Cultivation of fungi

Culture media: Balanced mixture of different nutrients necessary for the growth of microorganisms, it may be simple or complex composition in each case serves to provide the energy and basic units for building cells.

The purpose of using Culture media:

1- Growing and preserving fungi.
2- Study the effect of single nutrients found in media on the growth of fungus.
3- Inducing fungi to produce and forming some material.
4- Classification of fungi and study the cultural characteristics.

Type of Culture media

➢ According to the chemical composition:

1. **Natural media**: They are plant extract such as wheat extract, potato extract, carrot and others vegetable extract, also we can use fruit to prepare this kind of media.
2. **Synthetic media:** The main compositions of this medium are certain chemicals and some salts such as Czapek`s Dox Medium.
3. **Semi synthetic media**: they are mixed of two kinds of media (natural and synthetic) such as Potato Dextrose Media.

These three types of culture media are liquid so we can solidify them by adding **(1.5 – 2.0 %)** agar.

➢ According to the Textures:

1- **Solid media:** It may be natural such as potato chips, or it may be artificial, such as (PDA) Containing (Agar).

2- **Semi solid media:** Contains a half or a quarter of the amount Agar added to solid media.

3- **Liquid media:** Not contains Agar such as (PD) artificial, (Milk) natural.

➢ According to the purpose:

A. **General purpose media**: Media are used to growth different types of fungi, such as:

1. Water Agar (WA).
2. Potato Dextrose Agar (PDA).
3. Carrot Agar.
4. Malt extract agar.
5. Czapek′s Agar (CZ).
6. Corn Meal Agar (CMA).

B. **Selective media:** Contains a substance inhibits the growth of some fungi while helping growth another kind, such as add some antibiotics or modify the value of (PH), or add salt, or use Rose Bengal ex:

1- Selective *Fusarium* Agar.

2- *Phytophthora* selective medium.

The important elements for fungal growth

1. **Carbon sources:** (carbohydrates) such as monosugar (glucose and fructose) or di sugar such as sucrose and maltose and multi-sugars such as starch.
2. **Nitrogen sources:**
    a. **Organic source**: such as Amino acids and peptone.
    b. **In organic source**: such as nitrate and ammonia. The salts are added according to fungi requirements.
3. **Macro elements**: which add in large quantities such as Na, Mg, k, Zn.
4. **Micro elements**: which add in trace quantities such as Sc, Mn.

Preparation of Culture Media General

1- Broth & agar media are prepared by dissolving specified amount of powder in distilled water.
2- Boiling is often required to dissolve the powder by autoclave in 121 C° for 15-20 min.
3- Cool the flask containing the culture media to about 50 C°
4- Pour the culture media on the Petri dishes let it until Solidify.

Environmental conditions suitable for fungi cultivation

1. **Temperature**: Fungi are living in wide range of temperature and according toit, fungi classified in to:
    a. Mesophilic fungi: The range is (10–40ºC) and the optimum is (25 – 35ºC)
    b. Psychrophilic fungi: The range is (5–25ºC) and the optimum is (15ºC)
    c. Thermophilic fungi: The range is (20 – 50ºC) and the optimum is (40ºC)
2. **Hydrogen Ion concentration: pH**.
3. **Aeration**: All fungi prefer living in aerobic condition.

4. **Light**: is not necessary for fungal growth but it is (some time) important toform sexual and asexual structures.
5. **Humidity: a.** Some fungi are water mold.

   b. Some fungi need some water for growth.

   c. Some fungi are capable to growth in near-dry condition.