

## Low within-species specificity for fungal partner in the rare mycoheterotrophic orchid *Epipogium aphyllum* Sw.

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Most mycoheterotrophic plants exhibit high specificity towards their fungal partners. Individuals associate with a narrow fungal clade or fungal species. Some within-species variation in specificity has been reported raising questions about genetic *versus* habitat influence on this trait. This question, though very relevant, is rarely explored. *Epipogium aphyllum* Sw. is temperate, fully mycoheterotrophic orchid species that associates with a great range of species within the ECM fungal genus *Inocybe*. Unlike the other studied MH orchids, it shows marked variability within and between populations in associated fungal species. Our study asks whether the observed pattern reflects low specificity or cryptic, genetically-based differences in fungal preferences. We studied the mycorrhizal associations in an abundant population of *E. aphyllum*. We sampled rhizome from 40 randomly selected individuals. Plants were genotyped using nuclear SSR and cDNA markers designed for this species, and whose polymorphism has been assessed over Europe. Fungal symbionts were barcoded using ITS marker. All the sampled individuals belonged to one multilocus genotype presumably derived from vegetative propagation. We identified 14 fungal OTU that were widely distributed into two subgenera *Inocybe* and *Mallocybe*. Obtained results point to low specificity within *Inocybe* in studied species. We discuss the evolutionary and ecological implications of this pattern.