

New technique enables assessment of drought performance

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Measurement of chlorophyll fluorescence is an effective way of determining how well plants can cope with low-water conditions. The technique described in the open access journal *Plant Methods*, published by BioMed Central, allows a quantitative and precise determination of viability in intact, drought-stressed plants.

Source: BioMed Central

Due to the increasing demands of industrial, municipal and agricultural consumption on dwindling water supplies, botanists are increasingly engaged in efforts to cultivate plants that have low water requirements. Barry Pogson led a team of researchers from the Australian National University who investigated whether chlorophyll fluorescence could be used in the assessment of plant water status during such studies. He said "We found that plants' viability during increasing water deficit could be measured and quantified by measuring changes to the maximum efficiency of photosystem II (Fv/Fm), and that this was easily measurable by chlorophyll fluorometry."

Other methods of assessing plants' performance under water deficit have serious drawbacks. Methods that involve detaching parts of the plant are destructive and survival studies rely on qualitative observation of physical symptoms of water deficit stress such as turgor loss, chlorosis, and other qualities that can vary greatly between specimens and are also sensitive to experimental conditions. Chlorophyll fluorescence is non-invasive and minimal technical expertise and a basic understanding of fluorometry. Pogson said "By correlating the decline in the Fv/Fm parameter to loss of viability, our procedure allows the monitoring of survival under water deficit conditions, namely defining a threshold of 33% of well-watered Fv/Fm values."

This procedure may complement existing methods of evaluating drought performance while also increasing the number of tools available for assessment of other plant stresses.

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