

# THE SPATIAL DISTRIBUTION OF MACROPHYTES ON THE DANUBE GALATI – VÎLCOVO SECTOR

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## Abstract

*The purpose of this paper aims the spatial distribution of macrophytes on the Danube.*

*The macrophyte benthos is a permanent component of the water but not exclusive of the shore area, fixed on to the substrate through the roots or powerful rhizomes that pervades, in the most cases, the water column coming in contact with the atmosphere.*

*The macrovegetation coastline is spread in space depending on water depth, with three cenosis plant with different characteristics, namely: flora tough, flora emerged, submerged flora.*

*The macrophyte sampling was done on the Danube Galati – Vilcovo sector. The macrophyte vegetation sampling was conducted during their maximum development, represented by July 2015, the hottest month of the year. There were identified six species of plants belonging to the same class - Liliopsida but do appear in different orders different families respectively - Haloragaceae, hydrocharitaceae, Butomaceae, Potamogetonaceae and Trapaceae. Macrophytes are poorly presented in all the stations analyzed, except station 6 - Babina Canal, where biomass ranged from 16-124 g /plant SUM.*

**Key words:** macrophytes, species, families, biomass

## INTRODUCTION

The presence of aquatic vegetation, in addition to creating normal growth of juvenile fish and other hydrobionts still represents a source of food for them, as the same time also a valuable organic fertilizer.

Macrophytes is fixed particularly in quiet zones of the banks watercourse [2].

Macrophytes represent a serious competitor for the plant plankton - both through shading effect mass water produced and taking over active a great part of nutrients available [4].

Submerged macrophytes affect abiotic variables such as light, temperature, and oxygen concentration and provide additional habitat and resources for macroinvertebrates [7].

For emerged macrophytes excessive development in a way resulting in a shortage of oxygen in the warmer months, at dawn and causes death hydrobiontes [3].

This study aims to determination the macrophytes composition in the Danube river (the sector Galati and Vilcovo).

## MATERIAL AND METHODS

The present study was performed June 2015 during vegetative season.

Samples of macrophytes were collected in seven critical points on the Danube sector (table 1). Biological sampling was conducted within the project “Cross-border interdisciplinary cooperation for the prevention of natural disasters and mitigation of environmental pollution in Lower Danube Euroregion” MIS ETC 1676.

The macrophyte sampling was done in order to establish qualitative and quantitative structure of macrophyte vegetation present, particularly in littoral or shore left (MS) and shore right (MD).

The taxonomic identification was made after Antonescu C.S. [1], Sârbu I. [6], and Milian Gurau [5].

To determine the wet weight of the plants were washed to remove foreign matter and then drying the filter paper to remove excess water and then weighed.

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To determine dry biomass macrophyte apply the method used to determine the fixed residue chemistry.

Table 1 Sampling stations

Punct critic	Danube sector
01	Galati
02	Reni
03	Isaccea
04	Izmail
05	Chilia
06	Canal Babina
07	Vilcovo

## RESULTS AND DISCUSSION

In July 2015, presence of benthic macrophytes species was reduced as a result have been identified in all six species of plants.

All identified species of macrophytes belonging to the same class - Liliopsida but do appear in different orders that different families respectively - Haloragaceae, Hydrocharitaceae, Butomaceae, Potamogetonaceae and Trapaceae (table 2).

Table 2 List of macrophytes species identified on the Danube sector

Critical points Taxa	Family <i>Butomaceae</i> <i>Butomus umbrellatus</i>	Family <i>Haloragaceae</i> <i>Myriophyllum spicatum</i>	Family <i>Hydrocharitaceae</i> <i>Elodea canadensis</i>	Family <i>Hydrocharitaceae</i> <i>Hydrocharis morsus-ranae</i>	Family <i>Trapaceae</i> <i>Trapa natans</i>	Family <i>Potamogetonaceae</i> <i>Potamogetum pectinatus</i>
01- MD	-	-	-	-	-	-
02- MD	-	-	-	-	-	-
03- MD	+	-	-	-	-	-
04- MD	+	+	-	-	-	-
05- MD	-	-	-	-	-	-
06- MD	-	+	+	+	+	+
07- MD	-	-	-	-	-	-

Legend:

+ = present form

- = absent form



Fig. 1 *Myriophyllum spicatum* (original photo)



Fig. 2 *Butomus umbrellatus* L. (original photo)



Fig. 3 *Chironomus plumosus* (original photo)



Fig. 4 *Trapa natans* and *Hydrocharis morsus-ranae* (original photo)

The three identified genres of plants belonging to the following groups of flora:

- Genus *Butomus*: flora emerged leaves overhead;
- Genus *Hydrocharis*, Genus *Potamogeton* and sunroof: flora emerged with floating leaves;
- Genus *Elodea* and *Myriophyllum*: flora submerged.

Macrophytes missing critical points 01, 02 and 07 are underrepresented in critical

points 03 and 04 and abundant in critical point 06. (figure 4).

From the quantitative point of view, the number density of the species *Butomus umbrellatus* range from 76 plants /m<sup>2</sup> (03- MD) at 24 plants / m<sup>2</sup> (04- MD).

*Elodea canadensis* has a number density of 11 plants/m<sup>2</sup> (06- MD), species *Myriophyllum spicatum* has a number density of 2 plants/m<sup>2</sup> in 04- MD and 4 plants/m<sup>2</sup> in 06- MD and species *Hydrocharis morsus-*

wound and *Trapa natans* have a number density of one plant/m<sup>2</sup> (06- MD). *Potamogeton pectinatus* has a number density

of 6 plants/m<sup>2</sup> in 06- MD, which is a species of over 1 m by forming a vegetation rug.

Both the dry and wet biomass (Su and Sum g/plant) is shown in detail in Table 3.

Table 3 Dry and wet biomass on the Danube sector

Critical points	<i>Butomus umbrellatus</i>		<i>Myriophyllum spicatum</i>		<i>Elodea canadensis</i>		<i>Hydrocharis morsus-ranae</i>		<i>Trapa natans</i>		<i>Potamogeton pectinatus</i>	
	Wet biomass g SUM	Dry biomass g SU	Wet biomass g Sum	Dry biomass g SU	Wet biomass g SUM	Dry biomass g SU	Wet biomass g SUM	Dry biomass g SU	Wet biomass g SUM	Dry biomass g SU	Wet biomass g SUM	Dry biomass g SU
01 MD	-	-	-	-	-	-	-	-	-	-	-	-
02 MD	-	-	-	-	-	-	-	-	-	-	-	-
03 MD	4	0,41	-	-	-	-	-	-	-	-	-	-
04 MD	28	4	10	4	-	-	-	-	-	-	-	-
06 MD	-	-	16	6	70	10	124	24	90	18	30	4
07 MD	-	-	-	-	-	-	-	-	-	-	-	-

Legend: Su - dry substance  
Sum - wet substance

## CONCLUSIONS

Macrophytes are represented by a total of 6 species in biological samples taken on the Danube river between Galati and Vilcovo.

Macrophytes are poorly presented in all the stations analyzed, except the critical point 06.

The best represented species of macrophytes was *Butomus umbrellatus* it being found in two stations of the 07 stations analyzed, where or macrophytes found.

A general absence of macrophytes can be caused by water currents of Danube river, leading to more difficult fixation conditions for macrophytes, but also due to water level variation in the river in that year period.

Another cause may be due to the absence of macrophytes and facies of sandy-muddy banks of the Danube.

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