

CHLOROPHYLL FLUORESCENCE MEASUREMENTS IN ENVIRONMENTAL STUDIES

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Summary

The aim of this paper is to inform the readers about some possibilities of applying chlorophyll fluorescence measurements in studies of plants' condition under abiotic stress. We present basic knowledge on chlorophyll fluorescence emission and measuring techniques of prompt fluorescence, pulse amplitude modulated fluorescence, and the OJIP test. Special emphasis is placed on chlorophyll fluorescence parameters obtained from each measuring technique and their relevance to functioning of photosynthetic machinery and the whole process of photosynthesis. The influence of selected abiotic factors on chlorophyll fluorescence is described, focusing on the photosynthetic active radiation, temperature, drought, soil salinity, mineral deficiencies, and heavy metals. The paper presents also some of unusual applications of chlorophyll fluorescence measurements, such as testing of fruit maturity, seed vigor, or monitoring of aquatic ecosystems. In the summary, we highlight that measurements of chlorophyll fluorescence provide an universal tool for a quick evaluation and analysis of the effects of various unfavorable environmental conditions on the efficiency of photosynthesis.