Coryneum Canker of Cypress in Israel

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ABSTRACT

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Coryneum canker caused by *Seiridium cardinale* (*Coryneum cardinale*) was observed for the first time in Israel in 1980 on native cypress trees (*Cupressus sempervirens* var. *stricta* and var. *horizontalis*). Since then, the disease has been recorded in various parts of the country, most often on trees grown in or near irrigated gardens. Lesion development on branches of garden-grown trees was markedly slower when they were inoculated in late summer than in late winter or spring. High relative humidity and bark maturity enhanced artificial infection of nursery seedlings.

In 1980, we observed, for the first time in Israel, a disease causing cankers on native cypress trees (*Cupressus sempervirens* L.). The causal organism has been determined to be *Seiridium cardinale* (Wagen.) Sutton & Gibson (*Coryneum cardinale* Wagen.) (5). Coryneum canker was reported early in this century in California on *C. sempervirens* and *C. macrocarpa* Hartw. and in New Zealand on *C. macrocarpa*. The first European record was in France in 1944 on *C. macrocarpa*. The disease has spread eastward to Italy (1951), Greece (1963), Yugoslavia (1978), and Syria (1973), as well as to other continents (2). *C. sempervirens* was mentioned as a common host. We report the occurrence and severity of the disease in Israel, and the effect of RH, bark age, and season on tree reaction to inoculation.

MATERIALS AND METHODS

Inoculation procedure. Inoculum was obtained by placing disks of mycelium on autoclaved cypress cones, which produced copious acervuli with conidia after several weeks. Plants were inoculated by removing a disk of the bark with a 3-mm cork borer and placing a droplet containing a dense suspension of conidia in the hole (4).

Inoculation in the greenhouse. The experiment was conducted in a temperature-controlled greenhouse (20–22 C). Two-year-old potted seedlings of a mixed population of *C. sempervirens* were inoculated either in the stem or in the herbaceous branchlets and divided into groups of 20–24 plants, which were held under the following RH conditions: 1) humid chamber where the plants were maintained constantly wet for 5 days and then transferred to greenhouse benches, 2) greenhouse atmosphere (RH was not measured), and 3) greenhouse atmosphere, with inoculation points sealed with Parafilm. In uninoculated check plants, a 3-mm disk of the bark was removed. Infection was determined after 6 wk of incubation.

Inoculation of garden-grown trees. At various seasons, 20 young and old branches of a mixed population of 12-yr-old cypress trees (*C. sempervirens*) were inoculated as before, both at the base and near the apex. In uninoculated check plants, a 3-mm disk of the bark was removed. Canker length was evaluated 11 wk after inoculation.

RESULTS AND DISCUSSION

A disease survey conducted in various parts of Israel during 1980–1981 revealed the presence of the disease in many regions, including Western Galilee, Yizre'el Valley, The Sharon, the Judean Mountains, the southern Coastal Plain, and the northern Negev. The disease inflicts severe damage both in forest and in gardens, with many infected trees dying and others having many branches with dieback. Both varieties of *C. sempervirens, stricta*, and *horizontalis*, were infected the same. The disease was observed more frequently on adult trees than on young ones. Many of the disease records were of trees grown close to gardens, which are irrigated with sprinklers mounted on low risers. It appears that individual trees differ in their susceptibility because in groups of trees, some were severely infected but others were free of the disease. Because the disease has been found in various locations in the country, it is most probable that it was introduced into Israel several years ago.

The symptoms first appeared as small (about 1-cm-diam.) discolored areas on branches or the trunk. Dark-colored cankers eventually developed (up to 10 cm long), accompanied by much gum oozing from the lesion. At the margins of cankers, slight hypertrophy occurred. Outside the cankers, black acervuli (1–2

Fig. 1. Symptoms of *Seiridium cardinale* on a cypress branch, 11 wk after artificial inoculation (natural size).

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Table 1. Effect of incubation conditions on infection of cypress seedlings inoculated with *Seiridium cardinale*

Incubation conditions	Infection rate (%)[a]	
	Stem	Branchlets
Humid chamber 5 days	100	63
Greenhouse atmosphere	71	33
Inoculation points sealed with Parafilm	88	...
Wounded checks	0	0

[a]Infection rate was calculated from 20 to 24 inoculation points, 6 wk after inoculation.

mm diam.) were scattered (Fig. 1). Conidia from acervuli of naturally infected trees measured 18–33×8–11 μm. They consisted of six cells, of which the four median ones were dark brown and constricted at the septa and the basal and apical cells were hyaline with small appendages.

Results of inoculations of potted seedlings in the greenhouse (Table 1) indicate that high RH, as well as bark maturity, prompted infection. Grasso and Ponchet (2) noted that high RH enhances artificial infection. In all of our field experiments, either in forest or garden, 100% of the inoculations yielded lesions even in summer, apparently because of dew almost every night.

On garden-grown trees, canker length 11 wk after inoculation in early February, mid-March, and April was 60–70 mm compared with 27 mm 11 wk after inoculation in late July. Canker development did not differ significantly either between young thin branches and older ones or between inoculations at the base and at the apex of branches. No lesion developed in wounded checks.

Panconesi (3) observed in Tuscany, Italy, that new infection symptoms were particularly numerous in spring and autumn. Andréoli and Ponchet (1) verified this observation by inoculating excised branches in the greenhouse. They suggested that susceptibility was correlated with active growth in autumn and spring, and resistance corresponded to dormancy-like periods during summer and the end of winter. Our results support these observations of inhibition of infection in the summer but not in the winter. Because winter in Israel is milder than in Tuscany, the low temperature effect on infection in Israel is negligible.

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