

PRACTICAL NO 8

PREPARATION OF CULTURE MEDIA POTATO DEXTROSE AGAR (PDA) FOR FUNGI AND NUTRIENT AGAR (NA) FOR BACTERIA

Medium (media pl.) is the substance which provides nutrients for the growth of microorganisms. The nutrient preparation on which culture is grown in the laboratory is called culture medium. Microbes require different nutrients for their growth. There is no single medium which can support the growth of majority of microbes.

Thus, different types of media and environmental condition are to be used for a given group of microbes. Many special purpose media are needed to facilitate, recognition, enumeration and isolation of certain microbes.

Based on chemical composition, media can be classified into.

1) Natural 2) Semi-synthetic 3) Synthetic.

1. Natural medium: The exact chemical composition of this media isn't known properly. It includes ingredients of natural origin like yeast extract, beef, milk, tomato juice, blood etc. Sometimes this medium is also referred to as complex medium or non-synthetic medium because medium is of complex type and contain various ingredients of unknown chemical composition. This type of media is useful for cultivation of microbes whose specific growth factor requirement is not known.

Eg. Carrot slices, potato plugs, twigs, milk, meat extract, peptone etc.

2. Semi-synthetic: The chemical composition of media is only partially known. Media, which contains Agar, is semi-synthetic medium.

Eg. Potato Dextrose Agar medium, Nutrient Agar media.

3. Synthetic medium: The chemical composition of the medium is completely known. These media are very useful in studying the physiology, metabolic nature and nutritional requirements of microbes. Both autotrophs and heterotrophs can be grown in these media.

Eg. Mineral glucose medium, Richard's solution, Raulins medium etc.

Based on consistency the media are of three types as 1) **Liquid** 2) **Semisolid** 3) **Solid medium**

1. Liquid medium: Nutrient broth is the common liquid medium used in a microbiological laboratory. Its drawback is that the morphology of bacterial colony cannot be studied. But it supports a high microbial population.

2. Semi-solid medium: A semisolid medium is prepared with agar of concentration of 0.5% and is useful in the cultivation of micro aerophilic or studying bacterial motility.

3. Solid medium: If agar is added to a nutrient broth, it becomes solid medium. It is used for isolating microbes and to determine characteristics of colonies. It remains solid on incubation and not destroyed by proteolytic bacteria. The addition of 15g of agar in 1 l of liquid culture will produce a gel that liquefy at 95°C and solidifies at 40-45°C into gel.

Based on application or function, media can be classified as follows.

1. Selective media: Provide nutrients that enhance the growth and predominance of particular microbe and don't enhance or may inhibit other types of organisms that may be

INTRODUCTION TO PLANT PATHOGENSPRACTICALS

present. For instance, isolation of bacterium *Neisseria gonorrhoeae* from a clinical specimen is facilitated by the use of media containing certain antibiotic. These antibiotics don't affect pathogenic but inhibit the growth of contaminating bacteria.

2. Differential media: Certain reagents or supplements when incorporated into culture media may allow differentiation of kinds of bacteria. If a mixture of bacteria is inoculated on to blood agar media, some of bacteria destroy the RBC and others don't. Thus one can distinguish between haemolytic and non- haemolytic bacteria on the same medium.

3. Assay media: Media of prescribed composition are used for the assay of vitamins, amino acids, antibiotics etc.

4. Enumeration media: Specific kinds of media are used for determining the bacterial population in milk, water, soil and food etc.

5. Maintenance media: It is used for satisfactory maintenance of viability and physiological characteristics of culture.