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# Dissolution along faults-fractures and hypogenic karst in carbonates: examples from Brazil

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Dissolution along zones of preferential flow enhances anisotropy in geological media and increases its complexity. Changes in parameters such as porosity and permeability due to diagenesis and presence of ascendant fluids along fractures and faults can be responsible for hypogenic karstic system. The present study investigates the relationship between lithofacies, tectonics and karstification in the Neoproterozoic Salitre Formation, located in the central-eastern Brazil. This unit comprises several systems of caves including the Toca da Boa Vista and da Barriguda hypogenic caves, the largests in South America, and focus of this study. We focused on cave mapping and morphogenetic analysis, determination of petrophysical properties, thin-section description, micro-tomography, and isotopic analysis. The Salitre Formation, deposited in an epicontinental sea, comprises mud/wakestones, grainstones, microbial facies, and fine siliciclastic rocks. Passages occur in several levels within ca. 60 m thick cave-forming section, limited at the top by lithofacies with low permeability and fractures. Cave development occurred in phreatic sluggish-flow environment with overall upwelling flow. Fluids rise via cross-formational fractures and were distributed laterally within the cave-forming section using geological heterogeneities to eventually discharge up through outlets breaching across the upper confining beds. Maps of conduits show preferred directions for development of conduits: NNE-SSW and E-W. These two directions represents a relation between structures and hypogenic morphology. Joints, axis fold and fractures allowed pathways to the fluid rises, and then development of channels of entrance (feeders), outputs (outlets) and some cupolas, which are clearly aligned to fractures. Our data indicate several events of porosity evolution, such as subaerial exposure, folds and fractures, hydrothermal events (exotic minerals assemblage), sulfuric acid dissolution, dissolution at the water table, condensation corrosion, and faults and fractures reactivation. The major enhancement of secondary porosity was due to hypogene speleogenesis.