INHERITANCE OF ANTHRACNOSE RESISTANCE IN COMMON BEAN DIFFERENTIAL CULTIVAR AB 136

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Inheritance of anthracnose resistance of the common bean (*Phaseolus vulgaris* L.) differential cultivar AB 136 to races 89, 64 and 73 (binary system designation) was studied in crosses with the susceptible differential cultivars Michelite (race 89), Mexico 222 (race 64) and Cornell 49-242 (race 73) (Table 1). For each cross, the following number of seeds were sowed in the greenhouse in a completely randomized design: 30 seeds from each progenitor, 30 F_1 seeds, 195 F_2 seeds, and 60 seeds from each backcross (BC_r and BC_s). Fourteen days after sowing the first expanded trifoliate leaf from each of the 405 plants was inoculated on the lower and upper leaf surfaces with spore suspensions of *Colletotrichum lindemuthianum* (1.2×10^6 spores/ml) with a horse-hair paint brush. The plants were then incubated for seven days in a mist chamber, which was maintained at 20 - 22 °C and 100% relative humidity. After this period, each plant was scored visually for the disease symptoms using a 1 - 9 scale based on Pastor-Corrales (1992).

Our results (Tables 2-4) indicate that a single dominant gene(s) controls resistance to races 89 and 64, giving a segregation ratio of 3:1 in the F_2, 1:0 in the backcrosses to AB 136 and 1:1 in the backcross to Michelite (race 89), and to Mexico 222 (race 64). For race 73, the following segregation ratios between resistant and susceptible plants were observed: 13:3 in the F_2, 1:0 in the backcross to AB 136, 1:1 in the backcross to Cornell 49-242. Such results suggest that two independent genes may determine resistance of AB 136 to race 73, one dominant (*Co-6*) and one recessive, which we tentatively designated *Co-8*.

Given the dominant nature of anthracnose resistance genes present in line AB 136 and to the broad spectrum of resistance in this cultivar (Rava et al., 1994) we included it as one of the donor parents in our molecular marker assisted backcross breeding program, to develop common bean cultivars resistant to anthracnose and adapted to Central Brazil.

Table 1 - Origin of isolates of *Colletotrichum lindemuthianum*[a] used in the experiments.

Race (Binary system)	Group/Race (Classical nomenclature)	Origin (State - country)
64	Mexicano I/ Mexicano I	Espirito Santo - Brazil
73	Alfa/Alfa BR	Espirito Santo - Brazil
89	Alfa/Alfa BR	Minas Gerais - Brazil

[a] Rava et al., 1994.

Table 2 - Segregation for resistance to race 89 of *C. lindemuthianum* in the cross Michelite x AB 136.

Pedigree	Generation	No. of Plants		Expected ratio	χ^2	P
		Resistant	Susceptible			
Michelite	P1	0	27	-	-	-
AB 136	P2	30	0	-	-	-
Michelite x AB 136	F1	17	0	-	-	-
Michelite x AB 136	F2	129	42	3:1	0.031	0.9
F1 x Michelite	BCs	29	30	1:1	0.017	0.9
F1 x AB 136	BCr	56	0	1:0	0.000	1.0

Table 3 - Segregation for resistance to race 64 of *C. lindemuthianum* in the cross Mexico 222 x AB 136.

Pedigree	Generation	No. of Plants		Expected ratio	χ^2	P
		Resistant	Susceptible			
Mexico 222	P1	0	30	-	-	-
AB 136	P2	30	0	-	-	-
Mexico 222 x AB 136	F1	22	0	-	-	-
Mexico 222 x AB 136	F2	145	45	3:1	0.175	0.7
F1 x Mexico 222	BCs	28	31	1:1	0.152	0.7
F1 x AB 136	BCr	56	0	1:0	0.000	1.0

Table 4 - Segregation for resistance to race 73 of *C. lindemuthianum* in the cross Cornell 49-242 x AB 136.

Pedigree	Generation	No. of Plants		Expected ratio	χ^2	P
		Resistant	Susceptible			
Cornell 49-242	P1	0	30	-	-	-
AB 136	P2	27	0	-	-	-
Cornell 49 x AB 136	F1	22	0	-	-	-
Cornell 49 x AB 136	F2	155	35	13:3	0.013	0.9
F1 x Cornell 49-242	BCs	27	31	1:1	0.275	0.7
F1 x AB 136	BCr	58	0	1:0	0.000	1.0

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REFERENCES

Pastor-Corrales, M. 1992. Recomendaciones y acuerdos del primer taller de antracnosis en América Latina. Pages 240-250 in: La antracnosis del frijol común, *Phaseolus vulgaris*, en América Latina. Doc. de trabajo 113. Centro Internacional de Agricultura Tropical, Cali, Colombia.

Rava, C., Purchio, A. and Sartorato, A. 1994. Caracterização de patótipos de *Colletotrichum lindemuthianum* que ocorrem em algumas regiões produtoras de feijoeiro comum. Fitopatol. bras. 19:167-172.