

LONG-TERM STUDIES ON COLONISATION AND GROWTH PROCESSES ON LICHENS AT ANTARCTIC COASTAL TERRESTRIAL HABITATS

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The lichen and bryophyte floras and their ecological associations in Antarctic coastal sites have been described previously and in some detail. However, detailed studies of their long-term processes of development, growth and colonisation under defined environmental conditions are lacking. Studies of lichen growth, in particular, require extended periods. Lichens are characteristically slow-growing organisms, a feature that appears to be intensified at Antarctic locations.

Our studies have taken place near to the southern boundary of the maritime Antarctic (Ryder Bay, Adelaide Island, c. 68°S). At appropriate locations, permanent quadrats (15x15cm) on rock faces colonised by different lichen species have been monitored to quantify the growth of lichen species over a period of 8 years. The small research sites have been documented by photography. We present data for several different macro- and crustose lichen species generated from this long-term experimental monitoring. Macrolichens, such as *Umbilicaria antarctica*, show considerably greater growth rates than crustose lichens. Our results give fundamental information on the growth rate of epilithic lichens in the southern maritime Antarctic.

Culture experiments of diaspores of *Usnea* species have been carried out at the natural site and may be seen as a second method for long-term experiments. For this study a transect from the northern to the southern maritime Antarctic has been chosen. For analysis scanning electron microscopy has been used. The growth rate is substantially slowed down to the south but the single developmental steps are not differing. The experiments and their results are unique for the Antarctic.

The long-term experiments provide a baseline for the recognition and interpretation of the consequences of environmental change in this area in future decades.