Lysine Iron Agar

Cat. 1044

For studies of the decarboxylation of lysine for the rapid differentiation of Salmonella arizonae

Practical information

Aplications	Categories
Differentiation	Enterobacteria
Differentiation	Salmonella arizonae

Industry: Food

Principles and uses

Lysine Iron Agar is used for the rapid differentiation of Enterobacteriaceae, especially Salmonella arizonae, on the basis of lysine decarboxylation and deamination, and H2S production. This medium is very useful for the rapid differentiation of Salmonella arizonae from Citrobacter and Proteus spp.

The strains that rapidly ferment the lactose produce a large quantity of acid, changing the original purple color of the medium to yellow. Some strains of S. arizonae can rapidly ferment lactose and form colonies that are colorless or pink to red on media such as MacConkey Agar (Cat. 1052) or Desoxycholate Agar (Cat. 1020). Lysine Iron Agar is especially formulated to avoid this confusion.

Gelatin peptone and Yeast extract provide the nutrient sources for growth: nitrogen, vitamins, minerals and amino acids.
One reaction is the degradation of the fermentable carbohydrate Dextrose, with the production of acid, manifested in the color change from red to yellow. Sodium thiosulfate provides Sulphur and Ferric ammonium citrate is the indicator for H2S production under alkaline conditions. The bacteria that decarboxylate the L-Lysine to cadaverine, such as Salmonella arizonae, are identified by the presence of a purple-red color due to the elevation of the pH. Bromocresol purple is the pH indicator. Bacteriological agar is the solidifying agent.

Formula in g/L

Bacteriological agar	13,5	Bromocresol purple	0,02
Dextrose	1	Ferric ammonium citrate	0,5
Gelatin peptone	5	L-Lysine	10
Sodium thiosulfate	0,04	Yeast extract	3

Preparation

Suspend 33 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Dispense into tubes and sterilize in autoclave at 121ºC for 12 minutes. Allow to cool in a slanted position.

Instructions for use

Inoculate and incubate at 35 ± 2ºC for 18 – 48 hours.
Cultures rapidly producing lysine decarboxylase cause an alkaline reaction (purple colour) throughout the medium. Those organisms that do not decarboxylate lysine produce an alkaline slant and an acid butt (yellow colour). Proteus and Providencia produce a characteristic orange-red color on the slant while the butt is yellow from the production of acid from the deamination of lysine.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Purple	6,7±0,2

Microbiological test

Incubation conditions: (35±2ºC) y (18-48 h)

Microrganisms	Specification	Characteristic reaction
Shigella flexneri ATCC 12022	Good growth	Red-purple slant, Yellow butt, H2S (-)
Salmonella arizonae ATCC 13314	Good growth	Red-purple slant, Red-purple butt, H2S (+)
Salmonella typhimurium ATCC 14028	Good growth	Red-purple slant, Red-purple butt, H2S (+)
Escherichia coli ATCC 25922	Good growth	Red-purple slant, Red-purple butt, H2S (-)
Proteus mirabilis ATCC 25933	Good growth	Deep red slant, Yellow butt, H2S (-)
Citrobacter freundii ATCC 8090	Good growth	Red-purple slant, Yellow butt, H2S (+)

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

Bibliography

Edwards and Fite Applied Microbiol. 9:478, 1961.
Edwards and Ewing. Identification of Enterobacteriaceae. Burgess Publishing Co. Minneapolis, Minn., 1962.