Soil Microbiology LAB(1)

The soil is not a mass of dead debris, merely resulting from the physical and chemical weathering ofrocks; it is a more or less homogeneous system which has resulted from the decomposition of plantand animal remains.A normal soil is made up of solid, liquid, and gaseous constituents.

These can be broadly divided into five groups:

1. Mineral Particles.2. Plant and Animal Residues.3. Living Systems.4. Water.5. Gases.
2. Living systems is also plays a major role in soils.

1.1 Soil microbiology:Soil microbiology is the study of organisms in soil, their functions, and how they affect soilproperties. Soil microbiology is the scientific discipline that is concerned with the study of allbiological aspects of the life that exist in the soil environment. Microorganisms in soil are importantbecause they affect soil structure and fertility. Soil microorganisms can be classified as bacteria,actinomycetes, fungi, algae and protozoa. Each of these groups has characteristics that define themand their functions in soil.

1.2 Soil is a dynamic habitat for an enormous variety of life-forms.Soils give a mechanical support to plants from which they extract nutrients.Soil provides shelters for many animal types, from invertebrates such as worms and insects up tomammals like rabbits, moles, foxes and badgers.It also provides habitats colonised by a staggering variety of microorganisms.All these forms of life interact with one another and also interact with the soil to create continuallychanging conditions.This allows an on-going evolution of soil habitats.

1.3 Distribution of Microorganisms in soils is an important aspect in soil studies.Microorganisms constitute < 0.5% (w/w) of the soil mass, yet they have a major impact on soilproperties and processes.

About 60-80 % of the total soil metabolism is due to the microflora.These are the smallest organisms (<0.1 mm in diameter) and are extremely abundant and diverse.

They include algae, bacteria, cyanobacteria, fungi, yeasts, myxomycetes and actinomycetes.Most of them are able to decompose almost any existing natural material.Micro-organisms transform organic matter into plant nutrients that are assimilated by plants.Soil organisms represent a large fraction of global terrestrial biodiversity

Soil organisms can be grouped on the basis of:

– Size: how big they are

–Species: who they are related to

–Function: how they make their living

One gram of topsoil may contain:

- as many as one billion bacteria
- up to 100 million actinomycetes
- one million fungi
- 100 nematode

importance of Soil Organisms

- Responsible for cycling of C, N and other nutrients
- Enhance soil structure
- Relocate and decompose organic materials
- Maintain soil quality and health
- Increase soil aeration and penetrability
- Involved in disease transmission and control

Rhizosphere is the zone of plat roots.

The rhizosphere is the region of soil immediately adjacent to and affected by plant roots.It is a very dynamic environment where

plants, soil, micro-organisms, nutrients and water meet andinteract.The rhizosphere differs from the bulk soil because of the activities of plant roots and their effect onsoil organisms.

The major Functions of soils:

Soil organisms are responsible for carrying out many vital functions in the soil.The major Functions of soils are:

- Anchor plant roots
- Supply water to plant roots
- Provide air for plant roots
- Furnish nutrients for plant growth
- Release water with low levels of nutrients .