

Progress report of the research project

The chamal (*Dioon edule* Lindl.) in the state of San Luis Potosí

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Introduction

Dioon edule is a widely distributed species in the Huasteca zone, state of San Luis Potosi, Mexico, where its habitat has become deteriorated and populations reduced since crops and cattle breeding incursion. The purpose of the present study is to know what the situation of chamal habitat and natural populations is, what ethnobotany categories can be recognized, how traditional seeds cooking process is developed and how toxins could affect people that eat them. In this order, we will perform the chamal localities situation, habitat characterization and populations' structure analysis; ethnobotanical exploration with male key informants and interviews with housewives, and; neurotoxic effect experiment and neurological tests with Wistar rats in the laboratory. The project officially started in August, and the activities and financial progress occurred as follows.

Activities

Ecology

During the fourth period we finished the population structure characterization. We request for advice to the GIS laboratory at the University to locate sites in thematic maps (vegetation, geology, physiography, edaphology, topography). Soil samples analyses were finished for texture, organic matter content, potassium, phosphorous, sodium, calcium and pH determinations obtained in the laboratory with standard methods. Seed production analysis started in June when the students Gabriel Rubio and Raymundo Mora sowed the seeds to obtain germination data. The first seeds germinated the last week of August. Besides, during the third week of June the students involved in population structure study and other three involved in physiological studies during the summer (Paola Rodríguez, Dalia García and Paulina Rodríguez) went on a trip to the “Francisco Clavijero” Botanical Garden in Xalapa, Veracruz, to visit the cycad collection, and we met there M.Sc. Carlos Iglesias. This was a great opportunity for the students to exchange ideas with a specialist. Financial support for the trip was obtained through a special request to the University.



The group visiting the “Francisco Clavijero” Botanical Garden in Xalapa, Veracruz.

Ethnobotany

Ethnobotany informant interviews continue in xi'oi villages with direction of Dr. Fortanelli assisted by the student Elvia Tristán to facilitate the interviews with housewives. We explored the municipalities of Tamasopo, Rayón and Santa Catarina. Particularly, interviews with people inhabiting near *D. edule* populations were carried on in order to find out about chamal edible and market use or the kind of damages caused to cattle.

Derived from this information, a questionnaire was considered in order to obtain information in locations where chamal use is intensive. Inhabitants of the villages of La Manzanilla, Agua Puerca, Rincón de Ramírez and Los Pocitos in Tamasopo municipality, El Puente village in Santa Catarina municipality, and Gamotes village in Rayón municipality, were interviewed. Fourteen interviews were applied to 26 adult people, and sometimes a translator was needed to obtain the information from housewives because they only speak xi'iuy language.

During this process the student Elvia Tristán participation was very important. Particularly, during the summer she presented a poster with some results during the event "Summer of the Science" held at the University of San Luis Potosí, including the credits corresponding to TCS.

In the villages of Agua Puerca and El Puente, some families allowed the observation and record of cooking process of the tamal that takes about eight hours. Qualitative and quantitative records of the process were made, and xi'iuy names of used materials and products too. Videotape and pictures of all processes were recorded.

Another observation of tamal processing in Gamotes village with a family is pending, as well as precise cone collecting criteria of people at those locations. Besides, cattle damages caused by *D. edule* will be observed and registered from the people.

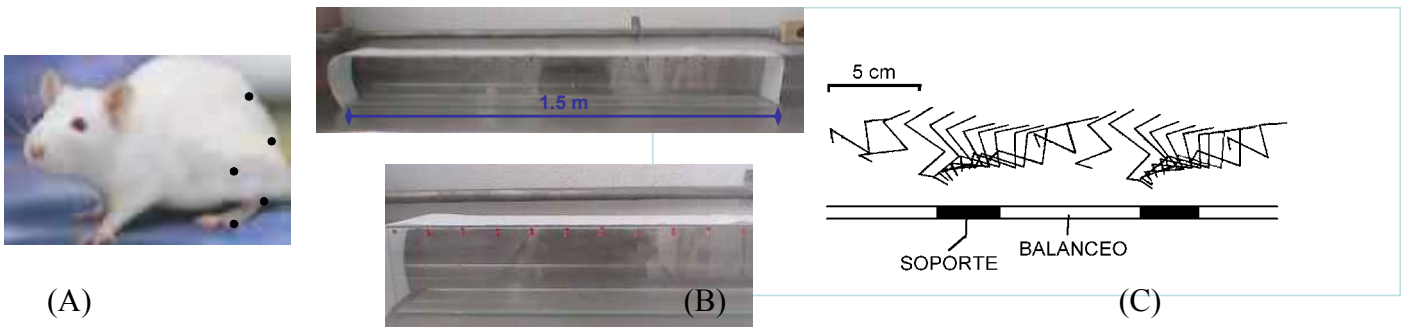


Interviews with housewives and observation of the tamal cooking process.

Toxicology

For the neurotoxic effects experiment, the seed cones were collected in May, when people use to collect them for cooking. We obtained the permission from Mexican government authorities (SEMARNAT) to collect the seed cones and use the seeds for the experiments.

The experiment began in July with 20 Wistar male rats, acquired in the University Medicine School, exposed to four treatments of chamal seeds diet for a 15 days period. At the end of the period, rats' locomotion was evaluated with the non restricted walk analysis. It was necessary to shave the rats and dot the waist, hip, knee, ankle and first phalanx, in order to make the rat walk in a glass structure and film it. Besides, we filmed the rat behavior in open field during a dark period with a web cam acquired for this purpose. The Chemistry student Alejandra Covarrubias Camarillo joined the group and is developing their Bachelor thesis under Dr. Erika Garcia direction. All filmed material will be evaluated in collaboration with Dr. Ismael Jiménez Estrada, researcher from the Physiology, Biophysics and Neuroscience Department at CINVESTAV in Mexico City.



Rats with black spots (A) walk through the glass structure for locomotion evaluation (B) resulting in a graph like (C)

Radio interviews

Laura Yáñez was invited to talk in a local radio station with the main goal to attract the attention of young people in science. I participated on Thursday 19th of June in a one hour section talking about cycads and particularly of *Dioon edule* in the state of San Luis Potosí, how TCS granted our research and how students and people could participate in cycads conservation. Next week Dr. Fortanelli and I were invited to return and talk about our research project, particularly about ethnobotany and ecology of cycads, and we answered some phone questions from the public and at the end we promised to donate a book about cycads to one person that wanted to know more about it.



Scholarship

Thanks to the successful negotiations of the Director from the Instituto de Investigación de Zonas Desérticas, Dr. J. Rogelio Aguirre Rivera, a scholarship was awarded to Raymundo Mora Cardona in order to develop his BSc. thesis during six months (July-December 2008).

Article

We have periodic reunions to discuss about our respective findings, and we will have a final meeting with all students at the end of September to listen to their experiences with researchers and the close encounter with *Dioon edule*. We intend to send the article in November, with the final results and conclusion of the project..

Activities report:

May 2008

Population structure characterization finished. Soil analysis and maps were developing.

Ethnobotany interviews with xi'oi male informants and housewives continued. Female cones collection.

June 2008

Ethnobotany interviews continued. Seed were dried. Soil analyses were finished. Students trip to "Francisco Clavijero" Botanical Garden in Veracruz.

July 2008

Ethnobotany interviews continued. Wistar rats were acquired and experiment installed.

Financial report:

Activity	Amount (US\$)
Meal expenses for field routes exploration and populations' measurements	100
Toll expenses for field routes exploration and populations' measurements	20
Petrol expenses for field routes exploration and populations' measurements	120
Garmin [®] GPS	380
Measurement equipment (leather gloves)	15
Measurement equipment (stakes)	5
Measurement equipment (string)	3
Sampling equipment (shovel)	7
August 2007 - October 2007	Subtotal 650
Meal expenses for field routes exploration and populations' measurements	280
Toll expenses for field routes exploration and populations' measurements	20
Expenses for accommodation and interviews with informants	390
November 2007 – January 2008	Subtotal 690
Accommodation expenses for interviews with informants	300
Meal expenses for interviews with informants	100
Meal expenses for field routes exploration and populations' measurements	80
Toll expenses for field routes exploration and populations' measurements	20
Petrol expenses for field routes exploration and populations' measurements	100
February 2008 – April 2008	Subtotal 600
Toll expenses for female cone collection	20
Petrol expenses for female cone collection	60
Wistar rats	300
Rats food	60
Electric razor	150
May 2008 – July 2008	Subtotal 590
	Total Amount 2530

Additional funds obtained from the San Luis Potosi Autonomous University.

Activity and/or material	Amount (US\$)
Expenses for accommodation and interviews with informants	600
Distilled water	40
Expenses to visit the “Francisco Clavijero” Botanical Garden in Veracruz (Five students)	520
Web cam (HP 2Mb)	180
Scholarship for one student developing his BSc. thesis (July-December 2008)	600
Total Amount	1940