M Endo Broth MF (MF Endo Medium) (M-Coliform Broth) M1103

M-Endo Broth MF is used in the one step membrane filter technique for the enumeration of coliform bacteria in water samples.

Composition**

Ingredients	Gms / Litre
Tryptose	10.000
Casein enzymic hydrolysate	5.000
Peptone, special	5.000
Yeast extract	1.500
Lactose	12.500
Sodium deoxycholate	0.100
Dipotassium phosphate	4.375
Monopotassium phosphate	1.375
Sodium chloride	5.000
Sodium lauryl sulphate	0.050
Sodium sulphite	2.100
Basic fuchsin	1.050
Final pH (at 25°C)	7.2±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 48.05 grams in 1000 ml distilled water containing 20 ml ethanol. Heat if necessary to dissolve the medium completely. DO NOT AUTOCLAVE. Cool to room temperature and dispense about 2 ml onto sterile absorbent pads. This medium should be used on the same day it is prepared and should be protected from bright light.

Caution : Basic fuchsin is a potential carcinogen and care should be taken to avoid inhalation of the powdered dye and contamination of the skin.

Principle And Interpretation

It is possible to remove bacteria from fluids by passing them through filters with such small pore size that bacteria are arrested. This filtration technique enables fairly large volumes of water to pass rapidly under pressure, but prevents the passage of any bacteria present. These nutrients are retained on the surface of the membrane which is then brought into contact with suitable liquid nutrients. These diffuse upwards through the pores thereby inducing the organisms to grow as surface colonies which can be counted (1).

M-Endo broth is used for the estimation of coliform bacteria in water samples using the membrane filtration technique. Endo Medium was first developed by Endo to differentiate between lactose-fermenters and non-fermenters. This medium employed sodium sulphite and basic fuchsin instead of bile salts to achieve inhibition of gram-positive bacteria (2).

M-Endo Broth MF is a selective and differential medium for the detection of coliforms by the membrane filter technique (3). Preliminary enrichment on a non-selective medium is not required in case of M-Endo Broth MF and therefore this is a medium of choice for the determination of coliform bacteria in water and other specimens by one step filtration technique.

Casein enzymic hydrolysate, tryptose, peptone special and yeast extract provide essential nutrients especially nitrogenous for the coliforms. Lactose is the fermentable carbohydrate. Sodium sulphite, sodium deoxycholate and basic fuchsin inhibit the growth of gram-positive organisms. Phosphates buffer the medium. Coliforms ferment lactose and the resulting acetaldehyde reacts with sodium sulphite and basic fuchsin to form red colonies and similar colouration of the medium. Lactose non-fermenters form colourless colonies.

Quality Control

Appearance
Light pink to purple homogeneous free flowing powder

Colour and Clarity of prepared medium
Pinkish red coloured opalescent solution in tubes

Reaction
Reaction of 4.8% w/v aqueous solution containing 2.0% v/v ethanol at 25°C. pH : 7.2±0.2

pH
7.00-7.40

Cultural Response
Cultural characteristics observed after an incubation at 35-37°C for 18-48 hours.

Cultural Response

Organism	Inoculum (CFU)	Growth	Colour of colony (on membrane filter)
Escherichia coli ATCC 25922	50-100	good-luxuriant	pink with metallic sheen
Enterobacter aerogenes ATCC 13048	50-100	good-luxuriant	pink to red (may have sheen)
Salmonella Typhi ATCC 6539	50-100	luxuriant	colourless to very light pink
Staphylococcus aureus ATCC 25923	>=10^3	inhibited	
Klebsiella pneumoniae ATCC 13883	50-100	good-luxuriant	pink to red
Salmonella Typhimurium ATCC 14028	50-100	luxuriant	colourless to very light pink

Storage and Shelf Life
Store below 30°C in tightly closed container and use freshly prepared medium. Use before expiry date on the label.

Reference
1.Cruickshank R., Duguid J. P., Marmion B. P., Swain R. H. A., (Eds.), Medical Microbiology, 1975, 12th Ed. Vol. II, Churchill Livingstone
2.Endo S., 1904, Zentralbl. Bakteriol., Abt. 1, Orig.35:109-110.
3.Fifield C. W. and Schaufus C. P., 1958, J. Am. Water Works Assoc. 50:193

Revision : 2 / 2015