

# Gypsum lichens: A global data set of lichen species from gypsum ecosystems

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## Abstract

Lichens are significant components of the biological soil crust communities in gypsum ecosystems and are involved in several processes related to ecosystem functioning, such as water and nutrient cycles or protection against soil erosion. Although numerous studies centered on lichen taxonomy and ecology have been performed in these habitats, global information about lichen species from gypsum substrates or their distributional ranges at a global scale is lacking. Thus, we compiled a global data set of recorded lichen species growing on gypsum. This review is based on systematic searches in two bibliographic databases (Web of Science and the more specialized database Mattick's Literature Index) using various keywords related to the substrate or ecology (i.e., gypsum, gypsiferous, semiarid, saxicolous, terricolous). In addition, we revised lichen literature from countries with gypsum soils using Mattick's, Hamburg University's Worldwide checklist, and different national lichen checklists. Ultimately the review includes a total of 321 studies. This data set included 6114 specimen records belonging to 336 recorded lichen species from 26 countries throughout the world. The results showed large differences in the number of species recorded among countries, reflecting differences in the sampling effort. We provide a table with the number of studies and species in relation to gypsum surface in order to account for the bias produced by sampling effort. The number of studies carried out per country was not related to the gypsum surface but probably to other factors, such as accessibility to field sampling, economic or political factors, or the presence of a wider community of lichenologists. Thus, Spain and Germany hosted the highest number of recorded species (160 and 114 species, respectively). Outside the European continent, only a few countries had a large number of species: Morocco (46), United States (42), and Iran (37). Remarkably, countries from the southern hemisphere (i.e., Australia, Chile, Namibia, and South Africa) showed a low number of studies from gypsum lands, supporting the stated biases observed in sampling efforts among countries. Considering the most studied countries, the results show that Teloschistaceae was the

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most represented family in gypsum ecosystems followed by Verrucariaceae and Cladoniaceae. Regarding particular species, *Psora decipiens* and *Squamarina lentigera* were some of the most widespread and abundant species in these habitats. This data set constitutes a basic and first step toward a much more comprehensive database, to be periodically updated in future releases, which also serves to identify countries or territories where future studies should be accomplished. There are no copyright restrictions on the data; please cite this data paper if the data are used in publications and teaching events.

#### KEYWORDS

arid, biological soil crust, BSC, gypsiferous, gypsophiles, gypsovags, occurrences, saxicolous, terricolous

#### CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

#### DATA AVAILABILITY STATEMENT

Data are available as Supporting Information. They are also available in the Global Biodiversity Information Facility repository at <https://doi.org/10.15470/6yne3u>.

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#### SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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