



Impact of fire disturbances in a Mediterranean maquis ecosystem

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Fire is an integral part of Mediterranean ecosystems, and for thousands of years it played an important ecological role in determining the evolution of the vegetation types in these areas. Mediterranean ecosystems are, in fact, mainly characterized by fire-prone vegetation. At small time scale, individual fires can affect both the fuel dynamics and the biological systems at different levels (individual, species, population), inducing changes in the spatial pattern of vegetation structure and composition, due to the increase of resource availability, such as water and light, and the reduction of plant competition.

In this context, we conducted a comparison between the species composition and plant and substrate cover in maquis communities of different ages in several burned and unburned areas. The aim of this study was to assess the effect of fire on vegetation richness and diversity, and to better understand the consequential structural evolution of the vegetation complexes.

The experimental area was located in the North West of Sardinia Island. The sampling scheme was constituted by eight sampling sites. In each site, species composition and plant height were determined by the point intercept method along two linear transects orthogonally disposed. Five plots (2x2 m) were displaced along the two transects, and in each plot digital photos were collected at about two meters above the plants. The photos were analyzed in order to calculate the area covered by each species. Substrate cover (e.g. the percent cover of stones, leaf litter, bare soil) was also recorded.

Substrate and vegetation data were analyzed using both the cluster and principal component analysis, with the aim to detect vegetation and substrate differences among plots and sites. In addition, several ecological indices as the species richness and the floristic diversity were evaluated.

Experimental results confirmed that fire controls the species composition and the substrate covers, contributing to changes in resource availability and plant competition, and allowing more species to germinate and grow. In general, burned sites showed higher richness with respect to unburned, where it was also found a lower number of shrub species contributing to the diversity.