15. Favero, Gabis and Vesley. 1984. *In* Speck (ed.), Compendium of methods for the microbiological examination of foods, 2nd ed. American Public Health Association, Washington, D.C.
16. Quisno, Gibby and Foter. 1946. Am. J. Pharm. *118*: 320.
17. Erlandson and Lawrence. 1953. Science *118*: 274
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20. Larone. 1995. Medically important fungi: a guide to identification, 3rd ed. American Society for Microbiology, Washington, D.C.
21. Vanderzant and Splittstoesser (ed.). 1992. Compendium of methods for the microbiological examination of foods, 3rd ed. American Public Health Association, Washington, D.C.
22. Marshall (ed.) 1993. Standard methods for the examination of dairy products, 16th ed. American Public Health Association, Washington, D.C.
23. ICMSF. 1988. Microorganisms in foods 4. Intern. Comm. on Microbiology Spec. for Foods. Blackwall Scient. Publs., Palo Alto, Calif.

Availability

Difco™ Sabouraud Dextrose Agar

BAM BS10 CCAM CMPH COMPF EP USP

Cat. No.	210940	Dehydrated – 100 g
	210950	Dehydrated – 500 g
	211661	Dehydrated – 2 kg
	210930	Dehydrated – 10 kg

BBL™ Sabouraud Dextrose Agar

BAM BS10 CCAM CMPH COMPF EP USP

Cat. No.	211584	Dehydrated – 500 g
	211585	Dehydrated – 5 lb (2.3 kg)
	293309	Dehydrated – 25 lb (11.3 kg)

United States and Canada

Cat. No.	221180	Prepared Plates (Deep Fill) – Pkg. of 20*
	221278	Prepared Plates (Deep Fill) – Ctn. of 100*
	221235	Sterile Pack **RODAC**™ Plates – Pkg. of 10*
	297739	Prepared Plates (150 x 15 mm-style), Deep Fill – Pkg. of 24*
	221012	Prepared Slants (A Tubes) – Pkg. of 10*
	221013	Prepared Slants (A Tubes) – Ctn. of 100*
	297072	Prepared Slants (C Tubes) – Pkg. of 10*
	297479	Prepared Slants (C Tubes) – Ctn. of 100*
	297812	Prepared Pour Tubes, 20 mL – Pkg. of 10*
	296182	Prepared Pour Tubes, 20 mL – Ctn. of 100*
	221136	**Mycoflask**™ Bottles – Pkg. of 10*
	221137	**Mycoflask**™ Bottles – Ctn. of 100*
	297720	Transgrow-style Bottles – Ctn. of 100*
	295699	Bottles, 1 oz. – Ctn. of 100*

Europe

Cat. No.	254039	Prepared Plates – Pkg. of 20*
	254083	Prepared Plates – Ctn. of 120*

Japan

Cat. No.	251180	Prepared Plates – Pkg. of 20*

BBL™ Sabouraud Dextrose Agar with Chloramphenicol

MCM7

Cat. No.	221851	Prepared Plates (Deep Fill) – Pkg. of 20*
	221825	Prepared Slants (C Tubes) – Ctn. of 100*
	221314	**Mycoflask**™ Bottles – Pkg. of 10*
	221315	**Mycoflask**™ Bottles – Ctn. of 100*
	299098	Bottle, 500 mL – Pkg. of 10

BBL™ Sabouraud Dextrose Agar with Chloramphenicol and Cycloheximide

Cat. No.	297649	Prepared Slants – Pkg. of 10*

BBL™ Sabouraud Dextrose Agar with Chloramphenicol and Gentamicin

MCM7

Cat. No.	296359	Prepared Plates – Pkg. of 20*

BBL™ Sabouraud Dextrose Agar with Lecithin and Polysorbate 80

Cat. No.	221233	Sterile Pack **RODAC**™ Plates – Pkg. of 10*
	292653	Isolator Pack, **Finger Dab**™ Prepared Plates (100 × 15 mm-style) – Pkg. of 10*
	292654	Isolator Pack, **Finger Dab**™ Prepared Plates (150 × 15 mm-style) – Pkg. of 5*

Difco™ Sabouraud Dextrose Broth

BAM

Cat. No.	238220	Dehydrated – 100 g
	238230	Dehydrated – 500 g
	238210	Dehydrated – 2 kg

Difco™ Fluid Sabouraud Medium

Cat. No.	264210	Dehydrated – 500 g

Difco™ Sabouraud Maltose Agar

Cat. No.	211020	Dehydrated – 500 g

Difco™ Sabouraud Maltose Broth

Cat. No.	242910	Dehydrated – 500 g

**Store at 2-8°C.*

Sabouraud Agar, Modified • Sabouraud Dextrose Agar, Emmons • Sabouraud Dextrose Agar, Emmons, with Antimicrobics

Intended Use

Sabouraud Agar, Modified (Emmons) and Sabouraud Dextrose Agar, Emmons are used in qualitative procedures for cultivation of dermatophytes and other pathogenic and nonpathogenic fungi from clinical and nonclinical specimens.

Sabouraud Dextrose Agar, Emmons is rendered selective by the addition of antimicrobial agents.

Summary and Explanation

Sabouraud Dextrose Agar was devised by Sabouraud for the cultivation of dermatophytes.[1] The low pH of approximately 5.6 is favorable for the growth of fungi, especially dermatophytes, and inhibitory to contaminating bacteria in clinical specimens.[2] The acidic pH, however, also may inhibit some fungal species.[2-4] Emmons modified the original formulation by adjusting the pH close to neutral to increase the recovery of fungi and by reducing the dextrose content from 40 to 20 g/L.[4] The two base formulations offered differ in peptone content and amount of agar. The addition of antimicrobics further increases the selectivity of the medium.[3,4]

Principles of the Procedure

Peptones are sources of nitrogenous growth factors. Dextrose provides an energy source for the growth of microorganisms. Gentamicin is an aminoglycoside antibiotic that inhibits the growth of gram-negative bacteria. Chloramphenicol is inhibitory to a wide range of gram-negative and gram-positive bacteria,

User Quality Control

NOTE: Differences in the Identity Specifications and Cultural Response testing for media offered as both **Difco**™ and **BBL**™ brands may reflect differences in the development and testing of media for industrial and clinical applications, per the referenced publications.

Identity Specifications

Difco™ Sabouraud Agar, Modified

Dehydrated Appearance:	Light beige, free-flowing, homogeneous.
Solution:	5.0% solution, soluble in purified water upon boiling. Solution is light to medium amber, slightly opalescent.
Prepared Appearance:	Light to medium amber, slightly opalescent.
Reaction of 5.0% Solution at 25°C:	pH 7.0 ± 0.2

Cultural Response

Difco™ Sabouraud Agar, Modified

Prepare the medium per label directions. Inoculate and incubate at 30 ± 2°C for 18-48 hours, or up to 7 days if necessary.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY
Aspergillus niger	16404	Undiluted	Good
Candida albicans	10231	30-300	Good
Lactobacillus rhamnosus	9595	30-300	Good
Saccharomyces cerevisiae	9763	30-300	Good
Trichophyton mentagrophytes	9533	Undiluted	Good

Identity Specifications

BBL™ Sabouraud Dextrose Agar, Emmons

Dehydrated Appearance:	Fine, homogeneous, free of extraneous material, may contain a large number of minute to small tan specks.
Solution:	4.7% solution, soluble in purified water upon boiling. Solution is pale to medium, yellow to tan, clear to slightly hazy.
Prepared Appearance:	Pale to medium, yellow to tan, clear to slightly hazy.
Reaction of 4.7% Solution at 25°C:	pH 6.9 ± 0.2

Cultural Response

BBL™ Sabouraud Dextrose Agar, Emmons

Prepare the medium per label directions. Inoculate with fresh cultures and incubate at 25 ± 2°C for 7 days.

ORGANISM	ATCC™	RECOVERY
Aspergillus niger	16404	Good
Aureobasidium pullulans	9348	Good
Blastomyces dermatitidis	56218	Good
Candida albicans	60193	Good
Cryptococcus neoformans	32045	Good
Microsporum audouinii	9079	Good
Nocardia asteroides	19247	Good
Penicillium roquefortii	9295	Good
Trichophyton mentagrophytes	9533	Good

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and cycloheximide is an antifungal agent that is primarily active against saprophytic fungi and does not inhibit yeasts or dermatophytes.[5]

Formulae

Difco™ Sabouraud Agar, Modified

Approximate Formula* Per Liter

Enzymatic Digest of Casein	10.0	g
Dextrose	20.0	g
Agar	20.0	g

BBL™ Sabouraud Dextrose Agar, Emmons

Approximate Formula* Per Liter

Pancreatic Digest of Casein	5.0	g
Peptic Digest of Animal Tissue	5.0	g
Dextrose	20.0	g
Agar	17.0	g

**Adjusted and/or supplemented as required to meet performance criteria.*

Directions for Preparation from Dehydrated Product

1. Suspend the powder in 1 L of purified water:
   Difco™ Sabouraud Agar, Modified – 50 g;
   BBL™ Sabouraud Dextrose Agar, Emmons – 47 g.
   Mix thoroughly.
2. Heat with frequent agitation and boil for 1 minute to completely dissolve the powder.
3. Autoclave at 118-121°C for 15 minutes.
4. Test samples of the finished product for performance using stable, typical control cultures.

Procedure

Consult appropriate references for information about the processing and inoculation of specimens.[2,3]

Prepared tubed slants primarily are intended for use with pure cultures for maintenance or other purposes.

For isolating fungi from potentially contaminated specimens, a selective medium should be inoculated along with the nonselective medium. Incubate the plates at 25-30°C in an inverted position (agar side up) with increased humidity. For isolation of fungi causing systemic mycoses, two sets of media should be inoculated, with one set incubated at 25-30°C and a duplicate set at 35 ± 2°C.

All cultures should be examined at least weekly for fungal growth and should be held for 4-6 weeks before being reported as negative.

Expected Results

After sufficient incubation, the plates or tubes should show growth with or without isolated colonies. Transfer of growth from tubes to plated media may be required in order to obtain pure cultures of fungi.

Examine plates or tubes for fungal colonies exhibiting typical color and morphology.[6] Biochemical tests and serological procedures should be performed to confirm findings.

Limitation of the Procedure

Antimicrobial agents incorporated into a medium to inhibit bacteria may also inhibit certain pathogenic fungi.

References

1. Sabouraud. 1892. Ann. Dermatol. Syphil. 3:1061.
2. Ajello, Georg, Kaplan and Kaufman. 1963. CDC laboratory manual for medical mycology. PHS Publication No. 994, U.S. Government Printing Office, Washington, D.C.
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4. Kwon-Chung and Bennett. 1992. Medical mycology. Lea & Febiger, Philadelphia, Pa.
5. Lorian (ed.). 1996. Antibiotics in laboratory medicine, 4th ed. Williams & Wilkins, Baltimore, Md.
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Availability

Difco™ Sabouraud Agar, Modified

SMWW

Cat. No.	274720	Dehydrated – 500 g
	274710	Dehydrated – 2 kg

BBL™ Sabouraud Dextrose Agar, Emmons

CMPH MCM7 SMWW

Cat. No.	211589	Dehydrated – 500 g
	221849	Prepared Plates (Deep Fill) – Pkg. of 20*
	221867	Prepared Plates (Deep Fill) – Ctn. of 100*
	221826	Prepared Slants (C Tubes) – Pkg. of 10
	221827	Prepared Slants (C Tubes) – Ctn. of 100
	296308	**Mycoflask™** Bottles – Pkg. of 10

BBL™ Sabouraud Dextrose Agar, Emmons with Chloramphenicol

MCM7

Cat. No.	297931	Prepared Plates (Deep Fill) – Pkg. of 10*
	297474	Prepared Plates (Deep Fill) – Ctn. of 100*

BBL™ Sabouraud Dextrose Agar, Emmons with Chloramphenicol and Cycloheximide

Cat. No.	297932	Prepared Plates (Deep Fill) – Pkg. of 10*

BBL™ Sabouraud Dextrose Agar, Emmons with Gentamicin

Cat. No.	296348	Prepared Plates (Deep Fill) – Pkg. of 20*

**Store at 2-8°C.*

Sabouraud Liquid Broth Modified

(See Antibiotic Assay Media)

Saline, 0.45% • Saline, Normal

Intended Use

Saline, 0.45% is used in procedures that require this saline diluent, such as with the VITEK™* identification and susceptibility testing system.

Saline, Normal (physiological) is used in procedures that require the use of an isotonic diluent.

**VITEK is a trademark of bioMerieux Vitek, Inc.*

Summary and Explanation

Saline, 0.45%, is used in procedures where this concentration of sodium chloride is suitable.[1]

An isotonic diluent may be used for dilution of bacterial cells to provide a concentration suitable for microscopic observation, determination of cell numbers, analysis for genetic or metabolic properties, washing cells preparatory to study, or preparation of standardized inocula.[2,3]

Principles of the Procedure

Saline is routinely used as a diluent to adjust the turbidity of bacterial cell suspensions to help maintain cell integrity and viability.[3,4]

Procedure

Using a sterile pipette, adjust the turbidity of a culture to be equivalent to a standard, such as a McFarland (barium sulfate) turbidity standard.[3,4]

The diluted culture should be used within the time limit stated in the appropriate method or procedure.

Expected Results

Cell integrity and viability is maintained within the parameters of the particular procedure being employed.

References

1. Aldridge, Jones, Gibson, Lanham, Meyer, Vannest and Charles. 1977. J. Clin. Microbiol. 6:406.
2. Koneman, Allen, Janda, Schreckenberger and Winn. 1997. Color atlas and textbook of diagnostic microbiology, 5th ed. Lippincott-Raven Publishers, Philadelphia, Pa.
3. National Committee for Clinical Laboratory Standards. 2000. Approved standard M2-A7, Performance standards for antimicrobial disk susceptibility tests, 7th ed. NCCLS, Wayne, Pa.
4. National Committee for Clinical Laboratory Standards. 2000. Approved standard M7-A5, Methods for dilution susceptibility tests for bacteria that grow aerobically, 5th ed. NCCLS, Wayne, Pa.

Availability

BBL™ Saline, 0.45%

Cat. No.	299489	Prepared Tubes (K Size), 1 mL – Ctn. of 100

BBL™ Saline, Normal

Cat. No.	297815	Prepared Tubes (K Size), 1 mL – Ctn. of 100
	221818	Prepared Tubes (K Size), 5 mL – Pkg. of 10
	221819	Prepared Tubes (K size), 5 mL – Ctn. of 100
	295771	Prepared Tubes (C size), 5 mL – Ctn. of 100
	297753	Prepared Tubes (D size), 10 mL – Ctn. of 100