

## ADDITIONS TO THE BRYOFLORA OF HAWK MOUNTAIN SANCTUARY, BERKS COUNTY, PENNSYLVANIA<sup>1</sup>

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### ABSTRACT

In order to aid in making sound stewardship decisions, Hawk Mountain Sanctuary Association has undertaken a complete biological resource inventory of sanctuary lands. In 1993, the bryophyte component of this project began with the cataloging of the bryoflora of public sanctuary sites. The current report expands upon this baseline data by focusing on the bryophyte inhabitants of Hawk Mountain sites to which public access is restricted. Specific sites, reflective of the ecological variety of restricted areas were selected for extensive bryophyte collection. Twenty moss and 4 liverwort taxa were added to the known bryoflora of Hawk Mountain, bringing the total of identified bryophyte taxa to 66; 48 moss species representing 22 families and 12 orders of the division Bryophyta and 18 liverwort species representing 12 families and 2 orders of the division Hepatophyta. Infrequently collected Pennsylvania bryophytes found only on sanctuary sites to which public access is restricted included *Diphyscium foliosum* (Hedw.) Mohr, *Drummondia prorepens* (Hedw.) Britt, *Hypnum pallescens* (Hedw.) P. Beauv. var. *pallescens*, *Leptodictyum riparium* (Hedw.) Warnst., and *Orthotrichum pusillum* Mitt. *Drummondia prorepens* and *O. pusillum* are endemic to eastern North America. Other bryophytes of note include *Anacamptodon splachnoides* (Froel. ex Brid.) Brid., which is of uncommon occurrence throughout eastern North America and the exclusively Appalachian *Lophocolea cuspidata* (Nees) Limpr. var. *alata* K. Mull.

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### INTRODUCTION

Located in the Appalachian Mountains of eastern Pennsylvania, Hawk Mountain Sanctuary is a 2400-acre preserve which affords diverse habitats for flora and fauna. In addition to its role in avian conservation, the sanctuary supports numerous research efforts and provides a variety of educational opportunities for the general public. In light of its conservation and education roles, Hawk Mountain Sanctuary Association has undertaken a complete biological resource inventory of sanctuary lands in order to aid in making sound stewardship decisions (Goodrich 1998). As part of this project, the bryophyte inhabitants of sanctuary sites frequented by the public were catalogued in 1993 (Bartholomew-Began 1993). The current floristic report expands the bryophyte baseline data by focusing on Hawk Mountain sites to which the public does not have access.

The sites surveyed in this investigation represent upland habitats ranging in elevation from approximately 1100 - 1487 ft. A dry to mesic, mixed deciduous forest of broad-leaved trees dominated by *Quercus prinus* L. (chestnut oak) characterizes the area, but habitat diversity includes isolated, exposed rock outcrops, vernal ponds, springs, open grasslands, mesic woodlands, and disturbed banks along the unpaved road used to access research sites.

### MATERIALS AND METHODS

The circumscribed study region encompassed areas which are carefully monitored to allow access only to official Hawk Mountain personnel and researchers. Specific sites, reflective of the ecological variety of these areas were selected for extensive collection (Figure 1). Two rock outcrops occasionally used by Hawk Mountain Sanctuary personnel for avian observations were

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investigated; a 1487 ft. rock outcrop called the Cobble and a 1460 ft. outcrop called Owl's Head. The open woodlands and hollows immediately surrounding the base of the Cobble as well as the open fields near Owl's Head were also examined. Extensive collections were made at the vernal pond (ca. 1100 ft. elevation) and the associated mesic woodlands that extend southwesterly to Pennsylvania State Gamelands 106. The microhabitats of the open woodlands that extend northeast from the research access road toward Hemlock Heights were extensively explored as were many of the shaded, disturbed banks along the unpaved research access road leading from the Visitor Center to Owl's Head. Additionally, two sites near Schaumbach's Tavern were collected; 1) Schaumbach's pond, and 2) the spring and

runoff area located on the southwest side of Hawk Mountain Road (opposite of Schaumbach's Tavern).

Collections are housed in the Darlington Herbarium at West Chester University (DWC) with a duplicate collection housed at Hawk Mountain Sanctuary. Moss nomenclature follows that of Anderson, Crum and Buck (1990) with the exception of *Sphagnum* which follows Anderson (1990). Liverwort nomenclature follows that of Stotler and Crandall-Stotler (1977).

## RESULTS

As a result of this survey, 20 moss and 4 liverwort taxa were added to the known flora of Hawk Mountain (Table

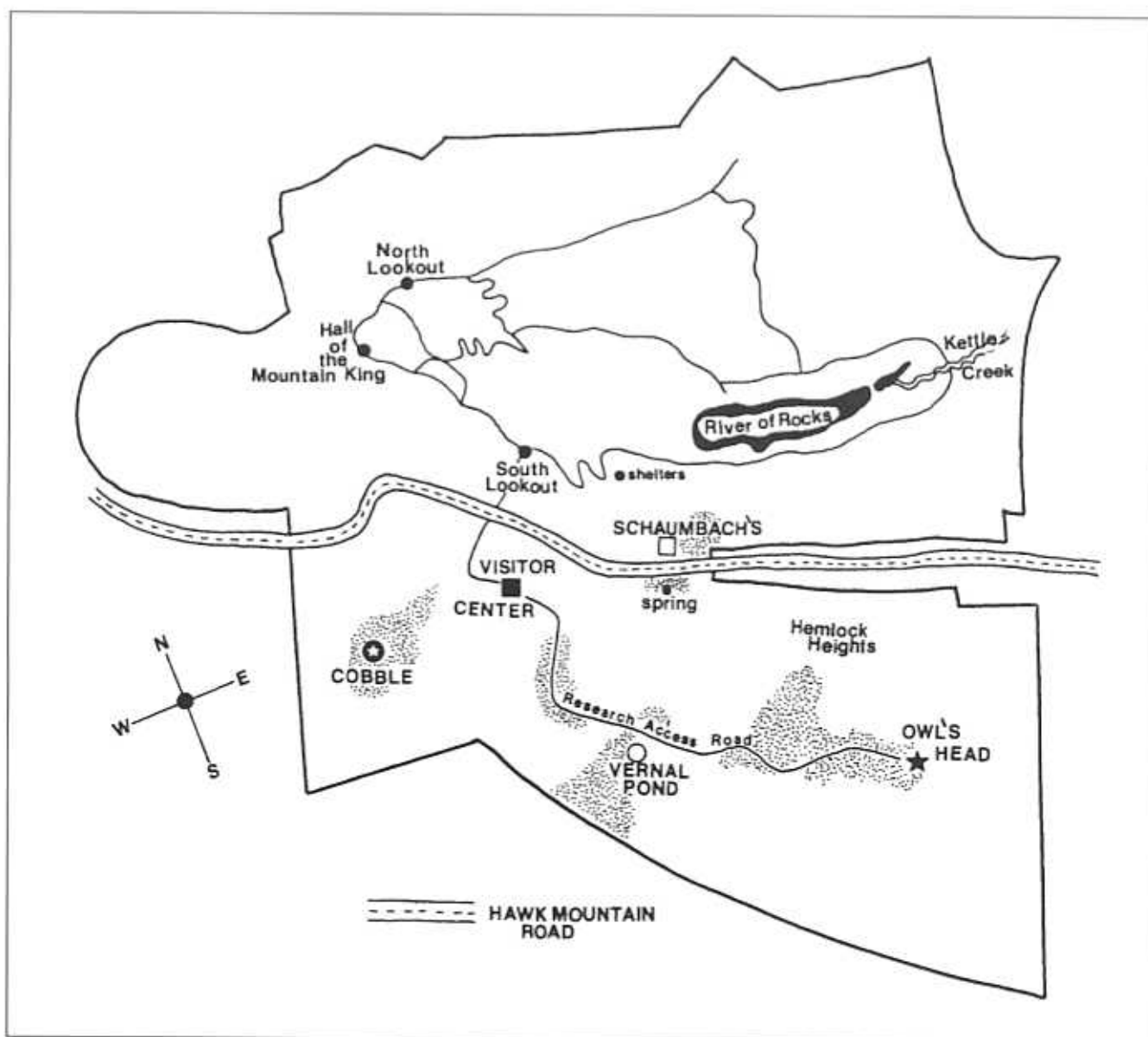


FIGURE 1. Map of Hawk Mountain Sanctuary lands. Stippled areas indicate concentrated collecting areas to which public access is restricted.

1). Thus, a total of 66 bryophyte species have been identified on sanctuary property; 48 moss species representing 22 families and 12 orders of the division Bryophyta and 18 liverwort species representing 12 families and 2 orders of the division Hepatophyta (see appended checklist).

Mosses of regular occurrence on both public and restricted sanctuary lands include *Atrichum angustatum* (Brid.) Bruch & Schimp. in B.S.G., *Brotherella recurvans* (Michx.) Fleisch., *Dicranella heteromalla* (Hedw.) Schimp., *Dicranum scoparium* Hedw., *Hypnum curvifolium* Hedw., *Leucobryum albidum* (Brid. ex P. Beauv.) Lindb., *Plagiommium ciliare* (C.Müll.) T. Kop., *Plagiommium cuspidatum* (Hedw.) T. Kop., *Platygyrium repens* (Brid.) Schimp. in B.S.G., *Polytrichum ohioense* Ren. & Card., *Steerecleus serrulatus* (Hedw.) Robins., *Tetraphis pellucida* Hedw., and *Thuidium delicatulum* (Hedw.) Schimp. in B.S.G. With the exception of *L. albidum*, these mosses are common throughout Pennsylvania (Porter 1904; Jennings 1951; Moul 1952; Cleavitt and Fahey 1996).

*Anacamptodon splachnoides* (Froel. ex Brid.) Brid., a moss regarded as rare or of infrequent occurrence in Pennsylvania (Pursell 1973), was found at two sites on Hawk Mountain. One small population was discovered on restricted lands growing in the knothole of a live tree amidst the boulders of the Cobble. During the 1993 survey, *A. splachnoides* was collected from a knothole of a fallen tree along the frequently hiked River of Rocks Trail (Bartholomew-Began 1993). In addition to being infrequently collected in Pennsylvania, *A. splachnoides* is considered as uncommon throughout eastern North America despite its wide range (Lesquereux and James 1884; Jennings 1951; Crum and Anderson 1981).

*Diphyscium foliosum* (Hedw.) Mohr., *Drummondia prorepens* (Hedw.) Britt., *Hypnum pallescens* (Hedw.) P. Beauv. var. *pallescens*, *Leptodictyum riparium* (Hedw.) Warnst., and *Orthotrichum pusillum* Mitt. were thought to be rare or infrequently collected in Pennsylvania (Moul 1952). However, *D. foliosum*, *H. pallescens* and *L. riparium* were recently reported in Pennsylvania from the northern end of the Delaware Water Gap National Recreation Area (Cleavitt and Fahey 1996). On Hawk Mountain, *Diphyscium foliosum*, *Drummondia prorepens*, *H. pallescens*, *L. riparium*, and *O. pusillum* were found only in areas which had restricted public access (*Diphyscium foliosum* at the Cobble; *Drummondia prorepens* at the vernal pond; *O. pusillum* and *H. pallescens* in the open woodlands between the research access road and Hemlock Heights; *L. riparium* in the spring opposite Schaumbach's Tavern). *Drummondia prorepens* and *O. pusillum* are also of note as they are endemic to eastern North America (Crum & Anderson 1981).

The liverwort flora is typified by ubiquitous taxa such as *Calyptogeja muelleriana* (Schiffn.) K. Müll. subsp. *muelleriana*, *Diplophyllum apiculatum* (Evans) Steph.,

*Frullania eboracensis* Gott., *Lophocolea heterophylla* (Schrad.) Dum., *Odontoschisma prostratum* (Sw.) Trev., and *Ptilidium pulcherrimum* (Web.) Hampe, all of which are abundant in both public and restricted sanctuary areas. Of these common eastern North American taxa, *D. apiculatum* is endemic to the temperate, deciduous eastern North American forests and is very likely of Appalachian origin (Schuster 1974).

*Lophocolea cuspidata* (Nees) Limpr. var. *alata* K. Müll. is an occasional inhabitant of mesic, protected sites on Hawk Mountain. According to Schuster (1980), variety *alata* is exclusive to the Appalachian Mountains of the Ridge and Valley Province and appears to be absent in the Coastal Plain and Piedmont. *Lophocolea cuspidata* var. *alata* has been reported from single localities in both Pike County and Potter County, Pennsylvania (Schuster 1980).

A second Appalachian taxon, *Cephaloziella hampeana* (Nees) Schiffn., is of occasional occurrence in very moist, protected microhabitats of both restricted and public areas of Hawk Mountain. Reportedly widespread in eastern North America, *C. hampeana* is rare south of New York and its range extends southward only in the Appalachian Mountains (Schuster 1980).

Of the 18 liverwort species found on the mountain, all but 2 are "leafy" liverworts (order Jungermanniales). Only *Pallavicinia lyellii* (Hook.) Carruth. and *Pellia neesiana* (Gott.) Limpr. represent the simple thalloid liverworts (order Metzgeriales). Both thalloid taxa were found on Hawk Mountain in areas that are mostly

TABLE 1. Hawk Mountain bryophytes known only from sanctuary sites to which public access is restricted.

#### BRYOPHYTA (MOSESSES)

*Amblystegium varium* (Hedw.) Lindb.  
*Atrichum undulatum* (Hedw.) P. Beauv.  
*Aulacomnium heterostichum* (Hedw.) Bruch & Schimp in B.S.G.  
*Bryum caespiticium* Hedw.  
*Bryum pseudotriquetrum* (Hedw.) Gaertn., et. al.  
*Diphyscium foliosum* (Hedw.) Mohr  
*Drummondia prorepens* (Hedw.) Britt.  
*Hypnum pallescens* (Hedw.) P. Beauv. var. *pallescens*  
*Hypnum pratense* (Rabenh.) W. Koch ex Spruce  
*Leptodictyum riparium* (Hedw.) Warnst.  
*Orthotrichum pusillum* Mitt.  
*Physcomitrium pyriforme* (Hedw.) Hampe  
*Pohlia elongata* Hedw. var. *elongata*  
*Pohlia nutans* (Hedw.) Lindb.  
*Pohlia wahlenbergii* (Web. & Mohr) Andrews  
*Rhizomnium magnifolium* (Horik.) T. Kop.  
*Rhizomnium punctatum* (Hedw.) T. Kop.  
*Rhodobryum roseum* (Hedw.) Limpr.  
*Sphagnum cuspidatum* Ehrh. ex Hoffm.  
*Sphagnum fimbriatum* Wils. in Wils. & Hook f. in Hook.  
*f. var. fimbriatum*

#### HEPATOPHYTA (LIVERWORTS)

*Bazzania trilobata* (L.) S. Gray  
*Jamesoniella autumnalis* (DC.) Steph.  
*Pellia neesiana* (Gott.) Limpr.  
*Scapania undulata* (L.) Dum. var. *undulata*

protected from human activities. *Pellia neesiana* was collected in the restricted access area of the mountain under a slight overhang at the edge of the vernal pond, while *Pallavicinia lyellii* was found in 1993 under grasses and forest litter along the banks of Kettle Creek, at the far easterly extent of the River of Rocks Trail (Bartholomew-Began 1993).

#### ACKNOWLEDGEMENTS

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#### APPENDIX

#### REVISED CHECKLIST OF THE MOSSES AND LIVERWORTS OF HAWK MOUNTAIN, BERKS COUNTY, PENNSYLVANIA

(Moss organization and nomenclature follows that of Anderson, Crum and Buck [1990] with the exception of *Sphagnum* which follows Anderson [1990]; liverwort organization and nomenclature follows that of Stotler and Crandall-Stotler [1977].

#### DIVISION BRYOPHYTA (mosses)

##### Sphagnales

##### Sphagnaceae

- Sphagnum compactum* DC. in Lam. & DC. - On soil in wet to boggy lowland flats and near ponds; *Bartholomew-Began* 339; *Bartholomew-Began, Jones & Page* 443.
- Sphagnum cuspidatum* Ehrh. ex Hoffm. - On wet soil near ponds; *Bartholomew-Began & Jones* 464.
- Sphagnum fimbriatum* Wils. in Wils. & Hook. f. var. *fimbriatum* - On moist soil along trail near pond, exposed; *Bartholomew-Began, Jones & Page* 442.

##### Dicranales

##### Ditrichaceae

- Ditrichum pusillum* (Hedw.) Hampe - On bare, sandy soil over sandstone blocks and at bases of vertical sandstone cliffs; *Bartholomew-Began* 310, 317.

##### Dicranaceae

- Dicranella heteromalla* (Hedw.) Schimp. - On bark at tree bases, on thin soil over rock, sandy soil along woodland trails and on shaded banks in open woodlands; *Bartholomew-Began* 284, 303; *Bartholomew-Began, Jones & Page* 406, 424, 440; *Bartholomew-Began & Jones* 448.
- Dicranum scoparium* Hedw. - On soil in open woods; *Bartholomew-Began* 266, 293; *Bartholomew-Began, Jones & Page* 405.

##### Leucobryaceae

- Leucobryum albidum* (Brid. ex P. Beauv.) Lindb. - On soil along trails and in open woodlands, occasional on moist logs; *Bartholomew-Began* 267, 294, 307, 356, 357; *Bartholomew-Began, Jones & Page* 411; *Bartholomew-Began & Jones* 456, 457.

## Fissidentales

## Fissidentaceae

*Fissidens taxifolius* Hedw. – On shaded, soil banks under litter; *Bartholomew-Began s.n.*

## Buxbaumiiales

## Buxbaumiaceae

*Diphyscium foliosum* (Hedw.) Mohr – On soil in ± protected nooks in mesic woodlands; *Bartholomew-Began, Jones & Page 408, 439.*

## Grimmiales

## Grimmiaceae

*Schistidium apocarpum* (Hedw.) Bruch & Schimp. in B.S.G. – On dry, exposed boulders; *Bartholomew-Began 270.*

## Funariales

## Funariaceae

*Physcomitrium pyriforme* (Hedw.) Hampe – On bare clay soil by road, exposed; *Bartholomew-Began & Jones 476.*

*Funaria flavicans* Michx. – On sterile soils in exposed, disturbed sites; *Bartholomew-Began 346.*

## Bryales

## Bryaceae

*Pohlia elongata* Hedw. var. *elongata* – On soil under litter in hollows; *Bartholomew-Began, Jones & Page 414, 419.*

*Pohlia nutans* (Hedw.) Lindb. – On wet soil at edges of ponds, occasionally on moist decorticate logs; *Bartholomew-Began, Jones & Page 426; Bartholomew-Began & Jones 456.*

*Pohlia wahlenbergii* (Web. & Mohr) Andrews – On wet soil by stream; *Bartholomew-Began & Jones 469.*

*Bryum argenteum* Hedw. – At edges and between bricks of walkways; *Bartholomew-Began 341.*

*Bryum caespiticium* Hedw. – On sterile soils in disturbed sites and in crevices of rocky outcrops; *Bartholomew-Began 347, 348, 351.*

*Bryum pseudotriquetrum* (Hedw.) Gaertn., et al. – On soil in spring; *Bartholomew-Began & Jones 473.*

*Rhodobryum roseum* (Hedw.) Limpr. – On soil and humus in open woodlands; *Bartholomew-Began, Jones & Page 434.*

## Mniaceae

*Rhizomnium magnifolium* (Horik.) T. Kop. – On moist soil at bases of trees; *Bartholomew-Began, Jones & Page 422.*

*Rhizomnium punctatum* (Hedw.) T. Kop. – On moist soil at bases of trees and on moist rock near streams and run-offs; *Bartholomew-Began, Jones & Page 431; Bartholomew-Began & Jones 468.*

*Plagiomnium ciliare* (C. Müll.) T. Kop. – On moist to wet soil in shaded locations, often along stream banks, and at bases of trees in woodlands; *Bartholomew-*

*Began 268, 287, 301; Bartholomew-Began & Jones 454, 465.*

*Plagiomnium cuspidatum* (Hedw.) T. Kop. – On moist, peaty soil in shaded locations; *Bartholomew-Began 344; Bartholomew-Began, Jones & Page 413.*

## Aulocomniaceae

*Aulacomnium heterostichum* (Hedw.) Bruch & Schimp. in B.S.G. – At tree bases in open woodlands; *Bartholomew-Began, Jones & Page 437.*

## Orthotrichales

## Orthotrichaceae

*Orthotrichum ohioense* Sull. & Lesq. in Aust. – On bark of trees usually near flowing water; *Bartholomew-Began 299.*

*Orthotrichum pusillum* Mitt. – On tree bark in open woodlands; *Bartholomew-Began & Jones 459.*

*Ulota hutchinsiae* (Sm.) Hammar var. *hutchinsiae* – On acidic, noncalcareous rocks in ± exposed areas of open woodlands; *Bartholomew-Began 286, 358.*

*Drummondia prorepens* (Hedw.) Britt. – On tree bases or under litter in ± protected nooks of mesic woodlands; *Bartholomew-Began, Jones & Page 435, 441.*

## Leucodontales

## Fontinalaceae

*Fontinalis dalarlica* Schimp. in B.S.G. – Attached to rocks and submerged in swiftly flowing water; *Bartholomew-Began 326.*

*Fontinalis novae-angliae* Sull. var. *novae-angliae* – Attached to various substrates and submerged in shallow-flowing water; *Bartholomew-Began 273.*

## Hypnales

## Fabroniaceae

*Anacamptodon splachnoides* (Froel ex Brid.) Brid. – Sheltered in knotholes of trees; *Bartholomew-Began 290.*

## Thuidiaceae

*Thuidium delicatulum* (Hedw.) Schimp. in B.S.G. – On moist, shaded soil and decorticate logs; *Bartholomew-Began 331, 335; Bartholomew-Began & Jones 456, 468.*

## Amblystegiaceae

*Amblystegium varium* (Hedw.) Lindb. – On rock in spring; *Bartholomew-Began & Jones 475.*

*Leptodictyum riparium* (Hedw.) Warnst. – Submerged on rock wall of spring; *Bartholomew-Began & Jones 474.*

## Brachytheciaceae

*Brachythecium oedipodium* (Mitt.) Jaeg. – On thin soil over rock in open woodlands; *Bartholomew-Began 342.*

*Stereocleus serrulatus* (Hedw.) Robins. – On moist,

shaded, peaty soil, on wood, and in crevices of sandstone cliffs; *Bartholomew-Began* 274, 276, 278, 279, 292.

### Sematophyllaceae

*Brotherella recurvans* (Michx.) Fleisch. - On moist soil and decorticate logs in shaded sites; *Bartholomew-Began* 298, 319, 329; *Bartholomew-Began & Jones* 446.

### Hypnaceae

*Platygyrium repens* (Brid.) Schimp. in B.S.G. - On bark at tree bases and on logs; *Bartholomew-Began* 264, 272, 320, 359; *Bartholomew-Began, Jones & Page* 410, 412; *Bartholomew-Began & Jones* 458.

*Hypnum curvifolium* Hedw. - On thin soil over rock and on decorticate logs in moist, shaded woodland sites; *Bartholomew-Began* 289; *Bartholomew-Began & Jones* 457.

*Hypnum pallescens* (Hedw.) P. Beauv. var. *pallescens* - On bark at bases of trees in open woodlands; *Bartholomew-Began & Jones* 451.

*Hypnum pratense* (Rabenh.) W. Koch ex Spruce - On wet soil in spring; *Bartholomew-Began & Jones* 472.

*Isopterygium tenerum* (Sw.) Mitt. - On sandy soil at bases of rocks in very sheltered woodland sites; *Bartholomew-Began* 295.

*Pseudotaxiphyllum elegans* (Brid.) Iwats. - On sandy soil in crevices of sandstone cliffs; *Bartholomew-Began* 307.

### Hylocomiaceae

*Pleurozium schreberi* (Brid.) Mitt. - On thin soil over rock in open woodlands; *Bartholomew-Began* 340.

## Tetraphidales

### Tetraphidaceae

*Tetraphis pellucida* Hedw. - On shaded, moist, peaty or sandy soils along stream banks and sheltered woodland sites, occasional on moist, shaded, decorticate logs; *Bartholomew-Began* 300, 323, 324, 325, 327, 330, 332, 333, 335; *Bartholomew-Began, Jones & Page* 438, 444; *Bartholomew-Began & Jones* 455.

## Polytrichales

### Polytrichaceae

*Atrichum angustatum* (Brid.) Bruch & Schimp. in B.S.G. - On soil in open woodlands and roadsides; *Bartholomew-Began* 304; *Bartholomew-Began & Jones* 462.

*Atrichum undulatum* (Hedw.) P. Beauv. - On soil near spring; *Bartholomew-Began & Jones* 471.

*Polytrichum ohioense* Ren. & Card. - On moist humus and sandy soils along trails and in open woodlands; *Bartholomew-Began* 280, 311, 321, 352.

## DIVISION HEPATOPHYTA (liverworts)

### Jungermanniales

#### Ptilidiaceae

*Ptilidium ciliare* (L.) Hampe - On rock in ± protected sites; *Bartholomew-Began* 353.

*Ptilidium pulcherrimum* (Web.) Hampe - On decaying logs and on bark at tree bases; *Bartholomew-Began* 275, 281, 318, 358; *Bartholomew-Began, Jones & Page* 407, *Bartholomew-Began & Jones* 447, 452.

#### Lepidoziaceae

*Kurzia sylvatica* (Evans) Grolle - On moist, peaty soil in sheltered lowland habitats along streams; *Bartholomew-Began* 327.

*Bazzania trilobata* (L.) S. Gray - On sandy soil over rock in sheltered hollow; *Bartholomew-Began, Jones & Page* 417.

#### Calypogejaceae

*Calypogeja muelleriana* (Schiffn.) K. Mull. subsp. *muelleriana* - On moist, peaty soil along stream banks and ponds, and on moist soil banks in sheltered sites; *Bartholomew-Began* 327; *Bartholomew-Began, Jones & Page* 426, 441; *Bartholomew-Began & Jones* 449, 460.

#### Cephaloziaceae

*Nowellia curvifolia* (Dicks.) Mitt. - Limited to moist, decorticate logs; *Bartholomew-Began* 322.

#### Adelanthaceae

*Odontoschisma prostratum* (Sw.) Trev. - On moist soil along streams, on moist, noncalcareous rocks, on bark at tree bases, and in ± exposed sites at bases of vertical sandstone cliffs; *Bartholomew-Began* 285, 296, 302, 314, 333, 337; *Bartholomew-Began, Jones & Page* 404, 427, 428, 429.

#### Cephaloziellaceae

*Cephaloziella hampeana* (Nees) Schiffn. - Occasional on wet, shaded soil in sheltered sites; *Bartholomew-Began* 338; *Bartholomew-Began, Jones & Page* 421, 445.

#### Lophocoleaceae

*Lophocolea cuspidata* (Nees) Limpr. var. *alata* K. Müll. - On moist humus at tree bases or in rock crevices; *Bartholomew-Began* 360, 361; *Bartholomew-Began, Jones & Page* 415.

*Lophocolea heterophylla* (Schrad.) Dum. - On various organic substrates such as moist, peaty soil, decorticate logs, and bark at tree bases, also on loose sandstone in crevices of vertical walls; *Bartholomew-Began* 271, 291, 297, 308, 309, 345; *Bartholomew-Began, Jones & Page* 425; *Bartholomew-Began & Jones* 450, 453, 455, 461, 463.

**Jungermanniaceae**

*Jamesoniella autumnalis* (DC.) Steph. - On thin, sandy soil over rock  $\pm$  exposed sites; *Bartholomew-Began, Jones & Page 420*.

**Scapaniaceae**

*Diplophyllum apiculatum* (Evans) Steph. - In crevices of sandstone cliffs and on peaty to sandy soil banks; *Bartholomew-Began 312, 313, 315, 316; Bartholomew-Began, Jones & Page 416, 421, 445*.

*Scapania nemorosa* (L.) Dum. - On wet soil over rocks at edges of streams; *Bartholomew-Began 265; Bartholomew-Began, Jones & Page 418, Bartholomew-Began & Jones 449, 466*.

*Scapania undulata* (L.) Dum. var. *undulata* - On wet soil at edges of streams; *Bartholomew-Began & Jones 470*.

**Jubulaceae**

*Frullania eboracensis* Gott. - On bark of trees and corticate logs in open woodlands; *Bartholomew-Began 269, 282, 283, 354, 355; Bartholomew-Began, Jones & Page 436*.

*Frullania tamarisci* (L.) Dum. subsp. *asagrayana* (Mont.) Hatt. - On acidic rocks; *Bartholomew-Began 288*.

**Metzgeriales****Pallaviciniaceae**

*Pallavicinia lyellii* (Hook.) Carruth. - On wet, shaded soil along lowland streams; *Bartholomew-Began 334, 336*.

**Pelliaceae**

*Pellia neesiana* (Gott.) Limpr. - On thin, fine soil over rock at edge of pond; *Bartholomew-Began, Jones & Page 430*.