

Salt caves of the Atacama Desert, Northern Chile

or

Is it time for another pisco sour?

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Extended Abstract

Chile is not noted for its caves. It's very big on coastlines, copper mines and the national drink, pisco sour. There are sea caves near Arica, close to the Peruvian border, while in Chilean Patagonia there are a few in conglomerate near Torres del Paine in Chilean Patagonia, and some archaeologically significant and other physically demanding caves in marble on the cold, desolate and windswept Isla Madre de Dios in the far south. In the Atacama Desert there are caves in rock salt near the small, World Heritage listed Atacameño (indigenous) town of San Pedro de Atacama.

The Atacama is the driest place in the world, and some villages have apparently not recorded rain since the Spanish arrived 500 years ago. San Pedro boasts a highly variable average of 0.4mm/pa. In an enclosed basin (Salar de Atacama) with stunning scenery dominated by Licancabur volcano (5,940m), it is an oasis watered and occasionally flooded by snow-melt and run-off from the main cordillera of the Andes.

At an elevation of 2,450 – 2500m, karst is widespread in the Salar de Atacama but exploration is restricted by rugged terrain, rough and/or sandy roads, and sharp karren. There have been two or three small French and one or two American expeditions, the latter financed by NASA grants ostensibly to study cave parameters that might inform exploration of similar terrain on Mars. Similar terrains exist elsewhere in northern Chile with very limited exploration to date.

The great rainfall variability results in cave initiation and enlargement being highly concentrated following the rare occasions of heavy rain, and the French expeditions estimated that some caves had been excavated in only 5,000 years. The halite is of variable purity, ranging from 50 to over 97% NaCl, most of the remainder being clay.

Chulacao Cave is occasionally used as a guided adventure cave by Chilean National Parks (CONAF). From three steep doline entrances in two branches below the main road to Calama, walking passages 1-2m wide and 3-6m high 3-4m pass

south through a ridge, emerging on the floor of the main valley of Salar de Atacama. Neither the Americans nor our own small team confirmed whether it can be entered at the southern end where the passage is very low. The cave floor is encrusted with salt over its whole length and there are a few tumbled boulders in a higher level at the largest entrance.

Cueva de Sal (Salt Cave) is a self-guided tourist cave about 9km SW of the town in Valle de la Luna (Moon Valley), which is probably the single biggest tourist attraction in the region. Beginning 50m up a dry wadi north of the road, a narrow meandering canyon (clearly discernible on GoogleEarth) is discontinuously roofed over for about half its length of about 400m, with the return walk being over the karst. The longest single cave is 70m and a torch is handy. There are a couple of smaller caves further up the dry stream bed beyond Cueva de Sal. The park's visitor centre features an excellent interpretation of the karst and the caves.

Other known caves include Cueva de Quitor (68m), a short tourist cave north of San Pedro, and Reseau de l'Election (Election Cave). Explored by a French team, this is of similar dimensions to Cueva de Sal, segmented into 15 roofed caves 1-2m high and 1.5-3m wide. Total passage length is 130m in a shallow canyon 483m long. Chulacao & Salt Caves were surveyed by the author and Dick Heffernan in 2012, but due to the flooded river we were unable to investigate possible similar features identified from GoogleEarth, east of a side road 3km north of San Pedro.

Other caves in rock salt are found in Roumania, Spain, Iran and Israel. The world's longest such cave is probably the well decorated Namakdan Cave, on Qeshm Island in the Strait of Hormuz, Persian Gulf, Iran.



Trekking to Chulacao Cave



Salt-encrusted stream bed in Chulacao Cave



Doline near Chulacao Cave



Karren at an entrance to Cueva de Sal



Low section, Cueva de Sal



Another entrance near Cueva de Sal



Typical passage, Cueva de Sal