B.D.G. - Broth, Hajna

M205

Intended Use:

Recommended for presumptive detection of enteric bacilli present in treated drinking water.

Composition**

Ingredients	g / L
Tryptose	20.000
Dextrose (Glucose)	5.000
Sodium chloride	5.000
Sodium deoxycholate	0.100
Dipotassium hydrogen phosphate	4.000
Potassium dihydrogen phosphate	1.500
Final pH (at 25°C)	7.0±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 35.60 grams in 1000 ml purified / distilled water. Heat if necessary to dissolve the medium completely. Dispense in tubes or flasks as desired. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes.

Principle And Interpretation

Examination of water for the presence of marker groups such as enteric bacilli is one of the most common tests in a microbiology laboratory, partly because of the relative ease and speed with which these tests can be accomplished. Where it is claimed that drinking water has been processed for safety, the finding of such organism demonstrates a failure of the process. It is a valuable bacterial indicator for determining the extent of fecal contamination of recreational surface waters or drinking water (1). B.D.G.-Broth, Hajna (Buffered Deoxycholate Glucose Broth) is a selective enrichment or presumptive test medium used for the detection of all enteric bacilli in drinking water.

This medium is prepared according to the formula of Hajna and Damon (2). These authors reported a higher number of positive coliform findings from water and food samples using this media than with the use of standard methods media (Lactose Broth, etc.) B.D.G. Broth supports excellent growth of gram-negative enteric bacilli other than coliforms and may be used for the detection of lactose non-fermenting organisms.

While testing treated water, tubes showing no gas and very little or no growth are considered as negative. Tubes with growth are sub cultured on MacConkey Agar (M081), SS Agar (M108) or Bismuth Sulphite Agar (M027) and suspected cultures are differentiated and identified (3). Authors reported recovery of a number of organism including *Proteus* from water samples showing growth but no gas in the presumptive medium. B.D.G. Broth contains sodium deoxycholate, which inhibits the development of spore formers and other gram-positive organism without affecting growth of coliform organisms and gram-negative bacilli. For sample checking it was suggested that 10 ml of the medium should be used for sample volume of 1 ml or less. For the examination of larger amounts of water, the medium should be prepared in multiple strength. For example, 10 ml of the inoculum is added to 10 ml of double strength medium. Tubes showing gas formation following incubation at 35-37°C are transferred for confirmation.

Hajna (4) also recommended the use of BDG Broth for the performance of the Methyl Red test and Voges Proskaur test.

Tryptose provides the essential nutrition required for the bacteria. Dextrose is the carbon source. Sodium deoxycholate inhibits all gram-positive bacteria and coliforms but allows gram-negative bacilli to grow. Sodium chloride provides essential ions. Dipotassium hydrogen phosphate and Potassium dihydrogen phosphate provide buffering to the medium.

Type of specimen

Water samples

Specimen Collection and Handling:

For water samples, follow appropriate techniques for sample collection, processing as per guidelines and local standards (5). 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. While testing treated water, tubes showing no gas and very little or no growth are considered as negative.

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 yellow coloured, clear solution without any precipitate

Reaction

Reaction of 3.56% w/v aqueous solution at 25°C. pH : 7.0±0.2

pH

6.80-7.20

Cultural Response

Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

Organism	Inoculum (CFU)	Growth
** *Bacillus spizizenii* ATCC 6633 (00003*)	>=10^4	inhibited
Escherichia coli ATCC 25922 (00013*)	50-100	luxuriant
## *Proteus hauseri* ATCC 13315	50-100	luxuriant
Salmonella Typhi *ATCC 6539*	50-100	luxuriant
Shigella flexneri ATCC 12022 (00126*)	50-100	luxuriant
Staphylococcus aureus subsp. *aureus ATCC 25923* (00034*)	>=10^4	inhibited

Key : (*) - Corresponding WDCM numbers.

**Formerly known as *Bacillus subtilis* subsp. *spizizenii*

Formerly known as *Proteus vulgaris*

Storage and Shelf Life

Store between 10-30°C in a tightly closed container and the prepared medium at 15-30°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. Corry J. E. L., Curtis G. D. W. and Baird R. M., Culture Media For Food Microbiology, Vol. 34, Progress in Industrial Microbiology, 1995, Elsevier, Amsterdam.
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3. Public Health Lab, 1951, 9:23.
4. Personal Communication, 1953.
5. Lipps WC, Braun-Howland EB, Baxter TE,eds. Standard methods for the Examination of Water and Wastewater, 24th ed. Washington DC:APHA Press; 2023.
6. Isenberg, H.D. Clinical Microbiology Procedures Handbook 2nd Edition.
7. 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.

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