MUG EC Broth

Intended Use
MUG EC Broth is used for the detection of *Escherichia coli* in water and food samples by a fluorogenic method.

Summary
EC Broth was devised by Hajna and Perry and further modified by addition of the fluorogenic compound MUG. MUG EC Broth is recommended by APHA for the analysis of drinking water, surface and ground water and wastewater for the presence of *E. coli*. *Escherichia coli* is a member of faecal coliform group of bacteria. It is a member of the indigenous faecal flora of warm blooded animals. *E. coli* is considered a specific indicator of faecal contamination and the possible presence of enteric pathogens. MUG permits rapid detection of *E. coli* when medium is observed for fluorescence using UV Light. MUG also detects anaerogenic strains which may not be detected in conventional procedure. MUG is hydrolyzed by the enzyme β-glucuronidase possessed by *E. coli* to yield a fluorescent end product 4-Methylumbelliferone.

Principle
Casein enzymic hydrolysate provides essential nutrients. Lactose is the fermentable carbohydrate. Sodium chloride maintains osmotic equilibrium. The medium has a strong buffering system to control the pH in the presence of fermentative action. The bile salts inhibit Gram-positive bacteria especially *Bacillus* species and faecal Streptococci. Mostly beta-glucuronidase activity occurs within 4 hours but some weak beta-glucuronidase-positive strains require overnight incubation. The fermentation of lactose by lactose fermenters leads to acidification of the medium, resulting in drop of pH. Adjustment of pH of cultures by sodium hydroxide enhanced fluorescence as observed by Maddocks and Greenman. Similarly, Freir and Hartman noticed that exposure of tubes to ammonia fumes enhanced fluorescence.

Formula*

Ingredients	**g/L**
Casein Enzymic Hydrolysate	20.0
Lactose	5.0
Bile Salts Mixture	1.5
Dipotassium Phosphate	4.0
Monopotassium Phosphate	1.5
Sodium Chloride	5.0
Methylumbelliferyl ß-D-Glucuronide (MUG)	0.05
Final pH (at 25°C)	6.9 ± 0.2

*Adjusted to suit performance parameters.

Storage and Stability
Store dehydrated medium below 30°C in tightly closed container and the prepared medium at 2°C-8°C. Avoid freezing and overheating. Use before expiry date on the label. Once opened keep powdered medium closed to avoid hydration.

Specimen Collection and Handling
Ensure that all samples are properly labelled. Follow appropriate techniques for handling samples as per established guidelines. Some samples may require special handling, such as immediate refrigeration or protection from light, follow the standard procedure. The samples must be stored and tested within the permissible time duration. After use, contaminated materials must be sterilized by autoclaving before discarding.

Directions
1. Suspend 37.05 g of the powder in 1000 mL purified / distilled water.
2. Heat, if necessary, to dissolve the powder completely.
3. Dispense in tubes containing inverted Durham's tubes.
4. Sterilize by autoclaving at 121°C (15 psi) for 12-15 minutes as per validated cycle.

Quality Control

Dehydrated Appearance: Cream to yellow homogenous, free flowing powder.
Prepared Appearance: Yellow to light amber coloured, clear solution without any precipitate.
Cultural Response: Cultural characteristics observed after an incubation at 35°C-37°C for 4-24 hours.

Organism (ATCC)	Growth	Gas	Fluorescence (under UV at 366 nm)
Escherichia coli (25922)	Good	+	Positive, throughout the tube
Klebsiella aerogenes (13048)	Good	-	Negative
Staphylococcus aureus subsp. *aureus* (25923)	Inhibited	-	Negative
Salmonella Typhi (6539)	Good	-	Negative
Shigella flexneri serotype 2b (12022)	Good	-	Negative

Performance and Evaluation

Performance of the product is dependent on following parameters as per product label claim:

1. Directions
2. Storage
3. Expiry

Warranty

This product is designed to perform as described on the label and package insert. The manufacturer disclaims any implied warranty of use and sale for any other purpose.

Reference

1. Hajna A. A. and Perry C. A., 1943, Am. J. Public Health, 33:550.
2. Feng P. C. S. and Hartman P. A. S., 1982, Appl. Environ. Microbiol., 43:132.
3. Robinson B. J., 1984, Appl. Environ. Microbiol., 48:285.
4. Greenberg A. E., Trussell R. R. and Clesceri L. S., (Eds.), 1988, Standard Methods for the Examination of Water and Wastewater, 20th Ed., APHA, Washington, D.C.
5. Maddocks J. L. and Greenan M. J. (1975) J. Clin. Pathol. 28. 686-687.
6. Freir T. A. and Hartman P. A. (1987) Appl. Env. Microbiol. 53. 1246-1250.
7. Data on file: Microxpress®, A Division of Tulip Diagnostics (P) Ltd.

Product Presentation:

Cat No.	Product description	Pack Size
201130690500	Dehydrated Culture Media	500 g