

Technical Information

Medium 14. Desoxycholate-Citrate Agar

Product Code: DM 1065M

Application: Medium 14. Desoxycholate-Citrate Agar is recommended for the a selective isolation and identification of Salmonellae in accordance with Indian Pharmacopoeia 2007.

Composition**

Ingredients	Gms / Litre
Peptone	10.000
Beef extract	10.000
Lactose monohydrate	10.000
Trisodium citrate	20.000
Ferric citrate	1.000
Sodium deoxycholate	5.000
Neutral red	0.020
Agar	13.500
Final pH (at 25°C)	7.3±0.2

**Formula adjusted, standardized to suit performance parameters

Principle & Interpretation

Desoxycholate Citrate Agar is prepared according to the modified formula of Leifson ⁽¹⁾ and is also recommended by Indian Pharmacopoeia 2007 ⁽²⁾. This medium is used for the isolation and maximum recovery of intestinal pathogens belonging to Salmonella and Shigella groups from foods and pharmaceutical products ⁽³⁾. However, it is recommended to use less inhibitory medium when Shigellae have to be isolated ⁽⁴⁾. Salmonella, major causative agent of enteric disease especially food borne toxic infection and typhoid was first observed by Eberth in 1880. This medium is routinely used to check the presence of Salmonella in food and pharmaceutical products.

Proteus and other Gram positive organisms are inhibited due to higher concentration of citrate and deoxycholate salts in this medium. Sodium desoxycholate at pH 7.3 to 7.5 is inhibitory for gram-positive bacteria. Sodium thiosulphate also helps in reactivation of sulphur containing compounds and prevents the desiccation of these compounds during storage. It also forms the substrate for enzyme thiosulphate reductase, which breaks it; to form H₂S. H₂S then reacts with Fe ions in the medium and produces black FeS precipitate. This gives the indicative appearance of colonies with black center. Sodium thiosulphates are also inactivators of halogens and can minimize its toxicity in the testing sample, during microbial limit tests. Citrate salt, in the concentration included in the formulation, are also inhibitory to gram-positive bacteria and most other normal intestinal organisms. Combination of beef extract and peptone supplies nitrogen, mineral, vitamin factors required for enhanced growth. Lactose monohydrate supplies fermentable carbohydrate source in this medium. Neutral red acts as indicators, in presence of which lactose fermenters like coliform bacteria give pink colonies while lactose non-fermenters give colourless colonies.

Salmonella gives either colourless and opaque colonies with or without black center, while Shigella gives colourless colonies without black center indicating absence of H₂S production. Precipitation of deoxycholate by acid produced by lactose fermenters may give a zone of precipitation around the colony. This medium provides essential growth factors for growth of several auxotrophic strains of Paratyphi and Typhi. The selectivity of this medium permits the use of fairly heavy inocula without danger of overgrowth of the Shigella and Salmonella by other microflora. For the routine examination of stool and urine specimens, it is suggested that other media such as MacConkey Agar (DM1082M), Bismuth Sulphite Agar (DM1027M) etc. be used in conjunction with this medium.

Methodology

Suspend 69.02 grams of powder media of in 1000 ml of purified/distilled water. Shake well & heat to dissolve the medium completely. Agitate to prevent charring. DO NOT AUTOCLAVE. Avoid excessive heating, as it is detrimental to the medium. Cool the medium to 45-50°C. Mix well before pouring into sterile Petri plates. Dry the agar surface before use.

Quality Control

Physical Appearance

Light yellow to pinkish beige homogeneous free flowing powder

Gelling

Firm, comparable with 1.35% Agar gel.

Colour and Clarity of prepared medium

Reddish orange coloured clear to slightly opalescent gel forms in Petri plates.

Reaction

Reaction of 6.90% w/v aqueous solution after heating. pH : 7.3±0.2

pH range 7.10-7.50

Cultural Response/Characteristics

DM 1065M: Growth Promotion is carried out in accordance with IP. Cultural response was observed after an incubation at 36-38°C for 18-24 hours. Recovery rate is considered as 100% for bacteria growth on Soyabean Casein Digest Agar.

Organism	Inoculum (CFU)	Observed Lot value (CFU)	Recovery	Colour of Colony	Incubation temperature	Incubation period
Test for specified microorganism						
<i>Salmonella Typhimurium</i> ATCC 14028	50 -100	25 -100	>=50 %	Colourless and opaque with or without black centres	36 -38 °C	18 -24 hrs
<i>Salmonella A bony</i> NCTC 6017	50 -100	25 -100	>=50 %	Colourless and opaque with or without black centres	36 -38 °C	18 -24 hrs
Cultural Response Additional microbiological testing						
<i>Salmonella Enteritidis</i> ATCC 13076	50 -100	25 -100	>=50 %	Colourless and opaque with or without black centres	36 -38 °C	18 -24 hrs
<i>Salmonella Typhi</i> ATCC 6539	50 -100	25 -100	>=50 %	Colourless and opaque with or without black centres	36 -38 °C	18 -24 hrs
<i>Escherichia coli</i> NCTC 9002	50 -100	0 -10	0 -10 %	Pink with bile precipitate	36 -38 °C	18 -24 hrs
<i>Escherichia coli</i> ATCC 8739	50 -100	0 -10	0 -10 %	Pink with bile precipitate	36 -38 °C	18 -24 hrs
<i>Shigella flexneri</i> ATCC 12022	50 -100	0 -10	0 -10 %	colourless	36 -38 °C	18 -24 hrs
<i>Enterococcus faecalis</i> ATCC 29212	>=10 ³	0	0 %		36 -38 °C	18 -24 hrs

Storage and Shelf Life

Dried media: Store below 30°C in tightly closed container and use before expiry date as mentioned on the label.

Prepared Media: 2-8⁰ in sealable plastic bags for 2-5 days.



Dehydrated Culture Media
Bases / Media Supplements

Further Reading

1. Leifson, 1935, J. Path. Bact., 40:58 1.
2. Indian Pharmacopoeia, 2007, Govt. of India, Ministry of Health and Family Welfare, New Delhi, India.
3. Speck M. (Eds.), 1984 Compendium of Methods for the Microbiological Examination of Foods, 2nd ed., APHA, Washington, D.C.
4. Frieker C.R., 1987, J. Appl. Bact., 63:99.

Disclaimer :

- User must ensure suitability of the product(s) in their application prior to use.
- The product conforms solely to the technical information provided in this booklet and to the best of knowledge research and development work carried at **CDH** is true and accurate.
- **Central Drug House Pvt. Ltd.** reserves the right to make changes to specifications and information related to the products at any time.
- Products are not intended for human or animal diagnostic or therapeutic use but for laboratory, research or further manufacturing of diagnostic reagents extra.
- Statements contained herein should not be considered as a warranty of any kind, expressed or implied, and no liability is accepted for infringement of any patents.
- Do not use the products if it fails to meet specifications for identity and performance parameters.

