

## Photobiont association and genetic diversity of the optionally lichenized fungus *Schizoxylon albescens*

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The fungus *Schizoxylon albescens* occurs both as lichen and as saprobe. Lichenized colonies grow on bark of *Populus tremula*, saprotrophic morphs grow on dead *Populus* branches. We wanted to (i) test if lichenized and saprotrophic *Schizoxylon albescens* are genetically distinct, (ii) investigate photobiont association and diversity, (iii) investigate interactions between fungi and algae that occur during co-cultivation, (iiii) test if *Schizoxylon* shows algal selectivity during the lichenization. Fungal and algal genetic diversity were investigated for three markers. Algae from lichenized thalli were isolated in axenic cultures, and the isolate sequence diversity was compared with the algae amplified directly from thallus fragments. Co-culture experiments of fungi and algae were performed to study morphological interaction patterns. Two distinct phylogenetic units are revealed in *S. albescens*, which are interpreted as phenotypically cryptic species.

The algae are related to *Coccomyxa* and *Pseudococcomyxa*, and form two distinct sister-clades separating samples isolated in cultures from those amplified directly from thallus fragments, indicating that more easily cultured strains of algae are not necessarily major components of the lichens. *Schizoxylon albescens* interacts with isolated algal strains, similarly to fungal-*Coccomyxa*-symbioses in nature. As the system is maintained without difficulty in culture, it can potentially be an easily controlled lichen symbiosis study system under lab conditions.