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Bryophytes of Rocky Branch Nature Preserve, Clark County, Illinois

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Bryophytes of Rocky Branch Nature Preserve, Clark County, Illinois

By

David C. Burnette
B. S. in Botany, Eastern Illinois University

Abstract of a Thesis
Submitted in partial fulfillment of the requirements of the degree of Master of Science in Botany at the Graduate School of Eastern Illinois University

Charleston, Illinois
1981

An extensive field survey of the Rocky Branch Nature Preserve in Clark County, Illinois, revealed a total of 52 bryophyte species. Of these, 38 were mosses and 14 were liverworts. Descriptions, habitats and distribution comments, plus a map showing the county distributions for each species in Illinois are included.

As a result of this survey, the liverwort Nardia lescurii (Aust.) Underw. is a new addition to the bryoflora of Illinois. There were also several other bryophytes found that were previously unreported for Clark County or the Rocky Branch Nature Preserve. These include Rhynchostegium pulchellum (Hedw.) Robins var. pulchellum, Isopterygium tenerum (Sw.) Mitt., Sphagnum girgensohnii Russ., Jamesoniella autumnalis (DeCand.) Steph. and Geocalyx graveolens (Schrad.) Nees. Two bryophytes that were reported by Vaughan (1941) but not by Arzeni (1947) were relocated. These are the moss Hookeria acutifolia Hook. and the liverwort Solenostoma crenuliformis (Aust.) Steph. The specimens for all the bryophyte species collected are housed in the Stover Herbarium at Eastern Illinois University, Charleston, Illinois.

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Acknowledgements

I would like to express my most sincere appreciation to Dr. Charles B. Arzeni for inspiring this study and for his advice and encouragement throughout our long association. I would also like to thank Dr. Wesley Whiteside and Dr. Roger Darding for their criticisms of this manuscript. I am also indebted to Dr. John Ebinger for his assistance with the distribution maps.

Alphabetical List of Bryophytes

Introduction

This paper is a taxonomic and ecologic study of the bryoflora of the Rocky Branch Nature Preserve in Clark County, Illinois. This beautiful and botanically unique area offers a wide variety of habitats, ranging from low-land woods to moist sandstone walls to dry upland woods. The bryoflora of Rocky Branch has been previously studied by Vaughan (1941) and Arzeni (1947). Both studies were essentially checklists although Arzeni does list habitats for some of the rarer species. The purpose of this study is to determine the habitat preferences for the bryophytes collected during the fall of 1980 and the winter of 1981 as well as to give some idea as to the stability or decline of the numbers of bryophyte species as compared to Arzeni's study of 34 years ago.

The Rocky Branch Nature Preserve is located six miles northwest of Marshall (Sect. 29 & 30, T12N, R12W), in Clark County, Illinois. Rocky Branch is a 130 acre tract originally purchased by the Nature Conservancy and now placed under the trusteeship of Eastern Illinois University, which maintains the area for research and environmental education purposes.

The preserve is bisected by Rocky Branch Creek, which flows northeasterly into the West Fork of Big Creek, which forms the eastern boundary of the preserve. These two creeks, due to their downcutting action since the Wisconsin glaciation have produced deep creek valleys with large,

exposed sandstone walls which are an excellent habitat for a large number of bryophyte species. Some of these sandstone walls approach 15 meters in height. Many small natural springs keep these sandstone walls constantly damp, which allows a profusion of bryophytes to utilize this unique habitat.

Glaciation has apparently been a major factor in influencing the vascular plants as well as the bryophytes found at Rocky Branch. The preserve is located a scant five miles south of the Shelbyville Moraine, which was the terminal moraine of the Wisconsin Glaciation, while the preserve itself lies on the till of the earlier Illinoisan Glaciation. Due to this glacial activity, the preserve contains a large number of plants which are either at the limits of their ranges or are beyond their normal ranges. Many northern species of plants were forced southward in front of the advancing glaciers. When the glaciers retreated, several species of these northern plants found suitable habitats at Rocky Branch and have persisted there to the present time. Ebinger and Hellinga (1970) list Bartonia virginica (L.) BSP.; Coral Root (Corallorhiza odontorhiza (Willd.) R.Br.); Rattlesnake Plantain (Goodyera pubescens (Willd.) R.Br.); Frostweed (Helianthemum bicknellii Fern.); Winterberry (Ilex verticillata (L.) Gray.); Pinweed (Lechea villosa Ell.); Bishop's Cap (Mitella diphylla L.); Interrupted Fern (Osmunda claytoniana L.); and Arrow-wood (Viburnum acerifolium L.) as being examples of this.

Stover (1930) reported the presence of the Clubmoss Lycopodium lucidulum Michx. but Ebinger and Hellinga (1970) report that it is probably now extinct in the area. It was not encountered during the course of this study. Ebinger and Hellinga (1970) also list several southern species of vascular plants that are at the northern extreme of their range. These include Agrostis elliottiana Schult.; Horsebalm (Collinsonia canadensis L.); Blazing Star (Liatris scabra (Greene) K. Schum.); Wood Rush (Luzula bulbosa (Wood) Rydb.); Partridge Berry (Mitchella repens L.); and Panic Grass (Panicum dichotomum L.).

Some of the bryophytes found at Rocky Branch are undoubtably present due to glacial influences. These bryophytes are primarily northern species at the southern edge of their range where they found suitable habitats, usually on the cool, wet, north-facing sandstone walls. An example of this phenomenon would be the two species of Sphagnum found in the preserve.

Literature Review

The study of bryology in Illinois predates the Civil War. In 1859, Frederick Brendel published a paper which contained an appendix entitled "Mosses occuring around Peoria". This checklist was the first attempt at cataloging the bryoflora of Illinois. In June of 1859, George Vasey presented a paper entitled "Mosses of Illinois" to the State Natural History Society at Bloomington and his paper was published by the society. In 1874, Harry Patterson published "Plants in the vicinity of Oquawka, Illinois" which contained a list of 38 moss species. In 1878, Wolf and Hall published a list which contained 145 species of mosses and 45 species of liverworts. Little work was done on Illinois bryophytes until the early 1900's when Hill published 6 papers in the 14 year span from 1902-1916. Taylor (1920a, 1920b) published two papers dealing with the ecological succession of mosses in the Chicago area. Bryophytes were then essentially ignored until the 1930's when Stella Hague rekindled interest in them through her series of papers and lectures in association with the Illinois State Academy of Science. Hague (1930) included 236 species in her checklist of Illinois mosses. In the same year, Montgomery (1931) published on the ecology of mosses of the Grand de Tour region of Illinois, paying special attention to pH relations. Grant and Hague (1931) published a list of mosses from Vermilion County, Illinois while Hague and Holmes (1933) published a list of 48 mosses

from Coles and Crawford Counties. Hague (1934) then published a list of 70 mosses from the Illinois Ozarks, which includes the southern counties of Saline, Pope, Johnson, Union, Williams and Hardin. In the same year, Galligar published a list of 41 mosses from a study in Macon County, Illinois. Boewe, Barrick and Hague (1935) reported 62 mosses from Apple River Canyon, Mississippi Palisades and White Pine Forest State Parks. Two years later, Hague published a checklist of 65 species of liverworts for Illinois. Hague and Drexler (1938) reported 29 liverwort species and 2 hornwort species from Jo Daviess, Peoria, Tazewell, Vermilion, La Salle, Hardin, Champaign, Ogle, Jersey, Saline, Pope, Johnson, Union, McLean, Carroll, Lake, Marion and White Counties.

Richards (1940) surveyed Starved Rock State Park in La Salle County and found 33 mosses and 18 liverworts while Vaughan (1940) listed 50 mosses from Moultrie County. The next year, Vaughan (1941) surveyed the Rocky Branch area in Clark County and found 72 mosses and 14 liverworts. Arzeni (1947) also searched the Rocky Branch area as part of his research in Coles and Clark Counties. He found 172 bryophyte species, including 42 liverwort species. More will be said of the work of Vaughan and Arzeni shortly.

Bryological work in Illinois continued when Hatcher (1952) reported 73 mosses and 28 liverworts from Jackson, Union and Pope Counties. That same year, Morrow (1952), in a study of clay pit areas in McDonough County, reported

17 mosses. The next publication concerning Illinois bryophytes was by Jones (1961) when he reported a new state record of Merseya from La Salle County. Four years later, Reichle and Doyle (1965) listed 28 mosses in their study of bryophyte succession in a northern Illinois bog. Redfearn (1966) added 8 mosses and 1 liverwort to the bryoflora of Illinois in his study of the Interior Highlands of North America. In Illinois, the Interior Highlands include Union, Pope, Williamson, Franklin, Jackson, Johnson and Randolph Counties.

Skorepa and Snider (1967) mentioned several mosses in their study of the lower plants of Lusk Creek Canyon in Pope County. Later that same year, Wunderlin (1967) reported 49 species of mosses from Carroll County.

Redfearn (1968), in his continuing survey of the Interior Highlands, added 10 mosses new for Illinois from collections in Union, Pope, Jackson, Saline and Randolph Counties while Skorepa (1968) also mentions that to the date of his publication, 90 liverworts had been reported for the state of Illinois.

Snider (1970) studied the genus Sphagnum in Illinois and found 14 species, including 2 varieties, from specimens collected in McHenry, Kendall, Lake, Clark, Fulton, Massac, Pope, Jackson, Randolph, Will, Grundy, Kankakee, Cook, Johnson, Williams and La Salle Counties. The next year, Zales (1971) reported 23 mosses and 7 liverworts from Goose Lake Prairie in Grundy County and the following year

Redfearn (1972) completed his study of the mosses of the Interior Highlands, many of which came from the southern Illinois counties listed previously.

O'Flaherty, Ives and Ozimek (1975) recorded Sphagnum fimbriatum as a new record for Illinois. This article cites an unpublished thesis by Sholl (1970) on the bryophytes of Lake Argyle State Park. This thesis is stored at Western Illinois University. Spessard (1975a) discovered 5 new mosses for Illinois. Later that year, Spessard and Arzeni (1975b) reported 71 mosses, 15 liverworts and 1 hornwort from Shelby County.

Stotler (1976) listed 35 mosses and 32 liverworts in his statistical analysis of the saxicolous bryophytes of the Little Grand Canyon in Jackson County. Later the same year, Arzeni and McKnight (1976) reported the addition of Buxbaumia aphylla to the bryoflora of Illinois. Zehr (1977) continued the statistical analysis of bryophyte communities in a study of three sandstone canyons in southern Illinois, while West and Stotler (1977) utilized the same type of approach in their study of the Panthers Den in Union County.

O'Flaherty (1978) reported Sphagnum centrale as new to Illinois. The next year, Crandall-Stotler and Stotler (1979) reported on the liverworts and hornworts of Lusk Creek Nature Preserve in Pope County. Zehr (1979) then reported on the phenology of selected bryophytes of southern Illinois. This is the most recent publication on Illinois

bryology, bringing the total number of scientific papers on this subject to 48.

Review of Literature Concerning Rocky Branch Nature Preserve

The Rocky Branch area of Clark County has been visited by botanists for at least the last 50 years. The first paper specifically concerning Rocky Branch was by Stover (1930). His paper was a floristic survey of the area. Vaughan (1941) published on the bryophytes of the Rocky Branch region of Clark County. He found 72 moss and 14 liverwort species. Arzeni (1947) reported on the bryophytes of Coles and Clark Counties. In this paper he reported that his collecting in Clark County was largely confined to the Rocky Branch region and that the area was especially rich in liverwort species, having 40 of the 42 species reported for both counties. Arzeni corrected misidentifications in the papers by Hague and Holmes (1933) and Vaughan (1941). Arzeni also gave the habitat preferences for the more rare or unusual bryophytes he collected.

The Rocky Branch area was not the subject of another paper until Ebinger and Parker (1969) conducted a survey of the oak-hickory-maple forest at the western edge of the preserve and reported a total of 35 woody species. The next year, Ebinger and Hellinga (1970) published additions to the flora of Clark County based on collections from the Rocky Branch Nature Preserve. They reported 120 taxa which had previously been unknown in Clark County. They reported that the preserve contained 445 species of

vascular plants in 97 families. Of these, 16 species are ferns or fern allies, 97 species are monocots and 332 species are dicots. Of these dicots, 80 species are trees, shrubs or woody vines while 252 species are herbaceous plants. Shortly after this paper, Wiedman (1971) surveyed the lichen flora of Rocky Branch and found 65 species, of which he considered 13 species to be very rare. This was the most recent publication concerning Rocky Branch.

Materials and Methods

An extensive search of the varied habitats at Rocky Branch was conducted in the fall of 1980 and the winter of 1981. An attempt was made to locate a specimen for every species reported by Arzeni (1947). The specimens were collected using a pocket knife where necessary and were stored in plastic sandwich bags. Field notes were taken noting habitats and location in the preserve. The specimens were then identified using the taxonomic keys of Conard (1956), Welch (1957) and Crum (1973). The nomenclature used follows Crum, Steere and Anderson (1973). The author's identifications for all specimens were confirmed by Dr. Charles B. Arzeni, with the exception of Nardia lescurii (Aust.) Underwood, which was confirmed by Dr. R.E. Stotler of Southern Illinois University at Carbondale.

The identified specimens were stored in standard bryological packets labeled with the scientific name and authority, fruiting or sterile condition, precise location in the preserve, habitat data, name of the collector, name of the determiner, date of the collection and the collection numbers of the author. These specimens were then deposited in the Ernest L. Stover Herbarium of the Eastern Illinois University.

Descriptions of the bryophytes found at Rocky Branch were compiled from Welch (1957) and Crum (1973). Habitat

and distribution information was drawn from Grout (1903), Bodenberg (1954), Welch (1957) and Crum (1973). Liverwort habitat data was derived from Frye and Clark (1937) and Schuster (1974). Habitat and ecological factors obtained from the literature were compared with the observations of the author as well as with the field collection notes. The distribution maps for the mosses were derived from McCleary and Redfearn (1979) while the liverwort distribution maps were compiled from the literature. Figure 1 is a county reference map, with the black dots representing the 12 counties where no bryological field surveys have been conducted.

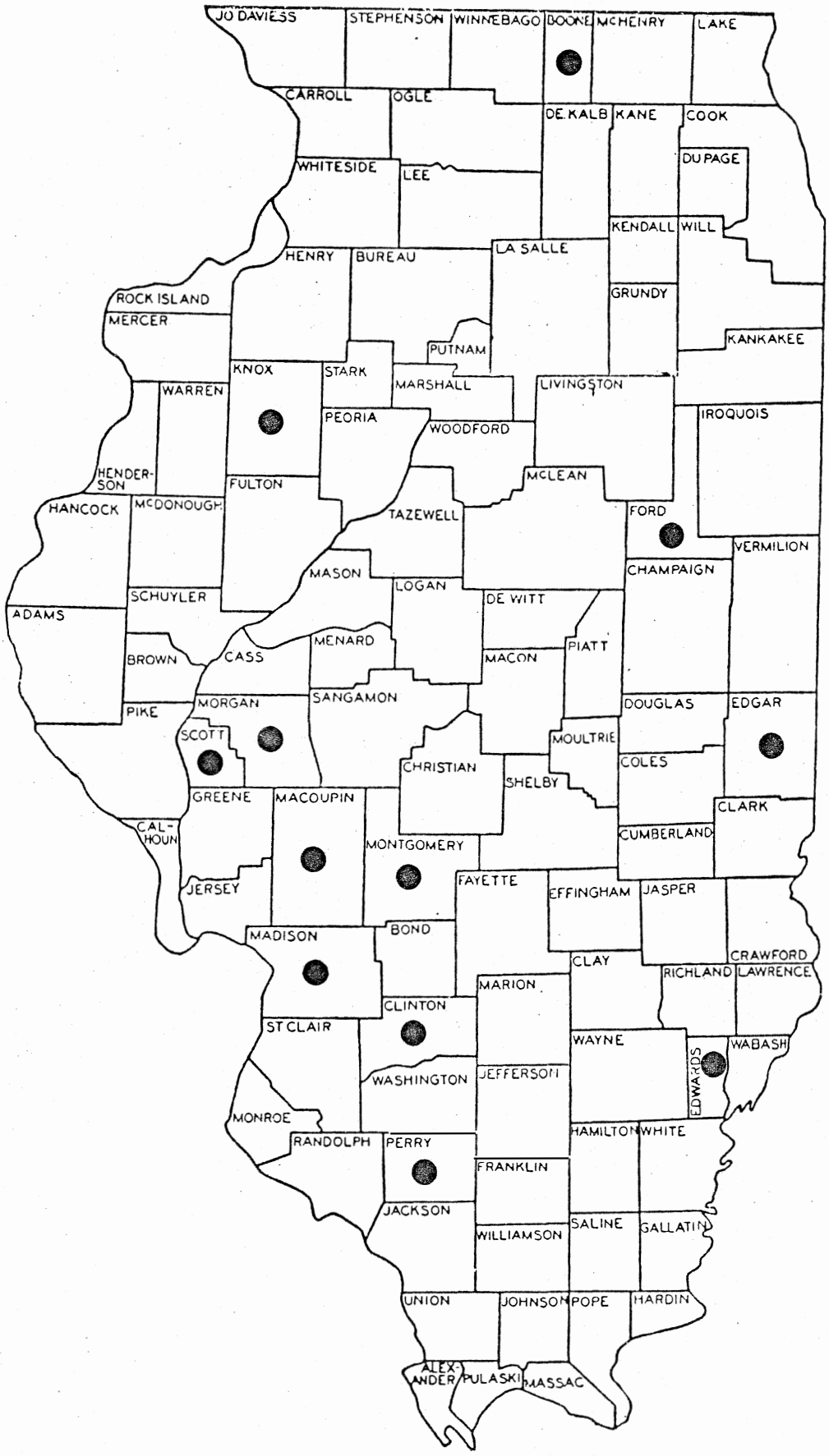

Figure 1. County reference map of Illinois showing the 12 counties where no bryological field surveys have been conducted.

Amblystegium tenax (Hedw.) C. Jens var. *tenax*
= (*Hygroamblystegium orthocladon* (Beauv.) Grout)

Medium sized, dark green to blackish plants; stems rigid, irregularly divided; stem leaves not crowded, erect or wide-spreading when fresh, incurved when dry, .7-1.5 mm long, ovate or ovate-lanceolate, becoming short acuminate; costa strong, disappearing near the apex; branch leaves oblong lanceolate to ovate, bluntly acuminate, .45-.8 mm long, erect incurved; autoicous or dioicous; setae 1-2.5 cm, brownish, contracted below the mouth when dry; peristome perfect, teeth 16; spores minutely papillose, maturing in spring or early summer.

Amblystegium tenax var. *tenax* is distributed in North America, Europe, North Africa, Madeira and the Caucasus. It ranges in North America from New Brunswick to Minnesota, south to Arkansas and Florida. It has also been reported from Arizona and Mexico. *A. tenax* var. *tenax* is known from 28 counties in Illinois (Figure 2). It is a moss of very moist habitats, usually prefering wet rocks in or beside streams.

A. tenax var. *tenax* is uncommon at Rocky Branch. It was located on only two rocks in Rocky Branch Creek. The eventual eradication of this species from the preserve is guaranteed unless the use of all-terrain vehicles is prevented.

Aulacomniaceae

Aulacomnium heterostichum (Hedw.) B.S.G.

Green plants in loose tufts 1.5-5 cm high; leaves 2-3.5 mm long, dense, erect, usually inclined in one direction, not altered when dry, oblong or oblong ovate, costa stout, ending below the apex, apices obtuse and apiculate to subacute, margins plane or narrowly recurved below the middle, coarsely serrate in the upper 1/2-2/3 of the leaf; autoicous; setae 6-15 mm long, erect, reddish brown; calyptra long rostrate and cucullate; capsules 2.5-3.5 mm long; suberect or inclined, slightly asymmetric; operculum short rostrate; urn oblong-cylindric, 6-8 striate, tapering below to a short neck; spores very finely papillose and maturing in early summer.

Aulacomnium heterostichum is quite common in eastern North America. It ranges from Ontario south to Florida and Texas and west to Minnesota and Kansas. It has been reported from 30 counties in Illinois. This moss is typically found in moist to dry woods on rich soil, in the shade at the bases of trees. Crum (1973) reports that this moss is often associated with Bartramia pomiformis.

This beautiful dark green moss can occasionally be found at Rocky Branch on moist, shaded banks south of Rocky Branch Creek. In several places, it is found to be associated with Bartramia pomiformis as suggested by Crum (1973).

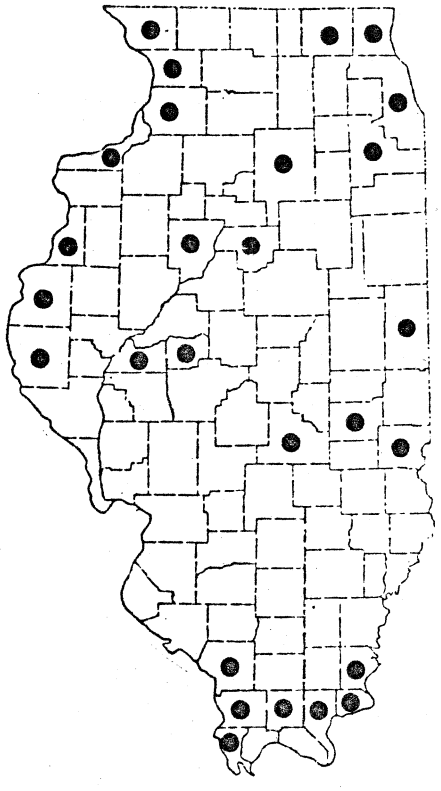

Figure 2. Distribution of Amblystegium tenax var. tenax in Illinois.

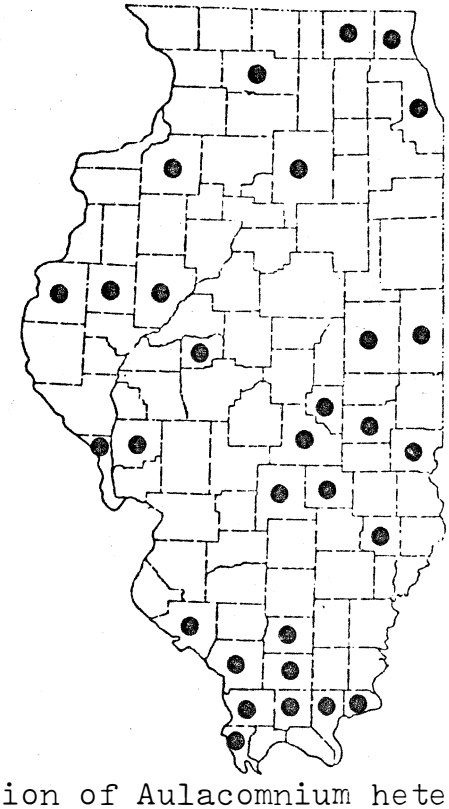

Figure 3. Distribution of Aulacomnium heterostichum in Illinois.

Bartramia pomiformis Hedw.

Plants in dense, soft, green or yellowish green tufts; densely tomentose below with brown papillose rhizoids; stems dichotomously branched, 1.5-8 cm long and erect; leaves normally spreading and flexuose or crisped from an erect base when dry, 4-5.5 mm long, narrowly lanceolate to linear-lanceolate; margins revolute almost to the apex, bistratose and doubly serrate; costa stout, shortly excurrent to a terete, spinulose tip; upper cells of the leaves oblong, elliptical, short rectangular or subquadrate; basal cells pale, thin walled, oblong to linear or long rectangular; setae erect, reddish brown, 8-20 mm long; capsules reddish to chestnut brown, usually exserted above the stem tips, globose to ovoid with deep furrows when dry, annulus none; peristome double, teeth lanceolate, reddish to reddish brown; spores spherical to reniform, coarsely papillose and maturing in May or June.

This moss is commonly known as the "Apple Moss" because the capsules resemble miniature apples. It is a fairly common moss in eastern North America and it is also found from Alaska to Oregon and Montana. It is also found in Europe, Asia, New Zealand, Greenland and Canada. It has been reported from 25 counties in Illinois (Figure 4). This moss prefers the moist, shaded soils typical of the deciduous forests of eastern North America. It is occasionally found growing on rock in crevices or on ledges.

At Rocky Branch, this handsome moss is occasionally found growing on moist, inclined sandstone walls, often among other mosses. Crum (1973) reports that this moss is often associated with Aulacomnium heterostichum. This association is evident at Rocky Branch.

Brachythecium oxycladon (Brid.) Jaeg. & Sauerb.

Plants in glossy, green or yellowish green mats; stems prostrate, usually much branched; branches erect, ends attenuate; branch leaves erect or erect-spreading, concave, plicate, serrulate; alar region strongly decurrent; alar cells smaller and subquadrate; costa 2/3-3/4 the leaf length; dioicous, rarely monoicous; setae 8-27 mm long, smooth, reddish; capsules curved, oblong cylindric, 2-3 mm long, suberect or inclined; peristome perfect, teeth 16, light reddish brown; spores finely papillose, maturing in fall or late winter.

Brachythecium oxycladon is found in Europe and North America. It is common in eastern North America from southeastern Canada to Minnesota and Nebraska, south to North Carolina and Missouri. It has been reported from 36 counties in Illinois (Figure 5). This moss is usually found in dry, disturbed habitats on shaded soil, rotten wood, tree bases or rocks.

B. oxycladon is occasionally found at Rocky Branch. It prefers the dry, disturbed areas among the rocks east of the parking area, on ditch banks along the road or on disturbed soil west of the road. It is difficult to separate this moss from B. salebrosum because of the extreme variability of both species. For accurate determinations, the leaf areolation must be microscopically observed.

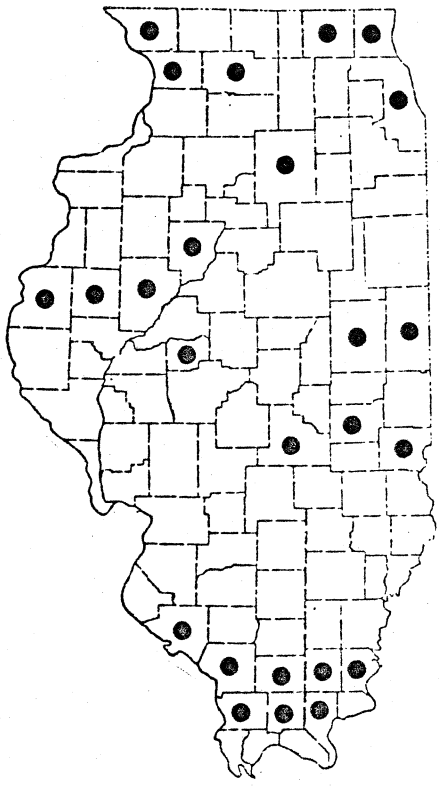

Figure 4. Distribution of Bartramia pomiformis in Illinois.

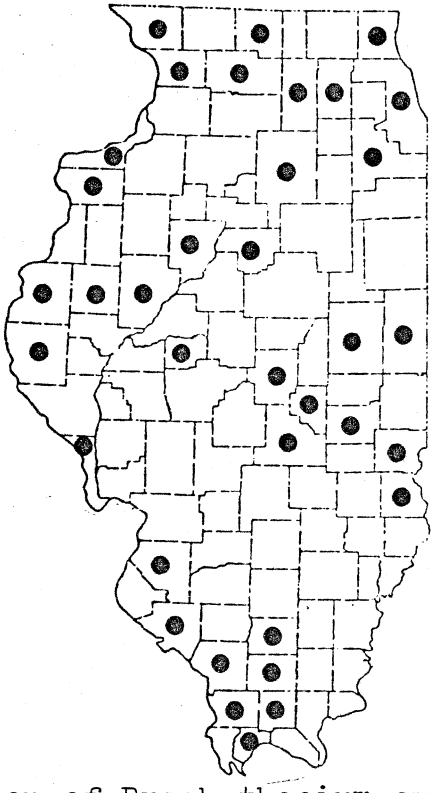

Figure 5. Distribution of Brachythecium oxycladon in Illinois.

Brachythecium salebrosum (Web. & Mohr.)

Glossy, yellow green plants in mats; stems prostrate, over 6 cm long, irregularly to subpinnately divided; branches terete-foliate; branch leaves erect spreading, lanceolate or ovate-lanceolate, strongly plicate, apex long acuminate, margins serrate above, entire below; costa 2/3 of the leaf length; alar cells large, loose, subquadrate, outside of a row 2-3 cells thick of shorter, irregular cells; autoicous; setae 10-27 mm long, smooth, reddish brown; capsule inclined to horizontal, oblong-ovoid, usually strongly curved; peristome perfect, teeth 16; spores finely papillose, brownish, maturing in fall or early winter.

Brachythecium salebrosum is circumpolar in distribution. It has also been reported from Tasmania. It is very common in North America, ranging from Alberta east and south across the continent. This moss has been reported from 35 counties in Illinois (Figure 6). B. salebrosum is often found in disturbed places where it grows on shaded soil, rocks, tree bases, logs and even suburban lawns.

This handsome moss is occasionally collected at Rocky Branch. It can be found on rocks and disturbed ground east of the parking area, on ditch banks along the road and west of the road in a disturbed area. This moss is difficult to separate from B. oxycladon because of the extreme variability of both species.

Brachytheciaceae

Bryoandersonia illecebra (Hedw.) Robins

Golden green to yellow green plants often forming mats; stems 8-10 cm long, creeping or ascending, irregularly divided and branching, branch leaves loosely imbricate when dry, erect spreading when moist, broadly ovate, very concave, 2-2.5 mm long, bases decurrent, apices rounded and abruptly acuminate to a filiform, twisted point, margins serrate to the middle, alar cells not differentiated; dioicous; calyptra smooth and narrowly cucullate; setae smooth, 1.5-3 cm long, reddish; capsule gradually narrowing into the seta, inclined, asymmetric, 3-4 mm long and brown; operculum conic, long rostrate, urn 2 mm long, contracted beneath the mouth when dry and empty; peristome hypnaceous, perfect, teeth 16; spores smooth and maturing in the fall.

This moss is commonly known as the "Worm Moss" or the "Spoon-Leaved Moss". The first name is in reference to the thick, rounded, worm-like appearance of the plant, while the second name refers to the shape of the individual leaves. Bryoandersonia illecebra is known only from North America where it ranges from Vermont to Florida, west to Illinois, Missouri and Louisiana. It is apparently more common southward and it is not found in Canada. It has been reported from 18 counties in Illinois (Figure 7). This large, distinctive moss is typically found in shady woods or in moist fields among other plants.

This moss is fairly common at Rocky Branch on soil at the base of the sandstone face south of Rocky Branch Creek and along the edges of footpaths in shaded but disturbed habitats. It can also be found occasionally in moist spots in the upland woods.

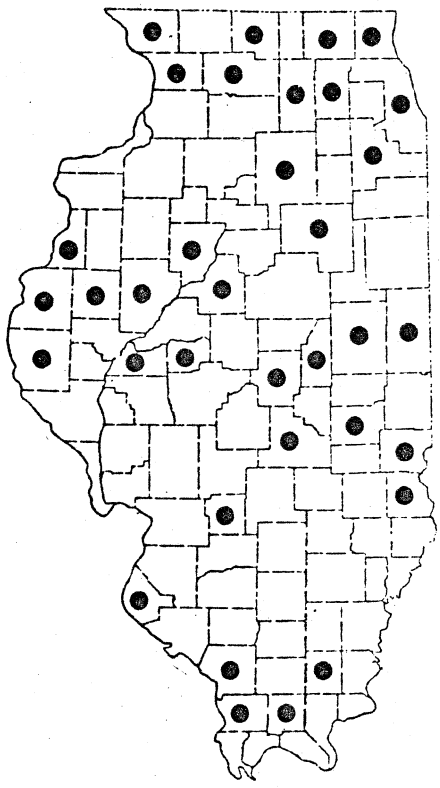

Figure 6. Distribution of Brachythecium salebrosum in Illinois.

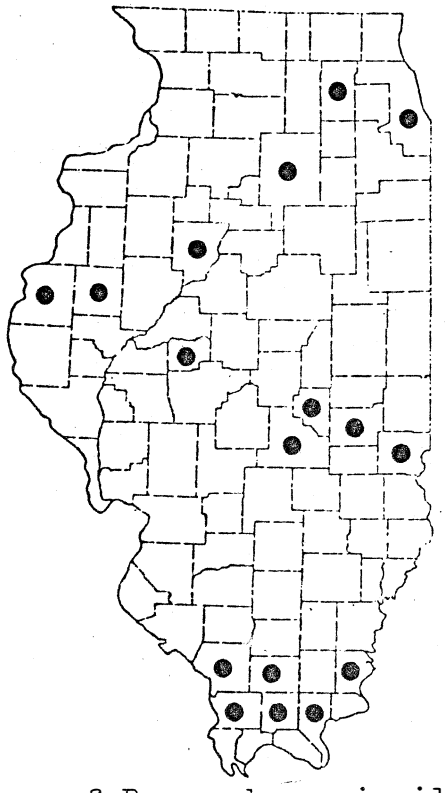

Figure 7. Distribution of Bryoandersonia illecebra in Illinois.

Brachytheciaceae

Rhynchostegium hians (Hedw.) Delong.

Dull or shiny green to yellowish green plants with irregular to subpinnate branching; stems 3-10 cm long, prostrate; stem leaves 1-1.2 mm long, ovate or triangular ovate, slenderly short-acuminate; branches 3-12 mm long, ascending; branch leaves erect spreading, .8-1.2 mm long, ovate, broadest 1/3 above the base, acute, margins serrulate, costa ending in a dorsal spine 3/4 of the way up the leaf; dioicous; setae 1-2.7 cm long, reddish or orange brown, very rough with low, rounded papillae; capsules 1.5-2.5 mm long, oblong-cylindric, inclined to horizontal; operculum 1-1.4 mm long, long rostrate; peristome hypnaceous, perfect, teeth 16; spores yellowish green, smooth to finely papillose and maturing in the late fall or early winter.

Rhynchostegium hians is a moss with an unusual world-wide distribution. It is known from North America, Europe, eastern Asia and Haiti. It is widely distributed in eastern North America and it has been recorded from Arizona and New Mexico. R. hians has been reported from 23 counties in Illinois (Figure 8). This moss is found growing on soil in moist, shady places.

R. hians is not common at Rocky Branch but it can be found on damp soil in the shade of the sandstone wall south of Rocky Branch Creek.

Brachytheciaceae

Rhynchostegium pulchellum (Hedw.) Robins var. pulchellum =(Eurhynchium pulchellum (Hedw.) Jenn.)

Robust, glossy green to yellowish green plants in mats; primary stems prostrate, 5-10 cm long, irregularly to pinnately branched; branches horizontal or erect ascending, terete or flattened; stem leaves erect, ovate, acute, 1mm long; branch leaves crowded, erect, .5-1 mm long, ovate lanceolate, bluntly acute to rounded obtuse, costa extending about 2/3 the length of the blade, margins serrate; phyllodioicous; setae smooth, reddish, 10-20 mm long; capsule inclined to nearly horizontal, yellowish brown; operculum slenderly rostrate, 1.5 mm long; urn asymmetric, ovoid to oblong cylindric, 2 mm long, contracted below the mouth when dry and empty; peristome perfect, teeth 16, spores yellowish, smooth to slightly papillose, maturing in the fall.

Rhynchostegium pulchellum var. pulchellum is circumpolar in distribution. In the Western Hemisphere it ranges southward through Mexico and Guatemala to northern South America. In temperate to arctic North America, it is distributed from Alaska to Newfoundland south to Arizona, Texas and Georgia. It has previously been reported from 16 counties in Illinois (Figure 9).

R. pulchellum var. pulchellum is a new addition to the bryoflora of Rocky Branch and Clark County. It is now recorded from 17 counties in Illinois. This moss is rare but can be found on rock north of the junction of the creeks.

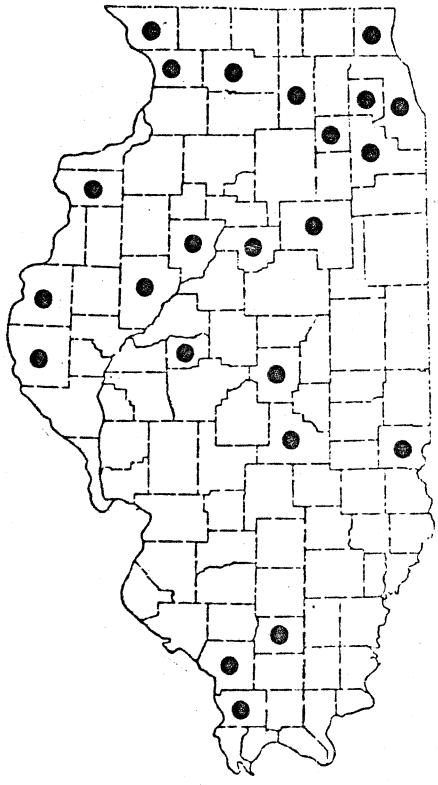

Figure 8. Distribution of Rhynchostegium hians in Illinois.

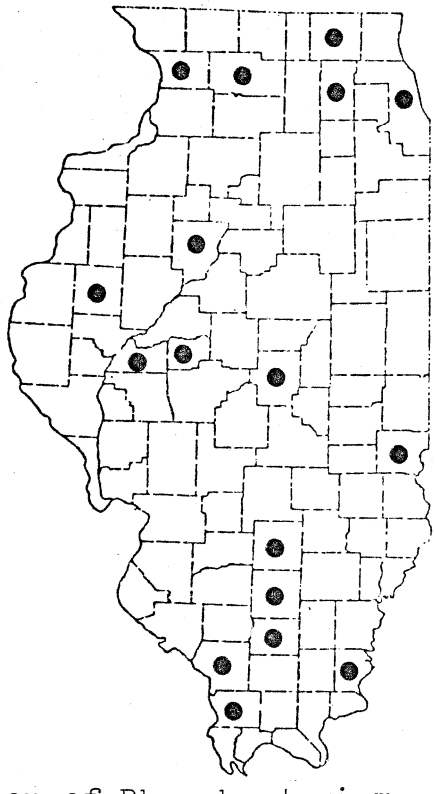

Figure 9. Distribution of Rhynchostegium pulchellum in Illinois.

Diphyscium foliosum (Hedw.) Mohr.

Small , dark green to blackish plants in tufts; stems very short, 1-2 mm high; leaves 1.3-4 mm long, erect spreading when moist, curled and contorted when dry, narrowly lingulate, costa broad and flattened, ending just below the apex of the leaf, apices obtuse and cucullate, occasionally briefly and bluntly acuminate, margins plane, crenulate papillose; dioicous; perichaetial leaves up to 8 mm long with the costa long excurrent as a brown, spinulose awn, bristle-like; capsules essentially sessile, immersed in or slightly emergent from the perichaetial leaves, greenish yellow when fresh, becoming brown with age; operculum acute conical, curved; urn 4-6 mm long, conic-ovoid, very asymmetric; peristome teeth very short and irregular; spores very small, finely papillose and maturing from early summer to early fall.

Diphyscium foliosum is commonly known as the "Wheat Grain Moss" because the capsule resembles a grain of wheat in both size and appearance. This moss can be found in North America, Europe, Madeira, Japan, Mexico, Guatemala and Jamaica. It is considered to be widely distributed in eastern North America. It has been recorded from 11 counties in Illinois (Figure 10). D. foliosum prefers soil or humus on shaded banks of moist hardwood forests. It is occasionally found on rock walls of stream gorges.

D. foliosum is very uncommon at Rocky Branch. It was found at only one location in the preserve. It can be found on the west side of a small, hanging ravine south of Rocky Branch Creek, nearly to the junction with the West Fork of Big Creek. Here it appears on a thin layer of soil which overlies sandstone.

Climacium americanum Brid.

Robust, glossy, yellowish green plants in loose tufts; primary stems prostrate, secondary stems erect, 5-8 cm tall, irregularly divided above into a cluster of spreading to ascending, foliated, terete branches, 1.5-2.5 cm long, tips acute to obtuse; leaves appressed when dry, erect spreading when moist, upper leaves oblong-lanceolate, lower leaves ovate to ovate-lanceolate, bases broadly and obviously auriculate, costa ending before the apex, margins sharply serrate above, denticulate below; dioicous; setae erect, brown; capsule erect to slightly curved, cylindric, brown, slightly contracted below the mouth when dry and empty; peristome double, teeth 16, orange-castaneous, distinctly papillose; spores yellowish, minutely roughened, maturing in the fall.

Climacium americanum is commonly known as the "Christmas Tree Moss" because of the dendroid growth habit. It is widely distributed in eastern North America, ranging from Canada to the Gulf of Mexico and west to the Rocky Mountains. It is most commonly found in the eastern states. It has been reported from 40 counties in Illinois (Figure 11). C. americanum is typically found on moist soil on shaded ravine banks.

C. americanum is becoming rare at Rocky Branch due to overcollecting. It is found on moist soil along the path into the preserve and near the creek junction.

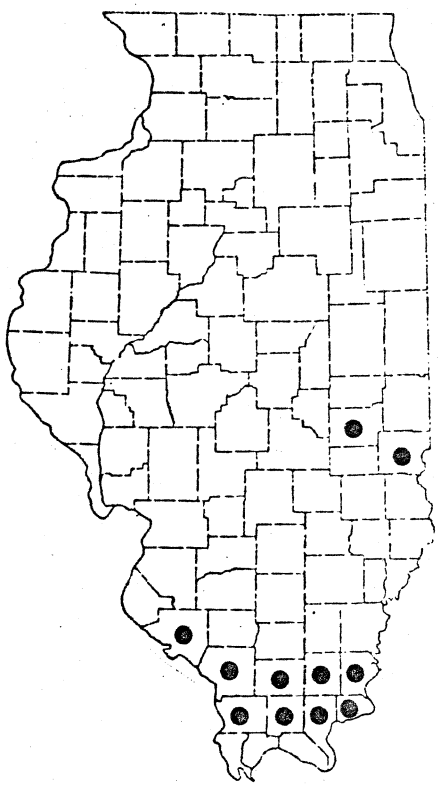

Figure 10. Distribution of Diphyscium foliosum in Illinois.

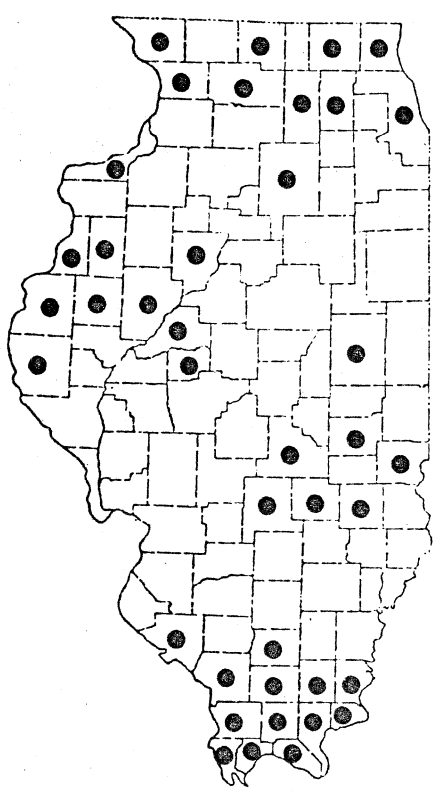

Figure 11. Distribution of Climacium americanum in Illinois.

Dicranella heteromalla (Hedw.) Schimp

Small, shiny, dark green to yellow plants in tufts 1 cm high; stems often branched, erect to ascending; leaves numerous, erect to falcate-secund, 2-3 mm long, ovate-lanceolate to lanceolate, broadest at the base and narrowing to a filiform, channeled awn, margins plane, entire below, denticulate toward the apex, costa excurrent, about 1/3 the width of the leaf base; setae yellowish, 5-15 mm long; capsules suberect to inclined to horizontal, 1-1.5 mm long, cylindric, asymmetric, furrowed when dry; operculum long rostrate, 1 mm long; peristome single, teeth 16, papillose; spores smooth, yellow and maturing from fall to winter.

Dicranella heteromalla is a circumpolar moss which extends southward into northern South America. In North America, it ranges from Newfoundland to Manitoba south to the Gulf of Mexico and also from Alaska southward to California. In Illinois, this moss has been reported from 28 counties (Figure 12). It is typically found on moist, clayey or sandy soils in shaded, disturbed areas. It is also found on soil covered logs and rocks as well as along roadsides. Gams (1932) reported that it may be an indicator of impoverished acid soils. Bodenberg (1954) however, considers it to be indifferent to soil acidity.

This moss is found at Rocky Branch in small, isolated patches in xeric upland woods,often at the bases of trees.

Dicranum scoparium Hedw.

Plants usually coarse and robust, shiny yellow green and forming large sods; stems erect 2-12 cm high, densely whitish or orange tomentose; leaves extremely variable but generally falcate-secund, narrowly or broadly lanceolate ending in an acuminate tip, usually strongly serrate in the upper 1/3; costa 1/4 - 1/3 the width of the leaf, ending in the apex or briefly excurrent, typically 2-4 ridged at the back and serrate above; cells smooth, elongate and porose throughout the leaf except for the alar cells which are inflated, orange brown and not quite extending to the costa; setae solitary, erect, 2.5-4 cm long and yellowish to reddish brown; capsule inclined and chestnut brown; operculum long rostrate, often longer than the urn; urn smooth, cylindric, occasionally slightly furrowed when dry and empty; peristome single, teeth 16; spores spherical, slightly rough and maturing from late summer to fall.

This moss is commonly known as the "Broom Moss" or "Windswept Moss" because the secund leaves give it a swept appearance. This moss is widespread throughout the world. It is circumpolar and also found in Australia and New Zealand. On the North American continent it ranges from Alaska to Greenland and south to California, Colorado, Louisiana and Florida. It has been reported from 24 counties in Illinois (Figure 13). McCleary and Redfearn

(1979) oddly overlooked Arzeni's (1947) report for this moss from Clark County. D. scoparium is typically a plant of dry soils, rock or decaying wood in shaded places. In most of eastern North America, this plant can be regarded as a plant indicator of acid soils having a pH of 4.2 - 4.8.

This moss is the dominant species of the upland forest floor at Rocky Branch. It is especially abundant on the ridge south of Rocky Branch Creek, where it forms beautiful, shiny beds several meters across.

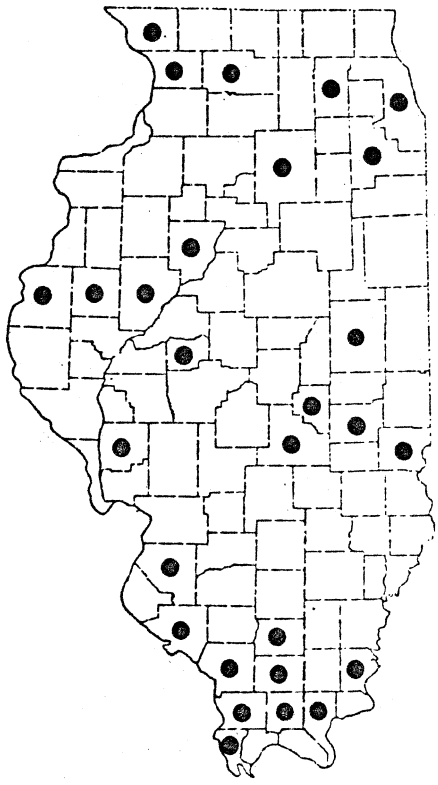

Figure 12. Distribution of Dicranella heteromalla in Illinois.

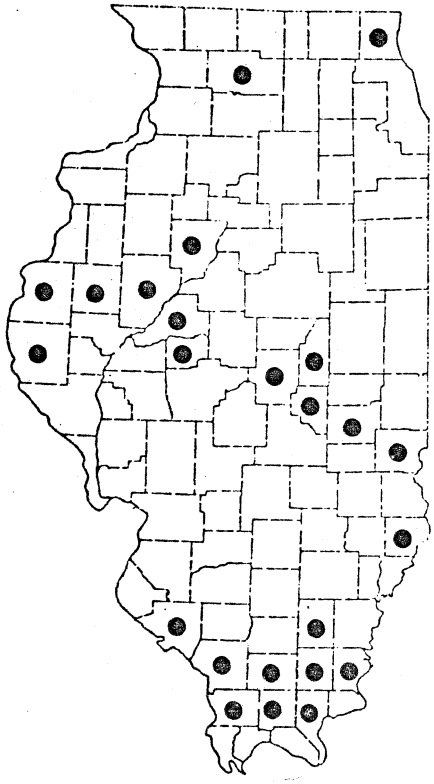

Figure 13. Distribution of Dicranum scoparium in Illinois.

Ditrichum pallidum (Hedw.) Hampe

Plants small, gregarious or caespitose, green to yellow green; stems simple, short and erect, arising from a prostrate base; leaves erect spreading, 3-5 mm long, linear-subulate from an ovate or lanceolate base; costa long excurrent, serrulate towards the apex; median cells thin walled, smooth, rectangular, composing a narrow margin on either side of the costa; basal cells oblong-hexagonal; calyptra up to 2.5 mm long, cucullate, slenderly rostrate, straight, smooth, setae 1-4 cm long, erect, slender, bright yellow to orange; capsule inclined, light brown to yellowish red; operculum conic; urn 1-2.5 mm long, slightly asymmetric, contracted below the mouth when dry; peristome single, with 16 deeply bifid teeth; spores spherical, papillose to warty and maturing in the early spring.

This moss is common in the eastern United States. It ranges from Nova Scotia to Ontario, south to Texas, Florida and Oklahoma. It is also found in Europe. It has been reported from 35 counties in Illinois (Figure 14). It is found in dry, sandy soil, bare soil at the edges of fields or in thin woods.

D. pallidum is occasionally found at Rocky Branch on bare soil at the edge of the forest above the cliffs north of Rocky Branch Creek. The golden seta is the most easily recognized field characteristic for this moss.

Ditrichum pusillum (Hedw.) Hampe.

Plants small, light green to yellowish green, forming dense sods; stems erect, 5-10 mm tall; lower leaves 1 mm long, lanceolate; upper leaves 2-3 mm long, lanceolate-subulate from an ovate-lanceolate base, slightly contorted when dry; costa 1/3 to 1/2 the width of the leaf, percuurent to excurrent into a denticulate, subulate apex; margins often serrulate, especially at the apex; median cells thick walled, rectangular to quadrate; basal cells rectangular to hexagonal or linear-rectangular; dioicous; calyptra extending to the base of the capsule; cucullate; setae 5-15 mm long, glossy, reddish brown; capsule erect, red to brown; operculum conic, rostellate; urn .5-1.5 mm long, oblong-cylindric or ovoid, not contracted below the mouth when dry and empty; peristome single, teeth 16, papillose, cleft nearly to the base; spores smooth, yellowish-pellucid, maturing in fall or winter.

Ditrichum pusillum is widely distributed in North America. It ranges from Labrador to Alaska south to British Columbia, Louisiana and Florida. It is most common in the northern states. This moss has been reported from 17 counties in Illinois (Figure 15). D. pusillum is typically found on moist, bare soil along stream banks, ditches or fields. Grout (1936) reports that it it is often found with Pogonatum pensilvanicum.

D. pusillum is relatively uncommon at Rocky Branch.

It was found growing on bare soil along the stream bank across the road from the parking area. Pogonatum can also be located along this same bank.

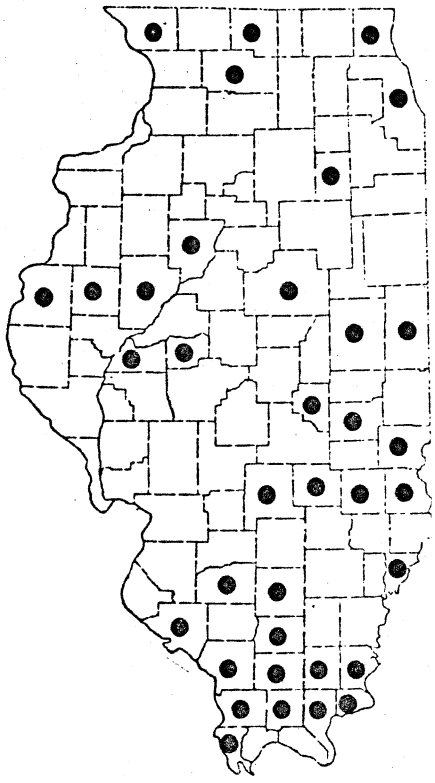

Figure 14. Distribution of Ditrichum pallidum in Illinois.

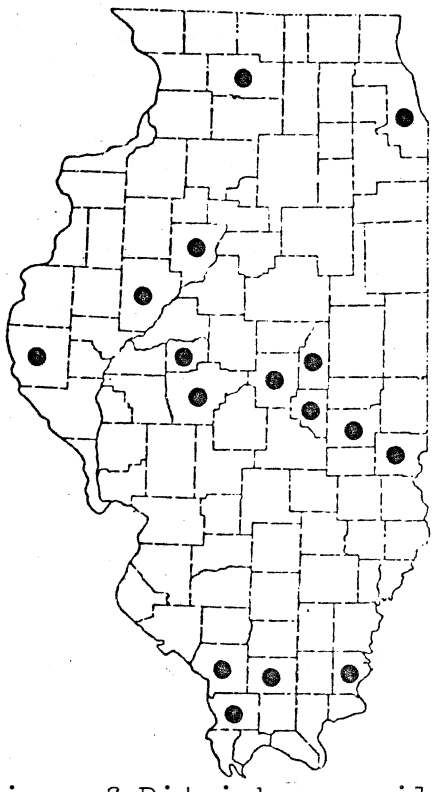

Figure 15. Distribution of Ditrichum pusillum in Illinois.

Entodon seductrix (Hedw.) C.M.

Glossy, yellowish green plants in mats; stems 5 cm long, subpinnately divided, creeping, terete or occasionally flattened; leaves imbricate, densely concave, oblong, ovate or elliptic, abruptly acute to apiculate; margins entire or slightly serrulate at the apex; costa short and double; alar cells numerous and quadrate; autoicous; setae red or brown, erect, glossy, 5-16 mm long; capsules dark brown, erect, symmetric or slightly curved, usually wrinkled-striate when dry and empty; operculum stoutly and obliquely rostrate; peristome double, teeth 16; spores yellowish, finely papillose, maturing from late summer to winter.

Entodon seductrix is widespread and common in eastern North America, ranging from Ontario to Minnesota, south to Texas and Florida. It has been reported from 42 counties in Illinois (Figure 16.). E. seductrix is typically found on rotten logs or at the bases of trees in dry, shaded woods. It is also occasionally found on rock or moist soil.

E. seductrix is fairly common at Rocky Branch. It can be easily located growing among rocks across the road from the parking area. It can also be found growing on decaying wood throughout the preserve.

Pleurozium schreberi (Brid.) Mitt.

Plants robust, bright green, bright yellowish green or pale yellowish green, in loose mats or dense cushions 10-15 cm deep; stems 10-15 cm long, rigid, nearly erect from a subprostrate base and bright red with age; branches julaceous, often tapering; stem leaves loosely to closely imbricate, semitransparent, oblong-ovate or elliptic, very concave, the bases decurrent, costa one, two, none or very faint, apices obtuse, rounded, margins involute near the apex, reflexed near the base, entire or crenulate, serrate at the apex; branch leaves narrower and more pointed; alar cells enlarged, subquadrate to subrectangular, often inflated; dioicous; calyptra smooth, narrowly cucullate; setae 2-4 cm long, reddish to yellowish red; capsules 2-2.5 mm long, usually horizontal; operculum conic-obtuse, acute or high convex; urn symmetric; subcylindric, contracted below the mouth upon drying; peristome perfect, teeth 16, papillose; spores smooth, chestnut brown and maturing in the fall.

This is an interesting moss in several respects. It has a very unusual worldwide distribution. Pleurozium schreberi is found mainly in North America, but disjunct populations occur in South and Central America. The fact that this moss rarely produces spores and that it has no obvious means of vegetative reproduction makes this distribution pattern difficult to explain. Watson (1964)

also notes that young growth stages, as evidence of recent establishment or active dispersal, are rarely encountered. In North America, this moss is found from the Atlantic to the Pacific across Canada and the northern United States south to North Carolina, Arkansas and Colorado. In Illinois, this moss has been reported from 8 counties (Figure 17). It is found on soil, humus or rock, usually in dry, open woods but it also occurs in wet coniferous woods or bogs.

P. schreberi is found at Rocky Branch on a sloping, north facing ledge 2 meters above the water level of Rocky Branch Creek. This location, due to seepage from the hillside above it, is constantly moist. This moss was not located at any other locations in the preserve so it is rare and should not be collected.

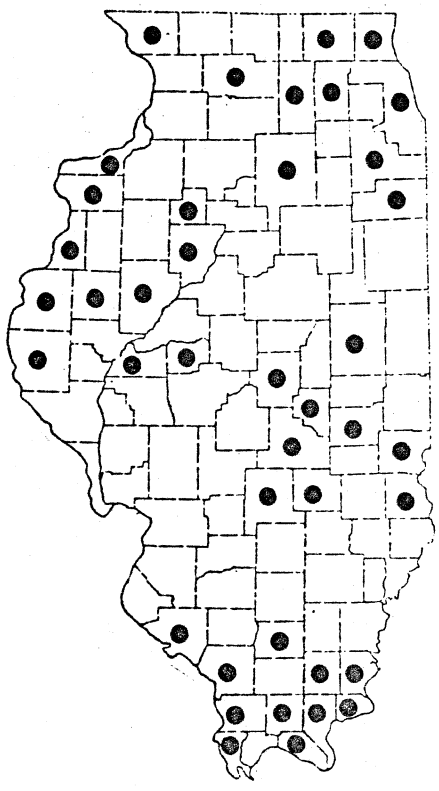

Figure 16. Distribution of Entodon seductrix in Illinois.

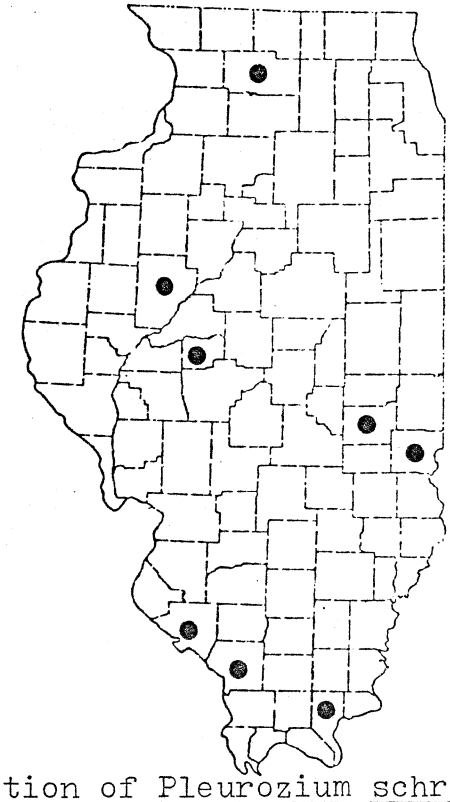

Figure 17. Distribution of Pleurozium schreberi in Illinois.

Hookeriaceae

Hookeria acutifolia Hook.

Complanate, light green plants in soft mats; stems prostrate, 3-6 cm long, foliated stems and branches often flattened; leaves thin, soft, glossy, translucent, imbricate, ovate to oblong-ovate, 4-5 mm long, slightly decurrent, ecostate, acute, entire, alar cells not differentiated; dioicous; setae smooth, 1-2 cm long; calyptra conical, shortly lobed at the base, mitrate; capsule short, ovoid, inclined to subpendant, more or less asymmetrical; operculum rostrate, sometimes equalling the urn; the urn 1-2 mm long; peristome hypnaceous, teeth 16, spores rarely produced and probably maturing in winter.

This unusual moss is found in North and South America, India, Sri Lanka, Java and the West Indies. In North America, it ranges from Illinois east to Ohio and Pennsylvania and south to North Carolina and Georgia. This moss is known in Illinois only from Clark County, specifically the Rocky Branch Nature Preserve (Figure 18).

This moss is extremely rare at Rocky Branch, being found in only one location. This colony is located one meter back under an overhanging ledge of the south wall of the valley formed by Rocky Branch Creek. This location is very damp and conforms to the reported habitat requirements for this moss. Vaughan (1941) first reported this moss at Rocky Branch while Arzeni (1947) reported that he could not locate it.

Hypnaceae

Isopterygium tenerum (Sw.) Mitt.
=(Plagiothecium micans (Sw.) Paris)

Slender, whitish green to light yellowish green plants in thin mats; stems 2-4 cm long, prostrate; branches prostrate; branch leaves often distant, erect spreading, twisted and usually curved to one side, ovate-lanceolate, very asymmetric, costa lacking, apices shortly and abruptly acuminate, margins serrulate near the apex; stem leaves gradually long acuminate; monoicous; setae 1-1.7 cm long, orange to reddish brown; capsule asymmetric, small, brown, contracted below the mouth when dry and empty, operculum conic-apiculate to very short rostrate; peristome perfect, teeth 16; spores yellowish green, papillose, maturing in the late fall and early winter.

Isopterygium tenerum ranges in North America from Long Island south to the Gulf of Mexico and west to Missouri. This moss has previously been reported from 7 counties in Illinois (Figure 19). This is the first report for this moss from Clark County. I. tenerum can be found in moist woods on rotten wood, bark or soil.

I. tenerum is not common at Rocky Branch. It was found growing on moist soil south of Rocky Branch Creek.

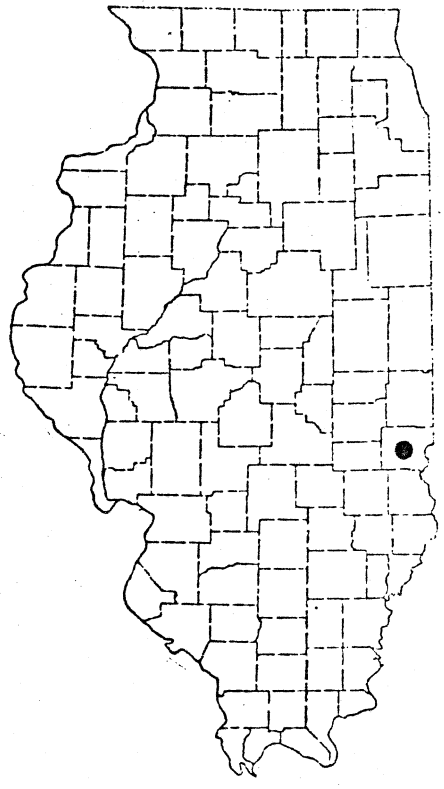

Figure 18. Distribution of Hookeria acutifolia in Illinois.

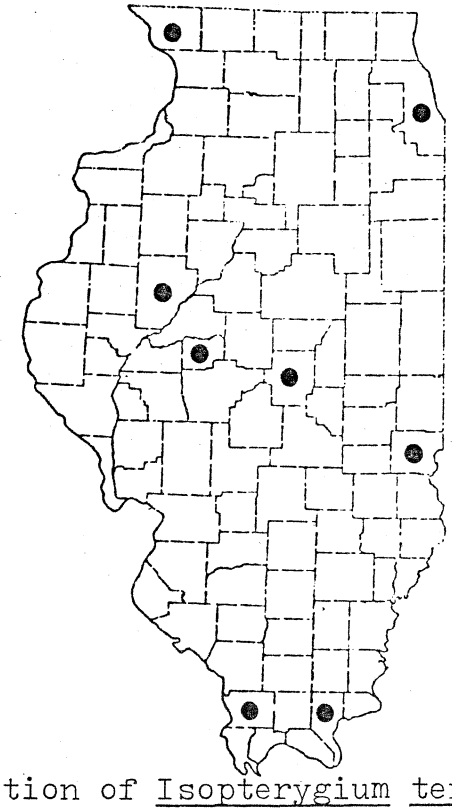

Figure 19. Distribution of Isopterygium tenerum in Illinois.

Hypnum imponens Hedw.

Robust, handsome, yellow green plants in mats; stems creeping to suberect, regularly pinnate, red to reddish brown; stem leaves strongly falcate secund, oblong triangular to oblong-lanceolate, acuminate, costa lacking or very short and double, margins serrulate in the upper half and reflexed near the base, alar cells quadrate, incrassate and partially opaque in groups of 4-6 cells; dioicous; setae red, 10-35 mm long; calyptra glabrous, narrowly cucullate; capsules smooth, cylindric, suberect, symmetric or slightly curved, chestnut brown; operculum conic or shortly and stoutly rostrate; peristome perfect, teeth 16; spores very finely papillose, yellow, maturing in late fall or early winter.

This mat forming moss is found in North America, Europe and Asia. In North America, it is distributed from Newfoundland to Wisconsin south to the Gulf of Mexico. It is also reported to be in the Canadian Yukon. This moss has been reported from 12 counties in Illinois (Figure 20). This particular species of Hypnum is typically found as a mat over rotting logs in moist forests. It is also found on rocks, humus or bark at the base of trees.

H. imponens can be found at Rocky Branch growing on rotting logs but it is much more common on rock boulders along the cliff south of Rocky Branch Creek. On several boulders it has formed large, pure stands.

Platygyrium repens (Brid.) B.S.G.

Plants in blackish green mats with an unusual oily sheen; stems 2-6 cm long, prostrate, irregularly divided; branches ascending, short cylindric, usually having minute brood branches in the axils of the upper leaves; leaves .7-1.2 mm long, erect spreading when fresh, closely imbricate when dry, concave, oblong-ovate to oblong-lanceolate, costa short and double or absent, apices acuminate, margins entire, recurved below, alar cells quadrate, numerous, extending up the margin of the leaf; dioicous; setae 1-2 cm long, glossy, smooth, erect; capsule 1.5-3 mm long, erect, symmetric, oblong cylindric, brown; operculum obliquely conic-rostrate; peristome teeth 16; spores finely papillose, maturing in early fall.

Platygyrium repens is circumpolar in distribution. It ranges in North America from British Columbia to New Brunswick southward. It is extremely common east of the Rocky Mountains. It has been reported from 38 counties in Illinois (Figure 21). This moss is found on logs and stumps, tree bark, soil or rock, often in dry, disturbed habitats such as pastures or roadsides.

P. repens is very common on decaying logs and tree bases throughout the Rocky Branch Nature Preserve.

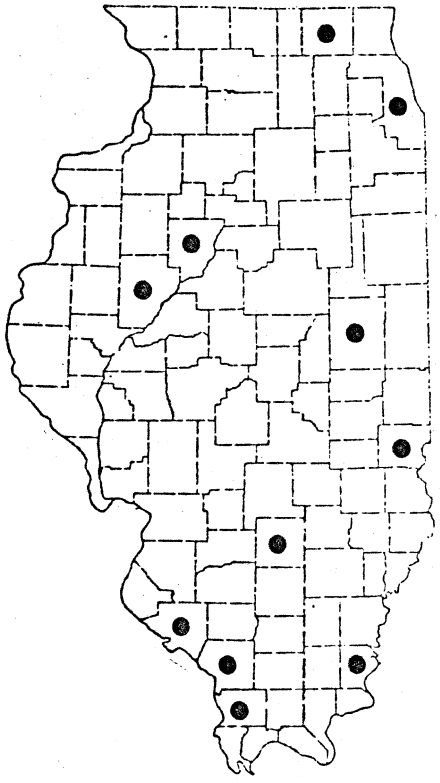

Figure 20. Distribution of Hypnum imponens in Illinois.

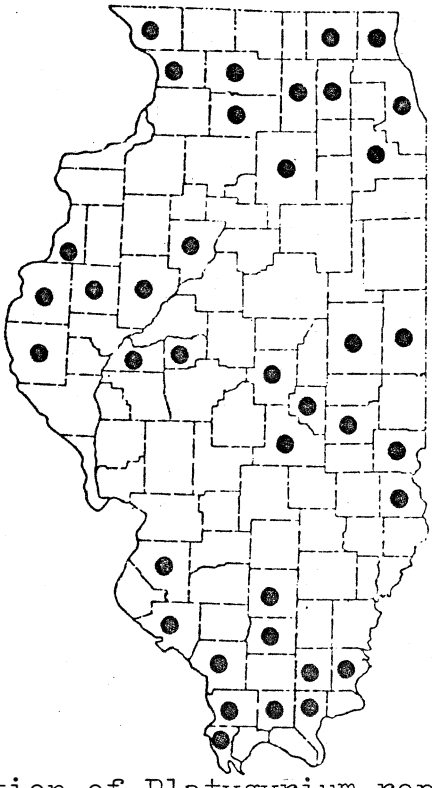

Figure 21. Distribution of Platygyrium repens in Illinois.

Leskea gracilescens Hedw.

Variously green plants in thin mats; stems pinnately divided, up to 4 cm long, prostrate; branches erect, simple, numerous; stem leaves erect spreading when fresh, appressed imbricate when dry, ovate, symmetric, .65-.9 mm long, costa subpercurrent and ending near the apex; apices gradually acute to obtuse, margins entire, often revolute, alar and basal cells quadrate; autoicous; setae 5-10 mm long, yellowish brown becoming reddish with age; capsule erect, oblong-cylindric, tapering at the base; operculum conic; peristome double, teeth 16; spores very finely papillose and maturing in the early summer.

This common moss is found nearly exclusively in the United States. It ranges in a band across the continental United States from the northeast to the Rocky Mountains. It is reported to be rare in Canada and the southern states and is apparently absent west of the Rocky Mountains. Leskea gracilescens has been reported from 31 counties in Illinois (Figure 22). It is often found on the base of trees, on rotting logs, rocks or on soil.

L. gracilescens can be found on any of the substrates listed above at Rocky Branch, with probably the most common habitat being the bases of trees. This moss is one of the most common corticolous mosses found in the mesophytic deciduous forests of east central Illinois.

Leucobryum glaucum (Hedw.) Angstr. ex Fr.

Robust, whitish plants in dense, spongy cushions, the upper part alive, the lower part dead and peaty, stems erect, dichotomously forked and fragile, 2-9 cm high; leaves crowded, erect to erect spreading or occasionally subsecund, oblong-lanceolate to ovate-lanceolate, concave, 3-10 mm long, from an oblong-ovate base, acute or apiculate, usually serrulate at the tip but otherwise entire; costa in cross section composed of two kinds of cells, a central chlorocyst layer between 1-3 leucocyst layers above and below; dioicous; calyptra longer than the capsule, inflated and cucullate; setae chestnut brown, erect, 1-2 cm long; capsule chestnut brown and inclined; operculum long rostrate from a conical base; urn cylindric, asymmetric, usually with 8 ridges when dry; peristome single, teeth 16, vertically striate and papillose, maturing in the fall.

This moss is commonly known as the "White Moss" or "Pincushion Moss" in reference to its color or its growth habit of forming dense tufts that resemble pincushions. This moss is found in Europe, the Azores, the Canary Islands, Japan, the Caucasus, Madeira and in North America from Newfoundland to Minnesota south to Louisiana and Florida. It is reported from 24 counties in Illinois (Figure 23). It prefers soil or humus in moist to dry forests. It is often found in association with the decomposed wood humus of decaying logs or stumps. Leucobryum glaucum often forms

large mats on the ridge tops in oak-hickory forests. This plant is unusual in that it rarely produces sporophytes but instead reproduces asexually by producing caducous leaves which can drop off to give rise to new plants.

This moss is found at Rocky Branch on the ridges north and south of Rocky Branch Creek. It is common but not nearly so common as Dicranum scoparium. This is the reverse of the usual situation in the forests of east central Illinois. L. glaucum can also be considered to be an indicator of acid soils having a pH of 4.2-5.4, a slightly higher pH range than that for D. scoparium, which is also an indicator of acid soils and which is usually found in the same habitat as L. glaucum.

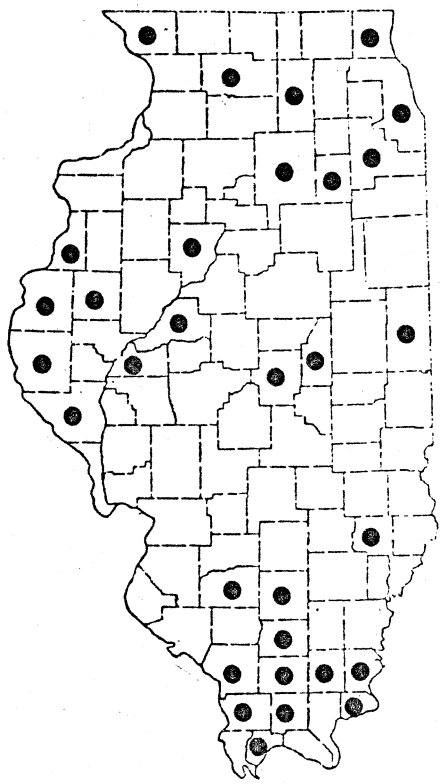

Figure 22. Distribution of Leskea gracilescens in Illinois.

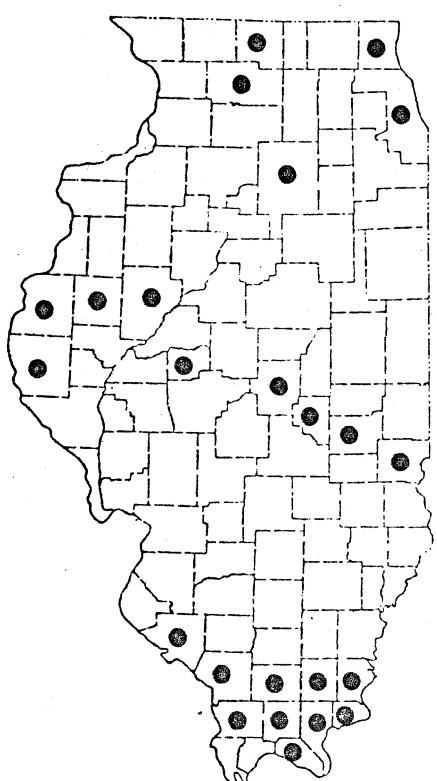

Figure 23. Distribution of Leucobryum glaucum in Illinois.

Mnium affine Bland ex Funck var. ciliare C.M.

Moderately large green plants in loose or dense tufts 3-9 cm high; sterile stems elongate, spreading to deflexed; fertile stems about 3 cm tall, erect, reddish brown, leaves 5-10 mm long, spreading when fresh, erect or spreading and very contorted when dry, oval, ovate, obovate, oblong-elliptic or narrowly spatulate, abruptly cuspidate-pointed, bases narrowed, costa excurrent as the cuspidate point, margins serrate nearly to the base with teeth of 1-3 cells; dioicous; setae 18-50 mm long, reddish, single but occasionally up to 4 from the same perichaetium; capsules pendulous, 3-5 mm long, oblong-cylindric, narrowed to a short, inconspicuous neck; peristome double, teeth 16; spores finely papillose, yellowish pellucid and maturing in the spring.

Mnium affine is circumpolar in distribution in the the Northern Hemisphere. It has also been reported from South America. In Noth America it ranges from Greenland to Alaska, south to California, Wyoming, Texas and Florida. M. affine var. ciliare is apparently restricted to North America while the variety affine is found in Europe and the Caucasus. The variety rugicum is circumpolar. Mnium affine var. ciliare has been reported from 14 counties in Illinois (Figure 24). McCleary and Redfearn (1979) in their checklist of Illinois mosses, record it from 13 counties but a report from Clark County by Arzeni (1947) was apparently overlooked. This moss is typically found

on moist, shaded rock, soil, stumps, logs and tree trunks in woods, meadows and swamps.

M. affine is a relatively uncommon moss at Rocky Branch. It can be found in a few damp locations along the sandstone walls south of Rocky Branch Creek.

Mnium cuspidatum Hedw.

Plants in loose, light to yellowish green tufts from 2-3.5 cm high; sterile stems green, spreading or horizontal, fertile stems reddish, simple and erect; leaves few, distant, more numerous and larger approaching the terminal rosette, strongly crisped and contorted when dry, spreading when moist, obovate, acute to cuspidate-acuminate, bases narrow, decurrent, single, sharp, margins serrate with unicellular teeth in the upper half, costa percurrent or slightly excurrent; synoicous; setae single, erect, up to 3 cm high; capsules 2-3 mm long, pendent; calyptra cucullate and inconspicuous; operculum convex-conic; urn oblong to oval; peristome double, teeth 16, spores yellow, faintly papillose and maturing in April and May.

This moss is commonly known as the "Woodsy Mnium" in reference to its habitat. It is a circumpolar moss that ranges in North America from Labrador to Alaska, south to Oregon and Arizona and throughout the eastern United States. Mnium cuspidatum has been reported from 50 counties in Illinois (Figure 25). This moss is found growing primarily on moist soil or humus in mesic woodlands but it is also occasionally found on logs, stumps, rocks or the bases of trees. It can often be found in damp pockets of soil on steep ravine banks.

This moss can be found growing on moist soil along the north facing sandstone walls at Rocky Branch.

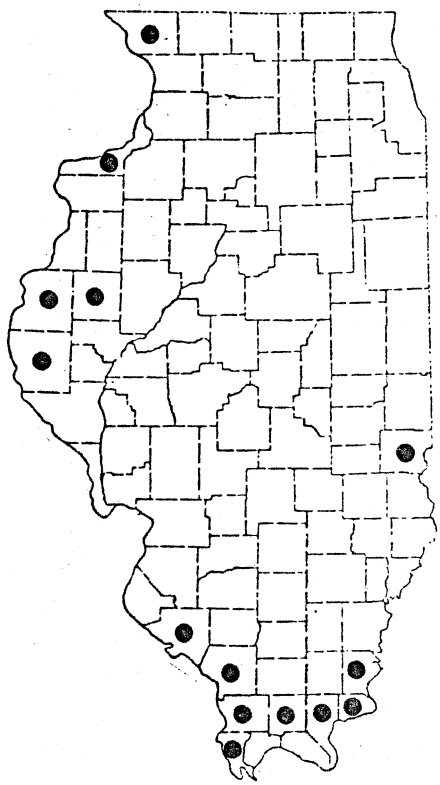

Figure 24. Distribution of Mnium affine in Illinois.

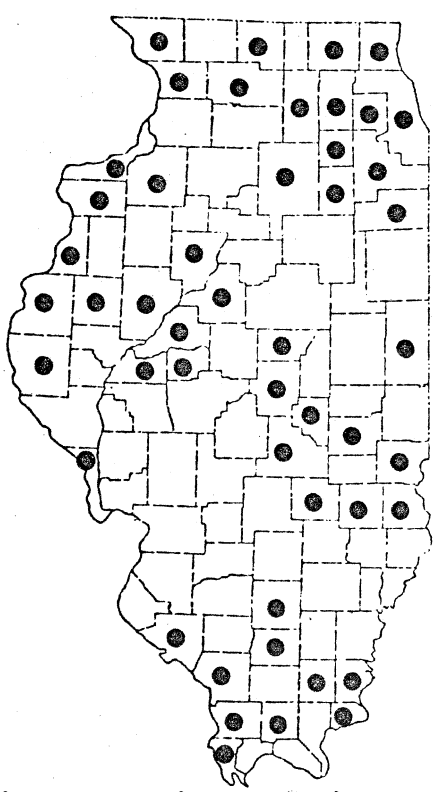

Figure 25. Distribution of Mnium cuspidatum in Illinois.

Mnium punctatum Hedw. var. punctatum

Pale or dark green plants in loose tufts; stems erect, rigid, 2.5-7.5 cm high, reddish, densely tomentose almost to the apex; leaves far apart except in the terminal rosette, erect, spreading, 3.5-9 mm long, oval, broadly obovate or obovate-spatulate, slowly narrowing to the base, margins entire, costa strong below, percurrent, ending in an apicular tip or ending just below the tip, the apices broadly rounded, border reddish or purplish and composed of 1-5 rows of elongated, incrassate cells 1-several cells thick; dioicous; setae 2-4 cm long, erect, glossy, reddish; capsule horizontal to pendulous; operculum stoutly rostrate; urn up to 5 mm long, ovoid, oval-oblong or oblong cylindric; peristome double, teeth 16; spores brownish yellow, smooth to finely papillose and maturing in winter or spring.

Mnium punctatum is circumpolar in distribution. In the Western Hemisphere, it can be found from Greenland to Alask, south to Georgia, Arkansas, Colorado and California. M. punctatum has been reported from 11 counties in Illinois (Figure 26). This moss prefers a very wet habitat. It can be found on wet soil, humus, rotten logs and rocks in damp woods, ravines and swamps.

M. punctatum is occasionally found at Rocky Branch on damp soil at the base of the limestone walls south of Rocky Branch Creek.

Polytrichaceae

Atrichum angustatum (Brid.) B.S.G.

Plants medium sized, 10-20 mm high, in clusters or tufts, olive green turning reddish brown in older plants; leaves erect to erect spreading when moist, undulate when dry, linear-lanceolate, 3-4.5 mm long, .6-.75 mm wide; lamellae 5-6 on upper surface of the costa with the costa and lamellae comprising 1/4-1/3 the width of the middle portion of the leaf, lamellae on the upper 3/4 of the blade 6-14 cells high; costa toothed near the apex on the lower surface; cells irregularly isodiametric, occasionally longer than wide; setae erect, 10-30 mm long; calyptra slenderly rostrate, hispid at the tip; operculum slenderly rostrate, about 1/2 the length of the urn; urn narrowly cylindrical; peristome single, teeth 32; spores pale green to reddish yellow, spherical, smooth to slightly roughened, maturing in late fall and winter.

Atrichum angustatum is widespread throughout the world. It is found in Europe and Asia as well as in North America, where it is probably one of the most widespread and common mosses. It ranges from Newfoundland to Manitoba south to the Gulf of Mexico. It has been reported from 45 counties in Illinois (Figure 27). This moss is often found on light, sandy soils in dry, open woods. It is also very common in disturbed areas.

This moss is relatively common at Rocky Branch. It is often found in the upland forest and throughout the preserve.

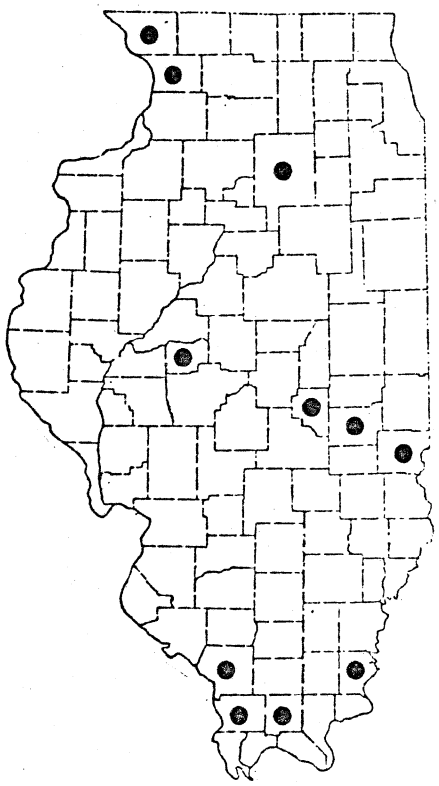

Figure 26. Distribution of Mnium punctatum in Illinois.

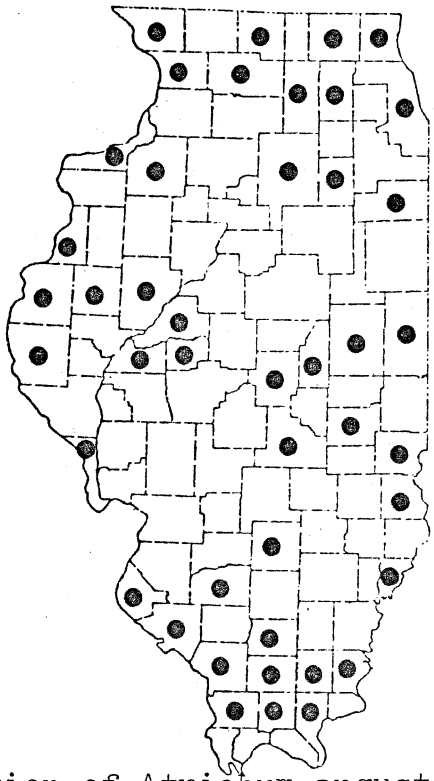

Figure 27. Distribution of Atrichum angustatum in Illinois.

Polytrichaceae

Atrichum undulatum (Hedw.) P.-Beauv.

Moderately robust, yellowish green to dark green plants 1.5-7 cm tall, stems erect from a branched rhizome, rarely branched; leaves conspicuously undulate, especially when dry, toothed at back in oblique rows corresponding to the undulations, 4.5-9.5 mm long, oblong lanceolate, serrate almost the entire length of the leaf; costa subpercurrent to percurrent with a few teeth near the apex on the lower surface; lamellae 4-6, 2-5 cells high; calyptra slenderly rostrate, cucullate and pale, covering 1/2-3/4 of the urn; setae straight, erect, 2-5 cm long, reddish; capsule inclined; operculum conic, 2.5-3 mm, almost as long as the urn; urn cylindric, 4-5 mm long, slightly curved; peristome single, teeth 32, minutely papillose; spores spherical, nearly smooth, yellowish green to orange, maturing in the late fall.

Atrichum undulatum was previously known as Catharinea undulata. It is the old generic name upon which the common name, the "Wavy Catharinea", is based. Crum (1973) reports that it has been irreverently referred to as the "Undulating Catharinea". This moss is of widespread distribution, being known from North America, Europe, Asia minor, China Japan, North Africa, Madeira and the Azores. A. undulatum ranges in North America from Alaska to California and from Nova Scotia to Minnesota south to the Gulf of Mexico. It has been reported from 30 counties in Illinois (Figure 28).

This moss is found on rich, moist soil, clay or mud in mesophytic woods and ravines.

This moss can be found at Rocky Branch on moist clay between Rocky Branch Creek and the south wall of the creek valley. A. undulatum is not at all common in the preserve. Only one robust colony was located, yet this colony could be easily eradicated through needless or careless collecting or destroyed by the illegal use of all-terrain vehicles in the preserve.

Polytrichum ohioense Ren. & Card.

Robust, dark green plants in loose sods, 1.5-6 cm high; stems simple, erect and rigid; leaves 5-8 mm long, erect or erect spreading when dry, spreading to recurved when moist, linear-lanceolate from a sheathing base 2 mm long, acuminate to a short, reddish, toothed awn, margin plane to erect, coarely toothed almost to the shoulders; lamellae 30-41, nearly equalling the width of the leaf above the shoulders, 3-7 cells high; costa shortly excurrent, sparsely toothed at back near the apex; dioicous or autoicous; setae very large, 15-85 mm long, capsule erect, horizontal or pendant; calyptra densely hairy, shorter than the capsule, operculum depressed conic with curved beak; urn oblong, acutely 4-5 angled, narrowed toward the base; peristome single, teeth 64; spores spherical, yellowish white, finely punctate and maturing in midsummer.

This moss is commonly known as the "Haircap Moss" or the"Pigeonwheat Moss" in reference to the hairy calyptra. Polytrichum ohioense is circumpolar in distribution. In North America, it is common in the eastern United States, but it has also been reported in New Mexico. It has been reported from 17 counties in Illinois (Figure 29). This moss prefers soil or humus in mesic woodlands. It is also occasionally found in old fields.

P. ohioense is common on the upland ridges at Rocky

Branch. It is the dominant moss on the ridge north of Rocky Branch Creek. Here it often forms beautiful dark green sods several meters across.

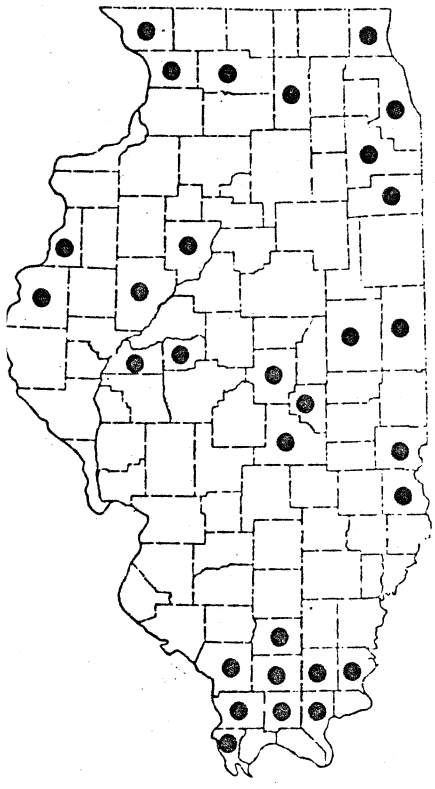

Figure 28. Distribution of Atrichum undulatum in Illinois.

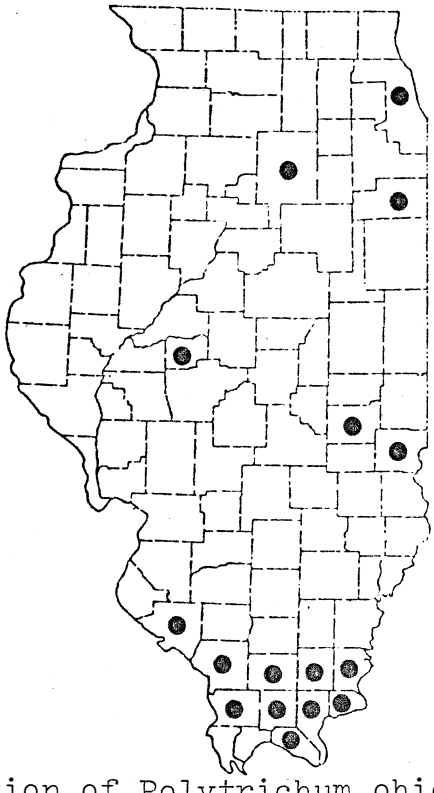

Figure 29. Distribution of Polytrichum ohioense in Illinois.

Pottiaceae

Barbula fallax Hedw.

Dull, brownish or reddish green plants in dense tufts, 5-30 mm high; stems slender, usually branched; leaves erect spreading when moist, incurved and contorted when dry, lanceolate from an ovate base, apex acuminate, margins entire, revolute, often nearly to the apex, costa strong, tapering upward to the leaf apex, dioicous; setae erect, red, 8-25 mm long; capsule erect, brown; operculum rostrate-subulate, often as long as the urn; urn elongated ovoid to subcylindric; peristome red, teeth 16, in 32 delicate filiform, much twisted divisions; spores smooth and maturing from late fall to early spring.

Barbula fallax is circumpolar in distribution. It ranges in North America from Nova Scotia to Minnesota, south to New York, Ohio, Missouri and Louisiana. It has been reported from 15 counties in Illinois (Figure 30). This moss is typically found on moist, calcareous soil, especially along roadsides.

B. fallax is commonly found at Rocky Branch in large colonies on several sandstone boulders north of the conjunction of Rocky Branch Creek and the West Fork of Big Creek.

Desmatodon obtusifolius (Schwaegr.) Schimp.

Small, densely caespitose, green to yellowish green plants; stems 3-10 mm tall; leaves 1.2-2 mm long, oblong, oblong-lanceolate or ovate-lanceolate, crispate when dry, erect spreading when moist; apex rounded obtuse, often apiculate; margins entire; costa ending below the apex to percurrent and extending into an apiculus; leaf cells densely papillose; autoicous, but often appearing dioicous; setae 6-12 mm long, brown; capsules erect, narrowly cylindric, finely wrinkled-striate when empty and dry; peristome teeth 16; spores smooth, yellowish, maturing in spring, summer or fall.

Desmatodon obtusfolius is widespread in distribution. It is found in North America, Europe, Greenland, the Caucasus and Asia Minor. It has a North American distribution from Alaska to New Brunswick, south to Tennessee, Texas, Colorado and California. D. obtusifolius is known from 14 counties in Illinois (Figure 31). This moss is rarely found on soil, preferring instead such limey substrates as damp, shaded rocks, stone walls or bridge supports. It is most commonly found on sandstone.

D. obtusifolius is occasionally found at Rocky Branch on the sandstone walls south of Rocky Branch Creek.

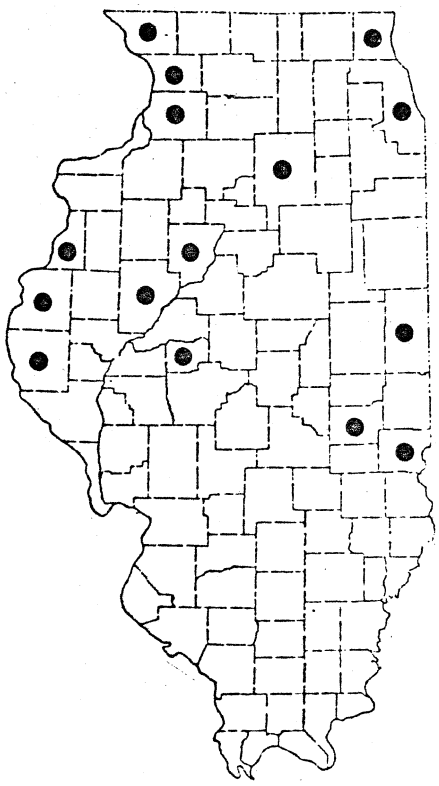

Figure 30. Distribution of Barbula fallax in Illinois.

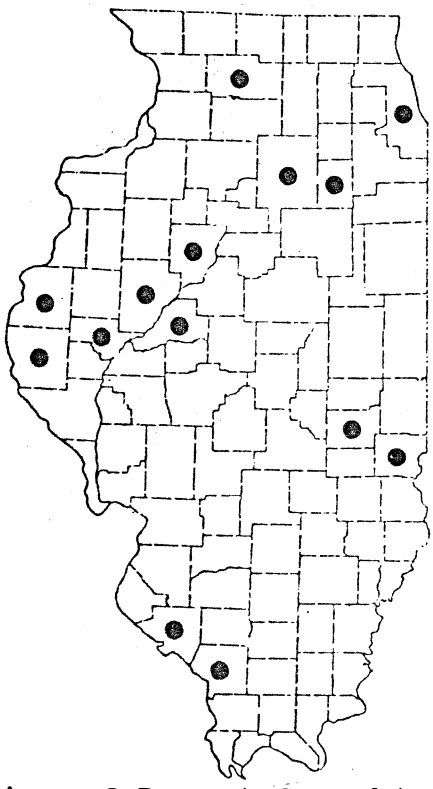

Figure 31. Distribution of Desmatodon obtusifolius in Illinois.

Pottiaceae

Gymnostomum aeruginosum Sm.
= (Gymnostomum calcareum Nees & Hornsch)

Small, densely caespitose plants, grayish, yellowish or dirty green above, rust colored below; stems erect, 2-7 mm high, branched; leaves 1-1.3 mm long, spreading and slightly recurved when moist, ligulate or linear-lanceolate, apices bluntly acute to narrowly rounded obtuse, margins plane, costa strong, ending below the apex; dioicous; setae erect, yellow, 3-5 mm long; capsule erect, cylindric, .6-.8 mm long, pale brown; calyptra cucullate; operculum conic, beak oblique; peristome none; spores smooth to very slightly roughened, yellowish and maturing in the summer.

Gymnostomum aeruginosum is circumpolar in distribution. It ranges in North America from southeastern Alaska and British Columbia to Newfoundland, south to Arizona, Colorado, Arkansas and North Carolina. It can also be found in Mexico and Guatemala. It is found in 8 counties in Illinois (Figure 32). McCleary and Redfearn (1979) report it from 7 counties, apparently failing to include the report by Arzeni (1947) for Clark County. G. aeruginosum is found on shaded, moist to wet calcareous cliffs or boulders.

This moss is often encountered under damp cliff overhangs at Rocky Branch. It is also found in places on the sandstone walls where water is actively seeping or dripping.

Sphagnum girgensohnii Russ.

Plants robust, 10-15 cm tall, green or sometimes yellowish to brownish, not reddish: stems flexuose and woody; terminal bud moderately large; wood cylinder green, yellowish or brownish, not at all reddish; cortical cells in 2-4 layers, lacking fibrils, isodiametric, thin walled, the outer cells with a single, large round pore, in cross section of the branch leaves the chlorophyllose cells are usually triangular to trapezoidal, with the broader exposure on the inner surface of the leaf, the hyaline cells slightly convex on the inner leaf surface and strongly convex on the outer, nearly enclosing the chlorophyllose cells; stem leaves tongue-shaped, narrowest at the apex, fimbriate-lacerate across the truncate tip; dioicous, rarely monoicous; fruiting branches erect; capsules dark brown; spores brownish yellow, very finely papillose.

Sphagnum girgensohnii is found in Europe, Asia and North America. It ranges in North America from Alaska to Oregon, Idaho and Montana and from Labrador through the Great Lakes south to North Carolina and Tennessee. It has previously been reported from two counties in northern Illinois (Figure 33). It prefers shaded eutrophic to mesotrophic bogs or swamps.

S. girgensohnii has not been previously reported from Clark County. It is abundant in one location on a steep hillside south of Rocky Branch Creek.

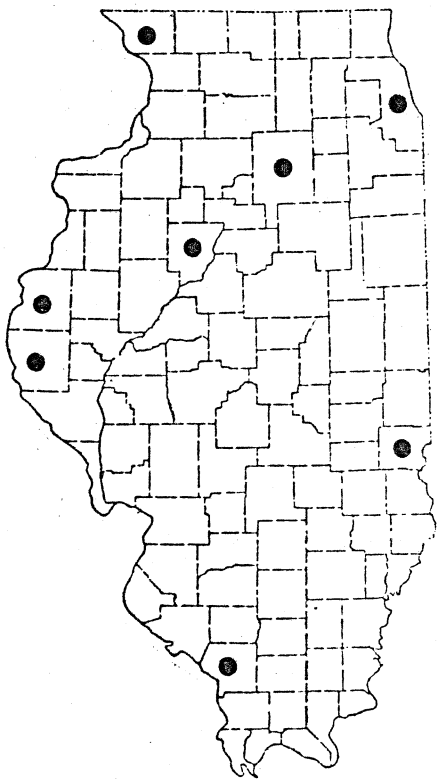

Figure 32. Distribution of Gymnostomum aeruginosum in Illinois.

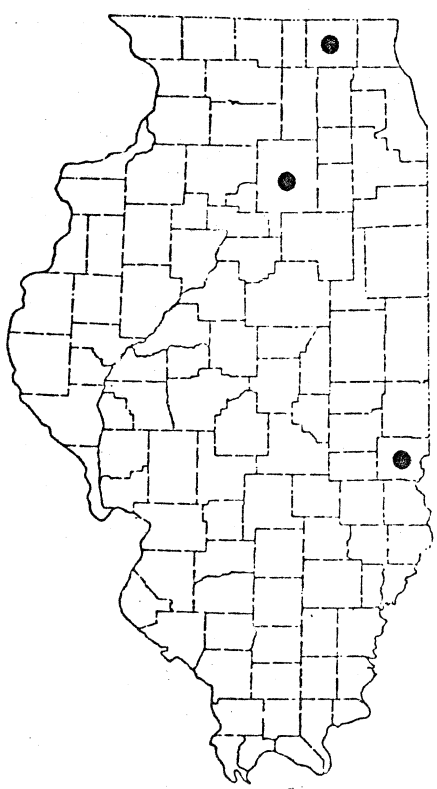

Figure 33. Distribution of Sphagnum girgensohnii in Illinois.

Sphagnum palustre L.

Plants low and compact to robust, usually 8-10 cm high, green or rarely brownish tinged; wood cylinder brownish or yellowish; cortical cells of stems 3 layered, thin walled, spirally fibrillose, the outer cells with 2-7 (occasionally 11) irregularly rounded pores; stem leaves spatulate-lingulate, up to 3 mm long, margin toothed, apex broadly rounded; branch leaves imbricate to squarrose, up to 3 mm long, broadly ovate, very concave, apex cucullate, in cross section the chlorophyllose cells are narrowly isosceles-triangular with the short base exposed on the inner surface of the leaf, the hyaline cells convex on the outer surface of the leaf; dioicous; fruiting branches erect, capsule brown and very exserted; spores yellow, finely roughened, maturing in midsummer.

Sphagnum palustre is found in North America, Europe and Asia. It ranges in North America from Newfoundland through the Great Lakes region and south to the Gulf of Mexico and Mexico. It has been reported from 5 counties in Illinois (Figure 34). S. palustre can be found growing in bog forests, bog mats, at the edges of quiet lakes and rivers and in wet places deciduous woods. Crum (1973) reports that it appears to be tolerant of a wide range of acid conditions.

S. palustre is locally abundant at Rocky Branch but it cannot really be considered common. It is found in

one very moist location on the steep hillside south of Rocky Branch Creek. This location is constantly damp due to seepage from the hillside above. S. palustre is not as common as S. girgensohnii in the preserve.

Tetraphis pellucida Hedw.

Plants minute, 8-15 mm high, bright green to brownish green, in loose, wide tufts; stems erect, barren shoots often with terminal gemmiferous cups 1 mm in diameter; leaves 1-1.3 mm long, ovate to ovate-lanceolate from a narrow base, upper leaves larger than the lower leaves, costa wide, ending below the apex, apices mostly acute, margins plane and entire; autoicous; setae erect, 1-1.5 cm long, reddish or brown, twisted when dry; capsule erect to ascending, narrowly cylindric, 2-2.7 mm long, green when young, bright reddish brown when ripe; peristome single, teeth 4; spores smooth or slightly papillose, maturing from spring to early fall.

Tetraphis pellucida has been called "The Four-Toothed Moss" in reference to the 4 peristome teeth which are an instant field recognition characteristic. This moss is circumpolar in distribution in the Northern Hemisphere. It ranges in North America from Labrador to Alaska, south to California, Arizona, Colorado, Arkansas and South Carolina. It has been reported from 15 counties in Illinois (Figure 35). T. pellucida is very common at Rocky Branch. It is found almost exclusively on sandstone rocks and walls where it often forms large, pure stands several meters across. It is very easy to identify fruiting material with peristome characteristics and non-fruiting material by the terminal gemmiferous cups.

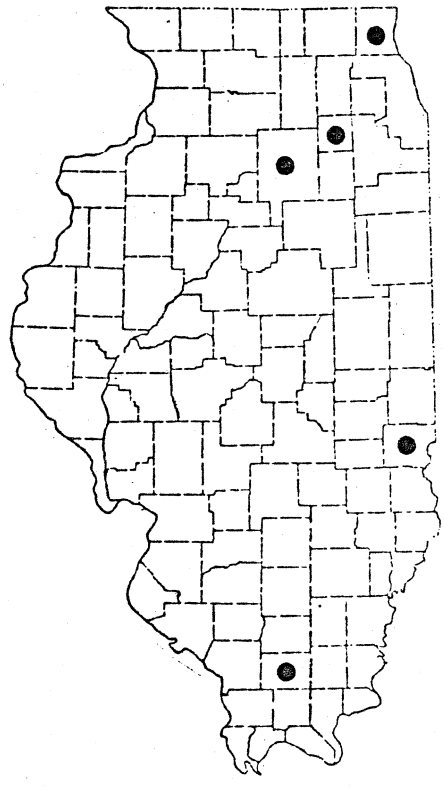

Figure 34. Distribution of Sphagnum palustre in Illinois.

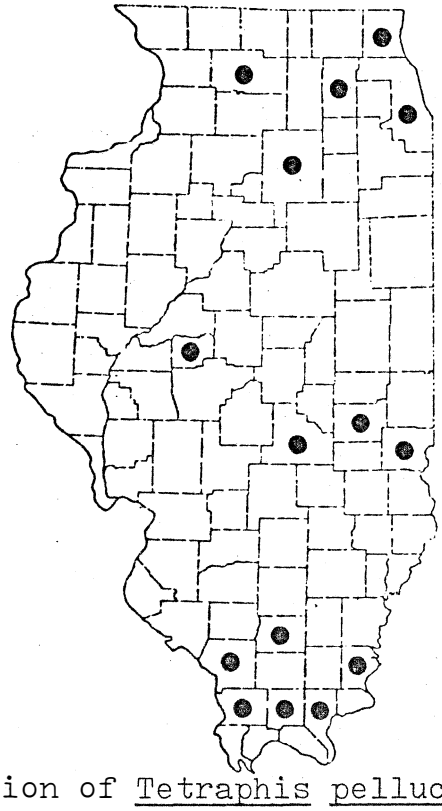

Figure 35. Distribution of Tetraphis pellucida in Illinois.

Anomodon attenuatus (Hedw.) Hueb.

Slender, dark green or yellowish green plants in loose mats or tufts; primary stems prostrate; secondary stems loosely spreading and abundantly branched, slender to flagelliform-attenuate, branches decurved when dry; leaves .8-1.8 mm long, erect spreading when fresh, loosely erect when dry, oblong lanceolate from a broadly decurrent base, apex acute, ending in a pale apiculus, margins plane but often slightly serrulate near the apiculus, costa strong and ending near the apex; dioicous; setae 13-27 mm long; calyptra smooth and cucullate; capsule 2-3 mm long, erect, smooth, cylindric; operculum 1.2-1.3 mm long, long rostrate; peristome double, teeth 16; spores very finely papillose, greenish brown and maturing in the fall.

Anomodon attenuatus is a moss of worldwide distribution. It can be found in the United States, Canada, México, Guatemala, Cuba, Jamaica, Europe and Asia. It is widespread in eastern North America and it is also known from Colorado, New Mexico and Arizona. A. attenuatus has been recorded from 37 counties in Illinois (Figure 36). It seems to prefer calcareous habitats such as rocks but it is also commonly found on stumps and at the bases of trees in woodlands.

A. attenuatus is fairly common and is typically found on bark at the bases of trees at Rocky Branch.

Anomodon minor (Hedw.) Fuernr.

Rather coarse, glaucous-green to yellowish or brownish green plants in loose mats; primary stems prostrate, with small leaves with squarrose or wide-spreading tips; secondary stems and branches erect-ascending; leaves erect and spreading when moist, imbricate when dry, broadly oblong from an ovate, broadly decurrent base, rounded or rounded obtuse at the apex, margins plane, papillose crenulate; costa strong, pellucid, ending well below the apex; dioicous; setae erect, pale yellow, 6-12 mm long; capsule erect, smooth, cylindric, dark brown, often furrowed when dry; calyptra cucullate, covering up to 1/2 of the urn; operculum conic, acuminate, about 2/5 the length of the urn; peristome teeth 16, spores smooth or finely papillose, brownish and maturing in the late fall or winter.

This moss is commonly called th "Blunt Leaved Anomodon" in reference to the rounded, obtuse leaf apices. Anomodon minor is found in eastern Asia and North America. Bodenberg (1954) believes that the distribution of this moss is closely correlated with the distribution of certain angiosperms, particularly Liquidambar and Hamamelis. It has been reported from 26 counties in Illinois (Figure 37). A. minor is typically found at the bases of trees but can often be found on logs, stumps or rocks. Crum (1973) reports that it probably prefers calcareous habitats.

A. minor was always found at the bases of trees.

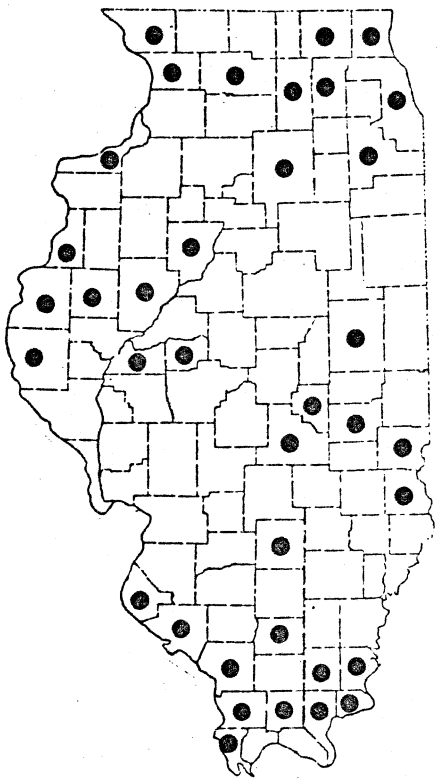

Figure 36. Distribution of Anomodon attenuatus in Illinois.

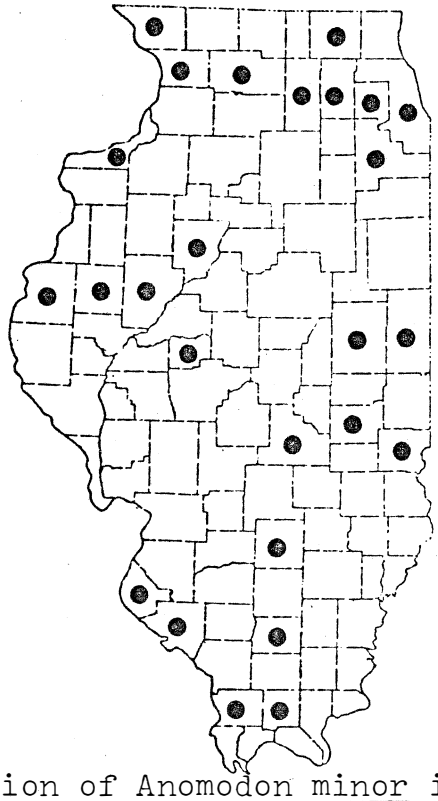

Figure 37. Distribution of Anomodon minor in Illinois.

Thuidium delicatulum (Hedw.) B.S.G.

Large, robust, bright green or yellowish plants in large interwoven mats, fern-like in appearance, stems 3-12 cm in length, prostrate or arched, 2-3 pinnate; leaves erect spreading when moist, appressed when dry, triangular ovate, furrowed, costa strong at the base and narrowing toward the apex, apices acuminate, margins recurved and papillate serrate, the papillae aligned at the middle of the cells; dioicous; setae smooth, erect, 15-45 mm long, reddish, calyptra cucullate; operculum conic-rostrate; capsule inclined to horizontal; urn curved, cylindric, asymmetrical, peristome large, teeth 16; spores smooth to slightly roughened, brownish yellow and maturing in late fall or winter.

Thuidium delicatulum is commonly called the "Fern Moss" in reference to its fern-like appearance. It can be found in Europe, Asia, North and South America and the West Indies. It is reported as widespread in eastern North America and it is known from Alaska, British Columbia, Labrador and Arizona. It also ranges from Mexico south to South America. T. delicatulum has been reported from 28 counties in Illinois (Figure 38). It is typically found on soil, humus, decaying wood or rocks in moist or wet places in shaded woods.

T. delicatulum is common at Rocky Branch on soil or rock in the shade of the wall south of Rocky Branch Creek.

Cephaloziaceae

Cephalozia lunulifolia (Dumort.) Dumort.

Small, flat, pale to yellowish green plants in patches, often among mosses; stems prostrate, strongly compressed; branches few, all ventral, intercallary and lacking stolons; leaves bifid, distant, very obliquely inserted giving an almost horizontal appearance; no underleaves; gemmae often present; dioicous; spores reddish brown, finely papillose.

Cephalozia lunulifolia is described as being holarctic in distribution. It is very widespread throughout the boreal and deciduous forest regions of the Northern Hemisphere. It ranges in eastern North America from New York to Georgia, west to Iowa, Missouri and Texas. In western North America it ranges from the Aleutian Islands of Alaska south to California and Nevada. It has apparently been reported from only 3 counties in Illinois (Figure 39). This extremely common and widespread liverwort can be found in a wide variety of habitats such as moist rocks and crevices, bogs, decaying logs and stumps or soil. C. lunulifolia has a strong tolerance for direct sunlight and wide pH variations (Schuster, 1957). These two factors allow it to utilize a wide variety of habitats.

C. lunulifolia is relatively common at Rocky Branch. It can be found growing on sandstone in many locations along the walls south of Rocky Branch Creek.

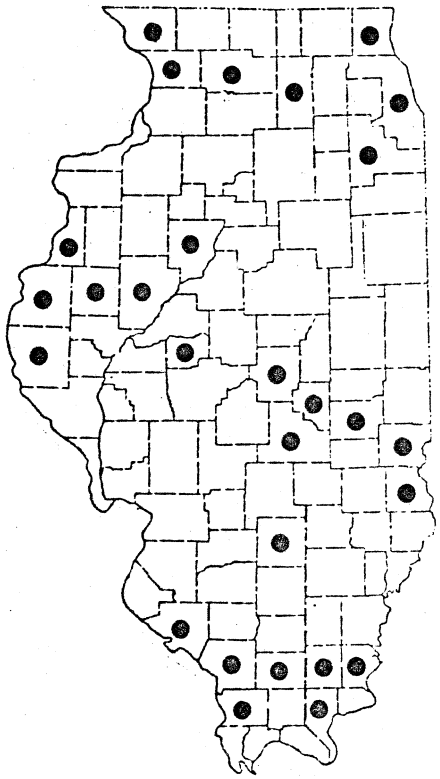

Figure 38. Distribution of Thuidium delicatulum in Illinois.

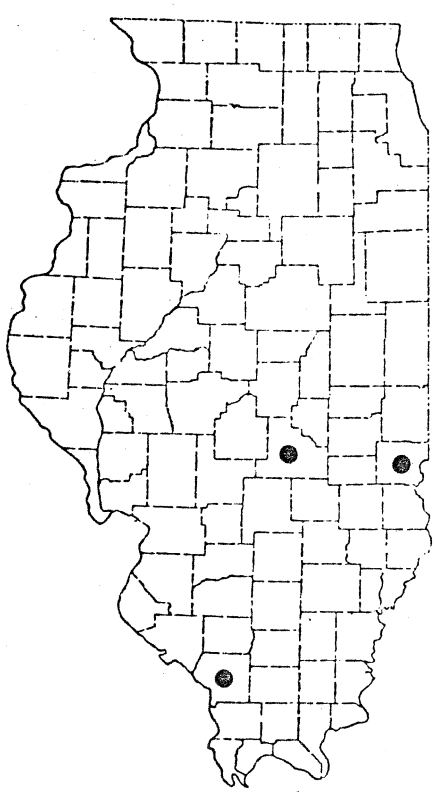

Figure 39. Distribution of Cephalozia lunulifolia in Illinois.

Frullania eboracensis Gottsche

Plants in small, blackish patches; stems prostrate, closely attached to the substrate; branches numerous; leaves imbricate, lobes suborbicular, concave at the base, margins entire, paracysts lacking; underleaves distant, 2-lobed, ovate to rhombic-ovate; dioicous; female inflorescence an oblong spike occupying a short lateral branch.

Frullania eboracensis ranges in North America from Nova Scotia south to Florida and west to Nebraska, Oklahoma and Texas. It has been reported from 13 counties in Illinois (Figure 40). This liverwort is typically found on rocks or trees.

F. eboracensis is occasionally found on the bark of various tree species throughout the preserve.

Frullania inflata Gottsche

Brownish green to reddish plants, closely appressed to the substrate; stems irregularly pinnate; leaves imbricate, lobes orbicular but not cordate at the base, margins entire, paracysts lacking, leaf cells without trigones or intermediate thickenings; underleaves distant to subimbricate, 2-lobed, ovate; monoicous; perianth terminal on the stem or a main branch; antheridial branch short, located just below the perianth.

Frullania inflata is widely distributed in North America, Europe and Asia. It ranges in North America from Maine to Florida, west to Utah, California and Mexico. It has been reported from 7 counties in Illinois (Figure 41). This liverwort is found growing on trees, fence posts and rarely on rocks.

F. inflata is occasionally found on the bark of various tree species throughout Rocky Branch Nature Preserve.

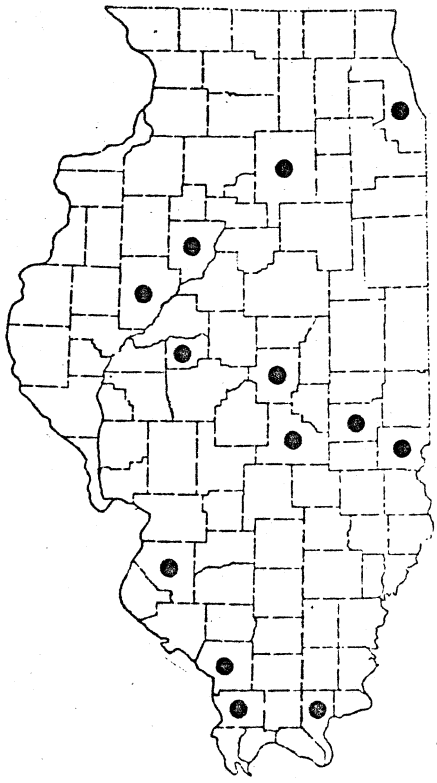

Figure 40. Distribution of Frullania eboracensis in Illinois.

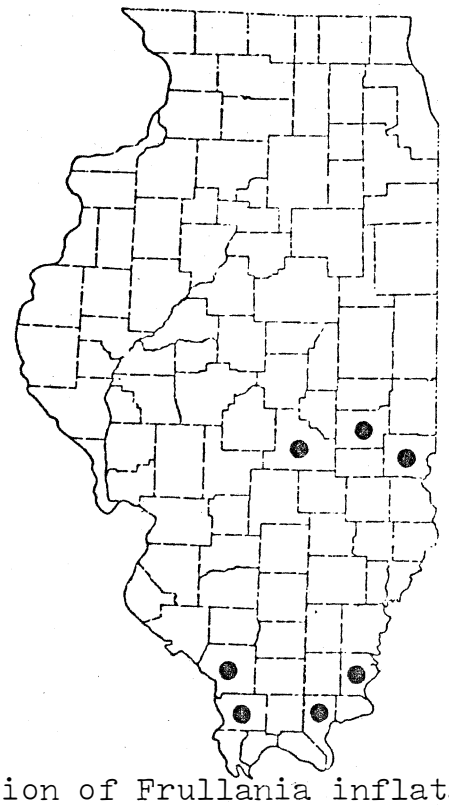

Figure 41. Distribution of Frullania inflata in Illinois.

Harpanthus scutatus (Web. & Mohr.) Spruce

Tiny, pale green plants in small patches, leafy shoot 1 mm wide; stems prostrate with ascending tips, up to 1.5 cm long; branches few, arising from the axils of the underleaves; leaves alternate, succubous, simply 2-lobed, margins entire to subsinuate; gemmae very rare; underleaves comparatively large; plants unisexual; perianth ovoid-oblong, bluntly 3-angled above.

Harpanthus scutatus is found in Europe, Asia and North America where it ranges from Labrador to British Columbia, Wisconsin, Tennessee and North Carolina. It is apparently reported from only 3 counties in Illinois (Figure 42). Wolf and Hall (1878) reported this liverwort from Johnson and Union Counties. Arzeni (1947) reported it for Clark County and indicated that it was not common and that it was found in association with Cephalozia lunulifolia and Blepharostoma trichophyllum. H. scutatus is typically found on sandstone, humus, rotten wood and tree bark.

H. scutatus is, as Arzeni (1947) reported, not common at Rocky Branch. It was found on sandstone south of Rocky Branch Creek in association with Cephalozia lunulifolia. No association with Blepharostoma trichphyllum was noted.

Jamesoniella autumnalis (DeCand.) Steph.

Olive green, prostrate plants in small, dense patches, becoming reddish with age and exposure to direct sunlight; Rhizoids numerous, nearly to the stem tip, hyaline; leaves obliquely inserted, rotund-quadrate to very shortly oblong-oval; apices rounded-truncate, occasionally emarginate; underleaves usually obsolete; asexual reproduction lacking; dioicous; androecia compactly spicate, often orange-red even when the rest of the plant is green; gynoecia variable; perianth mouth ciliate.

Jamesoniella autumnalis is found from the northern coniferous forests south through the deciduous forests of North America, Europe and Asia. It ranges in the Western Hemisphere from Greenland to British Columbia, south to Washington, Missouri and Alabama. It has previously been reported from 7 counties in Illinois (Figure 43). This liverwort is common on moist sandstone, decaying logs, humus or soil.

J. autumnalis is relatively rare at Rocky Branch. It can be found on the sandstone walls south of Rocky Branch Creek. This is the first report for this liverwort from Clark County.

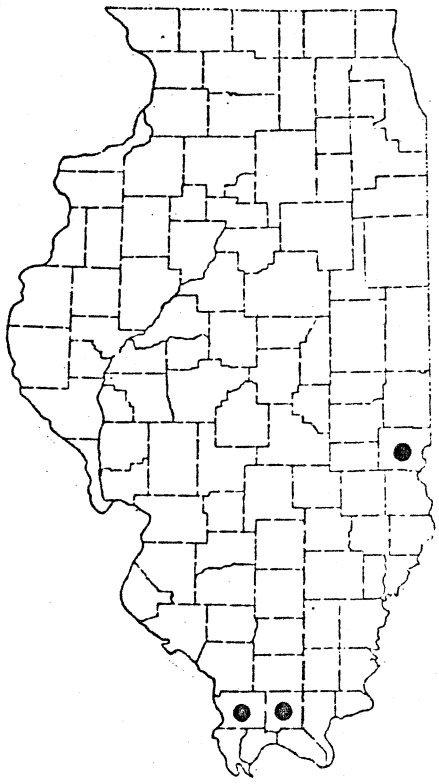

Figure 42. Distribution of Harpanthus scutatus in Illinois.

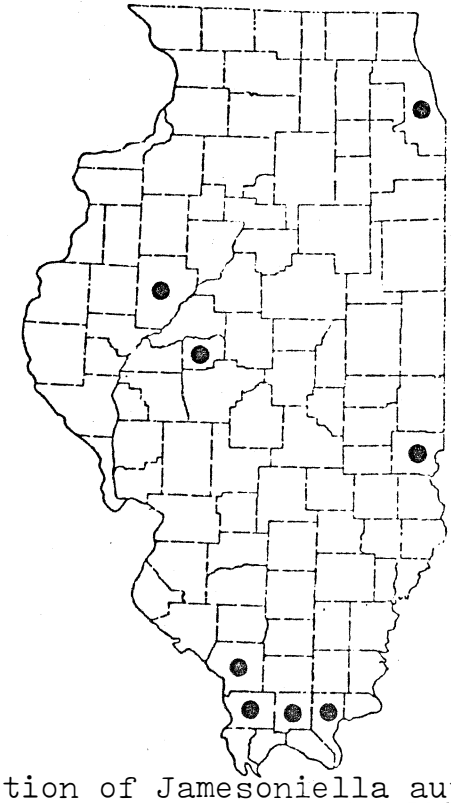

Figure 43. Distribution of Jamesoniella autumnalis in Illinois.

Jungermanniaceae

Nardia lescurii (Aust.) Underwood

Plants growing in more or less dense mats, varying in color but often a deep rose color; stems sparingly branched; leaves approximate to loosely imbricate, emarginate or emarginate-bilobed, the sinus acute or rounded, the margin entire; trigones, large, distinct, with bulging sides; oil bodies round to oval, 2-6 in each cell, persisting if dried quickly.

Nardia lescurii is a new record for the state of Illinois. This specimen was confirmed by Dr. R.E. Stotler of Southern Illinois University at Carbondale. Duplicates have been deposited in the Ernest L. Stover Herbarium at Eastern Illinois University and at the Southern Illinois University Herbarium. N. lescurii has previously been reported from North Carolina, South Carolina, West Virginia, Kentucky and Ohio. Its discovery at Rocky Branch represents a significant westward extension of its known range (Fig.44).

N. lescurii was discovered at Rocky Branch on a thin layer of soil over sandstone on the wall south of Rocky Branch Creek, nearly to the junction with Big Creek. It was found at only this one location in the preserve. It was collected in winter when the creek was frozen, which allowed the examination of areas along the sandstone walls which would not normally be examined. This probably explains why it was not discovered in earlier studies.

Solenostoma crenuliformis (Aust.) Steph.
=(Plectocolea crenuliformis Mitt.)

Prostrate plants in small patches or turfs; pale to yellowish green, distal halves of the leaves often reddish or purplish; leaves obliquely inserted, weak to moderately imbricate, concave, broadly rounded, marginal cells swollen, forming a border that appears elevated above the rest of the leaf; dioicous; perianth reddish, immersed and barely emergent at maturity.

Solenostoma crenuliformis is endemic to eastern North America and is common in the deciduous forests at low elevations in the Appalachian Mountains. It ranges from Quebec south to Georgia and west to Arkansas and Kansas. It has been reported from only 3 counties in Illinois (Figure 45). S. crenuliformis is typically found on noncalcareous rocks or sandstone along shaded streams and is often associated with Scapania nemorosa.

S. crenuliformis is occasionally found at Rocky Branch on the sandstone walls south of Rocky Branch Creek. It can be found in association with Scapania nemorosa.

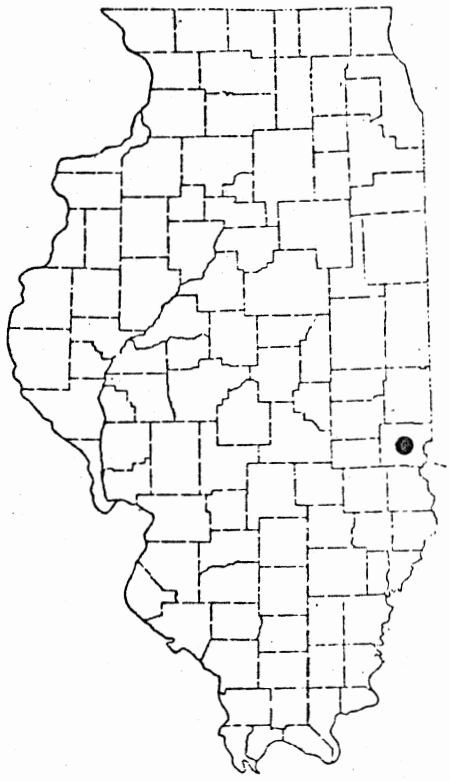

Figure 44. Distribution of Nardia lescurii in Illinois.

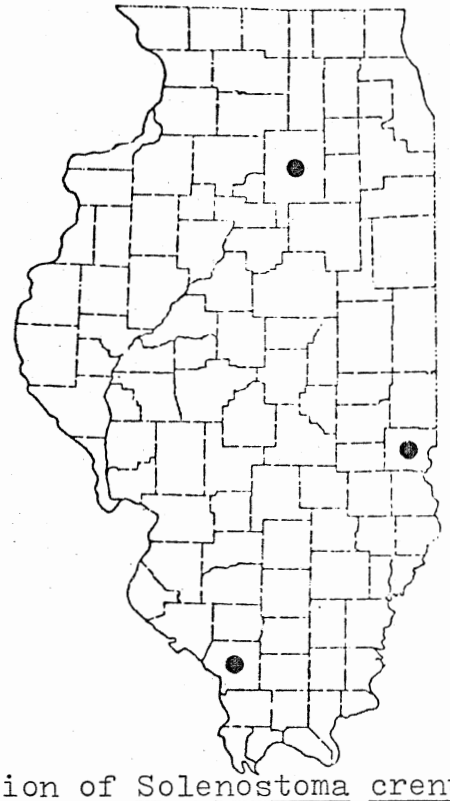

Figure 45. Distribution of Solenostoma crenuliformis in Illinois.

Lophocoleaceae

Geocalyx graveolens (Schrad.) Nees

Creeping, yellowish or greenish plants in patches, often among or over other mosses; stems fleshy, brownish green; branches none or few; rhizoids numerous in tufts at the bases of the underleaves; leaves alternate, succubous, regularly bilobed, lobes broadly triangular, sinus 1/3-1/6 the leaf length, margins entire; underleaves smaller than the leaves, narrower than the stem and appressed to it; bisexual.

Geocalyx graveolens is widely distributed, ranging from the Azores, Europe and Asia to North America. In eastern North America it can be found from Labrador south to Virginia and westward to Kentucky, Tennessee, Illinois and Minnesota. In western North America it ranges from Alaska and the Yukon south to the Pacific Northwest. This liverwort has previously been reported only from Will County in Illinois (Figure 46). It is typically found on shaded soil, decaying wood or rock.

The discovery of Geocalyx graveolens at Rocky Branch is the first report for the preserve and for Clark County, and apparently only the second report from Illinois (Figure 46). This liverwort is very similiar to Lophocolea heterophylla in gross appearance, differing only in that the leaves of G. graveolens are regularly bilobed. G. graveolens was found at Rocky Branch on a sandstone wall south of Rocky Branch Creek.

Marchantiaceae

Conocephalum conicum (L.) Dumort.

Thalli pale to dark green, flat, prostrate, 10-20 cm long; dorsal surface divided into distinct, elevated, one-pored polygonal areas; center slightly channeled, margin somewhat undulate; ventral surface pale green with a conspicuous midrib; plants giving off a distinctive and characteristic licorice odor when crushed; dioicous; spores large and multicellular, green and fruiting from February to April.

Conocephalum conicum is certainly one of our largest and most common thalloid liverworts. It is widely distributed in Europe, northern Asia and North America. It has been reported from 15 counties in Illinois (Figure 47). It is typically found in large, dark green mats on wet rocks, usually along streams, rivers or lakes.

C. conicum is found at Rocky Branch on wet sandstone along Rocky Branch Creek. It appears to thrive from the water level up to 1/2 meter up on the rock wall, although it can be found higher up at some locations in the preserve.

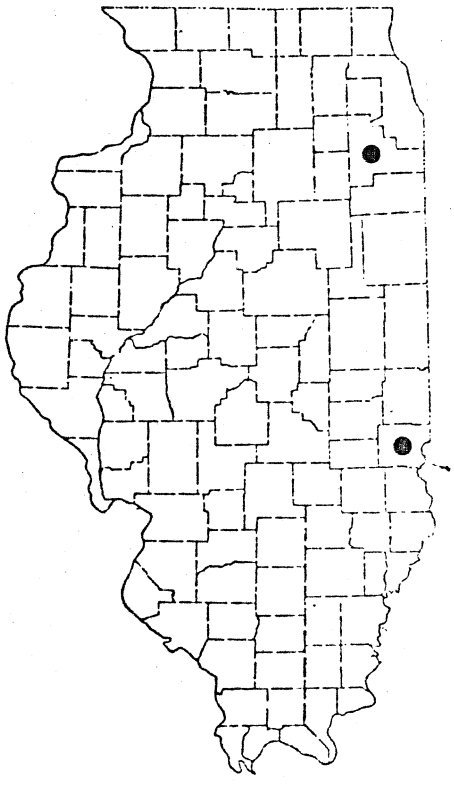

Figure 46. Distribution of Geocalyx graveolens in Illinois.

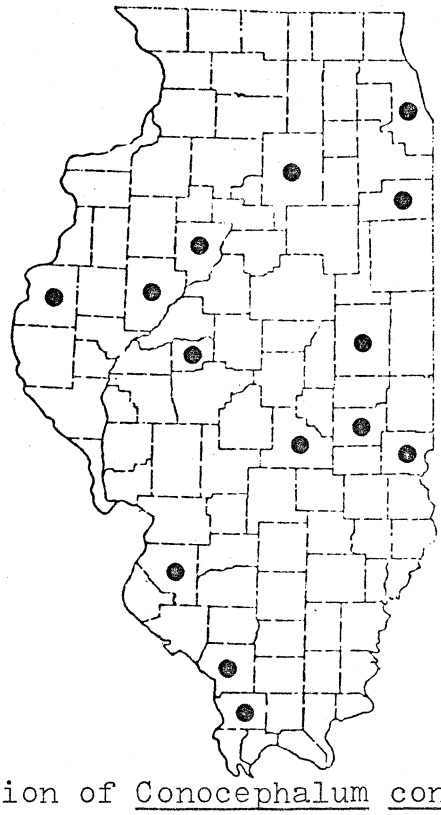

Figure 47. Distribution of Conocephalum conicum in Illinois.

Pellia epiphylla (L.) Corda.

Large, prostrate thalli, often purplish or maroon, sometimes dark green, forming mats; branches few and dichotomous, 1-7 cm long, 10-15 mm wide; rhizoids numerous, brown, median cross section 11-15 cells thick; cells with numerous oil bodies and thick, violet red, vertical, interlacing cell wall thickenings; thalli bisexual, antheridia directly behind the archegonia, the papilla over each antheridial cavity visible to the naked eye as a red point; calyptra very large, arcuate, tubular clavate, roughened with scattered 2-celled hairs; seta hyaline, up to 5 cm long; sporangium globose, dark olive green; spores multicellular, oblong-oval, yellowish green.

This liverwort is circumboreal in distribution. In North America it ranges from Alaska south to the Pacific Northwest and from Labrador south to North Carolina and west to Texas. It has been reported from 6 counties in Illinois (Figure 48). It is typically found on moist, shaded soil.

Pellia epiphylla is a common liverwort at Rocky Branch. It can be found on moist, shaded soil and on sandstone along the walls south of Rocky Branch Creek. It is easily recognized in the field by its purple or maroon coloration.

Ptilidiaceae

Trichocolea tomentella (Ehrh.) Dum.

Plants light yellowish green, forming loose, flocculent tufts or patches; stems 5-12 cm long, strongly paraphyllose, regularly 2-3 pinnate; rhizoids usually absent; leaves succubous, very oblique, finely dissected; dioicous, rarely producing sporophytes; setae stout, hollow at maturity, 3 cm long; capsule ovoid; spores finely roughened, red-brown; sporophyte maturing from March to May.

Trichocolea tomentella is widely distributed in the temperate areas of the Northern Hemisphere. It has erroneously been reported from Samoa and Tahiti. This liverwort ranges in North America from Newfoundland to Florida and west to Arkansas and Minnesota. It has been recorded in 6 counties in Illinois (Figure 49). T. tomentella prefers constantly moist, shaded soil. It is apparently unable to grow in places of sporadic moisture so it is generally restricted to shaded stream banks.

T. tomentella is now extremely rare at Rocky Branch. Arzeni (1947) reported that it was common on moist soil along the stream but it is now found in only two locations in the preserve. These colonies are very small and located on moist soil at the base of the sandstone wall south of Rocky Branch Creek. Due to its extreme rarity in east central Illinois and it apparently drastic decline over the last 34 years, I strongly discourage any further collecting of this beautiful liverwort from the preserve.

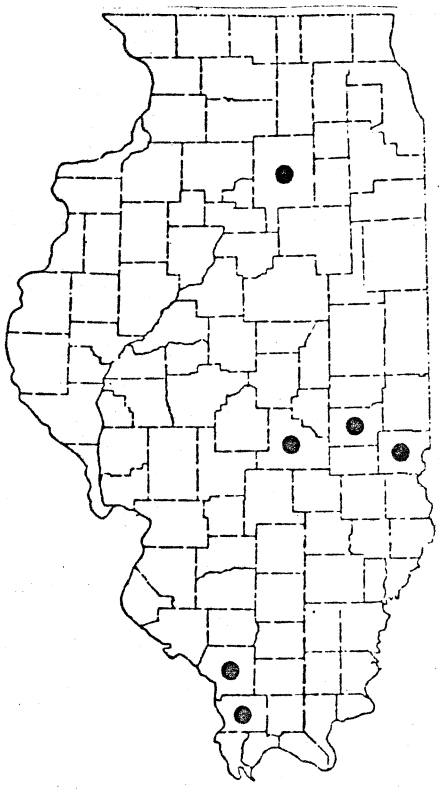

Figure 48. Distribution of Pellia epiphylla in Illinois.

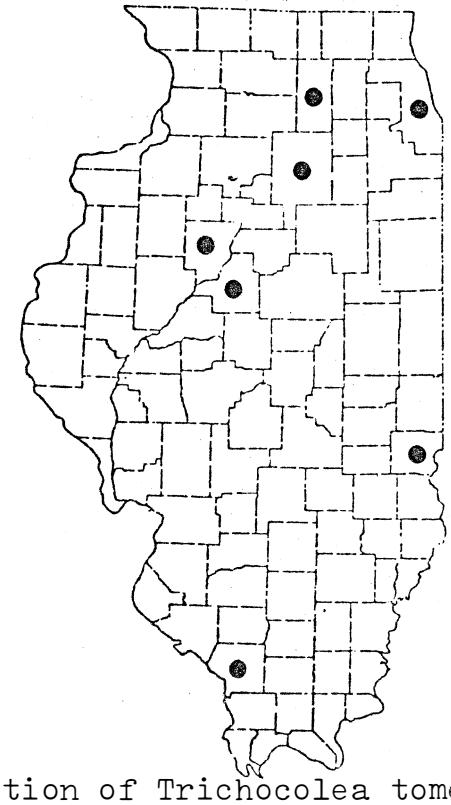

Figure 49. Distribution of Trichocolea tomentella in Illinois.

Reboulia hemisphaerica (L.) Raddi

Thalli 1-3 cm long, 6-7 mm wide, green in the center, brownish purple along the margins and below; margins thin, undulate, drying flat; dorsal epidermis without oil cells; pores elevated with 4-5 rows of cells radiating from it; ventral scale with 2 linear, acute appendages; thalli unisexual or bisexual; antheridial receptacle at the base of the female receptacle or terminating a separate branch, oval to broadly lunate, often deep purple; female receptacle stalked with slender bractlets at the base and at the apex, hemispherical; spores yellow.

Reboulia hemisphaerica is worldwide in distribution. It has been reported from Europe, Asia, Australia, North America, South America and the East Indies. It has been reported from 18 counties in Illinois (Figure 50). R. hemisphaerica is found on moist soil or rock.

R. hemisphaerica is locally abundant at Rocky Branch. It is common on sandstone at the junction of Rocky Branch Creek and the West Fork of Big Creek. Large patches of this liverwort at this location were found dead, apparently from dessication due to lack of precipitation in the fall and winter of 1980-81.

Diplophyllum apiculatum (Evans) Steph.

Pure green to reddish or brownish plants in patches; stems 3-5 mm long; rhizoids numerous, hyaline; leaves transverse or subimbricate, equal in size along the entire shoot, apex triangularly narrowed and usually strongly apiculate, margin irregularly denticulate toward the base or rarely entire on nongemmiparous shoots; gemmae common in clusters at the tips of the upper leaves; autoecious; male infloresence usually on the main shoots; female infloresence usually on a short branch arising below the male infloresence.

Diplophyllum apiculatum is an endemic species of the Appalachian Mountains. It ranges from there west to Minnesota, Oklahoma and Arkansas, south to Mississippi, Alabama and Georgia and northward possibly to Quebec. It has been reported from 6 counties in Illinois (Figure 51). This liverwort is often found in large mats on dirt banks or moist rocks.

D. apiculatum is relatively uncommon at Rocky Branch. It can be found on the sandstone walls south of Rocky Branch Creek.

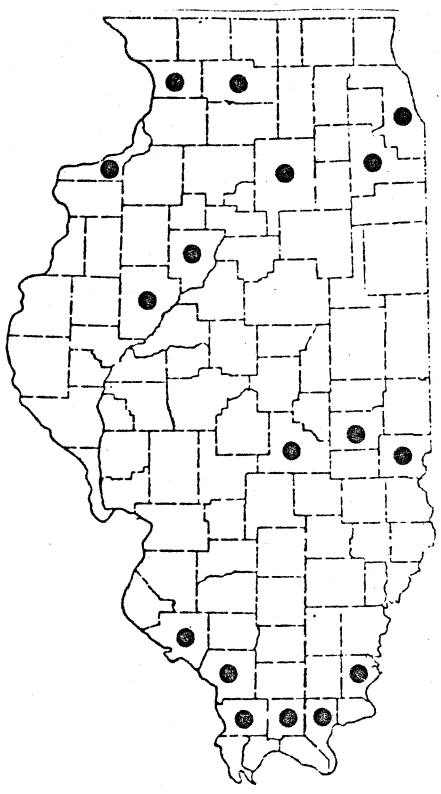

Figure 50. Distribution of Reboulia hemisphaerica in Illinois.

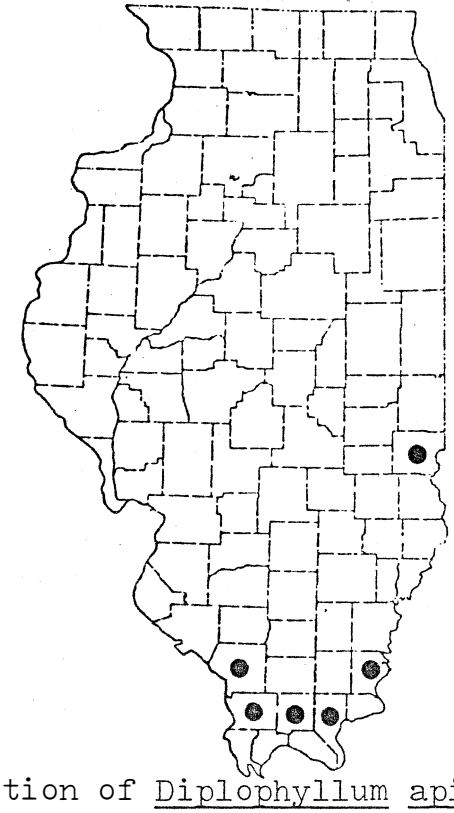

Figure 51. Distribution of Diplophyllum apiculatum in Illinois.

Scapania nemorosa (L.) Dumort.

Green or olive green to brownish or reddish plants in patches; extremely polymorphic; stems 1-10 cm long, erect, dark brown; leaves obliquely, arcuately inserted dorsally; leaf margins finely, sharply, spinose-ciliate; gemmae common, reddish brown, located at the stem tip; dioicous; spores finely verrculose, yellowish or reddish brown.

Scapania nemorosa is widely distributed in the Northern Hemisphere from 30-55 degrees North latitude, apparently being extremely common in Europe and Asia. It appears to be restricted to eastern North America, which is unusual for a liverwort that is so common in much of the rest of the world. This liverwort ranges from Nova Scotia south to Florida and west to east Texas, Nebraska and Minnesota. S. nemorosa has been reported from 7 counties in Illinois (Figure 52). It is typically found on moist, shaded sandstone ledges or cliffs. It is extremely tolerant of a wide variety of environmental conditions and substrates. Apparently the only habitat it is absent from is bogs or stream banks subject to periodic flooding.

S. nemorosa is a common liverwort at Rocky Branch. It is abundant on the sandstone walls and can be occasionally found growing on moist, shaded soil south of Rocky Branch Creek.

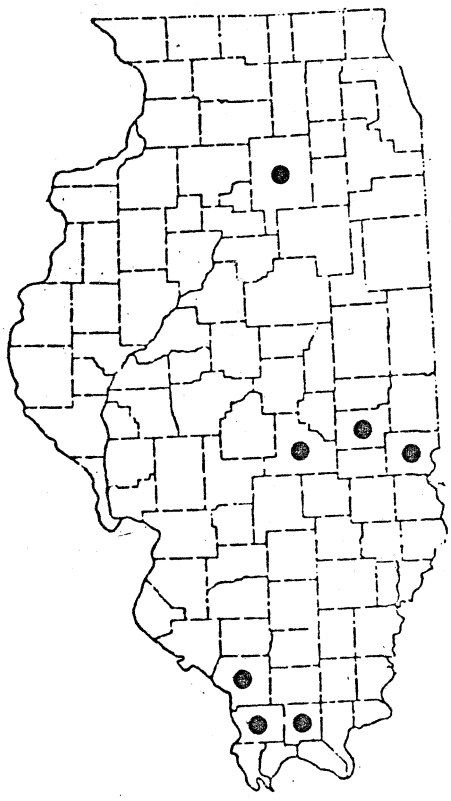

Figure 52. Distribution of Scapania nemorosa in Illinois.

Summary

A total of 52 bryophytes were collected and identified during the course of this study. The most notable discovery was the liverwort, Nardia lescurii (Aust.) Underwood, which is a new record for the state of Illinois. This find represents a considerable western extension of its known range from Ohio to Illinois.

Several other bryophytes were found that were previously unreported for the Rocky Branch Nature Preserve and Clark County. These include Rhynchostegium pulchellum (Hedw.) Robins var. pulchellum, Isopterygium tenerum (Sw.) Mitt., Sphagnum girgensohnii Russ., Jamesoniella autumnalis (DeCand.) Steph. and Geocalyx graveolens (Schrad.) Nees. Two bryophytes that were reported by Vaughan (1941) but not found by Arzeni (1947) were relocated in this survey. These are the moss, Hookeria acutifolia Hook. and the liverwort, Solenostoma crenuliformis (Aust.) Steph.

There appears to have been a decline in the number of bryophyte species present at Rocky Branch since 1947. Arzeni (1947) reported 111 mosses from Clark County. Of these, he considered 23 to be not common or rare, so it is not unlikely that some of these were inadvertently overlooked or that they have been eradicated. One difficulty in comparisons between 1947 and this study is that collecting for this study was confined to the present boundaries of the preserve while earlier studies ranged throughout the area.

Arzeni (1947) reported 40 Hepatics from Clark County and Rocky Branch, of which he considered 16 to be not common or rare. In this study, 14 liverworts and no hornworts were found. Whether this decline in the number of species is due to overcollecting, environmental factors or an inadequate search is unknown. The growth requirements for many of these bryophytes are virtually unknown and they often appear to be quite sensitive to environmental factors such as sulphur dioxide or ozone.

Another factor which in recent years may have been partially responsible for the decline is the unrestrained use of off-road motorcycles and 3-wheel Honda all-terrain vehicles in the preserve. While there are signs indicating the illegality of these activities, vandalism of the fence and a lack of enforcement have led to the formation of a virtual motorcycle motocross trail through the valley of Rocky Branch Creek. It is a real tragedy that one small group of reckless people will destroy one of the most scientifically significant nature preserves in the United States.

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