m-FC AGAR (7397)

Intended Use

m-FC Agar is used with rosolic acid for the detection and enumeration of fecal coliforms by membrane filtration.

Product Summary and Explanation

Geldreich et al. formulated a medium to enumerate fecal coliforms (FC) using the membrane filter (m) technique without prior enrichment.[1] Fecal coliforms, i.e., those found in feces of warm-blooded animals, are differentiated from environmental coliforms by their ability to grow at 44.5 ± 0.5°C.[2]

Many standard method membrane filtration procedures recommend m-FC media for testing water. The American Public Health Association (APHA) specified m-FC media and incubation at 44.5 ± 0.5°C in the fecal coliform procedure and other tests.[2,3] The Association of Official Analytical Chemists (AOAC) specifies m-FC Agar for detecting total coliforms and fecal coliforms in foods.[4] The US Environmental Protection Agency specified using m-FC media in fecal coliform methods for testing water by the direct MF method or the delayed-incubation MF methods.[5,6]

Principles of the Procedure

Enzymatic Digest of Casein and Enzymatic Digest of Animal Tissue provide nitrogen, carbon, and minerals in m-FC Agar. Yeast Extract is a source of vitamins and trace elements. Sodium Chloride maintains the osmotic balance. Lactose serves as a carbohydrate source. Bile Salts inhibit growth of Gram-positive bacteria. The differential indicator system combines Aniline Blue and Rosolic Acid which is added as a supplement. Agar is the solidifying agent.

Formula / Liter

Enzymatic Digest of Casein	9 g
Enzymatic Digest of Animal Tissue	2.5 g
Yeast Extract	6.5 g
Sodium Chloride	5 g
Lactose	12.5 g
Bile Salts	1.5 g
Aniline Blue	0.1 g
Agar	15 g

Final pH: 7.4 ± 0.2 at 25°C

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

Supplement

1% Rosolic Acid, 10 mL

Precautions

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

Directions

m-FC Agar

1. Suspend 52 g of the medium in 1 L of purified water containing 10 mL of 1% Rosolic Acid in 0.2 N NaOH.
2. Adjust pH to 7.4 with 1N HCl.
3. Heat with frequent agitation and boil for one minute to completely dissolve the medium.
4. Cool to 45 - 50°C and pour plates.
5. DO NOT AUTOCLAVE.

Rosolic Acid: Dissolve 1 g in 100 mL of 0.2 N NaOH to prepare a 1% solution.

Quality Control Specifications

Dehydrated Appearance: Powder is homogeneous, free flowing, and pale to light grey-blue to greyish-beige.

Prepared Appearance: Prepared unsupplemented medium is blue and clear to slightly hazy. Prepared appearance with 1% Rosolic Acid is trace to slightly hazy and cranberry red.

Expected Cultural Response: Cultural response incubated aerobically on m-FC Agar at 44.5 ± 0.5°C after 22 - 24 hours incubation.

Microorganism	Response with Rosolic Acid	Colony Color
Enterobacter aerogenes ATCC® 13048	Growth	Reddish-grey to blue-grey
Escherichia coli ATCC® 11775	Growth	Dark blue
Escherichia coli ATCC® 25922	Growth	Dark blue
Salmonella typhimurium ATCC® 14028	Growth	Reddish-grey
Staphylococcus aureus ATCC® 25923	Inhibited	---

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

Test Procedure

1. Filter duplicate samples through separate membrane filters.
2. Transfer filters to surface of separate m-FC Agar plates.
3. Place each plate in a separate waterproof plastic bag. Submerge in waterbath at 44.5 ± 0.5°C; incubate for 22 - 24 hours.

Results

Fecal coliforms will be various shades of dark blue. Non-fecal coliforms are grey to reddish-blue grey.

Storage

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

Limitations of the Procedure

1. Due to varying nutritional requirements, some strains may be encountered that grow poorly or fail to grow.
2. A few non-fecal coliform colonies may be observed on m-FC Agar due to the selective action of the elevated temperature and the addition of rosolic acid. It may be useful to elevate the temperature to 45 ± 0.2°C to eliminate *Klebsiella* strains from the fecal coliform group.[2]

Packaging

m-FC Agar	**Code No.**	**7397A**	**500 g**
		7397B	**2 kg**
		7397C	**10 kg**

References

1. **Geldreich, E. E., H. F. Clark, C. B. Huff, and L. C. Best.** 1965. Fecal-coliform-organism medium for the membrane filter technique. J. Am. Water Works Assoc. **57:**208-214.
2. **Eaton, A. D., L. S. Clesceri, and A. E. Greenberg (eds.).** 1995. Standard methods for the examination of water and wastewater, 19th ed. American Public Health Association, Washington, D.C.
3. **Cowman, S., and R. Kelsey.** 1992. Bottled water, p. 1031-1036. *In* C. Vanderzant, and D. F. Splittstoesser (eds.). Compendium of methods for the microbiological examination of foods, 3rd ed. American Public Health Association, Washington, D.C.
4. **Andrews, W.** 1995. Microbial methods, p. 17.1-17-119. In Official methods of analysis of AOAC International, 16th ed. AOAC International. Arlington, VA.
5. **Bordner, R., and J. Winter (eds.).** 1978. Microbiological methods for monitoring the environment. EPA-600/8-78-017. Environmental Monitoring and Support Laboratory, Office of Research and Development, U. S. Environmental Protection Agency, Cincinnati, OH.
6. **Environmental Protection Agency.** 1992. Manual for the certification of laboratories analyzing drinking water. EPA-814B-92-002. Office of Ground Water and Technical Support Division, U. S. Environmental Protection Agency, Cincinnati, OH.

Technical Information

Contact Acumedia Manufacturers, Inc. for Technical Service or questions involving dehydrated culture media preparation or performance at (517)372-9200 or fax us at (517)372-2006.

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