MUG Lauryl Sulphate Broth

M1046

Intended Use:

Recommended for detection of *Escherichia coli* in water and food samples by a fluorogenic method.

Composition**

Ingredients	Gms / Litre
Tryptone	20.000
Lactose	5.000
Sodium chloride	5.000
Dipotassium hydrogen phosphate	2.750
Potassium dihydrogen phosphate	2.750
Sodium lauryl sulphate	0.100
4-Methylumbelliferyl ß-D-glucuronide (MUG)	0.050
Final pH (at 25°C)	6.8±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 35.65 grams in 1000 ml purified/distilled water. Heat if necessary to dissolve the medium completely. Dispense into tubes with inverted Durhams tubes as required, taking into account the volume of sample to be tested. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes.

Principle And Interpretation

Lauryl Sulphate Broth was formulated by Mallmann and Darby (1) and is recommended by APHA for the detection and enumeration of coliform organisms in foods, water and wastewater (2,3). MUG is added in Lauryl Sulphate Broth as the fluorogenic compound which permits the rapid detection of *Escherichia coli* when observed under UV light where further confirmation is not required (4,3). MUG detects anaerogenic strains which may not be detected in the conventional procedure. Feng and Hartman (5) used MUG-containing medium for studying ß-glucuronidase activity and found *Escherichia coli* has 96-100% activity, *Salmonella* species with 17% and *Shigella* species 40% activity and other genera were negative. For weakly positive strains incubation should be carried out overnight. Robison (4) reported no false negative results and about 5% false positive results.

Tryptone provides nutrients while lactose act as energy source. Sodium lauryl sulphate inhibits many organisms other than coliforms. 4-methylumbelliferyl-ß-D-glucuronide is hydrolyzed by an enzyme ß-glucuronidase possessed by organisms to yield 4-methylumbelliferone, a fluorescent end product.

Type of specimen

Food samples; Water samples

Specimen Collection and Handling:

Inoculate 10 ml of the test specimen into three tubes each of single strength and double strength medium. Incubate the tubes at 35°C for 24 hours. Observe for opacity and gas formation. For confirmation of presumptive *E. coli,* observe for fluorescence and perform indole reaction using Kovacs Reagent (R008). 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 guidelines should be followed while handling specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations :

1. Well isolated colonies must be used to avoid erroreous results.
2. Other biochemical test must be performed in conjuction for confirmation.

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 yellow homogeneous free flowing powder

Colour and Clarity of prepared medium
Light amber coloured clear solution without any precipitate

Reaction
Reaction of 3.57% w/v aqueous solution at 25°C. pH : 6.8±0.2

pH
6.60-7.00

Cultural Response
Cultural characteristics observed after an incubation at 35-37°C for 4-24 hours.

Organism	Inoculum (CFU)	Growth	Fluorescence under uv at 366nm	Indole production
Escherichia coli ATCC 25922 (00013*)	50-100	luxuriant	positive	positive reaction, red ring at the interface of the medium
# *Klebsiella aerogenes* ATCC 13048 (00175*)	50-100	luxuriant	negative	negative reaction

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 2-8°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. 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 sample must be decontaminated and disposed of in accordance with current laboratory techniques (6,7).

Reference

1.Mallmann and Darby, 1941, Am.J. Public Health, 31:127.
2. Lipps WC, Braun-Howland EB, Baxter TE,eds. Standard methods for the Examination of Water and Wastewater, 24th ed. Washington DC:APHA Press; 2023.
3. Salfinger Y., and Tortorello M.L., 2015, Compendium of Methods for the Microbiological Examination of Foods, 5th Ed., American Public Health Association, Washington, D.C.
4.Robison, 1984, Appl.Environ.Microbiol., 48:285.
5. Feng P.C.S. and Hartman P. A., 1982, Appl. Environ. Microbiol., 43:1320.
6. 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.
7. Isenberg, H.D. Clinical Microbiology Procedures Handbook 2nd Edition.

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