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TECHNIQUES AND DNA-PROFILING IN PARTICULAR**


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GENOMIC CHARACTERIZATION OF MEXICAN NOPAL ACCESSIONS

Presentation prepared by experts from Mexico

Slide 1



Genomic Characterization of Mexican Nopal Accessions

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Slide 2

Introduction

- Mexico has been considered as the origin center and diversification of *Opuntia spp.*, because this genus presents broad inter and intra-specific genetic diversity.
- The nopal has many uses: such as vegetable, fruit, medicinal, to granna production, animal food, to avoid the erosion of soil, and its conservation etc.

Slide 3

The *Opuntia* genus represents for the Mexican people one of the biotic elements with more cultural meaning. *Opuntia* dates from the prehispanic time.

The nopal has great ecological, economical and social importance because it is one of the natural resources of the people who live in arid and semi-arid areas of Mexico.

Slide 4

- In Mexico, the nopal has been used as food product from pre-Hispanic times. In the 1950's cultivation began for "tuna" production (fruit).
- At the moment, there are 243 different accessions in a germplasm bank, of which 185 have been used for fruit production, 49 for vegetables, 4 for animal food and 5 with more than one purpose.

Taxonomical situation:

- The nopal has species in the *Opuntia* and *Nopalea* genus, both are classified into the *Cactaceae* family.

Slide 5

- Due to the wide genetic diversity of nopal, in Mexico there is confusion in *Opuntia* genus taxons.
- The present nopal classification based on the morphology and biochemical studies, are not enough to ubicate the actual cultivars.
- It is considered necessary to use other alternatives that they support the taxonomy and the appropriate establishment of germplasm banks.

Slide 6

- The precise and reliable estimation of the genetic diversity on Mexican *Opuntia* collections is actually taking place with molecular marker techniques.



Slide 7

General goal:

Genotyping the Opuntia Mexican accessions
and complementing their actual description.

Slide 8

Specific goals

- To support the appropriate establishment of *in situ* germplasm banks that guarantee unique and different genetic contents.
- To evidence genomic distinctness between Mexican nopal accessions in order to support the actual taxonomy.

Slide 9

Methodology

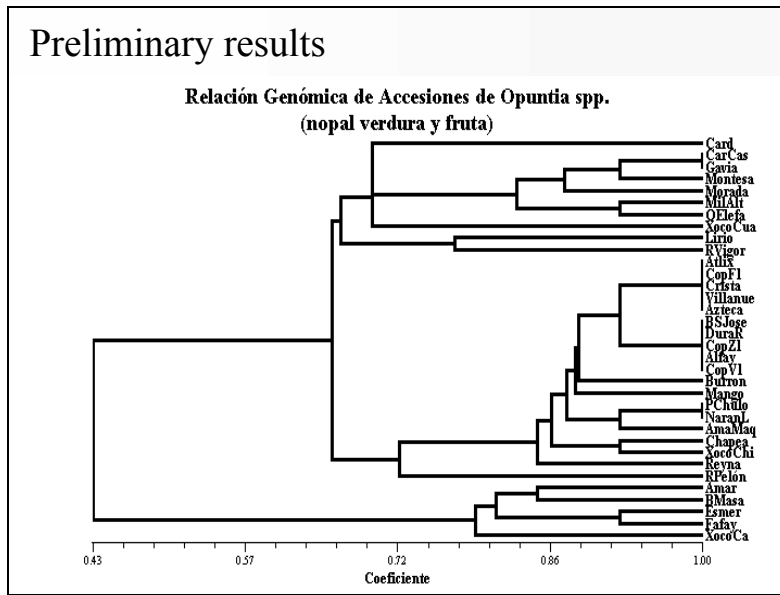
- ✓ DNA was obtained by several modifications of the Dellaporta *et al.*, (1983) method.
- ✓ The genomic analysis at beginning is carried out with DAF technique (DNA amplification fingerprinting):
15-20 ng DNA,
random primers (7-10 b)
PCR= desnaturation, anealling (> 40° C)
Products DNA are separated on acrilamide geles
- ✓ The NTSYSpc programme and UPGMA method are used to group different Mexican nopal accessions.

Slide 10

Actual accessions

1. Cardona	8. Cardón de Castilla	15. Gavia	22. Reyna	29. Rojo vigor
2. Amarillo	9. Esmeralda	16. Lirio	23. Rojo pelón	30. Amarilla maquihuana
3. Atlixco	10. Copena F1	17. Milpa Alta	24. Mango	31. Copena V1
4. Blanca San José	11. Copena Z1	18. Montesa	25. Naranjón legítimo	32. Azteca
5. Bola de masa	12. Cristalina	19. Morada	26. Alfayucan	33. Villanueva
6. Burróna	13. Chapeada	20. Oreja de Elefante	27. Xoconostle chivo	34. Xoconostle Cambray
7. Duraznillo rojo	14. Fafayuca	21. Pico Chulo	28. Xoconostle cuaresmeño	

Slide 11



Slide 12

!!!! Thank you very much !!!!

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