# 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).

| Organism | Inoculum (CFU) | Arginine decarboxylation |
|---|---|---|
| *Citrobacter freundii ATCC 8090* | 50-100 | variable reaction |
| *Enterobacter aerogenes ATCC 13048* | 50-100 | negative reaction, yellow colour |
| *Escherichia coli ATCC 25922* | 50-100 | variable reaction |
| *Klebsiella pneumoniae ATCC 13883* | 50-100 | negative reaction, yellow 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 | positive reaction, purple colour |
| *Salmonella Paratyphi A ATCC 9150* | 50-100 | delayed positive reaction/ positive reaction, purple colour |
| *Salmonella Typhi ATCC 6539* | 50-100 | delayed positive reaction / negative reaction, yellow colour |
| *Serratia marcescens ATCC 8100* | 50-100 | negative reaction, yellow colour |
| *Shigella dysenteriae ATCC 13313* | 50-100 | delayed positive reaction/ negative reaction, yellow colour |
| *Shigella flexneri ATCC 12022* | 50-100 | delayed positive reaction/ negative reaction, yellow colour |
| *Shigella sonnei ATCC 25931* | 50-100 | variable 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.

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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
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