

**Biotechnological Potential of Bacteria Associated to  
Lichens**

Castro, Jr J<sup>1</sup>, Gasser I<sup>1</sup>, Müller H<sup>1</sup>, Cardinale M<sup>2</sup>, Grube M<sup>2</sup>,  
Berg G<sup>1</sup>.

*1. Institute of Environmental Biotechnology, Graz  
University of Technology. 2. Institute of Plant Sciences,  
University of Graz*

Lichens harbour high abundances of bacteria but their potential for applications in biotechnology is still unexplored. Bacteria from lichens were sampled from Koralpe (Styria), isolated, and characterized in their biotechnological potential by biochemical and molecular assays. A total of 263 bacteria were investigated. Results showed that the isolates produced extracellular metabolites; and many of our cultivable strains were able to display enzymatic activities (proteolytic: 50%, chitinolytic: 14%, glucanolytic: 29%), whereas 23% of the strains showed phosphate-solubilizing activity. The ability to excrete siderophores was observed in 40% of the strains. In addition PCR using specific primers indicated the presence of PHB genes, suggesting a potential role of bacteria associated to lichens for biopolymer production. Furthermore, a proportion of isolates with antibacterial and antifungal activities was detected. According to the results lichen-associated bacteria have a considerable biotechnological potential.