Product :
LYSINE IRON AGAR (LIA)

Specification

Differential medium for Enterobacteria, recommended by Edwars and Ewing for *Salmonella* and *Arizona arizonae* (now know as *Salmonella choleraesuis subsp. arizonae*) identification.

Formula * in g/L

Gelatin peptone	5,00
Yeast extract	3,00
Dextrose	1,00
L-Lysine	10,00
Ammonium ferric citrate	0,50
Sodium thiosulfate	0,04
Bromocresol purple	0,02
Agar	15,00

Final pH 6,7 ±0,2 at 25 ºC

* Adjusted and /or supplemented as required to meet performance criteria

Directions

Suspend 34,5 g of powder in 1 L of distilled water and bring to the boil. Dispense in tubes and sterilize in the autoclave at 121ºC for 15 minutes. Allow to solidify in a slanted position, with a long butt and short slant.

Description

Lysine and Iron medium has been widely used for the differentiation of different biotypes of *Salmonella*, especially *S. arizonae*, which, on standard selective isolation media, such as MacConkey or deoxycholate, may give rise to coloured or colourless colonies due to the fact that their lactose fermentative capacity is quite variable.

By using LIA in combination with Kligler Iron Agar (Art. No. 01-103) or Triple Sugar Iron (Art. No. 01-192), when identifying isolates false negative results due to lactose negative *Salmonella* can be avoided.

Salmonella is the only genus of enterobacteria that normally decarboxylates lysine and produces substantial amounts of hydrogen sulfide.

LIA works perfectly verifying these two characteristics.

Technique

Presumptive colonies form the primary isolation media are. Inoculated into a Kligler's tube, and without reloading the inoculation loop, surface streak the slant and stab inoculate the butt of an LIA tube. Incubate them with loose lids, at 35 ±2ºC for18-24 hours.

Microorganisms that decarboxylate the Lysine, rapidly, produce a strong alkalinization in the entire medium turning the indicator purple. Those that have no Lysine decarboxylase activity, acidify the medium at the bottom producing a yellow colouration, whilst the surface of the medium remains the original colour or shows an alkaline reaction.

Proteus are distinguished easily, since, above the yellow butt, they produce a typical red or orange colour on the surface, due to the oxidative deamination of Lysine. The microorganisms which produce of hydrogen sulfide blacken the medium due to iron sulphur precipitates. However excessive acidification of the medium may mask SH2 production. For this reason, Proteus ssp., does not blacken the culture medium.

Although the gas production may be observed, generally this medium does not offer optimal conditions for this, and gives very irregular results, with total inhibition in some cases.

Quality control

Incubation temperature: 35°C ±2,0 **Incubation time:** 18-24 h

Inoculum: Stab the butt and streak the slant.

Microorganism	Growth	Remarks
Escherichia coli ATCC® 25922	Good	Slant: Alk (violet), Butt:Neutral, H_2S: -
Proteus mirabilis ATCC® 43071	Good	Slant: Red, Butt: Ac, H_2S: ND
Salmonella abony NCTC® 6017	Good	Slant: Alk (violet), Butt: Alk, H_2S: +
Salmonella typhimurium ATCC® 14028	Good	Slant: Alk (violet), Butt: Alk, H_2S: +
Shigella flexneri ATCC® 12022	Good	Slant: Alk (violet), Butt: Ac H_2S: -

References

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· DOWNES, F.P. & K. ITO (2001) Compendium of methods for the microbiological examination of foods. 4th ed. APHA. Washington.
· EDWARS, P.R., & FIFE, MARY A. (1961) Lysine-Iron Agar in the detection of Arizona cultures. Appl. Microbiol 99, 478 -480.
· EWING, J. (1982) Edwars and Ewing's identification of Enterobacteriaceae. 4th ed. Elsevier Sci. Pub. Co. Inc. N.Y.
· HORWITZ, W. (2000) Official Methods of Analysis. 17th ed. AOAC International. Gaithersburg. MD. USA.
· MARSHALL, R.T. (1992) Methods for the examination of dairy products. 16th ed. APHA. Washington.
· MacFADDIN, J.F. (1985) Media for the isolation, cultivation, identification and maintenance of medical bacteria. William & Wilkins. Baltimore.

Storage

For laboratory use only. Keep tightly closed, away from bright light, in a cool dry place (+4 ºC to 30 ºC).