D2935 Decarboxylase Broth Base, Moeller

Decarboxylase Broth Base, Moeller with the addition of the appropriate L-amino acid is used to differentiate bacteria on the basis of their ability to decarboxylate the amino acids.

Composition:

Ingredients	Grams/Litre
Peptic Digest of Animal Tissue	5.0
Beef Extract	5.0
Dextrose	0.5
Bromo Cresol Purple	0.01
Cresol Red	0.005
Pyridoxal	0.005
Final pH 6.0 +/- 0.2 at 25°C	

Store prepared media below 8°C, protected from direct light. Store dehydrated powder in a dry place in tightly-sealed containers at 2-25°C.
Appearance: Greenish yellow colored, homogeneous, free flowing powder.
Color and Clarity: Purple colored, clear solution without any precipitate.

Directions:
Suspend 10.52 g of Decarboxylase Broth Base in 1000 ml of distilled water. Add 10 g of either L-Arginine (Cat. No. A5006), or L-Lysine (Cat. No. 62840), or L-Ornithine (Cat. No. O2375). Heat to dissolve the medium completely. When L-ornithine is added, readjust the pH. Dispense in 5 ml quantities in screwcapped tubes. Sterilize by autoclaving at 15 lbs. pressure (121°C) for 10 minutes.

Principle and Interpretation:
This medium is used for differentiating gram-negative enteric bacilli on the basis of their ability to decarboxylate amino acids. The Decarboxylase Broth was introduced by Moeller for detecting the production of lysine, ornithine decarboxylase and arginine dihydrolase. Production of ornithine decarboxylase is helpful criteria in differentiating the *Klebsiella* and *Enterobacter* species. *Klebsiella* are nonmotile and do not produce ornithine decarboxylase, while *Enterobacter* are motile and produce ornithine decarboxylase, except for *Enterobacter agglomerans.*
This medium contains beef extract and peptic digest of animal tissue which provides 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 of this medium. When the medium is inoculated with dextrose fermenting bacteria, the pH is lowered due to acid production which changes the color of the indicator from purple to yellow. Acid produced stimulates the decarboxylase enzyme. Decarboxylation of lysine yields cadaverine while putrescine is produced due to ornithine decarboxylation. Arginine is first hydrolyzed to ornithine which is then decarboxylated for form putrescine. Formation of these amines increases the pH of the medium, changing the color of the indicator from yellow to purple. If the organism does not produce the appropriate enzyme, the medium remains acidic, yellow in color. Each isolate to be tested should be inoculated into the basal medium tube that lacks the amino acid. Inoculated tubes must be protected from air with a layer of sterile mineral oil. Exposure to air may cause alkalinization of the surface of the medium which makes the test invalid.

Cultural characteristics after 4 days at 35-37°C.

Organisms (ATCC)	Lysine	Arginine	Ornithine
Citrobacter freundi (8090)	-	+/-	+/-
Enterobacter aerogenes (13048)	+	-	+
Escherichia coli (25922)	+/-	+/-	+/-
Klebsiella pneumoniae (13883)	+	-	-
Proteus vulgaris (13315)	-	-	-
Proteus mirabilis (25933)	-	-	-
Pseudomonas aeruginosa (9027)	-	-	+
Salmonella paratyphi A	-	(+) or +	+
Salmonella typhi (6539)	+	(+) or -	-
Shigella flexneri (12022)	-	- or (+)	-
Shigella sonnei (25931)	-	+/-	+
Shigella dysenteriae (13313)	-	- or (+)	-
Serratia marcescens (8100)	+	-	+

+ = positive reaction, purple color
- = negative reaction, yellow color or no color change
± = variable
(+) = delayed positive reaction

References:

1. Atlas, R.M., (1993). Handbook of Microbiological Media, CRC Press.
2. Moeller, V., (1955). Acta. Pathol. Microbiol. Scand. 36:158.
3. Gale, G.F., (1940). Biochem. J. 34, 392.
4. MacFaddin, J., (1980). Biochemical Tests for Identification of Medical Bacteria. 2nd Edition. Williams and Wilkens. Baltimore, Maryland.
5. American Type Culture Collection, Manassas, Va., U.S.A.

Precautions and Disclaimer
This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.