



## Xylose Lysine Deoxycholate Agar (Harmonized)

**RDM-H-XLDA-01**

### Principle

Xylose lysine deoxycholate agar is a differential medium, slightly selective for the detection of pathogenic enterobacteria, especially *Salmonella* and *Shigella*. Media composed of xylose, lysine, lactose monohydrate, sucrose, sodium chloride, yeast extract, phenol red, sodium deoxycholate, sodium thiosulphate, ferric ammonium citrate and agar. Yeast extract provides sources of nitrogen and carbon, as well as vitamins and cofactors required for growth. Xylose, lactose and sucrose are the carbon source. Xylose is fermented by most enteric organisms except *Shigella* and *Providencia*. Sucrose and lactose provide sources of fermentable carbohydrate. Lysine is also added to differentiate *Salmonella*, which undergoes decarboxylation to cadaverine. Phenol red is pH indicator. Sodium deoxycholate inhibits growth of gram-positive organisms, but *Shigella* grows at this concentration. Sodium chloride maintains osmotic balance in the medium. Agar is a solidifying agent. In medium as the concentration of xylose is declined, the *Salmonella* organism's decarboxylate lysine causing is version to alkaline conditions. The resulted alkaline reversion by lysine-positive organisms is prevented by acid produced by the fermentation of lactose and sucrose. Simultaneously, the sodium thiosulfate is metabolized to hydrogen sulfide and reacts with ferric ammonium citrate which acts as indicator of hydrogen sulfide production under alkaline conditions. The hydrogen sulfide producers are detected by darker colonies, due to the ferric sulfate precipitate. Due to xylose, lactose or sucrose fermentation produce the acidification and lysine decarboxylation to cadaverine causes alkalization and consequently the phenol red indicator turns to red. This color disappears after 24 hours, so observations must be carried out between 18 and 20 hours. The *Shigella* and *Salmonella* are differentiated on basis of ferrous sulfur precipitation. The *Salmonella* colonies show red colored with black centers and *Shigella* are red colored without black center.

**Use:** Recommended for the isolation and enumeration of *Salmonella* and *Shigella* from pharmaceutical products in accordance with the microbial limit testing by harmonized principles of USP/EP/IP/JP.

### Contents\*

#### Ingredients

|                         | Gram/Litre |
|-------------------------|------------|
| Xylose                  | 3.500      |
| L-Lysine                | 5.000      |
| Lactose Monohydrate     | 7.500      |
| Sucrose                 | 7.500      |
| Sodium Chloride         | 5.000      |
| Yeast Extract           | 3.000      |
| Phenol Red              | 0.080      |
| Sodium Deoxycholate     | 2.500      |
| Sodium Thiosulphate     | 6.800      |
| Ferric Ammonium Citrate | 0.800      |
| Agar                    | 15.000     |
| pH at 25°C              | 7.4 ± 0.2  |

\* Formula adjusted for optimum performance and parameters

**Directions:** Dissolve 56.68 grams in 1000 ml purified/ distilled water. Heat until the medium boils with frequent agitation. **Do Not Autoclave or Overheat.** Transfer immediately to a water bath at 50°C. After cooling, pour into sterile petri plates and allow to solidify. Ensure complete solidification and inoculate test sample aseptically.

### Specimens types analyzed

Pharmaceutical samples, clinical and non-clinical samples etc.

### Precautions to be taken

All the handling, experiments, storage, and discarding should be performed with the help of skilled and knowledgeable technicians and as per the established guidelines. The material should be disposed only after proper sterilization by autoclaving. Please go through the MSDS of the media to avoid any accidents or in emergency.

### Performance and Evaluation

The expected performance of the medium is liable to use as per the direction on the label when stored at optimum conditions and within expiry date.

### Quality Control

|                                          |                                                              |
|------------------------------------------|--------------------------------------------------------------|
| <b>Appearance</b>                        | Light beige to pink colored homogeneous free flowing powder. |
| <b>Reaction of 5.66% solution</b>        | 7.4±0.2 at 25 °C.                                            |
| <b>pH</b>                                | 7.20- 7.60.                                                  |
| <b>Gelling</b>                           | Firm comparable with 1.35% agar gel.                         |
| <b>Color and clarity of ready medium</b> | Red colored clear to slightly opalescent gel.                |
| <b>Growth Promotion properties</b>       | Best at ≤ 100 CFU at 32-37 °C for 18-72 h.                   |
| <b>Indicative properties</b>             | Optimum at ≤ 100 CFU at 32-37 °C for 18-48 h.                |
| <b>Negative control</b>                  | Performed using sterile distilled water.                     |

**Different Microbial Response:** Cultural characteristics observed after incubation at 33-37°C for 18-48 hours. Inoculum 50-100 CFU.

| Organism                      | ATCC      | Growth    | Recovery | Colony color           |
|-------------------------------|-----------|-----------|----------|------------------------|
| <i>Salmonella typhimurium</i> | 14028     | Luxuriant | ≥ 70%    | Red with black centers |
| <i>Salmonella abony</i>       | NCTC-6017 | Luxuriant | ≥ 70%    | Red with black centers |
| <i>Salmonella enteritidis</i> | 13076     | Luxuriant | ≥ 70%    | Red with black centers |
| <i>Salmonella enterica</i>    | 9150      | Luxuriant | ≥ 70%    | Pinkish                |
| <i>Escherichia coli</i>       | 8739      | Poor      | ≥ 30%    | Yellow                 |
| <i>Staphylococcus aureus</i>  | 6538      | Inhibited | --       | --                     |
| <i>Staphylococcus aureus</i>  | 25923     | Inhibited | --       | --                     |

**Storage and Shelf Life:** The product is highly hygroscopic; keep the container tightly closed at all times and store it properly as per the conditions mentioned on the label. The declared expiry is valid only when stored as per the conditions mentioned on the label.

**Note:** Sterilize media immediately after reconstitution.

**Disposal:** To avoid the contamination or propagation of any hazardous microbes the used, unusable or modified preparation of this product must be disposed after autoclaving after completion of task.

### Reference

1. Atlas, R. M. (2005). *Handbook of media for environmental microbiology*. CRC press.
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4. *Indian Pharmacopoeia*, (2018), Govt. of India, the Controller of Publication, New Delhi.
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*examination of water and wastewater*. Prepared and published jointly by American Public Health Association, American Water Works Association, and Water Pollution Control Federation.

6. *The Japanese Pharmacopoeia*, 17<sup>th</sup> Ed. (2016), The Ministry of Health, Labour and Welfare.
7. *The United States Pharmacopoeia*, (2014), The United States Pharmacopeial Convention. 12601 Twinbrook Parkway, Rockville, MD 20852.

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