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## Soil microbiology

The answer of the questions :

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A- General description of soil :

- 1- Its composed of five matter components (mineral matter, water, air, organic matter and living organisms)
- 2- Water and air represented half of the soil volume.
- 3-organic matter represented 3-6% of the total constituents.
- 4-living organisms less than 1% of the total volume.
- 5- There are more than one type of soil :Clay,sandy,silt and loam .

B- Organic fraction of soil:

- 1- Often termed humus is a product of the synthetic and decomposing activities of the microflora .
- 2- The organic fraction contains compounds of carbon , hydrogen , oxygen , nitrogen ,phosphorous and sulphur .
- 3- Humus contains a number of polymerized substances e-g aromatic molecule and polysaccharides of several kinds.

C- Activity and function of actinomycetes in soil :

- 1- Decomposition of carbonaceous material .
- 2- Formation of humus through conversion of plant remains .
- 3- *Nocardia* causes infections of human and animals .
- 4- Actinomycetes acts as antoganism .

D- Role Microorganisms in nitrogen cycle :

- 1- Nitrogen mineralization :organic complexes in soil decomposed and converted to inorganic ions .
- 2- Nitrogen immobilization: leads to the biosynthesis of complex molecules of microbial protoplasm .
- 3- Denitrification : a process by certain microorganisms , by which nitrates are converted to N<sub>2</sub> gas .
- 4- Nitrogen fixation : Microflora regulates the supply and governs the availability and chemical nature of the nitrogen in soil .

E- Factors governed in the breakdown of organic matter :

- 1- Temperature :microbial metabolism and carbon mineralization are slower at low or at high temperature .
- 2- Hydrogen ion pH :decomposition of organic matter increased at neutral pH than in acid soil .
- 3- Moisture : At optimum moisture , the microbe can be decomposed the organic matter
- 4- O<sub>2</sub> : stimulate the carbon mineralization .
- 5- Nitrogen :is a nutrient substance for microbial growth and for organic matter decomposition .

F- Systematic of bacteria : Bergeys,s can be divided of bacteria according to :

- 1- Manual (morphology and physiology ) .
- 2- Absence of o<sub>2</sub> ability to grow (or not ) .
- 3- Relation of temperature: (psychrophilic , mesophilic and thermophilic ) .
- 4- Relation of pH (acid ,neutral ,alkaloid ) .
- 5- Relation of pH salt concentration (normal,halophilic) .
- 6- Types of nutrition (autotrophic or heterotrophic ) .