

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

Sergio Muriel  | Gregorio Aragón | Isabel Martínez | María Prieto

Área de Biodiversidad y Conservación,
Departamento de Biología y Geología,
Física y Química Inorgánica, Escuela
Superior de Ciencias Experimentales y
Tecnología (ESCET), Universidad Rey
Juan Carlos, Madrid, Spain

Correspondence

Sergio Muriel
Email: sergio.muriel@urjc.es

Funding information

European Union's Horizon 2020
Programme/MSCA-RISE-2017,
Grant/Award Number: 777803; Ayudas
para la contratación de investigadores
predoctorales de la Comunidad de Madrid,
Grant/Award Numbers: PEJD-2017-PRE/
AMB-4554, PEJD-2019-PRE/AMB-15825;
Convocatoria de plazas para contratación
de investigadores predoctorales en
formación en la Universidad Rey Juan
Carlos, Grant/Award Number: 2021/
PREDOC21-001

Handling Editor: Simona Picardi

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

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2024 The Authors. *Ecology* published by Wiley Periodicals LLC on behalf of The Ecological Society of America.

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>.

ORCID

Sergio Muriel  <https://orcid.org/0000-0002-1398-6548>

SUPPORTING INFORMATION

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

How to cite this article: Muriel, Sergio, Gregorio Aragón, Isabel Martínez, and María Prieto. 2024. "Gypsum Lichens: A Global Data Set of Lichen Species from Gypsum Ecosystems." *Ecology* 105(4): e4271. <https://doi.org/10.1002/ecy.4271>