

First Report of the White Pine Blister Rust Fungus, *Cronartium ribicola*, Infecting *Pinus flexilis* on Pine Mountain, Humboldt National Forest, Elko County, Northeastern Nevada

D. R. Vogler, USDA Forest Service, PSW Research Station, Institute of Forest Genetics, Placerville, CA 95667; **P. E. Maloney**, Tahoe Environmental Research Center, Incline Village, NV 89451; **T. Burt**, P. O. Box 2572, Kings Beach, CA 96143; and **J. Snelling**, Oregon State University, Corvallis, OR 97331.

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ABSTRACT

In 2013, while surveying for five-needle white pine cone crops in northeastern Nevada, we observed white pine blister rust, caused by the rust pathogen *Cronartium ribicola* Fisch., infecting branches and stems of limber pines (*Pinus flexilis* James) on Pine Mountain (41.76975° N, 115.61622°W), Humboldt National Forest, Elko County, Nevada. Nearby whitebark pines (*P. albicaulis* Engelm.) were also infected. Pine Mountain rises to 2,636 m, is sparsely forested, and is located 11.25 km west of the Jarbidge Mountains, where infection by blister rust on whitebark pine was first reported at Coon Creek Summit in 2004 (Vogler and Charlet 2004). In mid-June 2014, we revisited Pine Mountain to collect aeciospores from infections on pine; however, no sporulation was observed, though symptoms (branch and stem swellings, bark lesions, and traces of the previous year's bleached aeciospores) were visible on both pine species. In mid-June 2015, we returned to Pine Mountain and collected several vials of rust aeciospores from sporulating single-branch infections on three limber and two whitebark pines. We also noted active urediniospore production on infected leaves of nearby alternate host *Ribes cereum* Dougl. The oldest pine infections were on branch internodes dated back to 2005, indicating that the pathogen has been present on Pine Mountain for approximately a decade, but had not been reported. To confirm that the pathogen is *C. ribicola*, we extracted DNA from ground limber and whitebark pine-host aeciospores, amplified the internal transcribed spacer (ITS) region with basidiomycete-specific primers ITS1f and ITS4b (Gardes and Bruns 1993), and sequenced the PCR products to yield an 869-bp consensus sequence (GenBank accession no. KX574673) that differs by a single nucleotide (0.12%) from the matching segment of a *C. ribicola* ITS reference sequence (DQ533975), confirming that the fungus collected on both pine hosts at Pine Mountain is *C. ribicola*. These findings support two conclusions: (1) *C. ribicola* is spreading westward and establishing upon both known and previously uninfected hosts of the white pine group and on *Ribes* spp. in the Nevada Great Basin, despite the geographic isolation and small sizes of these forested islands; and (2) discovery of blister rust infection in remote locations may be delayed by a decade or more after the first *Ribes* plant or pine host has become infected.

References:

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