



Accumulation of dysprosium, samarium, terbium, lanthanum, neodymium and ytterbium by *Arthrospira platensis* and their effects on biomass biochemical composition

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<https://doi.org/10.1016/j.jre.2020.07.019>

Abstract

The growth of *Arthrospira platensis* and physiological changes in biomass under the effects of six rare earth elements Dy, Sm, Tb, La, Nd and Yb were evaluated. Elements were tested by three concentrations of 10, 20 and 30 mg/L. According to neutron activation analysis data *A. platensis*'s accumulation capacity toward studied elements changes in the following order of La > Dy > Nd > Sm > Yb > Tb. The results show that Dy and La ions stimulate biomass growth and Yb ions inhibit it, while Sm, Tb and Nd ions do not affect biomass accumulation. The contents of proteins and chlorophyll a are not affected by the presence of rare earth elements in the cultivation medium. Studied elements affect to different extents carbohydrates, phycobilins, β -carotene, lipids and MDA contents in spirulina biomass. Changes in the antioxidant activity under applied metal loads reveal a moderate stress in exposed *A. platensis*. Cyanobacterium *A. platensis* can be successfully used for bioremediation of natural water contaminated with REEs as well as REEs recovery from low polluted industrial effluents.

Keywords: rare earth elements, Biochemical composition, antioxidant activity, neutron activation analysis

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