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Distribution and new findings of newts (*Triturus* and *Lissotriton*) in the Lower Dnipro river area, Ukraine

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Distribution and new findings of newts (*Triturus* and *Lissotriton*) in the Lower Dnipro river area, Ukraine. — N. Suriadna, G. Mykytynets. — New findings of *Triturus dobrogicus* and *Lissotriton vulgaris* are recorded in the Lower Dnipro river area, Kherson region, Ukraine. The species *T. dobrogicus* and *L. vulgaris* were found for the first time in Pravi Solonets village, Oleshkovsky district, Kherson region (46°34'0"N 32°39'29"E) in spring 2017. We clarified the south-eastern range edge of the studied species. The newts were collected during night-time surveys in a riparian gallery forest dominated by *Quercus*, *Ulmus*, and *Fraxinus*. The abundance of newts was low, seven individuals were observed on 20–30 m of route: four specimens of *T. dobrogicus* and one of *L. vulgaris* in March, one specimen of *T. dobrogicus* and one of *L. vulgaris* in May. Collected specimens do not differ in external morphology, size, body shape, and colour pattern from other conspecific populations. The populations are threatened, especially during their migrations. We propose to include these newt species into the Regional Red Data List of Kherson region. We also suggest including the described biotope into the Oleshkivski Pisky National Nature Park for protection and effective conservation of unique amphibian populations in the Lower Dnipro area of the Kherson region, Ukraine.

Key words: *Triturus dobrogicus*, *Lissotriton vulgaris*, biotopes, Lower Dnipro river, Kherson region, Ukraine.

Introduction

Caudate amphibians are relatively rare in southern Ukraine. Three species are known for the continental south of Ukraine: the Danube crested newt *Triturus dobrogicus* (Kiritzescu, 1903), the northern crested newt *Triturus cristatus* (Laurenti, 1768), and the common newt *Lissotriton vulgaris* (Linnaeus, 1758). *T. dobrogicus* was considered one of four varieties of *T. cristatus* for a long time (Mertens, Wermuth, 1960, as cited in Litvinchuk, Borkin, 2002). Today, in the area of the Lower Dnipro river basin in Kherson region, the occurrence of only two species of different genera are confirmed: *T. dobrogicus* and *L. vulgaris* (Litvinchuk, Borkin, 2002, 2005, 2009; Pisanets, 2007, 2012). The southern border of *T. cristatus* range is at Oleksandriia city, Kirovohrad region and Chychyklyia river valley in Mykolaiv region. This species is very rare in Odesa region. Between the Dnipro and Danube rivers, the ranges of the Danube and northern crested newts are separated by dry saline steppes (Litvinchuk, Borkin, 2009). The Danube newt occurs in an intrazonal isolated biotope and also listed as an endemic species in the Red Data Book of Ukraine (2009). The biotope of *L. vulgaris* is also somewhat isolated. We confirmed that this species is present in Khortytsia island, Zaporizhzhia region (Mykytynets, Suriadna, 2017). For both species, the Lower Dnipro river basin area is the southeastern range border thus any new data and records enhance our understanding of the current state of their populations.

Therefore, the aim of the present work was to describe new newt habitats including short historical information to characterize their biotopes, abundance, morphology, and provide recommendations for protection and further regional conservation of these species.

Material and methods

The searches for newts have been numerous since 1990s. Herpetologists actually have been trying to find them in the Lower Dnipro river area since the 1970s. In the present paper, seven specimens were analysed: five *T. dobrogicus* (one female and four males) and two *L. vulgaris* (one female, one male).

In morphological analysis, standard morphological characters were used (Litvinchuk, Borkin, 2009). All measurements were done using a calliper with an accuracy of 0.1 mm. Studied qualitative

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characters include the overall colouring of the upper and lower body surfaces and sexual dimorphism. The biotopes were described following EUNIS classification (Onischenko, 2016), with modifications reflecting their regional specifics.

Fieldwork methods were standard (Pisanets, Suriadna, 2007), with a few notable details. The newts were observed during their seasonal and daily periods of activity during breeding season. The findings are dated to 23 March and 6 May 2017. The night-time surveys were conducted from 9 pm to 12 pm with a lamp. The length of the survey route was 20–30 meters due to the total area of the habitat. The newts were trapped with a dip net. The net had a sturdy metal ring, and the net bag was made from a tough mesh. The reason for this is that newts are sampled in the aquatic vegetation and silt from the bottom of the water reservoir, where the animals can hide. Samples were collected in several scoops of silt, dead and living vegetation from different places of the reservoir's bottom (as much as the net allowed). Then it was shaken off on the bank for careful selection of newts.

The currently known distribution of newts in the Lower Dnipro river basin area of Kherson region is reviewed based on literature data and materials of the Department of Zoology of the National Museum of Natural History, NAS of Ukraine (NMNH–Z).

All of the records from Kherson region, Lower Dnipro area are listed below.

- T. dobrogicus***: 1 — Oleshky city, 46°39'N, 32°45'E, (Litvinchuk, Borkin, 2009); 2 — suburbs of Pravi Solontsi village, Oleshky district, 46°34'0"N, 32°39'29"E (our data); 3 — Kherson city, 46°39'N, 32°36'E (Litvinchuk, Borkin, 2009); 4 — Kherson city, “chetverte selysche”, 46°36'N, 32°33'E (Litvinchuk, Borkin, 2009); 5 — Hola Prystan city, one specimen, collected by T. I. Kotenko, 1975 (NMNH–Z) (Pisanets et al., 2005; Pisanets, 2007; Litvinchuk, Borkin, 2009), 46°32'N, 32°31'E; 7 — Krasna khatka village, 46°35'N, 32°26'E (Litvinchuk, Borkin, 2009) (Fig. 1).
- L. vulgaris***: 2 — suburbs of Pravi Solontsi village, Oleshkovsky district, 46°34'0"N, 32°39'29"E (our data); 5 — Hola Prystan city, 41 specimen, collected by T. I. Kotenko, 01.04.1975 (NMNH–Z), 46°32'N, 32°31'E; 6 — Dniprovske village, Bilozir district, five specimens, collected by S. V. Taraschuk, 20.05.1979 (NMNH–Z), 46°35'16"N 32°27'58"E (Fig. 1).

Results and discussion

As a result of long-term field research we managed to record seven newt specimens: *T. dobrogicus* (n = 5, one female and four males) and *L. vulgaris* (n = 2; one female, one male) in the Lower Dnipro area in suburbs of Pravi Solontsi village, Oleshkovsky district, Kherson region — 46°34'0"N, 32°39'29"E (Fig. 1, point 2). Both newt species inhabited the same biotope and were even present in one sample.

The biotope is a mixed *Quercus–Ulmus–Fraxinus* woodland of great rivers, according to EUNIS classification (Onischenko, 2016). The plant species are mostly mesophilic (G1.22) (Fig. 2), and the typical shrub species belong to *Amorpha fruticosa*, *Rhamnus*, *Sambucus*, and *Tamarix*. The herbs are flood-tolerant, particularly meadow, meadow-marsh and riparian species. Mostly, there are reed and cattail–reed associations with *Phragmites australis*, *Typha angustifolia*, *Carex riparia*, *Carex acutiformis*, *Lemna*, *Ranunculus*, *Iris*, *Alisma plantago-aquatica*, *Mentha aquatica*, *Lythrum salicaria*, *Caltha palustris*, *Gramineae* and other species in stagnant or low-flow water with fallen old trees (which is a typical habitat and wintering site for newts). Tritons were found in shallow water (0.1–0.7 m, maximum 1 m), near a well-used dirt road. Seven specimens were found on a 20–30 m survey route, five specimens in March (four *T. dobrogicus*, one *L. vulgaris*), two in May (one *T. dobrogicus*, one *L. vulgaris*). Both species were not abundant, with *L. vulgaris* being rarer. The temperature of the studied biotope was +7...+17°C in air, +9...+17°C in water. The aquatic pH was 7.5 (neutral), with weakly mineralized water (2.62 ‰, Fig. 2). Coexisting amphibian species included *Bombina bombina*, *Pelobates fuscus*, *Hyla orientalis*, *Rana arvalis*, and *Pelophylax ridibundus*. In addition, in adjoining biotopes, the vulnerable *Pelophylax esculentus* and the rare *Pelophylax lessonae* were found.

The Danube crested newt is easily recognizable by external morphology, especially if compared with *T. cristatus*. Analysing the major specifics of body shape (head rounded, not pointed), skin structure (almost smooth, not granular), colouration (almost no white spots on body sides) (Litvinchuk,

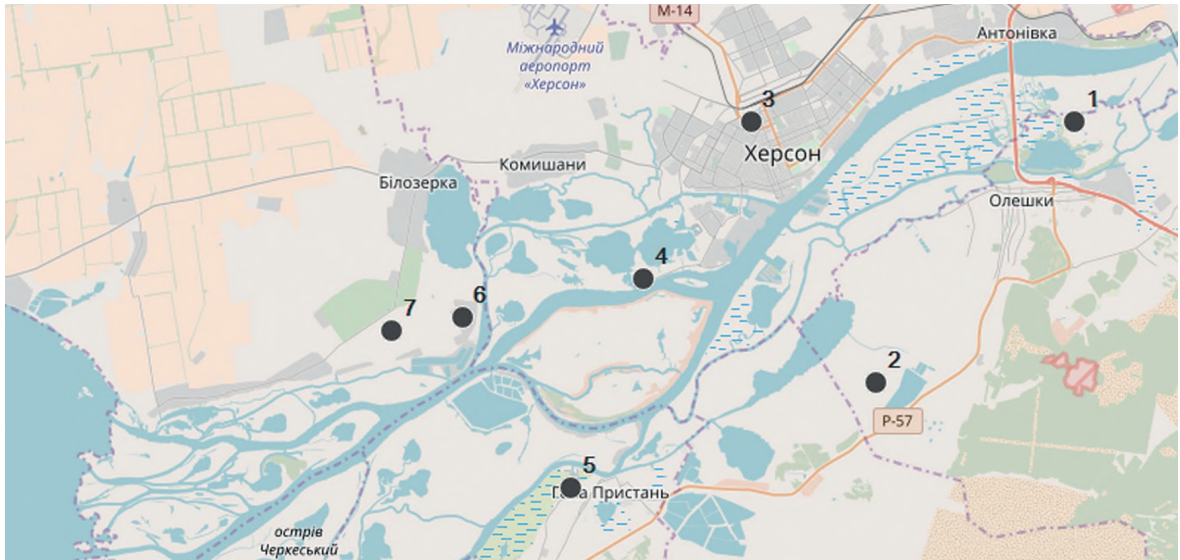


Fig. 1. Distribution of *Triturus dobrogicus* and *Lissotriton vulgaris* in Lower Dnipro river basin area, Kherson region of Ukraine (see the legend in text).

Рис. 1. Поширення тритонів *Triturus dobrogicus* та *Lissotriton vulgaris* в пониззі Дніпра в межах Херсонської області України (позначення в тексті).



Fig. 2. The biotope of *Triturus dobrogicus* and *Lissotriton vulgaris* in the Lower Dnipro river basin area, near Pravi Solontsi village, Oleshkovsky district, Kherson region.

Рис. 2. Біотоп *Triturus dobrogicus* та *Lissotriton vulgaris* в пониззі Дніпра, окол. с. Праві Солонці, Олешківського району, Херсонської області.

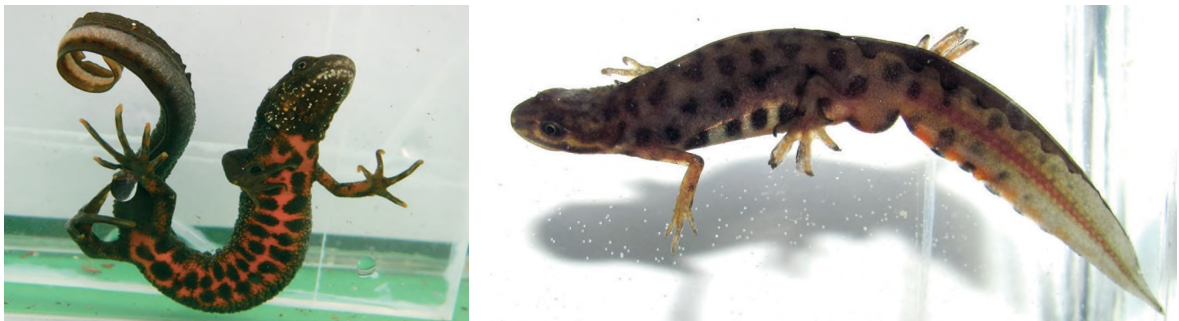


Fig. 3. *Triturus dobrogicus* (a) and *Lissotriton vulgaris* (b) from the Lower Dnipro river basin area, near Pravi Solontsi village, Oleshkovsky district, Kherson region.

Рис. 3. *Triturus dobrogicus* (a) та *Lissotriton vulgaris* (b) в пониззі Дніпра, окол. с. Праві Солонці, Олешківського р-ну, Херсонської обл.

Borkin, 2002, 2009) allowed us identifying *T. dobrogicus* with certainty. The overall colouration of the upper body surface is dark brown with black spots. The lower body surface is yellow-orange to red, with black spots of varying size. The throat is dark, with small white spots (Fig. 3 a). The body length of the examined Danube crested newts varied in the range from 81.2 to 138.0 mm.

Male *L. vulgaris* is grey-brown, while the lower body surface is yellow to orange with dark spots. The female is yellow to light brown, and has no dark spots on the ventral surface (Fig. 3 b). The body length of *L. vulgaris* varies in the range from 56.5 to 65.4 mm. The newts from the Lower Dnipro area are somewhat smaller compared to literature data (Pisanets, 2007; Litvinchuk, Borkin 2009).

The analysis of morphological variability, certain biological specifics such as seasonal and daily activity, reproduction, development and wintering continues.

The newts (large and small) were first recorded in Kherson region (then Kherson Governorate, Russian Empire) by A. A. Brauner (1903). He found the large newt (*Triturus*) even in the vicinities of Kherson city, in 1906 also in reed beds near Kherson city (Brauner, 1906). A. M. Nikolsky described specimens of the genus of large newts from the Kherson Governorate as well (Nikolsky, 1918: 205) without any information on their local habitats.

Lissotriton (small newt), according to A. A. Brauner (1903) was rare. It was recorded in Kherson city and at the upper and middle South Bug river basin (known as Pobuzhzhia). The author did not include the latter finding of *L. vulgaris* in his later work (Brauner, 1906).

Distribution and abundance of caudate amphibians in Lower Dnipro river were reviewed in better detail in (Brauner, 1923). In 11 March 1898, the author found male newts with sexual ornaments near Kherson city, and in September, nearly 70 newts were found in damp soil under a tree. The specimens of *Lissotriton* coexisted with *Triturus* newts but were more common. Representatives of both genera were hard to find despite their abundance. Information on the location of sampling sites in the Lower Dnipro river was not given.

V. I. Taraschuk (1959) in his report on amphibians of Ukraine noted the presence of the common newt in steppe river valleys, but did not describe its biotopes. The same was noted for the Danube crested newt, which, according to the author, was spread along the river valleys in steppe. It is unclear how far to the south they were distributed, and V. I. Taraschuk did not distinguish *T. dobrogicus* from *T. cristatus*.

The current distribution of newts in the studied region is given in detail in works of Ye. M. Pysanets (2007, 2012). The Danube crested newt is elaborated upon in Litvinchuk, Borkin, 2009. The cited papers include maps of distribution and cadastre data.

The Danube crested newt is a steppe species, very dependent on water resources. First findings of this nominative species in the Lower Dnipro river basin are given in works of S. N. Litvinchuk (Litvinchuk, Borkin, 2002; Litvinchuk, 2005). Its range in Ukraine is to a degree discontinuous and is confirmed in a number of not adjoining regions. The species is common in Zakarpattia (Transcarpathia), it can be found in Odesa region, at Kinburn spit in Mykolaiv region. In Kherson region, it is found only in the Lower Dnipro river, in 2007 and 2009 at the latest. It should be reiterated that there is an isolated population of *T. dobrogicus* in the Dnipro estuary (Pisanets, 2007: 79; Litvinchuk, Borkin, 2009: 307).

The only specimen of *T. dobrogicus* in the collection of the Department of Zoology, NMNH NAS of Ukraine (Pysanets et al., 2005) was found by T. I. Kotenko near Hola Prystan city in 1975 (Fig. 1, point 5). S. M. Litvinchuk listed five locations where *T. dobrogicus* was observed. Based on own studies, literature, and reports of colleagues, the author noted the following locations as know habitats of *T. dobrogicus*: “chetverte selysche” in Kherson city, Oleshky city (former Tsurupinsk), Hola Prystan city, and Krasna Khatka village (Litvinchuk, 2008; Litvinchuk, Borkin, 2009) (Fig. 1).

The common newt is widely distributed in Ukraine and is absent in south-eastern Ukraine and Crimea. In the Lower Dnipro river basin, it was found nearly 40 years ago. The collection of the Department of Zoology, NMNH NAS of Ukraine includes 41 smooth newt specimens from Hola

Prystan city (1975) and five specimens from Dniprovske village, Bilozir district, Kherson region (1979) (Fig. 1). These are the only two confirmed record localities of *L. vulgaris* in the studied region.

Thus, the new habitat in the present study is of utmost importance for protection of *T. dobrogicus* and *L. vulgaris* as vulnerable species and on the level of small isolated population.

Today we can confidently postulate that the steppe fauna of amphibians is unique, especially on the level of local populations (Mykytynets, Suriadna, 2017). It has a certain relict, sporadic character with some species having discontinuous ranges and with former refugia that formed in a number of geological and historical events in the south of Ukraine. The isolation of *T. dobrogicus* can be dated to Valday ice age, since nearly 10 000 years ago the Black Sea level was lower than now by 105 m (Varuschenko, 1982, as cited in Litvinchuk, Borkin, 2002), and the lower streams of the Danube, Dniester, Bug, Dnipro and Don rivers together formed one system of estuaries (Litvinchuk, Borkin, 2009). Hence, the specifics of origin and existing local populations reflect the complex speciation of amphibians and their establishment in the Lower Dnipro river basin area. Moreover, the transformation of natural steppe biotopes disturbs the biotic stability, which can cause the extinction of local amphibian populations in the Lower Dnipro river basin. This is especially important because of the decreasing abundance of newts everywhere.

The Danube crested newt is listed in the Red Data Book of Ukraine (2009) as a vulnerable species. It is an endemic of the Central European province of the European region of the Palaearctic realm and an endemic of the Danube and Dnipro estuary systems (Litvinchuk, Borkin, 2002). The common newt is protected by several international treaties as well. Unfortunately, on the regional level these species are not protected, as evidenced by the Red List of Kherson region (Resolution of XXVI session of sixth Kherson Oblast Council, No. 893, 13.11.2013).

Assessing the threat and factors that could or already do negatively affect the newt populations, we recognize that there are presumably both direct and indirect risks, especially for isolated populations. The road near the habitat presents a lot of danger and can cause death both during migration and under other circumstances. The impact could be minimized by warning signs or by cancelling the use of the road, which needs to be resolved locally. Regarding indirect influence, unfortunately, natural biotopes of amphibians in southern Ukraine have been almost destroyed or at least transformed. Regulation and large-scale hydro-construction on the Dnipro river completely changed its hydrological parameters and strongly impacted the biodiversity in general. This has led to the establishment of pseudo-natural ecosystems, which still function. Fragmented and discontinuous species ranges formed, and qualitative and quantitative population indicators changed. In addition, sewage pollution of the Dnipro river and its tributaries can negatively affect the local biota through changing hydrochemical parameters.

Given the vulnerability of the studied species, first, the Red List of the Kherson region should be expanded, adding newts together with their habitats. It should be noted that near Pravi Solontsi village there is Oleshkivski Pisky National Nature Park (Burkutynska arena). For effective protection, we consider necessary to expand the territory of this nature park establishing a conservation regime in the amphibian habitat, with land ownership transferred to the park. At the same time, the national park should conduct the appropriate security measures and constant monitoring work.

It should also be emphasized that, when describing any new findings of rare endangered species, it is necessary to adhere to an administrative principle since all effective, scientifically based measures of protection can be developed and implemented at this very level.

Conclusions

A new habitat of *T. dobrogicus* and *L. vulgaris* in the Lower Dnipro river was found near Pravi Solontsi village, Oleshkivsky District, Kherson region — 46°34'0"N 32°39'29"E (spring 2017). The south-eastern range border of the investigated newt species was clarified and expanded. Newts were found during night-time surveys. The biotope is a flooded gallery forest with domination of *Quercus*,

Ulmus, and *Fraxinus*. The reservoir is shallow with standing, sluggishly running water. The newt abundance is low, especially of *L. vulgaris*. Seven newt specimens were found at a survey route of 20–30 m: five in March (four *T. dobrogicus*, one *L. vulgaris*), two in May (one *T. dobrogicus*, one *L. vulgaris*). No specifics of external morphological features, size, body shape, pattern, and colour were found in the specimens. The body length of *T. dobrogicus* varies from 81.2 to 138.0 mm, while the length of *L. vulgaris* is between 56.5 and 65.4 mm, which is smaller compared to values for other areas of their range.

The population is threatened, especially during migrations. Special protection measures are required, especially since the Danube crested newt is listed in the Red Data Book of Ukraine (2009) and the common newt is protected by a number of international treaties. It is proposed to add them to the regional Red List of Kherson region. It is also suggested that the territory of Oleshkivsky Piski National Nature Park should be expanded, creating a protected area in accordance with functional zoning, for the effective conservation and protection of unique Lower Dnipro populations of amphibians.

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