

REACTION TO THE ANGULAR LEAF SPOT OF CREOLE BEANS ACCESSIONS CULTIVATED IN NORTH OF MINAS GERAIS, BRAZIL

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Belonging to the *Leguminosae* family, the bean (*Phaseolus vulgaris* L.) is one of the most widespread crops in the world, being grown in almost all tropical and subtropical countries. In addition, it is possible to produce grains up to three times a year in many regions. One of the factors that limit bean productivity and performance is diseases. Among the diseases of major importance, it is worth highlighting the angular bean leaf spot, incited by *Pseudocercospora griseola* (Sacc.) Crous & U. Braun. Given the great progress of plant breeding and the loss of some characteristics of interest, the rescue and maintenance of the genetic diversity of the creole species are considered environmental services and are strategic basis for an agriculture that seeks sustainability (Penteado, 2010). Thus, the aim of this study was to verify the reaction of creole beans accessions to *P. griseola*.

It was evaluated, for the reaction to the angular leaf spot, 24 creole beans accessions, which are commonly cultivated by family farmers of the North of Minas Gerais, Brazil. The seeds come from properties of the following cities Montes Claros, Porteirinha, Pai Pedro, Juramento, Lagoa dos Patos, Itacambira, Bocaiúva and São Francisco. It was used eight races (isolates) known to be virulent and highly aggressive, all kept in the mycological bank of the Biotechnology Laboratory (ICA/UFMG). The inoculums of each race (isolate) were obtained by multiplying the fungus in Petri dishes containing a mix of distilled water, tomato sauce, agar and calcium carbonate (CaCO_3) (Sanglard et al., 2009). Using scissors previously sterilized in alcohol, one of the primary leaves of the plants tested was cut ten days after sowing, when it presented approximately 2/3 of its complete development. Subsequently, it was immersed in an inoculum suspension, in concentration of 2.0×10^4 conidia/mL. Then, the leaves were transferred individually to Petri dishes (90 x 15 mm) containing filter paper previously moistened with 3.0 mL of distilled water. These Petri dishes were then incubated in a climatic chamber (B.O.D.) at 20°C, in periods of 12 hours of light per day, with a light incidence of approximately $28 \mu\text{moles/m}^2 \cdot \text{s}$. Every three days from the inoculation, 1.5 mL of distilled water was added to the filter paper of each petri dish until the disease symptoms were verified (Ragagnin et al., 2005). Thus, it was possible to maintain humidity high inside the plates. The severity of the disease was visually evaluated at 15, 18 and 21 days after inoculation, using a nine-degree severity scale proposed by Pastor-Corrales & Jara (1995). Twelve leaves of each accession, collected from individual plants, were inoculated. Reactions in the leaves with grades from one to three were considered resistant; intermediate resistance with grades between three and six; and susceptible with grades between six and nine.

The results confirm the great difficulty in the identification of genotypes with wide resistance to the angular leaf spot disease. Among the 24 Creole accesses tested, 21 were intermediate and / or susceptible to at least five races (isolates) (Table 1). However, the accesses 'Andu Indiano', 'Moiacho' and 'Rosa Precoce' were resistant to seven, seven and six of the eight races tested, respectively. In addition, they were also those that showed significantly lower averages of severity. Orozco & Araya (2005) have already demonstrated that, in places where Mesoamerican-type beans

are exclusively cultivated, selection on the prevailing populations of *P. griseola* occurs, which leads to the enhancement of correspondent races to the host gene pool.

This behavior type confirms that, in the North of Minas Gerais, there are predominance of races of the Mesoamerican group, as it happens in the rest of the country. With the observed data, that is, considering the presence of few genotypes with resistance to a large number of races, it can be concluded that only the use of complete vertical resistance is not the best strategy to be used to control this disease. Therefore, it is suggested that genotypes with the highest degrees of horizontal and partial resistance should also be used as source of resistance. Another relevant possibility to control the angular leaf spot would be the use of multilines cultivars (Sartorato, 2006). The results obtained in this study are relevant for genetic plant breeding programs, since they direct the researches of resistance sources identification.

Table 1. Reaction of 24 creole bean accessions, collected in Minas Gerais, to races (isolates) of *P. griseola*.

Races (Isolates) of <i>P. griseola</i>	Accessions of creole beans cultivated in North of Minas Gerais, Brazil																							
	Andu Indiano	Andu Manteiga	Andu Preto Precocce	Azul Claro	Azul Roxo	Bonina	Branco Mineiro	Campeiro Preto	Chamego Preto	Catador Grande	Jalo Precocce	Mangalô	Meguito	Moiacho	Ouro Velho	Parto Mineiro	Radiante Preto	Rajado Precocce	Rosa Precocce	Rosinha Mineiro	Roxim Mineiro	Sangue de Boi	Santo Antônio	Tocão
63.63	1.4	5.8	2.5	7.0	8.0	6.6	6.5	8.3	6.8	6.0	6.9	7.2	2.6	2.2	5.2	6.0	5.6	7.7	7.1	4.0	2.5	5.2	3.8	4.2
63.47	2.5	7.3	5.9	3.6	2.8	4.0	3.8	5.4	6.1	5.0	3.5	4.1	4.0	2.5	5.2	4.9	6.2	5.5	2.5	1.4	7.9	5.0	4.6	3.6
63.23	1.0	2.5	3.6	3.4	7.1	5.5	4.0	5.0	3.2	2.1	7.1	6.0	4.6	1.5	4.1	5.9	7.2	7.1	1.7	3.7	3.7	4.0	5.8	7.0
63.7	2.7	3.8	2.9	6.7	5.4	3.5	1.9	4.1	1.9	3.8	3.4	5.5	7.4	3.0	7.6	4.0	4.0	3.6	2.6	7.0	5.6	3.8	6.0	4.2
47.39	5.5	6.1	6.0	2.5	3.1	7.9	3.9	3.1	4.0	3.0	1.7	5.1	3.3	1.7	5.1	3.8	4.2	3.6	2.6	1.1	4.0	3.1	6.2	3.1
31.7	2.1	5.0	6.0	7.0	4.8	5.5	7.2	5.0	7.1	2.2	3.4	3.1	4.6	1.9	6.0	5.5	3.5	8.6	4.2	5.0	4.3	6.0	2.7	3.5
31.4	2.2	4.5	2.2	3.8	8.5	4.7	3.3	5.6	4.5	4.3	3.7	5.2	4.2	2.9	7.1	3.1	4.4	3.6	1.6	4.5	4.3	3.5	5.1	1.5
23.23	3.0	7.0	3.9	4.4	2.0	4.6	2.9	5.7	3.3	8.0	3.8	2.5	3.6	3.1	4.5	5.5	8.4	4.5	2.4	4.1	8.0	3.5	4.9	5.1

Severity averages calculated by the evaluation of 12 leaves of each access. Reactions in the leaves with grades from one to three were considered resistant; intermediate resistance with grades between three and six; and susceptible with grades between six and nine.

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