

THE MOSSES OF MONROE COUNTY.

BY F. L. PICKETT AND MILDRED NOTHNAGEL.

The only lists of Indiana mosses the writer has been able to find are as follows: A list of 69 species reported from Jefferson County by A. H. Young in 1876, and published in the *Botanical Gazette* of that date; a list of 13 species reported by W. S. Blatchley in March, 1887, and included in a thesis listing the plants of Monroe County under that date; a list of 49 species reported by L. M. Underwood in the *Proc. Ind. Acad. Sci.* for 1893; a list of 9 species reported by Guy Wilson from Hamilton County in the *Proc. Ind. Acad. Sci.* for 1894. Because of the meagerness of some of these lists and the changes in classification resulting from careful study of mosses since the publication of the first of these lists, there seems to be room for a new check list of Indiana mosses. As a beginning of such a list the present report is presented.

Early in 1911 a small collection of mosses maturing their spores in spring and early summer was made. A fuller collection of forms fruiting in fall and early winter was made in 1912. The material of this later collection has been carefully identified, and that of the earlier collection reidentified, altogether making a list of 51 species and 3 varieties from 34 genera and 12 families. With the exception of forms easily determined, only fruiting forms have been considered. The list as given includes but five sterile forms.

In every case herbarium preparations have been made. These are of two kinds. Fresh specimens of individual plants and of small typical groups were taken from a moist chamber and quickly dried under a pressure of 100 pounds to 150 pounds and then glued to cards for preservation in envelopes on herbarium sheets. Other specimens were allowed to dry without pressure in mats or tufts as they grew, and then kept in cardboard trays. The latter specimens are of special value as material for future comparison and to show the habit of the dried plants. Notes of time and place of collection, of substrata, appearance of the sporophyte at the time of collection, appearance of plants under normal conditions, and any peculiarities due to season and variation from type are recorded. Important observations touching these points are given under each species

in the list. Only Monroe County mosses are included in the present report, but it is hoped that there will be time and opportunity to later extend the list to include at least all the common mosses of Indiana.

In general it may be said that the past season has been unusually favorable for the growth and development of mosses, and as a result it has been possible to collect some very interesting forms. Among these should be mentioned *Anomodon attenuatus* with regularly pinnate to plumose habit due to strong secondary growth from lateral buds, the formation in fall of a second crop of spores by such spring fruiting forms as *Campylium chrysophyllum*, *Funaria flavicans*, *F. hygrometrica* and *Weisia viridula*, and the presence of a fairly abundant supply of spore cases on such rare-fruited forms as *Leucobryum glaucum*, *Plagiothecium deplanatum* and *Thuidium delicatulum*.

The work of identifying mosses is tedious and time consuming, and in the main requires much careful observation with the use of a good compound microscope. The writer has found that only after the collector is quite well acquainted with group characters can he do any satisfactory work without a good microscope. The most helpful work on classification is A. J. Grout's "Mosses with a Hand-lens and Microscope," with its usable keys, distinctive descriptions and splendid illustrations. The older manual of Lesquersux and James is often of value for descriptions of varieties and of rarer forms not described in Grout's work. In preparing the list the arrangement and nomenclature of Grout have been used. Specially difficult specimens have been referred to Dr. Grout for identification, and his name appears in connection with such.

Order BRYALES.

Suborder NEMADONTEAE.

Family *Polytrichaceae*.

Catharina undulata (L.) W. & M. (37, 64). Mature spore cases October 27.

Common along shady roadsides and in light woods, on clay.

Pogonatum brevicaulis (Brid.) Beauv (10). Mature capsules September 15.

On damp clay banks. Common.

Polytrichum commune L. (47). Spores in April.

On shady hillsides. Common.

P. ohioense R. & C. Spores in April.

On shady hillsides. This is the form usually met with in the neigh-

borhood of Bloomington, and is distinguished from *P. commune* by its longer and usually darker capsule.

P. piliferum Schreb (23). Sterile forms only.

On dry clay hillside in woods 3 miles northeast of Bloomington. Not common.

Suborder ARTHRODONTÆ.

Family *Fissidentacea*.

Fissidens bryoides (L.) Hedw. (44, 56). Mature capsules in November.

On damp rocks (limestone) in well shaded ravines. Common but easily overlooked because of minute size (3-8mm.).

F. cristatus Wils. (67). Mature capsules November 9. Determined by Dr. Grout.

This form usually matures spores in summer. Found in dense, dark green mats on quite damp soil in woods 5 miles southeast of Bloomington. Not common.

F. incurvus var. *minutulus*. Austin (45). Mature capsules November 9.

On damp limestone in same places and mingled with *F. bryoides*.

Family *Dicranacea*.

Dicrabella heteromalla (L.) Schimp. (41). Mature capsules in November.

In small tufts with *Leucobryum glaucum* on dry hillside 6 miles southeast of Bloomington. Rare.

D. varia (Hedw.) Schimp. (30). Mature capsules in October.

In small, dense tufts on clay and cinder piles. Common.

Dicranum scoparium (L.) Hedw. (19, 65). Mature capsules September and October.

On soil and damp decayed wood in shady hillside woods. Common.

Leucobryum glaucum (L.) schimp. (21). Mature capsules in October.

On shady clay bank at head of Huckleberry Ravine. The only fruiting specimen known to have been found in Monroe County was found by Miss Nothnagel as above stated on October 4.

Family *Tortulacea*.

Barbula unguiculata (Huds.) Hedw. (53). Mature capsules in November.

On shaded clay banks along roadside. Common.

B. unguiculata var. *obtusifolia* (Schultz.) B. & S. (29). Mature capsules in October. In crevices of walls of limestone quarry of Oëlitic Stone Mills Company. Uncommon.

Didymodon rubellus (Hoffm.) B. & S. (63). Mature capsules in December.

On clay and stone near warm water near condensing tank of I. U. power house.

Weisia viridula (L.) Hedw. (28). Mature capsules April, 1911, also in October, 1912.

On thin clay soil over stone and in sunny pastures. Common.

Family *Orthotrichacea*.

Orthotrichum porteri Aust. (3). Mature capsules April, 1911.

This rare moss has been found freely fruiting and in considerable quantity on the limestone bordering the main stream feeding the I. U. Water-works pond.

Family *Funariacea*.

Funaria flavicans Mx. (32). Mature capsules in October.

On stone waste at quarry of Ogilvie Stone Mills Company. This was probably a second growth specimen, as this species usually fruits in spring. Not common.

F. hygrometrica (L.) Sibth. (12). Mature capsules September 28.

On clay bank in Lively's woods. This form usually fruits in spring.

Physcomitrium immersum Sully. Mature capsules summer and autumn.

Very common on pots in greenhouse and on clay in fields.

P. turbinatum (Mx.) Brid. (4). Mature spores in spring and early summer.

Very common in lawns and pastures or old stubble fields.

Family *Aulacomniacea*.

Aulacomnium heterostichum (Hedw.) B. & S. (8, 13). Mature capsules May, 1911.

On damp humus between rocks, shady bank. Occasional.

Family *Bartramiacea*.

Bartramia pomiformis (L.) Hedw. (1, 66). Mature capsules in May.

In bright, yellowish green cushions on moist, shady banks. Common.

Family *Bryaceae*.

Bryum argenteum L. (11). Mature capsules in September.

Very common on yellow clay. This is the small moss usually found in small silvery cushions between the bricks of sidewalks.

B. capillare L. (55).

Only one specimen found and that showing empty capsules November 22, 1912. Among lichens on damp clay bank "Huckleberry" Ravine. Rare.

Mnium affine ciliare (Grev.) C. M. (57). Mature capsules in March and April.

Large spreading mats on rotten wood in shady, damp places. Common.
M. cuspidatum (L.) Leyss. (36, 69). Mature capsules in April.

On damp, decaying wood in shade. Common.

Rhodobryum roseum (Weis.) Limpr. (60). Sterile.

On damp rotten wood and on damp soil. Occasional.

Pohlia nutans (Schreb.) Lindb. (5). Mature capsules in May.

On damp, shady clay bank, Griffy Creek. Uncommon.

Family *Leskeaceae*.

Anomodon attenuatus (Schreb.) Huebn. (52). Mature capsules in November.

In close mats on damp rocks and rotten wood. This was found fruiting plentifully although reported as rarely fruiting. Some beautiful regularly pinnate specimens were found.

A. rostratus (Hedw.) Schimp. (14). Mature capsules in October.

Coarse, green, velvety mats at base of trees. Common. Determined by Dr. Grout.

Thuidium delicatulum (L.) Mitt. (27, 50). Mature capsules in October.

Although this species does not commonly fruit, several collections of fruiting plants were made this season. This, in sterile form is quite abundant, forming wide-spreading mats of beautiful fernlike branches on damp, rotten logs.

T. pygmaeum Br. & Sch. (62). Mature capsules in November.

Found in but one place, but quite plentiful there. In mouth of cave on stone and clay, one and one-half miles north of Bloomington.

Thelia hirtella (Hedw.) Sulliv. (49, 61). Mature capsules in November.

On bark of dead and decaying logs in dry shaded places. Occasional.

Family *Hypnaceae*.

Amblystegium riparium B. & S. (51). Sterile form only.

Attached to stones and soil in shallow running water above I. U. Water-works.

Brachythecium oxycladou (Brid.) B. & S. (15, 39). Mature capsules in October and November.

On damp stones and rotten wood. Common.

B. plumosum (Sw.) B. & S. (16, 38). Mature capsules in November.

Thin spreading mats closely applied to damp rocks and clay.

B. rutabulum (L.) B. & S. (17). Mature capsules in November.

On wet rocks and soil.

- B. salebrosum* (Hoffm.) Br. & Sch. (54). Mature capsules in November.
On wet, rotten wood, Griffy Creek, shady bank.
- B. starkei* (Brid.) B. & S. (40). Mature capsules in November.
In shady ravine on damp decayed wood with *B. salebrosum*.
- Campyllum chrysophyllum* (Brid.) Bryhn. (18). Mature capsules in October, although this species is supposed to mature its spores in early summer.
On damp clay-covered rocks in shady ravines. Common. Determined by Dr. Grout.
- Climacium americanum* Brid. (34). Sterile only.
One dry soil in shaded places. Occasional.
- Entodon cladorrhizans* (Hedw.) C. M. (31, 42). Mature capsules October.
On damp decaying logs in shade. Common.
- E. seductrix*. (Hedw.) C. M. (35). Mature capsules in October.
In close mats on dry, shaded rotten logs North Pike.
- Eurhynchium serrulatum* (Hedw.) Kindb. (43). Mature capsules empty in November.
In shady ravine on damp rotten log, near Jackson Creek.
- Hypnum curvifolium* Hedw. (2). Mature capsules in April.
On damp underbrush and decayed wood, shade, near water. Huckleberry Ravine.
- H. imponens* Hedw. (46). Mature capsules in November.
In shady ravine on damp decayed wood 6 miles east of Bloomington.
- Plagiothecium deplanatum* (Sch.) Grout. (22). Mature capsules in October.
This species, usually reported as rarely fruiting, was found with abundance of capsules. On damp soil, Huckleberry Ravine.
- P. geophilum* Aust. (58). Mature capsules in November.
Abundant on rocks in Huckleberry Ravine. Found fruiting plentifully.
- Platygerium repens* (Brid.) B. & S. (25, 33, 68). Mature capsules in October.
At base of trees and on dry rotten logs. Common. Determined by Dr. Grout.
- Pylaisia schimperi* R. & C. (7, 24). Mature capsules in October.
On trees, living *Juglans cinerea*, Huckleberry Ravine.
- Raphidostegium carolinianum* (C. M.) J. & S. (26). Mature capsules in October.
On damp rocks in ravine. Common.

R. carolinianum var. *admixtum* Sulliv. (48, 59). Mature capsules in October.

On rocks on dry hillsides. Occasional.

Family *Leucodontaceae*.

Leucodon julaceus (Hedw.) Sulliv. (6). Sterile only.

On bark of living trees, Huckleberry Ravine.

NOTE.—The numbers given after the species are the numbers of the specimens as arranged and left in Indiana University herbarium.

I. U. Botanical Laboratory.

