Splachnobryum in North America North of Mexico

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Since 1981 *Splachnobryum* has been regarded as the sole genus of the family Splachnobryaceae (Koponen 1981). Prior to then the genus had been considered to belong in the Pottiaceae (e.g., Crum & Anderson 1981) or in the Splachnaceae, where it was placed originally by Müller (1869). The axillary archegonia, lack of paraphyses, single circle of peristome teeth (considered to represent the endostome by Koponen, 1981), and the peculiar axillary hairs (mucilage hairs sensu Koponen, 1981) help define the family. The latter are sometimes difficult to demonstrate; they are helpful in recognition of the genus. Somewhat similar axillary hairs also occur in the Pottiaceae, in *Globulinella globifera* (G. E. L. Hampe) W. C. Steere, except that in the latter the terminal cell is clavate and symmetric instead of swollen and asymmetric. Although approximately 40 accepted species names are listed by Wijk et al. (1967), it is likely that far fewer will be retained following world-wide revision.

The purpose of the present article is to present the results of a recent review of *Splachnobryum* for North America north of Mexico undertaken for the *Flora of North America* project. Breen and Pursell (1959), after reviewing specimens of *Splachnobryum* from the United States, Mexico, Central America, and the West Indies, recognized only *S. obtusum*. They placed many names into the synonymy of *S. obtusum*. Following Breen and Pursell, only a single species is accepted here for North America north of Mexico. The species is sparingly distributed in the southern and southwestern United States.

Splachnobryum obtusum (S. E. Bridel) J. K. A. Müller, Verh. K.-K. Zool.-Bot. Ges. Wien 19: 504. 1869. *Weissia obtusa* S. E. Bridel, Musc. Recent. Suppl. 1: 118. 1806; *Splachnobryum bernoulii* J. K. A. Müller.

Plants gregarious, small, dull, often encrusted with soil. Stems erect, mostly simple, to 1 cm tall but mostly much shorter; axillary hairs 2--3-celled, proximal cell(s) short, with faintly yellowish walls, distal-most cell swollen,

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somewhat asymmetric, colorless, often encrusted; gemmae on axillary rhizoids rare; rhizoid tubers inconspicuous, of several bulging cells in linear arrangement. Leaves soft, commonly shriveled when dry, rarely uncontorted or nearly so, 0.6--0.8 mm long, oblong to obovate or spatulate, sometimes decurrent from costa and margins; medial cells smooth to distinctly mammillose on one or both surfaces; cells in upper portion of leaf in ascending rows diverging from costa; margins plane, or a little recurved proximally, mostly crenulate distally; costa weak to strong, 1/2 leaf length to nearly percurrent, sometimes spurred or forked, or both, distally.

Not producing sporophytes in the United States. Exposed sites on damp or periodically wet limestone, marl, calcareous soil, mortar-work; sea level to 1000 m; Arizona, Florida, Louisiana, Oklahoma, Texas; Mexico; West Indies; Central America; South America; Africa; Hawaii.

Splachnobryum obtusum is almost entirely restricted to base-rich substrates in the United States and probably elsewhere in its broad range. It is an obscure moss, difficult to find in the field because of its small size, drab aspect, and lack of obvious field characters. Most specimens from the United States are comprised of tiny, poorly developed plants with short stems and small leaves.

The typical habitat in North America is open areas on limestone or other limy substrates along rivers and streams; in the latter habitat *S. obtusum* may form minor tufa deposits, sometimes mixed with other calciphilic mosses. In North America underdeveloped specimens of various other mosses, mostly Bryaceae and Pottiaceae, are sometimes misidentified as *Splachnobryum*. (The type material of *S. kieneri* R.S. Williams is a *Bryum*; cf. Andrews 1949.) Under the microscope the leaf shape, crenulate distal leaf margin, and upper leaf cells in ascending rows diverging from the costa, are helpful for identification. The oddly shaped axillary hairs are also helpful for identification, but may be difficult to demonstrate. The leaves of many specimens of this moss are difficult to rehydrate after drying.

Plants with archegonia are common in at least some of the material distributed as Grout's *North American Musci Perfecti 448*, collected by Faith Pennebaker Mackaness on mortar-work in old cemeteries in New Orleans. However, neither archegonia nor antheridia have been found in field-collected specimens of *S. obtusum* from the United States. Limy substrates do not occur naturally in the vicinity of New Orleans, suggesting that the cemetery populations might

have been introduced. (See Chopra & Rashid 1969 and Chopra & Sheel 1974 for observations on the sex organs of *Splachnobryum*.)

Rhizoid tubers, as reported by Arts (1996) for African specimens of *S. obtusum*, are present in at least some of the specimens from the Flora area, including the New Orleans material. Although plants with sporophytes have never been found in the field in the United States, fertile plants of *Splachnobryum* are known from the United States from a specimen collected in a greenhouse in November, 1910, at Philadelphia, Pennsylvania (NY). The specific identity of the greenhouse plants is uncertain.

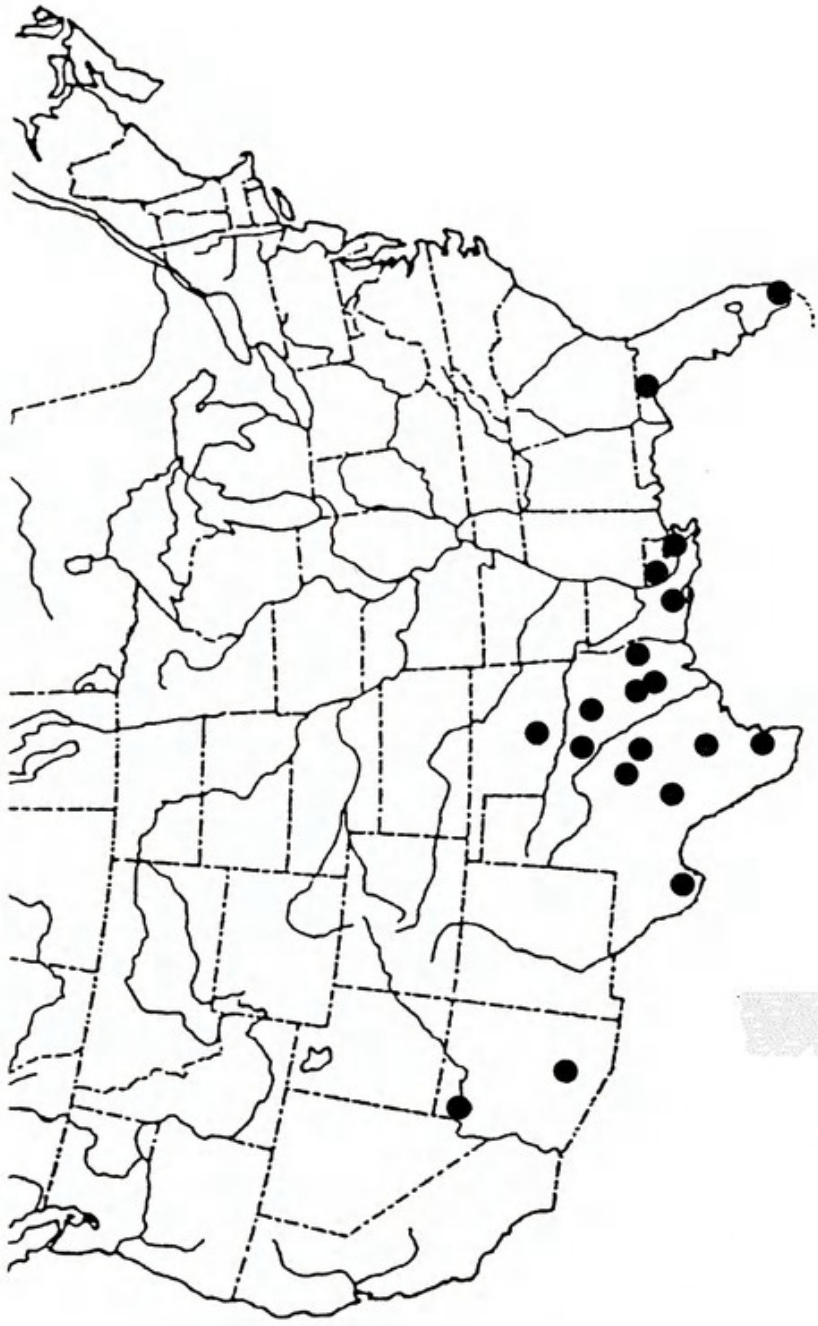
Specimens Examined

[NOTE: *Splachnobryum obtusum* (as *S. bernoulii*) was reported from Georgia, from Stone Mountain, by Schnooberger (1948). The specimens are correctly determined but it is doubtful that they actually came from Stone Mountain. See comments under Georgia, below.]

ARIZONA. Virgin Basin, Lake Mead, 5 mi. NNE of Middle Point, *Clover 6269,* MICH, NY. Pinel Co., Aravaipa Canyon, coll. Jessie Portmann, *Haring 12,407*, 29 April 1959, MNA.

FLORIDA. Dade Co., *Breen 2777*, NY; Leon Co., *Reese sn.*, 12 Nov 1955, LAF, and *Reese 510*, NY; *Redfearn 1081*, COLO, DUKE, LAF, MO, NY, TENN; *Pursell 400MF68*, COLO, NY; *400MF79*, DUKE.

[GEORGIA. Atlanta, on top of Stone Mtn., *Clyde Schnooberger*, Aug. 1943, MICH, NY. The Schnooberger specimens are correctly identified. However, the indicated locality is suspect. In 1948 Schnooberger reported on a collection of mosses that she said were taken by her brother Clyde from the top of Stone Mountain, Georgia. Of the nine specimens, four were identified as *Barbula cruegeri* (= *B. indica*), two as *Pohlia cruegeri* (= *Bryum apiculatum*), two as *Splachnobryum bernoullii* (= *S. obtusum*), and one as *Grimmia laevigata.* The first three species are tropical--subtropical lowland mosses that are unlikely residents of the cool windy summit of Stone Mountain in northern Georgia. The *Grimmia* could have come from almost anywhere. There is nothing about the list of mosses that Schornherst (1945) published for Stone Mountain that would indicate a tropical--subtropical floral connection. Another cause for caution on the Stone Mountain attribution is that the two collections of *S. obtusum* as published by Schnooberger are listed



Distribution of *Splachnobryum obtusum* in North America north of Mexico.

as numbers *5903* and *5905*, but the numbers published for these same collections by Breen and Pursell are given as *5902* and *5904*. The latter numbers were published as *Pohlia cruegeri* by Schnooberger. In view of the above, *S. obtusum* is here excluded from the bryoflora of Georgia.]

LOUISIANA. Lafayette Parish, *Reese s.n.*, 31 Aug 1994 (In 1998 this site was destroyed), LAF; Orleans Parish, *Mackaness s.n.*, 25 April 1942, DUKE; *Mackaness s.n.*, 23 May 1942, LAF ex NO; 14 Sept 1942, BRIT, MICH, MO, NY, TENN, & 17 Oct 1942, LAF, the latter two being different issues of Grout's *North American Musci Perfecti 448*; New Orleans, St. Roch's Cemetery, *Mackaness 9*, 29 March 1942, MICH; West Feliciana Parish, *Reese 10952*, LAF.

OKLAHOMA. Murray Co., *Merrill 13363b*, MICH.

TEXAS. Brewster Co., Big Bend National Park, *Reese 11564*, *Reese & Valentine 18364*, LAF; Burnet Co., *Reese & Pursell 3462*, LAF; Cameron Co., *Reese & Pursell 3365, 3366*, LAF; Dallas Co., *Mahler 8245*, BRIT, *Whitehouse 26296*, BRIT, NY; Hill Co., *Pursell & Reese 4564*, COLO, *Reese & Pursell 3661*, LAF; Jim Wells Co., *Burandt & Galloway T-75*, LAF; Kendall Co., *Reese & Pursell 4341*, LAF; Sabine Co., *Reese & Pursell 3791*, LAF; Travis co., *Whitehouse 24793*, BRIT; Walker Co., *Reese & Pursell 3610*, LAF.

E. B. Bartram's Arizona Specimens of "Splachnobryum"

Arizona. Santa Cruz Co., *Bartram 145* (DUKE, NY), *616, 1446a* (also at TENN), NY. The *145* and *1446a* (a Holzinger exsic.) are probably *Bryum cyclophyllum*, as discussed by Breen and Pursell (1959). The *616* probably belongs in the Pottiaceae, although the specimen at NY was annotated by Breen as *Splachnobryum wullschlaegelii* J. K. A. Müller, which Breen and Pursell (1959) list as a synonym of *S. obtusum*. However, the axillary hairs of this material are not like those of *Splachnobryum*.

Philadelphia Greenhouse *Splachnobryum*

Pennsylvania, Philadelphia, greenhouse, Sept. and Nov. 1910, the latter c.fr., NY

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