

ANALYSIS OF THE PATHOGENIC VARIABILITY OF *Colletotrichum lindemuthianum* IN BRAZIL

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Understand the pathogenic variability and the knowledge of broadly based sources of resistance are fundamental points in a breeding program. Consequently, the main goal of this work was to identify, among the *Colletotrichum lindemuthianum* differential cultivars, those with most ample resistance spectra for this pathogen in Brazil. All data were collected from the most important previously published papers of the Brazilian isolates of this fungus that were classified by using the differential series developed by Pastor Corrales (CIAT - Document 113, p. 249, 1992).

Our analyses showed that between 1994 and 2002, it was identified a total of 50 *C. lindemuthianum* pathotypes in Brazil (Table 1). Pathotypes 65, 73, 81 and 87 are the most frequent and wide distributed in the country, and are commonly found in the States of Paraná, Santa Catarina, Goiás and Distrito Federal. Pathotypes 1, 5, 17, 67, 79, 85, 86, 93, 96, 102, 105, 111, 117, 121, 123, 125, 137, 193, 217, 320, 321, 339, 343 and 585 were identified in only one Brazilian State. Although the number of collected isolates was different from each State, our data showed that the Paraná State presented the highest *C. lindemuthianum* variability (29 pathotypes) followed by the States of Goiás (17 pathotypes), Santa Catarina (16 pathotypes) and Rio Grande do Sul (14 pathotypes) (Table 1).

Differential cultivars carrying the gene *Co-4* and its alleles and genes *Co-6* and *Co-5*, individuality or in association with others genes, are those that confer the highest resistance to this disease in Brazil. Consequently, the cultivars G 2333 (*Co-4*², *Co-5* and *Co-7*), PI 207262 (*Co-4*³ and *Co-9*) and TO (*Co-4*) are incompatible with 50, 45 and 44 *C. lindemuthianum* pathotypes, respectively. The cultivars AB 136 (*Co-6* *co-8*) and TU (*Co-5*) confers resistance to 50 and 49 pathotypes, respectively. The allele *Co-1*² of Andean cultivar Kaboon, is the principal Brazilian Andean resistance source to anthracnose and is incompatible with 36 pathotypes originally collected mainly from the States of Espírito Santo, Mato Grosso do Sul, Minas Gerais, Bahia, Distrito Federal and Rio Grande do Sul. The *Co-2* gene of Cornell 49-242 confers resistance to 29 pathotypes, in several Brazilian States, including pathotypes 65, 81 and 87, widely distributed in Brazil (Table 1).

References (Table 1):

^bBalardin et al., 1997 (Phytopathology v.87, p.1184-1191); ^cBalardin, 1997 (Fitopatol. Bras. v.22, n.1, p. 50-53); ^dRava, et al., 1994 (Fitopatol. Bras., v.19, n.2, p.167-172); ^eThomazella et al., 2000 (BIC. v.43, p.82-83); ^fAndrade et al., 1999 (RENAFE-Brasil, Doc. 99. pp.242-244); ^gSartorato, 2002 (VII congresso nacional de pesquisa de feijão – Viçosa, Brasil-. p.114-116); ^hTalamini et al., 2002 (VII congresso nacional de pesquisa de feijão. Viçosa, Brasil, p.187-189).

Table 1. Pathotypes of *C. lindemuthianum* identified in Brazil.

	Virulence phenotype of differential cultivars												Pathotype	Brazilian States ¹														
	1 ^a	2	3	4	5	6	7	8	9	10	11	12		P R	G O	S C	R S	M G	E S	B A	D F	M S	P E	P B	S P	R J	S E	
1	+	-	-	-	-	-	-	-	-	-	-	-	1 ^{b,f}	X														
2	+	-	+	-	-	-	-	-	-	-	-	-	5 ^c			X							X					
3	+	+	+	-	-	-	-	-	-	-	-	-	7 ^{d,e,f}	X		X							X					
4	-	-	-	+	-	-	-	-	-	-	-	-	8 ^{d,h}		X			X										
5	+	-	-	-	+	-	-	-	-	-	-	-	17 ^c				X											
6	+	+	+	-	+	-	-	-	-	-	-	-	23 ^{c,d,f}		X		X			X			X					
7	+	+	+	+	+	-	-	-	-	-	-	-	31 ^{c,e}	X			X											
8	+	+	+	-	+	+	-	-	-	-	-	-	55 ^{c,d}	X		X	X											
9	-	-	-	-	-	-	+	-	-	-	-	-	64 ^{d,f}	X			X		X									
10	+	-	-	-	-	-	+	-	-	-	-	-	65 ^{c,d,e,f,g,h}	X	X	X	X	X	X	X	X	X		X				
11	+	+	-	-	-	-	+	-	-	-	-	-	67 ^d					X										
12	+	-	+	-	-	-	+	-	-	-	-	-	69 ^{e,f,g}	X	X		X	X			X							
13	+	+	+	-	-	-	+	-	-	-	-	-	71 ^{f,g}		X					X								
14	-	-	-	+	-	-	+	-	-	-	-	-	72 ^{d,f,g}	X			X		X									
15	+	-	-	+	-	-	+	-	-	-	-	-	73 ^{c,d,e,f,g}	X	X	X	X		X		X	X			X	X		
16	+	+	-	+	-	-	+	-	-	-	-	-	75 ^{d,g}			X			X									
17	+	-	+	+	-	-	+	-	-	-	-	-	77 ^g	X	X	X	X											
18	+	+	+	+	-	-	+	-	-	-	-	-	79 ^d						X									
19	+	-	-	-	+	-	+	-	-	-	-	-	81 ^{d,e,f,g,h}	X	X	X		X		X	X	X	X		X			
20	+	+	-	-	+	-	+	-	-	-	-	-	83 ^{d,g}		X			X										
21	+	-	+	-	+	-	+	-	-	-	-	-	85 ^g					X										
22	-	+	+	-	+	-	+	-	-	-	-	-	86 ^f				X											
23	+	+	+	-	+	-	+	-	-	-	-	-	87 ^{d,e,f,g,h}	X	X	X	X	X	X	X	X		X	X				
24	+	-	-	+	+	-	+	-	-	-	-	-	89 ^{d,e,f,g}	X	X	X		X					X					X
25	+	-	+	+	+	-	+	-	-	-	-	-	93 ^g	X														
26	+	+	+	+	+	-	+	-	-	-	-	-	95 ^{d,e,g}	X		X												
27	-	-	-	-	-	+	+	-	-	-	-	-	96 ^g	X														
28	+	-	-	-	-	+	+	-	-	-	-	-	97 ^{d,f,g}	X	X		X											
29	+	-	+	-	-	+	+	-	-	-	-	-	101 ^{d,g}	X						X	X							
30	-	+	+	-	-	+	+	-	-	-	-	-	102 ^d	X														
31	+	-	-	+	-	+	+	-	-	-	-	-	105 ^g	X														
32	+	-	+	+	-	+	+	-	-	-	-	-	109 ^{f,g}	X	X	X												
33	+	+	+	+	-	+	+	-	-	-	-	-	111 ^{f,g}				X											
34	+	-	+	-	+	+	+	-	-	-	-	-	117 ^d			X												
35	+	+	+	-	+	+	+	-	-	-	-	-	119 ^{d,e}			X		X		X	X		X					
36	+	-	-	+	+	+	+	-	-	-	-	-	121 ^f				X											
37	+	+	-	+	+	+	+	-	-	-	-	-	123 ^g	X														
38	+	-	+	+	+	+	+	-	-	-	-	-	125 ^g			X												
39	+	+	+	+	+	+	+	-	-	-	-	-	127 ^g	X	X													
40	+	-	-	+	-	-	-	+	-	-	-	-	137 ^f	X														
41	+	-	-	-	-	-	+	+	-	-	-	-	193 ^g	X														
42	+	-	-	+	+	-	+	+	-	-	-	-	217 ^f				X											
43	+	-	-	+	+	+	+	+	-	-	-	-	249 ^f	X		X												
44	-	-	-	-	-	-	+	-	+	-	-	-	320 ^f	X														
45	+	-	-	-	-	-	+	-	+	-	-	-	321 ^g	X														
46	+	-	-	-	+	-	+	-	+	-	-	-	337 ^b															
47	+	+	-	-	+	-	+	-	+	-	-	-	339 ^d										X					
48	+	+	+	-	+	-	+	-	+	-	-	-	343 ^d										X					
49	+	-	+	-	-	-	+	+	+	-	-	-	453 ^{c,d}	X			X											
50	+	-	-	+	-	-	+	-	-	+	-	-	585 ^d						X									
S	43	19	24	21	23	15	41	5	6	1	0	0																
R	7	31	26	29	27	35	9	45	44	49	50	50	Total	29	17	16	14	9	9	7	7	6	5	2	2	1	1	

^a1=Michelite, 2=Michigan Dark Red Kidney, 3=Perry Marrow, 4=Cornell 49-242, 5=Widusa, 6=Kaboon, 7=México 222, 8=PI 207262, 9=TO, 10=TU, 11=AB 136, 12=G 2333. ¹PR=Paraná, GO=Goiás, SC=Santa Catarina, RS=Rio Grande do Sul, MG=Minas Gerais, ES=Espirito Santo, BA=Baía, DF=Distrito Federal, MS=Mato Grosso do Sul, PE=Pernambuco, PB=Paraíba, SP=São Paulo, RJ=Rio de Janeiro, SE=Sergipe.