



Crossing compatibility between wild species and cultivated cassava

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INTRODUCTION

Although cassava wild species are important source of useful genes that can be used in cassava breeding programs for resistance to biotic and abiotic stresses, very few studies on crossing compatibility between wild and cultivated species have been reported.

Objectives:

- 1) To evaluate parameters related to crossing compatibility between cultivated cassava (*M. esculenta*) and cassava wild relatives.
- 2) To produce F1 hybrid sexual seeds to be evaluated for resistance to biotic and abiotic stresses.

METHODOLOGY

The plant material: accessions from the working collections of *Manihot* species at Embrapa/CNPMPF.

Nineteen crosses were performed, involving cultivars of *M. esculenta* and accessions of 13 wild species: *M. anomala*, *M. flabellifolia*, *M. jacobinensis*, *M. peruviana*, *M. tomentosa*, 'Pornúncia' (natural hybrid), *M. caerulescens*, *M. cecropiaefolia*, *M. dichotoma*, *M. glaziovii*, *M. irwinii*, 'Maniçoba' (probably *M. pseudoglaziovii*) and cassava 'Sete Anos'.

The six first wild species were used in reciprocal crosses and the other seven were crossed only as female parentals.

RESULTS

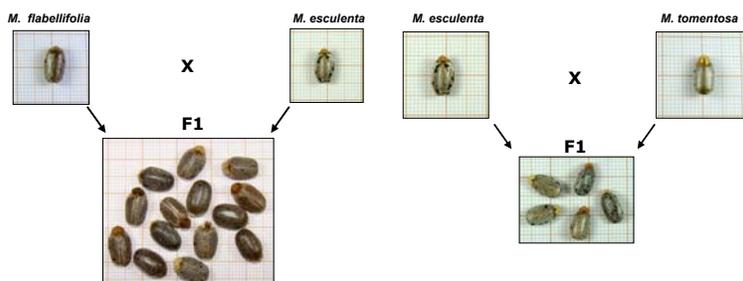


Fig. 1 - Crossbreeding between wild and cultivated species

Table 1 - Studies on crossbreeding between several accessions of wild species and varieties of *M. esculenta*

MOTHER	X	FATHER	# Pollinated Flowers	% Fertilized Flowers	% Fruit Set	% Produced Seeds	Dehiscence (days)
Wild Species (13 sp.)	x	<i>M. esculenta</i> (25 var.)	846	35,58	9,69	5,75	69
<i>M. esculenta</i> (14 var.)	x	Wild Species (7 sp.)	147	59,18	18,37	6,80	67
TOTAL			993	39,07	10,98	5,91	68

Table 2 - Studies on crossbreeding between wild species and *M. esculenta*

MOTHER (wild)	X	FATHER (cultivated)	# Pollinated Flowers	% Fertilized Flowers	% Fruit Set	% Produced Seeds	Dehiscence (days)
<i>M. anomala</i>	x	<i>M. esculenta</i>	92	43,48	2,17	1,45	66
<i>M. flabellifolia</i>	x	<i>M. esculenta</i>	318	23,27	10,38	8,49	68
<i>M. jacobinensis</i>	x	<i>M. esculenta</i>	43	20,93	9,30	6,20	48
<i>M. peruviana</i>	x	<i>M. esculenta</i>	80	35,00	11,25	6,67	75
<i>M. tomentosa</i>	x	<i>M. esculenta</i>	70	70,00	2,86	2,38	81
'Pornúncia'	x	<i>M. esculenta</i>	16	18,75	6,25	0	82
TOTAL			619	31,52	7,10	5,39	70

Table 3 - Studies on crossbreeding between *M. esculenta* and wild species

MOTHER (cultivated)	X	FATHER (wild)	# Pollinated Flowers	% Fertilized Flowers	% Fruit Set	% Produced Seeds	Dehiscence (days)
<i>M. esculenta</i>	x	<i>M. anomala</i>	14	50,00	14,29	0	66
<i>M. esculenta</i>	x	<i>M. flabellifolia</i>	62	66,13	35,48	15,05	66
<i>M. esculenta</i>	x	<i>M. jacobinensis</i>	20	70,00	0	0	0
<i>M. esculenta</i>	x	<i>M. peruviana</i>	15	100	0	0	0
<i>M. esculenta</i>	x	<i>M. tomentosa</i>	23	30,43	13,04	2,90	77
<i>M. esculenta</i>	x	'Pornúncia'	13	23,08	0	0	0
TOTAL			147	59,18	18,37	6,80	70

The crossing compatibility was highly genotype-dependent. Out of the 13 wild species, only 6 species produced seeds (*M. anomala*, *M. flabellifolia*, *M. jacobinensis*, *M. tomentosa*, *M. irwinii* and cassava 'Sete Anos').

The average rates of fertilized flowers, fruit set, and seed production were significantly different among species and dependent of both donor and receptor of the pollen grains. Only two wild species produced seeds in both ways (as male and female): *M. flabellifolia* and *M. tomentosa*. The period from pollination to fruit dehiscence varied from 48 to 97 days and a total of 176 hybrid seeds were produced from 993 pollinated flowers.

The production of seedlings from the 176 F1 hybrid seeds are underway. (Fig. 2)



Fig. 2 - Production of seedlings from the 176 F1 hybrid seeds.