PODZOLS CHARACTERISTICS AND FORMATION

Dr. V. K. Venugopal
Former Professor & Head
Department of Soil Science and Agricultural Chemistry
College of Agriculture,Vellayani
Consultant Digital University, Kerala

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Podzol

- Podzols are soils with dark organic matter rich O or Ah horizon and an ash-grey subsurface horizon, bleached by organic acids,
- The illuvial dark accumulation horizon (Bh) is brown or black humus and/or reddish iron compounds.
- Podzols occur in humid areas in the Boreal forests (Gr God Boreas) in Temperate Zones under coniferous forests in hilly or level lands composed of cold tolerant coniferous species such as spruce and fir.
- Distributed extensively in Northern Russia,Canada,South America, and in Tropics covering parts of Malaysia
- Formed from unconsolidated weathering materials of siliceous rock, including glacial till, alluvial, Aeolian deposits of quartzitic sands

Genesis of Podzols

Two processes are involved

- **Cheluviation**, movement of chelated metal organic complexes from the sandy upper horizons to the lower layers
- Soluble organic substances produced by microbial attack on plant litter, move downward with the soil solution as complexes with Al3+- and Fe3+-ions.
- Carboxylic and phenolic groups of dissolved soil organic matter act as Chelates and preferentially hold polyvalent metal ions such as Al3+and Fe3

- **Iluviation,** the accumulation of Fe and Al chelated complexes to form spodic
- horizon, process continues until the binding capacity of the organic matter is saturated.
- Uncharged organic matter is also transported by water. by 'hydrophobic arrangement',
- Arrangement of molecules is such that their hydrophobic parts are in contact with the interior structure of the organic molecules, while their charged parts are in contact with water.causing solubility of largely hydrophobic units.
- In quartz sands, podzol morphology is visible after a hundred years of soil formation,
- Much slower in clay rich parent materials

Podzolization and Laterization - opposite processes

- In Podzols, Fe- and Al-oxides dissolved by organic acids are leached out while in in laterization Fe- and Al-oxides remain stable and increase in content through relative accumulation.
- In Podzols, organic acids are the main weathering agent, whereas carbonic acid plays this role in laterization
- Organic matter decomposition is faster in the tropics in Ferralsols while it is slow in the temperate climate in Podzols

- Podzolization involves the mechanical breakdown of rock and soil, moving through processes of humification, leaching, and eluviation. Whereas, Lateralization is primarily the result of intense chemical weathering of rock and soil.
- Podzolization produces light-coloured, acidic soil that is rich in iron and humus. Whereas, Lateralization typically produces reddish soil that is high in aluminium and iron, but low in organic matter.
- Podzolization results in a thin layer of nutrient-depleted soil, whereas, lateralization creates an iron-rich layer of soil.
- Podzolization is primarily caused by acidic precipitation whereas, laterization is primarily caused by the high temperatures and rainy seasons in tropical climates

Podzol soil Profile
Typical sequence of organic topsoil , leached grey-white subsoil ,
and iron-rich horizon below


Thank You