

THE PEDO-CLIMATIC MICROZONES ON THE HABITAT OF CORNU LUNCII VILLAGE

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Cuvinte cheie: relief, teritoriu, microzone pedoclimatice, habitat.

ABSTRACT:

The territory where is placed the village Cornu Luncii, belong from point of geomorphologic of view on extra Carpathian passage of Moldavia (Baia Depression), which is interpose between Suceava Plateau, from the north of passage and sub Carpathian hills from the north of Culmea Pleșului, from south of passage. Thus, the relief of this territory formed through a selective evolution, in the longway of Moldavia valley, dominating the fluvial accumulation process and on the slopes and sub Carpathian tops, prevailing the fluviodeductionale process. The main role in the relief shaping belonged of the hydrographic arteries in the context of the epeirogenesis movements and of climatic quaternary variations. On the territory of the village Cornu Luncii there are 2 pedo-climatic micro zones (III-O-SP with numerical code 82 habitat 2, which cover 611,29 ha, that mean 12,02 % and III-L-SA, with numerical code 93 habitat 1, which cover 4539,19 ha, that mean 87,98 %).

1. Introduction

Suceava county is situated in the north-east part of Romania and cover a surface on 8553.5 km² (that mean 3.6% from the country area), being the second county from our country. The big dimensions of the Suceava county explain the geologic variety of landscape and natural resources.

In west part the Suceava county is surrounded by high mountains, and in the east part there is the Siret large and down plate which has a big opening over 100 km.

The county area is partially overlapped on the Eastern Carpathian and on Suceava Plateau. From west to east the relief registered a gradual decrease of the altitude, the forms types are orientated in strips with direction from north to south and generally parallel between them. This phenomenon is obvious especially in the mountain area.

In ensemble the county area comprise two main relief units:

- mountain region
- plateau region

Mountain Region includes massive, massive groups and complex peaks separated between them through deep valleys or depression areas.

Plateau region is lowered by an average of 200 m from the eastern and lower mountain peaks, being composed by structural plateaus, the slopes with sliding micro-relief, asymmetrical valleys, depressions, morphological passages.

The most important sub-units of relief in this region are:

- Marginea -Ciungi piemountains hills;
- Radauti Depression;
- Suceava Plateau, which is divided into Plateaus Fălticeni and Dragomirna;
- Liteni Depression;
- Baia Piemountains Plain;
- Siret River Valley corridor.

The highest, and most fragmented relief subunit is Marginea – Ciungi Piemountains hills, while the Siret valley corridor, the Baia Piemountains Plains, Radauti depression which represent areas with plane relief, sometimes terraced and with lower altitudes. The lower areas consist of meadows and low terraces along the rivers, the main feature is that the large extent of the groundwater is relatively high, giving rise to areas with excess moisture.

2. Material and research method

The purpose of this paper is carried agrochemicals characterization of soils of the two micro- pedoclimatic zones and highlighting distribution area of the physico – chemical characteristics, to the prior estimate of fertilizers (organic and/or minerals) and amendments. In the study took into agricultural village of Cornu Luncii (5150.36 ha), due to the diversity of soil types (Litosols, Aluviosols, Preluvosols, Luvosols, Phaeozems, Eutricambosols, Gleysols, Stagnosols) and plant cultivation, the agrochemicals characteristics of land in plough land layer are very varied too.

By performed laboratory tests it was find the establishment of the soil current reaction and reserves dosage of mobile forms of the main nutrients. The used analyzed methods highlight the global reserves of the mobile forms, then being place quantitative changes which characterize the seasonal dynamic of the soil during vegetation period.

Therefore, on basis of the obtained data we can make the general characterization of soils, valid during 3-4 years, which will be least possible to determine the net changing of the investigated traits.

The used working methods:

a) In field. For this agrochemicals characterization of the studied soils, were collected 206 soil samples on depth of each plough layer from 20 - 25 points on agrochemical plots depending by soil use. At the land plotting in order to collect the agrochemicals average soil samples we given attention to ground relief, the unit of soil and how to use, so that each agrochemical plot should be as homogeneous.

b) In laboratory. The determinations performed in the laboratory and on agrochemical soil samples were as follows:

- pH in water on 241 soil samples;
- Carbonates, through Scheibler method on 61 soil samples;
- The humus content, by Schollenberger method, at 163 soil samples;
- Total nitrogen content by Kjeldahl method at 82 samples;
- Mobile phosphorus content at 140 soil samples;
- Mobile potassium content in 140 soil samples;
- The variation bases sum by Kappen method on 131 samples;
- Hydrolytic acidity by Kappen method on 131 samples;
- Granulometry, by Kacinski method on 241 soil samples;

- Apparent density, by cylinders method at 108 soil samples;
 - Total content of salts, by Kappen method the variation bases sum at 128 soil samples;
 - The variation aluminium, by Socolov method for 60 soil samples;
- The tests were performed in following laboratories: OSPA Suceava and SCDA Suceava.

3. Results and discussions

Geographically, the territory of Cornu Luncii is situated on the high extracarpatic Moldova Valley which devised the Suceava Plateau to the north and Moldavian sub Carpathian to the south, from the north of Plesa Hill.

This village from administrative point of view belong to Suceava County, being at about 35 km from the Suceava town (fig. 1).

The territory of Cornu Luncii has the following neighbors:

- To the north : Drăgoiești, Horodniceni and Rădășeni villages;
- To the east: Rădășeni and Baia villages;
- To the south: Baia and Râșca villages;
- To the west: Malini and Valea Moldovei villages.

Territory outside surface is 7700.29 ha, of which, 5150.48 ha was carted.

The Cornu Luncii village, belongs, from geomorphologic point of view by Moldavian extracarpatic passage (Baia Depression), which is interposed between Suceava Plateau, from north of the passage and Sub-Carpathian hills from northern Plesa Top of the south of passage.

The relief of this territory was formed through selective development, along the valley of Moldova dominating processes of basin accumulation, and on Sub-Carpathian on tops and slopes dominating denudationale river processes. The primary role in shaping plans arteries accrue to the hydrographical artery, in the context epigenetic movements and quaternary climatic variations.

The valleys orientation for sub-Carpathian area has been imposed on the axis of Moldova, which is headed by the water courses which descends from Stânișoara Top with a position approximately perpendicularly to the valley of Moldova. Draining areas in the north of Moldova River is make through valleys insignificant expressed, as deep and wide are represented by brooks valleys: Corlat, Stejăroaia and Șomuz. Areas from south of Moldova water are draining with help of valley Sasca Mare. Absolute maximum altitude is 818 m, and it is located in the south-western territory Voiagi Hill, and the absolute minimum is 380 m, encountered a minor river of Moldova, output of the study territory.

The relief energy is 438 m. The temperate continental climate and vegetation of the foliose forest allowed the forming of a coating of soil topologic varied, but with a distribution in the territory which is moulded on existing forms of relief. In such geographical conditions in the southern territory studied the main forms of mezzo and microrelief are represented on toping hilly, usually peaks and weak inclined and slopes often patchy. It shows a high propensity to the accelerated current geomorphologic processes. These have led to significant degradation represented by areole washes, raven powerful, crumbing or earth flow.

Hydrographical network is represented on the left of Moldova with brooks Corlat (which is formed in the area of the village Corlata, Drăgoiești) Stejăroaia

(which is formed from west of Măzănăești, village Drăgoiești) and Șomuz (which is formed from the south of Lucăcești village. The brooks Corlata and Stejăroaia have intermittent ongoing, and brooks Șomuz flow permanently.

On the right of Moldova the lands are drained by brook Sasca Mare, which spring from the west of village Paiseni, and flow permanently.

The Moldova river, one of the main tributaries of the Siret River, has a power pluvio-nival, most trickling (over 77%) is covered during spring and summer time. Multi-flow environment is 26.2 cm / s or 6.51 l / s / square km. Maximum rate with insurance is 1% of 1830 cm / s and 10% of insurance is 860 cm / s. Minimum annual flow of 95% insurance is 3.2 cm / s. Șomuz brook has a length of about 20 km and drained an area of 95 square km. In Cornu Luncii territory the water supplying of the Șomuz brook is made only pluvial sources.

Pedo-climatic micro zones

In village Cornu Luncii there are 2 pedo-climatic microzone (III-O-SP with numeric code 82 area 2, which cover 611,29 ha, that mean 12.02 % and III-L-SA, with numeric code 93 and area 1, which cover 4539.19 ha, that mean 87.98%) presented in Table 1 together with those features.

From that table, on the territory of Cornu Luncii village prevails microzone III-A-SP, with areas 82/2, ACO 26 (the area of 153.79 ha), ACO 27 (the area of 440.90 hectares) and ACO 29 (with area of 16.60 ha). The total surface of this microzone in this area is 611.29 hectares. The average annual temperature between 7.1-8.0°C to ACO 26.27 and 6.1-7.0°C to 29 ACO, average annual rainfall between 601-700mm at ACO 26 and 27 and 701-800 to ACO 28 mm and 29, the thermal amplitude on 7 days in December to February was 24.7°C and rainfalls from May to August were on 343.9 mm.

Table 1. Pedo-climatic micro zones.

Geo-pedo-climatic Area	Carted surface	ACO no.	Meteo center	T. °C	Temp. sum >10° C	Days number without frost	Thermal amplitude	Precip.	Precip. May-Aug
82/2	153.79	26	Fălticeni	7-8	2700	145	24.7	650	343.9
82/2	445.25	27	Fălticeni	7-8	2500	155	24.7	650	343.9
82/2	16.60	29	Fălticeni	6-7	250	155	24.7	750	343.9
93/1	4253.27	50	Fălticeni	7-8	2700	145	24.7	650	301.0
93/1	281.57	51	Fălticeni	6-7	2500	155	24.7	650	343.1

The second micro zone geo-pedo-climatic is III-L-SA, with a surface of 4534.84 ha with the habitat 93/1, which comprises two ACO's. ACO 50 with a surface on 4257.62 ha, the annual average temperature between 7.1-8.0°C and annual average rainfall of 6-700 mm.

Thermal amplitude on 7 days in December-February is 24°C and rainfalls from May to August interval are on 301 mm. ACO 51 occupies the area of 281.57 hectares and has an annual average temperature of 6.1-7.0°C, the average annual

rainfall of 600-700 mm, the thermal amplitude on 7 days in December to February was 24.7°C and precipitation from May to August were of 343.1 mm.

The surface of outside territory is 7700.29 ha, of which have been carted 5150.48 ha. Assessment of these land use categories is presented in table 2.

Table 2. The utilization mode of outside areas.

Utilization category	Outside area (ha)	From which was carted (ha)
Arable	3450,57	3450,57
Pasture	931,40	915,31
Hay field	339,37	339,37
Orcharding	1,51	1,51
Vine	-	-
Forests	2274,19	-
Rivers	164,16	-
Roads	64,96	-
Building	15,73	-
Unproductive	458,40	443,72
Total	7700,29	5150,48

Characterization of soil units of study taken

Territorial unit of soil (U.S.) No. 1

Name: Litosol, eutric-gravel, very superficial, argillaceous sandy skeletal excessive on sandy, skeletal excessively, on materials transported occur with skeletal, derived from non carbonates mezzo basic rocks, on pasture, with moderate pollution with forest residues and plastics mass.

$$\text{Formule } LS_{eu-pr} = \frac{d_1 - sq_5 / nq_5 - Tfgq / NI - P\text{§} - Pg_2}{L - ST - P_{01} - Z_2 - Q_3 - I_3} \quad ACO = 27$$

Surface - 76 ha and 0.14 %

Suceava County. The administrative territory of Cornu Luncii

Prevalence: Upper basin of the brook Păișeni.

The appearance of the land surface: uniform.

The main soils is associated with: Luvosoils

Soil characteristics

Morphologically:

- AR 0 - 5 cm. Gray, clay-sandy, skeleton in percent on 80%, unstructured, non plastic without adhesives, excessive porosity, common roots.
- R-5 cm → yellow brown, sandy-clay, skeleton 95%, unstructured, without plasticity, excessive porosity and common roots.

Physically:

- Soil texture is argillaceous sandy (13.14% clay), in the horizon AR and is sandy in depth, with a clay percent of 4.53%.
- The skeleton is present on the surface (80%) and increase in depth over 95% in the horizon R.
- Total soil profile is non plastic, non adhesive and with excessive porosity.
- The soil has been formed a structure.

Chemically:

- The soil reaction is moderately acid in AR and neutral in depth.
- The content of humus is middle but the great percentage of the skeleton make that the soil humus reserves to be extremely low (3 t/50cm).
- The saturation degree in the bases is low (72.8%) although the soil still supports flood.

Other features (anthropogenic processes, current pedo-genetic processes, global drainage). Internal and excessive drainage and major skeleton from surface have been caused a rapid evolution of the soil by decarbonation, although the gravel in the bottom of the river are frequents carbonates fragments.

Territorial unit of soil (U.S.) No. 8

Name: Aluviosol, limestone, epilimestone, clayey on clayey, on middle transported material coming from river deposits from arable land.

$$\text{Formule } ASka \frac{K_2 - l/l - Tfm / NB - A}{L - SI - P_{01} - Q_5} \quad ACO = 50$$

Surface - 35.29 ha and 0.69 %

Suceava County. The administrative territory of Cornu Luncii

Prevalence: hill areas in the meadow of Moldova to the north of bridge over Moldova.

The appearance of the land surface: uniform.

The main soils is associated with: Luvosoils

Soil characteristics

Morphologically:

- AP 0 – 23 cm → Yellowish brown, clayey, friable granular, middle plastic, middle adhesive, middle porosity, rare coprolites, frequents roots with obvious transition.
- Ao 23 – 39 cm → Yellowish brown, clayey, granular, middle plastic, middle adhesive, middle porosity, rare coprolites, weak effervescence with HCl.
- AC 39 – 61 cm → Yellowish brown, clayey, unstructured, middle plastic, middle adhesive, middle porosity, weak effervescence with HCl, rare roots with obvious transition.
- Ck 61 cm → Light yellow, clayey sandy, unstructured, middle plastic, middle adhesive, great porosity, weak effervescence with HCl.

Physicals:

- Soil texture is argillaceous up to 61 cm (clay content: 22.74 and 20.06 %), is argillaceous sandy below to 61 cm (clay content: 16.41 and 15.16%).
- The structure is granular stable in Ao and missing fewer than 39 cm.
- The soil is middle plastic and middle adhesive on all soil profile.

Chemicals:

- The soil reaction is moderately alkaline on all soil profile, with values between 7,46 and 7,79 pH units.
- The carbonates are presented under 23 cm, they have a variable content from 0,21 to 1,06%
- The humus content of the soil in Ap is on 2,58%, and sharply decreases to depth to 1.87% in Ao and 0.98 in AC.

Other features (anthropogenic processes, current pedo genetic processes, global drainage). The soil was formed by bioaccumulation processes and decarbonation low only at horizon Ap level is occurred.

Territorial unit of soil (U.S.) No. 23

Name: Faeziom, cambic, clayey, weak skeletal on clayey poor skeletal, on materials in situ alteration-weathering, occur, brutishness, coming from uncarbonates sand, on arable land, acidified by crop cultivation.

$$\text{Formule } FZcb \frac{lq_1 / lq_1 - Ssg / NI - A - a}{T - OO - P_{01} - Q_7} \quad \text{ACO - 50}$$

Surface - 53.92 ha and 1.05 %

Suceava county. The administrative territory of Cornu Luncii

Prevalence: at west of flax smelter .

The appearance of the land surface: uniform.

The main soils is associated with: faeziomus .

Soil characteristics

Morphologically

- Ap 0-31 cm → Brown blackout, clayey, 10% skeletal, granular corners, middle plastic, middle adhesive, high porosity, rare coprolites, frequents roots with obvious transition
- Am 31-46 cm → Brown blackout, clayey, 10% skeletal, granular corners, middle stable, middle plastic, middle adhesive, high porosity, rare coprolites, frequents roots with obvious transition
- AB 46-67 cm → Brown blackout, clayey, 10% skeletal, paleoliedric, middle friable, middle plastic, middle adhesive, middle porosity, rare coprolites, rare roots with gradual transition.
- Bv 67 cm → Dark brown with yellowish spots, under 85 cm, brown yellowish, clay, brun galbui, lutos, columnoid prismatic, middle plastic, middle adhesive, middle porosity, 10% skeleton.

Physically:

- The soil fiber is clay for all soil profiles, with a variable argillaceous content, on 27,73 to 29,51%
- The skeleton is present on all soil profiles in 10 percentages.
- The soil is middle plastic and middle adhesive on entire control section.
- The soil structure in the Ap is rugged granular, in Am is stable and middle angular granular, in AB is middle friable polyedric, and in Bv is columnoid prismatic.

Chemicals:

- The soil reaction is moderates and high acids until 100m in depth, with a variable pH between 4,59 and 5,48.
- The humus content of the soil in Ap is 4,08%, in Am decreases to 1,87% and in AB decreases to 2,05%.
- The soil has a high degree of base saturation in the Ap 51.6% and in Bv 78.6%.

Other features (anthropogenic processes, current pedo-genetic processes, global drainage). The soil was formed by bioaccumulation processes and cambic alteration associated with an intense drainage which favored the debasification.

4. Conclusions

Cornu Luncii village is located on Moldova Passage, at the contact between the Suceava Plateau and Moldova Sub Carpathian, at north of Pleșu Top. The relief is characterized by extended large areas of plane surfaces at north of Moldova river and has a hilly character, heavily injured, with large extension of slopes which joining the narrow tops and bottom valley, poorly developed, at south of Moldova river.

This territory is framed in a temperate continental climate characterized by an annual average temperature of about 7.8°C and through an average annual rainfall of 635 mm.

Phreatic waters are located at a depth, which not influenced the soil morphological aspects through gleization processes, than an area of 333.06 hectares that mean 6.46%. The levigation phenomena affect about 33% from all area, the erosion processes affect 10% and landslides affect 8% from the total territory.

In this territory the soil was performed in the temperate climatic conditions, through specifically pedo-genetics processes.

The coating of soil is relatively diverse typological and is represented by 64 units of land are grouped into 10 soil types and 5 soil classes.

Viewed as a whole, the agricultural land forming part of the two microzone pedo-climatic conditions, after pH, could be grouped, in the following categories:

- high acids (pH < 5.0): 3957.18 ha, respectively 76.8 %;
- acids (pH = 5.01 – 5.80): 183.39 ha, respectively 3.6 %;
- low acids (pH = 5.81 – 6.80): 29.81 ha, respectively 0.6 %;
- neutral (pH = 6.81 – 8.40): 80.73 ha, respectively 1.6 %;
- low alkalines (pH = 7.21 – 8.40): 899.37 ha, respectively 17.4 %.

In concordance with pH and indices which characterizes exchange cationic capacity (Ah, SB, $V_k\%$) show large variations, such as the values of V_k are between 16.6% and 99%.

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