

IDENTIFICATION OF RAPD MARKERS LINKED TO RESISTANCE GENES TO ANTHRACNOSE IN COMMON BEAN CULTIVARS AB 136, TO AND G 2333

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Anthracnose is a fungal disease caused by *Colletotrichum lindemuthianum* (Sacc. & Magn) Scrib., which attacks the common bean (*Phaseolus vulgaris* L.) in Brazil and in other parts of the world. The main goal of this work was to identify RAPD markers linked to genes for anthracnose resistance present in differential cultivars AB 136, TO and G 2333. These markers will be used to facilitate the pyramiding of these genes in cultivar Rudá, a "carioca" type commercial variety widely grown and consumed in Brazil.

Three populations derived from crosses between the resistant cultivars AB 136, TO and G 2333 with Rudá (susceptible to races 65, 89 and 73 of *C. lindemuthianum*) were used. Primer OPAZ20 revealed a DNA marker of 940 bp linked in coupling phase at 7.1 cM of Co-6 resistance gene in the F₂ population derived from the cross Rudá X AB 136 inoculated with race 89 (Table 1). Markers OPH1 and OPZ04, previously identified by Young & Kelly (1997) and Alzate-Marin et al. (1997), respectively, were analyzed in the same population. OPZ04 did not reveal polymorphisms between Rudá and AB 136 and OPH1 revealed a DNA band linked in coupling phase at 23.7 cM of Co-6 (Table 1).

In the F₂ population derived from the cross Rudá X TO and inoculated with race 65 of *C. lindemuthianum*, two primers OPY20 and OPC08 revealed two DNA bands of 830 and 900 bp linked in coupling phase to Co-4 resistance gene (0.0 and 9.7 cM, respectively). In the same cross, primer OPB03 revealed one band of 1,800 bp linked in repulsion phase (3.7 cM) to Co-4 (Table 1).

In the BC₂F₂ population from the cross Rudá x G 2333 inoculated with race 73 of *C. lindemuthianum*, primer OPH18 revealed a marker linked in coupling phase at 9.2 cM of one of the resistance genes present in G2333 (Table 1). This marker was not linked to resistance in population BC₁F₂ from the same cross inoculated with race 89. Additional research is needed to confirm if the second gene present in this cultivar is responsible for resistance to race 89.

Table 1-Linkage analysis between molecular markers and resistance genes in crosses involving cultivars AB 136, TO and G 2333

Cross	Locus tested	Expected ratio	Observed ratio	χ^2	P	cM**
Rudá x AB136	Co-6/OPAZ20	9:3:3:1	176:13:2:48	149.57	0.00	7.1±0.05
Rudá x AB136	Co-6/OPAH1	9:3:3:1	155:34:8:42	84.77	0.00	23.7±0.05
Rudá x TO	Co-4/OPY20	9:3:3:1	125:0:0:46	189.43	0.00	0.0±1.1
Rudá x TO	Co-4/OPC08	9:3:3:1	112:12:12:35	82.99	0.00	9.7±2.1
Rudá x TO	Co-4/OPB03	9:3:3:1	80:45:46:0	156.64	0.00	3.7±1.5
Rudá x G 2333	RG2333*/H18	9:3:3:1	96:10:1:28	40.23	0.00	9.27±0.07

* Resistance gene present in G 2333.

** Distance, in centimorgans, between markers and resistance genes.

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