

Impact of landuse transformation on arbuscular mycorrhizal fungal diversity in the Kerala part of Nilgiri Biosphere Reserve, India

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ABSTRACT:

The study was conducted to analyze the effect of transformation of paddy fields into perennial crop dominant landuse systems on diversity, distribution and abundance of arbuscular mycorrhizal fungi (AM fungi). When the basal area of tree and palm community in different landuse systems derived from paddy fields did not differ significantly, density was low in coconut and rubber plantation. Among different landuse systems, polyculture homegarden showed significantly high value for tree species diversity index (2.31). Polyculture homegardens also differ from paddy field and other landuse systems studied with significantly more AM fungal spore abundance in the soil. Even though significantly low spore abundance in the soil was recorded, percentage of root colonization value was significantly more in the roots collected from arecanut mixed with perennial cropping system. In the present study, fifty six AM fungi species were recovered from paddy field and landuse systems derived from it. About 55%-74% of AM fungal species were found to be common in paddy fields and a given landuse system derived from it. AM fungal species diversity index values did not vary among landuse systems, with exceptions being in paddy fields and polyculture farms, where significantly low values were recorded. These findings highlight the fact that due to landuse transformation, aboveground plant species composition changed drastically while the changes in AM fungal species composition and spore abundance remained a slow process.

Keywords:

Aboveground plant diversity, AM fungal diversity, AM fungal spore abundance, Landuse transformation, Mycorrhizal root colonization, Paddy fields, Perennial cropping systems.