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Enlightening the Australian "dark" Fungi: Linking DNA barcodes to fungal names.

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eDNA metabarcoding of Fungi has revolutionized our views of biodiversity and enables monitoring of ecosystem functions and soil health across all groups of Fungi. Currently, the lack of knowledge about Australian Fungi hinders accurate species identifications that rely on reference DNA barcode sequences. Therefore, most eDNA studies end up with more than half of the molecular operational taxonomic units (mOTUs) not assigned at species level or even to a functional guild. While many fungal species await formal description, a good proportion of these unidentified mOTUs are simply lacking corresponding reference sequences. To assess this information gap, we review the state of knowledge about Australian fungal barcodes by combining the checklist of fungal names from the National Species List, with GBIF data on observations and specimens, along with data on ITS barcodes from the UNITE reference database. We further explore the potential and effectiveness of ITS barcoding of fungarium specimens for 1) filling this gap and 2) the rapid identification of specimens by non-specialists. We conclude that fungarium collections contain an untapped wealth of taxonomic, ecological and biodiversity information that is currently undervalued.

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