Expected Results

Difco™ Yeast Morphology Agar

Using the high-dry objective, observe for hyphae of filamentous yeasts.

Difco™ Yeast Carbon Base, Yeast Nitrogen Base, Yeast Nitrogen Base without Amino Acids and Yeast Nitrogen Base without Amino Acids and Ammonium Sulfate

Measure growth turbidimetrically at 660 nm wavelength using a spectrophotometer. Turbidimetric readings on assay tubes should be comparable to the control.

BBL™ Yeast Nitrogen Agar

After sufficient incubation, a zone of growth should be visible in the area surrounding carbohydrates that have been assimilated. A yeast species may be presumptively identified based on a pattern of assimilation of carbohydrates. Consult appropriate texts for information on biochemical tests and other identification procedures to confirm findings.[8,12,13]

Limitation of the Procedure

Yeasts grown on a rich medium may carry a reserve of nitrogen in the form of protein. Possible errors due to this reserve are eliminated by making two serial transfers in the complete medium. When the first transfer is seven days old, the culture is shaken and one loopful is transferred to a second tube of the complete medium containing the same source of nitrogen. If a positive test is obtained when the second culture is seven days old, the organism being tested assimilates this particular nitrogen source.

References

1. Warren and Hazen. 1995. *In* Murray, Baron, Pfaller, Tenover and Yolken (ed.). Manual of clinical microbiology, 6th ed. American Society for Microbiology, Washington, D.C.
2. Wickerham. 1951. Taxonomy of yeasts. Technical bulletin No. 1029, U. S. Dept Agriculture, Washington, D.C.
3. Wickerham and Rettger. 1939. J. Tropical Med. Hyg. *42*:174.
4. Wickerham. 1946. J. Bacteriol. *52*:293.
5. Wickerham. 1943. J. Bacteriol. *46*:501.
6. Wickerham and Burton. 1948. J. Bacteriol. *56*:363.
7. Beijerinck. 1889. Arch. Neerl. Sci. Exactes Nat. *23*:367.
8. Warren and Shadomy. 1991. *In* Balows, Hausler, Herrmann, Isenberg and Shadomy (ed.). Manual of clinical microbiology, 5th ed. American Society for Microbiology, Washington, D.C.
9. Guenter. Personal Communication.
10. Sherman, Fink and Hicks. 1986. Methods in yeast genetics. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, N.Y.
11. Brownstein, Silverman, Little, Burke, Korsmeyer, Schlessinger and Olson. 1989. Science. *244*:1348.
12. Haley, Trandel and Coyle. 1980. Cumitech 11, Practical method for culture and identification of fungi in the clinical mycology laboratory. Coord. ed., Sherris. American Society for Microbiology, Washington, D.C.
13. Larone. 1995. Medically important fungi: a guide to identification, 3rd ed. American Society for Microbiology, Washington, D.C.

Availability

Difco™ Yeast Morphology Agar

Cat. No. 239320 Dehydrated – 500 g

Difco™ Yeast Carbon Base

Cat. No. 239110 Dehydrated – 100 g

Difco™ Yeast Nitrogen Base

Cat. No. 239210 Dehydrated – 100 g

BBL™ Yeast Nitrogen Agar

Cat. No. 295977 Prepared Plates – Pkg. of 20*

Difco™ Yeast Nitrogen Base without Amino Acids

Cat. No. 291940 Dehydrated – 100 g
291920 Dehydrated – 2 kg
291930 Dehydrated – 10 kg

Difco™ Yeast Nitrogen Base without Amino Acids and Ammonium Sulfate

Cat. No. 233520 Dehydrated – 100 g
233510 Dehydrated – 10 kg

**Store at 2-8°C.*

Yeast Mold (YM) Agar • Yeast Mold (YM) Broth

Intended Use

YM Agar and YM Broth are used for cultivating yeasts, molds and other aciduric microorganisms.

Summary and Explanation

YM Agar and YM Broth are prepared according to the formulae published by Wickerham.[1-3] Wickerham suggested that YM Broth acidified to pH 3.0-4.0 be used as an enrichment medium for yeasts from populations also containing bacteria and molds.

Media selectivity may be enhanced through acidification or through addition of selective agents. YM Broth may be acidified prior to sterilization. YM Agar should be sterilized without pH adjustment and sterile acid added to the sterile molten medium cooled to 45-50°C. Acidified YM Agar should not be heated. Antibiotics may be aseptically added to the sterile media. Other fungistatic materials, such as sodium propionate and diphenyl may be added to YM Agar to eliminate molds and permit the enumeration of yeasts in mixed populations.

Principles of the Procedure

Yeast extract is a source of trace elements, vitamins and amino acids. Malt extract is a source of carbon, protein and nutrients. Peptone is an additional source of carbon and provides nitrogen and amino acids. Dextrose provides carbon. Agar is the solidifying agent.

Formulae

Difco™ YM Agar

Approximate Formula* Per Liter

Yeast Extract	3.0	g
Malt Extract	3.0	g
Peptone	5.0	g
Dextrose	10.0	g
Agar	20.0	g

Difco™ YM Broth

Consists of the same ingredients without the agar.

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

User Quality Control

Identity Specifications

Difco™ YM Agar

Dehydrated Appearance:	Beige, free-flowing, homogeneous.
Solution:	4.1% solution, soluble in purified water upon boiling. Solution is light to medium amber, very slightly opalescent.
Prepared Appearance:	Light to medium amber, slightly opalescent.
Reaction of 4.1% Solution at 25°C:	pH 6.2 ± 0.2

Difco™ YM Broth

Dehydrated Appearance:	Light beige, free-flowing, homogeneous.
Solution:	2.1% solution, soluble in purified water. Solution is light to medium amber, clear to very slightly opalescent.
Prepared Appearance:	Light to medium amber, clear to very slightly opalescent. At pH adjusted to 3.0-4.0, medium becomes slightly opalescent.
Reaction of 2.1% Solution at 25°C:	pH 6.2 ± 0.2

Cultural Response

Difco™ YM Agar or YM Broth

Prepare two sets of agar plates or broth tubes (one set pH 6.2, one set adjusted to pH 3.0-4.0) per label directions. Inoculate and incubate at 30 ± 2°C for 18-72 hours.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY pH 3.0-4.0	RECOVERY pH 6.2
Aspergillus brasiliensis (niger)	16404	10^2-10^3	Good	Good
Candida albicans	10231	10^2-10^3	Good	Good
Escherichia coli	25922	10^2-3×10^2	Marked to complete inhibition	Good
Lactobacillus rhamnosus	7469	10^2-3×10^2	Poor to fair	Good
Saccharomyces cerevisiae	9763	10^2-10^3	Good	Good

Directions for Preparation from Dehydrated Product

1. Suspend the powder in 1 L of purified water:
   Difco™ YM Agar – 41 g;
   Difco™ YM Broth – 21 g.
   Mix thoroughly.
2. Heat the agar medium with frequent agitation and boil for 1 minute to completely dissolve the powder.
3. Autoclave the agar and broth media at 121°C for 15 minutes.
4. To increase selectivity, acidify the medium to pH 3.0 to 4.0 (by adding sterile 10% HCl, tartaric acid or 10% citric acid) or add antibiotics (penicillin 20 units per mL final concentration or streptomycin 40 µg per mL final concentration) using aseptic technique. Acidified agar medium should not be reheated.
5. Test samples of the finished product for performance using stable, typical control cultures.

Procedure

Inoculate YM Agar plates or YM Broth tubes with sample to evaluate for the presence of yeasts, molds, or aciduric microorganisms. Incubate at 30 ± 2°C for 18-72 hours.

To favor isolation of fermentative species, add a layer of sterile paraffin oil 1 cm deep on the surface of the inoculated broth. Incubate the culture until growth appears and then streak onto YM Agar to obtain isolated yeast colonies. To isolate fermentative and oxidative strains, place acidified inoculated YM Broth on a rotary shaker for 1 or 2 days. This favors yeast recovery while preventing the sporulation of molds.

Expected Results

Examine the plates or tubes for growth. Record YM Agar results as colony-forming units (CFU) per volume of sample. Record YM Broth results as growth or no growth.

References

1. Wickerham. 1939. J. Tropical Med. Hyg. *42*:176.
2. U. S. Department of Agriculture. 1951. Tech. Bull. No. 1029.
3. Jong and Edwards. 1991. American Type Culture Collection catalog of filamentous fungi, 18th ed. American Type Culture Collection, Rockville, Md.

Availability

Difco™ YM Agar

AOAC COMPF

Cat. No. 271210 Dehydrated – 500 g

Difco™ YM Broth

Cat. No. 271120 Dehydrated – 500 g

Yersinia Selective Agar Base (CIN Agar Base) Yersinia Antimicrobic Supplement CN

(See CIN Agar Base)