# BRIEF ARTICLES

## ISOLATION OF GIBBERA COMPACTA FROM CRANBERRY AND THE EFFECT OF MOISTURE AND TEMPERATURE ON ASCOSPORE[1] DEVELOPMENT

*C.L. Lockhart*

Initial attempts in 1966 to isolate Gibbera compacta (Pk.) Shear from characteristic black spots, described by Bain (1), on cranberry leaves using 2% Cl as a sterilizing agent were unsuccessful. When 0.5% Cl (one part Javex to 9 parts water) was used in 1968, G. compacta was isolated from 12.5% of the leaf spots. No fungi were isolated from 54.1% of the diseased sections and 33.4% of them produced other fungi, some of which were known pathogens of the cranberry.

In 1966, G. compacta was rarely isolated from speckle-spots on cranberry fruit when 70% (v/v) ethyl alcohol was used as a sterilizing agent (3) but in 1968, using 0.5% Cl it was isolated from 8.2% of the spots. Carlson and Boone (2) had similar results in isolating G. compacta from fruit using strong and weak sterilizing methods. Gourley and Harrison (3), who used 70% ethyl alcohol as a sterilizing agent in their fruit rot investigations, did not report the presence of G. compacta.

Table 1. Effect of temperature and moisture on development of ascospores of Gibbera compacta in infected cranberry leaves held in moist chambers on the surface of wet filter paper or submerged in water

| Treatment | Days in moist chamber | % asci with ascospores at 10 C | 15 C | 22 C |
|---|---|---|---|---|
| Surface | 0 | 0 | 0 | 0 |
| Submerged | 0 | 0 | 0 | 0 |
| Surface | 6 | 0 | 5 | 25 |
| Submerged | 6 | 0 | 10 | 75 |
| Surface | 8 | 0 | 10 | 40 |
| Submerged | 8 | 1 | 15 | 75 |
| Surface | 14 | 1 | 15 | 60 |
| Submerged | 14 | 2 | 20 | 80 |

Samples of leaves, in which asci but not ascospores were apparent in the perithecia of G. compacta, were placed in large petri plates on moistened filter paper or on filter paper flooded with water (2 cm deep). In the latter, filter paper was placed on top of the leaves to keep them submerged. Leaves of both treatments were held at 10C, 15C and 22C for 2 weeks with periodic examinations of ascospore development. Ascospores formed and matured faster in the flooded treatment and at the higher temperatures (Table 1). In the normal practice of flooding cranberry bogs for frost and insect control, the development of ascospores of G. compacta would be stimulated if the water was warm when the bogs were flooded.

### Literature cited

1. Bain, H.F. 1926. Cranberry disease investigations on the Pacific Coast. U.S. Dep. Agr. Bull. 1434.

2. Carlson, L.W., and D. W. Boone. 1966. A berry speckle disease of cranberry and its control. Plant Dis. Rep. 50:539-543.

3. Gourley, C.O., and K.A. Harrison. 1969. Observations on cranberry fruit rots in Nova Scotia 1945-55. Can. Plant Dis. Surv. 49:22-26.

[1] Contribution No. 1379, Research Station, Canada Department of Agriculture, Kentville, Nova Scotia.

## VARIATION IN ISOLATES OF FUSARIUM SOLANI F. PISI COLLECTED FROM PROCESSING PEAS IN ONTARIO[1]

*A.T. Bolton, A.G. Donaldson, and V.W. Nuttall*

### Abstract

A survey and collection of plants in fields of processing peas (Pisum sativum) in Ontario yielded both Fusarium solani f. pisi and F. oxysporum f. pisi. Preliminary tests demonstrated differences in pathogenicity among isolates of F. solani f. pisi. Some correlation was found between highly pathogenic isolates and severity of disease in the pea fields.

### Introduction

For several years, isolates of Fusarium solani (Mart.) App. & Wr. f. pisi (F.R. Jones) Snyd. & Hansen from the pea disease nursery at the Ottawa Research Station have shown considerable variation in pathogenicity

[1] Contribution No. 256, Research Station, Canada Department of Agriculture, Ottawa, Ontario.

when used to test peas for root rot resistance. In 1967, a survey was made in several areas in Ontario where processing peas were being grown. A collection of diseased pea plants from these areas yielded cultures of both F. solani f. pisi and F. oxysporum f. pisi (Linford) Snyd. & Hansen. Although all isolates recorded as F. solani f. pisi completely fitted the description of this fungus given in the literature, differences in pathogenicity varied from inability to produce symptoms to complete destruction of 'Progress No. 9' seedlings in 14 days.

## Materials and methods

All isolates of F. oxysporum f. pisi and F. solani f. pisi were monospored before pathogenicity tests were made. Seedlings of the root rot susceptible 'Progress No. 9' pea (Pisum sativum L.) variety and of a root rot tolerant selection, 'M-129', were inoculated with each isolate. Ten-day-old plants grown in sterile sand were dug up, the roots trimmed to 2 inches and immersed in a spore-mycelium suspension for 2 hours prior to replanting in sterile soil. All disease ratings were made 14 days after inoculation.

Table 1. Incidence of Fusarium solani f. pisi in Ontario pea fields and pathogenicity rating of isolates in greenhouse tests

| Field number | Location (county) | Pea variety | % plants affected | Rating[+] |
|---|---|---|---|---|
| 1 | Prince Edward | | tr* | 3 |
| 3 | Prince Edward | | tr | 2 |
| 4 | Prince Edward | | tr | 3 |
| 5 | Prince Edward | Perfection | tr | 2 |
| 6 | Prince Edward | | 30 | 4 |
| 8 | Prince Edward | | 15 | 1 |
| 9 | Prince Edward | | 3 | 4 |
| 10 | Prince Edward | | 15 | 5 |
| 11 | Prince Edward | | tr | 3 |
| 13 | Prince Edward | | tr | 0 |
| 14 | Northumberland | Perfection | tr | 0 |
| 15 | Northumberland | Freezer 69 | 8 | 2 |
| 16 | Northumberland | | tr | 4 |
| 17A | Northumberland | Perfection | tr | 5 |
| 170 | Northumbcrland | Perfection | tr | 3 |
| 19 | Northumberland | Pride | tr | 0 |
| 20 | Northumberland | Spright | tr | 3 |
| 22 | Middlcsex | | tr | 3 |
| 23 | Middlescx | | tr | 0 |
| 24A | Middlcsex | Venus | 10 | 5 |
| 24B | Middlesex | Venus | tr | 3 |
| 25 | Middlesex | Spright | 20 | 4 |
| 26 | Middlesex | Alpine | tr | 5 |
| 28 | Huron | Perfection | tr | 4 |
| 29 | Perth | Delmar 16 | tr | 3 |
| 31 | lluron | Perfection | tr | 3 |
| 32 | Huron | Perfection | 20 | 5 |
| 35 | Carleton** | Wisconsin 183 | 5 | 5 |
| 37 | Carleton | Perfection WR | tr | 3 |
| 38 | Carleton | New Season | tr | 2 |
| 39 | Carlcton | New Wales | tr | 2 |

[+] 0 = no symptoms to 5 = death of the plants.
* tr = trace.
** Carleton Co. isolates were from plots at the CDA Research Station, Ottawa.

## Results and discussion

Of 31 specimens collected, 16 yielded F. solani f. pisi alone, 2 yielded F. oxysporum f. pisi alone, and 13 yielded both species. Several different cultural types of F. solani f. pisi were observed, as well as s——— that showed differences in pathogenicity when inoculated onto pea seedlings under controlled conditions in the greenhouse. The results of the survey and of preliminary pathogenicity tests are given in Table 1.

It appears from this survey that F. solani f. pisi is present in most fields in Ontario where processing peas are grown. In most cases, where a highly pathogenic isolate was obtained, the losses due to the disease were greater than in areas where a moderate or weak pathogen was isolated. F. solani f. pisi and F. oxysporum f. pisi occurring together in the plants did not always produce more extensive damage than either species alone. Since type of soil, moisture, and general environmental conditions were quite variable, it is impossible to determine the actual effect of both species within a single plant. Generally, where soil was poorly drained and where rainfall had been heavy during the early summer, damage caused by root rot was severe. Further investigations to determine pathogenic variation in isolates of F. solani f. pisi are in progress.

## PHYTOPHTHORA ROOT ROT OF ALFALFA IN ONTARIO IN 1969[1]

C.C. Chi[2]

In Canada phytophthora root rot of alfalfa (Medicago sativa L.) caused by Phytophthora megasperma Drechs. was first observed in Ontario in the Ottawa Valley in 1964 (1). The disease is one of the highly destructive maladies of alfalfa (1,3,4). In August 1969 a limited survey was made in Ontario and southern Quebec to determine the prevalence of the disease.

Samples were taken at random in alfalfa fields where the stand had been thinned, or in areas with plants showing yellow discoloration. The roots of suspected plants were examined, and root tissues with disease symptoms were plated on an agar medium selective for Phytophthora and Pythium (2), usinq the procedures described previously. (1).

Phytophthora root rot was found in alfalfa fields in the 19 Ontario and two adjacent Quebec counties surveyed (Table 1). The disease occurred in low areas, on slopes where drainage was poor, and in areas where

[1] Contribution No. 257 Research Station, Canada Department of Agriculture, Ottawa, Ontario.

[2] Plant pathologist.