

## UTRICULARIETUM AUSTRALIS TH. MÜLLER ET GÖRS 1960 IN POLAND

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### ABSTRACT

The paper presents the distribution, floristic composition and ecological requirements of the pleustonic plant community *Utricularietum australis* Th. Müller et Görs 1960 in Poland. The association was classified to the *Lemnetea minoris* class. *Utricularietum australis* is considered to be a rare and endangered plant community in Europe.

**KEY WORDS:** *Utricularietum australis*, *Lemnetea minoris* class, distribution, phytosociology, Poland, endangered association.

### INTRODUCTION

*Utricularietum australis* Th. Müller et Görs 1960 was first recognized in Baden-Württemberg in Germany in miry holes and peat extraction pits (Müller and Görs 1960). Subsequently, it has been found in other regions of Germany (Hilbig 1971; Dierschke and Tüxen 1975; Müller 1977; Franke 1986; Vahle and Preising 1990; Passarge 1996; Doll 1991; Wittig and Esser 1991; Pott 1995; Wageringel and Remy 1997; Hofmann 2001) and in Austria (Schratt 1993). Patches with domination of *Utricularia australis* have been reported also from Hungary (Kárpáti 1963) and the Danube valley in Slovakia (Ot'ahel'ová 1980). This community occurs in shallow (50-150 cm), oligotrophic or mesotrophic aciduous (pH 5.0-6.0) ponds in peatbogs, ponds formed after peat extraction, fishponds, peaty ditches (Hilbig 1971; Dierschke and Tüxen 1975; Müller 1977; Franke 1986; Vahle and Preising 1990; Passarge 1996; Doll 1991; Schratt 1993; Pott 1995; Wageringel and Remy 1997; Hofmann 2001). In Hungary and Slovakia *Utricularietum australis* has been reported from mesotrophic standing waters (Kárpáti 1963; Ot'ahel'ová 1980). The characteristic and dominant species of *Utricularietum australis* is *Utricularia australis*. The differential species for this association are *Potamogeton natans* (Müller and Görs 1960; Hofmann 2001) and *Sphagnum denticulatum*, *Lemna minor*, *Myriophyllum verticillatum* (Hofmann 2001). This association is considered to be poor in species and consists of about 3-9 taxa on an average (Müller and Görs 1960; Müller 1977; Hofmann 2001). Species as *Potamogeton natans*, *Spirodesma polyrhiza*, *Lemna trisulca*, *Lemna minor*, *Ricciocarpos*

*natans*, *Riccia fluitans* and *Potamogeton pusillus* (Müller and Görs 1960; Hilbig 1971; Müller 1977; Hofmann 2001) attain a higher constancy index. Until present only two sub-communities of this association: with *Potamogeton pusillus* and *Lemna trisulca* (Müller 1977) have been described.

*Utricularia australis* was observed in scattered positions all over Poland (Zajac and Zajac 2001). The greatest numbers of it were recorded in Lower and upper Silesia and on Western Pomerania (Żukowski 1974). Most positions of this species come from the turn of 19th and 20th centuries (Żukowski 1974), therefore most of them have to be considered as historical. After 1945 it was observed considerably less frequently. In most of the given positions it is present individually in shallow lentic waters, or in very slowly flowing waters (e.g. Wołek 1971; Sendek 1984; Żukowski et al. 1995; Nowak et al. 2000). This species was observed in *Nupharo-Nymphaetum* (Żukowski 1974) and in *Lemno minoris salvinietum natantis* (Tomaszewicz 1979). In Poland until now *Utricularietum australis* were observed in the area around Staszów in the region of the Małopolska Upland (Ochyra 1985). One relevé provided by Krzywański (1974) presenting an old river bed of the middle Warta river in Lemno-*Utricularietum* chart, without any doubt represents also this association. Around Staszów *Utricularietum australis* was formed in former turf pits and on transition peat-bogs in Pociieszka and Czajków in shallow waters (30-40 cm) with pH 5.5-6 (Ochyra 1985).

*Utricularietum australis* belongs to the class *Lemnetea minoris*, which includes primitive pleustonic communities, which form aggregations on surface of standing or slowly

running waters, mainly in eutrophic and mesotrophic, more rarely – dystrophic water reservoirs. These communities often form a complex with higher organised phytocenoses of aquatic plants from the class Potametea (e.g. Oberdorfer 1977; Schwabe-Braun and Tüxen 1981; Landolt 1982; Wołek 1991, 1997; Pott 1995; Schubert et al. 1995; Matuszkiewicz 2005). This pleustonic plant community is recognized as endangered on both regional and Central European scale (Schratt 1993; Pott 1995; Rennwald 2000).

This paper describes the *Utricularietum australis* community. The phytosociological table is given and floristic composition and ecological requirements of that community are discussed.

#### METHODS

The fieldwork was conducted during vegetation seasons 1999 and 2001. The *Utricularietum australis* community was studied following the Zurich-Montpellier School of Phytosociology (Braun-Blanquet 1964). Phytosociological nomenclature and syntaxonomical attachment are based on Oberdorfer (1994) and Pott (1995). Vascular plant species names are given according to Mirek et al. (2002), and bryophytes to Frahm and Frey (1992). Hydrogen ion concentration was measured with Elmetron pH microcomputer CP-315.

#### RESULTS

During geobotanical investigations carried out in southwestern Poland two new localities of *Utricularietum australis* were discovered. These localities are situated in the Nature Reserve “Jeleniak-Mikuliny” near Lubliniec, and a fishpond in village Lasowice Małe near Kluczbork in Silesia (Fig. 1). The total coverage of the community in 2001 was up to 0.2 ha in the Nature Reserve “Jeleniak-Mikuliny”, and 0.1 ha near Lasowice Małe. *Utricularietum australis* develops in insolated sites, screened from the wind by bushes or rushes, in water of depth 20-50 cm and pH 6.2 to

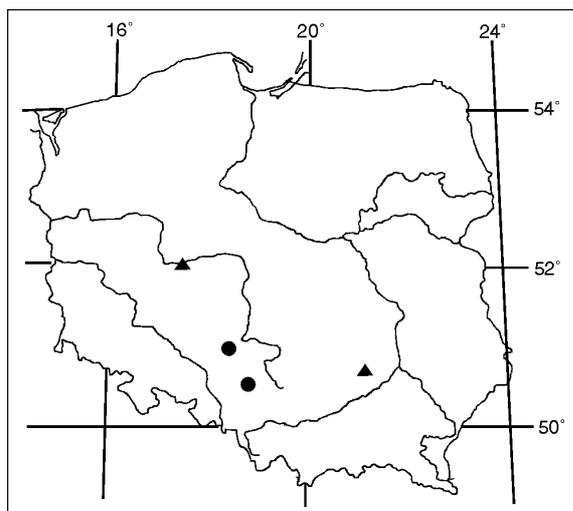


Fig. 1. Localities of *Utricularietum australis* in Poland. ● – new locality, ▲ – locality from the literature.

6.7. In this community *Utricularia australis* predominates (Table 1). There also occur, but with lower participation, e.g. *Potamogeton natans* and *Lemna trisulca*. Considering occurrences of the latter species, patches of this community should be assigned to the sub-community with *Lemna trisulca* (Müller 1977). *Utricularietum australis* built a micro-mosaic complex with *Potametum natantis* and *Phragmitetum australis* associations along southern edges of the ponds. However, the newly discovered localities are characterised by higher species-richness index in comparison with communities described until present. Opposite to the earlier described patches of this association, in Poland in this community a well-developed bryophyte layer can be distinguished, with species from the genus *Sphagnum* sp. Usually they are *Sphagnum fallax* and *Sphagnum denticulatum* (Table 1). The average species number in the relevés equals 6. The overall number of species observed in examined *Utricularietum australis* segments on newly discovered positions in southwestern Poland is 13, and is close to the number of the species of this group in analogical turf waters in northwestern Germany where the total of 11 species were observed (Hofmann 2001). In phytocoenosis of this group present in Silesia, as distinguished from its segments from Staszów area (Ochyra 1985) and in Germany (Müller and Görs 1960; Hilbig 1971; Müller 1977; Hofmann 2001), *Lemna minor* was not represented significantly. Similarly as in earlier described phytocoenosis described from Germany (Müller and Görs 1960; Hilbig 1971; Müller 1977; Hofmann 2001) and from Poland (Krzywański 1974; Ochyra 1985), the structure of *Utricularietum australis* segments in southwestern Poland is characterized by a definite two-layer structure. *Utricularia australis* with smaller quantity of *Lemna trisulca*, *Sphagnum fallax* and *Sphagnum denticulatum* dominates in the underwater layer. Layer above the waterline is formed by *Potamogeton natans* with some quantity of *Lemna minor* and *Alisma plantago-aquatica*.

Stands of *Utricularietum australis* in Poland should be covered with species protection. One of them, in the reserve “Jeleniak-Mikuliny” is already covered with protection. The pond in Laskowice Małe is also planned to be protected by law as a nature reserve. At present it is covered with protection as the area of ecological use in the local conservation strategy of the Kluczbork commune.

A complete phytosociological and habitat characteristic as well as the present distribution of *Utricularietum australis* in Poland should be a subject of further botanical investigations.

#### SYSTEMATICAL POSITION OF THE COMMUNITY

Class: Lemneta minoris R. Tx. 1955  
 Order: Hydrocharitetalia Rübél 1933  
 Alliance: Hydrocharition Rübél 1933  
 Association: *Utricularietum australis* Th. Müller et Görs 1960

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TABLE 1. *Utricularietum australis* Th. Müller et Görs 1960.

Relevé number	1	2	3	4	5
Date: year	1999	1999	1999	2000	2001
month	07	07	07	07	08
day	04	04	04	11	09
Locality	JM	JM	JM	LM	LM
Cover of herb layer [%]	25	15	15	20	15
Cover of moss layer [%]	15	5	-	5	+
Area of relevé [m <sup>2</sup> ]	10	10	8	10	10
Number of species in relevé	10	5	3	7	4
<b>Ch., D.* <i>Utricularietum australis</i></b>					
<i>Utricularia australis</i>	2	2	2	2	2
<i>Potamogeton natans</i> *	1	+	+	+	•
<i>Sphagnum denticulatum</i> *	1	•	•	+	•
<i>Lemna minor</i> *	+	•	•	•	+
<i>Potamogeton pusillus</i> *	•	+	•	•	•
<b>D. <i>Utricularietum australis lemnetosum trisulcae</i></b>					
<i>Lemna trisulca</i>	•	+	1	•	1
<b>Ch. Potametea</b>					
<i>Alisma plantago-aquatica</i>	+	•	•	+	•
<b>Ch. Phragmitetea</b>					
<i>Carex rostrata</i>	+	•	•	+	•
<b>Accompanying species</b>					
<i>Sphagnum fallax</i>	d	2	2	•	2

Sporadic species: Lemnetae minoris: *Hydrocharis morsus-ranae* + (1). Potametea: *Nuphar lutea* + (1). Phragmitetea: *Equisetum fluviatile* + (4); *Phragmites australis* + (1).

Explanation: JM – Jeleniak-Mikuliny Nature Reserve; LM – Lasowice Małe; Ch. – characteristic species; D. – differential species; d – moss taxa

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