

# Field Resistance of Pea Germ Plasm to Powdery Mildew (*Erysiphe polygoni*) and Rust (*Uromyces fabae*)

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## ABSTRACT

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A total of 292 accessions of pea (*Pisum* spp.) were screened under field conditions for resistance to powdery mildew (*Erysiphe polygoni*) and rust (*Uromyces fabae*). Five entries—P431, P436, Gloire de Quimper, Sel. 18, and Sel. 30—one wild type (PJ207508), and the species *Pisum asiaticum* were resistant to powdery mildew. Three accessions—PJ207508, PJ222117, and EC109188—were resistant to rust. PJ207508 was resistant to both diseases.

Powdery mildew (*Erysiphe polygoni* DC.) and rust (*Uromyces fabae* (Pers.) de Bary) limit pea (*Pisum sativum* L.) production in various parts of India (2,4,5). Both diseases are widespread and cause severe losses in south India. Although breeding programs are in progress, none of the commercial cultivars available in India are resistant to either disease. Effective, economical control of rust with fungicides is not possible. We screened accessions of *Pisum* spp. collected from all over the world to locate sources of resistance to these diseases for use in breeding programs.

## MATERIALS AND METHODS

Altogether, 269 entries and 23 species of *Pisum* were sown in 1976 and 1977 10 cm apart in 4.5-m rows with 30 cm between rows. The plants were inoculated after 20 days with a suspension of rust

spores in water (20–25 spores per microscopic field at  $\times 10$ ) collected from infected plants. Powdery mildew inoculations were made 1 wk later by dusting plots with freshly harvested inoculum.

Disease incidence was recorded periodically until crop maturity. Cultivars were categorized as resistant (no pustules), moderately resistant (less than 5% of foliage area infected), moderately susceptible (6–25% infected), susceptible (26–50% infected), and highly susceptible (more than 51% infected).

## RESULTS AND DISCUSSION

Five entries—P431, P436, Gloire de Quimper, Sel. 18, and Sel. 30—and two other species—*P. asiaticum* and PJ207508 (an unidentified wild species)—were classified as resistant to powdery mildew. Nine entries—Olympia-I, Weitor, EC108208, *P. puschki*, L-1584, *P. humile*, *P. elatius* L-5232, AC12092, and Erygel—were moderately resistant to powdery mildew, and two entries—Tridon and P439—were moderately susceptible. The rest were susceptible or highly susceptible to powdery mildew.

Three accessions—PJ207508, PJ222117, and EC109188—were resistant to rust. All the rest were susceptible or highly susceptible to rust. Only PJ207508 was resistant to both diseases.

The accessions found resistant to rust are not recommended for commercial cultivation but could be used by breeders to produce cultivars resistant to both diseases. None of the pea cultivars tested by Prasada and Singh (4) in Rajasthan showed any resistance to rust. Golubev and Kornev (1) reported resistance to *U. pisi* (Pers.) Wint. (not prevalent in India) in some fodder peas from the USSR, but no resistance to *U. fabae* has been reported.

Munjil et al (2) observed 21–31% reduction in number and 24–27% reduction in pod weight in crops 100% infected by powdery mildew. Sohi et al (5) reported some cultivars moderately resistant to powdery mildew and rust, but none that were completely resistant. Pierce (3) found a selection from the cultivar Stratagem that was immune to powdery mildew and transferred this character to several commercial cultivars. The lines found resistant to either or both of these diseases are being used in the breeding program at the Indian Institute of Horticultural Research.

## LITERATURE CITED

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