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ABSTRACTS

KEYNOTE LECTURES, COMMUNICATIONS, VIDEO ABSTRACTS

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11 = Preliminary investigations of ecophysiological traits in *Abies nebrodensis* (Lojac.) Mattei (Madonie, Sicilia)

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Abies nebrodensis (Lojac.) Mattei (Pinaceae) is an endemic relict species occurring in a small area of the territory of Polizzi Generosa, within the Madonie Natural Park (Sicily). It has been categorized as a "Critically Endangered" ("CR") species according to IUCN Red List Criterion D. The natural population consists of only 30 individuals, 25 of which produce fertile cones. In the last 20 years several actions within both National and European funded projects have been carried out, in order to avoid extinction and to increase the natural population (reintroductions, gradual elimination of non-indigenous fir species in the surrounding area, propagation by grafting, production of genetically pure seeds by means of controlled pollinations, etc.).

Within the activities of the LIFE4FIR project (LIFE 18 NAT/IT/000164) started in 2019, we performed some ecophysiological measurements to monitor the response of potted plants to dry conditions.

Key physiological traits such as leaf stomatal conductance to water vapour (g_s), leaf water potential (Ψ_L), turgor loss point (Ψ_{TLP}) threshold and hydraulic traits of branchlet xylem were assessed. Measurements were carried out on two sets of *A. nebrodensis*, one of 4-year-old and one of 10 to 12-year-old individuals, growing in 1.5 L pots. Plants came from the Piano Noce Nursery (Polizzi Generosa) and were grown for one year at the Botanical Garden of Palermo.

Pressure-Volume (PV) curves were constructed with the bench dehydration method using a PMS 1505D pressure chamber, and stomatal conductance was measured with a Decagon SC-1 leaf porometer. Hydraulic traits were based on anatomical observations of branchlet cross-sections stained with phloroglucinol and analysed with ImageJ software. Air temperature and RH, PAR and soil water potential were measured and stored with a Decagon EM50 datalogger. No significant differences in leaf water potential at turgor loss point or in leaf osmotic potential at full turgor were found between age groups or comparing summer and winter PV curves. After a 6-day drought stress experiment, the 10/12-year-old individuals reached Ψ_{TLP} (-2.1 MPa) at midday, while the 4-year-old individuals showed higher midday Ψ_L values (-1.7 MPa). The younger plants showed g_s levels twice those of older plants during water deficit imposition, and a slightly greater recovery of g_s upon re-watering.

These analyses provide useful information for planning targeted irrigation and transplantation interventions for young individuals grown in nursery. Our data suggest planning irrigation at 5 d intervals in periods with air temperatures up to 25 °C. Non-destructive monitoring of stomatal conductance allows the detection of stress onset when a 40 – 60% reduction in g_s is observed. Older individuals showed greater signs of stress, possibly due to root constriction. Younger and well consolidated saplings seem therefore more suitable for reintroduction interventions in areas of the Madonie Park.

<https://drive.google.com/file/d/1DKm4ub9xtrmRPpmsrF6YIqqymn0eZifB/view?usp=sharing>