

Violet Red Bile Agar with MUG (VRBA-MUG)

**SKU: 700003149, 700003150, 700003151, 700003152, 700004445
NCM0064**

Intended Use

Violet Red Bile Agar with MUG is used for the detection of coliforms and the fluorogenic detection of *Escherichia coli*. Violet Red Bile Agar with MUG is not intended for use in the diagnosis of disease or other conditions in humans.

Description

Violet Red Bile Agar W/ MUG is specified in many procedures to enumerate coliforms in food and dairy products. In 1982, Feng and Hartman developed a rapid fluorogenic assay for *Escherichia coli* by incorporating 4-methylumbelliferyl- β -D-glucuronide (MUG) into Lauryl Tryptose Broth. Similarly, incorporating MUG into Violet Red Bile Agar permits the detection of *E. coli* among the coliform colonies. Standard methods procedures specify Violet Red Bile Agar with MUG for detecting *E. coli* in food and dairy products by fluorescence. This medium is often abbreviated as VRBA w/ MUG.

Formula / Liter

Enzymatic Digest of Gelatin	7.0 g/L
Yeast Extract	3.0 g/L
Bile Salts Mixture	1.5 g/L
Lactose	10.0 g/L
Sodium Chloride	5.0 g/L
Neutral Red	0.03 g/L
Crystal Violet	0.002 g/L
4-Methylumbelliferyl- β -D-Glucuronide	0.1 g/L
Agar	15.0 g/L

Final pH: 7.4 \pm 0.2 at 25°C

Formula is adjusted and/or supplemented as required to meet performance specifications.

Precaution

Refer to SDS

Preparation

1. Suspend 41.6 g of the medium in one liter of purified water.
2. Heat with frequent agitation and boil for one minute to completely dissolve the medium. DO NOT AUTOCLAVE.
3. Cool to 45-50°C.

Test Procedure

1. Process each sample as appropriate by either the pour plate method (with or without overlay) or surface spread. (with or without overlay).
2. Incubate plates at 33-38°C for 18-24 hours.
3. Examine plates for growth and fluorescence.

Quality Control Specifications

Dehydrated Appearance: Powder is homogeneous, free flowing, and pinkish to reddish-beige.

Prepared Appearance: Prepared medium is trace to slightly hazy and reddish-purple.



Technical Specification Sheet



Expected Cultural Response: Cultural response on Violet Red Bile Agar w/ MUG incubated aerobically at 33-38°C and examined for growth after 18 - 24 hours.

Microorganism	Approx. Inoculum (CFU)	Expected Results	
		Recovery	Fluorescence
<i>Enterobacter aerogenes</i> ATCC® 13048	50-200	>50%	Negative
<i>Enterococcus faecalis</i> ATCC® 29212	>10 ⁴	Complete Inhibition	Negative
<i>Escherichia coli</i> ATCC® 25922	50-200	>50%	Positive
<i>Pseudomonas aeruginosa</i> ATCC® 27853	>10 ³	Growth	Negative
<i>Salmonella typhimurium</i> ATCC® 14028	50-200	>50%	Negative
<i>Staphylococcus aureus</i> ATCC® 25923	>10 ⁴	Complete Inhibition	Negative

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

Results

Coliform organisms form purple-red colonies that are generally surrounded by a reddish zone of precipitated bile. When examined under long-wave fluorescent light, MUG-positive colonies are surrounded by a bluish fluorescent halo. MUG-negative colonies lack the fluorescent halo. *E. coli* colonies are red surrounded by a zone of precipitated bile and fluoresce blue under long-wave UV light. *Salmonella* and *Shigella* strains that produce glucuronidase may be encountered infrequently, but these are generally lactose negative and appear as colorless colonies which may fluoresce.

Expiration

Refer to 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. Due to varying nutritional requirements, some strains may be encountered that grow poorly or fail to grow on this medium.
2. Glucuronidase-negative strains of *E. coli* have been encountered. Similarly, glucuronidase-positive strains of *E. coli* that do not fluoresce have been reported. Strains of *Salmonella* and *Shigella* that produce glucuronidase may infrequently be encountered. These strains must be distinguished from *E.coli* on the basis of other parameters, e. g., gas production, lactose fermentation or growth at 44.5°C.

Storage

Store dehydrated culture media at 2 – 30°C away from direct sunlight. Once opened and recapped, place the container in a low humidity environment at the same storage temperature. Protect from moisture and light by keeping container tightly closed.



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Technical Specification Sheet



References

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Record ID: FS-TSS-0237 Revision Number: 1.0 Effective Date: 2023-08-04 12:00 AM EDT



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