

Abstract

Forms of cavernous weathering - tafoni and honeycombs - belong to long-term investigated and discussed phenomena in geology. The reason for the difference in size between few centimetres-long honeycombs and the several-metres-long tafoni has not been yet studied. In my master thesis I compared the hydraulic properties of rocks with developed honeycombs and tafoni. The research consists of field measurements (measurement of suction pressures and capillary water absorption using Karsten tube) and laboratory measurements on tafoni and honeycomb samples (retention curve measurement, capillary water absorption, water vapour diffusion rate and saturated hydraulic conductivity). I have been studying honeycombs from various sites in the Bohemian Cretaceous Basin and tafoni from three different sites: Carbon Arkoses near Kralupy nad Vltavou, Cambrian Sandstone in Petra (Jordan) and Tunnel Spring Tuff in Crystal Peak (Utah). The measurements showed that values of suction pressure are far higher inside tafoni than inside honeycombs. This observation corresponds to different retention curves of studied rocks: steeper retention curve for honeycomb's quartz sandstone than for fine-grained arkosic sandstones to arkoses with tafoni. In the other part of my research I have compared the properties of hydrophobic crusts that are forming on rock surfaces with both tafoni and honeycombs. Hydrophobic effects were significant mainly by reducing the capillary water absorption of the sample. I have found that effective hydrophobic crusts is forming primarily outside the tafoni, whereas in both inside and outside of honeycombs. (In the pits of honeycombs I have found some extremely effective crusts reducing capillary absorption to less than 1% of the original rate inside the rock). Finally I tried to explain differences in the size of tafoni and honeycombs by the differences in retention curves or by developing strong crusts limiting further weathering. More complex study will be required to confirm these hypotheses.