Xylose Lysine Agar Base

M336

Intended Use

Recommended for isolation and identification of pathogenic enteric bacilli.

Composition**

Ingredients	Gms / Litre
Yeast extract	3.000
L-Lysine	5.000
Lactose	7.500
Saccharose (Sucrose)	7.500
Xylose	3.500
Sodium chloride	5.000
Phenol red	0.080
Agar	13.500
Final pH (at 25°C)	7.4±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 45.08 grams in 980 ml purified / distilled water. Boil for 1 minute. Add brilliant green if desired. Sterilize by autoclaving at 118°C (14 lbs pressure) for 10 minutes. Cool to 45-50°C and aseptically add 20 ml of sterile aqueous solution containing 34% sodium thiosulphate and 4% ferric ammonium citrate. Mix well and pour into sterile Petri plates.

Principle And Interpretation

XL Agar Base is formulated as per the modifications of Taylor (6-11) for the selective isolation, differentiation and enumeration of gram-negative enteric bacilli. The medium can be made selective for enteric bacilli by the addition of sodium deoxycholate with the resulting medium being XLD Agar (6). It can also be made selective for *Salmonella* by the addition of brilliant green dye (11).

The medium contains yeast extract, which provides nitrogen and vitamins required for growth. Though the sugars xylose, lactose and sucrose provide sources of fermentable carbohydrates, xylose is mainly incorporated into the medium since it is not fermented by *Shigella* but practically by all enterics. This helps in the differentiation of *Shigella* species. Sodium chloride maintains the osmotic balance of the medium. Lysine is included to differentiate the *Salmonella* group from the non-pathogens. *Salmonella* rapidly ferment xylose and exhaust the supply. Subsequently lysine is decarboxylated by the enzyme lysine decarboxylase to form amines with reversion to an alkaline pH that mimics the *Shigella* reaction. However, to prevent this reaction by lysine-positive coliforms, lactose and sucrose are added to produce acid in excess. Degradation of xylose, lactose and sucrose to acid causes phenol red indicator to change its colour to yellow. Bacteria that decarboxylate lysine to cadaverine can be recognized by the appearance of a red colouration around the colonies due to an increase in pH. These reactions can proceed simultaneously or successively, and this may cause the pH indicator to exhibit various shades of colour or it may change its colour from yellow to red on prolonged incubation.

To add to the differentiating ability of the formulation, an H_2S indicator system , consisting of sodium thiosulphate and ferric ammonium citrate is added for the visualization of hydrogen sulphide produced, resulting in the formation of colonies with black centers. The non-pathogenic H_2S producers do not decarboxylate lysine; therefore, the acid reaction produced by them prevents the blackening of colonies (6).

Type of specimen

Clinical samples - Faeces; Food and dairy samples; Water samples.

Specimen Collection and Handling

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (3,4).
For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (1,5,12).
For water samples, follow appropriate techniques for sample collection, processing as per guidelines and local standards (2).
After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions

In Vitro diagnostic Use. Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations

1. Further biochemical and serological tests must be carried out for complete identification.

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance
Light yellow to light pink homogeneous free flowing powder
Gelling
Firm, comparable with 1.35% Agar gel.
Colour and Clarity of prepared medium
Red coloured clear to very slightly opalescent gel forms in Petri plates.
Reaction
Reaction of 4.51% w/v aqueous solution at 25°C. pH : 7.4±0.2
pH
7.20-7.60
Cultural Response
Cultural characteristics observed with added sterile aqueous solution containing 34% sodium thiosulphate and 4%ferric ammonium citrate after an incubation at 35-37°C for 18-24 hours.

Organism	Inoculum (CFU)	Growth	Recovery	Colour of colony
# *Klebsiella aerogenes* ATCC 13048 (00175*)	50-100	good-luxuriant	>=50%	yellow
Escherichia coli ATCC 25922 (00013*)	50-100	good-luxuriant	>=50%	yellow
Proteus mirabilis ATCC 25933	50-100	good-luxuriant	>=50%	grey with black centers
Proteus vulgaris ATCC 13315	50-100	good-luxuriant	>=50%	grey with black centers
Salmonella Enteritidis ATCC 13076 (00030*)	50-100	good-luxuriant	>=50%	red with black centers
Salmonella Paratyphi A ATCC 9150	50-100	good-luxuriant	>=50%	red
Salmonella Paratyphi B ATCC 8759	50-100	good-luxuriant	>=50%	red with black centers
Salmonella Typhi ATCC 6539	50-100	good-luxuriant	>=50%	red with black centers
Salmonella Typhimurium ATCC 14028 (00031*)	50-100	good-luxuriant	>=50%	red with black centers
Shigella dysenteriae ATCC 13313	50-100	good-luxuriant	>=50%	red
Shigella sonnei ATCC 25931	50-100	good-luxuriant	>=50%	red
Shigella flexneri ATCC 12022 (00126*)	50-100	good	>=30%	red

Key : (*) Corresponding WDCM numbers.
(#) Formerly known as *Enterobacter aerogenes*

Storage and Shelf Life

Store between 10-30°C in a tightly closed container and the prepared medium at 20-30°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition Seal the container tightly after use. Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (3,4).

Reference

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4. Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.
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10. Taylor W. L. and Schelhart B., 1968, Am. J. Clin. Pathol., 16:1387.
11. Taylor W. L. and Schelhart B., 1969, Appl. Microbiol., 18.393-395.
12. Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.

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IVD — In vitro diagnostic medical device

CE Marking

10°C – 30°C — Storage temperature

Do not use if package is damaged

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