



Deoxycholate Citrate Agar (Agar Medium J)

ME065

Deoxycholate Citrate Agar is a selective medium recommended for the isolation of enteric pathogens particularly *Salmonella* and *Shigella* species in accordance with European Pharmacopoeia .

Composition**

Ingredients	Gms / Litre
Meat peptone	10.000
Beef extract	10.000
Lactose monohydrate	10.000
Sodium citrate	20.000
Neutral red	0.020
Sodium deoxycholate	5.000
Ferric citrate	1.000
Agar	13.500
pH after heating	7.3±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 69.02 grams (the equivalent weight of dehydrated medium per litre) in 1000 ml of purified/distilled water. Heat to boiling to dissolve the medium completely. DO NOT AUTOCLAVE. Avoid excessive heating, as it is detrimental to the medium.

Principle And Interpretation

Deoxycholate Citrate Agar Medium is prepared as per the modified formula of Leifson (1). This medium is recommended by European Pharmacopoeia, 2008 and is also designated as Agar medium J (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* contamination in food and pharmaceutical products as per EP 2008.

Sodium deoxycholate at pH 7.3 to 7.5 is inhibitory for gram-positive bacteria. Proteus and other Gram positive organisms are also inhibited due to higher concentration of both citrate and deoxycholate salts in this medium. The reduction of ferric citrate to iron sulphide gives the indicative appearance of colonies with black center. Citrate salt, in the concentration included in the formulation, are inhibitory to gram-positive bacteria and most other normal intestinal organisms. Combination of beef extract and meat 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 well-developed colourless colonies, 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 *Shigella* and *Salmonella* by other microflora.

Quality Control

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

pH

7.10-7.50

Growth Promotion Test

Growth Promotion is carried out in accordance with EP.

Cultural Response

Cultural response was observed after an incubation at 35-37°C for 18-72 hours. Recovery rate is considered as 100% for bacteria growth on Soyabean Casein Digest Agar.

Cultural Response

Organism	Inoculum (CFU)	Growth	Observed Lot value (CFU)	Recovery	Colour of colony
Test for Salmonella					
<i>Salmonella Typhimurium</i> ATCC 14028	50 -100	luxuriant	25 -100	>=50 %	colourless colonies
<i>Salmonella Abony</i> NCTC 6017	50 -100	luxuriant	25 -100	>=50 %	colourless colonies
Additional Microbiological testing					
<i>Salmonella Enteritidis</i> ATCC 13076	50 -100	luxuriant	25 -50	>=50 %	colourless colonies
<i>Enterococcus faecalis</i> ATCC 29212	>=10 ³	inhibited	0	0%	
<i>Escherichia coli</i> ATCC 8739	50 -100	poor	15 -30	20 -30 %	pink with bile precipitate

Storage and Shelf Life

Store below 30°C in tightly closed container and the prepared medium at 2 - 8°C. Use before expiry date on the label.

Reference

1. Leifson, 1935, J. Path. Bact., 40:581.
2. European Pharmacopoeia, 2008, European Department, for the quality of Medicines.
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.

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