Agencia Nacional de Investigación y Desarrollo

Ministerio de Ciencia, Tecnología, Conocimiento e Innovación

MILLENNIUM NUCLEUS OF PATAGONIAN LIMIT-OF-LIFE: ENVIRONMENTAL LIMITATIONS IN GENETICS AND ECOPHYSIOLOGY **LILI**

Focus Area: Natural Sciences
Specialty: Ecophysiology, Molecular and Genomic Biology

The Millennium Nucleus of Patagonian Limit-of-Life: environmental limitations in genetics and ecophysiology (LiLi), will develop a multidisciplinary research to characterize the ecophysiological synchrony among plants, animals and microorganisms in high mountain forests in southern South America.

The general objective of LiLi is to understand how these forests support a seasonally growing ecosystem, and to characterize their resilience to environmental changes. The synchrony of the biological cycles of three key components of the ecosystem (bark yeasts, monito del monte (Dromiciops gliroides) and lengas) will be evaluated by means of field sampling combined with physiological and genomic measurements. The biodiversity of the rhizosphere and tree bark will also be estimated by eDNA.

LiLi represents a harmonious balance of basic and applied science. Its applied science includes the promotion of sustainable regional socio-economic initiatives, such as developing local industry (spin-offs) and advising conservation decision makers. Science-based spin-offs will emerge from LiLi, because the Patagonian forests contain the source of global diversity of native yeasts, with enormous potential to produce fermented beverages.

The human team of LiLi is highly multidisciplinary and gender balanced. LiLi's scientific efforts are enhanced by a collaborative network of established centers and institutes (CAPES, IEB, FONDAP CRG center, iBio Millennium Institute, GAB Antarctic Rings), international collaborators and undergraduate and postgraduate students.

Since the Nucleus has synergy, each objective of LiLi will be carried out by at least two researchers with co-sponsored thesis students.

Research Lines:

• Seasonal dynamics of energy storage in lenga and its consequences for the proliferation of yeasts and biological cycle of the monito del monte (Dromiciops gliroides).

• Temperature constraints on seasonal growth cycle and Nothofagus spp, Saccharomyces spp, and Dromiciops spp genetic diversity along altitudinal and latitudinal gradients.

LiLi Límite de la vida Patagónica

Millennium Nucleus

>> SCIENTIFIC PRODUCTIVITY

ISI: **8**
Book chapter: **1**

*Data updated by Millennium Centers to June 2022
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Millennium Nucleus

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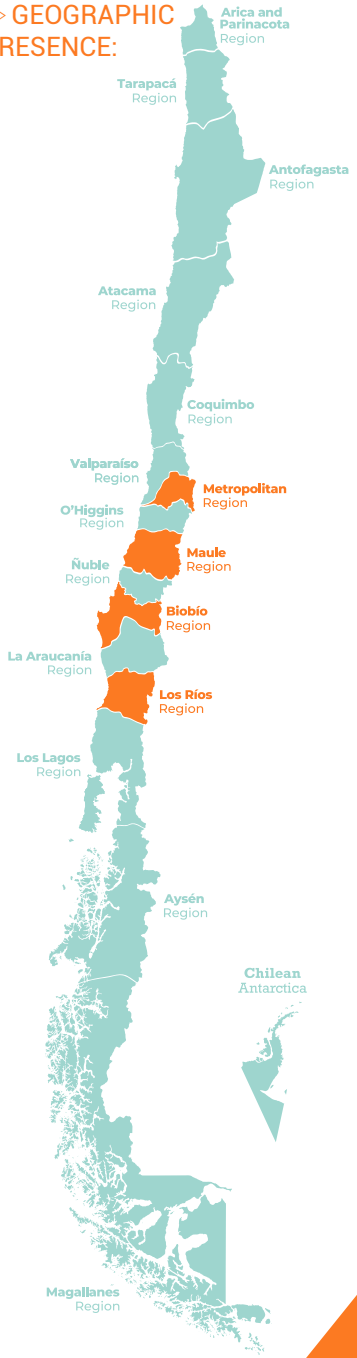
>> GEOGRAPHIC PRESENCE:



>> MAIN EXPECTED ACHIEVEMENTS:

- LiLi is the first scientific initiative that studies high mountain Patagonian ecosystems with a multidisciplinary approach.
- LiLi will develop spatially explicit geographic models to forecast distribution changes of key ecosystem organisms due to global warming.
- LiLi will strengthen the "spin-off" program for the use of native yeasts for entrepreneurs and craft breweries.

>> OUTREACH ACTIVITIES:

- We will deliver two training courses, one on the science of breweries and the other one on the impacts of global change on terrestrial ecosystems.

Information updated to June 2022

Sponsoring Institutions:
Pontifical Catholic University of Chile
University of Talca
University of Santiago, Chile
Austral University of Chile

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