INHERITANCE OF ANGULAR LEAF SPOT RESISTANCE AND RAPD MARKERS LINKED TO DISEASE RESISTANCE GENE IN COMMON BEANS

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Angular leaf spot, caused by the fungus *Phaeoisariopsis griseola*, is one of the most important bean diseases in Brazil. Losses due to this disease can be as high as 70%. The pathogen has demonstrated to be highly variable and a large number of pathotypes has been identified. Although it can be controlled by fungicides, the safest and most effective way to control the disease is through genetic resistance. As a result, any breeding program is dependent on the identification of the pathogen variability as well as on new resistance genes to be transferred into local cultivars.

The objectives of this study were to determine the inheritance of disease resistance and to identify RAPD markers linked to angular leaf spot resistant gene(s) within a segregating population derived from the cross between the mesoamerican cultivars Mexico 54 (resistant) x Ruda (susceptible). The progenitors, the F_1, F_2 and the backcross-derived plants were inoculated with *P. griseola* pathotype 63-19 under greenhouse conditions. Plants were inoculated with a spore suspension of 2×10^4 conidia.ml^{-1} 20 days after germination and rated for disease severity 12 days after inoculation according to a 1 to 9 scale. Plants rated 4 with up to 15% of disease severity were considered to be resistant.

Segregation ratios of 3:1 in the F_2, 1:0 in the backcross to Mexico 54 and 1:1 in the backcross to Ruda indicate that a single dominant gene controls disease resistance in cultivar Mexico 54 to pathotype 63-19. In the F_2 population primers OPN 02, OPAC 14 and OPE 04 revealed the presence of three RAPD markers of 890, 2,400 and 650 base pairs linked in coupling phase, at 5.9, 6.6 and 11.8 cM of the resistance gene, respectively. We propose the name *Phg-2* to designate the resistance gene present in cultivar Mexico 54.

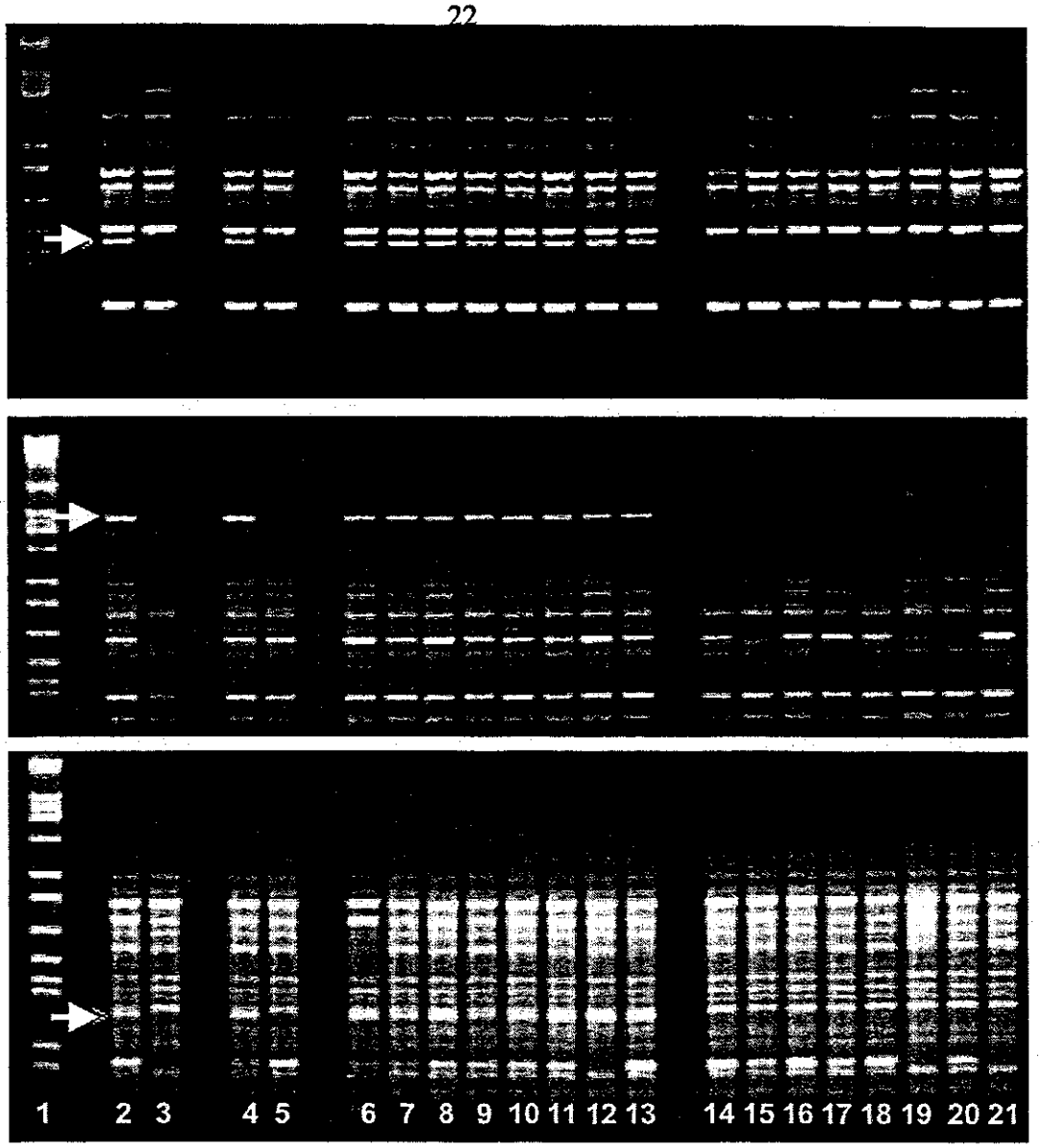

Fig. 1. Electrophoretic analyses of DNA amplification products obtained with RAPD primers OP N02 (A), OP AC14 (B), and OP E04 (C). Lanes are as follows: 1, lambda phage DNA digested with *Eco*RI, *Bam*HI and *Hin*dIII (size markers); 2, resistant cultivar (Mexico 54); 3, susceptible cultivar (Ruda); 4, resistant bulk; 5, susceptible bulk; 6, 6-13, resistant F_2 plants, and 7, 14-21 susceptible F_2 plants. Arrows indicate the polymorphic DNA bands.

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