

DIFFERENCES IN LESION SIZE CAUSED BY ANDEAN-SPECIFIC AND ANDEAN-NON-SPECIFIC ISOLATES OF  
*PHAEOSARIOPSIS GRISEOLA*

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Dry beans are grown in the higher rainfall areas of Southern Africa, and form an important food source for the rapidly increasing population. Angular leaf spot (ALS), caused by *Phaeoisariopsis griseola* (Sacc.) Ferraris, is a severe problem in the more humid areas to the east and north of the region. The breeding of resistant cultivars is essential as subsistence farmers cannot afford to use fungicides. The existence of Andean-specific and Meso-American-specific (or Andean-non-specific) isolates of *P. griseola* in Southern Africa has important implications for resistance breeding in the region. Large seeded Andean beans are by far the most popular, but all are inclined to be susceptible to ALS. Beans of Meso-American origin, on the other hand, are much more resistant (CIAT, 1989; Lusse, *et al.*, 1992; 1993; 1994); correspondingly, the Meso-American type of isolate of *P. griseola* is uncommon in the region. Although a few such isolates have been found (Guzmán *et al.*, 1995; Boshoff, *et al.*, in press), not much is known about them.

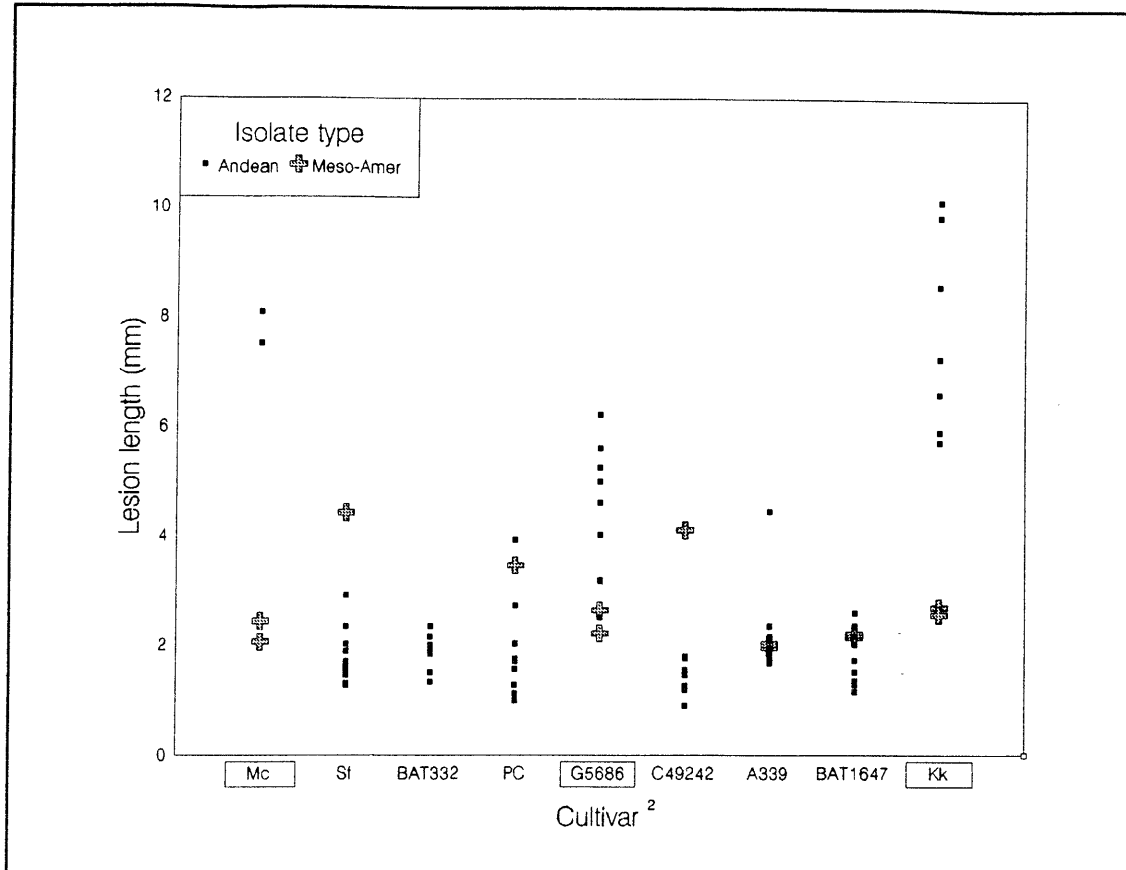
The resistance genes from Meso-American cultivars are at present the most suitable for use in backcrossing programmes for the improvement of the resistance of local large seeded cultivars to ALS. However, if these genes are widely used, any Meso-American-specific or Andean-non-specific pathotypes for which they are susceptible are likely to become more prevalent, resulting in a loss of resistance. For this reason, it is extremely important that promising sources of resistance be tested against as many as possible of these pathotypes present in the region.

Fifteen *P. griseola* isolates, which had previously been subjected to isozyme analysis by Boshoff *et al.*, (in press), and of which 13 were presumably Andean specific and two were presumably Meso-American-specific, were inoculated onto nine bean cultivars<sup>2</sup>, three of which were large seeded. Cultivars were rated for disease severity, using a zero to nine scale (Correa-Victoria, 1988). The length of ten lesions per leaf were also measured, using four replicates of each cultivar.

Clear differences were obtained between the two groups of isolates as far as disease reaction was concerned. The two atypical isolates caused moderate to severe infection on all cultivars, and should therefore be regarded as Andean-non-specific (Steadman, 1995). All Andean isolates caused severe infection on two of the Andean cultivars, and low to moderate infection on the remaining cultivars. The reaction of the large seeded cultivar G 5686 to the Andean-specific isolates, varied from resistant to susceptible. It also showed the most resistance to the Meso-American isolates. When disease assessment ratings were subjected to cluster analysis, the two groups could also be clearly distinguished. Lesion length, as such, could not be used to differentiate between the two groups of isolates. However, when cultivars were grouped according to origin, it was found that Andean-specific isolates caused large lesions on large seeded cultivars, and small lesions on small seeded cultivars. These differences were highly significant. Andean-non-specific isolates, on the other hand, caused small lesions on large seeded cultivars and medium sized lesions on small seeded cultivars, although these differences were not significant (Fig. 1).

It is proposed that further studies should be done in order to determine whether lesion size on the two types of cultivars can be used as a general differentiating characteristic between these two groups of isolates. If so, the chances of the collection of Andean-non-specific isolates in Southern Africa could be increased by looking for unusually small lesions on the commonly planted large seeded cultivars.

Figure 1. Lesion length for 15 isolates of *Phaeoisariopsis griseola* on nine bean cultivars<sup>1</sup>. Measurements were made 24 days after inoculation



<sup>1</sup> All 15 isolates are not shown on all cultivars due to defoliation. However, observations made at 13 days gave similar results, although not all cultivars showed symptoms at this stage

<sup>2</sup> Large seeded cultivars (shaded): Mc = Montcalm; G 5686; Kk = Kranskop  
Small seeded cultivars:  
Sf = Seafarer; BAT 332; PC = Pompadour Checa;  
C 49242 = Cornell 49242; A 339; BAT 1647

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