Xylose Lysine Deoxycholate Agar Plate (Harmonized)

Intended Use
Xylose Lysine Deoxycholate (XLD) Agar Plate is recommended as a selective medium for isolation and cultivation of *Salmonella* species from pharmaceutical products in accordance with microbial limit testing by harmonized methodology of USP/EP/BP/JP/IP.

Summary
XLD Agar plate is a differential medium used for the isolation of *Salmonella* and *Shigella* from clinical and non-clinical specimens like faeces and foods. It was developed by Taylor in order to increase the efficiency of isolation of the enteric pathogens, particularly *Shigella* from faecal specimens. The pathogens are differentiated not only from the non-pathogenic lactose fermenters but also from many non -pathogens, which do not ferment lactose or sucrose. Also, the medium was formulated to increase the frequency of growth of the more fastidious pathogens, which in other formulations have often failed to grow due to the inclusion of excessively toxic inhibitors. This medium is used in the microbial limit test for screening specimens for the detection of *Salmonella* and is recommended by APHA for the examination of foods, dairy products and water.

Principle
XLD Agar is both a selective and differential medium. Yeast extract provides nutrients while sodium deoxycholate inhibits Gram-positive organisms. Xylose is fermented practically by all enterics except *Shigella*, which enables the differentiation of *Shigella* species. Incorporation of lysine enables the *Salmonella* group to be differentiated from the non-pathogens since, without lysine, *Salmonella* would rapidly ferment xylose and be indistinguishable from non-pathogenic species. After *Salmonella* exhausts the supply of xylose, lysine is attacked, with reversion to an alkaline pH, which mimics the *Shigella* reaction. However, to prevent this reaction by lysine positive coliforms, lactose and sucrose are added in excess to produce acid and hence non-pathogenic H_2S producers do not decarboxylate lysine. The acid reaction produced by them prevents the blackening of the colonies. Sodium thiosulphate and ferric ammonium citrate are included for the visualization of hydrogen sulphide production, resulting in the formation of colonies with black centers. Sodium chloride maintains the osmotic balance.

Formula*

Ingredients	**g/L**
Xylose	3.5
L-Lysine	5.0
Lactose Monohydrate	7.5
Sucrose	7.5
Sodium Chloride	5.0
Yeast Extract	3.0
Phenol Red	0.08
Agar	13.5
Sodium Deoxycholate	2.5
Sodium Thiosulphate	6.8
Ferric Ammonium Citrate	0.8

*Adjusted to suit performance parameters.

Note: The medium may exhibit slight precipitation, which is inherent property of the medium, and it has no impact on the product performance.

Additional Material Required
Bacteriology Incubator.

Instruction for use
1. Open the sterile pack and remove Violet Red Bile Glucose Agar Plate aseptically.
2. Inoculate/streak the plate and Incubate in inverted position as per standard procedure.

Reading and interpretation

1. After incubation, observe the microbial growth and count the colonies.
2. Interpretation is assured by user.
3. User is responsible to define the action limits as per standard guidelines and alert limits on the basis of trend analysis & other relevant data.

Quality Control

Appearance: Gel with smooth, even surface, without any cracks, bubbles and drying or shrinking of media.
Colour of Medium: Orangish red to red coloured medium.
Quantity of Medium: 27 ± 2 g in 90 mm petriplate.
pH at 25°C ± 2°C: 7.4 ± 0.2
Growth Promotion Test: Growth promotion is carried out in accordance with the harmonized method of USP/EP/BP/JP/IP and growth is observed after an incubation at 30°C-35°C for 18-48 hours.
Growth Promoting Properties: The test results observed are within the specified temperature and shortest period of time, inoculating ≤ 100 cfu of appropriate microorganism.
Indicative Properties: The test results observed are within the specified temperature and time, inoculating ≤ 100 cfu of appropriate microorganism.

Growth Promoting + Indicative Organism (ATCC)	Growth	Colour of colony	Incubation Temperature	Incubation Period
Salmonella enterica subsp. *enterica* serovar *Typhimurium* (14028)	Good	Red with black centres	30°C-35°C	18 Hours
Salmonella enterica subsp. *enterica* serovar *Abony* (NCTC 6017)	Good	Red with black centres	30°C-35°C	18 Hours

Interpretation of Results

For Good growth, growth obtained on test media should not differ by a factor greater than 2 from calculated value for a standardized inoculum.

Precautions

Do not use plates if they show evidence of microbial contamination, discoloration, drying, cracking or other signs of deterioration.

Storage and Shelf Life

1. Store between 15°C-25°C to avoid water condensation. Condensation can be prevented by avoiding quick temperature shifts and mechanical stress.
2. Under optimal conditions, the medium has a shelf life of 3 months. Use before expiry mentioned on the label.

Reference

1. Bopp, C.A., Brenner, F.W., Fields, P.I., Wells, J.G., and N.A. Strockbine. 2003. Escherichia, Shigella, and Salmonella. In: Murray, P. R., E. J. Baron, J.H. Jorgensen, M. A. Pfaller, and R. H. Yolken (ed.). Manual of clinical microbiology, 8th ed. American Society for Microbiology, Washington, D.C.
2. Forbes B. A., Sahm A. S. and Weissfeld D. F., 1998, Bailey and Scotts Diagnostic Microbiology, 10th Ed., Mosby Inc. St. Louis, Mo.
3. Gunn B. A., Ohashi D K., Gaydos C. A., Holt E. S., 1977, J. Clin. Microbiol., 5(6) : 650.
4. Indian Pharmacopoeia, 2007, Govt. of India, Ministry of Health and Family Welfare, New Delhi, India.
5. Pollock, H.M., and B.J. Dahlgren. 1974. Clinical evaluation of enteric media in the primary isolation of Salmonella and Shigella. Appl. Microbiol. 27:197-201.
6. Taylor, W.I. 1965. Isolation of shigellae. I. Xylose lysine agars; new media for isolation of enteric pathogens. Am. J. Clin. Pathol., 44:471-475.
7. The United States Pharmacopoeia / National Formulary, 2008, USP 31, The United States Pharmacopoeial Convention Inc., Rockville, MD.
8. Taylor, W.I., and B. Harris. 1965. Isolation of shigellae. II. Comparison of plating media and enrichment broths. Am. J. Clin. Pathol. 44:476-479.
9. Taylor, W.I., and B. Harris. 1967. Isolation of shigellae III. Comparison of new and traditional media with stool specimens. Am. J. Clin. Pathol. 48:350-355.

10. Taylor, W.I., and D. Schelhart. 1967. Isolation of shigellae. IV. Comparison of plating media with stools. Am. J. Clin. Pathol. 48:356-362.
11. Taylor, W.I., and D. Schelhart. 1968. Isolation of shigellae. VI. Performance of media with stool specimens. Appl. Microbiol. 16:1387-1393.
12. USP Chapter 61: Microbiological Examination of Nonsterile Products: Microbial enumeration Tests.
13. USP Chapter 62: Microbiological Examination of Nonsterile Products: Tests for Specified Microorganism.
14. Data on file: Microxpress®, A Division of Tulip Diagnostics (P) Ltd.

Product Presentation:

Cat No.	Product	Pack Size
205240080100	Xylose Lysine Deoxycholate Agar Plate (Harmonized)	100 Plates