**EFFECTS OF SECONDARY COMPOUNDS AND WATER CONTENT ON OPTICAL PROPERTIES OF LICHEN THALLI**

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Lichens are symbiotic associations between a mycobiont and a green algae and/or cyanobacterium photobiont. The mycobiont protects the photobiont against high visible and UV light levels. The photobiont is normally well protected against high UV. Lichens are poikilohydric organisms that tolerate the dry state for long periods. However, they may be damaged by high light also in the dry state. In the dry state UV and visible light transmission through the lichen cortex is reduced, whereas damage is not necessarily reduced because damage cannot be repaired in the dry state. The lichen cortex often contains high amounts of secondary compounds synthesized by the fungal partner. These compounds are situated as crystals on the surface of the fungal hypha. Most secondary lichen compounds are colorless and absorb UV only, whereas a few colored substances absorb visible light. However, colorless secondary compounds in crystal form may screen visible by reflection. The ecological functions of the secondary compounds have been studied in a series of experiments using the acetone-rinsing method. Lichen compounds may be removed by acetone-rinsing without any harmful effect on the lichens. The susceptibility of the lichens against various stresses can then be tested with or without secondary compounds. One main conclusion from these experiments is that the secondary compounds are not essential for UV screening. However, UV may act as a signal for synthesis of the compounds, and their main function seem to be e.g. visible light screening and to deter herbivores. Techniques for direct and indirect estimation of cortical screening will be discussed.