Simple and low-cost methods for the long-term preservation of *Agaricus brasiliensis* fungi

**What is this research about?**
The edible mushroom *Agaricus brasiliensis* (also called *A. blazei* or *A. subrufescens*, or more commonly Almond Portobello) has been studied for a number of reasons, including its reproductive behaviour and its potential ability to stimulate the human immune system. In order to successfully research this mushroom species, scientists need to be able to preserve and keep samples for long periods of time – up to 12 months or more. Unfortunately, little is known about which varieties (subtypes) of this species are best suited to long-term preservation. Similarly, researchers have yet to determine the best methods for preserving and then storing *A. brasiliensis*. A number of different mushroom preservation techniques exist, including: cryopreservation (freezing using liquid nitrogen), freeze-drying, and placement in preservation solutions (such as mineral oil, water, or glycerol).

**What did the researchers do?**
The researchers tested combinations of different substrates (growing material), preservation solutions, and temperatures. Some preservation methods involved only a substrate and a specified temperature (no preservation solution). The CS1 variety of *A. brasiliensis* was added to tubes containing each of the 21 different treatments and kept for 12 months. Each month, a small sample from each tube was transferred to a Petri dish and incubated at 28°C for 5 days to see if the mushroom could reactivate and if so, how well it grew. Six *A. brasiliensis* varieties and four other mushroom species were also evaluated using parboiled rice as a substrate.

**What you need to know:**
The cold-intolerant and difficult to maintain *A. brasiliensis* mushroom can be kept long-term at room temperature, with paddy rice as a substrate and water as a preservation solution. Good alternatives include compost, soil, paddy rice, or parboiled rice without preservation solution at 10°C.
What did the researchers find?
The rice/water/room temperature method was the most effective for preserving the CS1 variety of *A. brasiliensis*, with 100% of varieties reactivating after 12 months. This variety was also well preserved when stored at 10°C with soil, mushroom cultivation compost, or rice as the substrate and no preservation solution. *A. brasiliensis* variety CS1 did not do well when stored at cool temperatures, even for short period of time. Parboiled rice was an effective substrate for five other varieties of *A. brasiliensis* as well as CS1. Reactivating mushroom varieties had no impact on mushroom productivity (a measure of growth).

How can you use this research?
Mycologists and researchers who work with *A. brasiliensis* can use this research to more effectively preserve, store, and reactivate *A. brasiliensis* varieties at low cost.

Keywords:
Mushrooms, *Agaricus brasiliensis*, *A. subrufescens*, Almond Portobello, preservation methods

About the University of Guelph researcher:
Danny Lee Rinker is an Associate Professor (retired) in the Department of Plant Agriculture, at the University of Guelph. Email: drinker@uoguelph.ca.

Article citation:

Cite this work:

This summary is a project of the Institute for Community Engaged Scholarship (ICES) at the University of Guelph, with project partners: the Catalyst Centre, SPARK Program at the University of Guelph, and the Knowledge Mobilization Unit at York University. This project is part of the Pan-Canadian Research Impact Network. http://csahs.uoguelph.ca/pps/Clear_Research

This work is licensed under the Creative Commons Attribution-NoDerivs 3.0 Unported