Technical Information

Lysine Iron Agar

Product Code: DM 1377

Application: Lysine Iron Agar is recommended for the differentiation of enteric organisms especially *Salmonella* Arizonae based on their ability to decarboxylate or deaminate lysine and to form hydrogen sulphide (H_2S).

Composition**

Ingredients	Gms / Litre
Peptic digest of animal tissue	5.000
Yeast extract	3.000
Dextrose	1.000
L-Lysine	10.000
Ferric ammonium citrate	0.500
Sodium thiosulphate	0.040
Bromocresol purple	0.020
Agar	15.000
Final pH (at 25°C)	6.7±0.2

**Formula adjusted, standardized to suit performance parameters

Principal & Interpretation

Lysine Iron Agar was developed by Edwards and Fife [1] to detect lactose fermenting Salmonellae. Salmonellae are known to decarboxylate lysine rapidly and produce large amounts of hydrogen sulphide [2, 3]. This medium is a sensitive medium for the detection of lactose fermenting and lactose non-fermenting *Salmonella* species. Many strains of this group ferment lactose very rapidly thus suppressing H_2S production on Triple Sugar Iron Agar (DM1021). So there is a possibility that the organisms frequently found in food poisoning outbreaks could be overlooked. Thatcher and Clark [4] described the isolation of Salmonella species from foods from selective agar and to inoculate it on Lysine Iron Agar and Triple Sugar Iron (DM1021) together. Using these two media greater differentiation can be observed between *Escherichia* and *Shigella* [5, 6].

Peptic digest of animal tissue and yeast extract provide essential nutrients. Dextrose is a source of fermentable carbohydrate. Ferric ammonium citrate and sodium thiosulphate are indicators of H_2S formation. Cultures that produce hydrogen sulphide cause blackening of the medium due to ferrous sulphide production. Lysine decarboxylation causes an alkaline reaction (purple colour) to give the amine cadaverine and the organisms which do not decarboxylate lysine, produce acid butt (yellow colour). Organisms that deaminate lysine, form # - ketocarboxylic acid, which reacts with iron salt near the surface of the medium under the influence of oxygen to form reddish-brown compound. The medium is stabbed to the base of the butt and streaked on slant.

Methodology

Suspend 34.56 grams of powder media in 1000 ml distilled water. Shake well & heat to dissolve the medium completely. Dispense into tubes and sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool the tubes in slanted position to form slants with deep butts.

Quality Control

Physical Appearance
Light yellow to greyish yellow homogeneous free flowing powder

Gelling
Firm, comparable with 1.5% Agar gel

Colour and Clarity of prepared medium
Purple coloured, clear to slightly opalescent gel forms in tubes as slants

Reaction
Reaction of 3.45% w/v aqueous solution at 25°C. pH : 6.7±0.2

pH Range 6.50-6.90

Cultural Response/Characteristics
DM 1377: Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

Organism	Inoculum (CFU)	Growth	Butt	Slant	H_2S
Citrobacter freundii ATCC 8090	50-100	luxuriant	acidic reaction, yellowing of the medium	alkaline reaction, purple or no colour change	Positive reaction blackening of medium
Escherichia coli ATCC 25922	50-100	luxuriant	alkaline reaction, purple or no colour change	alkaline reaction, purple or no colour change	negative reaction
Proteus mirabilis ATCC 25933	50-100	Luxuriant	acidic reaction, yellowing of the medium	Deep red,lysine deamination	Positive reaction, blackening of medium
Salmonella Arizonae ATCC 13314	50-100	Luxuriant	alkaline reaction, purple or no colour change	Alkaline reaction, purple or no colour change	Positive reaction, blackening of medium
Salmonella Enteritidis ATCC 13076	50-100	luxuriant	alkaline reaction, purple or no colour change	Alkaline reaction, purple or no colour change	Positive reaction, blackening of medium
Salmonella Typhimurium ATCC 14028	50-100	luxuriant	alkaline reaction, purple or no colour change	Alkaline reaction, purple or no colour change	Positive reaction, blackening of medium
Shigella flexneri ATCC 12022	50-100	luxuriant	acidic reaction, yellowing of the medium	Alkaline reaction, purple or no colour change	Negative reaction

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. Edward P.R. and Fife M.A., 1961, Appl. Microbiol., 9:478.
2. Moeller V., 1954, Acta Pathol. Microbiol. Scand., 355:259.
3. Ewing W.H., Davis B.R. and Edward P.R., 1960, Pub. Hlth. Labs., 18:77.
4. Thatcher F.S. and Clark D.S., 1968, University of Toronto Press, p. 100.
5. Johnson J.G., Kunz L.J., Barron W. and Ewing W.H., 1966, Appl. Microbiol., 14:212.
Finegold S.M. and Martin W.J., 1982, Bailey and Scotts Diagnostic Microbiology, 6th ed., The C.V. Mosby Co., St. Louis

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