Technical Information

Koser Citrate Medium

Product Code: DM 1069

Application: - Koser Citrate Medium is used to differentiate *Escherichia coli* from *Enterobacter aerogenes* on the basis of citrate utilization

Composition**

Ingredients	Gms / Litre
Sodium ammonium phosphate	1.500
Monopotassium phosphate	1.000
Magnesium sulphate	0.200
Sodium citrate	3.000
Final pH (25°C)	6.7±0.2

**Formula adjusted, standardized to suit performance parameters

Principle & Interpretation

Coliform bacteria serve as bacterial indicators of sanitary quality pertaining to food and water. These bacteria are normally found in the intestinal tract of humans and many warm-blooded animals [1]. Coliform comprises mostly members of family Enterobacteriaceae such as Enterobacter, Klebsiella, Escherichia, and Citrobacter. The characteristics of the members of Enterobacteriaceae are that they are gram-negative rods and ferment glucose to form acid along with gas production [2]. Two important members of the Enterobacteriaceae family are Escherichia coli and Enterobacter aerogenes. Both can be differentiated on the basis of IMViC test. Enterobacter species are able to utilize sodium citrate as the sole carbon source while E.coli fail to do so. This property is used to differentiate the coli-aerogenes group [3]. Koser Citrate Medium is used as a base for studying citrate utilization tests. This medium is recommended by APHA, and others, to presumptively identify coliforms encountered in the food and dairy industry [3-7].

The various salts used serve as source of carbon and nitrogen to the organisms. Citric acid or its sodium salt is utilized as a sole source of carbon and ammonium salt as the sole source of nitrogen by E.aerogenes while E.coli does not utilize these salts and hence fail to grow. Koser Citrate Medium may be used in place of Simmon Citrate Agar (MS1099). Inoculating into Koser Citrate Medium further identifies coli-like colonies from Endo or EMB Agar plates. After 24-48 hours incubation, tubes showing marked turbidity may be assumed to contain organisms from aerogenes group and if the medium remains clear it may be considered as coli. Presumptive positive organisms identified on this medium should be further confirmed by performing the biochemical tests.

Methodology

Suspend 5.7 grams of powder media in 1000 ml distilled water. Shake well & dispense into tubes and sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes.

Quality Control

Physical Appearance
White to cream homogeneous free flowing powder

Colour and Clarity of prepared medium
Colourless, clear solution without any precipitate

Reaction
Reaction of 0.57 w/v aqueous solution at 25°C. pH : 6.7±0.2

pH Range 6.50.6.90

Cultural Response/ characteristics
DM 1069: Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

Organism	Inoculum (CFU)	Growth	Citrate Utilisation
Enterobacter aerogenes ATCC 13048	50-100	luxuriant	positive reaction,turbidity positive
Enterobacter cloacae ATCC 23355	50-100	luxuriant	positive reaction,turbidity positive
Escherichia coli ATCC 25922	50-100	none-poor	negative reaction noturbidity positive
Klebsiella pneumoniae ATCC 13883	50-100	luxuriant	positive reaction,turbidity positive

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° in sealable plastic bags for 2-5 days.

Further Reading

1. Alcamo I. E., 2001, Fundamentals of Microbiology, 6th Edition, Jones and Bartlett Publishers.
2. Murray P. R., Baron J. H., Pfaller M. A., Jorgensen J. H. and Yolken R. H., (Ed.), 2003, Manual of Clinical Microbiology, 8th Ed., American Society for Microbiology, Washington, D.C.
3. Koser S. A., 1923, J. Bacteriol., 8:493.
4. U. S. Food and Drug Administration, 1995, Bacteriological Analytical Manual, 8th Ed., AOAC International, Gaithersburg, Md.
5. Williams, (Ed.), 2005, Official Methods of Analysis of the Association of Official Analytical Chemists, 19th Ed., AOAC, Washington, D.C.
6. Downes F. P. and Ito K., (Eds.), 2001, Compendium of Methods for the Microbiological Examination of Foods, 4th Ed., APHA, Washington, D.C.
7. Wehr H. M. and Frank J. H., (Eds.), 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.

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