Technical Information

PA Broth

Product Code: DM 2186

Application: - PA Broth is used for the detection of presence and absence of coliform bacteria in water from treatment plants or distribution systems.

Composition**

Ingredients	Gms / Litre
Peptic digest of animal tissue	5.000
Tryptose	9.830
Beef extract	3.000
Lactose	7.460
Sodium chloride	2.460
Dipotassium phosphate	1.350
Monopotassium phosphate	1.350
Sodium lauryl sulphate	0.050
Bromo cresol purple	0.0085
Final pH (at 25°C)	6.8±0.2

**Formula adjusted, standardized to suit performance parameters

Principle & Interpretation

Availability of clean water for bathing, drinking and cooking is critical for modern civilization. Different pathogens can be transmitted through water contaminated by faeces and other sources leading to water born diseases such as diarrhea, typhoid, cholera etc. Different strategies have been developed and adopted for bacteriological examination of water. Weiss and Hunter proposed a simplified procedure for the bacteriological examination of treated water [(1)]. Later on the PA (Presence Absence) test was developed as a simplified version. The test is based on the principle that coliforms and other bacterial indicators of pollution should not be found in 100 ml samples of treated water [(2)]. Other aspects of PA test were studied by Clark et al [(3)]. PA Broth has been included as a tentative standard on the theory that a 100 ml sample of drinking water should not contain any coliform. The Presence Absence (PA) test for the coliform group is a simple modification of the multiple-tube procedures and provides a qualitative estimate of coliforms. This test is mainly used on routine samples collected from distribution system or water treatment plants. When PA test is positive, coliform densities can be determined quantitatively in repeat samples to know the magnitude of the contamination [(4)].

The medium contains peptic digest of animal tissue, tryptose, beef extract which supply nitrogenous growth factors and trace ingredients to the coliforms. Lactose serves as the fermentable carbohydrate and energy source for bacterial metabolism. Phosphates provide buffering action while sodium lauryl sulphate inhibits many organisms other than coliforms. Bromocresol purple is the pH indicator which turns yellow at acidic pH. Majority of the lactose fermenting coliforms utilize the lactose to form acid. This acidity is detected by the pH indicator (Bromocresol purple) which change colour from purple to yellow at acidic pH. The medium is used a triple strength medium when examining 100 ml samples.

PA test is only a presumptive test for the presence of coliforms. Confirmation of these results must be achieved by using a medium like Brilliant Green Bile Broth (DM1121).

Methodology

Suspend 30.5 grams of powder media in 1000 ml distilled water or if desired, suspend 91.5 grams of powder media in 1000 ml distilled water to prepare a triple strength medium. Dispense 50 ml volumes into screw capped tubes. Sterilize by autoclaving at 15 lbs pressure (121°C) for 12 minutes.

Quality Control

Physical Appearance
Light yellow to greenish yellow homogeneous free flowing powder

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

Reaction
Reaction of 3.05% w/v aqueous solution at 25°C. pH : 6.8±0.2

pH Range 6.60-7.00

Cultural Response/Characteristics
DM 2186: Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

Organism	Inoculum (CFU)	Growth	Colour of medium
Escherichia coli ATCC 25922	50-100	Good- luxuriant	Yellow
Enterobacter aerogenes ATCC 13048	50-100	Good-luxuriant	Light yellow
Enterococcus faecalis ATCC 29212	>=10^3	Inhibited	-
Klebsiella pneumoniae ATCC 13883	50-100	Good-luxuriant	Yellow
Salmonella Typhimurium ATCC 14028	50-100	Good-luxuriant	No change (purple)

Storage and Shelf Life

Dried Media: Store below 30°C in tightly closed container and use before expiry date as mentioned on the label.
Prepared Media: 2-8^0 in sealable plastic bags for 2-5 days.

Further Reading

1. Weiss J.E. and Hunter C.A., 1939, J. Am. Water Works Assoc., 31: 707.
2. Clark J. A., 1969, Can. J. Microbiol., 5: 771.
3. Clark J. A., Burger C.A. and Sabatinos L. E., 1982, Can. J. Microbiol., 28: 1002.
4. Eaton A. D., Clesceri L.S. and Greenberg A. W.,(Eds.), 2005, Standard Methods for the Examination of Water and Wastewater, 21st Ed., APHA, Washington, D.C.

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