Decarboxylase Agar Base (DM642)

Intended Use

Decarboxylase Agar Base (DM642) with the addition of appropriate L-amino acid, it is used to differentiate bacteria on the basis of their ability to decarboxylate the amino acid.

Product Summary and Explanation

Decarboxylase media are used in the biochemical differentiation of gram-negative enteric bacilli based on the production of arginine dihydrolase and lysine and ornithine decarboxylase. Moeller[1] formulated the Decarboxylase Agar Base to differentiate bacteria on the basis of their ability to decarboxylate the amino acids. The medium is useful for the identification of the *Enterobacteriaceae* and other gram-negative bacilli.[2,3] For differentiating *Enterobacter* and *Klebsiella* species production of ornithine decarboxylase is especially useful as the former produces this enzyme and are motile while latter are non-motile and do not synthesize this enzyme.

Principles of the Procedure

Decarboxylase Agar Base contains peptic digest of animal tissue and yeast extract which provides nitrogenous nutrients required for the bacterial growth. Dextrose is the fermentable carbohydrate. Bromo cresol purple is the pH indicator which changes colour from purple to yellow in acidic condition. Under acidic pH the decarboxylase activity is stimulated and consequently the amino acids are decarboxylated or degraded to form corresponding amine. Production of these amines increases the pH of the medium changing the colour of the indicator and in turn the medium from yellow to purple violet.

Formula / Liter

Ingredients	Gms / Liter
Peptic digest of animal tissue	5.00
Yeast extract	3.00
Dextrose	1.00
Bromocresol purple	0.02
Agar	15.00
Final pH: 6.5 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	

Precautions

1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.

Directions

1. Suspend 24.02 grams of the medium in one litre of distilled water.
2. Heat to boiling to dissolve the medium completely. Add 5 grams of desired L-Amino acid (L-Lysine, L-Arginine, L-Ornithine) in hydrochloride form per litre of the medium.
3. Autoclave at 121°C, 15 lbs pressure for 15 minutes/validated cycle.
4. Dispense into sterile test tubes and cool in a slanted position.
5. When L-Ornithine hydrochloride is used, readjustment of pH is necessary.

Quality Control Specifications

Dehydrated Appearance	Light yellow to greenish yellow homogeneous free flowing powder
Prepared Medium	Purple coloured, clear gel forms in tubes as slants
Reaction of 2.4% solution	pH : 6.5 ± 0.2 at 25°C

Gel Strength	Firm, comparable with 1.5% Agar gel

Expected Cultural Response: Cultural characteristics observed after an incubation at 35-37°C for upto 4 days with addition of appropriate amino acids and overlaying with sterile mineral oil.

Sr. No.	Organisms	Results to be achieved			
		Inoculum (CFU)	Arginine decarboxylation	Ornithine decarboxylation	Lysine decarboxylation
1.	*Citrobacter freundii ATCC 8090*	50 - 100	variable reaction	variable reaction	negative reaction, yellow colour
2.	*Enterobacter aerogenes ATCC 13048*	50 - 100	negative reaction, yellow colour	positive reaction, purple colour	positive reaction, purple colour
3.	*Escherichia coli ATCC 25922*	50 - 100	variable reaction	variable reaction	positive reaction, purple colour
4.	*Klebsiella pneumoniae ATCC 13883*	50 - 100	negative reaction, yellow colour	negative reaction, yellow colour	positive reaction, purple colour
5.	*Proteus mirabilis ATCC 25933*	50 - 100	negative reaction, yellow colour	positive reaction, purple colour	negative reaction, yellow colour
6.	*Proteus vulgaris ATCC 13315*	50 - 100	negative reaction, yellow colour	negative reaction, yellow colour	negative reaction, yellow colour
7.	*Salmonella Paratyphi A ATCC 9150*	50 - 100	delayed positive reaction / positive reaction, purple colour	positive reaction, purple colour	negative reaction, yellow colour
8.	*Salmonella Typhi ATCC 6539*	50 - 100	delayed positive reaction / negative reaction	negative reaction, yellow colour	positive reaction, purple colour
9.	*Serratia marcescens ATCC 8100*	50 - 100	negative reaction, yellow colour	positive reaction, purple colour	positive reaction, purple colour
10.	*Shigella dysenteriae ATCC 13313*	50 - 100	negative reaction/ delayed positive reaction	negative reaction, yellow colour	negative reaction, yellow colour
11.	*Shigella flexneri ATCC 12022*	50 - 100	negative reaction/ delayed positive reaction	negative reaction, yellow colour	negative reaction, yellow colour
12.	*Shigella sonnei ATCC 25931*	50 - 100	variable reaction	positive reaction, purple colour	negative reaction, yellow colour
13.	*Pseudomonas aeruginosa ATCC 27853*	50 - 100	positive reaction, purple colour	negative reaction, yellow colour	negative reaction, yellow colour

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure
Refer to appropriate references for standard test procedures.

Results
Refer to appropriate references for interpretation of results.

Storage
Store the sealed bottle containing the dehydrated medium at 10 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

Expiration: Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

1. Each isolate must be inoculated into a tube of the basal medium without amino acid. If this tube becomes alkaline then the test is invalid.
2. Exposure of the medium to air may cause alkalinization so the inoculated tubes if covered with a layer of sterile mineral oil will give best results.[4]
3. For identification, organisms must be in pure culture. Morphological, biochemical and/or serological tests should be performed for final identification.
4. Consult appropriate texts for detailed information and recommended procedures.

Packaging
Product Name : Decarboxylase Agar Base
Product Code : DM642
Available Pack sizes : 500gm

References

1. Moeller, 1955, Acta. Pathol. Microbiol. Scand., 36:158.
2. MacFaddin J., 1985, Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria, Vol. 1, Williams and Wilkins, Baltimore.
3. Kelly, Brenner and Farmer, 1985, In Manual of Clinical Microbiology, Lennette, Balows, Hausler and Shadomy (Eds.), 4th ed., ASM, Washington, D.C.
4. MacFaddin J., 1980, Biochemical Tests for Identification of Medical Bacteria, 2nd ed., Williams and Wilkins, Baltimore.

Further Information

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