

# Effect of Extreme Temperature on Quantum Yield of Fluorescence and Membrane Leakage of the Canarian Endemic Pine (*Pinus canariensis*)

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The effect of extreme temperature on the quantum yield of fluorescence and membrane leakage of *Pinus canariensis* growing in 5 stands at different altitudes and orientation in Tenerife (Canary Islands, Spain) was determined. Needles were collected from the field and transferred to the laboratory where they were kept in a closed chamber with water-saturated air overnight. Then they were exposed for 30 minutes in plastic bags in a water bath at temperature treatments with steps of 2K between 56 °C and –24 °C and the effect was determined immediately and 24 hours after the treatment by chlorophyll fluorescence and electrolyte leakage.

Needles presented incipient damage at temperatures ranging from –5 to –10 °C depending on the altitude and orientation of the stand. The results were more evident when the measurements were done 24 hours after the cold treatment and values were consistent with the electrolyte leakage results. Different resistance to high temperature depending on the altitude and orientation was also found, varying the temperature for incipient damage from 42 to 44 °C detected with the fluorescence parameters but not with the leakage of electrolytes which was not found until 50 °C. The amplitude of thermal limits for photosynthetic efficiency alteration in needles of *P. canariensis* was relatively narrow and similar to that of evergreen Canarian laurel forest trees.