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Safeguarding saproxylic fungal biodiversity in Apennine beech forest priority habitats

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The FAGUS LIFE Project (LIFE11/NAT/IT/135) targets two European priority habitats, i.e. Habitat 9210* Apennine beech forests with Taxus and Ilex, and Habitat 9220* Apennine beech forests with Abies alba, within two National Parks: Cilento, Vallo di Diano and Alburni; Gran Sasso and Monti della Laga. The current limited distribution of the target habitats is also due to the impact of human activities on forest systems, such as harvesting and grazing. The FAGUS project aims at developing and testing management strategies able to integrate the conservation of priority forest habitats (9210* and 9220*) and the sustainable use of forest resources. In order to assess the responses to different management treatments the BACI monitoring design (Before-After, Control-Intervention) has been applied on forest structure and diversity of focus taxa before and after experimental harvesting treatments. Conventional management of Apennine beech forests impacts a wealth of taxonomic groups, such as saproxylic beetles and fungi, which are threatened throughout Europe by the lack of deadwood and of senescing trees, and by the homogeneous structure of managed forests. Deadwood has been denoted as the most important manageable habitat for biodiversity in forests not only for supporting a wide diversity of organisms, but also for playing a prominent role in several ecological processes, creating the basis for the cycling of photosynthetic energy, carbon, and nutrients stored in woody material. Especially fungi can be regarded as key group for understanding and managing biodiversity associated with decaying wood. The before-intervention field sampling was carried out in Autumn 2013 in 33 monitoring plots across the two national Parks. The occurrence at plot level of both Ascomycota and Basidiomycota sporocarps was surveyed. All standing and downed deadwood with a minimum diameter of 10 cm was sampled for sporocarps larger than 1 mm, and information on decay class and fungal morphogroups was recorded. Our results confirm Apennine beech forests as important repositories of saproxylic fungal diversity. We identified species of high scientific concern, in both National Parks. The most represented genus is Mycena with six and five species in the sampling units of “Gran Sasso and Monti della Laga” and “Cilento,Vallo di Diano and Alburni” national Parks respectively. Within the “Gran Sasso and Monti della Laga National Park” the area of Incodara is of special interest due to the occurrence of the species Ossicaulis lignatilis, which is among the 21 identified indicator species for assessing conservation value of beech forests in Europe. A consistent group of Ascomycota species, including Biscogniauxia nummularia, Bisporella citrina, Diatrype disciformis, Kretzschmaria deusta, Nemania serpens, and Xylaria hypoxylon, was tightly associated with coarse woody debris in “Gran Sasso and Monti della Laga National Park” plots. The decay stage seemed to exert a major influence on both species richness and their spatial patterns, with coarse woody debris in the intermediate to late stages of decay being the richest in species. (471 words)