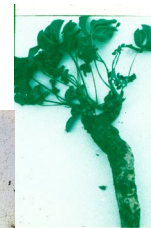


Genetic Resources, their conservation and manipulation: The case of wild cassavas, *Manihot* spp.

by
Nagib M. A. Nassar



Course by Nagib Nassar



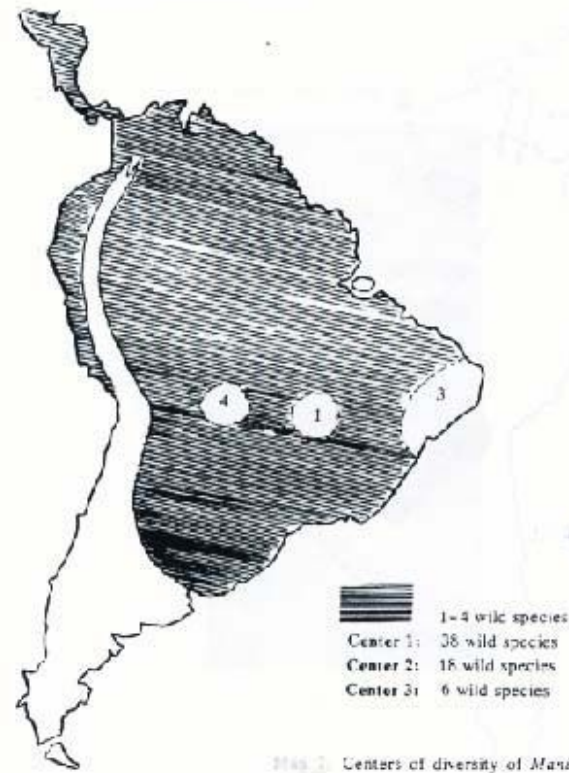
I – Wild Species

1. Determination of localities and collection of wild species
2. Genetic Variation and useful characters
3. Gene transference by interespecific hybridization
4. Development of interespecific hybrids

I 1. Determination of localities and collection of wild species

1.1 Centers of diversity

1.1 Centers of diversity

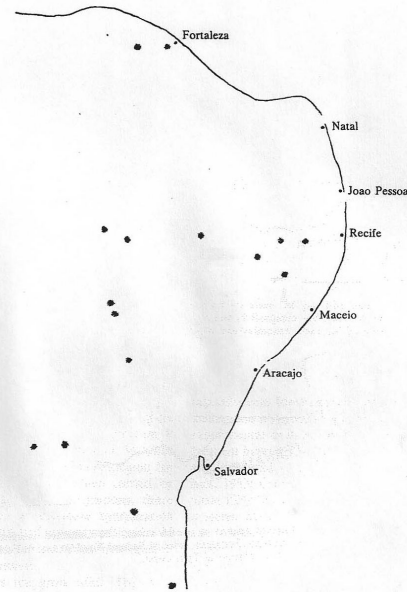


Nassar, N. M. A. (1978). Conservation of the genetic resources of cassava (*Manihot esculenta*); Determination of wild species localities with emphasis on probable origin. *Econ. Bot.* **32**, 311-320.

<http://www.geneconserve.pro.br/reprints3.htm>

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1.2 Collecting wild Manihot species native to Brazil

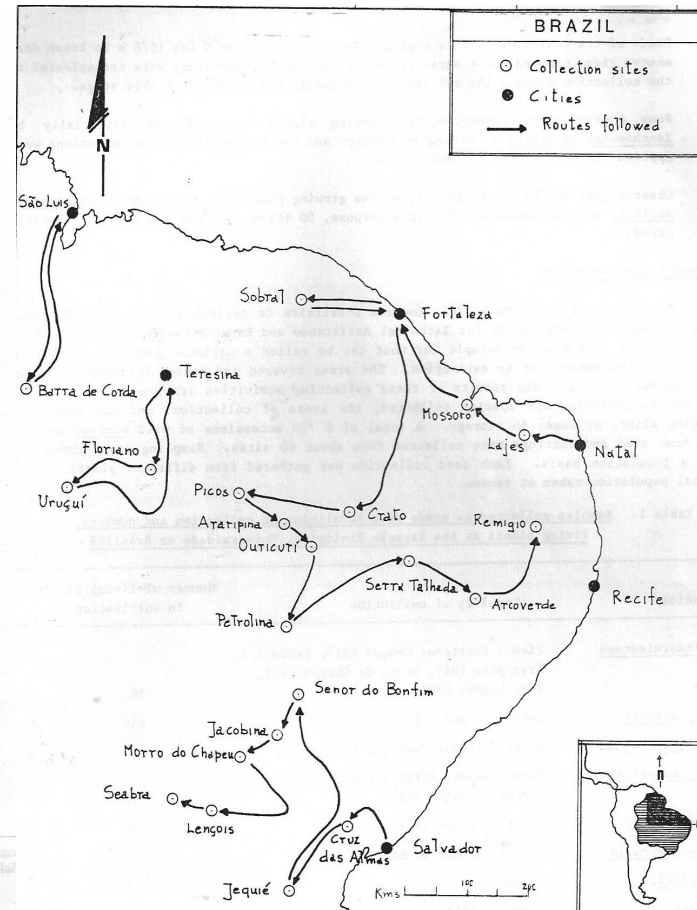


Map 1. (*) Localities of *Manihot* species collected from northeastern Brazil.

The third center of diversity is north-eastern Brazil, which includes

- M. zentneri* Ule
- M. surinamensis* Rogers et Appan
- M. quinquefolia* Pohl
- M. pseudoglaziovii* Pax et Hoffmann
- M. maroccanensis* Ule
- M. catingae* Ule
- M. brachyloba* Mueller
- M. quinqueparita* Huber
- M. caerulea* Pohl
- M. marajoara* Chermont de Miranda

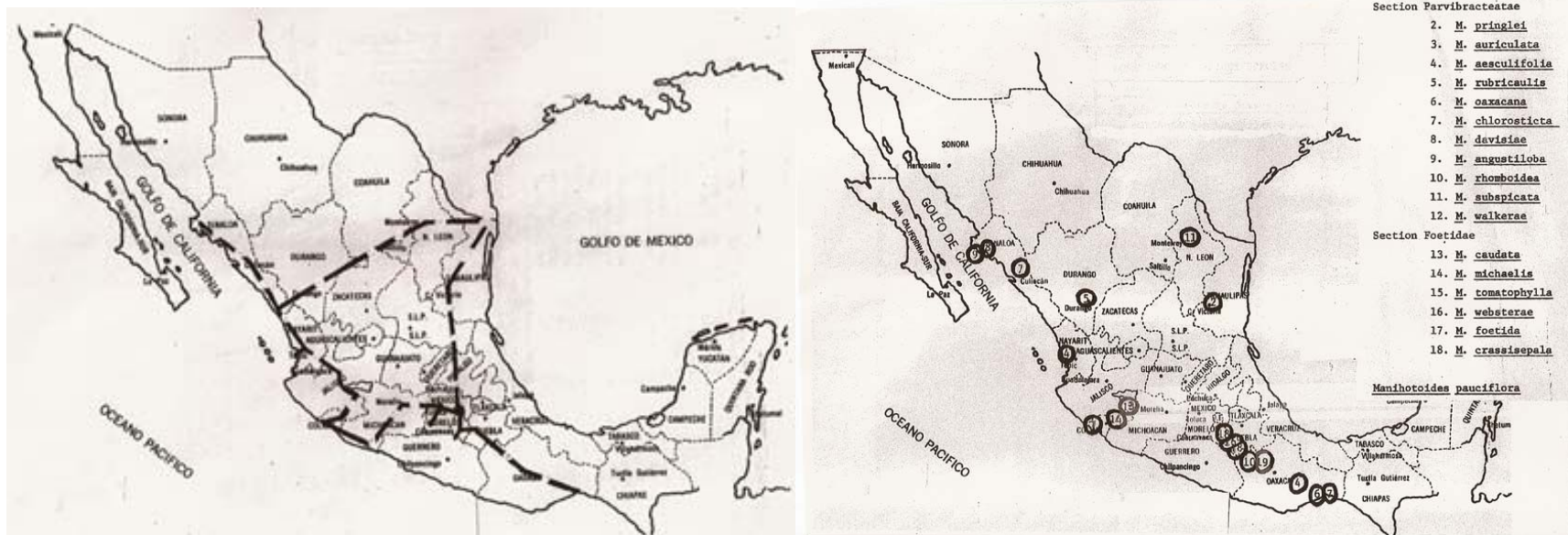
- M. trisis* Mueller
- M. glaziovii* Mueller
- M. sprunosa* Pax et Hoffmann
- M. brachyandra* Pax et Hoffmann
- M. dichotoma* Ule
- M. leptophylla* Pax
- M. reniformis* Pohl
- M. heptaphylla* Ule



Nassar, N. M. A. (1979). A study of the collection and maintenance of the germoplasm of wild cassavas *Manihot* spp. *Turrialba* 29(3), 221-225.

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1.3 Collecting wild Manihot species native to Mexico



NASSAR N.M.A. and Cardenas, R, 1985. Collecting wild cassava in Northern Mexico. **FAO/IBPGR Newsletter 65:29-31.**

M. pringlei

Victoria, Mexico, 1983



NASSAR N.M.A. and Cardenas, R, 1985. Collecting wild cassava in Northern Mexico.
FAO/IBPGR Newsletter 65:29-31.

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M. angustiloba **(Durango, Mexico, 1983)**

Photo
Nagib



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M. subspicata (Tamaulipas, Mexico, 1983)



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Manihotoides pausiflora (Tehuacan, Mexico, 1983)



NASSAR, N. M. A. . Has *Manihotoides pausiflora*, a Cassava Relative, become extinct?.
Diversity, USA, v. 15, n. 2, p. 20-20, 1999.

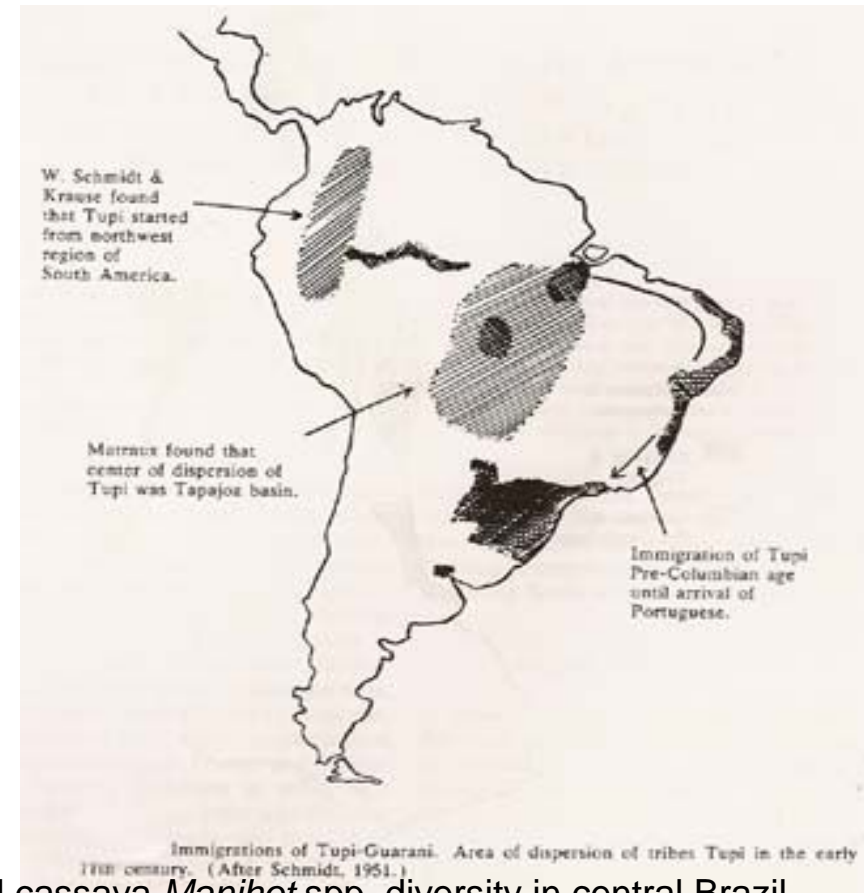
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Natural habitat of *Manihotoides pausiflora*



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1.4 Origin of diversity



NASSAR, N.M.A. 1978 Microcenters of wild cassava *Manihot* spp. diversity in central Brazil. *Turrialba*, 28(4): 345-7.

http://www.geneconserve.pro.br/artigo_10.htm



I 2. Genetic variation and useful characters

The living collection of wild manihot species at the Universidade de Brasília



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Common cassava plant



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M. Glaziovii Muell. Arg.



NASSAR, N. M. A. . Development of cassava interspecific hybrids for savanna (cerrado) conditions. *Jornal of Root Crops*, Thiruvandrum, v. 22, p. 9-17, 1996.

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M. Procumbens Muell. Arg.



Genetic Variation of Wild *Manihot* Species Native to Brazil and Its Potential for Cassava Improvement. *Field Crops Res.*, 13:177-184 (1986)

<http://www.geneconserve.pro.br/reprints4.htm>

M. Pseudoglaziovii Pax & Hoffmann



NASSAR, N.M.A. 1979 Three brazilian Manihot specdies with tolerance to stress conditions. **Can. J. Plant sci**, 59: 533-55.

<http://www.geneconserve.pro.br/reprints17.htm>

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Mean monthly precipitation, evaporation and temperature in natural habitats of *M. caesalpinum*

Month	Precipitation (mm)		Evaporation potential (mm)		Temperature (°C)	
	Picos	Posse	Picos	Posse	Picos	Posse
Jan	98.8	286.2	149.1	129.0	26.3	22.5
Feb	152.3	89.4	138.4	129.3	25.9	22.2
Mar	130.3	68.5	124.8	284.9	25.5	25.3
Apr	81.4	117.5	130.1	167.9	25.4	23.5
May	12.6	16.4	123.4	224.3	24.5	22.5
Jun	4.1	17.6	121.9	230.9	24.3	22.0
Jul	1.1	0.7	121.2	384.1	24.1	21.9
Aug	1.3	20.2	137.7	352.3	26.4	22.8
Sep	3.2	26.3	147.0	269.1	27.8	24.5
Oct	17.9	195.2	160.6	202.4	26.1	24.1
Nov	32.2	204.3	150.3	135.6	26.0	23.9
Dec	61.7	344.1	145.8	128.0	26.2	24.9
Total	556.7	1388.4				

Data from Picos and Posse federal meteorological stations.

NASSAR, N. M. A. . Three Brazilian Manihot Species With Tolerance To Stress Conditions.. *Car. J. Plant Sci.* 59, 2 : 553-555, 1979.

M. nana Muell. Arg.



NASSAR, N.M.A. 1979 A study of the collection and maintenance of the germplasm of wild cassavas. *Manihot* spp. *Turrialba*, 29(3): 221.

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M. neusana Nassar



NASSAR, N. M. A. . *Manihot neusana* Nassar: A New Species Native To Brazil..
CANADIAN JOURNAL OF PLANT SCIENCE, v. 65, n. 3, p. 1087-1100, 1985.

<http://www.geneconserve.pro.br/reprints21.htm>

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M. dichotoma Ule



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