Use of Potato Flakes Agar in Clinical Mycology

MICHAEL G. RINALDI

Department of Microbiology, Montana State University, Bozeman, Montana 59717

Received 21 December 1981/Accepted 1 March 1982

A formulation comprised of commercially available potato flakes, glucose, and agar provides a medium which is inexpensive, is easily prepared, and is particularly useful for the identification of mold fungi encountered in the clinical mycology laboratory. The inclusion of appropriate antimicrobial agents results in a selective medium effective in the isolation and identification of medically important fungi.

Fungi are increasing in prevalence and significance as etiological agents of infectious diseases. These organisms are particularly important in causing infections of the compromised host, e.g., "opportunistic" infections (3, 6, 7). Although yeasts may be identified in the clinical microbiology laboratory primarily by biochemical tests, the molds require microscopic evaluation of morphological structures for their proper identification (2). The frustration felt by microbiologists attempting to identify fungi seen in the clinical laboratory is enhanced by the failure to observe characteristic morphological structures when these organisms are isolated and grown on standard mycological media, e.g., Sabouraud dextrose agar.

To enhance the production of characteristic morphological features, e.g., conidia formed in relationship to conidigenous cells in molds, they are often set up by use of a slide culture technique or by transfer to a medium known to enhance conidiation, such as potato dextrose agar, corn meal agar, or malt extract agar, or both (1, 5). These efforts often require additional time, expense, and frequently necessitate the transfer of the unknown mold from the original isolation medium.

In my experience, the use of commercially available potato dextrose agar has not resulted in the optimal enhancement of the production of morphological structures by molds as has "home-made" potato dextrose agar (the use of whole potatoes which are washed, diced, boiled, and strained through cheesecloth to collect the liquid used in the medium). This communication describes the formulation of a medium which is equivalent to home-made potato dextrose agar in the promotion of conidiation by molds. It is inexpensive, easy to prepare, stable in storage, and simple to modify for the initial isolation and identification of many medically important fungi. The use of commercially available potato flakes resulted in this formulation being named potato flakes agar (PFA).

The ingredients necessary to prepare 1 liter of PFA are potato flakes (any commercially available brand of potato flakes may be used, e.g., Betty Crocker Potato Buds, Instant Mashed Potato Puffs, [both from General Mills, Inc., Minneapolis, Minn.]), 20 g; glucose, 10 g; agar, 15 g; and distilled water, 1,000 ml.

The medium is prepared by placing each of the ingredients into an appropriately sized Erlenmeyer flask and adding 1,000 ml of distilled water. The flask is capped and swirled to mix the ingredients. The contents are heated, with gentle stirring throughout, to the point of boiling. The heated flask is autoclaved at 121°C, 15 lb/in², for 15 min. After sterilization, plates may be aseptically poured. If agar slants are desired, the PFA should be dispensed into capped tubes after being heated and stirred. The PFA should be autoclaved and cooled; the tubes can then be slanted.

It is important to note that, after the sterilization step, the potato flakes may settle to the bottom of the flask (or tubes). The sedimented flakes may be resuspended by swirling the flask periodically while pouring plates or tilting the agar slants (the capped end should be tilted vertically downward) before allowing the agar to solidify.

This medium may be modified by the addition of 0.5 mg of cycloheximide (Upjohn Co., Kalamazoo, Mich.) per ml and 0.5 mg of chloramphenicol (Parke, Davis & Co., Detroit, Mich.) per ml to the boiling mixture before being autoclaved. In this case, PFA effectively becomes a selective isolation medium for many pathogenic fungi. The incorporation of the pH indicator bromthymol blue (Difco Laboratories, Detroit, Mich.) results in a selective isolation and identification medium for dermatophytic fungi. Detection of these fungi is enhanced because of a colorimetric change resulting from alkaline conditions formed from metabolic products produced by this group of molds (M. G. Rinaldi, V. J. Stevens, and C. Halde, Abstr. Annu.
Proper diagnosis and treatment of mycotic diseases rests upon isolation and accurate identification of the etiological agents. Correct identification of molds causing human and animal mycoses is incumbent on visualization of characteristic morphological features by the clinical microbiologist. PFA is a formulation which encourages sporulation of molds (4), is easy to make, is inexpensive, and remains stable when stored under refrigeration. With modification by addition of antimicrobial agents or specific pH color indicators, or both, PFA will allow selective isolation and enhance the production of morphological structures necessary for the identification of many pathogenic and opportunistic molds.

LITERATURE CITED