

# Flexible partnership allows lichens to occur in different habitats

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This image shows the habitat of the Spiny Heath Lichen (*Cetraria aculeata*).  
Credit: Christian Printzen

[Lichens](#) are symbiotic organisms consisting of a fungal partner and one or several algal partners. The association is so close that scientists until 1867 were not aware that lichens actually consist of two different partners. After the Swiss botanist Simon Schwendener discovered the dual nature of lichens, lichenologists were focusing on the fungal partner

when studying lichens, since it was often believed that only few algae are involved in the symbiosis.

Molecular studies have shown that it was a mistake to neglect the algal partner for a long time. The diversity of algal partners have been shown to be much higher than expected. In addition the study by Dr. Christian Printzen, Senckenberg Research Institute (Frankfurt), and his colleagues in Frankfurt and Madrid has shown that, by choosing different algal partners, lichen fungi are able to colonize different ecosystems.



The spiny heath lichen *Cetraria aculeata* occupies an extremely wide ecological niche. Potter Peninsula, King George Island. Credit: Christian Printzen

The study focuses on the Spiny Heath Lichen (*Cetraria aculeata*), which has a peculiar distribution range. It belongs to the so-called bipolar species that occur in polar and [alpine regions](#) of the northern and

southern Hemisphere. However, this species also occurs in the climatically different [Mediterranean region](#) with dry steppe-like vegetation. Dr. Printzen's studies now show that this distribution can be explained by the presence of different [algal species](#) in the polar vs. Mediterranean populations.



In the mediterranean belt *Cetraria aculeata* can also be found in steppe ecosystems such as this "sabinar" in Central Spain. Guadalajara, Zaorejas.  
Credit: Christian Printzen

The paper, published in the open access journal *Mycokeys*, discusses the [genetic differences](#) of these algae and their evolutionary and ecological implications. "It is an example how molecular techniques in tandem with ecophysiological studies can enhance our knowledge of the biology of

this fascinating type of symbiosis.", comments Dr. Christian Printzen the lead author of the study.

**More information:** Printzen C, Domaschke S, Fernández-Mendoza F, Pérez-Ortega S (2012) Biogeography and ecology of *Cetraria aculeata*, a widely distributed lichen with a bipolar distribution. In: Kansri Boonpragob, Peter Crittenden, H.Thorsten Lumbsch (Eds) *Lichens: from genome to ecosystems in a changing world*. *MycKeys* 6: 33, [doi: 10.3897/mycokeys.6.3185](https://doi.org/10.3897/mycokeys.6.3185)

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