

STUDIES ON THE TAXONOMY AND DISTRIBUTION OF SPHAGNUM. VIII. REDISCOVERY OF SPHAGNUM MACROPHYLLUM VAR. BURINENSE*

Sphagnum macrophyllum Bernh. var. *burinense* Maass is a very rare peat moss which was described from only a single locality on the Burin Peninsula in Newfoundland (Maass 1967). It has since not been collected anywhere else nor in the type locality itself. In September 1979, the type locality was revisited with a view to collecting the moss for an exsiccata. It was possible to relocate the larger of the two ponds in which the plant had been found, on the basis of the habitat photograph furnished with the description (Maass 1967, Fig 30). However, the ecology of the type locality has been drastically changed by road-building, and *S. macrophyllum* var. *burinense* and some of the accompanying species including *S. pylaesii* have disappeared completely. Even the very competitive species *S. torreyanum*, conspicuously visible from a distance by its strong and green capitula, has become scarce although there was no lack of water. On the contrary, the outlines of the ponds became obscured by flooding after the new highway No. 210 (Fig 1) was built in 1971 at a distance of about 150 m to the southeast of the old highway 11 seen in Figure 30 (loc. cit.). Eutrophication and/or toxic components from the tar of the fresh pavement may have contributed to the disappearance of the peat mosses. On the other hand, an unspoiled system of ponds on the large "blanket bog" northwest from the old highway, not far from the type locality, was found to show a very abundant growth of *S. macrophyllum* var. *burinense*. It grew in most of the ponds shown in Figures 2 to 4. Unfortunately, the variety cannot be distinguished in the field from var. *macrophyllum* when wet, except by microscopic study of the characteristic absence or presence of the sharply outlined row(s) of leaf pores (see illustrations in Maass 1967). However, upon drying, the curled or irregularly twisted leaves of var. *burinense* immediately distinguish the latter from the straight-leaved typical variety.

On the basis of the abundant material now available, it was possible to confirm the absence of pores from most of the hyaline cells (hyalocytes) in the branch leaves of var. *burinense* as a constant character. A few of the shorter cells near the leaf tips may, however, contain a single distinct end pore, and a few of the longer cells in the lower one-third of the leaves may contain up to 4 or 5 indistinct pores or membrane thinnings (as opposed to the always distinct and much more numerous pores of var. *macrophyllum*). In addition, the green cells (chlorocytes) in var. *burinense* tend to be wider than the hyalocytes, while the opposite is true with the typical variety. In var. *burinense* there is also a pronounced tendency for the replacement of hyalocytes of chlorocytes. This feature, which is common to some aquatic forms of a few *Sphagnum* species, indicates that environmental factors can interfere with the cell polarity in the very early stages of development, normally resulting in the perfectly regular network of alternating chlorocytes and hyalocytes by which the leaves of *Sphagnum* are characterized. In the dozen or so small ponds in which var. *burinense* was present (Fig 4), it was found either floating around the edges or anchored in the muddy bottom of the ponds down to a depth of 1 m or more. It also grew in a depression (Fig 4e) filled with hydrophilic species of *Sphagnum* identical to those in the ponds (*S. torreyanum*, *S. cuspidatum*, *S. pulchrum*, *S. pylaesii*). None of the

material showed any intergradation into var. *macrophyllum*, nor was the typical variety present at all. The typical variety of *S. macrophyllum* has recently been collected in Beaverskin L., Kejimikujik National Park, from a depth of up to 6 m where it formed a lake-bottom carpet along with *S. torreyanum* (Beauchamp 1980).

Twisted branch leaves combined with a severe reduction of leaf porosity are characteristics of a number of varieties that have been described for seemingly unrelated species of *Sphagnum* belonging to the *Cuspidata* and *Subsecunda* groups. The most famous case is probably *S. annulatum* H. Lindb. var. *annulatum*, the "normal" variety of this taxon being *S. annulatum* var. *porosum* (Schlieph.) Maass & Isoviita (also known as *S. jensenii* Warnst.). In this and similar cases it is not possible to recognize the normal and aberrant varieties in the field while the mosses are wet. As the flexuose varieties are generally very rare but tend to occur in mixed colonies together with their respective "normal" analogue, it is interesting to speculate that they represent a pathological condition and perhaps owe their existence to viral or microbial infections. As viruses have never been detected in mosses, an effort will be made to examine *S. macrophyllum* var. *burinense* for their possible presence. Evidence for a pathological origin of the flexuose varieties of *Sphagnum* would have consequences on their taxonomical status. For instance, *S. annulatum* and *S. jensenii* could not be treated as separate species as has been adopted by Andrus and Vitt (1979). Studies along these lines have been planned in collaboration with Dr. Guy Brassard of Memorial University of Newfoundland.

References

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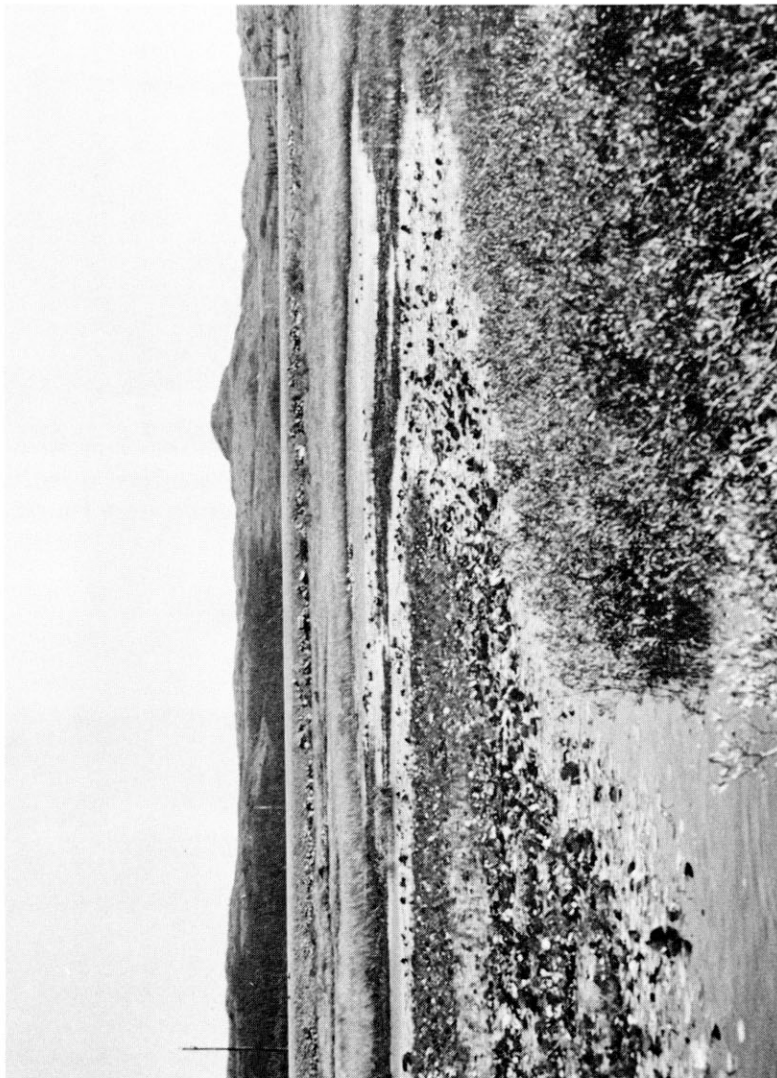


Fig 1. The type locality of *Sphagnum macrophyllum* var. *burinense*, photographed in a southerly direction from the same spot from which Figure 30 in Maass (1967) was taken. In the background is the new highway, the building of which caused changes of the water level and water chemistry and the disappearance of the *Sphagnum* community originally present.

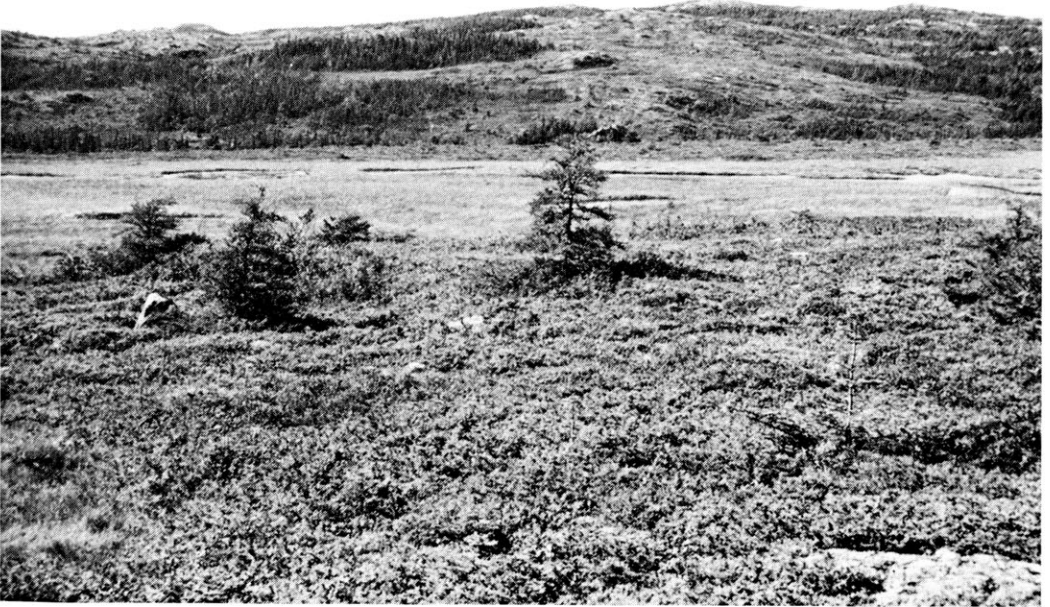


Fig 2. View of the blanket bog (in the middle ground) in a northwesterly direction from near the old road. All of the pools shown in this picture were found to contain *S. macrophyllum* var. *burinense*.

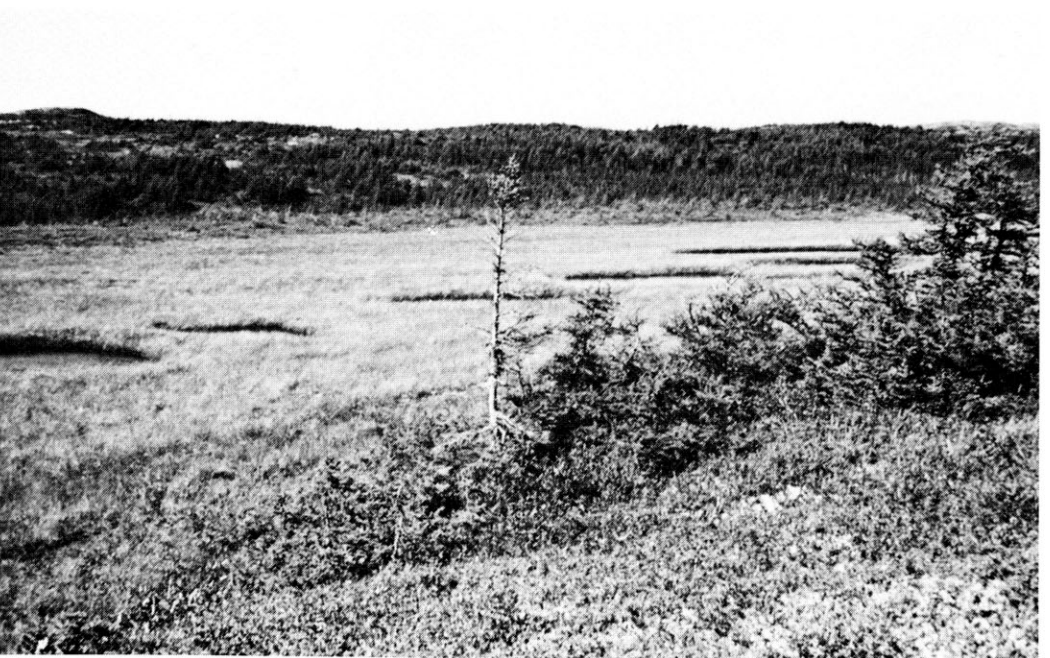


Fig 3. View of the blanket bog in a northerly direction. Most of the pools shown here were found to contain *S. macrophyllum* var. *burinense*.

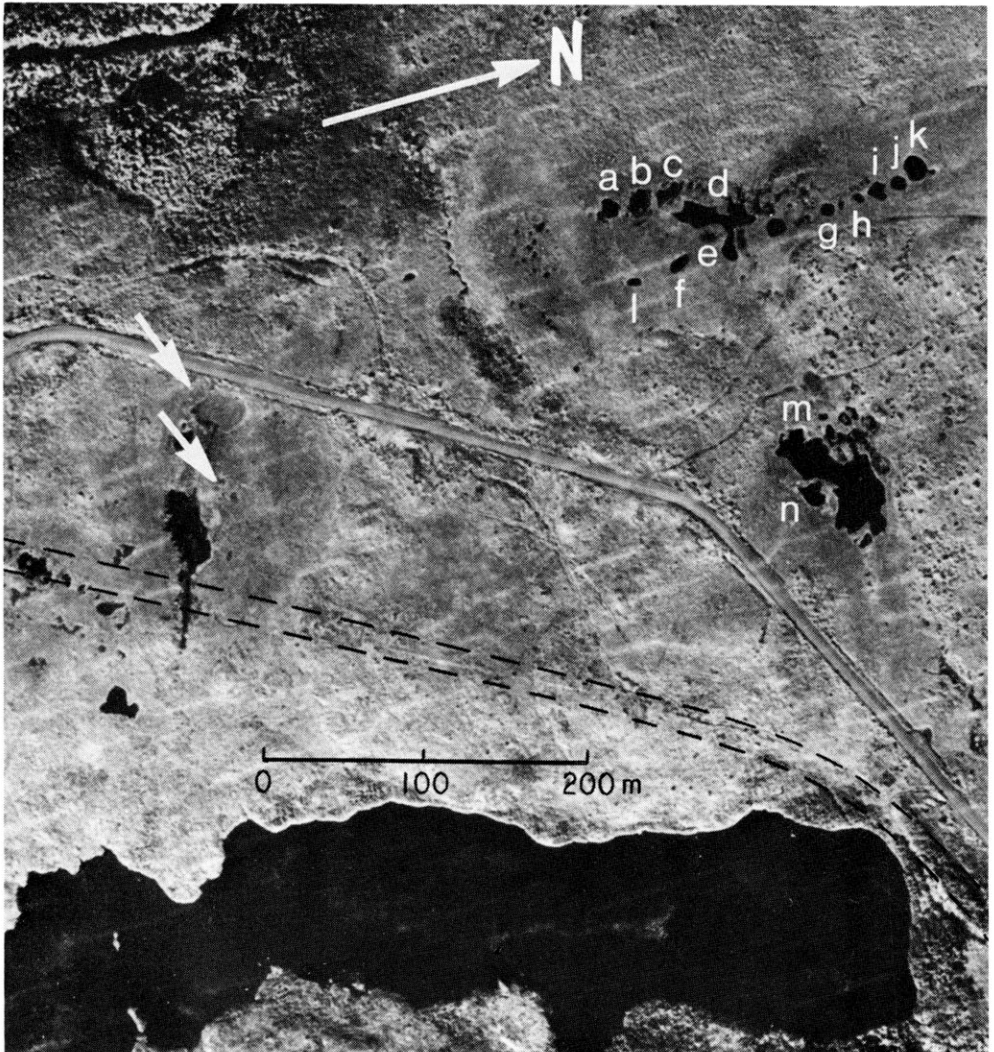


Fig 4. The presently known distribution of *Sphagnum macrophyllum* var. *burinense*. The lower case letters refer to collections from bog pools and bog ponds or wet depressions (e) which have been deposited at NFLD (duplicates of d and e are also at CANM and those of e and n in herb. Maass). Ponds m and n are on higher ground outside of the blanket bog and contained no more than one or two gametophytes each. In this aerial photograph of 1969, the original ponds of the type locality were still recognizable although completely filled in with vegetation (short arrows). The old dirt road (Hwy. 11) is clearly visible, and the approximate location of the tar road constructed in 1971 (Hwy. 210) has been indicated by broken lines. The present and former habitats of *S. macrophyllum* var. *burinense* all lie between 75-90 m elevation.