Technical Information

Bismuth Sulphite MiVeg Agar, Modified

Product Code : VM2004

Application:- Bismuth Sulphite MiVeg Agar, Modified is recommended for the selective isolation and preliminary identification of *Salmonella* Typhi and other Salmonellae from pathological materials, sewage, water supplies, food etc .

Composition

Ingredients	Gms / Litre
MiVeg peptone	5.000
MiVeg extract	5.000
Dextrose	5.000
Disodium phosphate	4.000
Ferrous sulphate	0.300
Bismuth sulphite indicator	8.000
Brilliant green	0.016
Agar	12.700
Final pH (at 25°C)	7.6±0.2

** Formula adjusted, standardized to suit performance parameters.

Principle & Interpretation

Bismuth Sulphite MiVeg Agar, is prepared by using Miveg peptones inplace of animal peptones which makes BSE/TSE risk free. This medium is a modification of the original formulation of Wilson and Blair Medium (1). It is also recommended for the isolation of *Salmonella* Typhi and other Salmonella (2, 3).

Ingredient in the medium like MiVeg peptone and MiVeg extract supplies carbon, nitrogen, vitamins and essential growth factors. Dextrose is the main carbon source. Disodium phosphate regulates the osmotic equilibrium. Bismuth sulphite indicator and brilliant green are incorporated in the medium to inhibit the intestinal gram-positive and gram-negative bacteria. Ferrous sulphate aids in detection of hydrogen sulphide production. Clinical samples can be directly used to inoculate on this medium. In case of food samples, pre enrichment of the sample is done prior to inoculation.

The Salmonellae constitute the most taxonomically complex group of bacteria among *Enterobacteriaceae* (4). Human *Salmonella* infections are most commonly caused by ingestion of food, water or milk contaminated by human or animal excreta. Humans are the only reservoirs of *S* . Typhi (5). Four clinical types of *Salmonella* infections may be distinguished (6) namely gastroenteritis, bacteremia or septicemia, enteric fever and a carrier state. Of the various media employed for the isolation and preliminary identification of Salmonellae, particularly *Salmonella* Typhi; Bismuth Sulphite Agar is the most productive (7).

S . Typhi, *S* . Enteritidis and *S* . Typhimurium typically grow as black colonies with a surrounding metallic sheen resulting from hydrogen sulphide production and reduction of sulphite to black ferric sulphide. *Salmonella* Paratyphi A grows as light green colonies. Bismuth Sulphite Agar may be inhibitory to some strains of *Salmonella* species and therefore should not be used as the sole selective medium for these organisms. *Shigella* species are mostly inhibited on this medium; exceptions being *S* . flexneri and *S* . sonnei (8) and also some *Salmonella* like *S* . Sendai, *S* . Berta, *S*. Gallinarum, *S* . Abortus-equi are inhibited (8). Also this medium favors use of larger inoculum as compared to other selective media, as it has unique inhibitory action toward gram-positive organisms and coliforms.

Methodology

Suspend 40 grams of powder media in 1000 ml purified/distilled water. Mix thoroughly. Heat to boiling to dissolve the medium completely. DO NOT STERILIZE IN AUTOCLAVE or by fractional sterilization since overheating may destroy the selectivity of the medium.
The sensitivity of the medium depends largely upon uniform dispersion of precipitated bismuth sulphite in the final gel, which should be dispersed before pouring into the sterile Petri plates.

Quality Control

Physical Appearance

Light yeow to greenish yellow coloured homogeneous free flowing powder

Gelling

Firm, comparable with 1.27% Agar gel.

Colour and Clarity of prepared medium

Greenish yellow coloured opalescent with flocculant precipitate

Reaction

Reaction of 4.0 % w/v aqueous solution pH: 7.6±0.2 at 25°C

pH range

7.40-7.80

Cultural Response/Characteristics

Cultural characteristics observed after an incubation at 35-37°C for 40-48 hours

Organisms (ATCC)	Inoculum (CFU)	Growth	Recovery	Colour of colony
Enterococcus faecalis ATCC 29212	<=10^3	Inhibited	0%	-
Enterobacter aerogenes ATCC 25922	50-100	None-poor	<=10%	Brown-green(depends on inoculums density)
Escherichia coli ATCC 25922	50-100	None-poor	<=10%	Brown-green(depends on inoculums density)
Salmonella Typhi ATCC 19430	50-100	luxuriant	<=50%	Black with metallic sheen
Salmonella Paratyphi B ATCC 8759	50-100	luxuriant	<=50%	Black with metallic sheen
Salmonella Enteritidis ATCC 13076	50-100	luxuriant	<=50%	Black with metallic sheen
Shigella flexneri ATCC 12022	50-100	None-poor	<=10%	Brown

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.Tindall B. J., Crimont P. A. D., Gorrity G. M., EUZESY B. P., 2005, Int. J. Sys. Evol. Microbiol., 55:521
2.Koneman E. W., Allen S. D., Janda W. M., Schreckenberger P. C., Winn W. C. Jr., 1992, Colour Atlas and Textbook of Diagnostic Microbiology, 4 th Ed., J. B. Lippinccott Company
3.Mandell G. L., Douglas R. G. Jr., Bennet J. E., (Eds.) , 1985, Principles and Practice of Infectious Diseases, 2nd Ed., 660-669, John Wiley & Sons New York.
4.Gunter and Tuft, 1939, J. Lab. Clin. Med., 24:461.
5.Wilson and Blair, 1927, J. Hyg., 26:374.
6.Anon, 1981, Int. Standard ISO 6579-1981, Geneva. International Organization for Standardization.
7.ICMSF, 1978, Microorganisms in Food, 2nd Edi, University of Toronto Press, Ontario.
8.MacFaddin J. F., 2000, (Ed.), Biochemical Tests for Identification of Medical Bacteria, 3rd Edition, Lippincott, Williamss & Wilkins, New York.

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