

ASSESSING THE RESPONSE OF GROUND-DWELLING BEETLES COMMUNITIES TO DIFFERENT LAND-USES IN MEDITERRANEAN CORK OAK SYSTEMS

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Studying of macroarthropods communities in different land-use systems may be widely useful in defining management strategies in Mediterranean forests, mainly due to their sensitivity to human impact. This aspect is really interesting in agroforestry systems, where resources shall be managed in terms of ecological and functional sustainability.

In our study, we assessed the response of beetles communities at low taxonomical resolution to different Mediterranean cork oak land-use systems. Spatial variation of dung-beetles communities was also analyzed because of their potential role as ecological indicators in grazed areas.

We selected twenty-two sites in the northern part of Sardinia (Italy) where beetles were sampled by using a total of 220 pitfall traps. In addition, in each site, a number of environmental variables related to cork oak woodlands structure and land use were measured.

During the entire sampling period a total of 4550 individuals belonging to 47 families of beetles were captured. Multivariate analysis performed on ground-dwelling beetles data showed a distinct separation in terms of assemblages between grazed and low-managed sites (stress value = 0.178). Environmental variables significant affecting beetles assemblages were the sheep grazing, the average diameter of cork oak trees, the altitude and the degree of shrubs cover. Further, constrained multivariate analysis indicated the significance of grazing, by both large ($F = 2.36$, $p = 0.03$) and small domestic herbivores ($F = 3.88$, $p < 0.01$), and altitude ($F = 3.54$, $p < 0.01$) as variables determining dung beetles assemblages. Our results support the reliability of ground-dwelling beetles as valuable tool both to detect environmental changes in Mediterranean cork oak woodlands and to define management strategies useful to increase the resilience of cork oak agroforestry systems under future global change scenarios.

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