PRODUCT INFORMATION

Product Type: Tubes

Cat No. TT143 - MIO MEDIUM

Intended Use:

Motility Indole Ornithine (MIO) Medium is used to demonstrate motility, indole production and ornithine decarboxylase activity for the differentiation of Enterobacteriaceae.

Principles and uses:

Peptones, yeast extract and dextrose provide amino acids and other nitrogenous and carbonaceous substances, vitamins and minerals essential for bacterial metabolism. Motility can be read because of the semi-solid consistency of the medium. Organisms that possess the enzyme "tryptophanase" degrade the amino acid tryptophan to indole-pyruvic acid, from which indole can be formed through deamination.[3] When ornithine decarboxylase is present, the ornithine is decarboxylated to putrescine which causes a rise in the pH and corresponding color change of the bromcresol purple from yellow to purple.

Procedures

To prepare the stored medium for use in motility studies, loosen caps, heat the medium to boiling and cool to room temperature prior to inoculation. Inoculate tubes of medium by a single stab to 1/4 inch from the bottom of the tube using growth from a primary isolation plate or other pure culture. Incubate all tubes for 18-24 hours at 35 ± 2°C in an aerobic atmosphere.

Expected Results

Read motility and decarboxylase activity prior to the addition of the reagent for the detection of indole production.

1. Motility is indicated by growth extending from the line of inoculation. Nonmotile organisms grow only along the line of inoculation.
2. Decarboxylation of ornithine is indicated by the development of a turbid purple to a faded yellow-purple color. A negative reaction is indicated by a yellow color.
3. Indole production is indicated by the formation of a pink to red color after the addition of three or four drops of Kovacs' reagent to the surface of the medium and gentle shaking. A negative reaction is indicated by the development of a yellow color.

Refer to appropriate texts for typical reactions produced by various members of the Enterobacteriaceae.[4-6]

References

1. Ederer and Clark. 1970. Appl. Microbiol. 2:849.
2. Oberhofer and Hajkowski. 1970. Am. J. Clin. Pathol. 54:720.
3. MacFaddin. 2000. Biochemical tests for identification of medical bacteria, 3rd ed. Lippincott Williams & Wilkins, Baltimore, Md.
4. Ewing. 1986. Edwards and Ewing's identification of Enterobacteriaceae, 4th ed. Elsevier Science Publishing Co., New York, N.Y.
5. Holt, Krieg, Sneath, Staley and Williams (ed.). 1994. Bergey's Manual of determinative bacteriology, 9th ed. Williams & Wilkins, Baltimore, Md.
6. Farmer. 1999. In Murray, Baron, Pfaller, Tenover and Yolken (ed.), Manual of clinical microbiology, 7th ed. American Society for Microbiology, Washington, D.C.

Composition:
Yeast Extract 3.0 g/L
Peptone 10.0 g/L
Tryptone 10.0 g/L
L-Ornithine HCl 5.0 g/L
Dextrose 1.0 g/L
Agar 2.0 g/L
Bromcresol Purple 0.02 g/L

Storage: 15°-25°C
Appearance: Purple, slightly opalescent
pH Range: 6.3 - 6.7

Exp. Date: Printed on label and on the item.
Required materials not supplied: Laboratory equipment as required.

Warning and Precautions:
Warning and Precautions - For professional use only. Follow good microbiological lab practices while handling specimens and culture. Do not use Tubes if they show evidence of microbial contamination, discoloration, drying, cracking, or other signs of deterioration. Avoid freezing and overheating. The Tubes may be used / inoculated up to the expiration date and incubated for the recommended incubation times. After use and prior to discarding, specimen containers and all contaminated material, including the used culture media and contaminated culture containers, must be sterilized or incinerated by validated procedures. Since the nutritional requirements of organisms vary, some strains may be encountered that fail to grow or grow poorly on this medium.

Waste Disposal
After interpretation all items should be destroyed by standard incineration methods.

Hy Laboratories Ltd.
6 Menachem Plaut St., Park Tamar, Rehovot 7670606, Israel
Tel. +972.8.9366475 **Email.** hylabs@hylabs.co.il

Implementation Date: 08/12/25
Version Number: 01

Performance Testing Results:

Test	ATCC NO	Incubation Temp. (℃)	Incubation Cond.	Reaction 1	INDOLE	MOTILITY	OR. DECBX
Escherichia coli	25922	33-37 ℃	Aerobic, 24 hours	Growth	+	+	+
Klebsiella pneumoniae	13883	33-37 ℃	Aerobic, 24 hours	Growth	-	-	-
Enterobacter aerogenes	13048	33-37 ℃	Aerobic, 24 hours	Growth	-	+	+
Proteus mirabilis	4630	33-37 ℃	Aerobic, 24 hours	Growth	-	+	+
Shigella flexneri type 29	29903	33-37 ℃	Aerobic, 24 hours	Growth	+	-	-

\+ Purple color throughout the top.

\- Purple band near the top while yellow below.

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