

Sexual recombination in *Colletotrichum lindemuthianum* occurs on a fine scale

E.A. Souza¹, O.A. Camargo Jr.² and J.M.A. Pinto¹

¹Departamento de Biologia, Universidade Federal de Lavras, Lavras, MG, Brasil

²Departamento de Agricultura, Universidade Estadual do Centro-Oeste do Paraná, Guarapuava, PR, Brasil

Corresponding author: E.A. Souza

E-mail: easouza@dbi.ufla.br

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ABSTRACT. *Glomerella cingulata* f. sp *phaseoli* is the sexual phase of the fungus *Colletotrichum lindemuthianum*, the causal agent of common bean anthracnose. This fungus is of great concern, because it causes large economic losses in common bean crops. RAPD markers of five populations of *G. cingulata* f. sp *phaseoli* from two Brazilian states were analyzed to determine if this population possesses the sexual reproductive potential to generate the genetic variation that is observed in this phytopathogen. We identified 128 polymorphic bands, amplified by 28 random primers. The estimates of genetic similarity in this analysis ranged from 0.43 to 1.00, and the dendrogram generated from analysis of all genotypes displayed five principal groups, coinciding with the five populations. Genetic differentiation was observed between the populations ($G_{ST} = 0.6455$); 69% of the overall observed genetic variation was between individual populations and 31% of the variance was within the sub-populations. We identified significant levels of linkage disequilibrium in all populations. However, the values of the disequilibrium ranged from low to moderate, indicating that this pathogen maintains a genetic structure consistent with sexual reproduction. The mean contribution of sexual reproduction was determined by comparison of the amplitudes of genetic similarity of isolates from sexual and asexual phases. These results support the

hypothesis that recombination plays an important role in determining the amplitude of variability in this pathogen population and that this determination occurs on a fine scale.

Key words: Anthracnose; Common bean; RAPD markers; Genetic variability