



# GENETIC DIVERGENCE AND EVALUATION OF FORAGE CACTUS CLONES IN THE SEMI-ARID OF PERNAMBUCO, BRASIL

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# Introduction

Characterization and evaluation of genetic variability are steps necessary for breeding programs aiming to produce hybrids. Quantification of genetic dissimilarity is one of the most important estimative for plant breeders, mainly when the objective is to obtain transgressive segregants and populations with large genetic variability.

## Materials and Methods

This experiment was carried out in 'São Bento do Una' (8°31'12" S and 36°33'00" W), 'Agreste' region of Pernambuco, Brazil.

□ Eight genotypes of forage cacti from the genus *Opuntia* and *Nopalea*

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1. Gigante
  2. Redonda
  3. Miúda
  4. Clone 20
  5. Orelha de elefante africano
  6. Algerian
  7. Copena F1
  8. Chilefruit

□ The following response variables were measured:

- ✓ Plant height (PH)
- ✓ Plant width (PW)
- ✓ Height/width ratio (H/W ratio)
- ✓ Cladode width (CW)
- ✓ Cladode length (CL)
- ✓ Cladode perimeter (CP)
- ✓ Cladode thickness (CT)

□ Complete randomized design with 10 replications.

Response variables were analyzed using ANOVA and means compared by Scott-Knott test ( $P < 0.01$ ). Genetic divergence was analyzed using canonic variables and the dissimilarity was estimated using the Mahalanobis' distance.

All tests were carried out using the computational resources of the Genes program.

(CRUZ, 2007)

## Results

**Table 01** - Comparison of Means and summary of the analysis of variance for the characters plant height (PH), plant width (PW) and ratio Height/Width of eight clones of cactus.

Source of Variation	PH	PW	H/W
Gigante	193,30 c	221,00 b	0,87 a
Redonda	158,40 b	199,00 b	0,79 a
Miúda	121,80 a	150,60 a	0,81 a
Clone 20	190,70 c	225,30 b	0,85 a
Orelha de elefante africano	166,10 b	198,60 b	0,84 a
Algerian	181,20 c	161,30 a	1,12 b
Copena F1	218,20 c	200,40 b	1,09 b
Chilefruit	198,80 c	200,20 b	0,99 b
QM Treatment	8765,68**	6835.25**	2889,44**
QM Residue	930,38	1821,23	783,96
CV (%)	17,08	21,94	29,04

**Table 02** - Cladode length (CL), Cladode width (CW), Cladode perimeter (PC) and Cladode thickness (CT) of eight cladodes of cactus pear clones

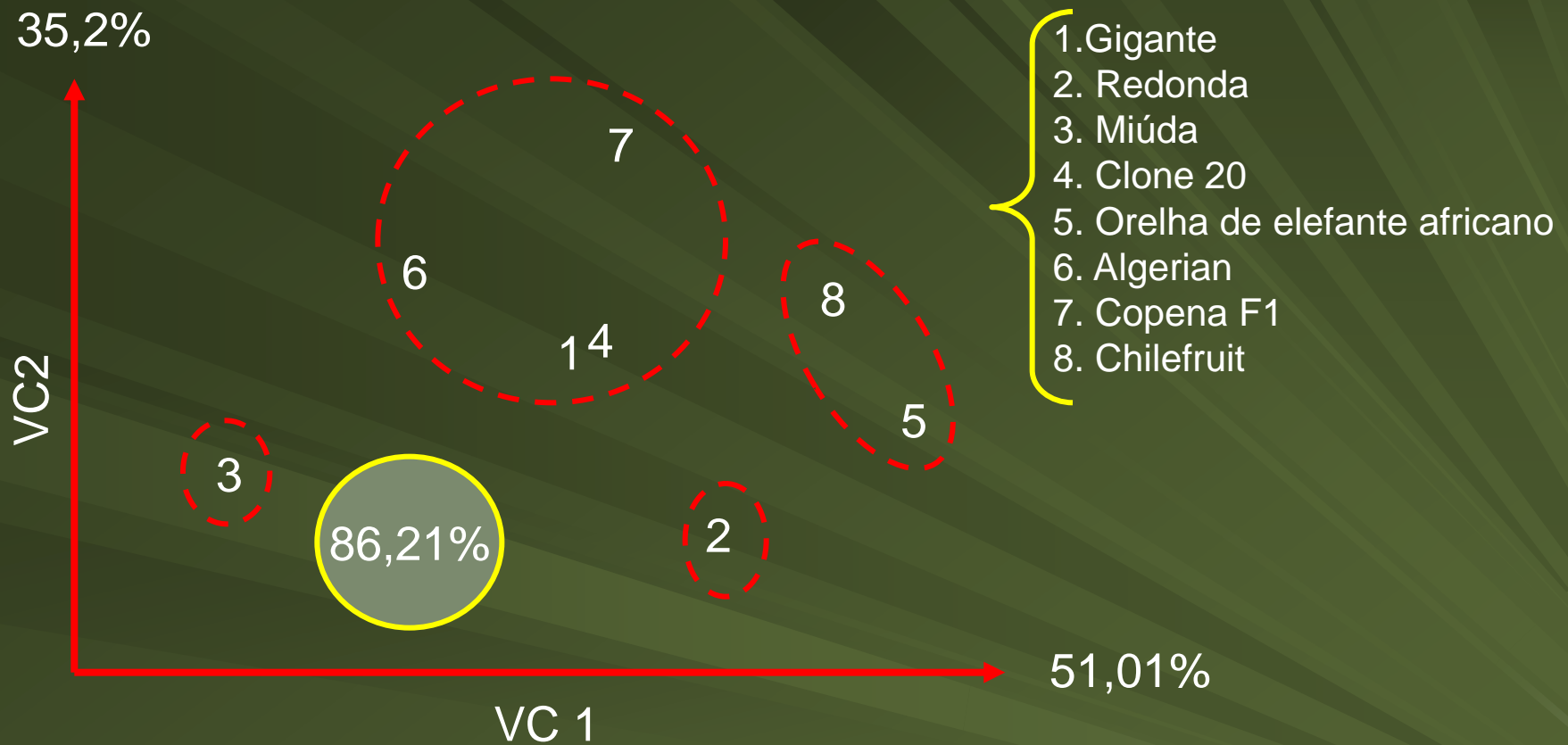
Source of Variation	CL	CW	PC	CT
Gigante	39,00 c	21,90 c	99,85 c	3,13 a
Redonda	34,20 b	26,20 d	93,75 c	2,75 a
Miúda	27,35 a	12,35 a	64,70 a	2,52 a
Clone 20	39,75 c	22,15 c	105,95 d	2,85 a
Orelha de elefante africano	43,89 c	28,45 d	113,78 d	3,17 a
Algerian	35,95 b	16,05 b	86,80 b	2,97 a
Copena F1	48,47 d	19,19 b	106,52 d	3,10a
Chilefruit	43,00 c	24,30 c	107,80 d	4,00 b
QM Treatment	4260021,25**	2818965,53**	24767371,25**	25026,02**
QM Residue	204047,91	84867,91	1132453,75	2997,54
CV (%)	11,60	13,66	10,93	17,72

**Table 03** - Proportion of variance and cumulative variance of the canonical variables

Canonical variables	Proportion of variance	Proportion of variance Accumulated
CAN1	51,012584	51,012584
CAN2	35,19973	86,212313
CAN3	7,278827	93,49114
CAN4	3,69351	97,184651
CAN5	1,991101	99,175752
CAN6	0,818203	99,993955
CAN7	0,006045	100,00







**Figure 01** – Dispersion graphic scores in relation to two axes representing the first two canonical variables (CV1 and CV2)

# Conclusions

Multivariate analyzes techniques were able to establish standards and classification of genetic diversity of the evaluated forage cactus clones, identifying the most divergent ones and, as result, grouping possible crossings between them.

# Acknowledgments

