

**The role of phenology, growth and nutrient retention during leaf fall in the competitive potential of two species of Mediterranean shrubs in the context of global climate changes**

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**Abstract**

Phenological patterns, growth and internal nutrient cycling of the Mediterranean shrubs *Cistus salviifolius* and *C. ladanifer* were analysed during two years of contrasted precipitation to compare their life strategies and their competitive potential to cope with future climate changes, leading to increased drought. The phenophases of both study species occurred mostly in spring, the most favourable period of the year, but while *C. salviifolius* produced greater number of shoot and leaves, *C. ladanifer* showed greater leaf area production, greater specific leaf mass and longer leaf life span. The latter species also showed more efficient N and P leaf resorption and recycling. Growth of both species was highly dependent on rainfall distribution pattern, but the two species exhibited different strategies to face the limitations imposed by the summer drought. *C. salviifolius* exhibited high seasonal dimorphism in plant structure, with great leaf shedding before summer drought, while the structure and biomass of *C. ladanifer* showed lower relative change throughout the year.

The increase in length and intensity of drought also caused greater variation on growth rates and leaf duration and shedding in *C. salviifolius*, than in *C. ladanifer*. Results suggest that *C. ladanifer* has greater stress-tolerance ability and hence higher competitive potential in response to varying environmental conditions, including increasing drought stress which is expected to occur with the ongoing global climatic changes.

Keywords: Climate change; Leaf traits; Mediterranean shrubs; Nutrient cycling; Phenology; Summer drought