

LICHENS AND THEIR THERAPEUTIC PROPERTIES

Summary

Lichens are mini-ecosystems, consisting of at least two organisms: a fungus (mycobiont) and a photosynthetic partner (photobiont). The photobiont, which contains chlorophyll, may be either a green alga (kingdom Protista) or a cyanobacterium belonging to an entirely different kingdom Monera. The dominant partner is the fungus. Lichens colonize some of the most inhospitable habitats on the earth. They can survive in extremely cold areas such as high mountains and such regions as the arctic. Lichens have a variety of different growth forms (crustose, foliose, fruticose). As adaptations for life in marginal habitats, lichens produce an arsenal of more than 500 unique biochemical compounds. Many of these substances, which belong to chemically diverse classes of compounds – including aromatic compounds such as depsides, depsidones and carotenoids – are unique to lichen fungi. Lichen substances have many ecological roles, including antibiotic, antimycobacterial, antiviral, anti-inflammatory, analgesic, antipyretic, antiproliferative and cytotoxic activities. However, only a very limited number of lichen substances has been screened for their biological activities and their therapeutic po-

tential in medicine. Medicinally lichens have probably been used by many early civilisations. In Europe, records from around the 15th century suggest that by then several lichens were in regular medicinal usage. For example *Usnea florida* was used for hair problems, *Xanthoria parietina* for jaundice and *Peltigera canina* as a cure for rabies. In some northern places *Cetraria islandica* is still used as a cough remedy. On a more scientific basis, usnic acid is a known antibiotic and has recently been developed into a salve in Germany. Possible use of several other lichens products as anti-viral and anti-fungal agents is still actively studied. For example, some lichen polysaccharides, glucans, and glycoproteins show antitumor activity and a polysaccharide from the edible rock tripe, *Umbilicaria esculenta*, inhibits the growth of HIV virus that causes AIDS. The use of lichens in folk medicines persists to the present day. *Usnea* species were most commonly utilized. *Cetraria islandica* is claimed to be effective in treating lung diseases and catarrh and preparations from this species are still sold in Europe, usually as pastilles. *Peltigera canina* is used in eastern India as a remedy for liver ailments..