**Study and conservation of Antarctic cyanobacterial diversity in the BCCM/ULC collection**

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The BCCM/ULC public collection presently includes 72 Antarctic cyanobacterial strains and its catalogue is available on <http://bccm.belspo.be/db/ulc_search_form.php>. An ISO9001 certificate was obtained for the public deposition and distribution of strains.

The purpose of this collection is to gather a representative sample of Antarctic cyanobacterial diversity from different biotopes (limnetic microbial mats, soil crusts, cryoconites, endoliths, etc.) and make it available for researchers to study the diversity, evolution, physiology, and genomic make-up. This is particularly important in view of the emerging use of metagenomic approaches on environmental samples, where the comparison with well-defined strain genome sequences can be very useful.

Our laboratories have focused on the study of the molecular systematics of Antarctic isolates belonging to polyphyletic filamentous genera, such as *Leptolyngbya* and *Phormidium*. A Multilocus Sequence Typing analysis is underway and supports the fact that a simple morphology hides large genetic differences. This analysis, together with ecology, ultrastructure, and morphology, elucidates the evolutionary history and putative biogeography of these morphologically simple organisms on this cold continent.

In addition, we have amplified, cloned, and analyzed fragments of the operons coding for NRPS (Non Ribosomal Peptide Synthase) and PKS (Polyketide Synthase) for 10 strains. These operons are involved in the production of secondary metabolites which could be of interest for pharmaceutical research. The homology search (BLAST) of the clones showed identities around 70% with NRPS sequences in the databases (e.g. nostopeptolide, cyanopeptolin) for 8 strains and the same level of similarity with PKS sequences (e.g. curacine) for 6 strains. The synthesis of bioactive compounds was also tested using bioassays. Cell extracts of strains *Plectolyngbya hodgsonii* ULC009 and *Phormidium priestleyi* ULC026 inhibited the growth of two fungi. These data confirm the renewed interest for biotechnological exploitation of cyanobacteria.

As Antarctic biotopes are generally oligotrophic, the capacity to fix atmospheric nitrogen can be very important for nutrient cycles. This was tested by amplification and cloning of a partial *nifH* sequence from non-heterocystous isolates. The strain ULC032 *Leptolyngbya antarctica* produces a putative new *nifH* sequence.