Decarboxylase Broth Base, Moeller(Moeller Decarboxylase Broth Base)

Intended Use:
Recommended to differentiate bacteria on the basis of their ability to decarboxylate the amino acids.

Composition**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Gms / Litre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peptone</td>
<td>5.000</td>
</tr>
<tr>
<td>HM peptone B</td>
<td>5.000</td>
</tr>
<tr>
<td>Dextrose (Glucose)</td>
<td>0.500</td>
</tr>
<tr>
<td>Bromocresol purple</td>
<td>0.010</td>
</tr>
<tr>
<td>Cresol red</td>
<td>0.005</td>
</tr>
<tr>
<td>Pyridoxal</td>
<td>0.005</td>
</tr>
<tr>
<td>Final pH (at 25°C)</td>
<td>6.0±0.2</td>
</tr>
</tbody>
</table>

**Formula adjusted, standardized to suit performance parameters

Directions
Suspend 10.52 grams in 1000 ml purified / distilled water. Add 10 gm. of L-Lysine, L-Arginine, L-Ornithine or other L-amino acids. When using DL-amino acids, use 2% concentration. Heat if necessary to dissolve the medium completely. When L-Ornithine is added, readjustment of the pH is required. Dispense in 5 ml amount in screw-capped tubes and sterilize by autoclaving at 15 lbs pressure (121°C) for 10 minutes.

Principle And Interpretation

Moeller Decarboxylase Broth Base is used for differentiating gram-negative enteric bacilli on the basis of their ability to decarboxylate amino acids. Moeller introduced the Decarboxylase Broth for detecting the production of lysine and ornithine decarboxylase and arginine dihydrolase (8). Prior to Moeller's work, bacterial amino acid decarboxylases were studied by Gale (3) and Gale and Epps (4). Production of ornithine decarboxylase is a helpful criterion in differentiating Klebsiella and Enterobacter species. Klebsiella are nonmotile and do not produce ornithine decarboxylase while Enterobacter are motile and produce ornithine decarboxylase except Enterobacter agglomerans (7).

This medium contains HM peptone B and peptone which provides nitrogenous and carbonaceous compounds, long chain amino acids and other essential 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 indicator from purple to yellow. Acid produced stimulates 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 to form putrescine. Formation of these amines 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 Moeller Decarboxylase Broth Base medium tube lacking the amino acid. 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.

Type of specimen
Clinical samples - Blood; Food and dairy samples; Water samples
Specimen Collection and Handling
For clinical samples follow appropriate techniques for handling specimens as per established guidelines (5,6).
For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (1,9,10).
For water samples, follow appropriate techniques for sample collection, processing as per guidelines and local standards.(2)
After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions :
In Vitro diagnostic Use. Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/ face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets

Limitations :
1. Some fastidious organisms may show delayed reaction.
2. Overlaying with mineral oil is essential for appropriate results.

Performance and Evaluation
Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

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 in tubes

Reaction
Reaction of 1.05% w/v aqueous solution at 25°C. pH : 6.0±0.2

pH
5.80-6.20

Cultural Response
Cultural characteristics observed after an incubation at 35-37°C for up to 4 days with addition of appropriate amino acids and overlaying with sterile mineral oil.

<table>
<thead>
<tr>
<th>Organism</th>
<th>Inoculum (CFU)</th>
<th>Arginine decarboxylation</th>
<th>Ornithine decarboxylation</th>
<th>Lysine decarboxylation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrobacter freundii ATCC 8090</td>
<td>50-100</td>
<td>variable reaction</td>
<td>variable reaction</td>
<td>negative reaction, yellow colour</td>
</tr>
<tr>
<td># Klebsiella aerogenes ATCC 13048 (00175*)</td>
<td>50-100</td>
<td>negative reaction, yellow colour</td>
<td>positive reaction, purple colour</td>
<td>positive reaction, purple colour</td>
</tr>
<tr>
<td>Escherichia coli ATCC 25922 (00013*)</td>
<td>50-100</td>
<td>variable reaction</td>
<td>variable reaction</td>
<td>positive reaction, purple colour</td>
</tr>
<tr>
<td>Klebsiella pneumoniae ATCC 13883 (00097*)</td>
<td>50-100</td>
<td>negative reaction, yellow colour</td>
<td>negative reaction, yellow colour</td>
<td>positive reaction, purple colour</td>
</tr>
<tr>
<td>Proteus mirabilis ATCC 25933</td>
<td>50-100</td>
<td>negative reaction, yellow colour</td>
<td>positive reaction, purple colour</td>
<td>negative reaction, yellow colour</td>
</tr>
<tr>
<td>Proteus vulgaris ATCC 13315</td>
<td>50-100</td>
<td>negative reaction, yellow colour</td>
<td>negative reaction, yellow colour</td>
<td>negative reaction, yellow colour</td>
</tr>
<tr>
<td>Salmonella Paratyphi A ATCC 9150</td>
<td>50-100</td>
<td>delayed positive reaction/positive reaction,purple colour</td>
<td>positive reaction, purple colour</td>
<td>negative reaction, yellow colour</td>
</tr>
</tbody>
</table>
### Salmonella Typhi ATCC 6539
- Delayed positive reaction / negative reaction
- Negative reaction, yellow colour
- Positive reaction, purple colour

### Serratia marcescens ATCC 8100
- Negative reaction, yellow colour
- Positive reaction, purple colour
- Positive reaction, purple colour

### Shigella dysenteriae ATCC 13313
- Negative reaction / delayed positive reaction
- Negative reaction, yellow colour
- Negative reaction, yellow colour

### Shigella flexneri ATCC 12022 (00126*)
- Negative reaction / delayed positive reaction
- Negative reaction, yellow colour
- Negative reaction, yellow colour

### Shigella sonnei ATCC 25931
- Variable reaction
- Positive reaction, purple colour
- Negative reaction, yellow colour

**Key**: (*) Corresponding WDCM numbers.
(###) Formerly known as Enterobacter aerogenes

### Storage and Shelf Life
Store between 10-30°C in a tightly closed container and the prepared medium at 15-25°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition. Seal the container tightly after use. Use before expiry date on the label.

Product performance is best if used within stated expiry period.

### Disposal
User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (5,6).

### Reference

Revision : 03 / 2019
Disclaimer:

User must ensure suitability of the product(s) in their application prior to use. Products conform solely to the information contained in this and other related HiMedia™ publications. The information contained in this publication is based on our research and development work and is to the best of our knowledge true and accurate. HiMedia™ Laboratories Pvt Ltd reserves the right to make changes to specifications and information related to the products at any time. Products are not intended for human or animal or therapeutic use but for laboratory, diagnostic, research or further manufacturing use only, unless otherwise specified. Statements contained herein should not be considered as a warranty of any kind, expressed or implied, and no liability is accepted for infringement of any patents.