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Lava tubes from central portion of the Paraná CFB Province, Brazil

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The identification of lava tubes in continental flood basalt provinces (CFBP) is difficult and reports of preserved drained tubes are rare. The large extension of flows in CFBP must be related to an efficient transport of lava and tubes are the most efficient mechanism to transport lava in insulated feeder pathways, like observed in modern volcanic fields. Waichel et al. [1] described two lava tubes systems in central portion of Paraná CFBP (*Casa de Pedra* and *Perau Branco*) and here we present more two drained tubes well preserved in the same area. These tubes occur in an area with predominance of the pahoehoe flows interlayered with volcanoclastic and sedimentary rocks. The *Casa de Pedra* tube system is composed of two principal chambers with similar dimensions, reaching up to 10 m long and 4.0 m high connected by a narrow passage. The general form of the chamber is hemispherical, with re-entrances of ellipsoidal shape probably formed by small lava lobes and collapse structures in the roof. The second chamber is connected with three secondary lava tubes. The minor secondary tube is small, with a circumference of 0.80 m and estimated length of 3.0 m. The major secondary tube 1 is large, has a bottleneck shape with an initial height of 1.5 m and 5 m long. Columns in the cave are formed when the flowing lava separates in two lava channels that join again further down the system, forming and anastomosing tube network. Lateral lava benches and lava drainings at the walls are observed in secondary tubes. The general lava flow is to SW. The *Perau Branco* system is composed of five tubes with ellipsoidal openings. The main features are the long tubes that emerge from the small flattened chambers. One tube is more than 20 m long, with alternating circular and flattened ellipsoidal sections. The general lava flow is to NE. *Pinhão* tube is the larger simple tube, have 3 meters diameter, 15m long and lava flow orientation to NW (215⁰). *Pinhão* tube has a bottleneck shape; linings composed of layers up to 3 cm thick are observed in the roof and walls, lateral lava benches, flow lines and levee. *Entre Rios* Tube has an ellipsoidal opening (2.5 m large, 1.2 m high), a flattened chamber (3.0 m large and 1.0 m high) and two circular secondary tubes (0.7 m diameter). The general lava flow is to NW. The lava flow directions measured in the tubes is to SW (*Casa de Pedra*, *Pinhão* and *Entre Rios*) and NE (*Perau Branco*) and this pattern is related to orientation of the Ponta Grossa swarm feeder dikes (NW).

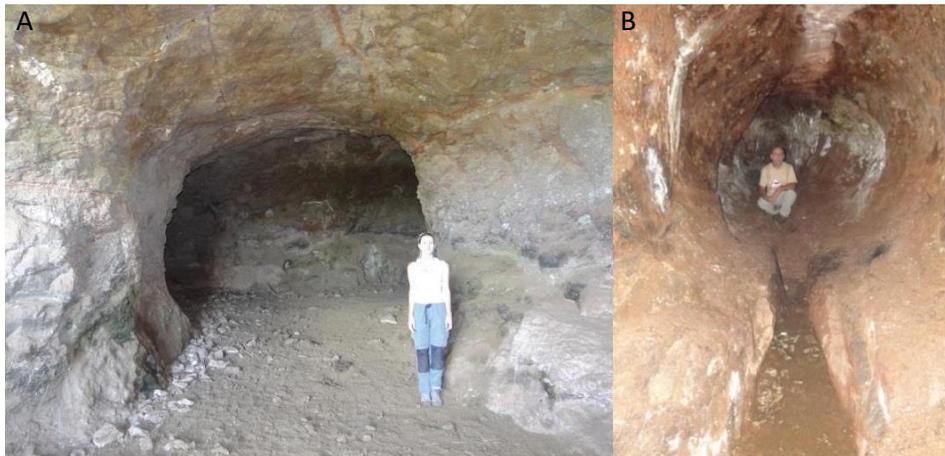


Figure 1: (A) Narrow passage between chambers in Casa de Pedra, (B) Pinhão tube.

References:

[1] Waichel et al. (2013) Jour. South American Earth Sci. 48:255-261.

