



Environmental signals from detrital cave sediments W and E of Lake Baikal (Russian Federation).

L. Lisa (1), J. Kadlec (1), M. Chadima (1), H. Hercman (2), A. Osintsev (3), H. Oberhansli (4)

(1) Institute of Geology AS CR, Prague, Czech Republic, (2) Institute of Geological Sciences, Warsaw, Poland, (3) Speleoclub Arabica, Irkutsk, Russia, (4) GeoForschungsZentrum Potsdam, Germany (lisa@gli.cas.cz)

The Botovskaya Cave which is developed in the Angarsko-Lensky Plateau ca 700 km N of Irkutsk in Ordovician limestones, is an example of a horizontal two-dimensional maze with a total length of explored passages exceeding 60 km. The cave system is located 310 m above the Lena River level. The detrital cave fills differ both in mineral magnetic and mineralogical parameters. Two depositional events could be observed. The older sediments consist of sands showing low magnetic susceptibility (MS) and low radioactivity values and are derived from weathered sandy Cambrian bedrocks. The sediments were transported by horizontally running water entering the cave system when the relief was peneplained, probably during the Late Tertiary. The overlying cave deposits, predominantly clays and sandy clays, reveal higher MS and radioactivity values and were transported vertically to the cave passages during rain or melt-water events. The Botovskaya Cave sediments underwent several periods of erosion and re-deposition. The last erosion event is dated radiometrically. We used a flowstone preserved as a relic on the limestone wall 1.5 m above modern-day sedimentary fill of the cave passage. The flowstone was originally deposited on the top of cave sediments, which were later eroded by running water. The flowstone showing normal paleomagnetic polarity is older than 350 ka based on a Th/U datings, but probably younger than 780 ka given the normal polarity. Its later erosion was triggered by extremely heavy precipitation events during which water entered the cave passages through shallow holes and fissures in the roof of the cave. The Dolganskaya Jama and the Delfin caves are located in the NW part of the Malo-Amalatskej Vpadiny Valley (ca 300 km E of the Lake Baikal). Cave detrital sediments, exposed in two sections preserved 120 and

36 m below the surface, were transported to the caves by local streams and comprise a uniform, but enriched heavy mineral assemblage derived from bedrock indicating mature detrital sediments possibly with a high degree of synsedimentary weathering during the Quaternary. The anisotropy of magnetic susceptibility and the sedimentary structure reveal post-depositional micro-cryoturbation fabrics. These structures documenting mean annual temperature in the cave below - 4°C were found at 120 m below the cave roof. They represent yet not dated times when permafrost was still a permanent feature in this area. Today the mean annual temperature is 1°C in the cave. The project is supported by the INTAS Program (No. 03-51-4152) and it is a part the research project of the Institute of Geology AS CR No. AV0Z30130516.