

Microbiological Process: Different Methods of Production of Anaerobic Bacteria and Different Anaerobic Bacteria used in Anaerobic Bacteriology

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ABSTRACT

This article explains about what the different methods are involved in cultivation/production of anaerobic bacteria which involves different types like 1). Evacuation & replacement of oxygen atmosphere in sealed jars, which involves Gas Pak system, Chromium Sulphuric acid method 2). Specialised techniques which involves Shake culture method, pyrogallic acid method, mcIntosh & fildes's Jar, Different active media used in anaerobic bacteriology which involves bactericides bile esculin agar, Anaerobic blood agar, thioglycolate broth.

Keywords: Anaerobic bacteria; Gas pak system.

INTRODUCTION

Anaerobic bacteria- different methods are present for cultivation of anaerobes.

It is of 2 types

1. **Evacuation & replacement of oxygen atmosphere in sealed jars.**
 - a. **Brewer Jar:** in order to create anaerobic solid medium cultures in clinical laboratories oxygen from atmosphere is removed. It is large sealed container; in this the atmospheric oxygen is removed by catalysing method of chemical combination of oxygen with hydrogen to form water.
 - b. **Gas Pak system:** By using gas pack anaerobic system, for the growth of anaerobic microorganisms, an oxygen free environment is created.
 - c. **Chromium Sulphuric acid method:** Chromous will be formed on reaction of chromium with sulphuric acid. A vigorous amount of hydrogen will be evolved. In the presence of sulphuric acid, chromous sulphate will be formed.
2. **Specialised techniques:** Evacuated Sealed jars are not used. It contains both solid & liquid medium.
Solid medium: Its composition involves incorporation of agar

into liquid media which is called as solidifying agent.

Eg: Nutrient agar

- a. **Shake culture method:** Agar or gelatin of deep culture is taken by using which even distribution of inoculum by shaking before solidification of medium, which we used mainly for demonstration of anaerobic colonies.
- b. **Pyrogallic acid method:** It is also called as pyrogallol autoxidation method.

In the existence of molecular oxygen, either in aqueous or in alkaline medium, various intermediate products are produced.

Liquid medium: The chief ingredients are peptone and NaCl. Louis Pasteur has used original media in which the main ingredients are urine or meat broth.

Eg: Nutrient broth

McIntosh & Fildes's Jar: Hydrogen gas is made to pass through it. Hydrogen & oxygen are combined by using a catalyst. On achievement of anaerobic process, methylene blue gas will persist colourlessness.

Displacement methods: In this method oxygen will be replaced with gases like hydrogen, helium or carbon dioxide. This is method is widely used

Eg: Candle Jar method

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Peptone-yeast extract glucose broth (PYG): In this, the anaerobic bacteria is produced for gas liquid chromatography.

Artemisinin

It is obtained from natural plant source in less amount by isolation process.

Approximately 24mg/l of amorpha-4-diene (amorphadiene) which is an artemisinin precursor. Formulation of codon optimised synthetic amorphadiene synthase gene. & mevalonate pathway from *S. cerevisiae* in *E. coli*. A 1105mg/l of artemisinic acid was produced after modification in further processing under optimal conditions.

Different active media used in anaerobic bacteriology are as follows

Bacterioides bile esculin agar (BBE): It is a nutritious, scrupulous & distinguished medium which is utilized for segregation & conjectural identification of anaerobic gram negative bacilli which are as follows *Bacteroides Fragilis* and *Biophila wadsworthia*.

Anaerobic blood agar: It is a type of solid media which is suggested for its utilization in empirical approach.

It mainly helps in proper growth and stereotypical pigmentation of scrupulous and dawdling anaerobes accompanied by anaerobes of similar clinical significance.

Thioglyconate broth: On accusation of anaerobic infection, endorsement of thioglyconate medium is done in order to segregate anaerobes from blood. Composition: It involves the following ingredients Pancreatic digest of casein, Dextrose, Yeast Extract, Sodium Chloride, Sodium thioglycollate, L-cysteine, Resazurin, Agar.

CONCLUSION

This article summarises that anaerobic bacteria can be produced by many other ways which includes Evacuation & replacement of oxygen atmosphere in sealed jars in which by using sealed jars anaerobic environment is created., specialised techniques which involves both liquid & solid medium, like shake culture, Pyrogallic acid method, McIntosh & Fildes' Jar, production of artemisinin. It explains about different active media used in anaerobic bacteriology *Bacterioides bile esculin agar*, *Anaerobic blood agar*, *Thioglyconate broth*.