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THE BUFFERING CAPACITY OF THE WATERS OF SOME LAKES FROM CHISINAU

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It is well known that the decrease of the natural waters buffering capacity manifests itself through deregulation of the hydrobionts normal activity.

In this study the results toward dynamics of acid-base equilibrium and limit/critical buffering capacity of the waters of „La Izvor" and "Valea Trandafirilor" lakes are exposed, during the period June 2012 – May 2013.

It was established the concentration of the species with acidity neutralizer properties, like HCO_3^-, HPO_4^{2-}, humic substances (COD_{Mn}), and it was confronted the dynamic of their concentration with the buffering capacity values.

The range of HCO_3^- concentration values varies in the limits of 1.8-7.7 mEq/L for "La Izvor" lake and 3.5-7.7 mEq/L for "Valea Trandafirilor" lake. The concentration of humic substances (COD_{Mn}) is an order smaller than the HCO_3^- ions amount and constitutes 0.1-0.6 mEq/L for the "La Izvor" lake and 0.4-0.9 mEq/L for the "Valea Trandafirilor" lake. Out of the natural waters compounds that lead to reach the acid-base equilibrium the HPO_4^{2-} ions can be mentioned. The concentration of respective ions has varied significantly in the samples of monitored waters, so their values are contained in the range of 0.0-0.018 mEq/L, for "La Izvor" lake and 0.0-0.055 mEq/L for "Valea Trandafirilor" lake.

Confronting the summative impact of compounds with proton neutralizer properties (HCO_3^- , HPO_4^{2-}, COD_{Mn}), it was not confirmed that the buffering capacity rises with the increasing of respective ion concentrations. The absence of a correlation between the important acidity neutralizers and buffering capacity proves that in the investigated waters the buffering system is much more complex.

Following the temporal evolution of buffering capacity, it was not noticed any minimal or maximal values of respective parameter during a certain season. So, it has not been attested higher values of buffering capacity in the high photosynthetic activity period (April − June), comparatively with that period when the photosynthetic activity is lower. It is known that the photosynthesis process influences the carbonate system equilibrium, therefore, the increase of O_2 concentration leads to increase the amount of CO_3^{2-} ions, that possess a higher neutralizer capacity than the HCO_3^- ions.

Out of investigations, it was established the maximal allowable (pH=6.5) and the critical buffering capacity (pH=5.6) for the studied waters. These data provide information about acidic load that can be accepted by the aquatic environment, in the way not to unleash such processes like disrupting the food chain and diminution of biological diversity down to irreversible biological changes.

The investigations have highlighted that the lakes waters can admit, in medium, an acidic load approximately of 0.105 mEq/L ("La Izvor" lake) and 0.135 mEq/L ("Valea Trandafirilor lake"). The critical quantity of acidic load for "La Izvor" lake constitutes 0.285 mEq/L, and, respectively, 0.255 mEq/L for "Valea Trandafirilor" lake.