

INHERITANCE OF RESISTANCE TO ASCOCHYTA PISI RACE "C" IN PEAS

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Ascochyta pisi, a component of the Ascochyta disease complex, frequently causes severe seedling losses in Hungary. To determine the races present in Hungary, several isolates were obtained from diseased plants collected in five different locations throughout the country.

To test for resistance to A. pisi, seeds were germinated for 3 days at 10°C and inoculated by dipping in a spore suspension containing $4-5 \times 10^6$ conidia per ml. Ten inoculated seeds were planted in a 15 cm pot filled with moist sand; then 20 ml of the inoculum were sprayed on the surface of the sand. The pots were kept at 17°C with 16 hr diurnal illumination in a growth room. Disease ratings were made ten days after inoculation and were based on the size and type of stem lesions as follows:

- 1 - no stem reaction
- 2 - small (<1 mm) lesions only
- 3 - lesions 2-3 mm in length, no pycnidia
- 4 - deep necrotic lesions with pycnidia
- 5 - seedlings killed

Plants with ratings higher than 2 were considered susceptible.

Race identification was performed according to the methods of Hubbeling (2). From Table 1, we can conclude that only race "C" was present at the five locations.

Previous reports vary with respect to the proposed inheritance of resistance of peas to A. pisi: two dominant genes (2); three dominant genes (5); duplicate dominant genes (3); single gene with incomplete dominance (1); single or 2-3 recessive genes (4).

Of nearly 200 varieties tested for resistance in the present study, 'Regis', 'Eldo', 'Rovar', and 'Venlona II' proved to be resistant. Three susceptible varieties were crossed with Regis or Rovar and the F2 and BC generations were tested. In these crosses resistance to race "C" seems to be controlled by a single dominant gene (Table 2).

1. Cousin, R. 1974. Le pois. INRA, Versailles
2. Hubbeling, N. 1972. Proc. Eucarpia Conf. Peas 161-164.
3. Lyall, L. H. and V. R. Vallen. 1958. Canad. J. Plant Sci. 38:215-218.
4. Matthews, P. and P. Dow. 1972. 63rd Ann. Rep. John Innes Inst. 36-39.
5. Wark, D. C. 1950. Austr. J. Agric. Res. 1:382-390.

Table 1. Race identification of A. pisi isolates.

Test varieties	Disease reaction of Isolates from different locations ^{1/}				
	1	2	3	4	5
Cobri	S	S	S	S	S
Kelvedon Wonder	S	S	S	S	S
Rovar	R	R	R	R	R
Glorie de Quimper	S	S	S	S	S
Venlona-II	R	R	R	R	R

^{1/} R = Resistant; S = Susceptible

Table 2. Reaction of F₂ and BC₁ progenies to inoculation with A. pisi race "C".

Crosses	No. of plants		Expected ratio	χ ²
	Resistant	Susceptible		
Regis x Wav. 18045 F ₂	168	55	3:1	0.01
Rovar x Skinado F ₂	317	96	3:1	0.67
Regis x Rapid F ₂	108	30	3:1	0.87
Rovar x Skinado BC ₁	40	44	1:1	0.19
Regis x Rapid BC ₁	22	23	1:1	0.02