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SOIL STRUCTURE

The term "structure" comes from the Latin word and means the building, construction method, composition.

Soil structure is defined as the grouping and arrangement of primary particles (mineral and organic matter) into larger, secondary particles called aggregates. These groupings are called peds or aggregates. Primary peds are relatively stable aggregates that are separated from each other pores or places weakened in links of mutual. They are the simplest form of the existence of soil materials. Next, it is naturally not divided into smaller units of soil. On the contrary, they can be further grouped into larger units - aggregates higher order. Most preferably the aggregates for favorable porosity are aggregates from 1 up to 10 mm. To soil quality are best round, crumb formation, and polyhedral structural aggregates .

Soil texture is determined by the ability of soil aggregates to create aggregation of grains of different diameters (from the clay over sand) or disaggregation large clumps into smaller.

Soil structure is the result of the spatial arrangement of the solid soil particles and their associated pore space. Aggregation mainly depends on the soil composition and texture, but is also strongly influenced by other factors such as biological activity, climate, geomorphic processes or the action of fire.

Quality of soil structure is considered beneficial earthworms. Earthworms may ingest substantial quantities of soil materials which are then cast on the surface or in earthworm burrows. When earthworms are plentiful, their burrows are large enough to dominate the macroporosity in the soils . Because the structure is not static, and changes with water content, and other agencies of stress, which may be used to the system .

The size and stability of the aggregates depend on the nature and quantities of cementing substances, which are minerals (clay and calcareous carbonate), and soil organic matter and micro-edaphone. The more organic and mineral soil contains a structure-forming substances, the better it is in conditions of aggregation. Aggregation process - the formation of soil aggregates is usually multistage from micro-aggregates to macro-aggregates.

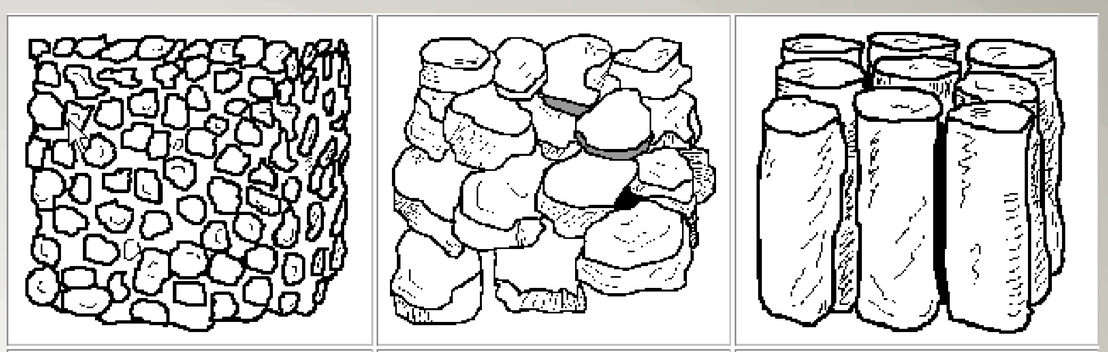
The fact that soil particles do not form a continuous and compact mass, but are associated, involves an interconnected pore space, makes possible the development of life in the soil. The volume formed by pores, channels, chambers and cracks allows the movement of fluids (air and water) in the soil, providing a favorable environment for microbial activity and facilitating root growth of plants.

The formation of soil structure involves the physical forces of shrinking and swelling created by changes in water status of soils, freezing and thawing, tillage, or by movement of the larger biota in soils. Thus changes of structural organization are maximal in clays.

Aggregation is strongly conditioned by colloids (clay and organic matter) and soil cementing substances (carbonates, sesquioxides, etc.), which coat solid particles, including them in groups (aggregates). If the proportion of colloids or cementing substances is too low, solid particles remain dispersed. Flocculation of colloids gives rise to the co-precipitation of colloidal particles (clay and organic matter), forming microaggregates, which then evolve resulting in macroaggregates.

Flocculation induced by cations in the soil solution plays an important role in the development of aggregates. Calcium and magnesium (in calcareous soils) or iron and aluminium (in acid soils) favour the formation of stable aggregates.

In contrast, monovalent cations as sodium contributes to dispersion of aggregates. Also, cementing agents as calcium carbonate (in calcareous soils) or iron oxides (acid soils) may enhance soil aggregation. In the formation of macroaggregates, biological agents are also involved, as plants (roots), animals (earthworms, arthropods, etc.), microorganisms (bacteria and, especially, fungi) are also important.



Granular: Resembles cookie crumbs and is usually less than 0.5 cm in diameter. Commonly found in surface horizons where roots have been growing.	**Blocky**: Irregular blocks that are usually 1.5 - 5.0 cm in diameter.	**Prismatic**: Vertical columns of soil that might be a number of cm long. Usually found in lower horizons.
Columnar: Vertical columns of soil that have a salt "cap" at the top. Found in soils of arid climates.	**Platy**: Thin, flat plates of soil that lie horizontally. Usually found in compacted soil.	**Single Grained**: Soil is broken into individual particles that do not stick together. Always accompanies a loose consistence. Commonly found in sandy soils.

Fig. 1 The various types of soil structures

Determination soil structure

The soil structure was determined by a modified method according to Novák .

A soil lump weighing approximately 15 g with 300 ml was distilled water placed on a 0,5 mm screen, washed in 300 ml of distilled water and poured into 1 l (three sets of determination).

Then the suspension is pipetted at appropriate times in a weighing basin. Weighing basin are vaporized on the fence and dry weighed.

Fig . 2 Process for the preparation of analyzes of soil structure

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