Naemacyclus minor Needlecast of Scots Pine in Massachusetts

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ABSTRACT

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Needlecast caused by *Naemacyclus minor* was found in Scots pine Christmas tree plantations in three towns in central and western Massachusetts. This is the first report of this pathogen from New England.

In 1932, Darker (2) ascribed a needlecast of *Pinus* spp. in Massachusetts and elsewhere to the fungus *Naemacyclus niveus* (Pers. ex Fr.) Sacc. Questions arose regarding the morphological variation in and the pathogenicity of this species; some workers considered the fungus a saprobe. Butin's (1) separation of the monotypic genus into two species, *N. niveus* and *N. minor* Butin, based on minor differences in size of apothecium, asci, and ascospores and major differences in pycnidiospore size and host range, eliminated the confusion over the observed morphological differences.

Kistler and Merrill (3) demonstrated that *N. minor* is a primary parasite causing needlecast of Scots pine (*Pinus sylvestris*) in Pennsylvania. However, *N. niveus*, apparently growing as a saprophyte, also has been collected from trees affected by *N. minor* needlecast in Pennsylvania (Merrill and Zang, *unpublished*). The following studies were done to determine which species of *Naemacyclus* was associated with needlecast of Scots pine in Massachusetts.

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MATERIALS AND METHODS

In November 1979, branches bearing needles with symptoms of Naemacyclus needlecast, a yellowing and casting of the second-year needles, were collected from commercial Scots pine Christmas tree plantations in Alford, Leichester, and Princeton, MA. In all three plantations, approximately 80% of the trees showed symptoms; approximately 50% of the second-year needles on each affected tree were symptomatic at the time of inspection.

The sizes of the apothecia and ascospores on symptomatic 1978 needles were measured. Symptomatic 1978 needles were surface-sterilized with 1% sodium hypochlorite for 1 min, rinsed in distilled water, cut into thirds, plated onto acid malt agar (20 g of malt extract and 15 g or powdered agar per liter of distilled water, acidified with 1.0 ml of concentrated lactic acid per liter after autoclaving), and incubated in diffuse light at 21 C.

After 9 days, hyphal tips from colonies resembling those of *Naemacyclus* spp. were transferred to plates of neomycin and streptomycin agar (15 g of powdered agar per liter of distilled water; 1 g of streptomycin and 0.12 g of neomycin per liter added after autoclaving) and incubated at 21 C. After 3 wk of growth, hyphal tip transfers from the neomycin and streptomycin agar were made to plates of malt agar (20 g of malt extract and 15 g of powdered agar per liter of distilled water) and incubated at 21 C until pycnidia developed.

RESULTS AND DISCUSSION

The average length of the apothecia on 60 needles from Princeton was 519 μm (range, 292–810 μm). The average width of the apothecia was 349 μm (range, 225–540 μm). The average length of 80 ascospores from several apothecia was 78.8 μm (range, 54.0–106.2 μm). The average length of 80 pycnidiospores of each isolate produced in vitro was as follows: Alford—5.7 μm (range, 4.0–8.8 μm); Leichester—5.5 μm (range, 4.0–7.2 μm); Princeton—7.3 μm (range, 4.8–9.6 μm).

The sizes of the apothecia and ascospores were within the ranges reported for *N. minor* (1). Pycnidiospores were somewhat smaller than reported for *N. minor*, but the average length fell within the range reported by Butin (1). Thus the fungus associated with the needlecasts of Scots pine in Massachusetts is *N. minor*. This is the first confirmation of this pathogen in the New England states.

LITERATURE CITED

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