Hayflick Medium

LQ159

Intended Use:

Recommended for the detection of *Mycoplasmas* in Pharmaceutical products, vaccines, cell banks and virus cultures in accordance with EP.

Composition**

Ingredients	
BHI Broth	90.000 ml
Yeast Extract (250g/l)	10.000 ml
Deoxyribonucleic acid (DNA) (2g/l)	1.200 ml
Phenol Red (0.6g/l)	5.000 ml
Penicillin (20,000 IU/ml	0.250 ml
Horse serum (unheated)	20.000 ml
Final pH (at 25°C)	7.8±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Label the ready to use LQ159 bottle. Inoculate 50-100 cfu sample and Incubate at specified temperature and time.

Principle And Interpretation

Mycoplasma , members of class Mollicutes represents a group of minute bacteria devoid of cellwalls (1). These are common and are responsible for causing serious contamination in cell and or tissue cultures used to generate compendial articles. They may also cause contamination of filtered sterilized Soyabean Casein Digest Broth. Infection of cells in a culture can affect nearly every pathway of cell metabolism including alteration of the cells phenotypical characterization and normal growth. The presence of Mycoplasma species does not always result in turbid growth in cultures or visible alteration of the cells. Hayflick et.al. have reported complex medias for growth of Mycoplasmas (2,3). Testing of Mycoplasmas is necessary to assure reliably pure biotech products and allied materials used to generate these products. Hayflick broth media (liquid) is recommended for general detection of Mycoplasmas in Pharmacopoeias (4,5) for testing of products for Mycoplasma . When testing for Mycoplasmas, at least two known Mycoplasma species or strains as positive controls, one of which should be dextrose fermenter (i.e. *M.pneumoniae* or equivalent species and strain) and one of which should be an arginine hydrolyzer (i.e. M. orale or equivalent species and strain) should be included in each test. Only when testing insect cell lines should one include a Spiroplasma control strain (e.g., *S.citri* ATCC 29747, *S.melliferum* ATCC 29416, or equivalent species and strains). Additionally these strains may be a little more fastidious in their nutritional requirements. They require lower incubation temperatures (as do insect cell lines).

The medium contains BHI Broth containing HM Infusion and peptone which provides nitrogen, vitamins, amino acids and carbon sources. Sodium chloride maintains the osmotic balance. Many Mycoplasmas require serum for their good growth. Addition of Penicillin suppress growth of unwanted flora. Phenol red in the medium indicates the growth of *Mycoplasma* on change of colour of medium from red to yellow or purple.Added Horse serum provides growth factors including lipid components to *Mycoplasma.* DNA provides additional nutrients to *Mycoplasma.* Yeast extract serves rich source of Nicotinamide Adenine Dinucleotide (NAD) required by *M.synoviae. Mycoplasma* species are either aerobic or facultative anaerobic but some are microaerophilic. Few are anaerobic saprophytic *Mycoplasma* which grow best at 22-35°C while pathogenic strains grow at 35°C. Tubes should be incubated in an atmosphere containing 5-10% carbon dioxide and examined after incubation of 48 hours but they should not be discarded as negative until after incubation for three weeks. *M.synoviae* is not able to grow on Hayflick broth medium because growth depends on NAD.

Type of specimen

Pharmaceutical samples

Specimen Collection and Handling:

A 10 ml of the product to be tested is inoculated in 100 ml of Hayflick Broth. The bottles are tightly closed and incubated for 20-21 days at 35-37°C. They are monitored every 2-3 days and are subcultured, if a colour change occurs. Subcultures are incubated for 7 days and microaerophilic conditions at 35-37°C. On days 2-4, 6-8, 13-15 and 19-21 after inoculation the

the liquid media are subcultured on atleast one plate of each type of Hayflick Agar (ME1886) and incubated for 7 days under microaerophilic conditions at 35-37°C.
In addition 0.2 ml of the product to be tested are inoculated directly onto each of the Hayflick Agar (ME1886) and incubated for not less than 14 days under microaerophilic conditions (5-10% CO2) and sufficient humidity at 35-37°C. Positive and negative controls have to be performed. According to the recommendations of EP the solid media are viewed for typical *Mycoplasma* colonies. After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions

Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations :

1. Bottles should be incubated in an atmosphere containing 5-10% carbon dioxide and examined after incubation of 48 hours but they should not be discarded as negative until after incubation for three weeks.

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance
Sterile Hayflick Medium in bottle.
Colour
Orange-pink coloured clear solution
Quantity of Medium
100 ml of medium in bottle.
pH
7.60-8.00
Sterility Test
Passes release criteria.
Cultural Response
Cultural characteristics observed in presence of 10% carbon dioxide (CO_2) after an incubation at 35-37°C for upto 7 days.

Organism	Inoculum (CFU)	Growth
Mycoplasma gallisepticum ATCC 19610	50-100	good-luxuriant
Mycoplasma orale ATCC 23714	50-100	good-luxuriant
Mycoplasma pneumoniae ATCC 15531	50-100	good-luxuriant

Storage and Shelf Life

Store between 2-8°C. Use before expiry date on the label. Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with sample must be decontaminated and disposed of in accordance with current laboratory techniques (6,7).

Reference

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2.Hayflick and Chanock, 1965, Bacteriol.Rev., 29: 18.
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4.Microbiological tests/<63>Mycoplasma Tests, United States Pharmacopoeia, 2022, The United States Pharmacopoeial Convention, RockVille, MD.
5.Mycoplasmas 2.6.7, European Pharmacopoeia 2020, European Department for the Quality of Medicines.
6.Isenberg, H.D. Clinical Microbiology Procedures Handbook 2nd Edition.
7.Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.

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