

D.M. IAKUSHENKO¹, O.O. ORLOV²

¹University of Zielona Góra, Department of Biological Sciences
Z. Szafrana 1, Zielona Góra, 65-516, Poland
d.iakushenko@wnb.uz.zgora.pl

²G.M. Vysotsky Polisskiy Branch of URIFFM
Neskorenkyh str., 2, Dovzhyk village, Zhytomyr District, Zhytomyr Region, 10004, Ukraine
orlov.botany@gmail.com

NEW RECORDS OF *UTRICULARIA AUSTRALIS* (*LENTIBULARIACEAE*) IN UKRAINE

Iakushenko D.M., Orlov O.O. New records of *Utricularia australis* (*Lentibulariaceae*) in Ukraine. – Ukr. Bot. J. – 2015. – 72(5): 468–473.

The data about the first findings of *Utricularia australis* in Ukrainian Polissia (Zhytomyr Region) are given. Ecological and coenotic patterns of this species for the new locations are presented. Species localities were represented by small artificial reservoirs in clay, peat and granite quarries, as well as ponds. It was revealed that *Utricularia australis* grew in four floristic associations: *Utricularietum australis* Müller et Görs 1960, *Nitelletum mucronatae* Corillion et Guerlesquin 1972, *Equiseteto fluviatilis-Caricetum rostratae* Zumpfe 1929, *Equisetetum fluviatilis* Nowiński 1930. For the first time in Ukraine, the association *Utricularietum australis* is reported and its characteristic is given.

Key words: *Utricularia australis*, aquatic vegetation, flora, Ukraine

Introduction

Utricularia australis R.Br. is a perennial free-floating submerged carnivorous aquatic plant species. In Europe the species occurs in temperate, boreal and mediterranean regions (Uotila, 2013). *U. australis* is listed in the Red Data Book of Ukraine (Chervona knyga..., 2009) as a vulnerable species. In Ukraine the species is known since 1997 from Transcarpathia (Prots', 2009); it was also registered in the Cis-Carpathian area in 2006 (Danylyk et al., 2007). A former locality in Dubliany, near Lviv (after Knapp, as *U. neglecta* Lehm.) listed in the «Flora of the Ukrainian SSR» (Visiulina, 1961) has not been recently confirmed.

Despite collections of *U. australis* made by W. Żukowski in eastern Poland, in Polesie Lubelskie (Żukowski, 1974), this species has never been reported in botanical literature for the neighboring area of Ukrainian Polissia.

During the study of the flora and vegetation in Zhytomyr Region (northern Ukraine – Ukrainian Polissia), the authors discovered several new localities of *U. australis*. These new points significantly extend the knowledge about the species distribution in Ukraine. The aim of the paper is to inform about these new records and to describe briefly the ecological-coenotic patterns of this species in the studied area.

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Methods

Field works were conducted in 2012 and 2014. Identification of *U. australis* was carried out according to the identification keys of W. Żukowski (1970), P. Taylor (1972) and Š. Husák (2000). Plant communities were studied according to J. Braun-Blanquet approach (Westhoff & van der Maarel, 1973), phytosociological relevés were stored using TURBOVEG software (Hennekens & Schaminée, 2001). Phytosociological nomenclature was given after K. Šumberová (2011), K. Šumberová et al. (2011) and D. Iakushenko & O. Borysova (2012). The Ellenberg indicator values were calculated using JUICE 7.0 software (Tichý, 2002).

Results

In July 2012, a small population of *U. australis* was found by D. Iakushenko in the southern vicinities of Korostyshiv town. In July-August 2014, four new localities of the species were observed in Ukrainian Polissia by O. Orlov.

The list of the localities is given below (Fig. 1):

1. Zhytomyr Region, Korostyshiv District, S vicinities of Korostyshiv town, Kyrychanka (N 50°17'44.95" E 29°03'36.67"); pond; 19.07.2012; D. Iakushenko;
2. Zhytomyr Region, Zhytomyr District, 0.5 km N Barashivka village (N 50°28'58.70" E 28°54'25.87"); clay quarry; 06.07.2014, 25.08.2014; O. Orlov (Fig. 2);

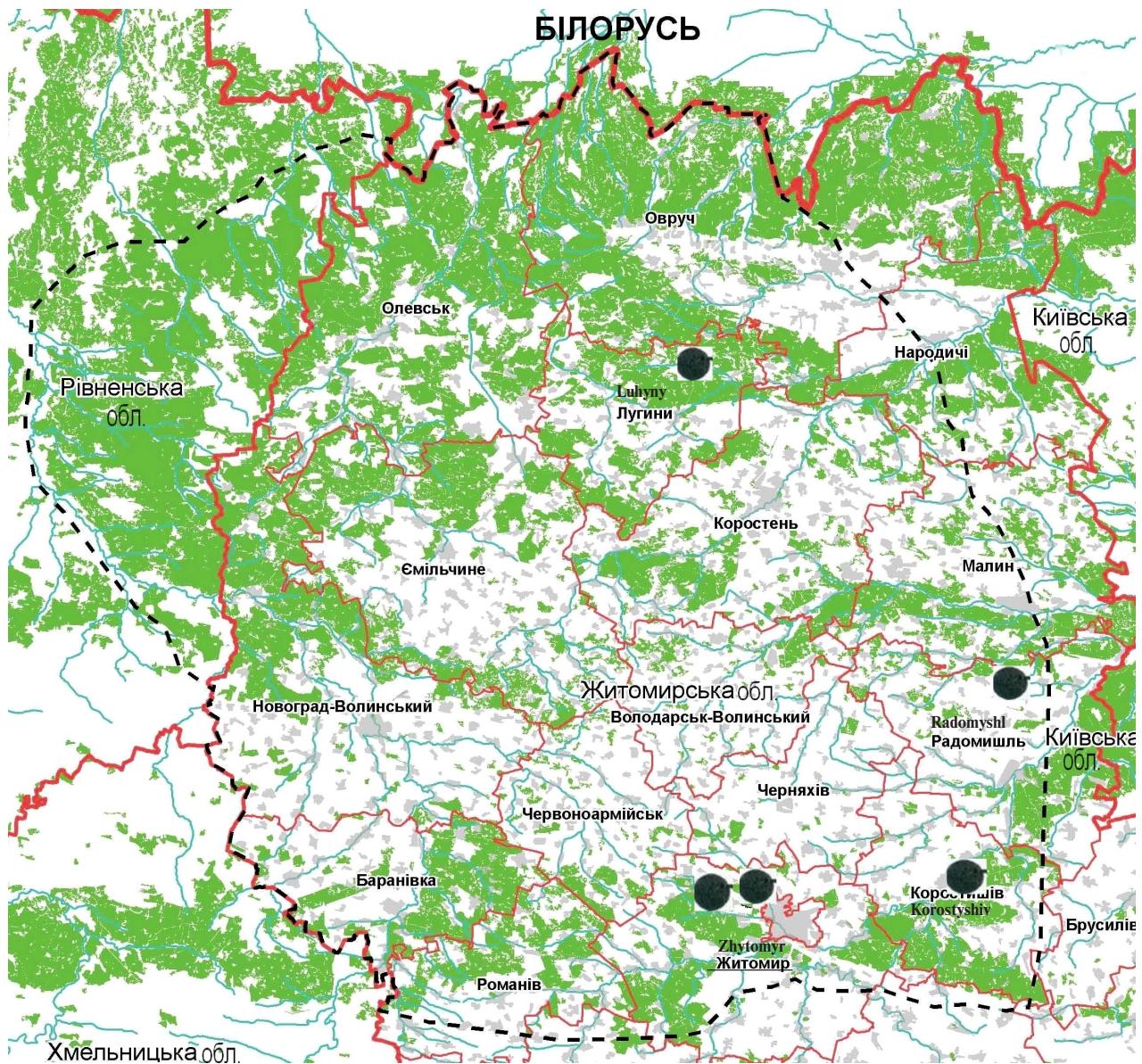


Fig. 1. Localities of *Utricularia australis* in Ukrainian Polissia (dotted line restricts Zhytomyr Polissia, the central part of the Region)



Fig. 2. *Utricularia australis* in a clay quarry near Barashivka village

3. Zhytomyr Region, W vicinities of Zhytomyr city, Bohunia ($N50^{\circ}29'03.53''$ E $28^{\circ}60'66.81''$); ephemeral water body near granite quarry; 27.07.2014; O. Orlov;
4. Zhytomyr Region, Luhyny District, Lypnyky village ($N 51^{\circ}18'34.69''$ E $28^{\circ}44'63.63''$); pond; 05.08.2014; O. Orlov;
5. Zhytomyr Region, Radomyshl District, 2 km SW Fedorivka village ($N 50^{\circ}41'45.73''$ E $29^{\circ}22'26.08''$); peat pit; 16.08.2014; O. Orlov.

Scarce phytosociological material regarding *U. australis* from Ukraine was published so far. Only 3 relevés were published from Transcarpathia (vicinities of Dyida settlement, Berehovo District) (Drescher, Prots', Mountford, 2003): 2 relevés belong to the association *Stratiotetum aloidis* Miljan 1933 and one relevé was made in community of *Butometum umbellati* Philippi 1973. In the area of National Nature Park «Hutsulshchyna» (Ivano-Frankivsk Region) *U. australis* was noted in one locality as synusia in communities of *Phragmitetum communis* Savič 1926 and *Typhetum angustifoliae* Pignatti 1953 (Danyluk et al., 2007; Iakushenko et al., 2011): P. 275, Table 9.15, relevés 1–2 made by L. Borsukevych. In the Red Data Book of Ukraine it is mentioned that this species forms the community *Lemno-Utricularietum australis* and also occurs in some other associations of *Lemnetea* class (Prots', 2009).

In the study region, *U. australis* forms free-floating pleustonic communities typical for aquatic bladderworts; however, it also occurs as a synusial aggregation in the complex of the littoral vegetation. Four associations were distinguished according to our data (Table).

Utricularietum australis Müller et Görs 1960 is a focal community in the study (Table, rel. 1–8). These plant communities were observed in shallow water bodies on depths from 0.15 to 0.90 m, with sandy, peat, or clay bottom covered by muddy sediments. The cover of *U. australis* changed from 30 to 80 %. The total cover varied from 50–60 % to 95–100 %, and the cover of natant layer – from 15 to 50 %. The number of species among coenoses differed significantly – from 1 (i.e. monodominant patches) to 10–12 vascular plant species per relevé. The second constant species was *Lemna minor* L.; other pleustonic species (*Hydrocharis morsus-ranae* L. and *Lemna trisulca* L.) were less frequent.

According to published phytosociological materials (Dubyna, 2006; Solomakha, 2008), this association has not yet been reported in Ukraine. Thus, association

characteristic was done in the form acceptable for the *Prodromus of Vegetation of Ukraine*.

Syntaxonomical position:

Lemnetea O. de Bolòs et Masclans 1955

Lemnetalia minoris O. de Bolòs et Masclans 1955

Utricularion vulgaris Passarge 1964

Association *Utricularietum australis* Müller et Görs 1960

Synonyms: *Lemno-Utricularietum neglectae* (Müller et Görs 1960) Passarge 1978, *Potamo-Utricularietum australis* (Müller et Görs 1960) Passarge 1996, *Utricularietum neglectae* Müller et Görs 1960.

Diagnostic species: *Utricularia australis* (opt., dom.)

Habitats: mesotrophic and eutrophic standing or slow-flowing, from slightly acid to neutral waters (shallow water bodies: small ponds, forest pools, open pits, etc.) with different types of bottom sediments.

Ecological requirements:

Mean of Ellenberg indication values (based on rel. 2–5, 7–8, Table): reaction – 6.59 ± 0.68 ; light – 7.01 ± 0.21 ; continentality – 3.85 ± 0.48 ; nutrients – 6.08 ± 0.54 ; moisture – 10.41 ± 0.67 ; temperature – 5.52 ± 0.22 .

Distribution in Ukraine: Zhytomyr Region. Patches of *U. australis* are also recorded for Transcarpathian and Ivano-Frankivsk Regions.

General distribution: Austria (Schratt, 1993), Czech Republic (Šumberová, 2011), Denmark (Lawesson, 2004), France (Felzines, 2012), Germany (Pott, 1995), Italy (Lastrucci et al., 2014), Lithuania (Sinkevičienė, 2013), Poland (Spałek, 2006), Portugal (Costa et al., 2012), Slovakia (Hrvnák, 2002), Spain (Rivas-Martínez et al., 2001). The association was described from SW Germany (Müller & Görs, 1960).

Protected status: The diagnostic species (*U. australis*) is listed in the *Red Data Book of Ukraine* (Prots', 2009). The association should be protected on the national level and listed in the new edition of the *Green Data Book of Ukraine*.

Besides pleustonic communities, the patches with domination of *U. australis* in the region were found in coenoses of the associations *Nitelletum mucronatae* Corillion et Guerlesquin 1972 (Table, rel. 9), *Equisetum fluviatile-Caricetum rostratae* Zumpfe 1929 (syn. *Carietum rostratae* Rübel 1912) (Table, rel. 10), and *Equisetum fluviatile* Nowiński 1930 (Table, rel. 11).

A phytosociological survey of *U. australis* in Ukraine should be a purpose of further study.

Phytosociological characteristic of *Utricularia australis* in the studied localities

Relevé number	1	2	3	4	5	6	7	8	Frequency, rel. 1-8, %	9	10	11
Locality (according to numbers listed in the text)	4	1	3	3	3	5	3	3		2	4	4
Relevé area, m ²	12	4	4	6	4	10	4	4		4	20	25
Number of species	1	8	8	12	10	8	7	6		15	10	7
Depth, m	0.9	0.5	0.3	0.2	0.2	0.9	0.2	0.2		0.4	0.8	0.7
Total cover, %	50	95	85	90	95	90	60	100		100	95	85
Syntaxon number							1			2	3	4
D.s. Ass. Utricularietum australis												
<i>Utricularia australis</i>	5	5	3	3	4	5	4	4		100	5	5
D.s. Ass. Nitelletum mucronatae												
<i>Nitella mucronata</i>	.	.	.	.	.	.	.	.	5	.	.	.
D.s. Ass. Equiseteto fluvialis-Caricetum rostratae												
<i>Carex rostrata</i>	.	.	.	.	.	.	.	.		.	4	.
D.s. Ass. Equisetetum fluvialis												
<i>Equisetum limosum</i>	.	.	.	.	.	.	.	.		.	.	4
D.s. Cl. Lemnetea												
<i>Lemna minor</i>	.	1	+	1	1	1	.	2	75	1	.	.
<i>Hydrocharis morsus-ranae</i>	.	2	.	1	.	+	2	2	63	1	.	.
<i>Lemna trisulca</i>	.	1	2	2	2	.	.	.	50	.	.	.
<i>Lemna gibba</i>	.	.	.	.	+	.	.	.	13	.	.	.
<i>Spirodella polyrhiza</i>	.	.	.	.	.	+	.	.	13	.	.	.
D.s. Cl. Potametea												
<i>Elodea canadensis</i>	.	1	1	.	1	1	.	.	50	1	.	.
<i>Batrachium circinatum</i>	.	.	.	.	2	.	1	.	25	2	.	.
<i>Potamogeton natans</i>	.	.	.	1	2	.	.	.	25	.	.	.
D.s. Cl. Charetea												
<i>Chara globularis</i>	.	.	1	2	.	1	.	.	38	.	.	.
D.s. Cl. Phragmito-Magno-Caricetea												
<i>Alisma plantago-aquatica</i>	.	.	1	1	1	.	.	.	38	2	+	.
<i>Eleocharis palustris</i>	.	.	1	.	.	.	2	.	25	.	.	.
<i>Rumex hydrolapathum</i>	.	1	.	+	.	.	.	.	25	.	.	.
<i>Carex acutiformis</i>	.	+	.	.	.	.	.	1	25	+	.	+
<i>Glyceria fluitans</i>	.	.	.	1	.	.	.	2	25	.	1	+
<i>Lythrum salicaria</i>	.	.	.	1	.	.	.	.	13	.	+	+
<i>Typha latifolia</i>	.	.	.	.	.	1	.	.	.	.	.	1
<i>Lycopus europaeus</i>	.	.	.	.	.	.	.	.	.	+	+	.
Other species:												
<i>Juncus conglomeratus</i>	.	.	.	.	.	.	1	.	13	.	+	.
<i>Ranunculus flammula</i>	.	.	.	.	.	.	.	1	13	+	.	.

Notes. Species noted in one relevé only: rel. 2 – *Sparganium emersum* (+); rel. 3 – *Potamogeton gramineus* (2); rel. 4 – *Epilobium hirsutum* (1), *Lysimachia vulgaris* (1); rel. 5 – *Juncus articulatus* (2), *Myriophyllum spicatum* (1); rel. 6 – *Typha angustifolia* (2); rel. 7 – *Phragmites australis* (2), *Rorippa amphibia* (1); rel. 9 – *Bidens cernua* (1), *B. frondosa* (1), *Callitrichia stagnalis* (1), *Glyceria plicata* (2), *Potamogeton trichoides* (1); rel. 10 – *Naumburgia thyrsiflora* (1), *Poa palustris* (+), *Potamogeton berchtoldii* (1); rel. 11 – *Hottonia palustris* (1).

Syntaxon numbers: 1 – *Utricularietum australis* Müller et Görs 1960, 2 – *Nitelletum mucronatae* Corillion et Guerlesquin 1972, 3 – *Equiseteto fluvialis-Caricetum rostratae* Zumpfe 1929, 4 – *Equisetetum fluvialis* Nowiński 1930.

Conclusion

Five new localities of the protected aquatic carnivorous plant species, *Utricularia australis*, were reported for Zhytomyr Region. For the first time in Ukraine, the association of *Utricularietum australis* was characterized based on phytosociological relevés. The authors believe that *U. australis* belongs to so called “neglected” species of the Ukrainian flora (its synonymous name, *U. neglecta*, seems to be remarkably appropriate). Undoubtedly, this species is rare but more widely distributed in Ukraine than it was estimated earlier. It is supposed that new records of *U. australis* will be found on the whole territory of Ukraine as there are no climatic, ecological and coenotic limitations for this species in the country. More accurate floristic research in Ukraine is still needed.

Samples of *U. australis* have been transferred to the National Herbarium (*KW*) of the M.G. Kholodny Institute of Botany, NAS of Ukraine.

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- ¹Зеленогурський університет, факультет біологічних наук
вул. З. Шафрана, 1, м. Зелена Гура, 65-516, Польща
d.iakushenko@wnb.uz.zgora.pl
- ²Поліський філіал УкрНДІЛГА імені Г.М. Висоцького вул. Нескорених, 2, с. Довжик, Житомирський р-н, Житомирська обл., 10004, Україна
polysskiy_branch@ukr.net
- У статті наводяться відомості про перші знахідки *Utricularia australis* на Українському Поліссі (Житомирська область). Подано екологічну та ценотичну характеристики виду в нових місцезнаходженнях. Локалітети *U. australis* представлені невеликими штучними водоймами в глиняних, торфових і гранітних кар'єрах, а також ставками. Виявлено, що *Utricularia australis* зростає в чотирох флористичних асоціаціях: *Utricularietum australis* Müller et Görs 1960, *Nitelletum mucronatae* Corillion et Guerlesquin 1972, *Equiseteto fluvialis-Caricetum rostratae* Zumpfe 1929, *Equisetetum fluvialis* Nowiński 1930. Уперше для території України вказано асоціацію *Utricularietum australis* і наведено її характеристику.
- Ключові слова:** *Utricularia australis*, водна рослинність, флора, Україна.
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- ¹Зеленогурский университет, факультет биологических наук
ул. З. Шафрана, 1, г. Зелёна Гура, 65-516, Польша
d.iakushenko@wnb.uz.zgora.pl
- ²Полесский филиал УкрНИИЛХА имени Г.Н. Высоцкого
ул. Нескоренных, 2, с. Довжик, Житомирский р-н, Житомирская обл., 10004, Украина
polysskiy_branch@ukr.net
- В статье приводятся данные о первых находках *Utricularia australis* в Украинском Полесье (Житомирская область), экологическая и ценотическая характеристики вида в новых местонахождениях. Локалитеты *U. australis* представлены небольшими искусственными водоемами в глиняных, торфяных и гранитных карьерах, а также прудами. Выявлено, что *Utricularia australis* произрастает в четырех флористических ассоциациях: *Utricularietum australis* Müller et Görs 1960, *Nitelletum mucronatae* Corillion et Guerlesquin 1972, *Equiseteto fluvialis-Caricetum rostratae* Zumpfe 1929, *Equisetetum fluvialis* Nowiński 1930. Впервые для территории Украины указана ассоциация *Utricularietum australis* и приведена её характеристика.
- Ключевые слова:** *Utricularia australis*, водная растительность, флора, Украина.