

Fusarium oxysporum Causes Basal Stem Rot of *Zygocactus truncatus*

G. W. MOORMAN, Assistant Professor of Plant Pathology, and R. A. KLEMMER, Research Technician, Suburban Experiment Station, University of Massachusetts, Waltham 02154

ABSTRACT

MOORMAN, G. W., and R. A. KLEMMER. 1980. *Fusarium oxysporum* causes basal stem rot of *Zygocactus truncatus*. Plant Disease 64:1118-1119.

Fusarium oxysporum was identified as the causal agent of basal stem rot of *Zygocactus truncatus*. Disease incidence is highest in plants wounded at the soil line, but wounding is not a prerequisite for disease. The four cactus cultivars tested varied little in relative susceptibility to the basal stem rot.

Zygocactus truncatus (1) is an important flowering pot crop grown by commercial floriculturists for sale during fall, winter, and spring holidays. Few diseases of this crop have been reported (2,3). In 1978 and 1979, specimens with a dry basal stem rot were submitted to the Plant Disease Laboratory (University of Massachusetts, Suburban Experiment Station).

The work reported was initiated to identify the cause of the basal stem rot, determine the importance of stem wounding to disease development, and to test the relative susceptibility of four cultivars to the stem rot.

MATERIALS AND METHODS

Isolations were made from sterile water-rinsed stems at the interface of healthy and diseased tissue above the soil line; this material was plated on potato-

Paper 2378 of the Journal Series of the Massachusetts Agricultural Experiment Station.

This research was supported in full by the Massachusetts Agricultural Experiment Station.

0191-2917/80/12111802/\$03.00/0

©1980 American Phytopathological Society

dextrose agar. Single spore cultures were established and sent to P. E. Nelson, Pennsylvania State University, for identification.

Plants of the cultivars Peach Parfait, Lavender Doll, White Christmas, and Christmas Charm were supplied by Olson's Greenhouses (Raynham, MA 02767) in 9.5-cm square pots in a soil/peat/perlite mix.

In the first experiment, 18–20 plants of each cultivar were treated. In the second experiment, rooted cuttings were potted in a peat/perlite (1:1, v/v) mixture amended with 3.5 g of superphosphate,

6.5 g of ground limestone, and 0.1 g of fritted trace elements (Peters Fertilizer Products, W. R. Grace & Co., Allentown, PA) per liter of mix. Seventeen to 20 plants of each cultivar were treated, but the White Christmas check included only six plants because of a plant shortage.

In both experiments, there were two single-stem plants, 10–20 cm tall, per pot. Greenhouse temperatures ranged from 18 to 35 C during these experiments. All plants were fertilized with 200 ppm N Geranium Special 15-15-15 (Peters Fertilizer Products).

The surface of 7-day-old *F. oxysporum* cultures grown on potato-dextrose agar were scraped with the edge of a glass microscope slide and flooded with tap water. Propagules from each plate were suspended in 275 ml of tap water. Five milliliters of this suspension were poured on the soil surface of appropriate pots. A scalpel was used to make a 3–4 mm incision on the periphery of the stem at

Table 1. Total disease incidence^a in two experiments 9 wk after inoculation of *Zygocactus truncatus* cultivars with *Fusarium oxysporum*

Cultivar	Treatment			
	Check	Wounded	<i>Fusarium</i>	Wounded + <i>Fusarium</i>
Peach Parfait	0/40	0/40	4/40	21/40
Lavender Doll	0/40	1/40	7/40	15/39
White Christmas	2/25	6/39	6/40	21/40
Christmas Charm	11/36	9/39	10/38	24/38

^aNo. of plants with stem rot/No. of plants in treatment.

the soil line of some plants before inoculation. All plants were examined for symptoms 9 wk after inoculation.

RESULTS AND DISCUSSION

The fungus isolated from the original plants was identified as *Fusarium oxysporum* (P. E. Nelson, *personal communication*). This fungus consistently infected inoculated plants and caused symptoms identical to those observed in the original specimens.

The initial symptom of infection is a reddish spot at the soil line of the stem. Although the spot may occur anywhere along the soil line, it is usually at the periphery of the flattened stem and rarely on the swollen center portion of the stem. As the spot enlarges, the tissues become papery and light tan (Fig. 1A-C). The plants are usually not killed, but in severe cases the terminal branches abscise. The stem rot often abates after the lesion has reached the edge of the swollen central portion of the stem that marks the location of the central vascular bundle (Fig. 1B), but the rot can engulf the entire stem along the soil line. A water-soaked rot with a reddish border was reported to be caused in *Zygocactus* by *Fusarium oxysporum* (3). It is not clear whether that blight and leaf spot is identical to the basal stem rot described in the present report.

Fusarium basal stem rot spreads readily, as evidenced by the occurrence of the disease in check plants and wounded plants that were not intentionally inoculated (Table 1). Disease severity varied greatly within each cultivar and treatment. Wounding the stems of inoculated plants increased the incidence of disease, but wounding was not a prerequisite for disease. The four cultivars differed little in relative basal stem rot susceptibility, as indicated by the disease incidence in inoculated plants.

The grower who maintains stock plants and the discerning customer who plans to keep the plants for an extended period should be concerned with this *Fusarium* stem rot. Because many diseased plants survive and flower well despite the damage, the customer who purchases a plant for the transient pleasure of the flower and then discards the plant could readily overlook the lesion. This is particularly true if the dry papery tissue has fallen away or if the lesion is slightly below the soil line.

We observed that the crop receives minimal care when not actually being readied for sale. Rough handling and placement in the least favorable growing space in the greenhouse during the off-season combine to increase the likelihood of cracking the stems at the soil line and contaminating the soil with *F. oxysporum*. Under these conditions, the *Fusarium* stem rot can be expected to continue reducing crop quality and plant longevity.



Fig. 1. (A) *Fusarium oxysporum* causes reddish lesion at the periphery of *Zygocactus truncatus* stems near the soil line. (B) When the lesion reaches the central portion of the stem, disease development generally abates. (C) Tissue in the lesion becomes dry, thin, papery, and tan.

LITERATURE CITED

1. GRAF, A. B. 1974. *Exotica*, 7th ed. Roehrs Co., Inc., E. Rutherford, NJ. 1,834 pp.
2. Index of Plant Diseases in the United States. 1960.

USDA Agric. Handb. 165. Washington, DC. pp. 43-44.

3. MILLER, J. W. 1975. Blight and leaf spot of Christmas cactus caused by *Fusarium oxysporum*. (Abstr. 181) Proc. Am. Phytopathol. Soc. 2:62.