

PRELIMINARY PEDOLOGICAL ANALYSES AT ARCHAEOLOGICAL STATIONS IN THE PROVINCES OF TRANSYLVANIA AND BANAT

(Abstract)

Preliminary analyses of phosphorus (P_2O_5), potassium (K_2O) and humus were carried out on soil from the neolithic and chalcolithic stations of Iclod, Tureni, both in Cluj county, and Parța, in Timiș county as well as from prehistoric and historic sites of Cluj-Napoca. The investigation contributed to a more thorough delimitation of the archaeological stratifications. At this stage, definite historical conclusions are difficult to be concluded yet the data are useful from methodological point of view.

The pedological sampling is due to M. Preda in Baciú — str. Nouă by M. Preda (from CCB) in a settlement belonging to Petrești culture, phase A — AB, with a culture layer about 3 m thick revealed interesting results contributing to a better understanding of the archaeological stratigraphy. We examined the evolution of phosphorus (fig. 1) and potassium (fig. 2) determined by Egner—Riehem and Gedersit method, which are currently used in the chemistry of the soil (Obrejanu 1964; for the application on the pedological analyses in archaeology.

Comparing the two diagrams to the archaeological stratigraphy established by Zoia Kalmar based on colour, consistence of the soil, and the traces of the inhabiting complexes, we can notice a high increase of phosphorus at the depth of 2.90 m which of correspond to the beginning of the Petrești culture phase A and Vinča C elements. In the later phase (Vinča C) an important change in the management of animals takes place especially by the increasing number of ovicaprine. This could explain a higher increase from the layer I (see fig. 1—2) and the archaeological stratigraphy of the site.

An increase of phosphorus takes place in the layer IIb (Petrești AB) too. The damage due to the burning of some houses was not noticed in the potassium diagram, though this was expected, but it can be noticed a decrease of phosphorus. Its sudden increase from the layer IIc and the subsequent decrease, in the time of the cultural hiatus from the Baciú stratigraphy observed between 1.8—2 m, perfectly corresponds to the archaeological observations. The potassium diagram also revealed this hiatus.

The pedological sampling is due to M. Preda and T. Picu in Cluj-Napoca — Baba Novac square. The sampling was carried out at a depth where the soil was not mixed with layers of the depth between 0.60—2.60 m, corresponding to the medieval cellars, remote layers. In a late neolithic settlement, belonging to Iclod group, to an early stage I/II. The stratigraphical observations are similar to the results from Baciú (see the periodicity in fig. 3—4).

The analyses from Baba Novac square revealed an indirect correlation between phosphorus and potassium. To the increase of phosphorus at —2.10 m, —1.70 m, —1.40 m corresponds a decrease of potassium and vice versa: the increase of potassium from —1.70 m, —0.50 — 0.60 m is associated to a decrease of phosphorus (see fig. 3—4). The problem should be further investigated. The stratigraphical separations coincide with the variations of phosphorus and potassium at the depth —2.55 m, level IIa; 1.8 and 1.6 m, level 3a and 3b.

The soil analyses on the bank of the river Someș from the cemetery A from Iclod, shows important oscillation of potassium (fig. 6c) and of phosphorus (fig. 6b). From the depth of 1.30 m geological perturbations take place. At a depth greater than —1 m the value are characteristic for the time of phase Iclod I and prior, a time when the A area was an agricultural one then it was a burial area. At a depth of —0.90 m, potassium decreases, a situation which took place in the Roman and late Roman period as well as early Middle Ages the habitation being only at 200—300 m distance, towards NE.

The analyses from Tureni-Carietă (fig. 10) show significant oscillation which are archaeologically relevant. Those of phosphorus (fig. 7) have two oscillations at

0.30 m and 0.50 m depth, the last belonging to layers in which were found traces from the Bronze Age. The increase could be associated with these data.

The analyses from Tureni-Poderei an area with an intense habitation situated on a terrace with a culture layer about 1.5 m thickness and about 7—8 periods of habitation, shows a direct correlation between the two diagrams. An increase of potassium (fig. 11) corresponds to the increase of phosphorus from 0.45 m (Bronze Age level; fig. 8). The situation is repeated at 0.60 m in a Coțofeni level, at 0.90 m, in the centre of the second layer from Tiszapolgar culture, as well as at 1.20—1.3 m on top of the eneolithic layer. The decrease of potassium from 1.40 m depth correspond to an hiatus period, archaeologically noticed with the artefacts from the Cluj — Cheile Turzii — Lumea Nouă and Petrești culture.

The analysis of the absolute values from fig. 13 and 14, show separate clusters for different stations, such as the case of Tureni-Carietă data. These results are characterized by a simple disturbance. The other samples are characterized by bimodal curves as those from Cluj-Baba Novac, Tureni-Poderei. Phosphorus has a more uniform distribution (fig. 14) and a bimodal distribution being noticed only for Iclod A data.

A hierarchical classification of the pedological samples from Baci (fig. 15) shows a close correlation between carbon and humus (as one parameter is calculated from the other) as well as between pH, phosphorus and potassium from the soil (the correlation coefficient is 0.86 see dendrogram 15).

The pedological analyses were also used for observations different from those of stratigraphical nature, i.e. for the delimitation of certain archaeological area. One case was the station from Parța (Dogaru — Gherghen 1981) when the data processing gave new information about the archaeological area.