Table 5. Branching response from two cytokinins and effects of application with Off-Shoot-O or Buffer-X. Experiment 5, 1982.

Cytokinin	Rate (ppm)	Off-Shoot-O[z]	Buffer-X[y]	Number of branches[x]
None		—	—	0.7 a
None		+	—	0.7 a
None		+	+	1.2 ab
BA	1000	—	+	1.7 bc
BA	1000	+	—	3.3 d
BA	1000	+	+	6.0 e
Accel	500	—	—	1.1 ab
Accel	1000	—	—	0.9 a
Accel	500	+	—	1.7 bc
Accel	1000	+	—	2.0 c

[z]+ = Off-Shoot-O added at 4.0% (v/v).

[y]+ = Buffer-X added at 0.3% (v/v).

[x]Means followed by the same letter or letters are not significantly different at the 5% level as determined by Duncan's Multiple Range Test.

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Occurrence of Cercospora Blight on *Cryptomeria japonica* (L.f.) D. Don in the United States[1]

R.L. Wick,[2] and R.C. Lambe[3]

Department of Plant Pathology, Physiology and Weed Science
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061

Abstract

This is the first report of the occurrence of *Cercospora sequoiae* as a pathogen of *Cryptomeria japonica* in the United States. Koch's postulates were fulfilled on rooted cuttings indoors; the fungus caused dark brown lesions on succulent needles and stems. Conidiophores were fascicled and measured 40-107 µm. Conidia were brown, 33-80 µm x 4-6 µm, echinulate and 3-8 septate.

Index words: *Cryptomeria, Cercospora* blight

Introduction

Cercospora blight of *Cryptomeria japonica* (L.f.) D. Don., caused by *Cercospora sequoiae* Ellis & Everhard (C. *cryptomeriae Shirai*), is the most destructive forest nursery disease in Japan (3). The disease is widespread in Japan where epidemics on *Cryptomeria* seedlings may occur. *Cryptomeria* seedlings may be killed within a single season, while young trees may die in a few years. Lesions that occur on young trees are perennial and may develop as sunken cankers on mature trees (4).

A blighted specimen of *Cryptomeria japonica* was received from a landscape in Lanexa, VA by the VPI & SU Plant Disease Clinic in 1982 and determined by the

[1]Received for publication July 6, 1984; in revised form October 5, 1984. Technical Assistance of Seth Richardson is greatly appreciated.

[2]Current Address: Assistant Professor, University of Massachusetts, Suburban Experiment Station, Waltham, MA 02254.

[3]Associate Professor of Plant Pathology.

senior author to be colonized by *C. sequoiae*. A search of the literature and correspondence with 27 Extension Plant Disease Clinics (within plant hardiness zones 5 and 6) revealed no evidence that this disease had been reported in the United States. We undertook an experiment to confirm that our *Cryptomeria* isolate of *C. sequoiae* was indeed pathogenic to *C. japonica*.

Materials and Methods

To demonstrate pathogenicity, mycelium from a single spore isolate was ground aseptically, suspended in sterile water and sprayed onto eight six-month-old rooted cuttings. Water-sprayed plants served as controls. The inoculated and control plants were placed in a dew chamber at approximately 22 °C (73 °F) for 72 hours. After this time, the plants were moved to a west-facing windowsill in the laboratory and examined periodically.

Results and Discussion

Forty days after inoculation, lesions up to 2 cm (0.75 in) long had formed on stems and foliage (Fig. 1A); noninoculated plants remained free of disease. When plants with lesions were placed in plastic bags (to produce a saturated atmosphere), prolific sporulation resulted (Fig. 1B). Conidiopores (Fig. 1C) were produced in fascicles on stromata and measured 40-107 um X 4-6 um (average 70.2 X 4.7). Conidia (Fig. 1D-F) were brown, 33 um X 4-6.5 um (average 52 X 5.2), echinulate and 3-9 septate.

Ito *et al.* (2) compared *C. cryptomeriae* isolates from Japan to isolates of *C. sequoiae* from the United States and concluded that they were indistinguishable from each other. Both isolates caused disease on *C. japonica* and *Sequoia sempervirens* (Lamb.) Encl. They also provided evidence suggesting that *C. cryptomeriae* was introduced into Japan from the United States.

Hodges (1) considered *Cercospora thujina* Plakidas to be synonymous with *C. sequoiae* and lists *Sequoia gigantea* (Lindl.) Dence., *Thuja* orientalis L., *Cupressus arizonica* Greene, *C. lusitanica* Mill, C. *macrocarpa* Hartw., *C. sempervirens* L. and *Juniperus virginiana* L. as hosts. Zinno (5) reports that *Taxodium distichum* Rich. is also a host on *C. sequoiae.* If indeed these three *Cercospora* species are synonymous and capable of causing Cryptomeria blight, then it is likely that the disease will occur in nurseries in the United States as well as in the landscape. It is important that nurserymen and diagnosticians alike be aware of this disease and its diagnosis.

Significance to the Nursery Industry

Cercospora blight of *Cryptomeria japonica* is caused by the fungus *Cercospora sequoiae*. This disease has not previously been recognized on *Cryptomeria* in the United States. The disease has been intensively studied in Japan where it has been reported to be the most important nursery disease in that country. The pathogen has previously been shown to cause blight of *Sequoia gigantea, Thuja orientalis, Cupressus arizonica, C. lusitanica, C. macrocarpa, C. sempervirens* and *Juniperus virginia* in the United States. Nurserymen who propagate *Cryptomeria,* particularly in the presence of the other hosts of *Cercospora sequoiae,* should learn to recognize this disease.

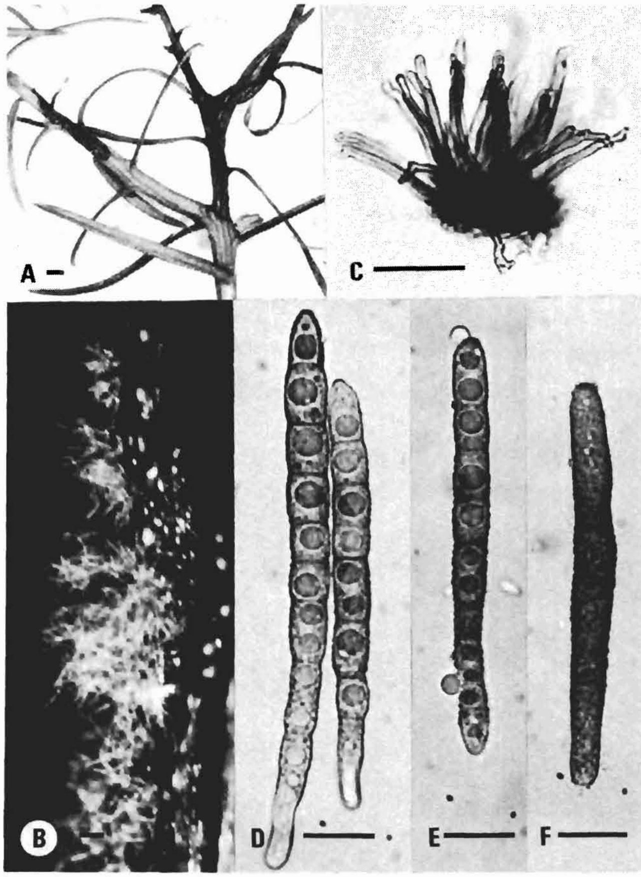

Fig. 1. Symptoms and incitant of Cercospora blight of *Cryptomeria japonica*. (A) Blighted stem and needles characteristic of symptoms on young plants. Scale bar = 2mm. (B) Sporulation of *Cercospora* on stem lesion. Scale bar = 50 um. (C) Conidiophores and stromata. Scale bar = 50 um. (D-F) Conidia. Scale bar = 10 um.

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