

## XLD Agar (Xylose Lysine Desoxycholate Agar) EP/USP

Cat. 1080

For the isolation of enteropathogenic bacteria, especially from the genus of Shigella and Salmonella.

### Practical information

Applications	Categories
Selective isolation	Salmonella
Selective isolation	Shigella

Industry: Pharmaceutical/Veterinary / Clinical / Food / Final product Quality Control

Regulations: USP / European Pharmacopoeia



### Principles and uses

XLD Agar (Xylose Lysine Desoxycholate Agar) was developed principally for isolating and differentiating Gram-negative enteric bacilli, particularly Shigella and Salmonella. It has been shown to be more effective than other enteric differential media.

The reactions that take place are the degradation of the three fermentable carbohydrates: xylose, lactose and sucrose, with the production of acid, manifested in the color change from red to yellow. Sodium thiosulfate serves as a reactive substance, with Ferric ammonium citrate as an indicator of the formation of hydrogen sulfide under alkaline conditions. Lysine allows the Salmonella group to be differentiated from the non-pathogens since, without it, salmonellae would quickly ferment the xylose and be indistinguishable from non-pathogenic species. Once the salmonellae consume the xylose, lysine is attacked via the enzyme, lysine decarboxylase, with a reversion to an alkaline pH which is similar to the Shigella reaction. The bacteria that decarboxylate the L-Lysine to cadaverine are identified by the presence of a purple-red color around the colonies due to the elevation of the pH. Phenol red is the pH indicator. Yeast extract is the source of vitamins, particularly of the B-group essential for bacterial growth. Sodium chloride supplies essential electrolytes for transport and osmotic balance. Sodium desoxycholate is the selective agent inhibiting Gram-positive microorganisms. Bacteriological Agar is the solidifying agent.

The European Pharmacopoeia, USP recommends this media in the paragraph 2.6.13: "Microbiological examination of non-sterile products: Test for specified microorganisms" for the testing of Salmonella in products.

### Formula in g/L

Bacteriological agar	13,5	Ferric ammonium citrate	0,8
L-Lysine	5	Phenol red	0,08
Sodium chloride	5	Sodium deoxycholate	2,5
Sodium thiosulfate	6,8	Sucrose	7,5
Xylose	3,5	Yeast extract	3
Lactose monohydrate	7,5		

### Preparation

Suspend 55,2 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. AVOID OVERHEATING. DO NOT AUTOCLAVE. Dispense into appropriate containers.

Preparation of large volumes, overheating and prolonged storage in water bath is to be avoided. Precipitates may be formed but do not affect the performance of the culture media.

### Instructions for use

» For clinical diagnosis, the type of sample is fecal and rectal sample.

- Inoculate on the surface. Parallel striae with the handle or hyssop.
- Incubate in aerobic conditions at 35±2 °C for 18-24 hours.
- Reading and interpretation of the results.

» For other uses not covered by the CE marking:

Test of specified microorganisms (*Salmonella*) according to European Pharmacopoeia:

- Inoculate a suitable amount of casein soya bean digest broth and incubate at 30-35 °C for 18-24 hours.
- Transfer 0,1 ml of casein soya bean broth to 10 ml of Rappaport Vassiliadis *Salmonella* Enrichment Broth (Cat.1414) and incubate at 30-35 °C for 18-24 hours.
- Subculture on plates of XLD and incubate at 30-35 °C for 18-48 hours.
- The possible presence of *Salmonella* is indicated by the growth of well-developed red colonies, with or without black centers. This is confirmed by identification tests.
- The product complies with the test if colonies of the types described are not present or if the confirmatory identification tests are negative.

Characteristics of the colonies:

Arizona: Red and transparent with a black center.

Citrobacter: Yellow and opaque. Can present a black center and clear edges.

*E.coli*, *Enterobacter* and *Serratia*: Yellow and opaque. Zone of yellow precipitation around the colonies.

*Edwardsiella*: Red with a black center and clear edges

*Klebsiella*: Large, yellow, pale, mucoid and opaque. Zone of yellow precipitation around the colonies.

*Proteus mirabilis* and *P.vulgaris*: Yellow, transparent, with clear edges. Black center especially *P.mirabilis*.

*Proteus morganii* and *P. rettgeri*: Red and transparent

*Salmonella*: Red, transparent with black centers and, if H<sub>2</sub>S is produced, yellow edges.

*Providencia* and *Shigella*: Red and transparent.

## Quality control

Solubility	Appearance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25°C)
w/o rests	Fine powder	Pink	Reddish-orange	7,4±0,2

## Microbiological test

According to Pharmacopoeia; *Salmonella typhimurium* ATCC 14028.

Incubation conditions: ( 30-35 °C / 18-48 h).

Inoculation conditions: (<=100 CFU).

Rest of strains:

Incubation conditions: ( 30-35 °C / 18-48 h).

Microorganisms	Specification	Characteristic reaction
<i>Shigella flexneri</i> ATCC 12022	Good growth	Red colonies
<i>Salmonella typhimurium</i> ATCC 14028	Good growth	Clear red colonies (black center)
<i>Escherichia coli</i> ATCC 25922	Partial inhibition	Yellow (precipitate) colonies
<i>Staphylococcus aureus</i> ATCC 25923	Inhibition	
<i>Staphylococcus aureus</i> ATCC 6538	Inhibition	
<i>Escherichia coli</i> ATCC 8739	Partial inhibition	Yellow (precipitate) colonies

## Storage

Temp. Min.:2 °C

Temp. Max.:25 °C

## Bibliography

Taylor, A. J. Clin. Path. 44:471. 1965. Taylor and Harris, A.J. Clin. Path. 44:476. 1965.

Rollender, W. U. Beckford; R.D. Belsky, B. Krostoff (1969) Comparison of Xylose Lysine desoxycholate agar and MacConkey agar for the isolation of *Salmonella* and *Shigella* from clinical specimens (tech. Bull. Reg. Med. Tech, 39 (1) 8-p)

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