PATHOGENIC VARIABILITY OF *Phaeoisariopsis griseola* IN COMMON BEANS

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In recent years, angular leaf spot of common bean, caused by the fungus *Phaeoisariopsis griseola* (Sacc.) Ferraris, turned out to be one of the most important bean production constraints in Brazil. Losses can be as high as 70% under disease favorable environmental conditions (intermittent dry-wet and warm-cool weather). This disease can be efficiently controlled by means of fungicide sprays and resistant cultivars. Although chemical control should be considered as an important control method, it can be dangerous to nature, farmer and consumer. Consequently, breeding for disease resistance is the most practical, economical and safe approach for angular leaf spot disease management. However, the strategy for developing new resistant cultivars requires an understanding of the genetic variation of the pathogen. Although several previous studies have reported pathogenic variation in *P. griseola* more study has to be done in order to understand the population dynamic of the pathogen and, as a result, identify new source of resistance to the disease. The objective of this study was to identify pathotypes of *P. griseola* in Brazil for later use in a breeding program to develop new angular leaf spot resistant bean cultivars.

Forty to fifty diseased bean leaves from cultivars Jalo Precoce, Rudá and Pérola was collected, at random, in Inhumas county, in the State of Goiás, Brazil. From each leaf collected in the field, it was isolated about two to three fungal colonies, resulting in 113 isolates. Up to now, only 50 of these isolates were tested. After a single spore isolation, cultures were stored either in individual glass flasks with sterile distilled water in the refrigerator (± 4 °C) or by the filter paper method. A set of 12 differential cultivars established at CIAT - Centro Internacional de Agricultura Tropical - besides the line AND 277 and the susceptible cultivar Rosinha G-2 were used for inoculation with *P. griseola* single spore isolates. Bean seeds were sown in aluminum pots with 2,0 kg of soil at the rate of 5 seeds/pot. Spores for inoculation were obtained by culturing the fungus in Petri dishes containing bean leaf-dextrose-agar medium kept in a BOD chamber at 24 ± 2 °C in darkness. After 14 days, 5-10 ml of sterile distilled water was added to each plate and the spore suspension was filtered in a double layer of cheesecloth for the removal of the pathogen mycelium. The spore suspension was adjusted to a concentration of 2×10^4 conidia.ml^{-1}. Inoculation was done when plants were in the V3 stage (14-16 days old). After inoculation, plants were incubated in a moist chamber (RH > 95%, at 25 ± 2°C) for 48 hours, with a 12 h photoperiod. Plants were maintained in greenhouse benches for another 14-18 days and evaluated for symptoms according to a 1 to 9 descriptive scale. Plant ratings 1 to 3 were considered resistant and 4 to 9 susceptible. When inoculated plants in the greenhouse showed symptoms with no sporulation, they were transferred to a moist chamber for 20-24 hours. Plants exhibiting non-sporulating lesions were considered resistant.

Isolates exhibited a different virulence pattern when inoculated on the 12 bean differential genotypes. From the 56 single spore isolates tested, it was identified nine different pathotypes of *P. griseola* (Table 1). This data shows that this pathogen is very variable even within a given area. Not including the pathotypes 31-15, 31-31, 47-31 and 55-31, all others were capable of inducing compatible reactions in all Andean cultivars. The pathotype 63-31 was the most widespread followed by the pathotypes 63-15, 31-31 and 63-63. The identification of the pathotype 63-63,

which "brokes" the resistance genes present in all differential cultivars, seems to be important for a breeding program aiming to develop new cultivars with resistance to this pathogen. This fact reinforces the necessity of a continuous search for new resistance gene sources to angular leaf spot in Brazil. Although most of the time accessions Cornell 49-242 and AND 277 have shown the same disease reaction (resistant or susceptible) when considering the accession AND 277 as a differential cultivar, the pathotype 63-63 could, some time, be divided into two different groups of isolates representing two different pathogenic entities: one that overcame the AND 277 resistance gene (s) and the other that did not. This shows that the accession AND 277 presents some genes that are different from those in the genotype Cornell 49-242.

Table 1. Reaction of differential cultivars inoculated with 56 isolates of *Phaeoisariopsis griseola* collected in Inhumas county, in the State of Goiás, Brazil. Embrapa Rice and Beans, 2000/2001.

Pathot	Andean beans						Middle American beans						Number
	1[a]	2	3	4	5	6	7	8	9	10	11	12	of Isolates
31-15	+	+	+	+	+	-[c]	+	+	+	+	-	-	1
31-31	+[b]	+	+	+	+	-	+	+	+	+	+	-	3
47-31	+	+	+	+	-	+	+	+	+	+	+	-	1
55-31	+	+	+	-	+	+	+	+	+	+	+	-	2
63-07	+	+	+	+	+	+	+	+	+	-	-	-	1
63-15	+	+	+	+	+	+	+	+	+	+	-	-	6
63-23	+	+	+	+	+	+	+	+	+	-	+	-	2
63-31	+	+	+	+	+	+	+	+	+	+	+	-	37
63-63	+	+	+	+	+	+	+	+	+	+	+	+	3

[a](1)Don Timóteo; (2) G 11796; (3) Bolón Bayo; (4) Montcalm; (5) Amendoin; (6) G 5686: (7) Pan 72;
(8) G 2858; (9) Flor de Mayo; (10) Mexico 54; (11) BAT 332; (12) Cornell 49-242.
[b] Compatible reaction (+)
[c]Incompatible reaction (-)

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