GENERAL CHARACTERIZATION OF THE MAIN SOILS IN OLTENIA AREA

POPESCU CRISTIAN

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ABSTRACT

Situated safely under the Carpathian chain, between the Danube and river Olt, the geographical area of Oltenia presents a wide natural frame, witch determined a great diversity of the pedological cover, forming a true natural soils museum.
In the plain area, on the plateau, on loessoid deposits were formed and chernozems are met. Continuing the chernozems, on more humid areas, covering almost entirely the area from steppe to forests, there are present the cambic chernozems and argic chernozems.
In the southern central area of the region, determining from pedogeographical point of view the transitional type between argic chernozem and preluvosoil from the hill area, there are present the reddish preluvosoil and luvic reddish preluvosoil.

The preluvosoils, luvosoils and albic luvosoils, are spread in the hill and table-land area, assigned according to the relief, rock and vegetation.

On well drained plane field and on rocks rich in alkalescent elements are prevailing the preluvosoils, on plane, lowlands and acid rocks the luvosoils and albic luvosoils are formed.

In the mountain area, the soils repartition is keeping a certain vertical areal, determined especially by heights. The eutricambosoils are met on the well drained slopes and on eruptive rocks with a lot of alkalescent elements and the districambosoils were formed on rocks poor in alkalescent elements, of heights between 600-1000 m.

At higher altitudes prepodsoles were met on gentle peaks and acid rocks, podsoles were met on the highest platforms and lowlands on acid rocks, and in the alpine area on a relief formed by plateau, gentle slopes and long ridges were met the humosiosoils.

INTRODUCTION

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The Oltenia Region is located between the Carpathian Mountains, the Danube and the Olt River and it has a high variety of soils. The diversity of the soils from Oltenia reflects the variety of the natural factors of solification.

MATERIAL AND METHOD

The researches have been carried out according to the instructions elaborated by the National Institute for Developing and Research for Pedology and Agrochemistry and Environment Protection Bucharest by field studies and laboratory analyses.

By the researches that have been carried out there were determined the main physical and chemical features of the soils and they were used in determining the yielding potential of the researched soils

RESULTS AND DISCUSSIONS

The main soil units of Oltenia are: chernozem, cambic chernozem, argic chernozem, preluvosoil, reddish preluvosoil, albic luvosoil, districambosoil, podzol, chernic gleyosoil, gleyosoil and psamosoil.

The chernozems are encountered in the plain zone on an even land and they formed on loessoide deposits. They are characterized by a not differentiated textural profile of Am-AC-C type.

The Am horizon is very well differentiated (30-40 cm) rich in humus,

with crumble structure. The reaction is generally low alkaline (pH=7,6-7,8).

The cambic and argic chernozems are located in continuing the chernozem zone toward the wetter zone occupying almost all sylvosteppe zone that are encountered near the Cujmir village zone, over Segarcea, till Corabia. They were formed in an more humid climate that have intensified the leaching and the alteration. The soil profile is better developed, there has appeared the Bv horizon or Bt that is less developed and texture differentiated.

They are neutral soils or low acid with high content in humus and nutrients (table 1).

Table 1

The main properties of some soils from Oltenia

Soil type	Horizon	Depth (cm)	Clay %	Da g/cm³	Humus %	pH H2O	V %
Chernozem	Am	0-40	25,1	1,30	3,5	7,8	100
	AC	40-60	24,5	1,28	2,1	8,1	100
Argic chernozem	Am	0-38	41,8	1,33	3,1	6,6	82
	Bt	38-130	48,2	1,51	1,2	6,8	85
	C	Sub 130	43,0	1,45	0,8	7,8	94
Reddish preluvosoil	Ao	0-30	30,9	1,36	2,3	6,2	78
	Bt	30-150	38,6	1,54	0,64	6,5	82
	C	Sub 150	28,2	1,52	0,40	7,4	91
Preluvosoil	Ao	0-25	35,8	1,35	2,1	6,1	75
	Bt	25-160	44,1	1,52	0,83	6,7	84
	C	Sub 160	40,5	1,53	0,44	8,0	96
Albic luvosoil	Ao	0-20	26,9	1,33	1,9	5,1	50
	Ea	20-40	25,2	1,40	1,1	4,8	47
	Bt	40-200	51,7	1,54	0,5	6,4	63
Districambosoil	Ao	0-20	11,5	1,16	4	4,3	16
	Bv	20-120	10,9	1,19	-	4,7	12
	C	Sub 120	10,2	1,21	-	5,1	14
Podzol	Ao	0-15	10,8	1,10	15,8	3,9	12
	Es	15-30	8,9	1,14	-	3,7	10
	Bhs	30-90	10,3	-	-	4,5	8
Humosiosoil	Ao	0-20	10,1	1,02	10,6	4,1	12
	AR	20-40	-	-	-	4,4	8
	R	Sub 40	-	-	-	5,0	-
Psamosoil	Ao	0-36	7,5	1,42	0,48	6,2	76
	C	Sub 36	7,1	1,51	0,26	6,7	81
Psamosoil	Ao	0-40	10,1	1,40	0,59	7,5	96
	C	Sub 40	9,9	1,52	0,30	7,7	100

The reddish preluvosoils and reddish luvic preluvosoils occupy the central-southern part of the region being the transition type between the argic chernozem and the preluvosoil from the hilly zone. These soils occupy a strip with corrugated edge that stretches from Tr. Severin over Craiova, till Caracal. They formed in a climate with annual rainfall over 520 mm and average annual temperatures of 9-11°C on loessoide parental material and silts, rarely on sands and clays. They have a profound profiler of Ao-Bt-C.

The preluvosoils, luvosoils and albic luvosoils are encountered in the hilly

zone scattered in function of relief, bedrock and vegetation. In this manner, on the well drained hills and on bedrocks that are rich in basic elements there are formed preluvosoils and on even surfaces, lower and on acid bedrocks there are formed luvosoils and albic luvosoils.

In general, these soils have a profile formed by horizons yet well differentiated, middle to fine texture with high accumulation of clay in the B horizon.

The researches carried out in this area have shown that the low fertility of these soils is determined by the high degree of debasification, by the acid reaction, the presence of mobile aluminum along with nutrients scarcity, lack of structure and the poor air-water regime.

Within the mountain zone there is also encountered an array of soils. In their repartition these soils keep a certain vertical distribution determined by the altitude and the climatic conditions. In this manner, within the mountain zone at 600-1000 m altitude there is encountered eutricambosoils and districambosoils, nigrosoils and prepodzols and in the alpine zone there appear on large surface the podzols and humosiosoils.

The eutricambosoils are encountered especially on well drained slopes with eruptive rocks and lot of basic elements, covered by beech woods and herbaceous not acid vegetation. It has a soil profile of Ao-Bv-C. The texture is loamy, not differentiated on the profile, crumbly and low developed. It's physical, physical and mechanical and aeration properties are, in general, favorable. The humus content is of 3-4%, the saturation bases degree is over 40%, the reaction is acid (pH 4,84-5,8), low supplyin by nutrients.

Districambosoils and nigrosoils were formed on poor bedrocks in basic elements under spruce woods with herbaceous acid vegetation. The districambosoils have Ao-Bv-C soil profile and the nigrosoils Au-Bv-C.

Their texture is silt, not differentiated on the soil profile, the structure is crumbly, low formed. The districambosoils have low humus content (3-9%) and the nigrosoils are rich in organic matter (5-15%). The pH values are between 4-5 and the bases saturation degree=20%.

Prepodzols. They are encountered on the light slopes with acid bedrocks that are covered by spruce and junipers with lot of acid vegetation. The soil profile is of Au-Bs-R type with short horizons yet well differentiated. The soil texture is loam sand, not differentiated on the soil profile, the structure is crumbly, very low formed, the reaction is acid (pH 3,8-4,5) and the bases saturation degree decreases under 15%. The raw humus quantity varies between 5-20%.

Podzols. They are encountered on the highest platforms or in depressions, on acid valleys that are covered by acid herbaceous vegetation. They have a very short profile of Au-Es-Bhs-R yet with very well differentiated horizons. The texture is sandy loamy, not differentiated on the soil profile, not structurated. The raw humus content is of 7-30%, the reaction is strongly acid (pH 3,8-4), and the bases saturation degree is 10-20%.

Humosiosoils. They have Au-Ar-R soil profile and are encountered on long edges, plateaus and light versants with acid valleys and acid herbaceous vegetation. The texture is sandy with lot of pebbles; the structure is crumbly, low formed. They are rich soils in organic matter (20-30%) debaseificated and acid.

Generally, these soils have a short profile with well differentiated horizons by colors and distinct hues. The pronounced alternation of the primary ores have's conducted to the iron getting out that determines on the entire profile a brown-rusty hue. Most of the mountain soils appear as complex form with accentuated change of the soil types, sometimes on a low scale. Between vegetation and soil there has been established the following correlation. In the mountain zone, under plant association of Agrostis tenuis and

Festuca rubra there appear eutricambosoils, under plant associations of Nardus stricta and Festuca rubra, districambosoils and where ericaceae are present there appear prepodzols. In the alpine zone, under Nardus stricta association there appear the prepodzol and under the woody vegetation as well as under Agrostis rupestris and Festuca stupina there appear the podzols. Under Carex curvula association there appear humosiosoils.

As regard the psamosoils there were observed that in the Southern Oltenia the sandy soils occupy 200.000 ha. The sandy material from Danube terraces covers between Ostrovul Corbului and Corabia a surface of 120.000 ha mainly being formed of SiO2 (86%).

The presence and the composition of this material, of Mg and Ca oxides 2,96% CaO and 0,45% MgO determine a neutral reaction. The sandy zone from the Left side of the River Jiu occupies a surface of 80.000 ha and comprises almost the entire Jiu terrace at the South of Amaradia stream confluence. The sandy material from this zone belongs to the Jiu deposits or from lacustrian deposits of Levantine age and have over 82% SiO2. On these thick deposits there were formed the sandy soils that are characterized by a low clay content (under 12%), thick texture, unstructurated or a crumbly structure, low formed with low physico-hydrical properties. They are poor in humus (under 1%) and in nutrients.

In function of the environment conditions and the ore composition of the deposits the psamosoils from Southern Oltenia have evolved to a clayilluviated evolution or chernozemic. The ones with clayilluvial evolution have formed on deposits that were rich in thick fractions and were acid, scarce in bases, in a wet climate and are encountered, mainly, in the Left Side of the River Jiu. The ones with chernozemial solification appear on the Danube sand deposits that are finer and are richer in bases.

The psamosoils from Southern Oltenia have the following subtypes: typical, molic, cambic, argic and gleic.

The typical psamosoils occupy, mainly, the edge of the dunes and a part of the modeled zones. They are characterized by the presence of the Ao horizon followed by the parental material formed by sandy windy deposits that have low clay content. The Ao horizon has a thick texture (clay under 12%), low acid reaction (pH=5,8-6,5), the crumbly structure low formed and a low humus content (0,2-0,5%).

The molic psamosoils occupy, mostly, the loess sands, are richer in humus (1-2%), they have a neutral reaction or low alkaline (pH=7-8) and an Am horizon with thickness of 30-40 cm.

The cambic psamosoils occupy larger areas in the Left Side of the River Jiu and they represent an advanced stage of evolution characterized by the differentiation of the Bv horizon.

The argic psamosoil are formed on a finer parental material and they are, mostly, encountered in the Left Side of the River Jiu and they represent the most advanced solification stage. They are characterized by the presence of a Bt horizon

The gleic psamosoils have evolved on lower zones with upper water table (2-3 m) and occupy larger surfaces on the inferior terraces of the Danube.

CONCLUSIONS

The diversity of the soils from Oltenia reflects the variety of the natural factors of solification. Such way, the steps relief consisting of mountain edges, hills, plateaus, plains, lowlands and depressions offer a high complexity of natural factors witch determined the differentiation of the solification process. Oltenia is the most typical zone from our country where, on a 150 km distance from Danube till the Parang peak there are encountered all soil types from Romania.

The soils from plain zone (chernozems, cambic chernozems and argic) ones have a high natural fertility, the ones from the hills and plateau zones (luvisoils) have a moderate productive potential. In the mountain zone (eutricambosoils, districambosoils, nigrosoils, prepodzols) and in the alpine zone (podzols and humosiosoils) are short profile soils and low natural fertility.

The unfavorable physical features, the low content in humus and nutrients and clay as well as the windy erosion that unfolds with different intensities determine a low natural fertility in the case of psamosoils, too.

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