

INHERITANCE AND NATURE OF RESISTANCE TO POWDERY MILDEW  
IN PEA (*Pisum sativum* L.)

By

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## ABSTARACT

A pea line resistant to powdery mildew caused by *Erysiphe polygoni* was obtained by single plant selection from a resistant line of cv. Early Perfection. A cross was made between the resistant line and a susceptible line derived from cv. Lincoln. Plants of the parental, F<sub>1</sub>, F<sub>2</sub>, and backcrosses to both parents were evaluated for resistance to powdery mildew. Resistance was controlled by one recessive gene. Correlation coefficients between leaf disease reaction of the F<sub>2</sub> plants and reduced, non-reduced, and total sugars content of leaves were .92, .89, and .95, respectively. Leaves of resistant plants contained less total sugars (2.46 gm and 2.61 gm / 100 gm fresh weight for leaf disease reaction ratings 1 and 2, respectively) than leaves of susceptible plants which contained higher total sugars (2.74 gm, 2.89 gm, and 3.38 gm / 100 gm fresh weight for leaf disease reaction ratings 3, 4, and 5, respectively). Leaf content of reduced, non-reduced, and/or total sugars can be used as a selection index for resistance to powdery mildew in pea.

## INTRODUCTION

Powdery mildew is one of the most serious diseases of pea (*Pisum sativum* L.). It is caused by *Erysiphe polygoni* DC. . The disease reduced yield of late-planted or late-maturing peas by 50% and lowered yield quality (Gritton and Ebert 1975). One recessive gene *er-1* determined resistance to powdery mildew in pea (Harland 1948); however, in another study, two recessive genes *er-1* and *er-2* controlled powdery mildew resistance in pea (Heringa et al 1969). It was found that healthy leaves of pea lines resistant to powdery mildew had less sugars than healthy leaves from susceptible lines (Chander 1989). It has been reported that in many host plants of powdery mildew the sugar concentration fluctuates near the optimum; the plants or parts of plants fluctuate from susceptibility to resistance as the sugar concentration fluctuates from below to above the optimum (Vanderplank 1984).