

# Cassava wild species: Diseases evaluation in different regions of Brazil

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## Introduction

- Cassava wild relatives are reservoirs of useful genes to be transferred to cultivated cassava, **but...**
- The number of identified traits, such as disease resistance, is low considering the existent diversity. **Thus,**
- This work aimed to evaluate disease incidence and severity in cassava wild species in order to identify sources of resistance for introgression in elite cassava cultivars.

## Methodology

Seedlings of different accessions of *M. anomala* (Fig. 1A), *M. flabellifolia* (Fig. 1B), *M. glaziovii* (Fig. 1C), *M. peruviana* (Fig. 1D) e *M. dichotoma* (Fig. 1E) planted in São Miguel das Matas (SMM), Tancredo Neves (TN) and Cruz das Almas (CA), in the Bahia State and in Petrolina (PT) in the Pernambuco State were evaluated monthly from 6 to 12 month after planting. SMM, TN and CA are characterized as subhumid environments with different annual average rainfall varying from 1000 to 1800 mm and PT is representative of the semi-arid (around 560 mm).

In all the regions cultivars of *M. esculenta* were planted as comparison pattern and inoculum source. Severity of anthracnose, rust and brown leaf spot was assessed using scales from 0 to 5 class (0: no symptoms and 5: maximum level of susceptibility).

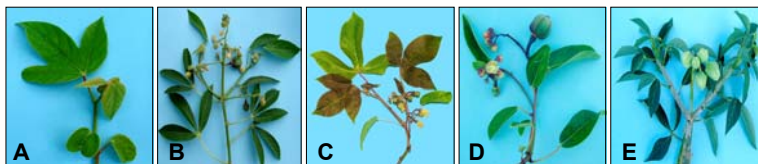


Fig. 1. Cassava wild species. A) *M. anomala*. B) *M. flabellifolia* C) *M. glaziovii*. D) *M. peruviana*. E) *M. dichotoma*

## Results

All the pathogens identified in wild species are common to cultivated cassava (*M. esculenta*). However, disease symptoms can be different, such as brown leaf spot (BLS) in *M. anomala* (Fig. 2A & 2B) and in *M. glaziovii* (Fig. 2C & 2D). In Bahia State the incidence of brown leaf spot (*Cercosporidium henningsii*), white leaf spot (*Phaeoramularia manihotis*), diffuse leaf spot (*Cercospora vicosae*), anthracnose (*Colletotrichum gloeosporioides* f. sp. *manihotis*) and rust (*Uromyces* spp.), was recorded (Fig. 2). In Petrolina, however, only sporadic lesions of BLS were found. BLS was the disease with the highest incidence and severity, being more intense in São Miguel das Matas, Tancredo Neves and Cruz das Almas, respectively (Table 1).

Regarding BLS severity, both inter- and intraspecific differences were observed (Fig. 3). The other diseases showed lower values than BLS, ranging from classes 1 to 2 of the evaluation scale (data not shown). Regardless of localities, accessions of *M. glaziovii* were more susceptible and of *M. flabellifolia* more resistant (Table 1; Fig. 3).

For all the evaluated diseases, accessions with high level of resistance were identified. These accessions are excellent candidates, not only to be used as resistance sources for cassava breeding, but also for studies addressed to understand genetic and molecular basis of disease resistance in cassava.

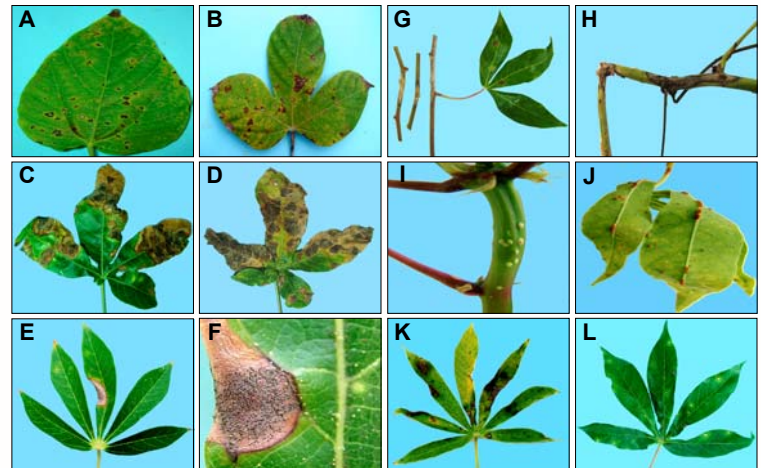


Fig. 2. Symptoms of disease in cassava wild species. Brown leaf spot in *M. anomala* (A & B), *M. glaziovii* (C & D) and *M. peruviana* (E & F). Anthracnose in *M. peruviana* (G & H). Rust in *M. flabellifolia* (I & J). Diffuse leaf spot (K) and Brown leaf spot in *M. peruviana* (L).

Table 1. Disease incidence (%) in cassava wild species in different regions of Brazil

Disease/Specie	SÃO MIGUEL DAS MATAS				
	<i>M. anomala</i>	<i>M. dichotoma</i>	<i>M. flabellifolia</i>	<i>M. peruviana</i>	<i>M. glaziovii</i>
Brown leaf spot	100.00	100.00	100.00	100.00	100.00
White Leaf spot	28.20	60.00	75.00	75.00	0.00
Diffuse leaf spot	0.00	0.00	0.00	7.00	0.00
Anthracnose	14.00	0.00	31.00	42.00	50.00
Rust	85.00	0.00	50.00	78.00	50.00

Disease/Specie	TANCREDO NEVES				
	<i>M. anomala</i>	<i>M. dichotoma</i>	<i>M. flabellifolia</i>	<i>M. peruviana</i>	<i>M. glaziovii</i>
Brown leaf spot	100.00	94.00	100.00	100.00	100.00
White leaf spot	50.00	0.00	80.00	67.50	14.28
Diffuse leaf spot	25.00	0.00	5.00	0.00	0.00
Anthracnose	37.50	0.00	70.00	89.00	0.00
Rust	37.50	29.40	85.00	70.00	0.00

Disease/Specie	CRUZ DAS ALMAS				
	<i>M. anomala</i>	<i>M. dichotoma</i>	<i>M. flabellifolia</i>	<i>M. peruviana</i>	<i>M. glaziovii</i>
Brown leaf spot	92.30	37.50	100	100	100
White leaf spot	7.00	0.00	0.00	42.80	5.88
Diffuse leaf spot	7.00	0.00	66.6	14.28	5.88
Anthracnose	0.00	0.00	10.00	15.00	0.00
Rust	0.00	4.00	0.00	0.00	5.88

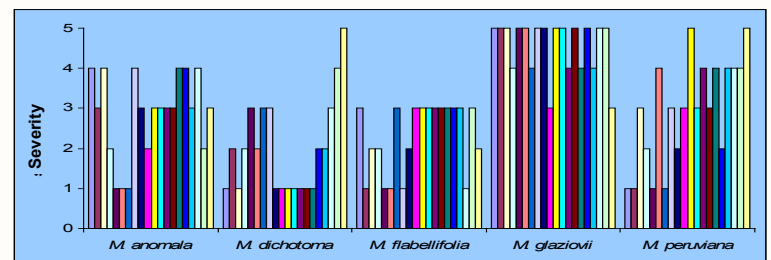


Fig. 3. Severity (in class from 0 to 5) of brown leaf spot in different accessions of cassava wild species in São Miguel das Matas, Bahia, Brazil