

## PETROGRAPHIC AND GEOCHEMICAL STUDIES ON A TRAVERTINE CONE IN SOUTH VÉRTES MTS. (HUNGARY): EVIDENCE FOR MAGMATIC FLUID INFLUENCE?

SIKLÓSY, Z.<sup>1</sup>, GÁL-SÓLYMOS, K.<sup>1</sup>, KORPÁS, L.<sup>2</sup> & SZABÓ, Cs.<sup>1</sup>

<sup>1</sup> Lithosphere Fluid Research Lab, Department of Petrology and Geochemistry, Eötvös Loránd University, Pázmány Péter sétány 1/C, H-1117 Budapest, Hungary.

E-mail: z.siklosy@freemail.hu

<sup>2</sup> Geological Institute of Hungary, Stefánia út 14, H-1143 Budapest, Hungary.

### Introduction

Spectacular reddish brown carbonate cone was found in the southern part of Vértes Mts. (Transdanubian Central Range), close to NW of village Gánt (PEREGI & KORPÁS, 2002). Some red calcite dikes were already described from other parts of the Transdanubian Central Range (HAAS *et al.*, 1984; DEMÉNY *et al.*, 1997). These dikes are mostly situated in Upper Triassic carbonates and never cut Tertiary rocks. There are two localities where their Upper Cretaceous age could be stratigraphically determined. The origin of these red calcite formations is different from the other calcite veins that can be found in almost all Mesozoic and Tertiary carbonates. A detailed stable isotope and fluid inclusion study of DEMÉNY *et al.* (1997) suggested that percolation of magmatic fluids played a significant role during the formation of the red calcite dikes. PEREGI & KORPÁS (2002) postulated a travertine spring cone origin for the Gánt occurrence and we have carried out a careful petrographic and geochemical study to determine its relation to the red calcite dikes.

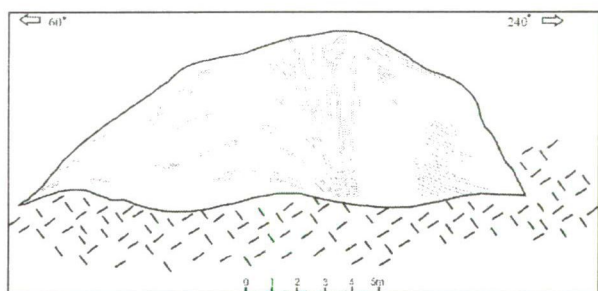


Fig. 1: The studied carbonate cone in the Vértes Mts.

### Structure of the carbonate cone

The isometric and elliptical carbonate cone is 40 to 50 m long and 7 to 8 m high. It has a ring structure likened to a willow-tree that differs totally from the surrounding Upper Triassic Hauptdolomite (Fig. 1). The middle part of the cone is vertically bedded, whereas at the rim the beddings turn to less steep: 10-50°. The carbonate material itself has a typical

travertine fabric and consists of alternating massive, layered and porous calcite.

### Results and conclusions

Samples are composed of mostly calcite crystals that can grow up to 0.5 mm. The calcite crystals mostly banded due to the zonation of Fe-oxide layers. Based on petrographic study, the carbonate cone can be described as a travertine deposit. Electron microprobe and scanning electron microscope techniques and neutron activation analyses were also used to determine the accessories minerals of sitting in the carbonate material. Xenomorphic zircon, xenotime and monazite were found as small grains (up to 10  $\mu\text{m}$ ). Based on the textural features, only monazite and xenotime can be considered as autochthon minerals. The carbonate cone is relatively enriched in light rare earth elements (La, Ce, etc.) particularly samples collected close to the hypothetical vent facies. Also, each sample has a positive U anomaly (up to 3.73 ppm). The presented geochemical data are partially characteristic and similar to the Quaternary thermal Buda travertine as indicated by KORPÁS *et al.* (2003). In our case a generic relation to the Late Cretaceous lamprophyres occurring in the northern part of the Transdanubian Central Range (SZABÓ *et al.*, 1993) can be considered.

### References

- DEMÉNY, A., GATTER, I., & KÁZMÉR, M. (1997). *Geologica Carpathica*, 48: 315-323.
- HAAS, J., JOCHÁNÉ EDELÉNYI, E., GIDAI, L., KAISER, M., KRETZOI, M., & ORAVECZ, J. (1984). *Geologica Hungarica Series Geologica*, 20: 353 p.
- KORPÁS, L., KOVÁCS-PÁLFFY, P., LANTOS, M., FÖLDVÁRI, M., KORDOS, L., KROLOPP, E., STÜBEN, D., & BERNER, Zs. (2003). *Quaternary Research* (submitted)
- PEREGI, Zs., & KORPÁS, L. (2002). *Földtani Közlöny*, 132: 477-480.
- SZABÓ, Cs., KUBOVICS, I. & MOLNÁR, Zs. (1993). *Mineralogy and Petrology*, 47: 127-148.