

Surface denudation rate of gypsum in Sicily

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Studies on surface denudation rate of karst rocks were carried out for many years with different methods, although researches on limestones are much more numerous than those on gypsum.

In Sicily the most large and complete Messinian evaporite succession of Gruppo Gessoso – Solfifero outcrops and since 1993-1994 surface denudation measurements were performed on different types of gypsum by the Micro-Erosion Meter (M.E.M.) method. MEM stations were placed on natural sites representing different lithological features of gypsum outcrops of the Island: 1) selenite gypsum with centimetre-sized crystals; 2) selenite gypsum with sub-centimetre crystals; 3) gypsum arenite; 4) microcrystalline gypsum; and 5) gypsum laminite (balatino type). The measuring stations are positioned in three localities in western and central Sicily: Santa Ninfa (Trapani), Ciminna (Palermo) and Campofranco (Caltanissetta).

The average lowering rates vary in the different lithofacies: from 0.25 mm yr^{-1} in microcrystalline gypsum to 0.74 mm yr^{-1} in selenite gypsum with centimetre-sized crystals. The average surface denudation rates are 0.40 mm yr^{-1} in balatino gypsum and gypsum arenite, and 0.37 mm yr^{-1} in selenite gypsum with sub-centimetre crystals. These different values are connected to several factors such as: rock texture, dip of gypsum surfaces, climatic conditions, troubles on the measurement sites (e.g.: presence of lichens, soil, remains of vegetation, etc.).

The aim of this paper is to show the results of roughly twenty years of experimental measurements, and to compare the surface denudation rate of gypsum in Sicily with those of other evaporite areas characterised by different climatic settings.