

GASTROPODS FROM AN EUTROPHIC LACUSTRINE ECOSYSTEM WITHIN THE OLTENIA PLAIN (preliminary data)

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Abstract. Cilieni pool is part of the eutrophic ecosystems category. It is characterized by an increased production of the aquatic and paludous macrophytes, of the planktonic and benthonic populations. Gastropods represent the main group of the benthic production, as there appear 10 species. Due to its ecological features and geographical location, Cilieni pool is included in the list of protected areas within Dolj County.

Key words: gastropods, eutrophic system

Rezumat Gastropode dintr-un ecosistem lacustru eutrof din Câmpia Olteniei (Date preliminare). Balta Cilieni face parte din categoria ecosistemelor eutrofe. Se caracterizează prin producția mare a macrofitelor acvatice și palustre, a populațiilor planctonice și bentonice. Gastropodele constituie un grup principal al producției bentale, fiind identificate un număr de 10 specii. Prin particularitățile sale ecologice și poziția sa geografică, balta Cilieni este inclusă în lista arilor protejate din județul Dolj.

Cuvinte cheie: gastropode, sistem eutrof

INTRODUCTION

It is well known that gastropods represent a group with multiple ecological valences. Some of the species are cryophilic, others are thermophilic; some of them are characteristic to the oligotrophic ecosystems, while others are eutrophic (BREZEANU, GRUIȚĂ 2002). From this point of view, gastropods are representative organisms for different types of ecosystems with a variable degree of ecological features.

Our research took place on a typically eutrophic lake – Cilieni pool (Băilești).

MATERIAL AND METHOD

There have been made numerous seasonal field observations between 2006 and 2007. There have also been drawn numerous samples for the physical-chemical analyses of the water and qualitative samples for the determination of the phytoplankton and of the zoobenthos.

PHYSIOGRAPHIC AND ECOLOGIC FEATURES

Located within the Oltenia Plain, Cilieni pool displays a surface of 47 ha and makes part of the Danube lower hydrographical basin. Its main supply source is the Balasan stream and the springs that outlet on the bottom of the pool (Fig.1).



Figure 1. The localization of the Cilieni pool

Figura 1. Localizarea bălții Cilieni

As it is placed within a plain agricultural area, the pool is influenced indirectly by the human activities. The agricultural crops located nearby represent the source that induces the eutrophic character due to the drainage of the organic nutrients in the pool after each rainfall (Table 1).

The water chemism is characterized by high values of the nutrients (NO_3^- , PO_4^-), which can explain the mass development of the aquatic and paludous macrophytes and of the phytoplankton (CIOBOIU & CHICIUDEAN 2000).

The main macrophytes species are: *Thypha angustifolia* L., *Phragmites communis* Trin., *Nuphar alba* L., *Ceratophyllum submersum* L., *Alisma plantago aquatica* L., *Sagittaria sagittifolia* L., *Lemna minor* L., *Iris pseudacorus* L., *Schoenoplectus lacustris* L., *Carex elata* All. (LAZĂR et al, 2001).

Table 1. Physical-Chemical Composition of the Water
Tabel 1. Compoziția fizico-chimică a apei

Analysed indicators	Băilești Cilieni 1	Băilești Cilieni 2	Analysis method
Concentration of the hydrogen ions (pH), unit. pH	7.2	8.4	STAS 6325-75
Maximum electric conductivity	760	720	STAS 7722-84
Dissolved oxygen (O ₂), mg/dm ³ , min.	7.4	8.0	STAS 6536-87
Oxidable organic substance CCOCr mgO ₂ /dm ³ ,max	11.1	12.0	STAS 3002-85
Total hardness, German degrees, max	16.5	16.7	STAS 3026-76
Ammonia (NH ₄), mg/dm ³ , max	2.937	3.498	STAS 6328-85
Calcium (Ca ²⁺), mg/dm ³ , max	40	38	STAS 3662-62
Magnesium (Mg ²⁺), mg/dm ³ , max	47	49	STAS 6674-77
Nitrates (NO ₂), mg/dm ³ , max	0.201	0.177	STAS 3048-90
Nitrites (NO ₂), mg/dm ³ , max	16.7	14.1	STAS 3048- 77
Chlorides (Cl), mg/dm ³ , max	21	25	STAS 3049- 86
Phosphates (PO ₄ ³⁻), mg/dm ³ , max	0.13	0.12	STAS 3265-66
Sulphates (SO ₄), mg/dm ³ , max	25	24	STAS 3002-87
Sodium mg/dm ³	58.5	59.5	STAS 3223-52
Potassium mg/dm ³	9.5	9.0	STAS 3223-52

With regard to the phytoplankton, the main groups that intensely develop during summer and lead to the algal blooming of the water are: Cyanophyceae (*Microcystis aeruginosa*, *M. flos-aque*), Euglenophyceae (*Euglena acus*), Bacilariophyceae (*Achnanthes minutissima*, *A. microcephala*, *Cyclotella chaetoceras*, *Navicula cryptocephala*, *N. longirostris*, *Nitzschia acicularis*, *N. gracilis*, *Synedra acus*), Chlorophyceae (*Chlamydomonas* sp., *Chlorella vulgaris*, *Scenedesmus bicaudatus*, *S. granulatus*, *Spirogyra* sp., *Volvox aureus*). Similar situations have been identified in other eutrophic lakes located within the Oltenia plain (NICULESCU, CIOBOIU & BREZEANU 1999).

The benthic facies is made up of a thick layer of organic silt and vegetal detritus. This fact explains the clogging tendency of the pool.

The main groups of benthonic invertebrates are: Oligochaeta, Chironomidae, Plecopterae, Bivalves. Gastropods (Table 2) represent the dominant group of the benthos.

The following species are characteristic due to their frequency and numerical density: *Viviparus acerosus*, *Physella* (*Costatella*) *acuta*, *Radix balthica*, *Lymnaea stagnalis*, *Planorbis planorbis*, *Planorbarius corneus* (CIOBOIU 2002, 2003).

Table 2. Species met within Cilieni Pool
Tabel 2. Specii din balta Cilieni

GASTROPODA CLASS CUVIER, 1798	
PROSOBRANCHIA SUBCLASS MILNE EDWARD, 1848	
MESOGASTROPODA ORDER THIELE, 1925	
Viviparidae family GRAY, 1847	<i>Viviparus acerosus</i> BOURGUIGNAT, 1870
Valvatidae family THOMSON, 1840	<i>Valvata (Cincina) piscinalis</i> O. F. MULLER, 1774
Thiaridae family TROSCHER, 1857	<i>Esperiana esperi</i> (A. Ferussac, 1829) <i>Esperiana (Microcolpia) daudebardii acicularis</i> (A. FERUSSAC, 1823)
PULMONATA SUBCLASS Cuvier, 1917	
BASOMMATOPHORA ORDER A. SCHMIDT, 1855	
Physidae family FITZINGER, 1833	<i>Physa fontinalis</i> (LINNAEUS, 1758) <i>Physella (Costatella) acuta</i> (Draparnaud, 1805)
Lymnaeidae family RAFINESQUE, 1815	<i>Lymnaea stagnalis</i> (LINNAEUS, 1758) <i>Radix balthica</i> (LINNAEUS, 1758)
Planorbidae family RAFINESQUE, 1815	<i>Planorbis planorbis</i> (LINNAEUS, 1758) <i>Planorbarius corneus</i> (LINNAEUS, 1758)

Viviparus acerosus BOURGUIGNAT, 1862 presents a conical-oval shell of about 50-70 mm. It lives in lakes and marshes, as well as in slow streams.

Physella (Costatella) acuta (DRAPARNAUD, 1805) displays a fragile yellow-reddish shell of about 7-12 mm. It lives in stagnant waters (pools) rich in submerged plants on oozy bottoms.

Lymnaea stagnalis (LINNAEUS, 1758) is a common species for eutrophic pools where it forms entire populations. It displays a height of 45-60 mm, a breadth of 20-25 mm and a fragile shell with a very sharp point.

Radix balthica (LINNAEUS, 1758), a small gastropod (h = 24-25 mm, b = 16-17 mm), has an oval yellowish shell, which is also slightly transparent. Like the other mentioned species, it lives in highly eutrophic lakes, marshes, and rarely in streams.

Planorbis planorbis (LINNAEUS, 1758) is characterized by its disk-like shell (h = 3.5 mm, b = 15-17 mm). It lives in stagnant waters, on oozy bottoms and it is largely spread in the lacustrine ecosystems from Romania.

Planorbis corneus (LINNAEUS, 1758) is characteristic to slow streams and rivers; it also appears in the lakes from the plain area, as it is the case of Cilieni pool. Its height is of about 11-12 mm, while its breadth of 27 mm (GROSSU 1986, 1987, 1993).

Due to their density and biomass, gastropods represent the main component of the benthic biological production (CIOBOIU 2002).

CONCLUSIONS

- Due to its geographical location, Cilieni pool is representative for the Oltenia Plain. It is part of the Danube lower hydrographical basin.
- It makes part of the protected areas category from Dolj country.
- Taking into account the structural features of the biocoenoses dominated by populations of aquatic and paludous macrophytes, the high quantity of phytoplankton and the composition of the zoobenthos, the pool displays all the characteristics of the eutrophic ecosystems.
- The identified gastropods, which count a number of 10 species presently, represent an important group in the structure of the zoobenthos and in the biological production of the pool.

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