Chrysomyxa weirii on *Picea pungens* in Vermont

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ABSTRACT

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Chrysomyxa weirii was found on *Picea pungens* in an ornamental tree nursery in Vermont in 1982. This is the first report of this rust on *P. pungens* and the first report for the northeastern United States.

Picea pungens Engelm. (blue spruce) is largely restricted to the middle and upper slopes of the central Rocky Mountains (2). There, its upper elevation range occasionally overlaps the lower range of Engelmann spruce (*P. engelmanni* Parry), its only natural spruce associate. Certain varieties of blue spruce are highly prized as ornamentals, primarily because of their beautiful foliage and ability to withstand environmental extremes. Because of this, the species is widely grown in nurseries and extensively planted in North America and Europe. We report the occurrence of *Chrysomyxa weirii* Jackson on *P. pungens* in Vermont.

C. weirii is an autoecious microcyclic rust that infects only the newly formed needles of spruce each spring. During summer, localized chlorotic spots or bands develop on infected needles. The following spring, telia and basidiospores are produced, completing the short life cycle as summarized by Weir (6).

The natural host range for *C. weirii* in North America includes *P. engelmannii*, *P. glauca* (Moench) Voss, *P. mariana* (Mill.) B.S.P., *P. rubens* Sarg., and *P. sitchensis* (Bong.) Carr. (1,5,7). According to Ziller (7), this fungus has a transcontinental distribution in the northern boreal and subalpine forests of Canada. Its known distribution in the United States, however, is limited to the Pacific Northwest (Washington, Oregon, Idaho, and Montana), the Black Hills (South Dakota), and the southern Appalachian Mountains (Tennessee and West Virginia) (1,4,7). *C. weirii* has also been reported from south-central Asia (3).

In May 1982, *C. weirii* was found on blue spruce in an ornamental tree nursery in Bakersfield, VT (identification confirmed by R. S. Peterson, St. John's College, Santa Fe, NM). Infection ranged from only a trace on some trees to nearly 100% of the new needles on the lowermost branches of others. These observations are consistent with previous reports of this rust on other species of spruce (4,6).

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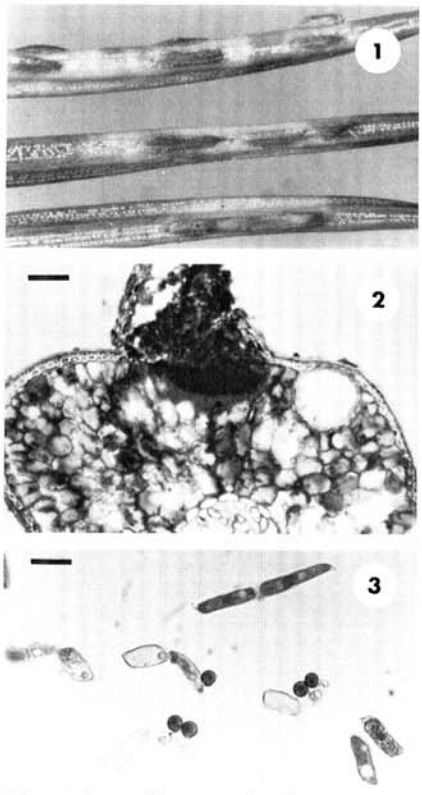

Figs. 1–3. (1) Mature telia of *Chrysomyxa weirii* on needles of *Picea pungens*. **(2)** Cross section of a needle of *P. pungens* showing the erumpent telium of *C. weirii*. Scale bar = 100 μm. **(3)** Teliospores, basidia, and basidiospores of *C. weirii* from needles of *P. pungens*. Scale bar = 15 μm.

Infected trees ranged in height from 1 to 2 m and in age from 6 to 8 yr. Infected needles had chlorotic areas with mature, erumpent telia (Figs. 1 and 2). Teliospore dimensions were 15–25 × 6.2–7.5 μm (based on 30 spores) (Fig. 3). These measurements are consistent with those of Peterson (4).

Major dissemination of basidiospores appeared to have occurred during an intermittent but prolonged period of precipitation during 1–7 June 1982. At that time, the new needles of blue spruce were rapidly expanding and should have been susceptible to infection. By 8 June, chlorotic needles with telia were showing evidence of necrosis and premature abscission was beginning.

Blue spruce trees have been sold from the Bakersfield nursery for many years with no evidence or complaints of rust. *C. weirii* was first noticed after the 1982 shipping season on trees remaining in the nursery. Nursery records indicate that most blue spruce were sold to residents of Vermont, but out-of-state movement probably occurred.

It is not known how long *C. weirii* has been present in the Bakersfield nursery, but evidence of previous needle abscission indicates infection for at least several years. The origin of the original inoculum is unknown; but it was most likely introduced on spruce seedlings. This is the first report of *C. weirii* on *P. pungens* in the northeastern United States.

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