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Córdoba, Argentina

Online seminar
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LIA FORESTIA 2023

Drought stress tolerance strategies of *Prosopis alba*, a key specie from "Gran Chaco Americano"

Drought is one of the major abiotic stresses that restrict terrestrial plant growth. Predicted climate change in subtropical regions raises concerns about the ability of forest ecosystems to cope with longer, more severe and unpredictable summer drought periods.

The *Gran Chaco Americano* extends into tropical and temperate zones and is one of the major wooded grasslands in South America, being currently one of the ecosystems with the highest deforestation rates of the world. Among important Chaco tree species, *Prosopis* spp, Algarrobos (Mesquite), are well-known to be tolerant to drought, having a xeromorphic leaf structure and an adapted root structure that can cope with temporal and spatial variability in soil water availability. In particular, *Prosopis alba* is the most widely distributed species of the genus, grows throughout the semi-arid and humid Chaco region of Argentina, Bolivia and Paraguay, covering areas from 500 to 1200 mm of average annual precipitation of summer concentration.

P. alba is distributed in contrasting environments, and we expect different strategies towards drought stress and even adaptations to particular local conditions. Our objective was to evaluate the strategies of *Prosopis alba* to tolerate drought stress and to identify if these strategies are under natural selection. By combining a macroscopic characterization (yellowing and senescence) after water deprivation in a controlled common garden experiment with open pollinated families and the distribution of neutral genetic variation (microsatellites) between and within *P. alba* populations we attempt to address the following questions: Do the different *P. alba* provenances growing in contrasting environments with respect to precipitation and temperature have different strategies to tolerate stress? Are there genetic differences between these provenances that may indicate adaptive processes?

In the context of climate change, information regarding *Prosopis alba* provenances tolerant to drought becomes more important, particularly for forest management and future (re)forestation.



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Diego López Lauenstein is researcher from Institute of Plant Physiology and Plant Genetic Resources of INTA, Córdoba, Argentina. His research focuses on adaptation strategies for different types of abiotic stresses (drought and saline) on woody species from Chaco region, mainly of the *Prosopis* genus, and on the study of native forest genetic resources in the Chaco region with objectives of genetic improvement and conservation. He uses tool from ecophysiology and molecular marker to provides information for the management of forest genetic resources in order to ensure the evolutionary resilience of populations in the context of climate change. He is in charge of the forest genetic resources network of Inta.



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