Scientific Papers, UASVM Bucharest, Series A, Vol. LIV, 2011, ISSN 1222-5339

SOIL BACKGROUND OF ILFOV COUNTY

ANCA-LUIZA STĂNILĂ, M. PARICHI

„Spiru Haret" University of Bucharest

Keywords: *pedogenetic parameters, soils, the Vlasiei Plain*

Abstract

Ilfov County is situated in the Vlasiei Plain and it entirely overlaps on the Maia, Snagov, Superior Mostistea, Otopeni-Cernica, Cotroceni-Berceni and Calnau fields, which have common geomorphologic characters, but with important differences concerning the soil cover.

The diversity of pedogenetic factors, especially the relief, the water table and the stagnation water have imprinted the soil cover a complex character.

As a consequence, in the territory we wild find protisoils represented through aluviosoils, cernisoils with cambic, argic chernozems and greic faeosioms, luvisoils with preluvosoils and luvosoils with eutric hydric soils and stagnosoils and antrisoils represented through erodosoils.

In the territory, preluvosoils, argic and cambic chernozems are prevalent.

INTRODUCTION

The soil cover of Ilfov County reflects abundantly the un-uniformity of the pedogenetic factors and especially the relief, water table and parental material ones, which have imprinted a complex character. This results from the simple fact that the limits of the 245,000 ha on which the county is stretched presently, have been defined over 130 types, subtypes and soil associations belonging to the protisoils, cernisoils, luvisoils, hidrisoils and antrisoils classes.

MATERIAL AND METHODS

Over the soil cover of Ilfov County have been attempted pedologic research in several stages: Ana Conea, C. Tutunea (1954); N. Florea, Ana Conea, C. Oancea, T. Gogoaşă (1964); M. Parichi and collab. (1982-1988); Anca-Luiza Stănilă, M. Parichi (1988) - Pedogeografic observations in the west side of Snagov Plain (1988); Pedogeografic study of Snagov Plain (2000).

The mapping was made at big scales (1:5,000-1:10,000) by the complex pedologic study method (having as purpose the watering arrangement and stopping excessive humidity) and at medium scales (1:50,000) for mapping all the soils of the former Ilfov County.

The material used for editing the present paper is mainly based on the research performed in the 1982-2000 periods.

The analytic data were collected in the Soil Service laboratories of the Geologic Prospections Institute of Research Institute for Soil Science, Agrochemistry and Environmental Protection of Bucharest.

Based on these materials were carried out the soil map, the relief, parental material, water table maps and a series of interpretable maps concerning the arrangement for watering and stopping the excessive humidity.

RESULTS AND DISCUSSION

Situated in the South of the country, in the Romanian Plain, Ilfov County has varied natural conditions which are clearey reflected in its soil cover.

As defined, this county overlaps on six subunits of the Vlasiei Plain, which is a unit of the Romanian Plain, such as: Maia Field, Snagov, Superior Mostistea, Otopeni-Cernica Field, Colentina Field, Cotroceni-Berceni and Calnaului Field.

The Maia Field is partially deployed in the North-East extremity of the county, to the north of Ialomita. It is made out of gravels and sands covered by a thick horizon of loess of about 3-4 m in which a lot of croves have deepened. Its medium height is between 75 and 90 m.

The Snagovului Field. It is covered with forests in a percentage of about 40% and it corresponds to the geographic space between Ialomita-Cociovaliste and Caldarusani Lake. On its structure there are sediments that belong to the upper Pleistocene, represented sands, gravels, clay and clay loessoid deposits, mostly proluvial.

The relief is mostly flat, with absolute altitudes between 86-119 m, moderately fragmented by the Snagov, Vlasiei and Ciocovalistea Valleys in interfluves wide up to 5-6 km and relatively well sewed.

As characteristic morphologic elements, except the versants, we must add numerous croves, from which some are much deepened.

The Superior Mostistea Field is defined by Cociovalistea Valley in the north and Pasarea Valley in the south. It is developed on the NW-SE direction, from altitudes of 95-100 m (Corbeanca-Otopeni) to 75-80 m (Branesti). It is made out of sands with frequent areas of clay, covered by a layer of loess thick of 6-8 m. In the west, where sewing is bad, the water table is at 3-5 m depth, in the east, the microdepression areas (padins), as corves, they appear abundantly on the surface of the interfluves which separate the Cociovalistea-Mostistea-Pasarea, Sindrilita and Colceag Valleys.

The Otopeni-Cernica Field. It corresponds in the western half to a depression surface, weakly sewed (the water table is about 2-3 m). As a result, the field here

is crossed by numerous drainage channels for eliminating the excessive water table, under 5 m. There are numerous croves left with depth, of 0.5-1.5 m under the reference level of the field.

Concerning the parent material of the soils, it is represented this by clay and loam loessoid deposits in the west and loess clay in the rest.

The Colentina Field is between the Dambovita and Colentina, oriented NW-SE, and reaches a length of almost 30 km and width of 3-6 km. The absolute altitude is of about 80-95 m in the west and it comes down to under 60 m in the East. Croves and old water beds are there, too. It is hard to track the three terraces of the Dambovita. On the surface, the field is made out of a complex of sands and gravels from Colentina, over which there are loess deposits with a general thickness of 7-8 m.

The Calnaului Field represents the South Eastern part of the county from the right of Dambovita and it is drained by the Calnaului Valley and numerous small valleys. It is situated at a height of 65-70 m, well sewed. The loessoid deposits have a thickness of 8-10 m, favor the development of croves.

The Arges-Sabar meadow occupies inside the county, a surface of about 2%, at an altitude of about 55-80 m and a width of about 5-6 km. There is a meadow terrace and a low meadow well developed in the Arges area.

In a climatic report, the Ilfov County is situated in a hot draught area, sub-area 4 (INMH, 1987), characterized high thermal resources, modest water resources and high stress parameters. The medium annual temperature is between 10.5-11.5ºC, the maximum absolute temperature is about 44ºC, and the minimum temperature doesn't go under -35ºC. The annual medium throughfall varies between 450-550 mm, to which the humidity deficit represents about 230 mm.

In the soil conditions mentioned above, the soil cover of the Ilfov County is characterize through a wide range of types, subtypes and varieties of soils, which, in the Romanian Soil Taxonomy System (2003) reunites five classes of soils: protisoils, cernisoils, luvisoils, hidrisoils and antrisoils, with physic, hydrophysic, chemic and agroproductive specific characteristics. From all of these, the biggest preponderance have the cernissoils, followed by luvisoils (80%) (Figure 1).

PROTISOILS

They are considered to be the youngest soils of the county, represented only through entic and gleic aluviosoils. They are made out of fluvic parental material on at least 50 cm thickness and A horizon (Am, Ao). They can be found on the river valleys, and on wider areas in the Arges and Dambovita meadows, where they crop successfully corn, wheat and vegetables.

CERNISOILS

In this class are included the soils that have an A molic horizon (Am), followed by intermediary Bv and Bt horizons. The accumulation of carbons horizon can be present in the first 125 cm or lower.

To this class belongs the cernosiom represented through the following subtypes: cambic chernozem, argic chernozem and the faeosiom with the greic subtype.

Cambic chernozems are spread on small surfaces in the Eastern half of the county, mostly in the Mostistei Field and are characterized through a well developed *Am-AB-Bv-Cca* profile. They have a midst or midst delicate texture. The structure is glomerular, well developed giving this soil a good permeability for water and air and also medium values of hydro-physic subscripts.

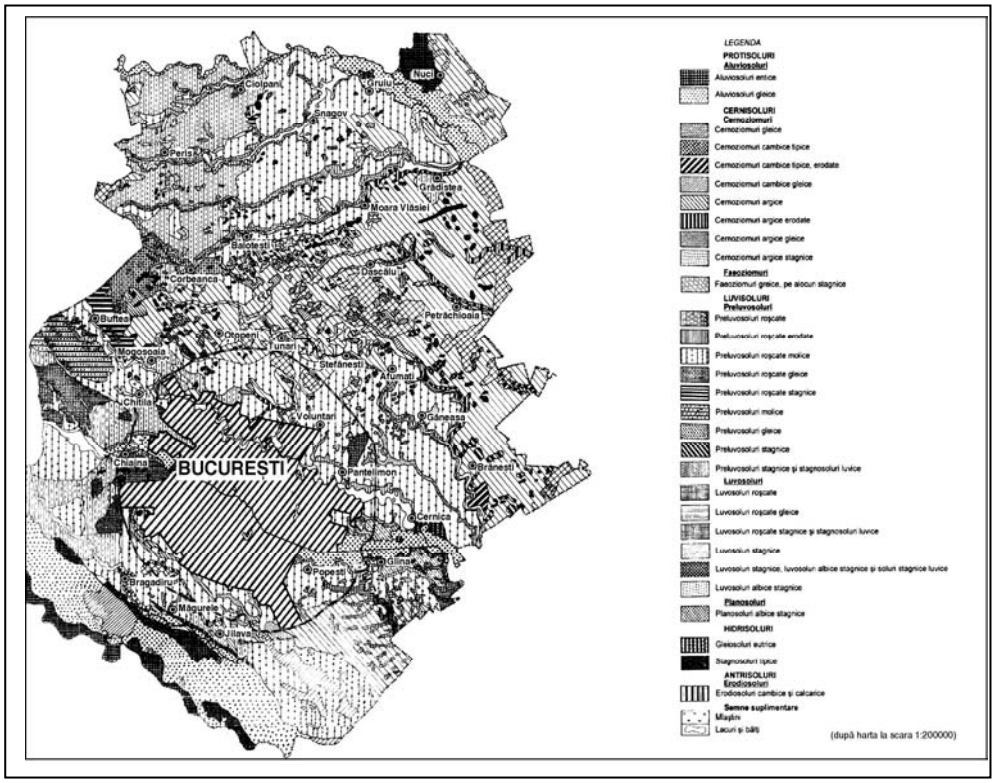

Fig. 1. Soil cover of Ilfov County

Argic chernozems are also very spread in the Mostistei Field. In the case of these soils the humification processes are a little more spread, and the ones of the free coloiz migration are more accentuated than at the cambic chernozems. They have a type *Am-AB-Bt-Cca* profile, differenced texturally (1.2), low-middle humus content (3.7-3.8%), weak acid reaction (6.4) and a saturation degree with bases under 86.0%. The nutrient supplying is good (N, 0.185%; P, 53 ppm and K, 260 ppm), (Table 1).

Table 1

Physical and chemical data concerning argic chernozems

Horizon	Depth (cm)	Granulometric composition				Humus (%)	pH (H_2O)	Ntotal (%)	P (ppm)	K (ppm)
		<0.002 mm	0.002-0.02 mm	0.02-0.2 mm	0.2-2.0 mm					
Ap	0-16	34.0	29.1	32.2	0.4	3.7	6.4	0.185	53	260
Am	22-40	37.0	26.5	31.8	0.32	3.8	6.4	0.199	35	194
A/B	50-61	37.9	26.1	31.1	0.3	1.8	6.7	0.099	12	176
Bt_1	70-90	40.0	26.1	30.9	0.3	1.6	6.8	89.7	0.091	-
Bt_2	110-130	36.5	28.4	33.0	0.3	1.1	7.0	89.6	-	-
Bt_3	140-160	34.5	28.4	35.3	0.3	-	-	-	-	-
Cca	185-205	27.2	25.0	32.0	0.3	-	-	-	-	-

LUVISOILS

In this class are included the preluvosoil, luvosoil and planosoil types.

Preluvosoils are morphologically characterized through: the presence of the A ocric or molic horizon (Ao, Am), followed by the argic horizon (Bt), having colors with values of over 3.5 in a humid state and a saturation degree in bases (V%) over 5.3%. They are represented through molic preluvosoils, stagnic preluvosoils, sometimes associated with luvic stagnosoils, red preluvosoils including eroded, molic, gleic and stagnic red preluvosoils. From all these the most spread are red and molic preluvosoils. They appear in Snagovului, Colentinei, Berceni and Calnau Fields.

Red preluvosoils have a well developed *Ao-Bt-C* profile. They are weakly texturally diferenciated (Idt=1.3), slightly tamped, poor in humus (2.3-2.5%) and not well supplied with nutrients (Table 2).

Table 2

Physic and chemic data concerning reddish preluvosoils

Horizon	Depth (cm)	Grainmetric composition				Humus %	pH (H_2O)	N total %	P ppm	K ppm
		< 0.002 mm	0.002-0.02 mm	0.02-0.2 mm	0.2-2.0 mm					
Ap	0-14	26.8	28.1	36.2	5.2	2.5	6.2	0.131	16	185
Ao	14-27	29.4	27.7	34.6	5.1	2.3	6.3	0.125	11	150
A/B	27-41	33.5	27.7	33.1	4.2	2.0	6.5	0.106	9	-
Bt_1	41-57	36.7	26.9	31.1	4.1	1.0	6.4	0.089	-	-
Bt_2	95-115	34.1	28.5	33.7	3.8	-	-	-	-	-
Bt_2	135-155	28.1	26.7	35.2	.0	-	-	-	-	-

Luvosoils are morphologically characterized through the presence of the A ocric horizon (Ao) followed by an E eluvial (El) or E albic (Ea) horizon and a B argilic (Bt) horizon, with a saturation degree (V) over 53%, or at least in a horizon in the superior part. It has no textural abrupt transit (between E and Bt on less than 7.5 mm).
Representative in the Ilfov County are red luvosoils and typical luvosoils, both in varied scope at a subtype level or varied because of the local relief conditions and drainage - gleic and stagnogleic.
Planosoils appear in the stagnic albic variant and are morphologically characterized through the presence of the A ocric (Ao) horizon followed by an eluvial E albic (Ea) horizon and a B argic (Bt) horizon, the transit between E and B horizons is made through a sudden textural change, on a thickness smaller than 7.5 cm. They appear locally in the Colentina Field and in some micro-depression crove areas.

HIDRISOILS

The soils in this class are represented through the subtypes of eutric gleiosoils and typical stagnisoils, formed under the influence of humidity excess.
Eutric gleiosoils are found locally in Ialomita's meadow, north from Gruiu and as in the Dambovita's meadow in Cernica. They are watery hydromorph soils defined through an A ocric (Ao) horizon and gleic properties (Gr horizon) which appear in the upper part of the profile starting with the depth of 0-50 cm.
Typical stagnosoils have an island appearance and are spread in the Snagov and Mostistea Fields, they are characteristic to the crove microrelief.

ANTRISOILS

In this class are the soils that have their upper horizons removed through erosion, on the surface they have B or C horizon. This is the way ***erodosoils*** are. They appear on the versants of most of the valleys that pass the Ilfov County.
Usually, on the surface they have an Ap horizon from the change of the B or C horizon, having under 20 cm.

CONCLUSIONS

1. Through its geographic positioning in the Southern part of the country, Ilfov County has natural conditions that are relatively varied and that reflect through its soil cover. The most predominant are preluvosoils (red and molic) and chernozems (argic and cambic). With a certain frequency, in the territory appear locally red stagnic luvosoils, albic luvosoils, including stagnic, gleiosoils and stagnosoils, but also erodosoils with limestone, and on the main valleys (Ialomita, Arges-Sabar, Dambovita) can be found entic and gleic aluviosoils.
2. The good chemic and physic characteristics enlarge the scope of crops, of vegetables for grains and oil plants.

REFERENCES

1. Parichi M. şi colab., 1986. *Caracterizarea resurselor de sol ale Sectorului Agricol Ilfov*. Arhiva I.C.P.A., Bucureşti.
2. Parichi M., 1996. *Revizuirea hărţii solurilor din zona Bucureşti*. Arhiva I.C.P.A., Bucureşti.
3. Stănilă Anca-Luiza, M. Parichi, 1998. *Observaţii pedogeografice în partea de vest a Câmpiei Snagovului*. Analele Univ. Spiru Haret, Seria Geografie, nr. 1, Bucureşti.
4. Stănilă Anca-Luiza, 2003. *Câmpia Snagovului-studiu de pedogeografie*. Ed. Carol Davila, Bucureşti (pp. 164).