

Photosynthetic characteristics of lichens growing in a high arctic glacier foreland

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In the previous our study, we investigated species composition and community structure of lichens on a glacier foreland in a high Arctic Spitsbergen Island. We noticed the differences of lichens distribution pattern among their habitat. Most probable reason to explain the difference are suggested as the difference of ecophysiological response among lichen species under natural environmental moisture regime (Kappen, 1973). However, there are still many unsolved and unevaluated points are left behind to confirm the hypothesis. Consequently, we tried to evaluate the response of photosynthetic reaction to the water availability of the dominant lichen species using a pulse-amplitude modulation chlorophyll fluorometer. Eight lichen species were selected to investigate the relationships between absorption rate of water and photosynthetic recovery. Among these, two dominant species, *Ochrolechia frigida* and *Cetrariella delisei*, showed the highest photochemical rate at fully watered condition and the rapidest recovery of photosynthesis when it was watered, respectively. Both lichens showed variability of light-photochemical rate relation at their habitat; the direct relationships between their water content and the achieved maximum photochemical rate, or photochemical efficiency were not clear. Present results possibly suggest that the photosynthetic response to water may be one of the essential factors to allow the dominance of certain lichens on a glacier foreland. Light-photosynthetic reaction at their habitat may be not only affected by water condition but also by the other limiting conditions such as nutrient, growth stage of lichens, as well as prehistory of water availability, which could not be considered in the present study.