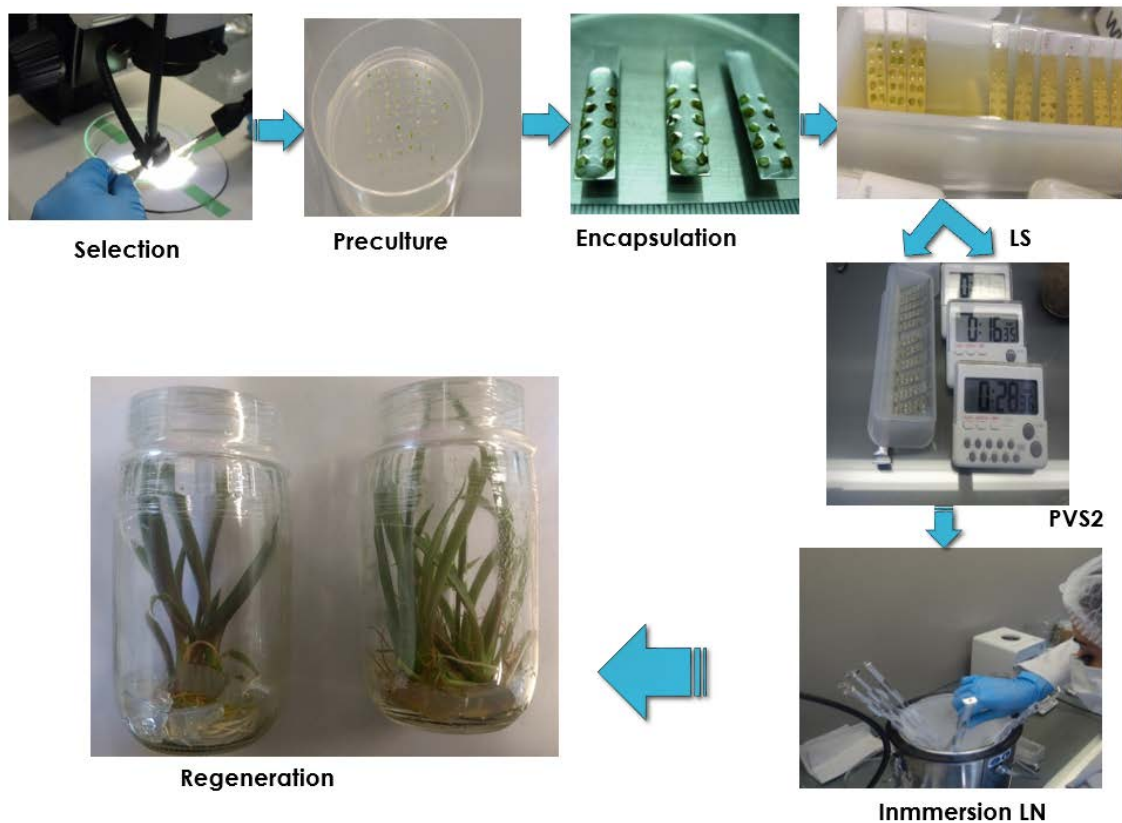


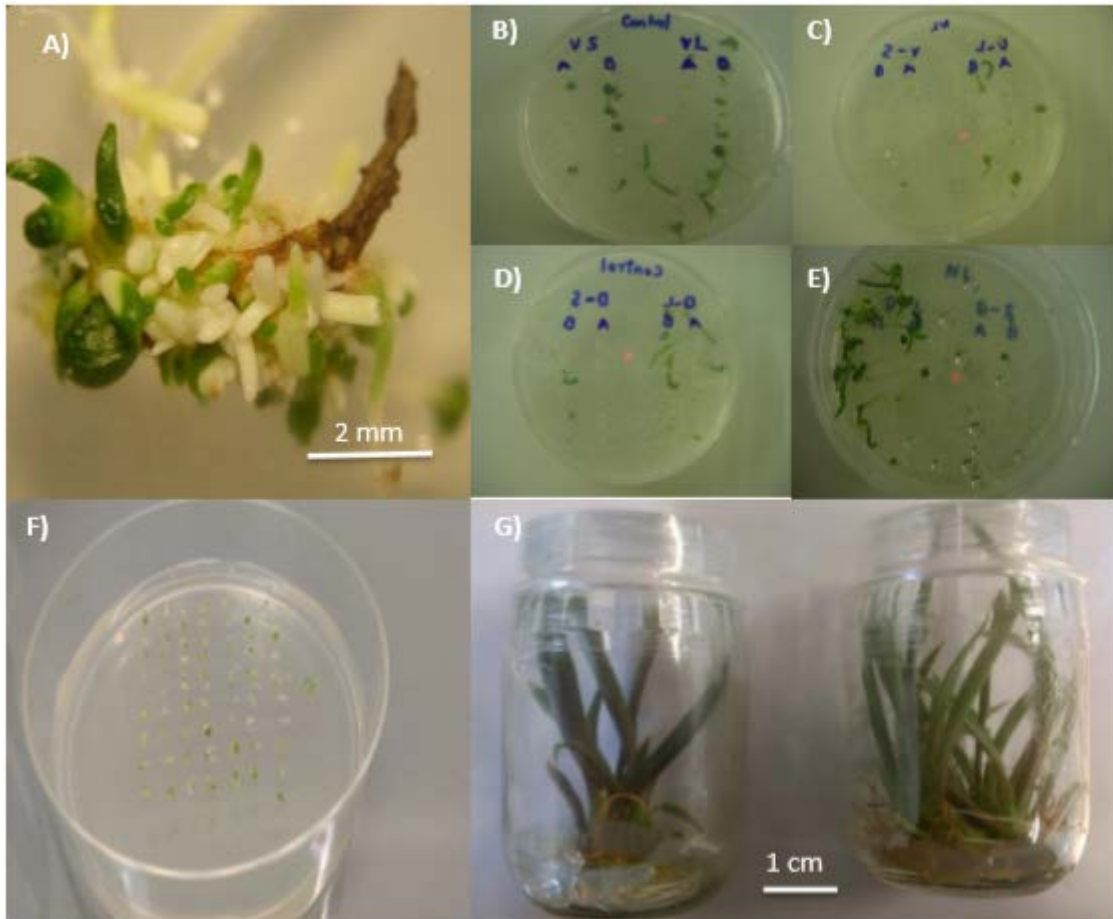
## Project Update: November 2019

### Cryopreservation of accessions / July 2019 – March 2020

Cryopreservation of accessions. Cryopreservation bioassays will be carried out with somatic embryos and shoot tips previously regenerated in vitro for long-term conservation. A pre-culture will be carried out to standardise the conditions of temperature, time and suitable concentrations for the regeneration of the material. For vitrification, they are loaded with highly concentrated solutions (i.e. Plant Vitrification Solution 2, PVS2). Finally, the samples are immersed in liquid nitrogen for at least 30 min. In order to test whether the material remains viable, they are subjected to a recovery treatment, in which they are soaked in the rewarming solution and placed in regeneration medium to evaluate the size, color, form, and survival and recovery rates. The encapsulation method allowed the obtention of transparent samples without irregularities or stresses caused by thermal shock.



Procedure for cryopreservation. © Lourdes Delgado-Aceves.



Study material for cryopreservation. A) Stages of somatic embryos in the explant. B), C), D), and E) Embryos response to liquid nitrogen with their controls. F) Selection of embryos by size and stage (coleoptilar). G) Post-cryopreserved germinated somatic embryos (120 d). © Lourdes Delgado-Aceves.

### Dissemination of scientific information

#### Seminars in Universities

As part of the project, we have conducted seminars at other universities in our country for the scientific dissemination of the conservation of the *Agave* genus. The knowledge shared in seminars with students in the biological area, aims to stimulate interest for the development of projects in the preservation of species.

Seminars in universities and the participation of master's students  
©Felipe Romo-Paz

The result obtained from the seminars imparted, was the participation of graduate students generating proposals, answering questions for their scientific works, as well as problems raised and solutions for each of the species.

#### Participation in the IV International Symposium on Agave ISA

From March 6 to 8 2019, the fourth edition of the Agave International Symposium was held in the city of Oaxaca, Oaxaca, an event that served as a meeting point for researchers, students and entrepreneurs to know and share knowledge related to the agave that have been generated in recent years.

We have participated in the symposium presenting a poster with the title: "Micropropagation systems reported in *Agave* spp.: common errors". This work was derived from the experiments performed in the laboratory.

#### Exchange of scientific knowledge

An international academic stay was carried out in the "The Huntington Library, Art Collections and Botanical Gardens" in that stay, techniques and skills were learned to support the second phase of the project.

"Strengthening Bonds with Mexico Through Cryopreservation"

Posted on August 7, 2019 by Usha Lee McFarling

<https://www.huntington.org/verso/2019/08/strengthening-bonds-mexico-through-cryopreservation?fbclid=IwAR2p9T97YeSuWif5Xhwn7Su1Drt4TGM8-Rt0VAKCh9Wnwxi0hIAwUY3BU>

Huntington Cryopreservation Research Botanist Raquel Folgado supervises as trainees Lourdes Delgado and Felipe de Jesús Romo Paz prepare plant tissue for cryopreservation. Photo by Deborah Miller.

Achieved goals

1. Update and learning of new methodologies in the area of plant biotechnology.
2. Relationship in the area of cryopreservation worldwide
3. The work developed can be applied globally.
4. Recognition of benefit and problematic projects in common between countries.
5. Linking with international institutions.
6. Linking and academic cooperation with international specialists (Spain, United States of America, Belgium and Japan).
7. Invitation for collaboration in future projects in international institutions.
8. Training for the management of plant materials and the cryopreservation of accessions of *Agave* species. Three species of the genus were worked, of which they were micropropagated, extraction of the apical meristems and the application of the "droplet vitrification" methodology were performed.

#### Recognition

The progress of the project was recognised within the 56th meeting of the cryobiology society, for its scientific and social reach, but above all for the noble work of conserving our natural resources. Several institutions such as the Cincinnati Zoo, Fort Collins, among others, showed their solidarity and interest in working together.



©María Teresa Gonzalez Arnao



©María Teresa Gonzalez Arnao

CERTIFICATE OF RECOGNITION

This certificate is presented to

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**Maria De Lourdes Delgado-Aceves**

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in recognition of their oral presentation at

**CRYO2019**

THE 56TH ANNUAL MEETING OF  
THE SOCIETY FOR CRYOBIOLOGY

held in San Diego, July 22-25, 2019.



International Society for Low  
Temperature Biology and Medicine

A handwritten signature in black ink, reading "Nicole Evans", is positioned above a horizontal line. The signature is written in a cursive, flowing style.

**Nicole Evans**  
Executive Director, Society for Cryobiology

**The Society for Cryobiology**

hereby presents to

**Lourdes Delgado-Aceves**

**The Student Travel Award**

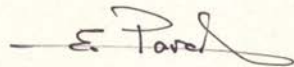
**Co-Sponsored by Cincinnati Zoo**

**at the 56<sup>th</sup> Annual Meeting of the Society for Cryobiology  
San Diego, USA**

**Presented on this 25<sup>th</sup> Day of July in the Year 2019**

**Chairman, Awards Committee**

**President, the Society for Cryobiology**



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**Prof. Estefania Paredes**



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**Prof. Dayong Gao**



## IV INTERNATIONAL SYMPOSIUM OF AGAVE Integral and Sustainable Use of Agave

Otorga el presente

# RECONOCIMIENTO

a:

**Lourdes Delgado-Aceves, Hilda Palacios, Felipe Romo-Paz, Liberato Portillo Martínez**

Por su participación con el tema **Micropropagation systems reported in *Agave spp*: Common errors** en modalidad póster.

Oaxaca, Oax. México 6-9 de marzo 2019.



Dr. Inocencio Higuera Ciapara  
Director General CIATEJ



Dra. Antonia Gutiérrez Mora  
Presidenta del Comité Organizador

