

Why taxonomy matters in biotechnological research

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Abstract

This paper will give examples of how taxonomy can improve biotechnological research. In the tropics there is a huge potential for finding new cultivatable mushrooms and this should be exploited. With this aim we are carrying out taxonomic and phylogenetic studies of the genus *Agaricus* and other selected potential, edible macrofungal groups (e.g. *Gasteromycetes*, *Lepista*, *Lepiota*, *Macrolepiota*, *Tuberaceae*, *Volvariella*) in northern Thailand and have discovered numerous potential new cultivatable fungi. We have collected and isolated numerous species and strains of these potentially cultivatable edible mushrooms and maintain a culture collection of strains of these fungi at Mae Fah Luang University. We are carrying out a molecular study of selected taxa in order to establish their phylogeny. This will help us to predict which fungi are edible. We will investigate the potential nutritious and medicinal properties (nutriceuticals) of selected indigenous species and their characterization. Any novel chemical structures will be characterized and the results published. Results for several promising taxa will be presented in this paper. Several of the taxa are potentially edible and cultivatable species and some examples will be given. We have selected some *Agaricus* species and are trying to develop ways to cultivate them. Finally we will carry out research to develop methods to industrially produce several mushrooms at a laboratory scale and then source funding for commercializing potential new edible mushrooms or strains. We will also discuss non-industrial ways to establish and produce mushrooms. The talk will relay our experiences in collecting and finding potential species for domestication and illustrate how we select species, how we use molecular data to aid our research and the results of laboratory scale studies. Other examples where taxonomy will impact on biotechnological research will be touched upon.

Keywords: molecular study, mushrooms, taxonomy