To What Extent Is There a Relationship Between Phosphorus and Nitrogen Concentrations and Excessive Cyanobacteria Growth in Simulated Upper Sure Lake Conditions?

Partsch, Glenn (School: International School of Luxembourg)

Each year now, Luxembourgish wildlife is threatened by toxic Cyanobacteria that poisons the water of the biggest lake, The Upper Sure Lake, causing the local tourism sector to be slowed due to water activity bans. The causes of cyanobacteria proliferation vary on the location and are always investigated in conditions applicable to Luxembourg. Thus I wanted to see how each factor impacted cyanobacteria in the Luxembourgish climate. I focused on changing nutrient concentration with lake water then different concentrations of Sach's Culture (1,2,3 and 4 times) while simulating lake conditions by leaving all 25 cultures outside, no matter the weather for 6 weeks. The strains present were all found in the Upper Sure Lake by collecting a water sample. Lake water yielded a 460% increase in biomass while 1 times Sach's culture concentration had a 3810% increase, an effect which stabilised as the highest Sach's Culture concentration yielded a 4770% increase in biomass. However, all cultures wouldn't grow if irradiance was lower than 3000 LUX (no growth during overcast days) and outside temperatures of 17 to 30°C. Nutrients from agricultural runoff sustain growth while appropriate light intensity and temperature are needed to start it. We could infer that as climate change brings more favourable conditions to cyanobacteria growth, wildlife and tourism will be increasingly impacted while countries lacking proper water treatment will start suffering from depleting drinking water supplies.

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