Selenite Cystine Broth Base

Intended Use:
It is recommended as a selective enrichment media for Salmonella and possibly Shigella sonnei from faeces, urine, water and foodstuffs.

Composition**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Gms / Litre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tryptone</td>
<td>5.000</td>
</tr>
<tr>
<td>Lactose</td>
<td>4.000</td>
</tr>
<tr>
<td>Disodium phosphate</td>
<td>10.000</td>
</tr>
<tr>
<td>L-Cystine</td>
<td>0.010</td>
</tr>
<tr>
<td>Final pH ( at 25°C)</td>
<td>7.0±0.2</td>
</tr>
</tbody>
</table>

**Formula adjusted, standardized to suit performance parameters

Directions
Suspend 19.01 grams in 1000 ml distilled water. Add 4 grams of sodium hydrogen selenite (M1079B). Warm to dissolve the medium completely. Distribute in sterile test tubes. Sterilize in a boiling water bath or free flowing steam for 10 minutes. DO NOT AUTOCLAVE. Excessive heating is detrimental. Discard the prepared medium if large amount of selenite is reduced (indicated by red precipitate at the bottom of tube/bottle).

Note: Instead of M1079B, DD056-Sodium Biselenite discs (1 disc per 10 ml of the medium) or DB001-Sodium Biselenite Bud (1 bud per 100 ml of medium) can be added to the medium after boiling.

Principle And Interpretation
Klett (1) first demonstrated the selective inhibitory effects of selenite and Guth (2) used it to isolate Salmonella Typhi. Leifson fully investigated selenite and formulated the media. Selenite Cystine Medium is a modification of Leifsons (3) formula with added cystine (4). Modification of original composition and similar medias are recommended by AOAC, APHA, USP etc (3-9). Enrichment media are routinely employed for detection of pathogens in faecal specimens as the pathogens are present in a very small number in the intestinal flora. Selenite Cystine Broth is useful for detecting Salmonella in the nonacute stages of illness when organisms occur in the faeces in low numbers and for epidemiological studies to enhance the detection of low number of organisms from asymptomatic or convalescent patients (10).

Tryptone provides nitrogenous and carbonaceous compounds, long chain amino acids, vitamins and other essential nutrients. Lactose maintains the pH of medium. Selenite is reduced by bacterial growth and alkali is produced. An increase in pH lessens the toxicity of the selenite and results in overgrowth of other bacteria. The acid produced by bacteria due to lactose fermentation serves to maintain a neutral pH. Sodium phosphate maintains a stable pH and also lessens the toxicity of selenite. L-cystine improves recovery of Salmonella.

Enriched broth is subcultured on differential plating media such as Bismuth Sulphite Agar (M027), Brilliant Green Agar (M016), XLD Agar (M031) etc. Do not incubate the broth longer than 24 hours as inhibitory effect of selenite decreases after 6 - 12 hours of incubation (11).

Type of specimen
Clinical: faeces, urine, Water samples and Foods

Specimen Collection and Handling
For clinical samples follow appropriate techniques for handling specimens as per established guidelines (12,13).
For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (6,7).
For water samples, follow appropriate techniques for sample collection, processing as per guidelines and local standards (8).
After use, contaminated materials must be sterilized by autoclaving before discarding.
Warning and Precautions
In Vitro diagnostic use only. 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
NA

Performance and Evaluation
Performace 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 light yellow homogeneous free flowing powder

Colour and Clarity of prepared medium
Cream to yellow coloured clear solution without any precipitate

Reaction
Reaction of 1.9% w/v of medium along with 0.4% w/v selenite aqueous solution at 25°C. pH : 7.0±0.2

pH
6.80-7.20

Cultural Response
Cultural characteristics observed with added sodium hydrogen selenite (M1079B) when subcultured on MacConkey Agar(M081) after an incubation at 35-37°C for 18-24 hours.

Cultural Response

<table>
<thead>
<tr>
<th>Organism</th>
<th>Inoculum (CFU)</th>
<th>Recovery</th>
<th>Colour of colony</th>
</tr>
</thead>
<tbody>
<tr>
<td>Escherichia coli ATCC</td>
<td>50-100</td>
<td>none to poor (no increase in numbers)</td>
<td>pink with bile precipitate</td>
</tr>
<tr>
<td>ATCC 25922</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salmonella Choleraesuis ATCC 12011</td>
<td>50-100</td>
<td>good-luxuriant</td>
<td>colourless</td>
</tr>
<tr>
<td>Salmonella Typhi ATCC 6539</td>
<td>50-100</td>
<td>good-luxuriant</td>
<td>colourless</td>
</tr>
<tr>
<td>Salmonella Typhimurium ATCC 14028</td>
<td>50-100</td>
<td>good-luxuriant</td>
<td>colourless</td>
</tr>
</tbody>
</table>

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.

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 (12,13).

Reference

Please refer disclaimer Overleaf.