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Some Optimal Growth Media For Use In The Botany Classroom

MARSHALL D. SUNDBERG*

ABSTRACT—Cultures of various bacteria and fungi are often used in introductory botany classes. In most cases the students are simply asked to examine these colonies or to prepare a microscope slide. Directions are given in this paper for the preparation of optimal growth media which may be consumed by the student. This provides a new twist to otherwise routine laboratory exercises.

PREPARATION OF MEDIA

1. *Streptococcus thermophilus* (yogurt)

Necessary supplies and equipment:

- 1 quart jar with lid (preferably wide-mouth)
- 1 quart milk
- 1 tbsp plain yogurt
- powdered milk (optional)
- 37°C incubator

Procedure:

- bring milk to a boil
- set aside and allow to cool to about 37°C
- pour all but 1 cup into a clean quart jar
- mix 1 tbsp plain yogurt into cup of milk and add to remainder of milk
- cover with aluminum foil and place in 37°C incubator for 6 or more hours. DO NOT DISTURB. (Longer incubation periods produce a more sour population.)
- after growth period is complete, remove culture from incubator and refrigerate
- S. thermophilus* may be eaten plain or with fruit, according to the individual's taste preference.

2. *Leuconostoc* spp. and others. (sauerkraut)

Necessary supplies and equipment:

- 1 wide mouth container—preferably crockery (1000 ml beaker will work)
- 1, or more, shoots of *Brassica oleracea* var. capitata (cabbage)
- sodium chloride
- kraut cutter (food grater will work)

Procedure:

- coarsely grate the *Brassica* shoot
- add 2 tsp NaCl per pound of grated *Brassica* and mix well
- firmly pack the medium in the wide-mouth container, cover with a clean cloth, and add a weight to maintain the solid portion of the medium below the liquid surface.
- set aside in a cool corner of the room (preferably 15°C)
- periodically skim the scum from the surface of the medium

-after 4 or more weeks the medium should be boiled, uncovered, for at least 15 minutes and transferred to clean plate.

(Students may wish to add celery seed to the boiling medium and introduce bratwurst or frankfurters to the study materials on the plate.)

3. *Saccharomyces cerevisiae* (beer)

Necessary supplies and equipment:

- 1 strong glass container which will hold at least 5½ gallons
- several bottles - enough to hold 5 gallons (screw cap varieties will work but a bottle capper and caps work best)
- 1 stopper to fit the large container (1-holed)
- 1 length of tubing to carry exhaust to a smaller container of water
- 5 gallons water
- 3 to 3½ pounds sugar
- 1 small bit of a cake of *Saccharomyces cerevisiae*
- ½ can malt extract (Blue Ribbon Hop-flavored Extract of Malted Corn and Barley)
- 1 small potato-peeled and sliced (optional)

Procedure:

- mix water, sugar, malt extract, and potato in the large container
- add *S. cerevisiae* and stir in well
- place stopper in the container and run the tubing into the smaller container of water
- allow mixture to sit at room temperature for 8 to 10 days until few bubbles exit into the exhaust bottle
- add 1 tsp sugar to each quart sized bottle and siphon medium from large container, filling each bottle
- cap bottles tightly and allow to stand until clear (5 or 6 days)
- decant medium into glasses. (Chilling of medium may be preferred, depending on the individual experimenter.)

NOTE: At no time should the equipment or glassware be washed with any soap or detergent. Rinsing with clear water makes everything ready for repetition.

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