

Glutamine Synthetase, Peroxidase and Protease as Indicators of the Ecological State of Higher Aquatic Plants

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Abstract

The contamination of water by heavy metals leads to conditions of ecological tension in the aquatic systems. In this work we consider to use the peroxidase, protease and glutamine synthetase of aquatic higher plants *Typha angustifolia* and *Lemna polórhiza* as indicators of ecological state of the aquatic biocenosis. In response to the 2.5 mg/l lead contamination the glutamine synthetase activity dropped down 10-fold already in 1 hour in the photosynthetic tissues of both plants with following restore up to 70-80% of initial activity values in 3 hours. Also strong inhibition of proteolytic activity without recovery in both *L. Polórhiza* and *T.angustifolia* leaves was detected after the lead introduction. By contrast, the peroxidase did not exhibit high sensitivity to the lead contamination and demonstrated 2-fold decreased activity. Taking together, these data demonstrate the possibility to evaluate the ecological state of higher aquatic plants by measuring the activity of the glutamine synthetase, peroxidase and protease in their photosynthetic tissues. © IDOSI Publications, 2014.

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Keywords

Aquatic plants, Glutamine synthetase, Lead contamination, Peroxidase, Protease