

The Distribution of North American Bryophytes
***Drytodon patens* (Hedw.) Brid.**

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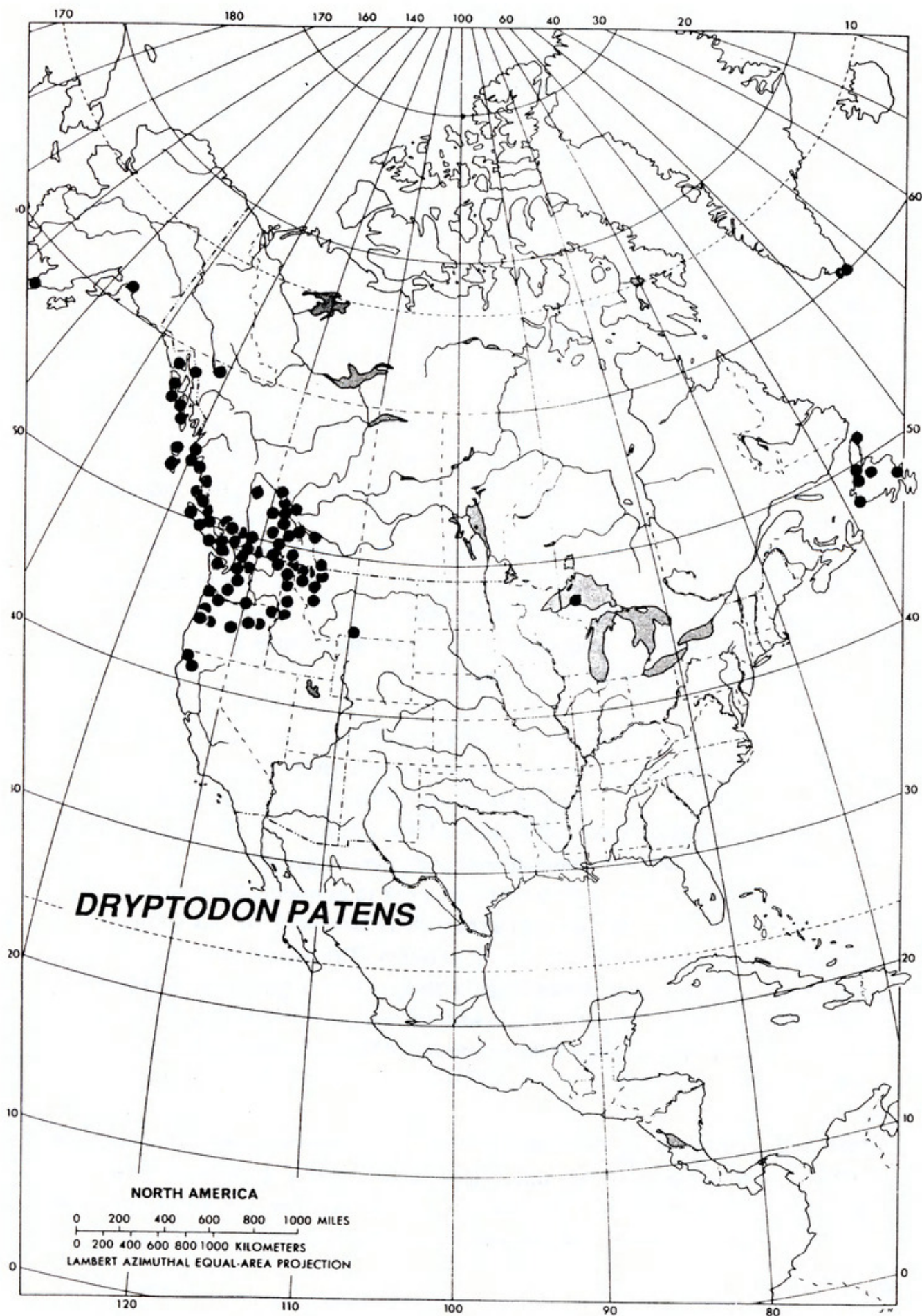
Drytodon patens is a monotypic genus belonging in the Grimmiaceae. Historically it has been placed in *Grimmia*, usually by European bryologists, where its correct name must be *Grimmia curvata* (Brid.) De Sloover (Crundwell 1971), or in *Racomitrium*, usually by North Americans, where its name is *Racomitrium patens* (Hedw.) Hueben. *Drytodon patens* superficially resembles muticous species of *Racomitrium* in size and growth habit. *Drytodon* shares features with species of *Racomitrium*, including relatively long setae, long sinuose basal leaf cells, rather large conic-mitrate calyptrae that are non-plicate, and a haplolepidous peristome of long linear, spinose-papillose teeth split about one-half the distance to the base. It also has similarity with some species of *Grimmia*, especially in the smooth, non-sinuose, more-or-less quadrate upper leaf cells and often upright, loosely tufted growth habit. However it also has several features that are either unique or very rare when compared with these two genera; these include ribbed capsules (rare in *Grimmia*), arcuate setae, especially when moist (uncommon in *Grimmia*), muticous leaves (also found in scattered species of both genera), and 2(3-4) ridges (lamellae) on the abaxial (dorsal) surface of the upper part of the leaves (unique to *Drytodon*).

Drytodon patens occurs on acidic or neutral rock surfaces. It is most common in moist, oceanic to montane, coniferous forests, but extends into mesic subalpine and low alpine tundra habitats. Ochyra & Szmajda (1990) reported it from high elevations in the European Alps (2400 m) and Honshu, Japan (3100 m). In western North America we have seen material collected from as high as 1800 m elevation. In the west, it occurs on mesic cliff faces and on mesic to exposed boulders and rock faces. *Drytodon patens* grows in similar habitats in Newfoundland. It has been collected from near sea level to elevations of 660 m. The species is frequently found on siliceous rocks or boulders at the edge of streams or ponds in exposed or partly sheltered sites. *Drytodon patens* is also known from early snowbed habitats. In its habitat preferences, it is more similar to species of *Racomitrium* than to those of *Grimmia*.

The world distribution of *Drytodon* has recently been mapped by Ochyra & Szmajda (1990). They reported a strongly disjunct, northern hemisphere range centered around the oceanic portions of northwestern Europe and western North America. In Europe, the species can be locally abundant in Scotland (the type locality) and

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Scandinavia and occurs as far south as Sardinia, the Canary Islands, and the Iberian Peninsula and east to the Carpathians and Latvia. It is known from the Altai Mountains in central Asia and from Japan.

The North American range is tricentric. In the west, it is widespread from southern coastal Alaska through northwestern British Columbia, continuing south and eastward to the interior mountains of British Columbia, and becoming rare on the eastern slopes of the Rocky Mountains of Alberta. It is common in suitable habitats in western Washington and northwestern Oregon, becoming more infrequent inland in the Rocky Mountains of northern Idaho and northwestern Montana. Farther south, it is known from two counties in northernmost California, including Del Norte Co. (*Duell 405/1aa* (ALTA)). Field work in 1990 yielded the easternmost station in western North America in Carbon County, Montana (*Vitt 35456* ALTA). In the east it is known from disjunct occurrences in two counties on the Keweenaw Peninsula of Michigan (Crum & Anderson 1981) and from several stations on the island of Newfoundland, where it occurs mainly in the highlands of the west coast (map in Belland 1987). The species also has an isolated station near Port Blandford, on the northeastern coast of the island (Tuomikoski *et al.* 1973). It has also been reported from southernmost Greenland (*Hansen 67-329* ALTA) and from Iceland.

The occurrence of this species in Newfoundland and on the Keweenaw Peninsula of Michigan is similar to that of a number of species of bryophytes, including *Grimmia hartmannii* and *Timmia austriaca*. This distribution has been used to support the idea that these species survived at least some of the Pleistocene Glaciations in refugia in eastern North America (Steere 1938). Many of the species having this tricentric disjunction are calcicolous and it has been argued that this pattern of occurrence is edaphic, not historical. However it is interesting that *Dryptodon patens* is a decided acidophilous species. Belland (1987) presented an extensive discussion of the possibilities of survival of these species in eastern refugia versus their migration from western areas following the retreat of Wisconsinan glaciation. *Dryptodon patens* has an eastern North American distribution that might support either the idea of westward migration along a tundra corridor at the margin of the icesheet (Marie-Victorin 1938) or glacial survival of the species in this corridor and subsequent postglacial migration northward and contraction of range with the retreat of the ice sheet (Crum 1972; Given & Soper 1981). The latter hypothesis is generally favored and there is subfossil evidence to show that many species grew close to the southern edge of the ice sheet during the early postglacial (Miller 1980a, 1980b). However, there is as yet no subfossil evidence to show that these populations were the source for many of the disjunct populations in Newfoundland or elsewhere in the Gulf of St. Lawrence region. It is equally likely that *D. patens* and species with similar eastern North American distributions survived the glaciation in Gulf of St. Lawrence refugia. Some of these species (including *D. patens*) are ecologically associated with

bryophytes whose distributions suggest a relictual glacial status, or have ecologies what would allow them to survive in such refugia.

Additional reports, new collections, and range extensions should be sent to the author. These new findings can be reported in future editions of this series.

NEXT SPECIES: *Ulota crispa* (Hedw.) Brid.

Literature Cited

- Belland, R. J. 1987. The disjunct moss element of the Gulf of St. Lawrence region: Glacial and postglacial dispersal and migrational histories. *Journal of the Hattori Botanical Laboratory* 63: 1-76.
- Crum, H. A. 1972. The geographic origin of the mosses of North America's eastern deciduous forest. *Journal of the Hattori Botanical Laboratory* 35: 269-298.
- Crum, H. A. & L. E. Anderson 1981. *Mosses of Eastern North America Volume 1*. Columbia University Press, New York. 663 pp.
- Crundwell, A. C. 1971. Notes on the nomenclature of British mosses. II. *Transactions of the British Bryological Society* 6: 323-326.
- Given, D. R. & J. H. Soper. 1981. *The arctic-alpine element of the vascular flora at Lake Superior*. National Museums of Canada, Publications in Botany, Number 10.
- Marie-Victorin, Fr. 1938. Phytogeographical problems in eastern Canada. *American Midland Naturalist* 19: 489-558.
- Miller, N. G. 1980a. Fossil mosses in North America and their significance. In: R. J. Taylor & A. E. Leviton (eds), *The Mosses of North America*. Pacific Division, American Association for the Advancement of Science, San Francisco. pp. 9-38.
- Miller, N. G. 1980b. Mosses as paleoecological indicators of late glacial environments: Some North American studies. *Journal of the Torrey Botanical Club* 107: 373-391.
- Ochyra, R. & P. Szmajda (eds) 1990. *Atlas of the geographical distribution of spore plants in Poland*, Series V, mosses (Musci) 5: 7-52.
- Steere, W. C. 1938. Critical bryophytes from the Keweenaw Peninsula, Michigan, II. *Annales Bryologici* 11: 145-152.
- Tuomikoski, R., T. Koponen, & A. Ahti. The mosses of the island of Newfoundland. *Annales Botanici Fennici* 10: 217-264.



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