Psychrophilic fungi from the world's roof

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During a survey of cold-adapted fungi in alpine glaciers on the Qinghai-Tibet Plateau, 1 428 fungal isolates were obtained of which 150 species were preliminary identified. *Phoma sclerotioides* and *Pseudogymnoascus pannorum* were the most dominant species. Psychrotolerant species in *Helotiales* (*Leotiomycetes, Ascomycota*) were studied in more detail as they represented the most commonly encountered group during this investigation. Two phylogenetic trees were constructed based on the partial large subunit nrDNA (LSU) to infer the taxonomic placements of these strains. Our strains nested in two well-supported major clades, which represented *Tetracladium* and a previously unknown lineage. The unknown lineage is distant to any other currently known genera in *Helotiales*. *Psychrophila* gen. nov. was therefore established to accommodate these strains which are characterised by globose or subglobose conidia formed from phialides on short or reduced conidiophores. Our analysis also showed that an LSU-based phylogeny is insufficient in differentiating strains at species level. Additional analyses using combined sequences of ITS+TEF1+TUB regions were employed to further investigate the phylogenetic relationships of these strains. Together with the recognisable morphological distinctions, six new species (i.e. *P. antarctica*, *P. lutea*, *P. olivacea*, *T. ellipsoideum*, *T. globosum* and *T. psychrophilum*) were described. Our preliminary investigation indicates a high diversity of cold-adapted species in nature, and many of them may represent unknown species.

Keywords: GLACIERS; PHOMA SCLEROTIOIDES; PSEUDOGYMNOASCUS PANNORUM; PSYCHROPHILA; PSYCHROTOLERANT; TETRACLADIUM

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