

Lab.1

Soil Microbiology

Soil is the brittle part of the hemisphere which formed due to different physicals and chemicals factors.

The soil differ in its texture regarding to its content of stones , grits and sand. The percentage of these content in the soil affect actively in the presence and viability of the M.O.

As we know the M.O need to quantity of water named (Active water) to continue its biological activities. So its spread and density will be high in the heavy soils comparing to its presence and spread in the light soils .Also the contents of the soil in organic & inorganic compound consider one of the main factors that affect the presence and the viability in the soil.

Factors which effect on the types and distributions of M.O. in the soil :

1- Type of the soil:

The types of the M.O, it's numbers and forms differ according to mechanical soil structure and the heavy soils are more rich in the M.O. than the sandy soils.

2- Light:

Most of M.O prefer to keep away from the light except the alge which prefer to life on the surface of the soil or near it.

3-Ventilation:

Most of the M.O of the soil are aerobic which mean its grow only in air present.

Some of them are an aerobic which mean that it's growth stop when the air is presented. Another type is facultative (it can grow in the presence or absence of air).

4- Humidity:

Is essential to vitalize the soil but it differ to the degree of their tolerance to the dryness.

5- Temperature:

Most of the M.O. can live in the all type of the soils, but some of them like low or moderate temperature. The another type of M.O.like high temp. with soil rich in organic materials.

6- Acidity:

Most of the M.O.in the soil prefer neutral pH for their living, and Some prefer to live in acidity or alkaline Soil.

7- Types and Quantitative of the nutrient:

The M.O.of the soil are either parasitic, predator or opportunistic.

Types of the M.O. and its distributions in the soils :

1- Protista:

They are primitive M.O. Characterize by poor evolution. They play a role in the biochemical changes which break down the organic materials to its original metals.

2- Prokaryote:

Its nucleus M.O not Surround by nuclear membrane it is include the bacteria which is the smallest regarding to the size. and proliferation by simple division, the cells are either cocci, bacilli or spiral. live single or group, and forms colonies.

3- Viruses:

Its spread in the soil but it quickly loss its viability because of absences of the parasite (host) in the soil which is essential to its life.

4- Eukaryta:

Its nucleolus M.O has nuclear membrane and its either unicellular or multicellular , Its highly spread in the soils. Include fungi , alge and protozoa.

5- Microphona:

Its small M.O include primitive and some nematode and flat worms, Most of them are depend on another M.O for nutrition.

The role of M.O in the soil

Beneficial effects:

The small M.O break down the remnant of the animal and plant organic materials and help it's lysed and convert it to beneficial form for plant nutrition.

Harmful effects:

Some of the M.O in the soil cause many diseases to the human and animals and these M.O contaminate the soil via irrigation and dead infected animals, ex: bac. which cause tetanus and anthrax.

Collection of soil sample

- 1- Take in the consideration type of the soil fertilized or non fertilized soil, salty or not .
- 2- Remove the superficial layer of the soil because it's contaminated by so many environmental factors results from human activities , exposure to UV Light.
- 3- The sample should be taken from 3-5 cm under the surface of the Soil.
- 4- Take several samples (at least 5) from each site and these simple must collected randomly.
- 5- Clean the samples from stones and remnant of the root of the plants.
- 6- Mix these to form one sample.
- 7- Use sieves with small pores (each experiments has it's sieve pores diameters).
- 8- Use clean and sterile tools , ex; clean nylon sac.
- 9- Immediate study and exanimation of the samples as soon as possible and avoid storage otherwise store in cool place.