Bryophytes of Cabin Creek Raised Bog

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The Cabin Creek Raised Bog, discovered and named by Ray C. Friesner and J. E. Potzger (2), occurs in Randolph County, Indiana, along State Highway 1, six miles north of Modoc and three miles south of Farmland. They gave it this name because of its location in the floodplain of Cabin Creek. These botanists determined that the central portion of the convex mass is 10 ft. above the floodplain, that the entire region is glaciated terrain, dating to the activity of Early Wisconsin glaciation, and that the bog is about 50 miles south of the limits of the Late Wisconsin glaciation in Indiana. Of the three types of raised bogs in America, they reported that the Cabin Creek Raised Bog has been caused by artesian spring water, high in calcium content, with mosses, sedges, and grasses as the chief peat formers. This type of bog occurs in inland areas. In addition, Friesner and Potzger stated that Cabin Creek Raised Bog is an example of a raised bog formed by weakly expressed hydrostatic pressure causing wet areas favorable to luxuriant growth of mosses *(Drepanocladus)* as well as growth of sedges and grasses, and that the accumulating remains will form an ever-deepening layer of peat which will gradually build up a convex mound.

By means of 73 borings and an intensive two-year study, the following information was contributed by Friesner and Potzger. They found no open water beneath the peat but a fairly compact mass of peat through which water was forced by some head pressure. From their findings they assumed that originally there was a deep, water-filled hole in an ancient stream bed and that the early filling was due to water-deposited, finely divided material, composed mainly of inorganic particles and marl. Their borings gave evidence of small pieces of wood, a few leaves of mosses and parts of sedges, mixed with this deposit at the 13-foot level. From the 12-foot to the 8-foot levels mosses and sedges contributed the organic sediment constituents, according to the Butler University botanists, and from the 7-foot to the 1-foot levels peat was formed chiefly by wood. Their boring 7 was made in the deepest part of the bog. In boring 7, at 8-foot level, the sediment was chiefly moss-sedge, at 12-foot level, moss-sedge; in boring 1 (all on land), moss was found from 13-foot to 8-foot levels; in boring 5, moss occurred in sediment from 10- to 7-foot levels. In summary, the moss fragments occurred from 13- to 7-foot levels, below 13, very little organic matter, above 7, mainly wood or sedge, or wood and sedge.

In their boring 1, the sandy soil is abruptly overlain by 3 feet of a coarse, raw *Drepanocladus* (determined for Friesner and Potzger by W. C. Steere) peat. In the great majority of borings they had evidence

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of abundant marl. The absence of ericads, plant indicators of acid substratum, is also indicative of the alkaline habitat.

The data obtained from their studies of borings at different foot-levels showed retardation of peat formation as the bog increased in height and apparent increased evaporation rate, resulting in increased oxidation of plant remains.

The several small streams which flow from the peat moss at the present time arise at the artesian springs.

The writer has followed the classification of bogs as fens if the habitat is alkaline.

On June 16, 1962, the author visited the bog[2] to collect bryophytes for the preparation of records of the mosses and liverworts presently growing in the Cabin Creek Raised Bog. The areas cited are those used by W. A. Daily in his report (1) of the algae occurring in the bog: Spring Area 1, Spring Area 2, and the Knoll. Sixty collections were made at random, assuming that this method would produce the species and the associations of the bryophytes now occurring in this bog.

According to W. A. Daily, the temperature of the water at the opening of the artesian springs is ± 52°F throughout the year, and the pH Value of the bog water is ± 7.

Gordon (3) reported two mosses in the Urbana Raised Bog: *Anomodon rostratus* and *Tortella caespitosa*.

Neither *Drepanocladus* reported by Friesner and Potzger nor *Anomodon* or *Tortella* recorded by Gordon were found in the author's 60 collections.

The only hepatic collected was *Riccardia pinguis* (L.) S. F. Gray. This hygrophytic liverwort occurs with the mosses, growing in between the plants, on soil at base of spermatophytes, as well as on crusty, alkaline soil at margin of the stream and extending into water. It occurred in 6 collections. In 1961, Fay K. and W. A. Daily sent a specimen to the writer for determination.

Campylium stellatum (Hedw.) Lange & C. Jens. was the most common moss in the fen, occurring in 37 of the 60 collections. It grows in large sods at base of spermatophytes, alone, or with other mosses, in Spring Area and on Knoll. This moss either prefers or is tolerant of fens and apparently has had a prominent part in filling up bodies of water such as quaking bogs, by growth upon the ground and by aiding in the formation of a surface mat. *C. chrysophyllum* (Brid.) Bryhn was found in one collection, in Spring Area 2.

Bryum creberrimum Tayl. [formerly *B. cuspidatum* (B.S.G.) Bryhn] was growing in the three areas, Spring Areas 1 & 2, and on the Knoll, and occurred in 11 of the 60 collections. *B. pseudotriquetrum* (Hedw.) Schwaegr. grows in both Spring Areas and was collected twice. On Sept. 23, 1961, W. A. & Fay K. Daily collected it in Spring Area 1.

Fissidens adiantoides Hedw. was collected in Spring Area 2 and on the Knoll, occurring in 13 collections.

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2. The leader of the Cabin Creek Raised Bog foray was Wm. A. Daily. Other members of the excursion were Fay K. Daily, T. G. Yuncker, Charles and Joan Hall, Mr. and Mrs. Robert Holliday, Mike Holliday, and the writer.

Rhynchostegium serrulatum (Hedw.) Jaeg. [formerly *Eurhynchium serrulatum* (Hedw.) Kindb.] occurs in each of the three areas, and was found in 5 collections.

Each *Hygroamblystegium tenax* (Hedw.) Jenn. [formerly *H. irriguum* (Wils.) Loeske] and *Cratoneuron filicinum* (Hedw.) Roth occur in 6 collections. *Hygroamblystegium* was found in both Spring Areas and *Cratoneuron* was collected in Spring Area 2. *C. filicinum* grows especially in calcareous areas and is regarded as an important plant in the forming of tufa.

Pleurozium schreberi (Brid.) Mitt. [formerly *Calliergonella schreberi* (B.S.G.) Grout] was collected once, in Spring Area 2; *Mnium affine* Bland. once, in Spring Area 1; and *Ceratodon purpureus* (Hedw.) Brid. once, on the Knoll.

At least eleven species of mosses and one species of hepatics occur in the Cabin Creek Raised Bog at this time. These species occur in the following bryophyte associations in this fen: *Bryum creberrimum & Campylium stellatum; Bryum creberrimum & Fissidens adiantoides; Campylium chrysophyllum & Fissidens adiantoides; Campylium stellatum, Bryum creberrimum, & Fissidens adiantoides; Campylium stellatum & Bryum pseudotriquetrum; Campylium stellatum & Cratoneuron filicinum; Campylium stellatum & Fissidens adiantoides; Campylium stellatum & Rhynchostegium serrulatum; Campylium stellatum & Riccardia pinguis; Campylium stellatum, Riccardia pinguis, & Fissidens adiantoides; Ceratodon purpureus & Campylium stellatum; Cratoneuron filicinum & Bryum pseudotriquetrum; Fissidens adiantoides, Campylium stellatum, & Pleurozium schreberi; Hygroamblystegium tenax, Bryum creberrimum, Cratoneuron filicinum, & Fissidens adiantoides; Hygroamblystegium tenax & Rhynchostegium serrulatum; Rhynchostegium serrulatum, Campylium stellatum, Bryum creberrimum, & Fissidens adiantoides; Rhynchostegium serrulatum & Fissidens adiantoides;* and *Riccardia pinguis, Cratoneuron filicinum, & Campylium stellatum.*

Among the mosses of Cabin Creek Raised Bog, *Campylium stellatum* and *Cratoneuron filicinum* are regarded as indicators of calcareous habitats, supporting the previous findings by the absence of ericaceous plants and by chemical tests, and the classification of this bog as a fen. From the evidence of the frequency of *Campylium stellatum* alone or in bryophytic associations, the author has concluded that it is the chief bryophyte factor in the present stage of development of the Cabin Creek Raised Bog and in the plant life of the fen.

Literature Cited

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3. Gordon, Robert B. 1933. A Unique Raised Bog at Urbana, Ohio. The Ohio Journ. Sci. **33**(6):453-459.