Malonate Broth Ewing Modified

Intended Use
Malonate Broth Ewing Modified is recommended for the differentiation of members of *Enterobacteriaceae* on the basis of malonate utilization.

Summary
Leifson developed a synthetic liquid medium, which differentiated *Aerobacter* (now *Enterobacter*) from *Escherichia* species based on their ability to utilize malonate where *Enterobacter* utilizes malonate and *Escherichia* does not. Ewing *et al.,* further modified this medium by the incorporation of yeast extract and dextrose. The addition of yeast extract, a source of vitamins, and a relatively small amount of dextrose, a minimal carbon source, is included in Ewings modification to stimulate the growth of some organisms. The medium, therefore, will support the growth of organisms that cannot utilize malonate or ammonium salt. Any spontaneous alkalinization produced by such organisms is buffered by the phosphate system and counteracted by the acid produced by the fermentation of the small amount of dextrose. An alkaline reaction (blue colour) is produced in this medium by organisms capable of utilizing malonate and ammonium sulfate.

Principle
An organism that can simultaneously utilize sodium malonate as its carbon source and ammonium sulfate as its nitrogen source produces alkalinity due to the formation of sodium hydroxide. The alkali changes the colour of the bromothymol blue indicator in the medium to light blue and finally to prussian blue. The colour of the medium remains unchanged in the presence of an organism that cannot utilize these substances. Some malonate-negative strains produce a yellow colour due to the fermentation of dextrose only, which results in increased acidity causing the pH indicator to change to yellow at a pH of 6.0. Also, some malonate-positive organisms produce only a slight alkalinity that causes the results to be difficult to interpret. Therefore, these tubes should be compared with an uninoculated malonate tube.

Formula*

Ingredients	**g/L**
Sodium Malonate	3.0
Ammonium Sulphate	2.0
Sodium Chloride	2.0
Yeast Extract	1.0
Dipotassium Phosphate	0.6
Monopotassium Phosphate	0.4
Dextrose	0.25
Bromothymol Blue	0.025
Final pH (at 25°C)	6.7 ± 0.2

*Adjusted to suit performance parameters

Storage and Stability
Store dehydrated medium below 30°C in tightly closed container and the prepared medium at 2°C-8°C. Avoid freezing and overheating. Use before expiry date on the label. Once opened keep powdered medium closed to avoid hydration.

Type of Specimen
Water samples

Specimen Collection and Handling
Ensure that all samples are properly labelled. Follow appropriate techniques for handling samples as per established guidelines. Some samples may require special handling, such as immediate refrigeration or protection from light, follow the standard procedure. The samples must be stored and tested within the permissible time duration. After use, contaminated materials must be sterilized by autoclaving before discarding.

Directions

1. Suspend 9.28 g of the powder in 1000 mL purified / distilled water mix thoroughly.
2. Dispense in desired containers as per requirements.
3. Sterilize by autoclaving at 121°C (15 psi) for 15 minutes as per validated cycle.

Quality Control

Dehydrated Appearance: Light yellow to light green coloured, homogenous, free flowing powder.
Prepared Appearance: Bluish green to green coloured, clear solution without any precipitate.
Cultural Response: Cultural characteristics observed after an incubation at 35°C-37°C for 18-48 hours.

Organism (ATCC)	Growth	Malonate Utilization
Klebsiella aerogenes (13048)	Good	+
Klebsiella pneumoniae (13883)	Good	+
Salmonella Arizonae (13314)	Good	+
Escherichia coli (25922)	Good	-
Salmonella enterica subsp. *enterica* serovar *Typhimurium* (14028)	Good	-

Performance and Evaluation

Performance of the product is dependent on following parameters as per product label claim:

1. Directions
2. Storage
3. Expiry

Warranty

This product is designed to perform as described on the label and package insert. The manufacturer disclaims any implied warranty of use and sale for any other purpose.

Reference

1. Leifson, 1933, J. Bact., 25:329.
2. Ewing W., Davis B. and Reavis R., 1957, Public Hlth. Lab., 15:153.
3. MacFaddin J., 1985, Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria, Vol. I, Williams and Wilkins, Baltimore.
4. Data on file: Microxpress®, A Division of Tulip Diagnostics (P) Ltd.

Product Presentation:

Cat No.	Product description	Pack Size
201130290100	Dehydrated Culture Media	100 g
201130290500	Dehydrated Culture Media	500 g