

Technical Data

Moeller Decarboxylase Broth w/ Arginine HCl

M689

Moeller Decarboxylase Broth with Arginine hydrochloride, is used to differentiate bacteria on the basis of their ability to decarboxylate the L-Arginine hydrochloride.

Composition**

Ingredients	Gms / Litre	
Peptic digest of animal tissue	5.000	
Beef extract	5.000	
Dextrose	0.500	
Bromocresol purple	0.010	
Cresol red	0.005	
Pyridoxal	0.005	
L-Arginine hydrochloride	10.000	
Final pH (at 25°C)	6.0 ± 0.2	
**Formula adjusted, standardized to suit performance parameters		

Directions

Suspend 20.52 grams in 1000 ml distilled water. Heat if necessary to dissolve the medium completely. Dispense in 5 ml amount in screw-capped tubes and sterilize by autoclaving at 15 lbs pressure (121°C) for 10 minutes.Cool the tubed medium in an upright position. Inoculate the tubes and overlay with 2-3 ml of sterile mineral oil.

Principle And Interpretation

Moeller Decarboxylase Broth with Arginine hydrochloride is used for differentiating gram-negative enteric bacilli on the basis of their ability to decarboxylate L-Arginine hydrochloride. Decarboxylase Broth was introduced by Moeller for detecting the production of lysine and ornithine decarboxylase and arginine dihydrolase (1). Prior to Moellers work, bacterial amino acid decarboxylases were studied by Gale (2) and Gale and Epps (3). Decarboxylase media are also recommended by standard methods for identification of bacteria (4-7).

This medium contains beef extract and peptic digest of animal tissue which provide nitrogenous nutrients for the growth of bacteria. Dextrose is the fermentable carbohydrate and pyridoxal is the

co-factor for the decarboxylase enzyme. Bromo cresol purple and cresol red are the pH indicators in this medium. When the medium is inoculated with dextrose fermenting bacteria, the pH is lowered due to acid production which changes the colour of the indicator from purple to yellow.

Acid produced stimulates decarboxylase enzyme. Arginine is first hydrolyzed to ornithine which is then decarboxylated to form putrescine. Formation of the amine putrescine increases the pH of the medium, changing the colour of the indicator from yellow to purple. If the organisms do not produce the appropriate enzyme, the medium remains acidic, yellow in colour. Each isolate to be tested should also be inoculated into the basal medium tube lacking the amino acid. After incubation, a decarboxylase test may show two layers of different colours, yellow and purple. Shake the tube gently before interpreting the results (8).

Inoculated tubes must be protected from air with a layer of sterile mineral oil. Exposure to air may cause alkalinization at the surface of the medium which makes the test invalid.

Quality Control

Appearance Light yellow to greenish yellow homogeneous free flowing powder Colour and Clarity of prepared medium Purple coloured clear solution without any precipitate Reaction Reaction of 2.05% w/v aqueous solution at 25°C. pH : 6.0±0.2 pH

5.80-6.20

Cultural Response

M689: Cultural characteristics observed after an incubation at 35-37°C for upto 4 days (Inoculated tubes are overlaid with sterile mineral oil).

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Organism	Inoculum (CFU)	Arginine decarboxylation
Citrobacter freundii ATCC	50-100	variable
8090		reaction
Enterobacter aerogenes	50-100	negative
ATCC 13048		reaction, yellow
		colour
Escherichia coli ATCC	50-100	variable
25922	00 100	reaction
Klebsiella pneumoniae	50-100	negative
ATCC 13883	50 100	reaction, yellow
mee 15005		colour
Proteus mirabilis ATCC	50-100	negative
25933	30-100	reaction, yellow
25955		colour
	50 100	
Proteus vulgaris ATCC	50-100	negative
13315		reaction, yellow
_ .		colour
Pseudomonas aeruginosa	50-100	positive
ATCC 9027		reaction, purple
		colour
Salmonella Paratyphi A	50-100	delayed
ATCC 9150		positive
		reaction/
		positive
		reaction, purple
		colour
Salmonella Typhi ATCC	50-100	delayed
6539		positive
		reaction /
		negative
		reaction, yellow
		colour
Serratia marcescens ATCC	50-100	negative
8100		reaction, yellow
		colour
Shigella dysenteriae ATCC	50-100	delayed
13313		positive
		reaction/
		negative
		reaction, yellow
		colour
Shigella flexneri ATCC	50-100	delayed
12022	20 100	positive
12022		reaction/
		negative
		reaction, yellow
		colour
Shigella sonnei ATCC 2593.	1 50-100	variable
Singenia sounei AICC 2393.	1.50-100	reaction

Storage and Shelf Life

Store below 30°C in tightly closed container and the prepared medium at 2 - 8°C. Use before expiry date on the label.

Reference

1. Moeller V., 1955, Acta Pathol. Microbiol. Scand. 36:158.

2. Gale G. F., 1940, Biochem. J., 34:392.

3. Gale and Epps, 1943, Nature, 152:327.

4. Isenberg (Ed.), 1992, Clinical Microbiology Procedures Handbook, Vol. I, ASM, Washington, D. C.

5. FDA Bacteriological Analytical Manual, 8th Ed., AOAC International, Gaithersburg, Md.

6. Eaton A. D., Clesceri L. S. and Greenberg A. E., (Ed.), 1998, Standard Methods for the Examination of Water and Wastewater, 20th Ed., American Public Health Association, Washington, D.C

7. Downes F. P. and Ito K., (Ed.), 2001, Compendium of Methods for the Microbiological Examination of Foods, 4th Ed., American Public Health Association, Washington, D.C

8. MacFaddin J. F., 2000, Biochemical tests for Identification of Medical Bacteria, 3rd Ed., Lippincott, Williams and Wilkins, Baltimore.

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