

Mycorrhizal and non-mycorrhizal mushroom cultivation- constraints and opportunities for Sub-Saharan Africa

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Abstract

Mushrooms have a long history of cultivation, dating back to 600 AD. However, most edible mushroom species worldwide are still gathered from the wild, a practice which is unsustainable in contributing to global food security. Cultivation of saprotrophic mushroom species has successfully used agricultural waste as growing substrate. Their mycorrhizal counterparts, however, remain dependent on their woody hosts and seasonality thereby being less accessible to urban communities. The main reason has been the lack of methods which effectively simulate mycorrhizal symbiotic environments. Apart from requiring particular species of bacteria for mycorrhization with their woody host species, mycorrhizal mushrooms also strictly require glucose or fructose as their only source of carbon. Hence, sustainable off-host cultivation of mycorrhizal mushrooms will require better understanding of exact conditions of mycorrhization and fructification. In this review, a brief history of use and general biology of mushrooms, and the cultivation methods employed for non-mycorrhizal and mycorrhizal mushrooms are discussed. Finally, a discussion is provided on the prospects for Sub-Saharan Africa in developing modern sustainable cultivation methods for wild mushrooms towards meeting the key UN Sustainable Development Goals.

Keywords: carbon source, ectomycorrhizae, macrofungi, Sub-Saharan Africa, mushroom cultivation, nitrogen source, spawn, sporocarp