosa* in the territory of Moldova is discussed in the article based on the opinion of other authors and the lack of favourable habitats in the area. The map presented illustrates the areas in Moldova with the lack of data on the presence of dragonflies. This elucidated the understudied regions. Unfortunately, some records from the literature sources are given without any coordinates, so they could not be mapped. This analysis will help in planning further research into dragonflies of Moldova. Moldova still remains poorly studied from an odonatological point of view. Further investigations will undoubtedly fill in the ‘white spots’ on the distribution of species in the territory of Moldova and will help in the development of modern recommendations of habitat protection, underline urgent conservation measures in the country and highlight priority species. We expect that 10 to 20 species of dragonflies remain to be discovered in Moldova. Also, field research in different phenological periods will presumably help to add some new species. The data about dragonflies of Moldova were amended after three field trips of the author in 2005 (the area near Saharna) and in 2009 and 2011 (the route covered the territory of Moldova from south to north). Based on the author’s field research, three species of dragonflies are listed for the first time for the territory of Moldova: *Lestes macrostigma*, *Coenagrion ornatum*, and *Orthetrum brunneum*. For one species, *Coenagrion scitulum*, the exact locations are given for the first time by the author. The presence of the species of European concern in Moldova include *Lestes macrostigma* and *Coenagrion ornatum*, and *Gomphus flavipes* might be considered as well by odonatologists from the neighbouring countries.

Бабки Молдови: оновлений контрольний список одонатофауни

Олена Дятлова

Резюме. У цьому дослідженні зібрано всі відомі дані про бабок Молдови (з початку ХХ ст. до наших днів) на основі усієї відомої літератури та інших джерел, а також особистих спостережень автора у 2005, 2009 та 2011 роках. Подана коротка історія молдавської одонатології з перервою у понад 50 років одонатологічних досліджень у Молдові в середині минулого століття. Контрольний список бабок Молдови та Придністров'я складається з 37 видів. Наявність декількох видів у Молдові потребує підтвердження. У статті обговорюється мала ймовірність існування *Nehalennia speciosa* на території Молдови на основі думки інших авторів та відсутності відповідних біотопів у регіоні. На мапі проілюстровано, для яких територій у Молдові бракує даних щодо присутності там бабок, що дозволило з'ясувати, які регіони потребують подальшої уваги. Нажаль, деякі види згідно з даними літератури наведені без врахування координат, де вони були знайдені, тож ці знахідки на території Молдови не були відображені на мапі. Цей аналіз допоможе у плануванні нових досліджень на території Молдови. Молдова, як і раніше, залишається маловивченою з одонатологічної точки зору. Подальші дослідження, безумовно, заповнять «білі плями» щодо поширення видів на території Молдови і допоможуть у розробці сучасних рекомендацій з охорони місць існування представників одонатофауни у країні, «підкреслять», які природоохоронні заходи в країні є терміновими та допоможуть виділити пріоритетні види. Ми очікуємо, що в Молдові можливо виявити від 10 до 20 видів бабок. Крім того, польові дослідження в різні фенологічні періоди, ймовірно, допоможуть додати деякі нові види. Дані про бабок Молдови були розширені після трьох еспедицій автора у 2005 (територія в околицях Сахарни) та 2009 і 2011 роках (маршрут охоплював територію Молдови з півдня на північ). За результатами польових досліджень автора, три види бабок наводяться вперше для території Молдови: *Lestes macrostigma*, *Coenagrion ornatum* та *Orthetrum brunneum*. Для одного виду, *Coenagrion scitulum*, вперше вказуються території у Молдові, де само зустрічається вид. Важливе значення мають знахідки видів *Lestes macrostigma*, *Coenagrion ornatum* та *Gomphus flavipes*, які охороняються в рамках міжнародних документів. Дані щодо цих знахідок мають бути враховані одонатологами сусідніх з Молдовою країн.

Ключові слова: Odonata, бабки, Молдова, фауна, контрольний список.

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Introduction

The information on the Odonatofauna of Moldova is still very limited despite the latest publications devoted to this subject [Dyatlova 2010; 2018]. This was considered as a serious gap between the state of knowledge of odonate distribution in Western and Eastern Europe [Dyatlova 2015]. Therefore, several consecutive field studies were carried out in different parts of the country: in 2005 and 2009 [Dyatlova 2010], and in 2011 [Dyatlova 2018].

For the purpose of the present research, a thorough review of all published records and personal information was found important as such compilation has the power to elucidate understudied regions, highlight priority species and underline urgent conservation measures. It also acted as incentive for studying the Odonata of Moldova.

The information obtained during the field trips of the author and from all known literature sources was depicted on maps of the Atlas of the European Dragonflies and Damselflies [Boudot & Kalkman 2015]. Together with the data from Ukraine, this gave an impression on the species composition of dragonflies in Eastern Europe.

Brief history of Moldovan odonatology

Brauner [1910] published the first data on the regional Odonata fauna, followed by Artobolevsky [1917] and Bezvali [1932]. These publications contain information only about 19 species. In addition, some of the listed taxa need a critical discussion, and confirmation of their presence in Moldova is required. This applies to *Nehalennia atrinuchalis* Selys, 1876. Bezvali [1932] reported *N. atrinuchalis*

from Leova. De Marmels [1984] synonymised *N. atrinuchalis* with *Paracercion hieroglyphicum* [Brauer 1865] and *P. calamorum* [Ris 1916], which are two species with general distribution from far-east Russia to Japan and south to Indonesia [Wilson 2009].

Bernard and Wildermuth [2005] questioned the validity of Bezvali's [1932] record too referring to two possible scenarios for the confusion: (1) If Bezvali based his identification on the original description of *Nehalennia atrinuchalis* then his specimen should be considered another species, which is also different from *N. speciosa* Charpentier, 1840, however, (2) If Bezvali made a mistake in the species name only then his record should be considered the only *N. speciosa* record for Moldova. Giving that the general distribution of *P. hieroglyphicus* and *P. calamorum* is far from Moldova and that the presence of *N. speciosa* in Moldova has never been confirmed by other researchers, the inclusion of the latter in the species checklist for the country must be validated by further studies.

Also, *Chalcolestes viridis* (Vander Linden, 1825) was mentioned by Andreev [1998] for Talmaz, Dnister River. However, this taxon is probably confused with *Chalcolestes parvidens* (Artobolevsky, 1929), which occurs in the lower Dnister River on the Ukrainian side [Dyatlova 2005; 2006].

After a gap of more than 50 years of odonatological studies in Moldova, A. V. Andreev published the information about the dragonflies of the Dnister River in the Talmaz area [Andreev 1998]. A total of 20 Odonata species were recorded in this area. Andreev [1998] also summarised the status of Moldovan odonatology prior to the 1990s.

Osetsymskiy [2006] investigated invertebrate and vertebrate animals in the territory of the Jagorlyk Reserve located in Transnistria (the self-proclaimed Pridnestrovian Moldavian Republic) between Ukraine and the Dnister River. In his publication, he gives a list of Odonata species recorded in the Jagorlyk Reserve: *Calopteryx splendens* (Harris, 1780), *Platycnemis pennipes* (Pallas, 1771), *Ischnura elegans* (Vander Linden, 1820), *Aeshna juncea* (Linnaeus, 1758) and *Sympetrum vulgatum* (Linnaeus, 1758). We propose that a confirmation of the presence of *A. juncea* in Transnistria is needed, as the species is not very common in neighbouring Ukraine [Gorb *et al.* 2000] and prefers bogs and other standing water with well-developed *Sphagnum* vegetation [Boudot & Kalkman 2015], habitats, which are probably not presented in Transnistria.

There are two other species of Odonata that could be candidates for inclusion in the checklist of dragonflies of Moldova: *Erythromma lindenii* (Selys, 1840) and *Leucorrhinia pectoralis* (Charpentier, 1825). The information on their distribution in Moldova is not published yet and results from personal communications of V. V. Derzhansky and A. V. Andreev to the author. The exact locality for *E. lindenii* was never specified, and therefore could not be mapped.

The same applies to the report and some publications from Moldova. In a report [Anonymous, 2007], two species are indicated for the Talmaz area (lower Dnister area): *Gomphus flavipes* (Charpentier, 1825) and *Coenagrion mercuriale* (Charpentier, 1840). We cannot use these data for mapping since no exact date and locality are indicated and *C. mercuriale* is probably a doubtful species for Moldova according to the species range in Europe [Boudot & Kalkman 2015].

Also, several species are mentioned in another publication for Moldova [Andreev & Derzhansky 2004], such as *Lestes virens* (Charpentier, 1825), *Coenagrion armatum* (Charpentier, 1840), *Coenagrion mercuriale*, *Coenagrion scitulum* (Rambur, 1842), *Brachytron pratense* (Müller, 1764), *Libellula fulva* Müller, 1764, and *Orthetrum coerulescens* (Fabricius, 1798). Unfortunately, these records also could not be used for the mapping as nothing is known about the date and the locality (even approximately) of them.

Finally, the author started her fieldwork on Moldovan Odonata in 2005 and compiled a brief checklist of the species recorded in the beginning of August in the area of the most famous monastery near Saharna and its surroundings. This place is located on the right bank of the Dnister River. This is a picturesque natural place where small rivers flow into the Dnister and form a system of canyons, waterfalls, and small lakes.

This study was followed by field work in 2009, extending the study to additional parts of the country. Summarising the data obtained during the field work in 2005 and 2009, 25 Odonata species were recorded, among them several species were new for the territory of Moldova: *Lestes macrostigma* (Eversmann, 1836), *Coenagrion ornatum* (Selys, 1850), and *Orthetrum brunneum* (Fonscolombe, 1837). For *Coenagrion scitulum* the exact locality and habitats were described for the first time [Dyatlova 2010].

Field work in 2011

On 15–19 June 2011, field work was concentrated on the northern part of Moldova—the most poorly studied area from the odonatological point of view. During the next field work in 2011, 25 sampling sites were investigated, three of them were revisited since the last surveys given [Dyatlova 2010] mentioned as Loc. 5, 15 and 23 in a recent research [Dyatlova 2018] and, respectively Loc. 27, 15 and 6 in the previous publication [Dyatlova 2010].

After this field work in 2011, we confirmed the presence of *Libellula fulva* and *Gomphus flavipes* in Moldova because the previous mentions of the species did not provide information about their habitats.

In Table 1, we summarise all localities where odonates were recorded from the beginning of the 20th century until present. In Table 2, a checklist of Odonata from Moldova is given with references to literature sources in which the records are published (doubtful species are included and discussed). Coordinates of record localities are listed in Table 1.

Table 1. A list of all record localities of Odonata in Moldova known from the literature and by own investigations

Таблиця 1. Список усіх місць знаходження бабок у Молдові, відомих з літературних джерел та власних спостережень автора

Loc.	Locality	Coordinates
1.	Talmaz, Dnister	N 46°39'13.57" E 029°39'59.22"
2.	Jagorlyk Reserve (Transnistria)	N 47°22'15.03" E 029°10'03.02"
3.	Râscăeți, Dnister	N 46°34'49.37" E 029°46'45.53"
4.	Kopanka, Dnister	N 46°40'31.83" E 029°36'20.60"
5.	Chișinău	N 47°01'15.29" E 028°48'54.42"
6.	Căpřiana	N 47°7'3" E 028°30'16"
7.	Leova	N 46°29'06.04" E 028°14'31.48"
8.	Lapushna	N 46°53'36.19" E 028°24'39.37"
9.	Ciutulești	N 47°45'41.00" E 028°23'44.00"
10.	Zagorna	N 47°47'48" E 028°33'10"
11.	Kornesty	N 47°21'22" E 028°00'30"
12.	On the border of the forest and swampy meander, downstream from the village of Chobruchi (Raionul Stefan-Voda)	N 46°35'17.73" E 029°45'24.85"
13.	Surroundings of Glodeni, Point 1	N 47°46'08.4" E 027°20'59.6"
14.	Surroundings of Glodeni, Point 2 (Butești)	N 47°47'45.3" E 027°20'09.1"
15.	Surroundings of Glodeni, Point 3	N 47°37'23.3" E 027°25'19.6"
16.	Surroundings of Glodeni, Point 4	N 47°48'40.0" E 027°21'09.3"
17.	Surroundings of Glodeni; Nature reserve: Pădurea Domnească (cantonul N 8), Point 1	N 47°38'12.1" E 027°22'20.2"
18.	Surroundings of Glodeni; Nature reserve: Pădurea Domnească (cantonul N 8), Point 2	N 47°38'06.7" E 027°22'36.0"
19.	Surroundings of Glodeni; Nature reserve: Pădurea Domnească (cantonul N 8), Point 3	N 47°38'17.4" E 027°22'08.7"
20.	Surroundings of Galashany	N 47°51'58.7" E 027°17'18.7"
21.	Surroundings of Orhei	N 47°13'12.9" E 028°46'21.8"
22.	Kogil'nik river around Chuckuleny	N 46°58'26.0" E 028°28'21.5"
23.	Ganaseni-Nou, surroundings of Leova	N 46°25'15.8" E 028°15'05.9"
24a	Saharna, surroundings of Rezina	N 47°41'52.08" E 28°58'30.52"
24b	Saharna, in the territory of 'rock monastery'	47°41'47.6" N 028°57'30.7" E
25.	Surroundings of Kongaz	N 46°09'12.6" E 028°37'36.4"
26.	Surroundings of Pyrlitsa	N 47°21'49.2" E 027°51'01.9"
27.	Surroundings of Fălești	N 47°30'09.5" E 027°46'41.9"
28.	Pond around Sarata-Galbena	N 46°42'32.0" E 028°30'42.3"
29.	Between Bardar and Kotovsk, Point 1	N 46°51'55.5" E 028°38'37.7"
30.	Between Bardar and Kotovsk, Point 2	N 46°51'52.7" E 028°38'48.8"
31.	Sarata River around Sarata-Galbena	N 46°43'40.3" E 028°30'50.8"
32.	Botna River between Salkutsa and Zaim, surroundings of Căușeni	N 46°36'28.8" E 029°18'52.1"

Loc.	Locality	Coordinates
33a	Between Kornesty and Comești, surroundings of Ungheni, Point 1	N 47°21'23.3" E 028°01'59.8"
33b	Between Kornesty and Comești, surroundings of Ungheni, Point 2	N 47°21'23.3" E 028°01'59.8"
34	Surroundings of Glodeni; Nature reserve: Pădurea Domnească (cantonul N 8), Point 4	N 47°38'07.4" E 027°22'02.6"
35	Surroundings of Ryshkany	N 47°56'46.3" E 027°26'48.2"
36	Surroundings of Glinzheny	N 47°37'40.9" E 027°51'47.4"
37	Cioburci	N 46°35'59.43" E 029°43'18.16"
38a	Țipova village, from Țipova monastery a serpentine path down to the Dnister River	N 47°36'30.4" E 028°59'03.5"
38b	Țipova village, near the Loc. site 38a, open bank of Dnister River	N 47°36'30.4" E 028°59'03.5"
39	Surroundings of Graseni (mentioned as 'Surroundings of Pylritsa' in [Dyatlova 2010])	N 47°21'51.7" E 027°51'00.9"
40a	Surroundings of Hijdieni	N 47°47'55.7" E 027°24'14.6"
40b	Surroundings of Hijdieni	N 47°46'31.4" E 027°28'13.1"
41	Between Cornești and Pojarna	N 47°20'53.4" E 028°02'12.1"
42	The outskirts of Glodeni	N 47°40'46.4" E 027°27'13.6"
43	Surroundings of Biești	N 47°30'50.6" E 028°53'08.2"
44a	Trestieni, Loc. 1	N 48°16'16.5" E 027°06'58.0"
44b	Trestieni, Loc. 2	N 48°16'16.5" E 027°06'58.0"
45a	Surroundings of Terebna, Loc. 1	N 48°01'57.6" E 027°14'19.7"
45a	Surroundings of Terebna, Loc. 2	N 48°01'57.6" E 027°14'19.7"
46	Lalova	N 47°33'54.3" E 029°01'25.8"
47a	Surroundings of Navyrnets	N 47°36'20.4" E 027°33'40.9"
47b	Surroundings of Navyrnets	N 47°36'20.4" E 027°33'40.9"
48	Surroundings of Pînzăreni	N 47°36'39.1" E 027°39'37.0"
49	Făgădău	N 47°26'05.8" E 027°48'06.7"
50	Surroundings of the village of Chetrosica Veche	N 48°06'35.5" E 027°24'05.5"
51	Near Lake Moldovanca	N 47°37'15.1" E 027°36'38.0"
52	Mărcăuți	N 48°18'23.4" E 027°13'20.3"
53	3.5 km NE of Sturzeny	N 47°56'36.6" E 027°28'46.2"
54	Ivanča, Orhei region. Numerous emergence	N 47°17'05" E 028°51'25"

Table 2. A checklist of Odonata from Moldova with references to literature sources in which the records are published (doubtful species are also included)

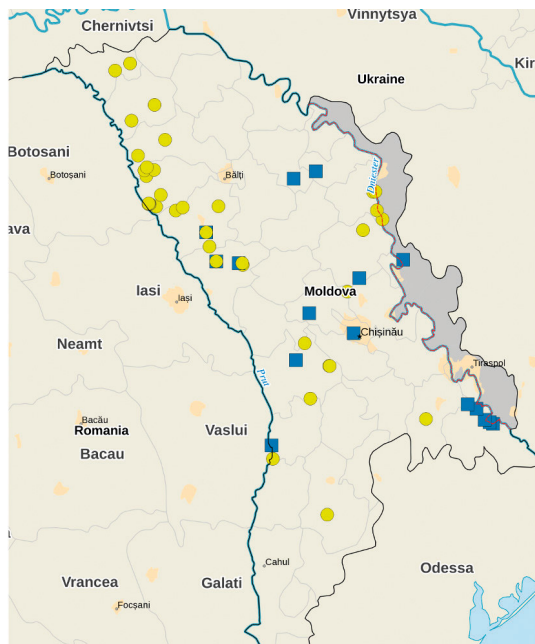
Таблиця 2. Список видів бабок Молдови з посиланнями на літературні та інші джерела, у яких згадується вид (сумнівні види також включено до списку)

No.	Species	References
1	<i>Calopteryx splendens</i> (Harris, 1780)	Andreev 1998: [1]; Osetsymskiy 2006: [2]; Dyatlova 2010: [13], [20], [21], [22], [23], [24a]; Dyatlova 2018: [38a], [38b], [24b]
2	<i>Lestes macrostigma</i> (Eversmann, 1836)	Dyatlova 2010: [25], [26], [27]
3	<i>Lestes barbarus</i> (Fabricius, 1798)	Andreev 1998: [1], [3]; Dyatlova 2010: [17], [24a], [28]
4	<i>Chalcolestes parvidens</i> (Artobolevskij, 1929)	Andreev 1998: [1]
5	<i>Lestes sponsa</i> (Hansemann, 1823)	Bezvali 1932: [5]; Dyatlova 2010: [25], [26]
?	<i>Lestes virens</i> (Charpentier, 1825)	Andreev & Derzhansky 2004: the exact locality is not provided
6	<i>Sympetma fusca</i> (Vander Linden, 1820)	Bezvali 1932: [5], [6], [7]; Dyatlova 2010: [18], [26], [27]
7	<i>Platycnemis pennipes</i> (Pallas, 1771)	Andreev 1998: [1], [3]; Osetsymskiy 2006: [2]; Dyatlova 2010: [13], [14], [19], [20], [21], [22], [23], [24a], [29], [31], [32]; Dyatlova 2018: [38a], [42]
8	<i>Coenagrion puella</i> (Linnaeus, 1758)	Brauner 1910: [9], [10]; Andreev 1998: [1]; Dyatlova 2010: [24a], [30], [33b], [34]; Dyatlova 2018: [41], [40b], [43], [44a], [45a]
9	<i>Coenagrion pulchellum</i> (Vander Linden, 1825)	Brauner 1910: [9]; Dyatlova 2010: [34]; Dyatlova 2018: [43], [46]
10	<i>Coenagrion scitulum</i> (Rambur, 1842)	Andreev & Derzhansky 2004: the exact locality is not provided; Dyatlova 2010: [29], [30]
11	<i>Coenagrion ornatum</i> (Selys, 1850)	Dyatlova 2010: [29], [30], [31]
?	<i>Coenagrion mercuriale</i> (Charpentier, 1840)	Anonymous 2007: [without locus] Andreev & Derzhansky 2004: the exact locality is not provided
?	<i>Coenagrion armatum</i> (Charpentier, 1840)	Andreev & Derzhansky 2004: the exact locality is not provided
12	<i>Enallagma cyathigerum</i> (Charpentier, 1840)	Brauner 1910: [9]; Dyatlova 2010: [30]; Dyatlova 2018: [45b], [47b], [48]
?	<i>Erythromma lindenii</i> (Selys, 1840)	Andreev 1998: <i>Erythromma lindenii</i> was recorded by V.V. Derzhansky (Andreev, 1998): in Moldova but the exact locality is not provided
13	<i>Erythromma viridulum</i> (Charpentier, 1840)	Andreev 1998: [1], [4]; Dyatlova 2010: [15], [24a], [30], [33a], [35]; Dyatlova 2018: [39], [40a], [41]
14	<i>Ischnura elegans</i> (Vander Linden, 1820)	Andreev 1998: [1], [4]; Osetsymskiy 2006: [2]; Dyatlova 2010: [15], [18], [20], [24a], [25], [26], [27], [30], [31], [32], [33a], [34], [35], [36]; Dyatlova 2018: [14], [38a], [38b], [39], [40a], [40b] [41], [42], [43], [44a], [44b], [45a], [45b], [46], [48], [49], [52]
15	<i>Ischnura pumilio</i> (Charpentier, 1825)	Andreev 1998: [1]; Dyatlova 2010: [15], [16], [18], [25], [26], [27], [29], [33a], [36]; Dyatlova 2018: [40b], [41], [44a], [44b], [45a], [45b], [47a], [48], [50], [51], [52]

No.	Species	References
?	<i>Nehalennia</i> sp.	Bezvali 1932: [7]; According to Bernard & Wildermuth [2005] the record of <i>Nehalennia</i> sp. is probably doubtful
17	<i>Gomphus flavipes</i> (Charpentier, 1825)	Anonymous 2007: [without locus]; Dyatlova 2018: [38a]
18	<i>Aeshna affinis</i> Vander Linden, 1820	Brauner 1910: [11], [54]; Andreev 1998: [4]; Dyatlova 2010: [19], [34]
?	<i>Aeshna juncea</i> (Linnaeus, 1758)	Osetsymyskiy 2006: [2]
19	<i>Aeshna isoceles</i> (Müller, 1767)	Brauner 1910: [9], [10]; Dyatlova 2018: [38b], [40a], [43], [50]
20	<i>Aeshna mixta</i> Latreille, 1805	Bezvali 1932: [5]; Andreev 1998: [3], [4]
21	<i>Anax imperator</i> Leach, 1815	Bezvali 1932: [5]; Brauner 1910: [10]; Dyatlova 2010: [13], [30], [30a], [30b], [34]; Dyatlova 2018: [38b], [40a], [41], [43]
22	<i>Anax parthenope</i> (Selys, 1839)	Bezvali 1932: [5]; Dyatlova 2010: [36]; Dyatlova 2018: [38b], [43], [49], [52], [53]
?	<i>Brachytron pratense</i> (Müller, 1764)	Andreev & Derzhansky 2004: the exact locality is not provided
23	<i>Somatochlora flavomaculata</i> (Vander Linden, 1825)	Brauner 1910: [10]
24	<i>Crocothemis erythraea</i> (Brullé, 1832)	Andreev 1998: [1], [4]; Dyatlova 2010: [34]; Dyatlova 2018: [51]
25	<i>Leucorrhinia pectoralis</i> (Charpentier, 1825)	A. V. Andreev, pers. comm (unpublished data): [12]
26	<i>Libellula depressa</i> Linnaeus, 1758	Brauner 1910: [9], [10]; Andreev 1998: [1]; Dyatlova 2010: [29], [30], [36]
27	<i>Libellula fulva</i> Müller, 1764	Andreev & Derzhansky 2004: [without locus]; Dyatlova 2018: [38b], [41], [47a], [51]
28	<i>Libellula quadrimaculata</i> Linnaeus, 1758	Brauner 1910: [10]
29	<i>Orthetrum albistylum</i> (Selys, 1848)	Andreev 1998: [1]; Dyatlova 2010: [15], [20], [24a], [27], [28], [30], [33a], [33b], [34], [35], [36]; (Dyatlova 2018): [38b], [40a], [44b], [45a], [48], [50], [52]
30	<i>Ortetrum brunneum</i> (Fonscolombe, 1837)	Dyatlova 2010: [14], [15], [16], [22], [31], [32]; Dyatlova 2018: [47a], [50], [51]
31	<i>Orthetrum cancellatum</i> (Linnaeus, 1758)	Brauner 1910: [9]; Dyatlova 2010: [17], [27]; Dyatlova: [42], [45a], [49], [50]
?	<i>Orthetrum coerulescens</i> (Fabricius, 1798)	Andreev & Derzhansky 2004: the exact locality is not provided
32	<i>Sympetrum depressiusculum</i> (Selys, 1841)	Bezvali 1932: [5]; Andreev 1998: [1], [3], [4]
33	<i>Sympetrum flaveolum</i> (Linnaeus, 1758)	Bezvali 1932: [6], [8]; Brauner, 1910: [10]; Andreev 1998: [1]
34	<i>Sympetrum meridionale</i> (Selys, 1841)	Bezvali 1932: [6], [8]; Andreev 1998: [1], [3], [4]; Dyatlova 2010: [13], [17], [18], [24a], [26], [27], [28]
35	<i>Sympetrum sanguineum</i> (Müller, 1764)	Artobolevsky 1917: [37]; Andreev 1998: [1]; Dyatlova 2010: [24a], [34]; Dyatlova 2018: [43]
36	<i>Sympetrum vulgatum</i> (Linnaeus, 1758)	Bezvali 1932: [6], [8]; Andreev 1998: [1]; Osetsymyskiy 2006: [2]
37	<i>Sympetrum striolatum</i> (Charpentier, 1840)	Andreev 1998: [1], [3], [4]; Dyatlova 2010: [18], [27].

Discussion

In this study, we summarised all known records on Odonata in Moldova. This analysis allowed us to create a checklist of Odonata in Moldova, including Transnistria, which currently comprises



37 species. Several species known from the literature need a confirmation of their presence in the study area (*Nehalennia* sp., *Erythromma lindenii*, and *Aeshna juncea*).

Data presented on a map (Fig. 1) clearly shows that large parts of the country urgently need to be studied for their Odonata fauna. Not only the representation of study localities is scarce, but also the cover of different phenological periods.

Fig. 1. Record localities of dragonflies in Moldova based on data of different authors [Artobolevsky 1917; Bezvali 1932; Brauner 1910; Andreev 1998; Andreev, pers. comm.; Osetsymyskiy 2006]—marked as ■, and by our own records in 2005 and 2009 [Dyatlova, 2010] and in 2011 [Dyatlova, 2018]—marked as ●.

Рис. 1. Місця знаходження бабок в Молдові за даними різних авторів [Artobolevsky 1917; Bezvali 1932; Brauner 1910; Andreev 1998; A. Andreev, усне повід.; Osetsymyskiy 2006] — позначені як ■ та за власними дослідженнями автора у 2005, 2009 [Dyatlova 2010] та 2011 р. [Dyatlova 2018] — позначені як ●.

Additional investigations could fill the gaps on the map of Moldova, amend the checklist with other species and bring new data on the distribution and abundance of the species of European concern in Moldova and on the state of their habitats (*Lestes macrostigma*, etc).

At Locality No. 24b (Saharna village, in the territory of a monastery situated on a rock), there could probably be some habitats suitable for *Cordulegaster* species. In our research, it lacks in larval records of species in running waters, the best way to prove the presence of cordulegastriid or gomphid taxa. But this should be refined or refuted by new investigations in the territory of Moldova.

In Moldova, a country with an intensive agriculture, many habitats seems to be polluted and exist without considering standards of water quality and management. This could also influence the species composition, which demonstrates a very poor fauna at some habitats.

Acknowledgements

Financial support was obtained from the International Dragonfly Fund. I am very grateful to my husband Vadym for his overall help and assistance of my investigations, Dr Milen Marinov for his incredibly useful corrections of the first versions of the manuscript, and Dr Igor Zagorodniuk who strongly encourages and supports odonatological investigations in Ukraine and Moldova.

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