Technical Information

Moeller Decarboxylase Broth with Lysine HCl

Product Code: DM 1687

Application: - Moeller Decarboxylase Broth with Ornithine hydrochloride is used to differentiate bacteria on the basis of their ability to decarboxylate L-Ornithine 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-Lysine hydrochloride	10.000
Final pH (25°C)	6.0±0.2

**Formula adjusted, standardized to suit performance parameters

Principle & Interpretation

Many species of bacteria possess enzymes capable of decarboxylating specific amino acids in the test medium releasing alkaline-reacting amines and carbon dioxide as byproducts. The decarboxylase activity of *Enterobacteriaceae* is most commonly measured with Moeller Decarboxylase Broth [(1)]. This medium was devised by Moeller for detecting the production of lysine and ornithine decarboxylase and arginine dihydrolase [(2)]. Prior to Moellers work, bacterial amino acid decarboxylases were studied by the methods of Gale [(3)] and Gale and Epps [(4)].

Decarboxylase media are also recommended by standard methods for identification of bacteria (5-8). Moeller Decarboxylase Broth with lysine hydrochloride is used for differentiating bacteria on their ability to decarboxylate lysine hydrochloride.

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 the dextrose fermenting bacteria, the pH is lowered due to acid production which changes the colour of the media from purple to yellow. Acid produced stimulates decarboxylase enzyme. Decarboxylation of lysine yields cadaverine. Formation of the amine cadaverine increases the pH of the medium, changing the colour of the media 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 [(9)]

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.

Methodology

Suspend 20.52 grams of powder media in 1000 ml distilled water. Shake well & 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.

Quality Control

Physical 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 2.5% w/v aqueous solution at 25°C. pH : 6.0±0.2
pH range 5.80-6.20
Cultural Response/ characteristices
DM 1687: Cultural characteristics observed after an incubation at 35-37°C for upto 4 days (Inoculated tubes are overlaid with sterile mineral oil).

Organism	Inoculum (CFU)	Ornithine decarboxylation
Citrobacter freundii ATCC 8090	50-100	negative reaction, yellow colour
Enterobacter aerogenes ATCC 13048	50-100	positive reaction, purple colour
Escherichia coli ATCC 25922	50-100	variable reaction
Klebsiella pneumoniae ATCC 13883	50-100	positive reaction, purple colour
Proteus mirabilis ATCC 25933	50-100	negative reaction, yellow colour
Proteus vulgaris ATCC 13315	50-100	negative reaction, yellow colour
Pseudomonas aeruginosa ATCC 9027	50-100	negative reaction, yellow colour
Salmonella Paratyphi A ATCC 9150	50-100	negative reaction, yellow colour
Salmonella Typhi ATCC 6539	50-100	positive reaction, purple colour
Serratia marcescens 8100	50-100	positive reaction, purple colour
Shigella dysenteriae ATCC 13313	50-100	negative reaction, yellow colour
Shigella flexneri ATCC 12022	50-100	negative reaction, yellow colour
Shigella sonnei ATCC 25931	50-100	negative reaction, yellow colour

Storage and Shelf Life

Dried Media: Store below 30°C in tightly closed container and use before expiry date as mentioned on the label.
Prepared Media: 2-8^{o} in sealable plastic bags for 2-5 days.

Further Reading

1. Koneman E. W., Allen S. D., Janda W.M., Schreckenberger P. C., Winn W. C. Jr., 1992, Colour Atlas and Textbook of Diagnostic Microbiology, 4th Ed., J. B. Lippinccott Company
2. Moeller V., 1955, Acta Pathol. Microbiol. Scand. 36:158.
3. Gale G. F., 1940, Biochem. J., 34:392.
4. Gale and Epps, 1943, Nature, 152:327.
5. Isenberg (Ed.), 1992, Clinical Microbiology Procedures Handbook, Vol. I, ASM, Washington, D. C.
6. FDA Bacteriological Analytical Manual, 8th Ed., AOAC International, Gaithersburg, Md.
7. 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
8. 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
9. MacFaddin J. F., 2000, Biochemical tests for Identification of Medical Bacteria, 3rd Ed., Lippincott, Williams and Wilkins, Baltimore.

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