

In form of plant and animal residues



In general, soils have following four horizons: an organic or O-horizon and three mineral (A, B, C) horizons. Some workers recognized a D-horizon, in which rocks are in active weathering state, in between C and R-horizons. R-horizon is the consolidated bed rock on which a soil profile rests. A and B-horizons form the true soil or solum. Each horizon of soil profile is further subdivided.

Horizon subdivisions are indicated by a series of letters with Arabic numbers as subscripts, e. g., O₁, O₂, A₁, A₂, etc., (Fig. 9 3). Different layers of soil profile have following characteristics:

O Horizon:

The uppermost horizon of soil profile is called O horizon or litter zone. It is present in soils of forests but absent in the soils of deserts, grasslands and cultivated fields. It includes following two sublayers: O₁ horizon (A_{oo} or L horizon): It is the top layer of soil consisting of freshly fallen litter (i. e., dead leaves, twigs, bark, flowers, fruits and animal excreta and remains). In O₁ horizon, original form of plant and animal residues can be recognized with the naked eye and in it, the decomposition has not yet started. The A₁ level may be seasonal in nature: it is thickest in a deciduous forest immediately after leaf fall, when the forest floor is covered with fresh leaves and is virtually gone by the end of the following summer, when the leaves have largely decomposed. Fig.

9-3. A generalized profile of soil. O₁ : Loose leaves and organic debris; O₂: organic debris partly decomposed or matted; A₁ : A dark coloured horizon with a high content of organic matter mixed with mineral matter; A₂: A light

coloured horizon of maximum leaching; A3: Transitional to B but more like A than B; B1: Transitional to B but more like A than B; B2: A deeper coloured horizon of maximum accumulation of clay minerals or of iron and organic matter; B3: Transitional to C; C: Weathered material (regolith); R: Consolidated bedrock (Smith, 1974). O2 horizon (Ao or H horizon): O2 horizon underlies the O1 or litter horizon and contains blackened unrecognizable decomposed litter. The upper portion of O2 horizon contains partially decomposed detritus, the duff, so is called duff layer. Its lower part contains completely decomposed, light and amorphous organic matter, the humus and is called humus or H layer. Insects and other small animals are abundant in this layer.

A Horizon:

Underlying the litter zone is the A horizon or topsoil. It is the zone of eluviation (leaching) or the horizon in which materials are brought into aqueous suspension or solution and move downward through the soil. The amount of material that is actually leached out of this zone is a function of the amount of percolating gravitational water. The topsoil or A horizon includes following three subzones: A1 horizon: The A1 horizon is the zone of humus incorporation with minerals of soil.

It is almost always dark coloured and relatively rich in organic materials thoroughly mixed with the mineral soil. Micro-organisms like bacteria and fungi are present in huge numbers in A1 layer. A2 horizon: The A2 horizon underlies A1 horizon and is the zone of maximum leaching (eluviation).

It contains less humus and is a light-coloured horizon from which materials like silicates, clays, oxides of iron (Fe) and aluminium (A1), etc., are being removed at the greatest rate. A3 horizon: It is transitional to the subjacent B horizon.

B Horizon:

B horizon or subsoil underlies A horizon and is the zone of illuviation (collection of materials) in which much of the material leached out of the zone of eluviation (i. e., A horizon) is precipitated and enriched. It is coarse textured and deep coloured with aluminium, iron and organic colloids and it is rich in clay. B horizon can also be divided into three zones of which the B1 and B3 are transitional to the A and the C horizons, respectively and B2 is the zone of maximum precipitation of transported material.

The roots of shrubs and trees usually reach upto this horizon.

C Horizon:

Underlying the B horizon is the weathered rock or sediment that serves as the parent material for the mineral fraction of the soil. It is called C horizon or regolith. It is a light-coloured and is virtually lacking in organic materials.

R Horizon:

C horizon is underlain by unweathered bedrock which is called R horizon. The relative thickness and importance of the major horizons are highly variable.

However, the concept of the soil profile is of great value because it provides a single genetic model by which all zonal soils can be compared.