

Reviewing the taxonomy of podaxis: Opportunities for understanding extreme fungal lifestyles.

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Abstract

There are few environments more hostile and species-poor than deserts and the mounds of Nasutitermitinae termites. However, despite the very different adaptations required to survive in such extreme and different environments, the fungal genus *Podaxis* is capable of surviving in both, where few other fungi are reported to grow. Despite their prominence in the landscape and their frequent documentation by early explorers, there has been relatively little research into the genus. Originally described by Linnaeus in 1771, in the early 20th Century, the then ~25 species of *Podaxis* were almost entirely reduced into one species: *Podaxis pistillaris*. Since this reduction, several new species of *Podaxis* have been described but without consideration of older descriptions. This has resulted in 44 recognised species names in *Index Fungorum* but the vast majority of studies and fungarium specimens still refer to *P. pistillaris*. Studies of the extremely

different lifestyles is hampered by its effective reduction to a single-species genus. Here we examine the history of the taxonomy of *Podaxis* before focusing on its extreme lifestyles. From this, we consider how the muddled taxonomy of *Podaxis* may be resolved; opening up further avenues for future research in this enigmatic fungal genus.

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