

Also known as

Medium G

Specification

Liquid medium, for the detection and enumeration of coliforms, according to the Pharmacopeial Harmonized Method.

Formula * in g/L

Pancreatic digest of gelatin	20.00
Lactose monohydrate	10.00
Ox bile	5.00
Bromocresol purple	0.01

Final pH 7.3 ±0.2 at 25 °C

* Adjusted and /or supplemented as required to meet performance criteria

Directions

Dissolve 35 g in 1 l of distilled water. Heat only if necessary. Distribute into tubes fitted with Durham tubes and sterilize by autoclaving at 121 °C for 15 minutes.

Description

MacConkey media is a well known popular enrichment media for coliform bacteria. This MacConkey Broth is a modification of the classic medium, where neutral red is replaced by a less aggressive indicator, according to the European Pharmacopoeia.

At the beginning of the last century, MacConkey made the original formulation and included ox bile as an inhibitor of Gram positive bacteria and litmus as the indicator of acid production from lactose sugar. More recently the litmus has been substituted by a phenol red indicator making interpretations easier and more precise.

Advanced knowledge of bacterial physiology has allowed adaptation of this media facilitating coliform detection. The most significant modification to the original formulation has been:

- The substitution of the ox bile by purified bile salts that improve selectivity and avoid the inherent turbidity due to the fat composition of bile. The efficiency of the inhibition due to bile salts is variable and depends on the relative concentration of cholate and taurocholate.

- In the 60's, the toxicity of neutral red on the stressed cells of coliforms was demonstrated, especially on some strains of *Escherichia coli*, therefore the pH indicator was changed to the bromocresol purple, being less harmful than the neutral red.

Technique

The MacConkey Broth is used for the enumeration of coliforms by the MPN technique, selecting the positive tubes that show turbidity, a colour change to yellow and gas production. Confirmation of the presence of coliform should be at 42 -44 °C. The colour change of the medium to yellow in the presence of *E. coli* may be delayed 24 h to 48 h, depending on the volume and concentration of inoculum.

Quality control
Incubation temperature: 30-35°C / 43°C±1 **Incubation time:** 24-48 h

Inoculum: Practical range 10-100 CFU (productivity)/10¹-10⁴ CFU (selectivity), according to Ph. Eur.

Microorganism	Growth	Remarks
<i>Staphylococcus aureus</i> ATCC® 6538	Inhibited	48h
<i>Escherichia coli</i> ATCC® 25922	Good	Medium (yellow) Gas (+) 43°C±1
<i>Escherichia coli</i> ATCC® 8739	Good	Medium (yellow) Gas (+) 43°C±1
<i>Salmonella typhimurium</i> ATCC® 14028	Good	Medium (violet) Gas (-)
<i>Pseudomonas aeruginosa</i> ATCC® 9027	Good	Medium (violet) Gas (-)

References

- ATLAS, R.M., L.C. PARKS (1993) Handbook of Microbiological Media. CRC Press, Inc. London.
- EUROPEAN PHARMACOPOEIA 8.0 (2014) 8th ed. § 2.6.13. Microbiological examination of non-sterile products: Test for specified microorganisms. Harmonised Method. EDQM. Council of Europe. Strasbourg.
- MacCONKEY, A.T. (1905) Lactose-Fermenting Bacteria in Faeces. J. Hyg 5:333.
- MacCONKEY, A.T. (1905) Lactose-fermenting bacteria in faeces. J. Hyg 5:333.
- USP 33 - NF 28 (2011) <62> Microbiological examination of non-sterile products: Test for specified microorganisms. Harmonised Method. USP Corp. Inc. Rockville. MD. USA.

Storage

Keep tightly closed, away from light, in a dry place (4-30 °C).