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Biosorption of magnesium in *Chlorella vulgaris* under different culture conditions

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A study investigating the accumulation of magnesium by *Chlorella vulgaris* under different culture conditions is described. The dissolved and biomass-associated concentrations of magnesium were measured with atomic absorption spectroscopy during the course of *C. vulgaris* growth under autotrophic or mixotrophic conditions both in shake-flask (100 mL) and photo-bioreactor (5 L) cultures. The adsorbed (extracellular) and absorbed (intracellular) ions associated with the biomass were determined using adapted published methods. During the experiments, a clear relationship between the growth extent of *C. vulgaris* and magnesium removal from the medium was observed. In an autotrophic shake-flask culture with a medium concentration of 19.1 mg Mg²⁺/L, 78% of the initial magnesium content of the medium was associated with the biomass, of which 6% was adsorbed on the cell wall and 72% absorbed into cells at the end of the experiment (480 hours). In a mixotrophic photo-bioreactor culture with glucose (10%) as the sole organic carbon source, *C. vulgaris* accumulate 90% of the initial magnesium content of the growth medium, of which 4% was adsorbed on the cell wall and 86% absorbed by the biomass. Magnesium association with *C. vulgaris* was faster and more extensive under mixotrophic conditions. These results could be interesting for the accumulation of metal ions by microalgae on an industrial scale.

Biography

Hela Ben Amor-Ben Ayed is pursuing her PhD. She obtained an Engineering Diploma in Biology from the National School of Engineering of Sfax, Tunisia which she followed with a Master's on Environmental Biotechnology from the Institute of Biotechnology of Sfax. During her Master's degree, she worked on potable water treatment in Paris. She has submitted 3 manuscripts during her PhD in reputed journals, the first one of which has been published.

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