**Biomass and nutrient dynamics in Mediterranean seasonal dimorphic shrubs: Strategies to face environmental constraints**

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Abstract

To analyze biomass and nutrient dynamics of Mediterranean seasonal dimorphic shrubs, aboveground biomass (AGB) and belowground biomass (BGB), litterfall (LF), aboveground net annual primary production (ANPP), and nutrient allocation and turnover were estimated in Cistus salviifolius and C. ladanifer, during two years, in southern Portugal. AGB, BGB, LF, and ANPP of C. salviifolius are within the range reported for other seasonal dimorphic plants, while those of C. ladanifer are closer to evergreen sclerophylls. Leaf renewal was higher for C. salviifolius than for C. ladanifer, especially for winter leaves, while root-to-shoot ratio and accumulation of live wood was greater in the latter. The concentrations of N, K, Ca, and Mg were lower in leaves of C. ladanifer than in those of C. salviifolius, suggesting less nutritive requirements for the former. Moreover, leaf nutrient translocation was higher in C. ladanifer than in C. salviifolius. Therefore, C. ladanifer shrubs seem to be more efficient with respect to carbon uptake, even during severe drought, while those of C. salviifolius act as weaker sinks more susceptible to the negative effects of drought. Additionally, C. ladanifer seems to have a competitive advantage in more arid conditions, as a great proportion of its annual nutrient requirement may derive from internal sources.