Decarboxylase Test Medium Base (Falkow)

M912S

Decarboxylase Test Medium Base (Falkow) is used for testing amino acid decarboxylase activity.

Composition**

Ingredients	Gms / Litre
Peptic digest of animal tissue	5.000
Yeast extract	3.000
Dextrose	1.000
Bromo cresol purple	0.020
Final pH (at 25°C)	6.7±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 9.02 grams in 1000 ml distilled water. Heat, if necessary to dissolve the medium completely. Divide into four equal parts. One part is tubed without addition of any amino acid. To the remaining three parts, add separately L-lysine hydrochloride, L-arginine hydrochloride and L-ornithine hydrochloride to a final concentration of 0.5%. Dispense in 3-4 ml quantities in screw capped tubes and sterilize by autoclaving at 10 lbs pressure (115°C) for 20 minutes. To avoid false alkalinization at the surface of medium it is recommended to add liquid paraffin to a height of about 5mm before sterilization.

Principle And Interpretation

Decarboxylase Test Medium Base is used for differentiating bacteria on their ability to decarboxylate the amino acids. First practical application of amino acid decarboxylase test was reported by Moeller for distinguishing various microorganisms (1). Moellers work was based on the experiments done by Gale (2) and Gale and Epps (3) on bacterial amino acid decarboxylases. Moeller observed that production of lysine, arginine, ornithine decarboxylase by various members of *Enterobacteriaceae* offered an important parameter to other biochemical tests for differentiating bacteria within closely related groups. Further, to differentiate *Salmonella arizonae* from *Citrobacter* , Calquist (4) developed a medium utilizing the lysine decarboxylase reaction. Later on Falkow (5) was the one who emphasized and developed the lysine decarboxylase medium for differentiating Salmonellae and Shigellae by the valid and reliable results. This medium is recommended by BIS for detection of dihydrolase and decarboxylase activity of *Vibrio cholerae* and other vibrios (6).

Dextrose is fermented by the enteric bacteria resulting in acidic pH. Bacteria which produce lysine or ornithine or arginine decarboxylase will produce alkaline products and increase the pH. The resulting reaction after 24-96 hours will indicate an alkaline reaction seen as purple colour for decarboxylase producing bacteria and an acid pH (yellow) by the bacteria not producing decarboxylase. Inoculated tubes must be protected from air (by overlaying the medium with sterile mineral oil) to avoid false alkalinization at the surface of the medium. Control tubes of basal media should be inoculated.

Biochemical testing should be attempted on pure culture isolation only and subsequent to differential determinations. The decarboxylase reactions can be considered indicative of a given genus or species but conclusive and final identification of these organisms cannot be made solely on the basis of the decarboxylase reactions.

Quality Control

Appearance

Yellow to greenish yellow coloured homogeneous free flowing powder

Colour and Clarity of prepared medium

Purple coloured clear solution without any precipitate.

Reaction

Reaction of 0.9% w/v aqueous solution at 25°C. pH : 6.7±0.2

Cultural Response

M912S: Cultural characteristics observed after an incubation at 35-37°C for upto 4 days .

Organism	Lysine Decarboxylation	Arginine decarboxylation	Ornithine Decarboxylation
Enterobacter aerogenes ATCC 13048	positive reaction, purple colour	negative reaction,yellow colour	positive reaction, purple colour
Escherichia coli ATCC 25922	variable reaction	variable reaction	variable reaction
Klebsiella pneumoniae ATCC 13883	positive reaction,purple colour	negative reaction,yellow colour	negative reaction,yellow colour
Proteus vulgaris ATCC 13315	negative reaction,yellow colour	negative reaction,yellow colour	negative reaction,yellow colour
Pseudomonas aeruginosa ATCC 27853	negative reaction,yellow colour	positive reaction, purple colour	negative reaction,yellow colour
S. serotype typhi ATCC 6539	positive reaction, purple colour	delayed positive reaction or negative reaction,yellow colour	negative reaction,yellow colour
Serratia marcescens ATCC 8100	positive reaction, purple colour	negative reaction,yellow colour	positive reaction, purple colour
Shigella flexneri ATCC 12022	negative reaction,yellow colour	delayed positive reaction or negative reaction,yellow colour	negative reaction,yellow colour
Vibrio cholerae ATCC 15748	negative reaction,yellow colour	positive reaction,purple colour	positive reaction, purple colour

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, 1954, Acta Path. Micro. Scand., 34:102.
2.Gale, 1940, Biochem. J., 34:392, 583, 846.
3.Gale and Epps, 1943, Nature, 152:327.
4.Calquist, 1956, J. Bact., 71:339.
5.Falkow, 1958, Am. J. Clin. Path., 29:598.
6.Bureau of Indian Standards, IS : 5887 (Part V) 1976, reaffirmed 1986.

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