

Light, conspecific density and soil fungi have different effects on seedling growth of temperate tree species

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Tilia amurensis Rupr. Credit: PlantNet.org, [CC BY-SA](#)

Tree regeneration plays an important role in affecting community dynamics and future forest structure and functioning. Seedling growth, as a key part of tree regeneration, is strikingly influenced by multiple abiotic and biotic factors, such as light availability, conspecific density and soil fungi. However, the interactive effects of these factors on seedling growth are poorly understood.

To address the [knowledge gap](#), a research team led by Dr. Wang Xugao and Dr. Lin Fei from the Institute of Applied Ecology of the Chinese Academy of Sciences conducted a controlled pot experiment on seedlings of two dominant tree [species](#) in northeast China, namely, ash (*Fraxinus mandshurica*) and linden (*Tilia amurensis*) at two levels of light availabilities (30 and 80% of full light) with different filters, and two conspecific densities (two and eight seedlings) with soil collected from underneath conspecific adult trees.

To measure the effects of [soil fungi](#), the Illumina high-throughput sequencing technology was used to investigate soil fungal communities. The two species in this study have different functional traits. Ash is shade-intolerant and [arbuscular mycorrhizal fungi](#) (AM)-associated species, whereas linden is shade-tolerant and [ectomycorrhizal fungi](#) (EM)-associated species.

Results showed contrasting effects of light availability, conspecific density and soil fungi on seedling growth of ash and linden. Ash seedlings were better suited to environments with more light and fewer conspecifics, whereas linden seedlings preferred environments with relatively less light and more conspecifics under which a higher proportion of EM fungi was in the soil.

Moreover, the response differences of species were related with their own traits, such as shade tolerance and mycorrhizal type.

This study, titled "The effects of light, conspecific density and soil fungi on seedling growth of temperate tree species," was published in *Forest Ecology and Management*.

More information: Jin Yin et al, The effects of light, conspecific density and soil fungi on seedling growth of temperate tree species, *Forest Ecology and Management* (2022). [DOI: 10.1016/j.foreco.2022.120683](https://doi.org/10.1016/j.foreco.2022.120683)

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