

How Grasslands Respond in Terms of Functional Strategies to Stimulated Climate Change in Submediterranean Region

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Abstract : Climate change models predict for the Mediterranean region a strong increase of intensity and frequency of drought events, with an expected effect on grassland biodiversity and functioning. The research aim was to understand how the grassland species modulate their resource acquisition and conservation strategies to short-term variation of the pattern of summer water supply. The study area is mountain meadows located in the "Montagna di Torricchio" (1130 m a.s.l.) a Nature Reserve in central Italy. In 2017 we started a manipulative experiment for 2 year (2017-2018), and we defined two treatments, one with increasing water (watering condition) and the other with less water (drought condition). Then, we investigated how species change their resource strategies at different amount of water availability by measuring the specific leaf area (SLA) and leaf area (LA). We used ANOVAs to test the effect of treatment over time on leaf area and specific leaf area, considering all the species together and also separately according to their growth form (forb, grass, legume). Our results showed that species may respond differently depending on their growth form and that using all the species together may cover more detailed variation. Overall, resource retaining strategies (lower SLA, LA) are resulted by increase of drought condition, while increase in water amount and number of watering events fosters acquisitive strategies (higher SLA, LA). However, this pattern is not constant for all growth form. Grass species are able to maintain their strategies to variation of the pattern of water availability. Forb and legume species on the other side have shown decreasing trend of SLA, LA values with increasing drought condition, a pattern more marked for the latter growth form. These variations suggest not only an increase of slow-growing strategies for both growth form, but also a decrease of their nutrient pastoral values since their leaves are supposed to become harder. Local farmers should consider the effect of climate change on grassland and adapt their management practices to guarantee the cattle welfare.

Keywords : function strategies, grasslands, climate change, sub Mediterranean region

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