SIM Medium

M181

Intended use

SIM Medium is recommended for determination of hydrogen sulphide production, indole formation and motility of enteric bacilli.

Composition**

Ingredients	Gms / Litre
HM Peptone B#	3.000
Peptone	30.000
Peptonized iron	0.200
Sodium thiosulphate	0.025
Agar	3.000
Final pH (at 25°C)	7.3±0.2

**Formula adjusted, standardized to suit performance parameters

- Equivalent to Beef extract

Directions

Suspend 36.23 grams in 1000 ml distilled water. Heat to boiling to dissolve the medium completely. Dispense in tubes. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Allow the tubes to cool in an upright position.

Principle And Interpretation

SIM Medium is used to differentiate enteric bacilli particularly *Salmonella* and *Shigella* on the basis of sulphide production, indole formation and motility (1, 2). Jordan and Victorson (3) reported that *Salmonella* Paratyphi A and Paratyphi B can be distinguished on the basis of H_2S production using lead acetate. Sulkin and Willett (4) used Triple Sugar Iron Agar with 1% agar for motility along with H_2S production and carbohydrate fermentation. Sosa (5) described a peptone medium with low agar for motility and indole determination.

SIM Medium enables determination of three characteristics by which enteric bacteria can be differentiated. Peptonized iron and sodium thiosulphate are the indicators of H_2S production. This H_2S reacts with peptonized iron to form black precipitate of ferrous sulphide (4, 5). Motile organisms intensify the H_2S reaction. Motile organisms grow away from line of inoculation showing diffused growth while non-motile organisms grow along the stabline. Motility detection is possible due to the semisolid nature of the medium. Growth radiating out from the central stabline indicates that the test organism is motile. Peptone and HM peptone B provides nitrogeneous and carbonaceous compounds, long chain amino acids, vitamins and other essential nutrients. Tryptophan from peptone, is degraded by specific bacteria to produce indole (2). The indole is detected by the addition of chemical reagents following the incubation period.

Inoculate fresh culture with a single stab using straight needle through the center of the medium. Following incubation, observe for motility (diffuse growth outward from the stabline or turbidity throughout the medium) and for H_2S production (blackening of the medium). To detect indole production, add three or four drops of Kovacs reagent (2) and observe for development of red color (positive reaction). Determine motility and H_2S production prior to determination of indole production.

Type of specimen

Pure culture isolate

Specimen Collection and Handling

After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions :

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 guidleines should be followed while handling specimens. Safety guidelines may be referred in individual safety data sheets

Limitations :

This medium is general purpose medium and may not support the growth of fastidious organisms.

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

Cream to beige homogeneous free flowing powder

Gelling

Semisolid, comparable with 0.3% Agar gel.

Colour and Clarity of prepared medium

Medium amber coloured slightly opalescent gel forms in tubes as butts

Reaction

Reaction of 3.6% w/v aqueous solution at 25°C. pH : 7.3±0.2

pH

7.10-7.50

Cultural Response

M181: Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

Organism	Inoculum (CFU)	Growth	Motility	Indole production(on addition of Kovac's	H_2S
Cultural Response					
Escherichia coli ATCC 25922 (00013*)	50-100	luxuriant	positive, growth away from stabline causing turbidity	positive reaction, red ring at the interface of the medium	negative reaction
Salmonella Typhimurium ATCC 14028 (00031*)	50-100	luxuriant	positive, growth away from stabline causing turbidity	negative reaction	positive reaction, blackening of medium
Shigella flexneri ATCC 12022 (00126*)	50-100	luxuriant	negative, growth along the stabline, surrounding medium remains clear	negative reaction	negative reaction
Salmonella Paratyphi A ATCC 9150	50-100	luxuriant	positive, growth away from stabline causing turbidity	negative reaction	Negative reaction
Salmonella Paratyphi B ATCC 8739	50-100	luxuriant	positive, growth away from stabline causing turbidity	Negative reaction	Positive reaction, blackening of medium
Klebsiella pneumoniae ATCC 13883 (00097*)	50-100	luxuriant	negative, growth along the stabline, surrounding medium remains clear	Negative reaction	Negative reaction

Key : *Corresponding WDCM numbers.

Storage and Shelf Life

Store between 10-30°C in a tightly closed container and the prepared medium at 2-8°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle inorder 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 (6,7).

Reference

1. MacFaddin J. F., 1985, Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria, Vol. 1, Williams and Wilkins, Baltimore.
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3. Jordan E. O. and Victorson R., 1917, J. Inf. Dis., 21:554.
4. Sulkin S. E. and Willett J. C., 1940, J. Lab. Clin. Med., 25:649.
5. Sosa L., 1943, Rev. Inst. Bacteriol., 11:286.
6.Isenberg, H.D. Clinical Microbiology Procedures Handb0ook. 2nd Edition.
7. Jorgensen,J.H., Pfaller , M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.

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