

# RELATIONS BETWEEN THE OVERALL AND LOCAL TECTONIC PATTERN OF THE SUNCUIUȘ DEPOSIT AND THE PALEOKARST AT ITS BOTTOM

BOGDAN P. ONAC and VALENTIN POPESCU

Exploration and mining of fireclays at Suncuiuș, emphasized the close relation between the tectonics of the clays and the Ladinian paleokarst which they overlay. The overall and local patterns of the deposit are conditioned by the already mentioned paleokarst.

## GENERAL DATA

The fireclay deposit of Suncuiuș is located on the northern frame of Pădurea Craiului Mountains, being bordered by Brăteuța Valley to the east, Izbindiș Valley to the west, the hills of Cărmăzan and Runcu to the south, Crișul Repede river and the village of Bălnaca to the north.

The mining perimeter is divided into approximately two halves by the Mișid Valley. These two halves are "suspended" synclines in relation with the axial anticline along which the Mișid Valley is inserted.

From the geological viewpoint, we shall underline only the formations directly involved in the topic. We present a litho-stratigraphic column including the Middle Triassic and Lower Liassic formations outcropping in the Suncuiuș mining area (Fig. 1). The Triassic's last term consists of white marmorean limestones reaching sporadically 180 m of thickness. Once the deposition ended, an episode of continental evolution generated the Ladinian paleokarst subsequently covered by red clays

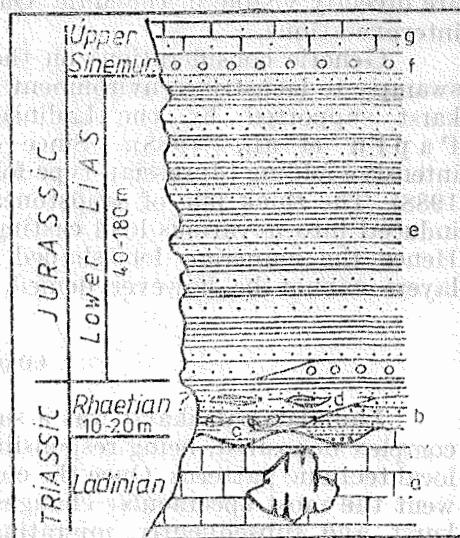


Fig. 1. — Generalized stratigraphic column of the Lower Lias in Pădurea Craiului Massif. a — Massive marmorean limestone; b — Conglomerates; calcareous breccias and clay; c — Red clays with limestones blocks; d — Red clays; fine sandstones with clay lenses; e — Coarse sandstone and quartzitic microconglomerates with fireclay interbeds; f — Basal conglomerates; g — Sandy limestone with Gryphaea.

with limestone blocks, sandstones and lenses of siderolithic clays, which indicate continental alteration. The clayish-detrital formation is red (rich in hematite), partly filling the paleokarst. This formation is covered by the so-called "productive complex", a detrital-quartzitic pile displaying a *Gresten* facies, with sandstones and microconglomerates interbedded with clayish sandstones, siltites and fireclays (Corvin Papiu et al., 1988).

Several faults cut the perimeter (Sesii, Hapatag and Mişid Faults) joined by less ample fractures which are however important for the karst development and the mining of fireclays. Intraformational fractures are also present, key-factors for karstification and very much complicating spatial correlation of fireclays.

#### FIELD DATA

The investigation were conducted by drillings in a 50 × 50 m grid, providing clear litho-stratigraphic columns of the productive complex and the bathymetric location of the clay/limestone boundary. Computer processing of these data provided high-resolution imagery of the clay/fireclay-filled paleokarst. Geological sections showed horizontal fireclay layers that "plunge" into dolines (Fig. 2) gradually thinning to disappearance on the bottom (of dolines).

Boreholes located in the central areas of these paleodolines provided interesting information: instead of massive limestones, the bottoms are made of a breccia including blocks of Ladinian limestones, sandstones, fireclays and red clays. This strongly suggests collapsing into karstic voids beneath. This breccia reaches sometimes 45 m of thickness. Both features mentioned above (fireclays layer fluctuation of thickness and the breccia) are directly visible in the Main Quarry at Recea, confirming our graphic interpretations.

Genetic considerations on the fireclays assume formation within a swampy to lacustrine environment developed on the Rhetto-Liassic paleokarst supported by the Ladinian marmorean limestones (Corvin Papiu et al., 1988). Since deposition, this formation underwent intensive folding (Jurassian-type folds) and erosion (Czier, Popescu, 1988). The thick pile of sandstones and limestones covering the fireclay induced into it various load casting features closely following paleokarst. Hence the numerous lens-shaped fireclay bodies. Spatial continuity of layers cannot be however denied.

#### CONCLUSIONS

Ladinian paleokarst was a support on which the Liassic productive complex deposited, being responsible in the meantime for the overall and local tectonic patterns. Once the compaction achieved, the fireclays underwent the most spectacular changes, given their plasticity, casting paleokarst and subsequently migrating, thickening here, edging out there. The presence of ancient karstic voids induced collapsing of paleodolines, disrupting the structure and hindering mining.

## REFERENCES

- 1988 CORVIN PAPIU V., IOSIF V., RADAN S., *Constitution and genesis of the Lower Jurassic fireclay formation of the Pădurea Craiului Massif*. D.S. Inst. Geol. Geofiz., 72—73, 2, 73—89.
- 1988 CZIER Z., POPESCU V., *Cercetări geologice-paleobotanice asupra liasicului inferior de la Suncuius-Cariera Principală Recca/județul Bihor/I*. Crisia, XVIII, 597—626

*Mining Enterprise Suncuius*

Received November, 1990