M- Enrichment Broth

M1109

M-Enrichment Broth is used as a non-selective medium for enumeration of bacteria by membrane filter technique and for preliminary enrichment of organisms on membrane filter prior to using selective media.

Composition**

Ingredients	Gms / Litre
Proteose peptone	40.000
Yeast extract	6.000
Dipotassium hydrogen phosphate	3.000
Sodium chloride	5.000
Final pH (at 25°C)	7.0±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 54 grams in 1000 ml distilled water. Heat if necessary to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes.

Principle And Interpretation

Membrane filter technique is an alternative to most probable number (MPN) method used in microbiological analysis of water samples. In membrane filter technique, fluid sample is passed through organic membrane using a filter funnel and vacuum system. Any organism in the sample is concentrated on the surface of the membrane. The filter membrane is then placed on surface of nutrient agar plate. The colonies can then be counted to determine the number of bacteria originally present (1). Bacteria may become stressed or injured in water and waste water. These injured bacteria are incapable of growth and colony formation under standard conditions because of structural or metabolic damage. Resuscitation of stressed or injured organisms is enhanced by inoculating samples and initially culturing them in an enriched, non-inhibitory medium (2). M-Enrichment Broth is used for the preliminary enrichment of organism. Enrichment also helps to detect small numbers of organisms, if present.

M-Enrichment Broth is prepared according to the formula described by Clark et al (3). This medium is also recommended for use in conjunction with M-EMB Broth (M1105) and M-Bismuth Sulphite Broth (M1101). This medium has been recommended by various authors for enrichment of organisms prior to isolation (4-7).M-Enrichment Broth medium is devoid of any carbohydrate source or indicator. However, these ingredients (or may be other ingredients also) can be added to this nutritive medium to obtain a variety of media capable of demonstrating biological characteristics of microorganisms. Proteose peptone and yeast extract supply the nitrogenous nutrients like amino acids, peptides, vitamin B1, trace ingredients etc. to the growing organisms. Dipotassium phosphate buffers the medium while sodium chloride maintains the osmotic balance.

Sterile cotton absorbent pads are saturated with around 2 ml of M-Enrichment Broth. Membrane filter used for filtration procedure is aseptically placed on these saturated absorbent cotton pads containing M-Enrichment Broth. The membrane filters are incubated for 4-6 hours. Following this, the membrane filters are aseptically placed on selective media plates for selective isolation of the desired organisms. However, pre-enrichment for 6 hours, rather than 24 hours, resulted in significantly higher numbers of false-negative results (8).

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 5.4% w/v aqueous solution at 25°C. pH : 7.0±0.2

pH

6.80-7.20

Cultural Response

M1109: Cultural characteristics observed after an incubation at 35-37°C for 1 8 - 24 hours.

Organism	Inoculum (CFU)	Growth(on membrane filter)
Cultural Response		
Escherichia coli ATCC 25922	50-100	luxuriant
Salmonella Typhi ATCC 6539	50-100	luxuriant
Staphylococcus aureus ATCC 25923	50-100	luxuriant

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.

Reference

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3. Clark H. F., Geldreich E. E., Jeter M. L. and Kabler P. W., 1951, Publ. Hlth. Repts., 66:951.
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