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Dwarf Mistletoe Parasite in Spruce

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Dwarf Mistletoe Parasite in Spruce[1]

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ABSTRACT — Locations of all known major infection centers of dwarf mistletoe (*Arceuthobium pusillum*) in Minnesota are presented and compared to botanical ranges of important hosts. A brief summary of disease symptoms and identification of the parasite are included.

The eastern dwarf mistletoe (*Arceuthobium pusillum* Peck) is a flowering plant of the family Viscaceae (Barlow, 1964). It parasitizes black and white spruces (*Picea mariana* (Mill.) B.S.P. and *Picea glauca* (Moench) Voss) and infrequently eastern larch (*Larix laricina* (Du Roi) K. Koch.) over much of the hosts' ranges in northeastern United States and southeastern Canada. It appears to be the most important cause of disease loss of black spruce, and it has been estimated that as much as 11 per cent of the acreage (Anderson, 1944 of this species in Minnesota is infected. The commercial black spruce forest type occupies approximately 1,400,000 acres in northern Minnesota (Stone, 1966) so this amounts not only to a rather sizable loss in timber volume but also to loss in growth potential.

Dwarf mistletoe occurs in slowly expanding infection centers ranging from a few trees to woods of many acres in extent, and causes formation of witches' brooms, deformation, stunting, and eventually death of the infected trees (Anderson, 1949).

Although the occurrence of witches' brooms (Fig. 1) is the most obvious symptom and is usually reliable evidence that the parasite is present, positive identification

FIGURE 1. A characteristic witches' broom in a stand of spruce infected with the eastern dwarf mistletoe.

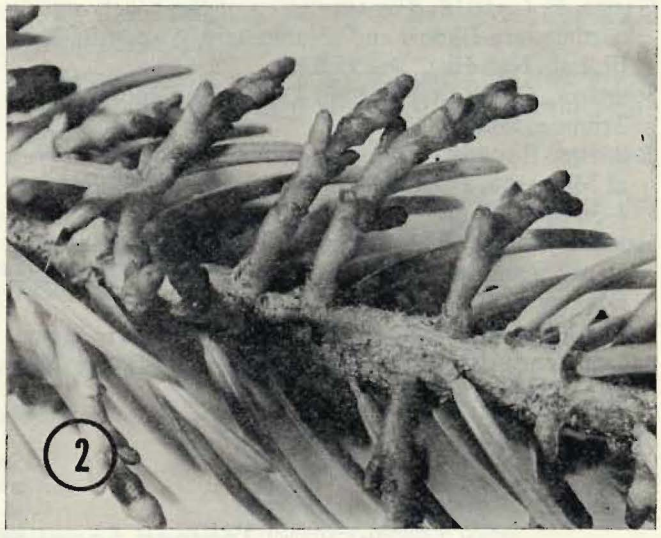

FIGURE 2. Pistillate aerial shoots of the eastern dwarf mistletoe on black spruce.

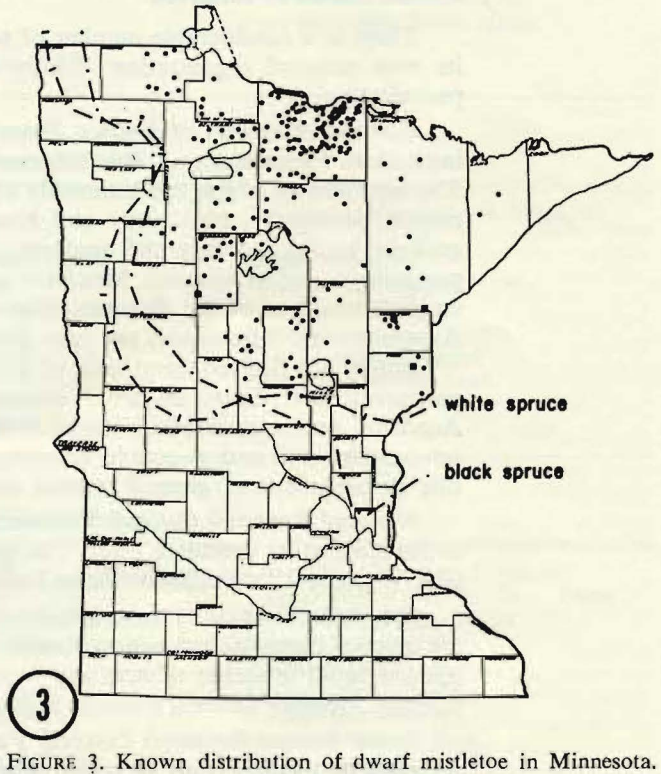

FIGURE 3. Known distribution of dwarf mistletoe in Minnesota. Each round dot indicates the approximate location of an infection center. Centers containing infected eastern larch are marked by square dots. Broken lines indicate the southwesterly limits of black and white spruces, the most common hosts.

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is based on the presence of the tiny aerial shoots (Fig. 2) on younger twigs within the brooms.

The known distribution of dwarf mistletoe infection in Minnesota is shown in Figure 3. This map is based largely on information furnished by state foresters and compiled by John Hall, assistant regional forester, Minnesota Department of Conservation. The southwesterly limits of the botanical ranges of black and white spruces are indicated (Rudolf, 1965a & b). Previously known locations of infected eastern larch are also included (Tainter and French, 1967 & 1968).

The eastern dwarf mistletoe occurs generally over much of its hosts' ranges but is most prevalent in cool, moist bogs or in areas where the relative humidity is comparatively high during much of the growing season (Leggett, 1876; Arthur, 1900; Bernard, 1957).

Acknowledgment

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BOTANY

Records of the Higher Fungi of Minnesota

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ABSTRACT — This paper, presenting an annotated list of 203 species of Ascomycetes and Basidiomycetes of Minnesota, is the first published report of the occurrence of many of the species in the state. The collections on which the list is based were made in five Minnesota counties and are deposited in the senior author's herbarium at Faribault, Minnesota, and in the University of Michigan Herbarium at Ann Arbor, Michigan.

Several years of collecting and studying the mushrooms and other fungi of Minnesota have revealed a rich fungous flora in the state. The flora is little known, however, and the paucity of published records of the state's higher fungi has prompted this report.

Publications of the Minnesota Academy of Science contain only two mycological papers of a taxonomic or floristic nature. One is an account of the two Minnesota species of *Aleurodiscus* (Stork, 1943); the other mentions approximately 50 species of higher fungi from the vicinity of Winona (Sister M. Sylvia, 1938).

The collections reported in this paper were made in the following localities:

(1) Itasca State Park (abbreviated ISP in the annotated list), Clearwater County. The forests contain white, red, and jack pine, balsam fir, spruce, white cedar, and various hardwoods.

(2) Between Pelican Lake and Lake Markee (PL), north of Brainerd, Crow Wing County. Three habitats represented in this locality are open, sandy areas; marshes bordering the lakes; and sandy, upland woods with white, red, and jack pine, burr oak, northern red oak, basswood, white birch, and aspen.

(3) St. Croix State Park (SCSP), Pine County. The open woods have chiefly jack pine, aspen, and birch.

(4) East Bethel Village (EBV), Anoka County. Two habitats sampled here are a marsh and an adjacent, sandy, upland woods with red oak predominating.

(5) Faribault (F), Rice County. Lawns with plantings of various woody species are the type of habitat in which collections were made.

(6) In and near Nerstrand Woods State Park (NWSP), Rice County. The upland woods areas have calcareous soils; and the trees are predominantly sugar maple, basswood, red oak, and white and red elms.

Collections made in these few areas during a period of only seven years (1961-1967) are not considered to include the complete higher fungous flora of Minnesota and additions to the list are planned following further research.

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