

PHYSICAL AND CHEMICAL CHARACTERIZATION OF MAIN SOILS FROM NORTH WEST PART OF DOLJ DISTRICT

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ABSTRACT

The territory taken into study is the North-Western zone of Dolj District and it is characterized by climate province c.f.a.x., being located in an oak woody area with vernal herbaceous vegetation underneath yet with grass vegetation and pulses. The bedrock is variable as formation, generally, clay with the underground water at deep depth that do not influences the formation of soils, excepting the low zones where there is found shallow, close to the soil surface (under 1 m).

The main identified soils are: preluvosol, found on plateaus, having a fine or middle texture due to the clay bedrock material yet to the intense alteration processes, the eroded preluvosol, on versants with different degree of declination where the erosion is slow and long a high part from the shallow horizon, the luvisol, in micro depression zones on wide plateaus, characterized by more intense processes of debazification, eluviation and illuviation after which there was released colloidal silica and on the long of the valleys there are encountered the gleyed aluvisol, where the underground water is shallow and it has determined processes more or less intense of gleyisation.

INTRODUCTION

The need of pedological research in this zone is determined by the relief and microrelief particularities which have conducted to the formation of soils with certain characteristics that must be accounted when the lands are used for cropping by local farmers from the zone and the establishing of the reclaiming measures. The natural herbaceous vegetation and oak woods, the erosion and the bedrock material, the waterlogging, the groundwater at low depth, etc. are other factors that have conducted to the formation of a high number of soils into the researched zone. In the present paper there will be presented and characterized as physical and chemical features four soils from the mosaic of soils that can be found in the researched zone, on units of different microrelief, the preluvosol, identified in the zone of plateaus, the eroded preluvosol on versants, the luvisol in micro depressions and the gleyed aluvisol in low lands along the river side.

MATERIAL AND METHOD

The task of knowing of the soil cover and its main physical and chemical features is for pedological research which must pose to the disposal of specialists who works in agriculture, data, as exact as it can be about soil, as a main mean of production in agriculture in order to elevate the agricultural yield, both qualitatively and quantitatively.

On this line, there were carried out pedological complex researches in the North Western zone of Dolj District, zone that has been less studied till now, where there were tried to be brought a modest contribution to the knowing of the pedological fund and the main cropping features of it in this part of the territory.

The researches have been carried out in the field and in the laboratory and tried to found the following aspects:

- Which are the natural conditions where the soils have formed and how they influence their actual evolution;

- Which are the soils that forms the pedological fund from the North – west zone from Dolj District and their physical, chemical and cropping features;

In order to identify different soils on the land there where dug up soil profiles on all micro relief soil profiles of soil, down to 1.5-2.0 m down till to the groundwater. The researches have been. The field researches have been accompanied by laboratory analyses for all soil profiles.

RESULTS AND DISCUSSIONS

Generally, the territory of North-Western zone of Dolj District is characterized by debazeification, eluviation and iluviation processes. Under the action of a lot of factors that acted along the years, in this part of the territory of the Dolj District, by land researches there have been identified a multitude of types and sub types of soils spread on large or small surfaces. Within the present paper there are presented the main four soil units of soil.

The preluvosol has been encountered on plain terrains or low reclined of the researched territory, where the external and internal drainage is good. Morphologically, it is characterized by a soil profile of Ao-AB-B_t-C type.

The size analysis shows that that thick sand has a 9% decreasing on the soil profile till 6.3%, in the B_t horizon, while the clay occupies a high percent, between 40 and 53%.

This soil is very compacted (Da between 1.34 and 1.54 g/cm³, it is average supplied by humus, 2.4% and nutrients and it has a low acid reaction, pH = 6.2 (fig. 1).

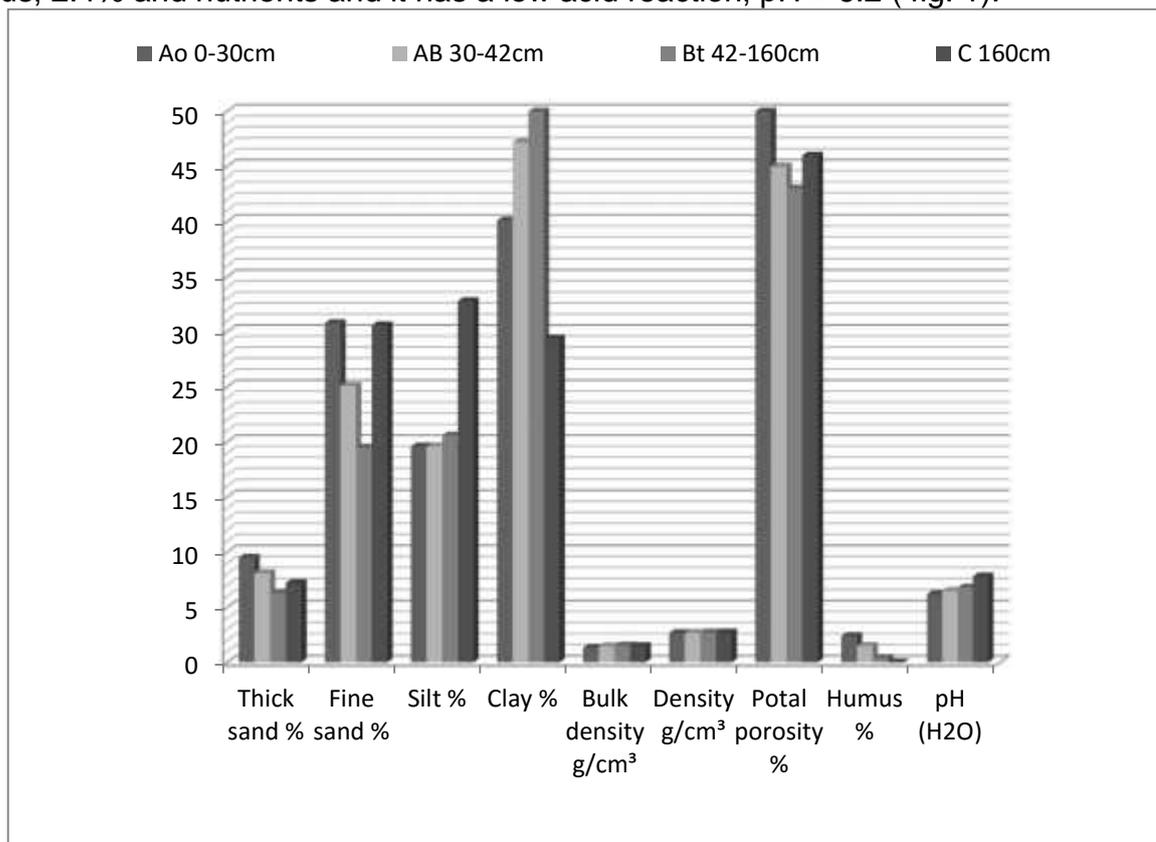


Fig. 1 The main physical and chemical features of preluvosol

These properties give to this soil an average fertility status.

The eroded preluvosol is encountered on the mild versants, and this the cause why the most of the fertile surface horizon has been carried away on the long of the streams.

Generally, this unit of soil is like the soil previously presented as regard the physical and hydro physical features yet, due to partial erosion of the shallow horizon, the eroded

preluvosol is low supplied by nutrients and humus than the typical preluvosol, so, it has a lower natural fertility (fig. 2).

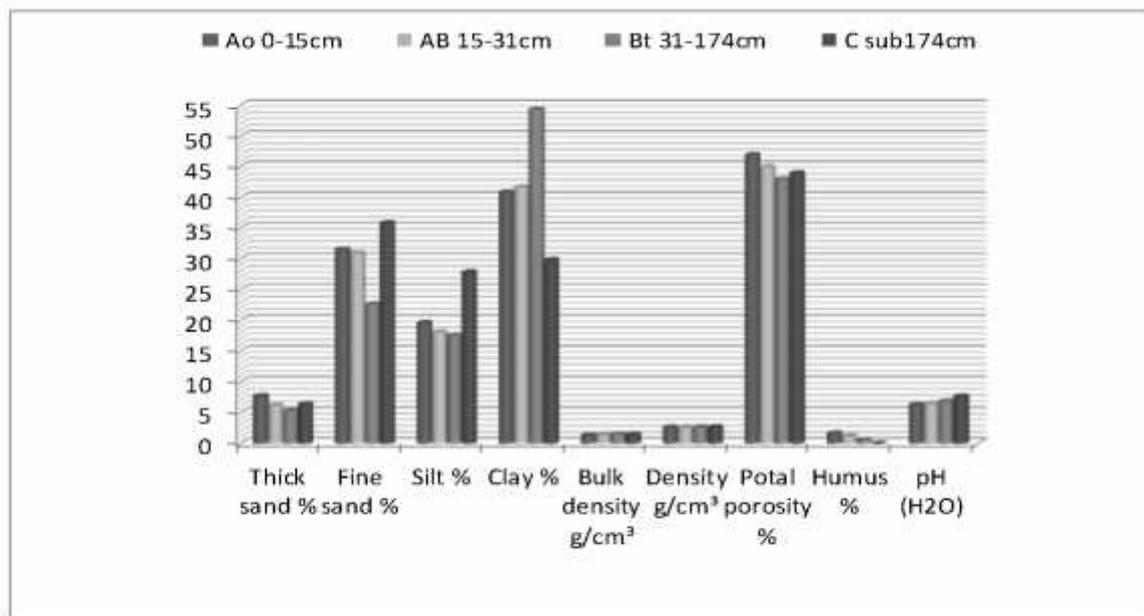


Fig. 2 . The main physical and chemical features of eroded preluvosol

The luvisol is encountered on even terrains, in micro depression zones and on northern zones that low reclined, where the waterlogging or shadow, is on long term on the first part of the soil, profile.

Due to the higher moisture, the alteration processes are more intense, thus, a part of the clay give back oxides and bases that are leached deep and colloidal silica that is deposited, giving an whitish color. It is characterized by a soil profile of Ao-EI-Bt-C type.

From the analyses that have been carried out there can be seen that the soil has a fine texture given by the size composition where the clay predominates. (fig. 3.), this soil strongly compacted, its reaction is acid (pH=5.4) and the nutrient supplying degree is low.

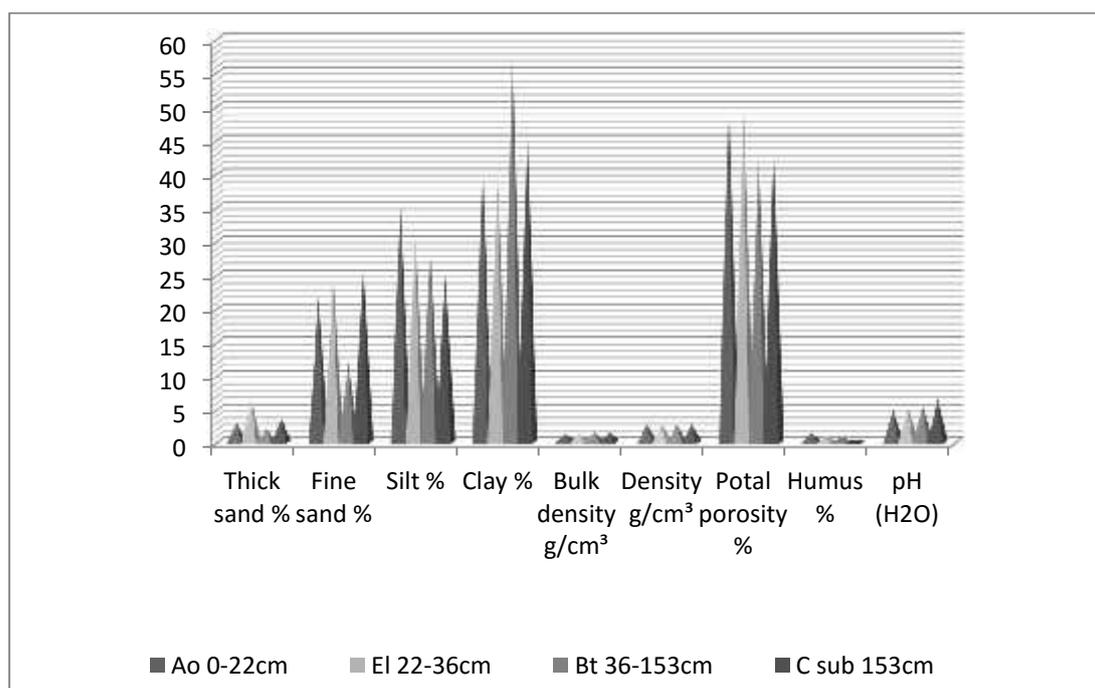


Fig.3. The main physical and chemical features of luvisol

These features give to this soil an low natural fertility.

The gleysated aluvisol is encountered on the lowlands, where, on the contrary to the previous presented soils, the bedrock is an alluvial material, eroded and transported and deposited from versant, and the groundwater are located at low depth (1-1.5 m) producing gleysation processes at the base of the soil profile.

Morphologically, the soil is characterized by a profile Ap – Ao-AG-CG.

It is loosened at the surface, wher the DA is 1.35 g/cm^3 and compacted in the deeper horizons, the da reaches 1.49 g/cm^3 .

It has an average humus content (3.1%) in the Ap horizon and it is average supplied by nutrients.

The soil reaction is neutral, (the pH = 6.8 -7.0) in the shallow horizons, Ao and Ap and low alkaline in CG(pH=7.7) (fig. 4.).

All these features determine a superior natural fertility of these soils that are anterior presented.

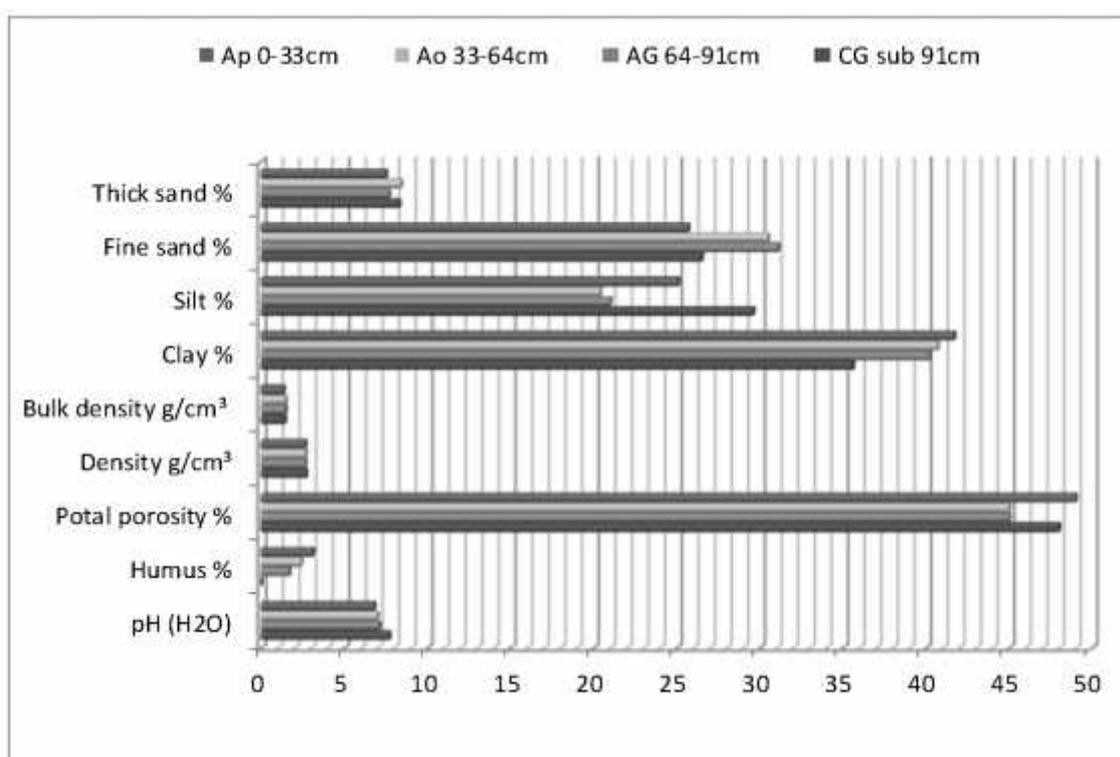


Fig. 4. The main physical and chemical features of gleysated aluvisol

CONCLUSIONS

The North-Western zone of the Dolj District is characterized by a temperate climate and it has a corrugated relief and a vegetation of oak woods. The bedrock is represented by clay, excepting the low line of the valleys where there are encountered alluvial materials.

Due to natural heterogenous conditions, in this part of territory there was formed a complex of soils, mostly, belonging to luvisols class.

The debazeification and eluviation proceses are evident, frequently determining the apparition of eluviation and illuviation horizons.

On plateaus, there are frequently encountered stagnation proceses of water, on versants, from low to excessive yet on the lowland, gleysation proceses.

The soils of this zone are clayey, compacted and they need deep works of reclaiming in order to restore the air – water regime, the using of a proper range of

machinery, yet where among them, the luvisols, reclaim the using of amendments based on lime.

BIBLIOGRAPHY

1. **Popescu C., 1998** *Solurile din bazinul hidrografic Raznic si potentialul lor agroproductiv, Teza de doctorat, Universitatea din Craiova.*
2. **Popescu S., Lucreia Popa, Glodeanu M., 2006,** *Reserch regarding the influence of the constructive and functinal parameters of the braking equipment on the braking behaviour of the tractor semi-trailer transport system, Third Conference „Energy Eficiency and Agricultural Engineering”, Rousse, Bulgaria.*
3. **Vasile C., 2012,** *Analysis of the Correlations Between Fodder’s Productions and Dynamic Livestock Farms Activities of our Country., Annals of the University of Craiova – Agriculture, Montanology, Cadastre Series, Vol. XLI 2011/2, pag. 403-410, ISSN: 1841-8317, Conference ESNA 2011, Craiova.*
4. **Sorop Gr., Vasile D., 1976.** *Solurile din bazinul Amaradiei si posibilitatile de folosire rationala, Analele Universitatii din Craiova.*
5. **Sorop Gr., Vasile D., 1976.** *Solurile acide cu exces de umiditate din Oltenia si potentialul lor agroproductiv, Analele Universitatii din Craiova.*