The information obtained upon measuring the oxygen concentration and the oxidation-reduction potential in water biotopes

By G. Dechev, E. Matveeva, S. Yordanov and G. Hiebaum

With 3 figures in the text

Abstract

The present investigation of the distribution of the oxygen concentration and the value of the oxidation-reduction potential (ORP) in the biotopes shows that waters with different saprobity have characteristic curves which represent only qualitative characteristics of their state. Different types of experimental curves of diurnal changes in the oxygen concentration depending on the saprobity are presented and discussed. The possibilities provided by the determination of the oxygen concentration and ORP are considered on the basis of theoretical studies and experimental results, and the necessity for dynamic descriptions of the water basins as open systems is substantiated.

Introduction

The direct or indirect participation of the oxygen and of the oxidation reduction potential (ORP) genetically related to it in all biological processes indicates their exceptional significance for the water biotopes. The concentration of the dissolved oxygen and the ORP value in a water basin result almost entirely from the biological processes taking place and therefore they are the most important indicators of them. At the same time these two values are some of the basic factors of the environment determining definitely the conditions of the metabolic processes, hence also the species composition of the biocoenosis. The measurement of the concentration of the oxygen dissolved in the water with the aid of modern electrochemical methods is widely applied for the investigation of water basins (Ohle 1953, Tödt 1958, Føyn 1967, Goltermann 1969, Höll 1970). The significance of the ORP, which alone characterizes the degree of oxidation or reduction of the system after the exhaustion of the dissolved oxygen, remains still underestimated according to the literature available (Effenberger 1967, Goltermann 1969, Höll 1970). On the one hand this...