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Comparison between Saprobic index and physical – chemical elements supporting the biological community for some rivers from Romania

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The following physical – chemical elements in the rivers, supporting the biological community were taken into consideration: temperature, biochemical oxygen demand (BOD), dissolved oxygen (DO) and ammonium (NH_4).

Stream temperature is an important and highly sensitive variable affecting physical, chemical and biological processes. It is particularly important for salmonids and other freshwater fish, which cannot regulate their body temperature. Temperature influences the maximum dissolved oxygen (DO) concentrations and the activity of all in-stream organisms. There is more activity in summer month than winter, resulting in higher rates of uptake of oxygen by microorganisms and higher organic matter decomposition rates. Light and temperature are significant predictors of chlorophyll "a" concentrations in the water column.

In Romania the Saprobic index has until now been the basis of biological quality assessment for phytoplankton, phytobenthos and benthic invertebrates. The Saprobic index is calculated with the following relationship (Pantle -Buck modified method):

SI = *Sum of* (s_i*h_i) / *Sum of* h_i
where:

SI: saprobic index
s_i: saprobial valence of the i-th taxon

h_i: abundance of the i-th taxon

Saprobic index (SI) does not always correlate with physical-chemical elements. By example inorganic nitrogen (nitrates, ammonium) do not have a direct impact on fish and benthic invertebrates, except for worst cases of eutrophication , when high concentrations of ammonium and very low levels of dissolved oxygen occurs. These two situations can lead to the death of sensitive species, affecting the species composition and the age structure.
The analysis, to find correlations between SI and the above mentioned physical-chemical elements, was performed for some important rivers from Romania: Somes, Mures, Olt, Siret, Arges and Danube (Romanian territory). The results were obtained from more than 80 monitoring stations, for different stream typologies and a various range of the water quality elements.

The paper presents the relevant relations found between the biological elements (by means of Saprobic index) and the water quality (physical – chemical) elements.