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*Analysis and perspective within the context of bio-based economy
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Bryophytes as ecological indicators in beech woods of Sicily

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Beech woods, which have in Sicily one of the southernmost places of their distribution area, are localized in the mountain belt of North and North-Eastern Sicily, at an altitude of 1300-1900 m, reaching 900 m on the Peloritani. They are referred to the priority habitat 9210*, according to the Natura 2000 network of the European Union. Beech woods settle on different soils, such as incoherent sandy volcanic (Etna), calcareous or silico-arenaceous (Madonie) and clayey-schistose soils (Nebrodi and Peloritani). Bryophytes are considered important components of forestry ecosystems. Many of these organisms are specific to particular types of microhabitats and sensitive to changes such that species richness, abundance and specific composition, are directly correlated to microhabitat quality. Thus, bryophytes are able to provide information on the state of health of forestry ecosystems, pointing out where it is appropriate to perform restoration interventions. The analysis of the Sicilian beech woods, carried out using biological and ecological parameters (life form, life strategy, ecological indices, human impact), has emphasized a high rate of bryophyte diversity with more than 170 species, some of which are threatened and candidate to the inclusion in the new European red list. A multivariate analysis was used to examine the bryophyte composition of beech woods, showing a high diversification of the floras of different mountain ranges. Overall, it is a very peculiar bryoflora, when compared with that of other Italian beech forests. Data obtained from ecological and biological parameters are consistent with the climatic, microclimatic and edaphic characteristics of examined woods. The human impact, although not high, is present, mostly on the Etna. Sicilian beech woods, for their peculiarity highlighted also from the bryophyte flora, must be protected and supervised for their persistence over time. Thus, it is necessary to monitor these forests to plan any restoration with a more effective vigilance on Etna beech woods.

Current processes affecting forests and challenges for forestry in Mediterranean area

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