PATHOGENIC VARIABILITY AMONG ISOLATES OF *PSEUDOCERCOSPORA GRISEOLA* COLLECTED IN MINAS GERAIS STATE

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INTRODUCTION

Common bean (*Phaseolus vulgaris* L.) can host several pathogens, including the *Pseudocercospora griseola* (Sacc.) Crous & U. Braun fungus, causal agent of angular leaf spot (ALS). This disease is responsible for significant crop damage in Brazil. Yield losses may reach up to 70%. The development of resistant cultivars is pivotal to any effective strategy used to control ALS. Constant evaluation of pathogenic variability is of crucial importance for the development of adequate pathogen resistant cultivars. The objective of this study was to evaluate the pathogenic variability of 48 isolates of *P. griseola*, collected in Minas Gerais State, Brazil.

MATERIAL AND METHODS

A collection of 48 isolates of *P. griseola* was obtained from naturally-infected bean leaves and pods collected in experimental fields in the counties of Lavras (27 isolates), Ijaci (19 isolates) and Alterosa (2 isolates), in the state of Minas Gerais, MG, Brazil. A set of 12 differential cultivars, plus the Rosinha G-2 cultivar (susceptible) and AND 277 cultivar (resistant), were used to classify *P. griseola* pathotypes. Seeds from differential cultivars were sowed in aluminum pots at a density of five seeds per pot containing 2.0 kg of soil. Spores for inoculation were obtained by culturing the fungus on bean leaf-dextrose-agar medium. Inoculum concentration was adjusted at the level of $2x10^4$ conidia.ml^{-1}. The first trifoliate leaf from each differential cultivars was inoculated (on both sides) at the V_3 development stage. The inoculated plants were incubated in a moist chamber, > 95% of RH, for 48 h (22±2°C) with a 16-h photoperiod and then transferred to the greenhouse. Disease reactions were scored 14-18 days after inoculation according to the 1-9 descriptive scale developed at CIAT. Plants rated 1 to 3 presenting incompatible reaction, whereas plants with scores 4 or higher presenting compatible reaction.

RESULTS AND DISCUSSION

Isolates were classified into 10 pathotypes (Table 1). Pathotype 63-63 was the most widespread. Pathotypes 55-15 and 63-25 were identified just in the county of Lavras-MG. Pathotype 63-27 occurred only in the county of Alterosa-MG. Pathotypes 55-15, 63-15, 63-25 and 63-27 had not been previously reported in Minas Gerais State. Furthermore, this is the first report on the occurrence of pathotypes 55-15, 63-25 and 63-27 in Brazil. Pyramiding resistance alleles from both gene pools (Andean and Mesoamerican) can be an efficient control strategy, considering that ALS genetic resistance is monogenic (Mahuku et al. 2002; Sartorato, 2004). Taking into account that the ALS genetic resistance is inheritance more complex, the recurrent selection is a good alternative, since it provides an increasing number of favorable resistance alleles to the same lineage (Ramalho et al. 2001). The pathotypes (63-31 and 63-63) presented wide adaptation to different regions, generated by the free grain trade within the state. The high frequency of the pathotype 63-63 observed in this work poses a risk due to a wide pathogenicity spectrum, revealing the need for a continuous search

for new ALS resistance. The differential cultivars BAT 332 (*Phg-6*^{2}) and Cornell 49-242 (*Phg-3*) are important sources of resistance for a breeding program to control ALS.

CONCLUSIONS

A large variability among *P. griseola* isolates has been demonstrated, emphasizing the great potential of this fungus to generate variability. Information gained from this study has significant implications for regional ALS resistance breeding.

TABLE 1 Pathotype identification and reaction of differential cultivars to the isolates of *Pseudocercospora griseola* collected in Minas Gerais State.

Pathotype	Differential cultivars												Number of isolates
	Andean[a]						Mesoamerican[b]						
	2^0	2^1	2^2	2^3	2^4	2^5	2^0	2^1	2^2	2^3	2^4	2^5	
Lavras													**27**
55-15	+[c]	+	+	-[d]	+	+	+	+	+	+	-	-	1
63-15	+	+	+	+	+	+	+	+	+	+	-	-	1
63-25	+	+	+	+	+	+	+	-	-	+	+	-	1
63-31	+	+	+	+	+	+	+	+	+	+	+	-	6
63-47	+	+	+	+	+	+	+	+	+	+	-	+	1
63-63	+	+	+	+	+	+	+	+	+	+	+	+	17
Ijací													**19**
63-07	+	+	+	+	+	+	+	+	+	-	-	-	1
63-15	+	+	+	+	+	+	+	+	+	+	-	-	2
63-23	+	+	+	+	+	+	+	+	+	-	+	-	1
63-31	+	+	+	+	+	+	+	+	+	+	+	-	6
63-47	+	+	+	+	+	+	+	+	+	+	-	+	2
63-55	+	+	+	+	+	+	+	+	+	-	+	+	2
63-63	+	+	+	+	+	+	+	+	+	+	+	+	5
Alterosa													**2**
63-27	+	+	+	+	+	+	+	+	-	+	+	-	1
63-63	+	+	+	+	+	+	+	+	+	+	+	+	1
Total	48	48	48	47	48	48	48	47	46	44	40	28	48

[a] 2^0 - Don Timóteo; 2^1 – G11796; 2^2 – Bolón Bayo; 2^3 – Montcalm; 2^4 – Amendoin; 2^5 – G5686.
[b] 2^0 – Pan 72; 2^1 – G2858; 2^2 – Flor de Mayo; 2^3 – Mexico 54; 2^4 – BAT 332; 2^5 – Cornell 49-242.
[c] Compatible reaction (+).
[d] Incompatible reaction (-).

ACKNOWLEDGEMENTS

The authors thank the National Council for Scientific and Technological Development, CNPq, for the scholarship and for funding the project.

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