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Soils zones in Romania and pedogenetic processes

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Abstract

Orohydrographic conditions, climate and vegetation that are specific to our country's territory they have made a small area to develop most soils globe. Romania presents a diversity of soils, from the semi-arid zones in which specific zones encountered the wet and cold. Most soils in our country are distributed in a horizontal zonality plains and low hills are represented by cernisols (kastanozems, chernozems, phaeozems) and luvisols (preluvosols, luvosols) and a vertical zonality of high hills and mountain regions including cambisols zone (eutricambosols, districambosols), spodisols zone (prepodzols, podzols) and umbrisols zone (nigrosols, humosiosols).

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1. Introduction

Soil zone represents a territory characterized by the predominance of a soil type. The concept of zonality of the soil has been issued, as it is known by V. V. Dokuceaev (1898), in our country is evidenced by Gh. M. Murgoci (1911) and was widely used in soil geography.

Soil zonality is determined by climate zonality, natural law of nature, and the earth's rotation sphericity, and influence on climate and mountainous regions and the maritime currents.

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Typically, a soil zone is established by pedogenetic processes relative to climate, vegetation and course in relief (Posea and Cruceru, 2005). Based on these considerations, our land soils are judiciously disposed in the plains, plateaus and low hills in a horizontal zonality gradually passing into regions of high hills and mountains in a vertical zonality (Murgoci, 1911).

Of course, that vertical zonality, is identical, but not analogue, with horizontal zonality; there are specific zones that are missing in mountainous horizontal zonality as, for example, cambisols zone and the humosiosols specific alpine meadows.

2. Materials and Methods

The field studies consisted of mapping and spatial reambulating the studied area on maps at 1:10.000 and 1:25.000 scale, with collection of numerous soil and groundwater samples, with observations on relief, micro-relief, parent material, climate, etc.

The basic research and mapping unit of the areas with soil zone was the soil profile, thus allowing the study of morphological characteristics of the soils. As a result, soils were classified based on intrinsic properties, namely the soil profile, taking into account diagnostic horizons and characteristics (Soil survey methodogy, 3 Volume, 1987).

Soil profiles were located on the ground so that to form a network of studied points. The method of parallel routes, located almost at equal distances has been used, to cover more or less uniformly the whole working area.

The morphological description of soil profiles was done according to the Romanian System of Soil Taxonomy (SRTS, 2003, 2012), ICPA Bucharest.

In order to establish the soils diagnosis, their morphological features have been taken into account, namely the thickness of morphological horizons, color, texture, structure, composition, adhesion, etc. Soil samples were taken from genetic horizons both in modified and unchanged settings.

In modified settings, soil samples of 20 cm thickness were taken in bags, for the chemical characterization to be carried.

In natural (unchanged) settings, soil samples were taken using a metal cylinder of known volume (200 cm^3), to characterize the physical and hydro-physical features, as well as the momentary soil moisture.

3. Results and Discussions

Horizontal zonality start with the ***cernisols zone***, represented by types kastanozems, chernozems and phaeozems, to which pedogenetic processes dominant are bioaccumulation with the formation of the mollic A horizon (Am); followed by clay migration with the development of the horizon B argic (Bt) and argillisation which leads to the appearance of cambic horizon (Bv) (Figure 1, 2, 3, Table 1) (Florea et al., 2012; Ispas and Stănilă, 2015).

Cernisols zone overlaps plains, plateaus and low hills (0-550 m), in hot dry climates sub-humid moderate heat, until cool and humid (Suceava Plateau) under the vegetation of the steppe and forest-steppe. This zone occupies a quarter of the country (26.7%).

The next zone is that of the ***luvisols,*** including as soil types preluvosols and luvosols (Figure 4). Of pedogenetic processes it should be mentioned clay migration with the formation of eluvial horizons (El, Ea) and iluvial horizon (Bt argic). This zone overlaps the plains and high plateaus, Sub-Carpathian hills and piedmont (200-800 m).

The climate remains relatively warm and semi-humid with average annual temperatures of 7-10^oC and 550-800 mm rainfall, under the forests of quercinee or quercinee mixture with *Fagus sylvatica*. Occupies a different quarter of the country's 25.5 %.

Layout of vertical soil starts with ***cambisols zone*** which includes eutricambosols associated with regions of high hills districambosols and only districambosols low mountainous regions. Argillisation is pedogenetic processes that led to the formation of cambic horizon (Bv), diagnostic for cambisols.

Cambisols zone overlaps the lower mountain stage (500-1450 m), with cool climate - wet, average annual temperatures of 3-6^oC and 6-8^oC and annual rainfall between 700-1300 mm under beech and mixed forests (beech-spruce).

Spodisols zone with the main soil types prepodzols and podzols that forms as a result of the podzolization runs in alpine East (1450-1900 m) (2200 m) (Figure 5).

The climate is very humid and cold with average annual temperature of 2-6^oC and average annual rainfall of 800-1400 mm and a characteristic vegetation consists of forests of spruce, fir and spruce that are thinned and then gradually disappear, their place being taken by *Pinus mugo* and *Juniperus communis*.