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Full Length Research Paper

Measuring the effects of salinity stress in the red mangrove, *Rhizophora mangle* L.

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Abstract

The mangrove habitat exhibits many unique physical features, one of the most important of which is a salinity gradient. Photosynthetic rates, as measured by leaf stomatal conductance and leaf chlorophyll fluorescence induction, were tested as indicators of salinity stress in seedlings of the red mangrove, *Rhizophora mangle*, grown under five different salinity levels: 0, 15, 30, 45, and 60 parts per thousand. Photosynthetic gas exchange (measured by stomatal conductance), as well as the light reaction of photosynthesis (measured by chlorophyll fluorescence) were found to decrease as salinity increased. The use of leaf stomatal conductance and chlorophyll fluorescence as a measure of photosynthesis allowed a rapid and reliable quantification of the known stressor, salinity, in seedlings of *R. mangle*. These non-destructive *in-vivo* techniques were found to be rapid and reliable for monitoring photosynthetic stress, an important physiological parameter determining survival and growth of mangrove plants. These techniques should be considered in forestry management and mangrove restoration projects to assess plant condition.

Key words: chlorophyll fluorescence, photosynthesis, *Rhizophora*, stomatal conductance, salinity.