Types of Media

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 I 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

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.