B.C.P.-D.C.L.S. Agar (DM030)

Intended Use
B.C.P.-D.C.L.S. Agar (DM030) is recommended for isolation of *Salmonella* and *Shigella* species.

Product Summary and Explanation
Salmonella and *Shigella* belong to the *Enterobacteriaceae* family and are widely distributed in animals affecting mainly the stomach and the intestines. They are gram-negative, facultatively anaerobic, non-sporulating rods. *Shigella* is the causative agent of bacterial diarrhoea and *Shigella* infection is caused typically by ingestion (fecal-oral route). *Salmonella* enter through the digestive tract and the infection is caused by ingestion of food, water or milk contaminated by human or animal excreta.[1] Arizona group was originally named *Salmonella* Arizonae. It has been found mainly in reptiles and birds and occasionally in human patients with diarrhoea or septicemia. It is difficult to differentiate these organisms biochemically from *Escherichia coli*, one of the most commonly recovered bacteria in clinical laboratory. B.C.P-D.C.L.S Agar (Bromo Cresol Purple - Deoxycholate - Citrate - Lactose-Sucrose Agar) is the modification of the original formulation of Leifson,[2] which was later, modified by Hajna and Damon.[3] B.C.P.-D.C.L.S. is a useful modification of D.C.A. (Deoxycholate Citrate Agar) that contains both lactose and sucrose.[3] It allows easy isolation of *Salmonella*, *Shigella* and *Arizona* organisms from a mixed culture by differentiating between lactose-negative, sucrose-positive coliforms. It also inhibits all gram-positive bacteria and most of the *Proteus* species along with some strains of *S. dysentriae*.[4]

Principles of the Procedure
B.C.P.-D.C.L.S. Agar contains peptic digest of animal tissue, casein enzymic hydrolysate, yeast extract and beef extract which provide nitrogen, vitamins and minerals required for bacterial growth. Lactose and sucrose are the fermentable carbohydrates and addition of these two sugars allows the formation of yellow colonies by organisms that ferment lactose, sucrose or both. Sodium thiosulphate is the indicator of H_2S production. All gram-positive bacteria and coliforms are inhibited by sodium citrate and sodium deoxycholate, allowing the gram-negative bacilli to grow. Sodium chloride helps to maintain the osmotic balance of the medium. Bromo cresol purple is the pH indicator.

Formula / Liter

Ingredients	Gms / Liter
Peptic digest of animal tissue	5.00
Casein enzymic hydrolysate	5.00
Yeast extract	3.00
Beef extract	3.00
Sucrose	7.50
Sodium citrate	10.00
Sodium chloride	5.00
Sodium thiosulphate	5.00
Sodium deoxycholate	2.50
Bromocresol purple	0.02
Agar	14.00
Final pH: 7.2 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	

Precautions

1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.

Directions

1. Suspend 67.52 grams of the medium in one liter of distilled water.
2. Heat to boiling with gentle swirling to dissolve the medium completely.
3. DO NOT AUTOCLAVE or OVERHEAT.
4. Cool to 45-50°C. Mix well and pour into sterile Petri plates.

Quality Control Specifications

Dehydrated Appearance	Light yellow to beige homogeneous free flowing powder
Prepared Medium	Purple coloured, clear to slightly opalescent gel forms in Petri plates
Reaction of 6.75% Solution	pH : 7.2 ± 0.2 at 25°C
Gel Strength	Firm, comparable with 1.4% Agar gel

Expected Cultural Response: Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

Sr. No.	Organisms	Results to be achieved			
		Inoculum (CFU)	Growth	Recovery	Colour of Colony
1.	*Escherichia coli ATCC 25922*	50 - 100	none-poor	<=10%	yellow
2.	*Proteus mirabilis ATCC 25933*	50 - 100	none-poor	<=10%	colourless
3.	*Proteus vulgaris ATCC 13315*	50 - 100	none-poor	<=10%	colourless
4.	*Salmonella Typhimurium ATCC 14028*	50 - 100	good-luxuriant	>=50 %	colourless, may show faint bluish coloured colonies
5.	*Salmonella Enteritidis ATCC 13076*	50 - 100	good-luxuriant	>=50 %	colourless, may show faint bluish coloured colonies
6.	*Shigella dysenteriae ATCC 13313*	50 - 100	good	>=50 %	colourless, may show faint bluish coloured colonies
7.	*Shigella flexneri ATCC 12022*	50 - 100	good-luxuriant	>=50 %	colourless, may show faint bluish coloured colonies
8.	*Shigella sonnei ATCC 25931*	50 - 100	good-luxuriant	>=50 %	colourless, may show faint bluish coloured colonies

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure

Refer to appropriate references for standard test procedures.

Results

1. For enrichment a larger amount of the material can be inoculated into an enrichment medium followed by inoculation onto an agar plate, thereby, facilitating the isolation of Salmonella, when present only in small numbers.
2. On incubation, *Salmonella* multiply rapidly, while *E.coli* and most other bacteria are inhibited.
3. After enrichment, the enriched culture is plated onto a differential agar medium.

4. Some coliforms ferment sucrose more readily than lactose. Sucrose fermenting and lactose non-fermenting strains, e.g. some strains of *Proteus* and *E.coli*, form colonies distinguishable from the pale colonies of *Salmonella* and *Shigella*, which do not ferment sucrose, on this medium.
5. Hence the number of false positive cultures requiring biochemical testing is reduced and the efficiency of isolation of *Salmonella* and *Shigella* is increased.
6. Refer to appropriate references for interpretation of results.

Storage

Store the sealed bottle containing the dehydrated medium at 2 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

Expiration

Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

1. B.C.P.-D.C.L.S. Medium is unsuitable for the isolation of *Yersinia* species, which are sucrose positive. Non-selective media should be inoculated along with this media.
2. The medium can be directly inoculated with the test specimens. Alternatively, the sample can be enriched in GN Broth, Hajna (DM117), Tetrathionate Broth (DM353), or Selenite Broth (DM241), and subsequently isolated on B.C.P.-D.C.L.S. Agar. A less inhibitory medium should be run in parallel to B.C.P.-D.C.L.S.
3. For identification, organisms must be in pure culture. Morphological, biochemical and/or serological tests should be performed for final identification.
4. Consult appropriate texts for detailed information and recommended procedures.

Packaging

Product Name : B.C.P.-D.C.L.S. Agar
Product Code : DM030
Available Pack sizes : 500gm

References

1. MacConkey A., 1900, The Lancet, II:20.
2. MacConkey A., 1905, J. Hyg., 5:333.
3. Speck M. L., (Ed.), 1985, Compendium of Methods for the Microbiological Examination of Foods, 2nd Ed., APHA, Washington, D.C.
4. 4. Greenberg A. E., Clesceri L. S. and Eaton A. D., (Eds.), 1992, Standard Methods for the Examination of Water and Wastewater, 18th ed., APHA, Washington, D.C.
5. Marshall R., (Ed.), 1992, Standard Methods for the Examination of Dairy Products, 16th Ed., APHA, Washington, D.C.
6. Cruickshank R. Duguid J. P., Marmion B. P., Swain R. H. A., (Eds.),1975, Medical Microbiology, 12th Ed., Vol. II, Churchill Livingstone, Edinburgh, London.

Further Information

For further information please contact your local MICROMASTER Representative.

MICROMASTER LABORATORIES PRIVATE LIMITED
Unit 38/39, Kalpataru Industrial Estate,
Off G.B. Road, Near 'R-Mall', Thane (W) – 400607. M.S. INDIA.
Ph: +91-9320126789/9833630009/981991103
Email: sales@micromasterlab.com

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