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The Use of Pulse Amplitude Modulation (PAM) Fluorescence Technique to Assess the Periphyton Community

Master Thesis

Abstract

Microphytobenthos provide an energy source for other organism in the running water ecosystems. As they are attached on the substrates in the stream and river, they are seen as a good indicator for environmental monitoring in aquatic ecosystems. To assess changes of benthic algal community, the abundance, species number and the pigment content are metrics useful to observe environmental changes. In order to analyze for example the pigment content, fluorescence based measurements are suitable method.

Pulse Amplitude Modulated (PAM) fluorescence techniques is the fast, non-destructive tools that have been used to measure the chlorophyll fluorescence and photosynthetic rates in algae. Therefore, this thesis was investigated the use of PAM technique to observe the periphyton community in term of biomass contents and class composition. Also analyzing the case study of hydro-peaking effects experiment using PAM measurement, in collaboration with the use of other methods (HPLC, Fluorometry).

The findings confirmed that PAM could be an authentic tool to assess the patterns of benthic algae structure changing over time, enabling rapid evaluation. Moreover, using PAM has to take into account about the thickness and type of samples; also the combined methods should be required for more productive measurement.