

## Responses of *Abies pinsapo* Boiss to ozone in both field and growth chamber conditions.

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*Abies pinsapo* is an endemic relict fir species native to Andalucía (Southern Spain) where it forms almost monospecific forests. Following the last glacial period, it got isolated in wet mountains (in between 1200 and 1800 m o.s.l.), but subjected to the drought constrictions of a Mediterranean-type climate. Proximity to sources of air pollution (industrial factories of the Bay of Algeciras) raises the possibility that these forests are subjected to the effect of oxidizing gases. Our main goal is to elucidate the main determinants of *A. pinsapo* sensitivity to ozone.

The study combines field (adult trees) and lab (seedlings) analysis including forest atmosphere quality (O<sub>3</sub>), leaf and plant structure, and gas exchange variables.

Four years old seedlings were grown at low light intensity (150 µE) to mimic seedling habitat, and fumigated during three months (six hours per day) in controlled growth chambers at 0 ppb, 150 ppb and 250 ppb air ozone concentrations.

Seedlings appear to be quite resistant to treatment. Thus, seedling gas exchange parameters remained undisturbed, through the first month (150 ppb treatment), while underwent only a 35 % decrease in the strongest treatment (250 ppb). Observed decreases were associated to losses in photosynthetic capacity, chlorophyll concentration and stomatal control (the last in the strongest treatment only). By opposite, leaf structure was very sensitive to O<sub>3</sub> treatment in both seedlings (lab) and mature trees (50 ppb in field conditions). Discrepancies between physiological and structural responses appear to be related with both, dissimilar sensitivity of specific physiological processes to O<sub>3</sub>, and light intensity differences in field and lab conditions.

From the methodological point of view, the results warn about the danger of using single indicators (for example: gas exchange parameters), or particular growth conditions (for example, growth chambers) to quantify the effect of a pollutant.