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ASPECTS CONCERNING MORPHOLOGICAL, CHEMICAL, PHYSICAL AND AGROPRODUCTIVE CHARACTERIZATION OF THE GLEYIC SOLONETZ FROM VIZIRU PLANE

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Abstract

Situated in the Southern extremity of the Romanian Plane, Viziru Plane presents a relative large soils scale, unified in Cernisoils and Salsodisoils classes. From Salsodisoils class are found gleyic solonetz that occupies relative small areas (900 ha) and appears locally in Northern part of the plane, which corresponds to some microdeppresions area imperfect drained.

INTRODUCTION

In the present paper the collective author presents some aspects concerning morphological characteristics, chemical and physical attributes concerning agroproductive characterstics of gleyic solonetz from Viziru Plane.

MATERIAL AND METHODS

To establish the principal properties of the gleyic solonetz from Viziru Plane a series of chemical and physical analyses were effected. Physical analyses effected on soil drawing samples were ascertained in apparent density, total porosity, aeration porosity, withering coefficient, field capacity, utile water capacity, total capacity for water and saturate hydraulic conductivity determination.

Chemical analyses were ascertained in determination of the: pH, organic matter, total nitrogen, accessible phosphorus and potassium.

Physical and chemical analysis for drawing soil samples were made in conformity with "Methodology of pedologycal studies elaboration" made by I.C.P.A. Bucharest and soils type were established in conformity with "Romanian System of Soils Taxonomy, 2003".

RESULTS AND DISCUSSION

From geographical point of view, Viziru Plane is situated in Eastern extremity of the Romanian Plane, in a subunit of this, the Northern Baragan.

Geologically, like part of the Romanian Plane, Viziru Plane is formed and it has evolved concomitant with this. Surface deposits are represented by loess, loess deposits and sandy aeolian deposits.

Relief is formed of one plate plane with altitudes by 20 - 21 m at South from Viziru locality and 13 - 16 m in North part (Braila). Although the plane surface is apparent plate, this is distrubed in North by sand dunes and in central part by some low portion with callow aspects named gullyes.

As result of effected researches in Viziru Plane, it was put into evidence a relative large scale of soils unified in class Cernisoils and Salsodisoils.

From these the smallest spreading have soils from Salsodisoils class that occupy 7% through territory. Among soils from this class are counting gleyic solonetz (900 ha), over which we stop in this paper.

In the frame of the Viziru Plane, gleyic solonetz appear locally, on small area, in Northern part that corresponds with micro callows. Gleyic solonetz presents the following morphological characters:

Ao horizon (0 - 12 cm), texture (LL) average clay, dark brown nuances color (10YR 3/1) at wet state, and brown dry state (10YR 4/1), granular, weakly compact, herbs roots relative gauge frequents, clear passing.

Btna horizon (12 -65 cm), texture (LL) average clay, dark gray brown (10YR 3/2) at wet state, and gray dry state (10YR 5/1), columnar, compact, separation ferimanganics, net passing.

Cca horizon (65 – 90 cm), texture (LL) average clay, dark yellowish brown (10YR 5/4) at wet state, and yellowish brown dry state (10YR 5/4 cu 4/1), slightly compact, massive, newformation limestone and salt, gradual transition.

C/Go horizon (90 – 130 cm), texture (LL) average clay, yellowish brown with spots of color dark gray (10YR 5/4) at wet state, and gray open dry state (2.5YR 7/2), newformation limestone and salt, gradual transition.

Gr horizon (under 132 cm), sandy-claying (LN) texture, gray (10Y 5-6/1) frequency spots yellowish red and greenish gray, massive, separation ferimanganics and stains, concretion small $CaCO_3$ friable.

Physical and *hydro-physical characteristics*. Gleyic solonetz shows clear differentiation texture on profile, but in the same class (medium). Thus if Ao horizon in clay is 22.6%, in Cca, this significantly increases, reaching 27.3% in Btna, for deep decrease slightly, reaching 19.6% in Gr horizon (table 1, figure 1). Btna horizon is extremely compacty in state dry, but state in wet becomes a table viscous, plastics and impermeable.

Chemical characteristics. Organic matter content up to 12 cm presents medium values (4.05%), then becomes smaller in depth. Low values presents also the supply of nitrogen (0.07 – 0.22 %) (table 2, figure 2). Reaction of the gleyic

solonety is neutral in the superior part (pH = 7.1), and below where complex adsortiv is saturated change in sodium large proportion becomes weak to strong alkaline (table 2, figure 2). In the composition of soluble salts it is remarkable the high content of Na^+ (table 3).

Table 1

Analytical data regarding particle size distribution of the gleyic solonetz

Horizons	Depth cm	Granulometric composition (mm in %)				Texture
		Coarse sand (2.0 – 0.2)	Fine sand (0.2 – 0.02)	Dust (0.02 – 0.002)	Clay < 0.002	
Ao	0 – 12	1.2	51.4	24.8	22.6	LL
Btna	12 – 65	1.3	48.9	22.5	27.3	LL
Cca	65 – 90	1.4	48.1	22.0	28.5	LL
CGo	90 – 130	0.1	50.5	24.8	24.6	LL
CGr	130 - 140	0.1	59.1	21.2	19.6	LN

Table 2

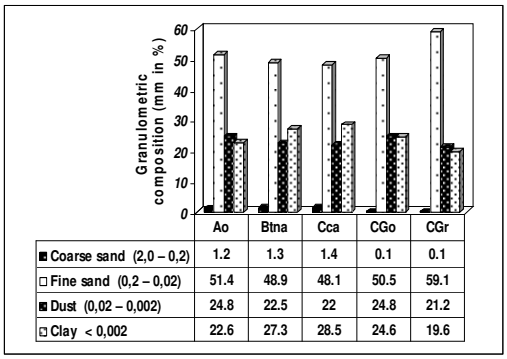
Analytical data regarding chemical properties of the gleyic solonetz

Horizons	Depth cm	pH (H_2O)	Organic matter %	N total %	C/N	$CaCO_3$ %
Ao	0 – 12	7.1	4.05	0.22	12.4	-
Btna	12 – 6 5	8.2	2.96	0.13	15.6	-
Cca	65 – 90	8.9	0.64	0.09	13.5	*26.8*
CGo	90 – 130	9.3	0.29	0.07	12.0	*29.8*
CGr	*130 - 140*	*9.3*	-	-	-	*22.0*

Table 3

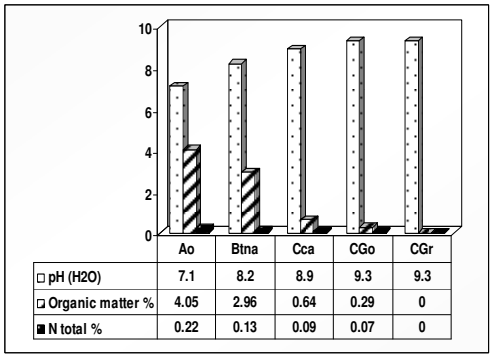
Analytical data regarding soluble salt content (in aqueous medium 1: 5) of the gleyic solonetz

Horizons	Depth cm	Soluble salts %	HCO^-_3	SO^-_4	Cl^-	Na^+
			% the amount soluble salts			
Ao	0 – 12	0.05	17.7	15.0	17.3	34.4
Btna	12 – 65	0.12	14.9	10.4	24.7	39.5
Cca	65 – 90	0.51	3.0	2.5	43.9	43.4
CGo	90 – 130	0.35	4.8	4.5	38.4	45.9
CGr	130 - 140	0.28	6.1	6.6	34.5	44.5



	Ao	Btna	Cca	CGo	CGr
Coarse sand (2,0 – 0,2)	1.2	1.3	1.4	0.1	0.1
Fine sand (0,2 – 0,02)	51.4	48.9	48.1	50.5	59.1
Dust (0,02 – 0,002)	24.8	22.5	22	24.8	21.2
Clay < 0,002	22.6	27.3	28.5	24.6	19.6

Fig. 1. Granulometric composition of the gleyic solonetz



	Ao	Btna	Cca	CGo	CGr
pH (H2O)	7.1	8.2	8.9	9.3	9.3
Organic matter %	4.05	2.96	0.64	0.29	0
N total %	0.22	0.13	0.09	0.07	0

Fig. 2. Chemical properties of gleyic solonetz

Agro-productive characteristics. Gleyic solonetz is characterized by small natural fertility. Fertility is low because of the high Na changeble and possibly slightly soluble salts, to which is added the water regime and heat regime. The largest part of gleyic solonetz are used as pastures, but with small productivity. To improve the soil is costly.

CONCLUSIONS

1. Gleyic solonetz are soils with local spreading, occupying a surface of approximate 900 ha.
2. These soils have physical and chemical properties less favorable, which lead to low fertility.
3. These are soils with weaker fertility comparative to other chernozems because of the relative high content of changeable Na and easy soluble mineral salts, they are used mostly as pastures.

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