

IDENTIFYING THE DIVERSITY OF MACROPHYTES EXISTENT IN CRISUL REPEDE RIVER IN 2008

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Abstract

The paper presents aspects regarding inventory of macrophytes communities during 1 year from the Crisul Repede basin. The macrophytes biotic communities were inventoried in the choosen 20 river sections. Were determined macrophyte species found then specific parameters were calculate.

Key words : *macrophyte* , water;

INTRODUCTION

According to the requirements of the Framework Directive of the European Union referring to water policy, one has to take in consideration lots of biological elements in order to evaluate the ecological condition of the aquatic systems: phytoplankton, phytobenthos, macrophytes, ichthyofauna and the macroinvertebrates. (*** Water Framework Directive (2000/60/EC)

Of all these elements mentioned above, the macrophytes have an extremely important ecological function by their natural participation to the recycling of nutrients and to water purifying. By identifying the macrophytes existent in the Crisul Repede river, we can discover diverse levels of anthropical impact.

MATERIALS AND METHODS

For the purpose of achieving our goals, the steps undertaken were to identify the representative sections, to take samples, to do some laboratory tests and to process the data. There were used Romanian and European methodologies for the analysis and interpretation of results obtained.

The samples have been taken during the period of time: May – September 2010, from sections with a length of 500 m each (250 m upstream and 250 m downstream, every 50 m): Iad – am. Ac. Lesu, Dobrinesti-Cacuciul Vechi, Mnierea-am.Galseni, Secatura-Pestis, Cropanda-Tileagd, Chijic-Sacadat, Uileac-Ineu de Cris, Tasad-Osorhei, Corhana -CPE2- Padurea Radvani, CCE1-Oradea-CCE1-Cheresig, Alceu-Toboliu, Peta-am Sanmartin, Peta-av.Oradea, Crisul Repede-Saula, Alunis-Braisoru, Crisul Repede-av.Huedin, Crisul Repede-av.Suncuius, Crisul Repede-am Alesd, Crisul Repede-am. Oradea, Crisul Repede- Tarian.The

sample analysis was performed within the Water Quality Laboratory of “Crisuri” Water Basin Administration.

For the identification of macrophytes, there were issued resources from the Romanian and foreign specialty literature. The present paper intends to unfold the results obtained in 2010. It has been realized a basic inventory of aquatic macrophytes to the end of obtaining an individual evaluation of the species and of their abundance, by making use of the Kohler methodology.

RESULTS AND DISCUSSION

The aquatic macrophytes represent a real source of valuable information concerning the environmental conditions from a specific section of a watercourse, due to their abundance. In the same time, their existence offers us the possibility of making a correlation between their expansion and the typology of the watercourses. Generally, macrophytes can scarcely be found in alpine and subalpine lotic systems. (** DRAFT prEN 15460 ianuarie 2006).

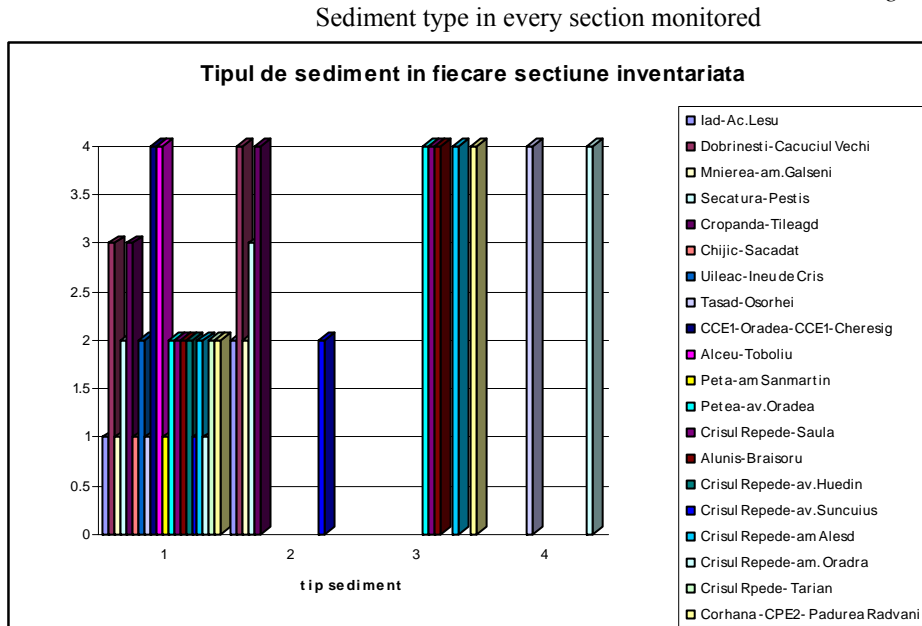
There were found 28 species of macrophytes in the watercourses of Crisul Repede hydrographic basin.

Upstream, there were noticed especially bryophytes (*Fontinalis* sp.), while downstream there were mainly found species of magnoliophyta (*Epilobium palustre*, *Typha angustifolia*, *Juncus Inflexus*, *Juncus Effusus*). The taxonomic spectrum was poor in hydrophytes.

The following families were reported to have been present in the reference sections: Lemnaceae, Lamiaceae, Polygonaceae and Cladophoraceae. The *Fontinalis* type is representative for the oligo-beta-mezosaprobe zones. (Antonescu, C. (1959); — Plante de apă și mlaștină. Ed. de Stat pentru literatură științifică și didactică, București)

As for the macrophyte, we had in consideration the type of the sediment of every section. If the studied sections display an aquatic growth, there have been taken into consideration the following types of sediment: 1. rocks, 2. gravel, 3. sand, 4. fine inorganic material, 5. artificial materials (concrete, asphalt), 6. detritus or other organic materials.

Figure no1



As Figure no. 1 points out, the predominant sediment types are: type 1 (rock), 2 (gravel) and 4 (fine inorganic material). The type of sediments is one of the parameters taken into consideration for tracing the features of the habitat. It was determined the existence of two categories of macrophytes in the sections that were studied: halophytes and hydrophytes.(Cook, C.D.K., Gut, B.J., Rix, E.M., Schneller, J. & M. Seitz, 1974: Water plants of the world: a manual for the identification of the genera of freshwater macrophytes.- Junk, The Hague).

Although the resistance of the hydrophytes during winter has not been included in the biomonitoring of the aquatic environment, the Crisul Repede river is abundant in halophytes.

Table no 1

Hydrophytes and helophytes presence in monitored sections

| Nr crt | Denumire sectiune | Hydrophytes | Helophyte |
|--------|--------------------------------|-------------|-----------|
| 1 | Iad-Ac.Lesu | - | X |
| 2 | Dobrinesti-Cacuciul Vechi | X | X |
| 3 | Mnierea-am.Galseni | X | X |
| 4 | Secatura-Pestis | - | X |
| 5 | Cropanda-Tileagd | X | X |
| 6 | Chijic-Sacadat | - | X |
| 7 | Uileac-Ineu de Cris | X | X |
| 8 | Tasad-Osorhei | X | X |
| 9 | Corhana -CPE2- Padurea Radvani | X | X |
| 10 | CCE1-Oradea-CCE1-Cheresig | X | X |
| 11 | Alceu-Toboliu | X | X |
| 12 | Peta-am Sanmartin | X | X |
| 13 | Petea-av.Oradea | X | X |
| 14 | Crisul Repede-Saula | X | X |
| 15 | Alunis-Braisoru | - | X |
| 16 | Crisul Repede-av.Huedin | - | X |
| 17 | Crisul Repede-av.Suncuius | - | X |
| 18 | Crisul Repede-am Alesd | X | X |
| 19 | Crisul Repede-am. Oradra | X | X |
| 20 | Crisul Rpede- Tarian | X | X |

Table no. 1 displays the sections with macrophytes of Crisul Repede river, sections monitored during 2010. As one can notice, it is registered the lack of hydrophytes in the alpine region (Iad-Ac. Lesu, Repede –av. Suncuius). Helophytes have been found in all monitored sections. The existence of plants in a specific region is a circumstance for the environment abiotic factors so, consequently, the existence of some plants on a territory points out the ecological factors that define that region. (Sârbu A., Janauer, G., Smărăndescu, D., Pascale, G. 2005, Plante acvatice și palustre din sectorul românesc al Dunării. Editura Universității din București).The organic forms of some species reflect their adaptability, while the ecological factors reflect the ecological features of the habitats where they live.

Figure no 2

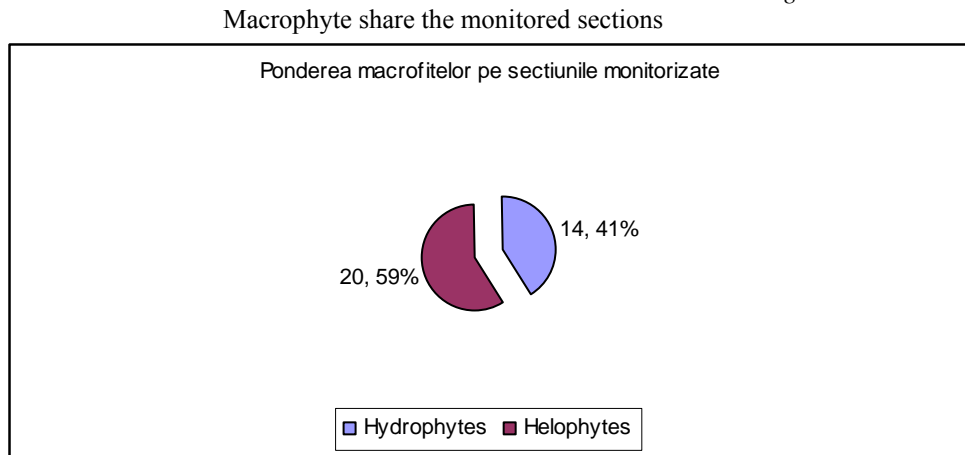
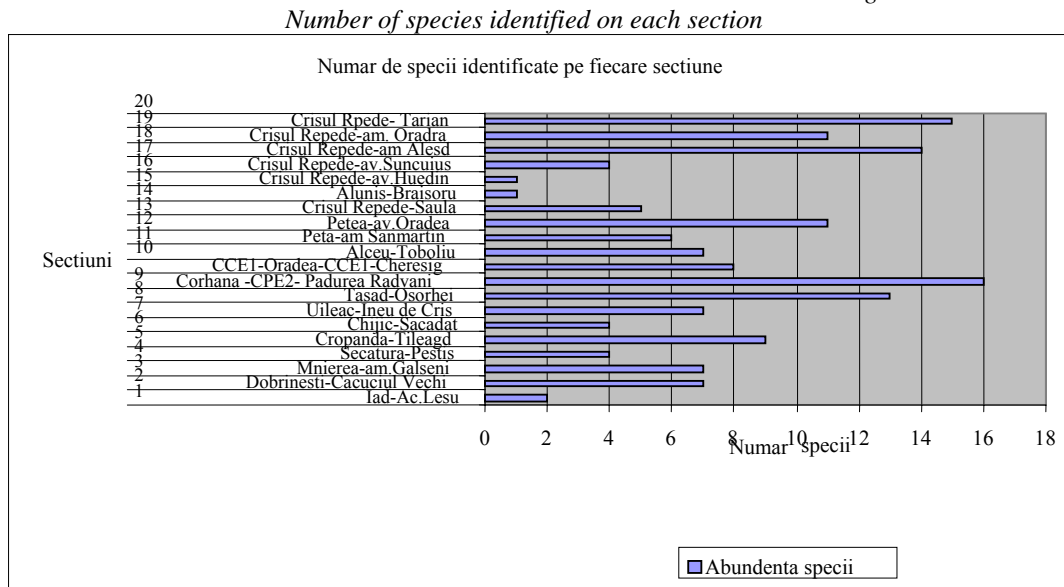


Figure no. 2 underlines that out of the 20 sections that were studied for the macrophytes level, the highest percentage is assigned to the halophytes. Each species of plants manifests specific needs of water, heat, light, soil minerals and it can live between the limits of variability due to the above mentioned factors. (Kohler, A. (1978): Methoden der Kartierung von Flora und Vegetation von Süßwasserbiotopen. Landschaft und Stadt).

Figure no 3

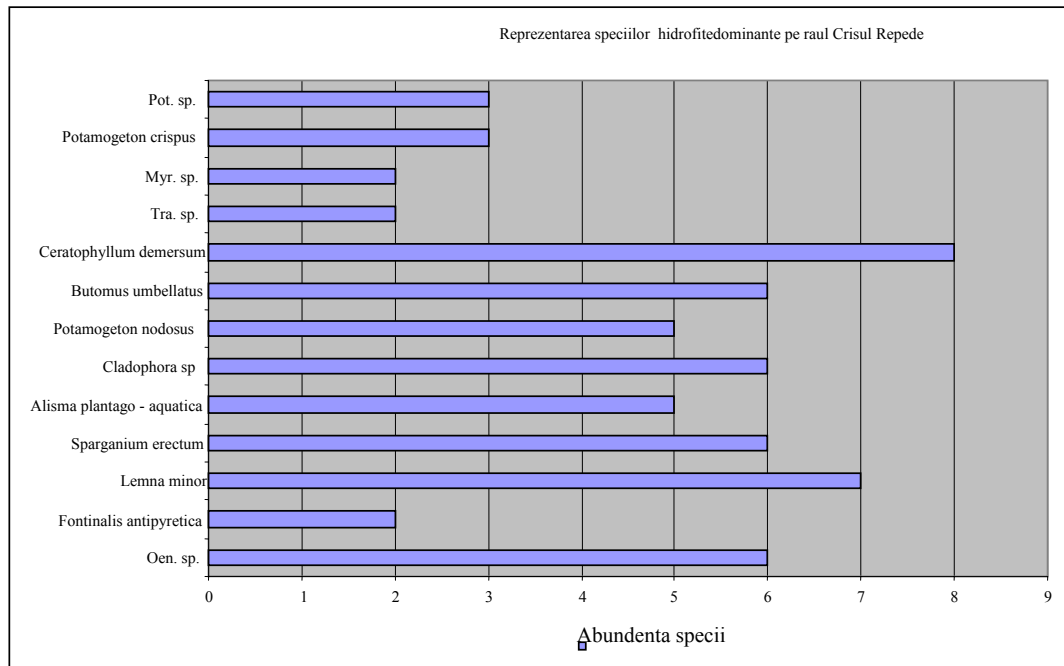


After analyzing the data, we conclude that the hydrophytes are scarcely present in the main watercourse, as the diversity and expansion of macrophytes turn out to be much more significant in tributary streams, according to the study of some sections. As for the halophytes, they are

present in every section. From the point of view of the abundance, the hydrophytic macrophytes are not so abundant as the halophytes, while in some regions they do not occur at all.

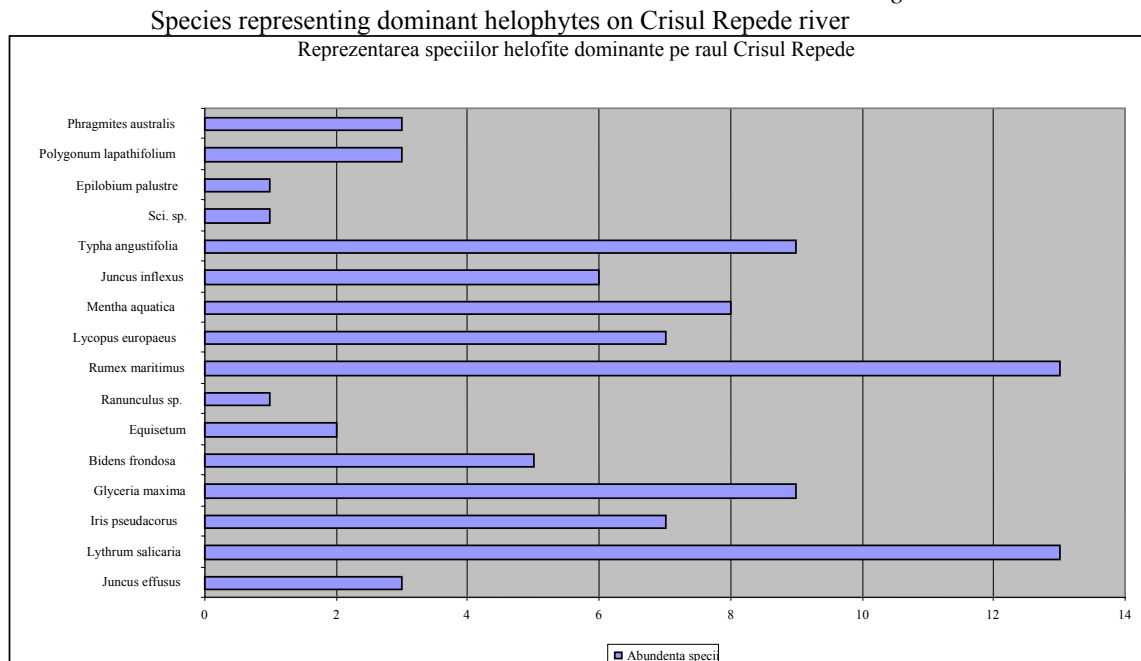
Figure no 4

Species representing dominant hydrophytes on Crisul Repede river



In Figure no. 4, one can notice that *Ceratophyllum demersum* is the predominant species of the sections studied of Crisul Repede river, while the species *Tra. Sp.* And *Myr. Sp.* are rarely found. There was still found a constant for the species: *Lemna minor*, *Sparganium erectum*, *Plantago aquatica*, *Cladophora sp* *Umbellatus Butomus* and *Nodosus Potamogeton*.

Figure no.5



The abundance of halophytes from the monitored sections of the Crisul Repede river is represented in Figure no. 5. The most common species found are: *Lythrum salicaria*, *Rumex maritimus*, *Glyceria maxima*, *Typha angustifolia*, *Mentha aquatica* and *Pseudacorus Iris*.

CONCLUSIONS

After having analyzed the results, it was recorded that there are plants adapted to live in a significant variability of ecological factors and these are actually some weak indicators for biomonitoring: other plants are tolerant or limited to a specific environmental factors, therefore these species are considered to be strong and efficient indicators. On the main watercourse it was noticed a poor occurrence of the hydrophytes. The taxonomic spectrum is rich in tributary streams. The taxonomic diversity was more significant upstream due to the relatively reduced anthropic impact, human impact, generally due to the human activities carried out in small group of dwellings and to the hydromorphological conditions (Lesu dam, bridges).

The biocenosis of Crisul Repede river is always influenced by the human activities.

The main causes that occurred in the living environment of the alpine region are the clearings, by reducing the habitat of species, and, in what concerns all regions, due to the expansion of agrocenosis to steppe, expansion of rural dwellings, dams, use of fertilizers and pesticides, activities of soil pollution with municipal waste, the excessive exploitation, the unsustainable land use. The concrete offtakes built at the lake sides are inappropriate for the life of the aquatic organisms, except the regions with significant depositions of sediment. The anthropic impact upon Crisul Repede river is mainly caused by the sources of pollution that imply activities such as: obtaining and processing the water supply, trade and different services performed for people, construction activities and chemical processing activities.

Based on the living conditions of species, we were able to conclude that the taxonomic spectrum of macrophytes existent in Crisul Repede river does not display a significant variety.

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* SR EN 14184:2004

** *DRAFT prEN 15460 ianuarie 2006*

*** Water Framework Directive (2000/60/EC)