Technical Information

Endo Agar Plate

Product Code: PM 1029

Application: -Recommended for confirmation of the presumptive test for members of the coliform group from clinical and non-clinical samples.

Composition**

Ingredients	Gms / Litre
Peptone	10.000
Lactose	10.000
Dipotassium phosphate	3.500
Sodium sulphite	2.500
Basic fuchsin	0.500
Agar	15.000
Final pH (at 25°C)	7.5±0.2

**Formula adjusted, standardized to suit performance parameters

Principle & Interpretation

Endo Agar was developed by Endo to differentiate gram-negative bacteria on the basis of lactose fermentation, while inhibiting gram-positive bacteria (2). Inhibition of the later was achieved without the use of bile salts as was traditionally used. Endo was successful in inhibiting gram-positive bacteria on his medium by the incorporation of sodium sulphite and basic fuchsin. The resulting Endo Agar, also known as Fuchsin Sulphite and Infusion Agar, was used to isolate the typhoid bacilli. Many modifications of this media have been done over the years. Endo Agar is recommended by APHA as an important medium in the microbiological examination of water and wastewater, dairy products and foods (1, 5, and 6). Endo Agar is used to confirm the detection and enumeration of coliform bacteria following presumptive test of drinking water. It is also used for the detection and isolation of coliforms and faecal coliforms from milk, dairy products and food. The medium contains peptone which provides nitrogen, carbon, vitamins and minerals required for bacterial growth. Sodium sulphite and basic fuchsin make this medium selective by suppressing gram-positive organisms. Coliforms produce pink colonies on fermentation of lactose while lactose non-fermenters produce colourless colonies on the medium. With *Escherichia coli* , this reaction is very pronounced as the fuchsin crystallizes, exhibiting a permanent greenish metallic luster (fuchsin luster) to the colonies. Medium should be stored away from light to avoid photo-oxidation.

Type of specimen

Clinical samples - faeces; Food and dairy samples; Water samples

Specimen Collection and Handling:

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (3,4). For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (5,6). For water samples, follow appropriate techniques for sample collection, processing as per guidelines and local standards.(1) After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions :

In Vitro diagnostic Use. Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/ face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets

Limitations :

1. Besides Enterobacteriaceae, other gram negative bacteria and yeasts may also grow.
2. Avoid exposure of the medium to light, as it may lead to photo oxidation and decrease productivity of the medium.
3. Overheating of the medium must be avoided, as it may destroy the productivity of the medium.
4. Individual organisms differ in their growth requirement and may show variable growth patterns on the medium.
5. Each lot of the medium has been tested for the organisms specified on the COA. It is recommended to users to validate the medium for any specific microorganism other than mentioned in the COA based on the user's unique requirement.
6. Further biochemical tests must be carried out for further confirmation.
7. It is recommended to store the plates ta 24-30°C to avoid minimum condensation.

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature

Quality Control

Appearance
Sterile Endo Agar in 90 mm disposable plates.
pH
7.30-7.70
Quantity of medium
25 ml of medium in 90 mm disposable plates.
Colour of medium
Orangish pink coloured medium
Sterility Test
Passes release criteria
Cultural Response
Cultural characteristics observed after incubation at 35-37°C for 18-24 hours.

Oragnism	Inoculum (CFU)	Growth	Recovery	Colour of Colony
Bacillus subtilis subsp. *spizizenni* ATCC 6633 (00003*)	>=104	inhibited	0%	
* *Klebsiella aerogenes* ATCC 29212 (00087*)	50-100	good-luxuriant	>=50%	pink
Enterococcus faecalis ATCC 29212 (00087*)	50-100	none-poor	<=10%	pink, small
Escherichia coli ATCC 25922 (00013*)	50-100	good-luxuriant	>=50%	pinkto rose red with metallic sheen
Klebsiella pneumonia ATCC 13883 (00097*)	50-100	good-luxuriant	>=50%	pink, mucoid
Proteus vulgaris ATCC 13315	50-100	good-luxuriant	>=50%	colourless to pale pink
Pseudomonas aeruginosa ATCC 27853 (00025*)	50-100	good-luxuriant	>=50%	colourless, irregular
Salmonella typhi ATCC 6539	50-100	good-luxuriant	>=50%	colourless to pale pink
Staphylococcus aureus subsp.*aureus* ATCC 25923 (00034*)	>=104	inhibited	0%	
Enterobacter cloacae ATCC 13047 (00083*)	50-100	good	40-50%	pink
Salmonella typhimurium ATCC 14028 (00031*)	50-100	good-luxuriant	>=50%	colourless

Salmonella enteritidis ATCC 13076 (00030*)	50-100	good-luxuriant	>=50%	colourless
Shigella flexneri ATCC 12022 (00126*)	50-100	good-luxuriant	>=50%	colourless

#Key: Formerly known as Aspergillus niger *Corresponding WDCM numbers

Storage and Shelf Life

- On receipt store between 20-30°C.
- Use before expiry date on the label.
- Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with sample must be decontaminated and disposed of in accordance with current laboratory techniques (2, 4).

Further Reading

1. Baird R.B., Eaton A.D., and Rice E.W., (Eds.), 2015, Standard Methods for the Examination of Water and Wastewater, 23rd ed., APHA, Washington, D.C.
2. Endo S., 1904, Zentralbl. Bakteriol., Abt. 1, Orig.35:109-11
3. Isenberg, H.D. Clinical Microbiology Procedures Handbook 2nd Edition.
4. Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.
5. Salfinger Y., and Tortorello M.L., 2015, Compendium of Methods for the Microbiological Examination of Foods, 5th Ed., American Public Health Association, Washington, D.C.
6. Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.

Disclaimer :

- User must ensure suitability of the product(s) in their application prior to use.
- The product conform solely to the technical information provided in this booklet and to the best of knowledge research and developmentwork carried at **CDH** is true and accurate
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