



# **Biomass of *Arthrospira platensis* enriched with lithium by bioaccumulation and biosorption process**

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## **Abstract**

The process of production of lithium-enriched *Arthrospira platensis* biomass in bioaccumulation and biosorption processes was studied. Lithium, Na and Mg content in biomass was determined using the Proton Induced Gamma Emission technique. In bioaccumulation experiments, lithium in concentrations range of 5–500 mg/L was added in the *Arthrospira platensis* nutrient medium at inoculation and on the third day of cultivation (exponential phase of growth). The effect of lithium on biomass amount and its biochemical composition was studied. The amount of biomass and proteins was not influenced by lithium action, while the content of phycobiliproteins, carbohydrates, lipids, chlorophyll a, and  $\beta$ -carotene was affected by lithium concentration as well as the phase of its introduction in the cultivation medium. The changes produced can be considered acceptable for the application of *Arthrospira platensis* biomass as the source of bioactive compounds. In biosorption experiments, the effect of time, lithium concentration and temperature on lithium uptake was investigated. The highest uptake of lithium was observed at its low concentration in solution (10 mg/L). According to thermodynamic studies, lithium biosorption by *Arthrospira platensis* is an exothermic and spontaneous process. Equilibrium data fitted well with the Freundlich model with a maximum adsorption capacity of 1.35 mg/g. The pseudo-second-order and Elovich models were found to fit better the experimental data. *Arthrospira platensis* biomass proved to be an excellent matrix for the production of lithium-containing food supplements.

*Keywords: Arthrospira platensis biomass, lithium enriched biomass, bioaccumulation, biosorption, biochemical composition*