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Karst landforms on an evaporite dome in northern Coprates Chasma, Mars: similarities with Earth karst.

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Coprates chasma is part of the large Valles Marineris canyon system. It forms part of the backbone of the Valles Marineris canyon system, extending approximately east-west for roughly 966 kilometers (600 miles). Coprates Chasma is the longest and deepest of the Valles Marineris troughs system.
In the westernmost part of Coprates chasma, next the borderline with Melas Chasma an embayment on the northern wall can be observed. In the central part of the embayment, a mound of layered material rises from the chasma floor displaying a characteristic dome-shaped morphology.
The mineralogical characteristic of the dome have been previously determined by analysis of the CRISM image HRL00003752. The dome appears to be constituted by magnesium sulphate materials, showing on the slopes clear signatures of kieserite (MgSO4 H2O) and of polyhydrates sulphates.
Through the analysis of the MRO HiRISE images we studied in great detail the dome surface. In particular we focused our analysis on the features that we interpreted as karst landforms, investigating the possible processes involved in their formation and shaping.
Closed surface depressions interpreted as dolines of polygenetic origin exist on the dome surface. The dolines occur as scattered, isolated individuals or in densely packed groups that form polygonal karst landscapes. The depressions on the flanks are either bowl-shaped or rounded-shaped, display asymmetrical walls and concave-up or flat floor geometry. In some cases, the floors are subdivided into smaller and shallow depressions, highlighting a second generation of dolines.
Polygonal karst can be observed on the parts of the dome that have lower slope angles. Here dolines entirely pock some parts of the surface and occupy most of its area. The depressions appear to be spaced farther apart and display well defined shape with sharp divides. Viewed from above, the divides between adjacent depressions form a cellular mesh pattern just as typically happens in evaporite terrains on Earth, where the inherently high solubility of evaporite rocks make the densely-packed depressions.
The analysis carried out show that the landforms observed clearly indicate the presence of solutional processes and that they were not built or shaped by other processes such as, wind erosion, or impact craters heavily eroded or reworked by geomorphic processes.
These landforms strongly resemble similar features found on Earth displaying deep morphological similarities with dolines that develop in all kind of evaporite and mountains karst terrains.