

Mineral phases and element composition of the Cu hyperaccumulator lichen *Lecanora polytropa*

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Mineral phases and element composition are being determined in bright blue-green *Lecanora polytropa* and its substrate sampled from a Swedish Copper Mine. This study aims to determine if different coloured regions of the lichen contain similar compounds and if they are organic or mineral.

Phytochelatin production and thiol peptide status were first reported in this crustose lichen [1]. These represent two possible detoxification mechanisms in this Cu-tolerant species which accumulates up to 1.3% Cu d. wt. Oxalic, citric and malic acids are potential ligands for heavy metals in plants and fungi and play an essential role in detoxification and tolerance. Their low concentration and presence of plate-like crystals in Cu-rich *L. polytropa* apothecia suggests some Cu may occur in the form of complexes with oxalic and other organic acids. Copper oxalate was previously reported within the medulla of other Cu-tolerant species [2,3]. Copper complexation by low molecular mass organic acids and non-protein thiols do not entirely account for its tolerance.



References

- [1] Pawlik-Skowrońska B., Purvis O.W., Pirszel, J., and Skowroński T. (2006) *Lichenologist* **38**, 267-275.
- [2] Chisholm A.B., Jones G.C., and Purvis O.W. (1987) *Mineralogical Magazine* **51**, 715-718.
- [3] Haas J.R., and Purvis O.W. (2006) Fungi in Biogeochemical Cycles (Gadd, G.M., Ed.) Cambridge University: Cambridge, 344-376.