Culturing and Maintaining Fungi

Live Material Care Guide

Background

Kingdom Mycetae, also referred to as Kingdom Fungi, consists of very unique organisms. Fungi are found in both terrestrial and aquatic environments all over the world. They obtain nutrients from the environment through absorption. This unique trait sets them apart from plants and animals. Fungi are also the primary decomposers of organic matter, making them indispensible to ecosystems. Some species, however, are parasitic, causing massive damage to crops and livestock. Other types of fungi are quite beneficial to society, such as those used to make antibiotics (i.e., *Penicillium*) as well as yeasts and mushrooms used in food. Species range in size from microscopic, single-celled creatures to huge multicellular organisms.

Culturing/Media

Upon arrival of fungal stock cultures, place cultures in a dark or dimly lit area at a temperature appropriate for the type of fungus. Two wide spectrum agars, in which many fungi will grow, include Potato Dextrose Agar and Sabouraud Dextrose Agar. Sabouraud Dextrose Agar and Cornmeal Agar are especially good for yeasts. Recommended temperatures and appropriate media for many common fungal species are shown in the chart below.

Aspergillus niger. Ascomycete. Black mold found on plants. Citric acid producer.	25 °C Potato Dextrose Agar
Penicillium chrysogenum. Ascomycete. Blue mold on cheese and fruit. Producer of penicillin.	25 °C Potato Dextrose Agar
Rhizopus stolonifer (nigricans). Plus Zygomycete. Black bread mold. Used with minus strain for zygospore demonstration.	25 °C Potato Dextrose Agar
Rhizopus stolonifer (nigricans). Minus Zygomycete. Black bread mold. Used with plus strain for zygospore demonstration.	25 °C Potato Dextrose Agar
Saccharomyces cerevisiae. Ascomycete. Baker's and brewers' yeast.	25–30 °C Potato Dextrose Agar
Saccharomyces cerevisiae var. ellipsoides. Ascomycete. Winemakers' yeast.	25–30 °C Potato Dextrose Agar
Sordaria fimicola. Wild type. Ascomycete. Produces brown ascospores.	30 °C Cornmeal-Glucose-Yeast Agar
Sordaria fimicola. Tan Mutant. Ascomycete. Produces tan ascospores.	30 °C Cornmeal-Glucose-Yeast Agar
Sordaria fimicola. Wild/Tan Combination Plate.	30 °C Cornmeal-Glucose-Yeast Agar
Basic Fungi Set *Schizophyllum commune.* Basidiomycete. *Schizosaccharomyces octosporus.* Ascomycete. *Phycomyces blakesleeanus.* Zygomycete. *Arthorobotrys conoides.* Deuteromycete. *Achyla* or *Saprolegnia.* Oomycete.	 25–30 °C Sabouraud Dextrose Agar 25–30 °C Sabouraud Dextrose Agar 25–30 °C Potato Dextrose Agar 25–30 °C Cornmeal Glucose Agar 20–25 °C Cornmeal Agar for short term, sterile wheat seed in sterile water for long term

Keep culture tubes sealed with the caps, or replace with plugs, to avoid cross-contamination and dehydration. Fungal cultures should be subcultured to fresh agar every few weeks to maintain active growth. Cultures typically require 3 to 7 days before they begin to develop.

Sterile techniques need to be implemented at all times when handling fungal cultures. Wear gloves and goggles while handling organisms. It is important to sterilize the metal inoculating loop between "dips" to control cross contamination. Place the inoculating loop in the flame until it glows red and remove from flame and hold still until cool. If a hissing sound is heard when the loop enters the media, remove and reflame to sterilize. Upon finishing work with fungal cultures, sterilize the work area and wash your hands with soap. (It is also a good idea to sterilize the incubator/cabinet handle and any surface that may have been touched by your glove with a 70% ethanol or 10% bleach solution in a spray bottle.)

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Disposal

Please consult your current *Flinn Scientific Catalog/Reference Manual* for general guidelines and specific procedures, and review all federal, state and local regulations that may apply, before proceeding. Fungal cultures may be disposed of according to Flinn Suggested Biological Waste Disposal Method Type I.

Tips

- Although all fungal strains sold by Flinn Scientific are nonpathogenic, we recommend and strongly encourage that teachers and students practice aseptic techniques when working with fungi. Flinn Scientific, Inc. assumes no responsibility for infection resulting from laboratory use of fungus.
- Sterilization prior to disposal is highly recommended—autoclaving is the preferred method.
- Prepare 10% bleach solutions for sterilization by diluting regular household bleach by a factor of 10 (i.e., add 100 mL of bleach to 1 L of water). Use within one week.
- In general, fungi, including yeast and bacteria will remain viable longer on solid agar slants than submerged in broths. Even healthy-looking cultures need to be subcultured periodically to prevent the build up of toxic gases.

Materials for *Maintaining Fungal Cultures* are available from Flinn Scientific, Inc.

Catalog No.	Description
LM1019	Aspergillus niger
LM1020	Penicillium chrysogenum
LM1021	Rhizopus stolonifer (Plus Zygomycete)
LM1022	Rhizopus stolonifer (Minus Zygomycete)
LM1023	Saccharomyces cerevisiae
LM1024	Sacchromyces cerevisiae var. ellipsoides
LM1150	Sordaria fimicola, Wild Type
LM1219	Sordaria fimicola, Tan Mutant
LM1259	Sordaria fimicola, Wild/Tan Combination Plate
LM1260	Basic Fungi Set
P0098	Potato Dextrose Agar, 100 g
S0337	Sabouraud Dextrose Agar, 100 g
FB2012	Cornmeal-Glucose Agar, 40 g
FB0541	Wheat Seed, 100 g
AB1470	Petri Dish, Disposable Polystyrene, 20
AP1051	Inoculating Loop
ML1381	Microscope Slides, Glass
ML1385	Coverslips, 22 × 22 mm
MS5040	High School Compound Microscope

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.