



Abstract

Effects of Physicochemical Variables on the Cyanobacteria Biovolume in Iberian Peninsula [†]

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Abstract: The growing need for water supply, because of the massive population growth, causes continuous problems. Water is subjected to great pressures, diminishing its quality and affecting the flora and fauna that depend directly or indirectly on it, as well as humans. These aspects increase the cost of its treatment or the loss of water bodies for human consumption. One of the main problems that appear in inland water bodies is nutrient enrichment, which is associated with problems of eutrophication or even hypertrophy, which can cause massive blooms of cyanobacteria, altering or destroying aquatic ecosystems. This work focuses on the study of different physicochemical variables of inland water bodies in the NE of the Iberian Peninsula in the Ebro river basin, such as temperature, residence time, pH, total nitrogen, inorganic nitrogen, total phosphorus, orthophosphates, silicates and phycocyanin, in order to establish a relationship with cyanobacterial biovolumes and how they affect their proliferation. These variables were analyzed in the laboratory in order to, subsequently, carry out a correlation between variables and a multistatistical analysis of components. On the other hand, remote sensing was used by applying a previously developed algorithm to evaluate phycocyanin concentrations and compare them with in situ measurements. This provided significant correlations between the temperature, total nitrogen, total phosphorus and residence time according to the biovolume of cyanobacteria; we also obtained a negative correlation, for example, in the case of silicates. The results showed alarming levels of cyanobacteria in a large part of the reservoirs, which should be studied due to the danger associated with the possible appearance of cyanotoxins.

Keywords: cyanobacterial harmful algae blooms; remote sensing; phycocyanin; cyanobacterial biovolume; reservoirs



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