

Frank G. Hawksworth

U.S. Forest Service
Rocky Mountain Forest and Range Experiment Station
Fort Collins, Colorado

Delbert Wiens

Department of Botany
University of Utah
Salt Lake City, Utah

Donald P. Graham

U.S. Forest Service
Regional Office
Portland, Oregon

Dwarfmistletoe on Brewer Spruce in Oregon

Brewer spruce, *Picea breweriana* S. Wats., is a rare tree restricted to a few areas in northern California and southern Oregon. The only report of dwarfmistletoe (*Arceuthobium*) on this tree is a single collection from the Siskiyou Mountains of California (Gill, 1935; Hawksworth and Graham, 1963).

In 1964 we found that Brewer spruce was severely infested by dwarfmistletoe near the summit of Flat Top Mountain in the Siskiyou National Forest, about 24 air miles west of Grants Pass, Josephine County, Oregon. Damage to Brewer spruce was severe and many trees had been killed (Figure 1).

The dwarfmistletoe on Brewer spruce was *Arceuthobium campylopodum* Engelm. f. *abietinum* (Engelm.) Gill, which was also common on the associated white fir, *Abies concolor* (Gord. & Glend.) Lindl. It is unusual that the white fir dwarfmistletoe, although it will not parasitize California red fir, *Abies magnifica* A. Murr. (Parmeter and Scharpf, 1963), readily attacks a tree of the genus *Picea*. Brewer spruce, at least in this area, seemed to be about as susceptible to infection by the dwarfmistletoe as white fir. The associated *Pinus monticola* Dougl. and *Pseudotsuga menziesii* (Mirb.) Franco were not attacked by the parasite.

Gill (1935) discussed the only other reported instance of dwarfmistletoe on Brewer spruce—a collection by E. P. Meinecke in 1913 on a ridge above Applegate Creek in the Siskiyou Mountains, Siskiyou County, California. This was listed by Gill as *Arceuthobium campylopodum* f. *microcarpum* (Engelm.) Gill. However, Hawksworth and Graham (1963) have since shown that this taxon is restricted to Arizona and New Mexico where it is a serious parasite of *Picea engelmannii* Parry and *P. pungens* Engelm. The taxonomic status of Meinecke's specimen thus remains uncertain



Figure 1. Brewer spruce on Flat Top Mountain, Oregon. A. healthy tree; B. dwarfmistletoe-infected tree showing characteristic witches' brooms; C. trees heavily infected by dwarfmistletoe—the center tree has been killed by the parasite; D. two spruces killed by dwarfmistletoe.

because the collection is too fragmentary to permit positive identification. Hawksworth and Graham (1963) listed it as probably *A. campylopodum* f. *tsugensis* (Rosend.) Gill, primarily because this parasite was known to occur in the same general locality on *Tsuga mertensiana*. Our recent field studies in Oregon, Washington, and California have shown that f. *tsugensis* has an unusually broad host range. It is found on a

number of species of *Abies* and *Pinus*, in addition to *Tsuga mertensiana* (Bong.) Carr. and *T. heterophylla* (Raf.) Sarg. Thus, it would not be too surprising if it were also found on Brewer spruce.

In view of the serious damage being caused to Brewer spruce on Flat Top Mountain by dwarfmistletoe (Figure 1) and because of the scarcity of Brewer spruce, a thorough reconnaissance of stands of this species is recommended to determine whether control measures are warranted to protect this rare tree. Another reason for such a reconnaissance is that dwarfmistletoe has recently been found on Brewer spruce in two other areas in the Siskiyou National Forest (P. A. Thielson, U.S. Forest Service, personal communication): near Fiddler Mountain and near the headwaters of Lucky Creek. These areas are about 13 and 5 air miles south of Flat Top Mountain, respectively. These recent finds suggest the dwarfmistletoe may be widespread on Brewer spruce in the Siskiyou Mountains of southwestern Oregon.

Literature Cited

- Gill, L. S. 1935. *Arceuthobium* in the United States. Conn. Acad. Arts and Sci. Trans. 32: 111-245.
- Hawksworth, F. G., and D. P. Graham. 1963. Dwarfmistletoes on spruce in the western United States. Northwest Sci., 37: 31-38.
- Parmeter, J. R., Jr., and R. F. Scharpf. 1963. Dwarfmistletoe on red fir and white fir in California. J. Forest., 61: 371-374.

Accepted for publication, May 12, 1966.

Notice of Publication Policy Change

Commencing with the February 1967 issue there will be a voluntary page charge of \$20 for each page published in *Northwest Science*. The page charge will be levied after a paper has been accepted for publication and will not in any way whatsoever influence the publication of any paper. Each author will receive a request to honor the voluntary charge or any part of it, after acceptance of the paper. Should the author not have access to funds for this purpose he should so inform the Editor and the publication costs will be borne by the Northwest Scientific Association as they have been heretofore.

JWM, Editor