Ecological Patterns of Wood-Inhabiting Myxomycetes in a Natural Forest of the Kamikochi, the Hida Mountain Range, Central Japan

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The ecology of lignicolous myxomycetes on fallen dead wood has never been clearly demonstrated in an intact forest. We compared the occurrence of myxomycete sporocarps on the dead wood of deciduous broad-leaved trees (BW) and coniferous trees (CW) to determine species preferences for tree types and wood decay stages. Surveys of sporocarps were performed during summer and autumn 2011–2013 in a conserved forest of the Northern Japan Alps. We recorded 89 taxa (87 species, two varieties): 60 species on BW and 64 species on CW. Between seasons, the percentage similarity of myxomycete occurrence was low (0.239), while between tree types it was higher (0.463). Ordination of the assemblages using non-metric multidimensional scaling demonstrated that myxomycete occurrence changed seasonally and exhibited tree type preference. Forty-nine species (55\% of the total) exhibited seasonal and/or tree type preferences. A majority of the species occurred on the intermediate decay stage of both tree types, but 38 species were correlated with particular decay stages of either CW or BW. The tree types contain wood parts at various decay stages, creating microenvironments that seasonally provide heterogeneous microhabitats for myxomycetes. Such diverse microhabitats on a local scale can promote myxomycete diversity in a natural forest.

Key words: Decay stages, myxomycetes, natural forest, preference, seasonality, tree types.

The myxomycetes (also known as the true slime molds) are a group of eukaryotic microorganisms, usually appearing as a fungus-like fruiting body that measures less than 1–2 mm in size (Martin and Alexopoulos 1969). They inhabit microenvironments in forest ecosystems, such as the bark surface of living trees, forest floor litter, and fallen trees (Stephenson 1988, 1989). The best-known species are those that occur on dead wood, as these myxomycetes tend to produce fruiting bodies large enough to be detectable in the field. Our understanding of myxomycete macrodistribution and ecology comes mainly from studies performed in forests of temperate and neotropical terrestrial ecosystems (e.g., Schnittler and Stephenson 2000, Takahashi and Hada 2010). Forest vegetation and climatic conditions influence the distribution and diversity of myxomycetes (e.g., Rojas and Stephenson 2007, Takahashi and Harakon 2010, 2012). A macroecological study showed that forest structure


高橋和成 a, 原紺勇一 b: 北アルプス上高地の自然林における腐朽木生変形菌の生態

多くの変形菌は倒木などの腐朽木上に発生するが、森林内での種多様性や生態についてはよく分かっていなかった。本研究の目的は、北アルプスの特別保護地区にある上高地で、落葉広葉樹と針葉樹の腐朽材に出現する変形菌を季節的に調査し、変形菌の季節性と樹種および木質腐朽段階への選好性を明らかにすることである。調査は2011–2013年に行い、本地域に87種20変種の変形菌が分布することが明らかになった。変形菌の種群の夏と秋の類似性は、百分率類似度で0.239となり低い値であった。変形菌の種群は、計量多次元尺度構成法により季節と樹種の違いで区分された。全出現種の55%にあたる49種が、季節性や樹種選好性を示した。多くの種は適度に腐朽した木質に出現し、特定の腐朽段階に出現する種として38種が認められた。変形菌は森林内の腐朽木に季節的に発生し、樹種や木質の腐朽段階を選び分けて分布している。こうした生態的分布パターンにより、森林生態系における変形菌の種多様性が維持されていると考えられる。

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