
VASCULAR PLANTS OF HOLMES COUNTY, OHIO¹

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Editor's Note: Due to space limitations, the comprehensive list of Vascular Plants of Holmes County, Ohio could not be included in the Journal. The editor apologizes for this omission. A copy of the complete plant list is on permanent file at the Kent State University Herbarium, Kent, Ohio, and copies can be obtained from the author, Hugh D. Wilson,² upon request.

ABSTRACT

Holmes County, Ohio, located in a geologically and biologically interesting portion of the state and yet little known botanically, was the object of a floristic study during the growing seasons of 1970 and 1971. The result of this study, a catalog listing 1,061 vascular plant species, is statistically summarized. This summary is prefaced by a brief discussion concerning the natural areas of Holmes County and the history of its vegetation.

The first botanist to make major vascular plant collections in Holmes County was William A. Kellerman of The Ohio State University. These collections, made in September of 1895, have since been supplemented by those of other noted Ohio botanists, including W. H. Camp, R. B. Gordon, L. E. Hicks, H. N. Moldenke, J. H. Schaffner, and A. D. Selby. The botanical exploration of Holmes County did not keep pace with that of other counties located in closer proximity to the state's major colleges and universities. In 1961, Holmes was considered one of the most poorly represented counties in state herbaria, with an estimate of less than 100 recorded species of vascular plants (Cooperrider, 1961).

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By 1971, however, mainly through the efforts of Erwin M. Herrick, Tom S. Cooperrider, Allison W. Cusick, and Clara G. Weishaupt, the number of species recorded for Holmes County stood at 561. These are represented by 745 collections located in herbaria at The Ohio State University and at Kent State University.

This writer began collecting plants in Holmes County in June of 1970, as part of a thesis project at Kent State University. Collecting continued through October of 1971, and produced 2,600 specimens, which are now housed in the Kent State University Herbarium.

A catalog has been prepared, available from the author upon request, which lists 1,061 species, from 466 genera and 121 families of vascular plants. This catalog has been compiled from all Holmes County collections now present in herbaria of The Ohio State and Kent State universities. Each entry in the catalog is accompanied by a frequency rating and brief habitat statement. Complete collection data are included for those taxa determined to be of rare occurrence in the county flora. Complete collection data for all taxa listed can be found in Wilson (1972). The following discussion serves as both a preface to this catalog and as a brief description of the vascular flora of Holmes County, past and present.

DESCRIPTION OF THE COUNTY

The borders of Holmes County circumscribe an irregular rectangle that covers 424 square miles of rural Ohio. This rectangle lies astride the glacial border on the western edge of the Appalachian Plateau (Fenneman, 1938). Millersburg, the most populous village and also the county seat, is centrally located in the county ($40^{\circ}33'$ N. latitude and $81^{\circ}44'$ W. longitude), and lies 60 miles south of Cleveland and 85 miles northeast of Columbus.

Bedrock of the Holmes County area, as described by White (1949), is mostly sandstones and shales of Mississippian and Pennsylvanian ages. It is most obvious as scattered sandstone joint-blocks on the southern, unglaciated uplands.

Soil of the unglaciated portions of the county is derived from the underlying bedrock. This area is identified as a Sandstone and Shale Residual Soil Region by Dotson (1963). The northern, glaciated portion of the county is in a Low Lime Till Region. In addition, alluvial soils are extensive along the wide valleys of Killbuck Creek and its tributaries.

The climate of this region falls within the Humid Temperate, Hot Summer Zone (Cfa) of Köppen's climate classification (Trewartha, 1968). The average dates for the first killing frost and the last freeze are 11 October and 11 May, respectively. Temperatures for the month of January average 30°F , and those for July average 74°F . Average annual precipitation is 37.6 inches. Normal distribution throughout the year ranges from 4.2 inches in June to 2.2 inches in February. These averages are taken from reports covering a 20-year reporting period (U.S. Department of Agriculture, 1941).

Land within the borders of Holmes County was, in preglacial times, characterized by the topographic regularity of a plateau dissected to early-middle maturity in the erosion cycle (White, 1949). The original hill-and-valley topography, which is still present in the county's southern unglaciated portion, has been altered by glacial deposition in the northern townships and by glacially induced drainage irregularities along the Wisconsinan boundary that extends across the center of the county. Unusual plant communities, which contain species not normally associated with the area's typical mixed-deciduous forest, can be found in association with many of these topographic products of glaciation.

One of Ohio's three major preglacial divides ran from southeast to northwest through Holmes County (Coffey, 1961). Major preglacial drainage systems headed along this divide and extended to the north and south. Both pre-Wisconsinan and Wisconsin-age ice advances caused diversions and reversals of the

area's north- and northwest-flowing drainage systems. The drainage patterns thus produced contain river and stream valleys in various stages of development (White, 1934). The vegetation of some of these valleys, although greatly modified since European settlement, still stands as an indication of their unusual glacial history.

The pre-Illinoian Holmes River valley, now occupied by Killbuck Creek, extends north and south through the center of the county. The wide, marshy floodplain of this ancient valley contains Ohio's most extensive inland marsh area (Ohio Department of Natural Resources, 1970). These marshes, dominated in many areas by bur-reed (*Sparganium eurycarpum*) and spatter-dock (*Nuphar advena*), also contain several species, such as *Ranunculus flabellaris*, *Hydrocotyle ranunculoides*, and *Carex typhina*, that are unique in the county flora. The deciduous forest cover of the valley walls, however, is not strikingly different in species composition from that of the surrounding uplands. This is in contrast to several of those valleys in the county that have experienced Illinoian and post-Illinoian rejuvenation.

An Illinoian-age gorge, that of the Mohican River, is present in portions of the county's western townships. The steep walls of this young valley harbor isolated populations of eastern white pine (*Pinus Strobus*), Canadian hemlock (*Tsuga canadensis*), and Canadian yew (*Taxus canadensis*). The distribution of white pine and Canadian yew in the county, as well as several other interesting species, is apparently limited to the Mohican River valley. Canadian hemlock, however, can be found in three other areas—Salt Creek valley, Doughty Creek valley at Troyer's Hollow, and Whispering Hills recreation area. Salt Creek valley and Troyer's Hollow were created by post-Illinoian glacial-drainage diversion, whereas the gorge at Whispering Hills is apparently the work of a consequent stream of non-diversional origin (G. W. White, 1972, personal communication).

Kettle-hole depressions, another product of glacial activity, are frequent in the northern portion of Holmes County. The most extensive of these depressions lie in the now-abandoned valley of the West Fork of the pre-Illinoian Holmes River (White, 1934) and contain the only natural lakes in the county. This area of morainic topography also contains relict sphagnum bog and fen communities that were, at one time, much more extensive (Dachnowski, 1912). The county's last remaining sphagnum bog, Bonnett Pond bog, is inhabited by many unusual acidophilic plant species, including sundew (*Drosera rotundifolia*), beak-rush (*Rhynchospora alba*), cranberry (*Vaccinium macrocarpon*), and bladderwort (*Utricularia gibba*).

A small remaining fen area, known as Kick fen, is dominated by shrubby cinquefoil (*Potentilla fruticosa*). This *Potentilla*, found only as an ornamental in other parts of the county, grows from a thick, hummocky sphagnum mat that supports a dense population of *Drosera rotundifolia*. Associated fen species include *Lobelia Kalmii*, *Campanula aparinoides*, *Solidago Riddellii*, *Muhlenbergia glomerata*, and *Smilacina stellata*.

It should be noted here that the relict communities mentioned above are ecologically fragile and extremely vulnerable to the type of development that is certain to occur in Holmes County during the coming decades. These unique ecosystems, containing many species populations that have been isolated from their ancestral gene pools for many generations, are of great interest to the ecologist and evolutionary biologist. Local species extirpations, such as the elimination of the pitcher plant (*Sarracenia purpurea*) from Holmes County, are an indication that these living laboratories are becoming a lost resource for Ohio biologists. The Stark County Wilderness Center has recently obtained a portion of the Wisconsin-age gorge at Troyer's Hollow, which is located in an area of expanding strip-mining activity. Many additional unique areas, in Holmes and other counties along Ohio's glacial border, need similar protection.

The magnitude of future man-induced vegetational changes in the Holmes County area can, perhaps, be envisioned by an extrapolation from what has occurred during the past 150 years. The area's vegetation, before European settlement, was dominated by a vast, essentially unbroken canopy of mixed deciduous forest (Gordon, 1966). Openings in the canopy occurred in scattered areas characterized by extreme wetness or dryness. Areas of open wetland included a fairly extensive sphagnum area north of Berlin known as the Cranberry Plains (Newton, 1898). Open wetland was present also along Killbuck Creek and in the previously mentioned abandoned valley between Loudonville and Big Prairie. The latter locality was mapped by Gordon (1966) as fresh-water marshes and fens. Sphagnum bogs, including those described by Dachnowski (1912), were also present in this abandoned valley. Open xeric areas, described by Sears (1926) as Oak Barrens, covered several isolated hillsides in the extreme southwestern portion of the county. This type of opening, which contained plant species characteristic of prairie areas to the west, may also have occurred over several other localities in the unglaciated part of the county (R. B. Gordon, 1972, personal communication).

European occupation of the Holmes county area began in the early 1800's. The county was formed in 1824 from territory previously included in Wayne, Coschocton, and Tuscarawas Counties. Total population had increased to 9,123 by 1830, and to over 20,000 by 1887, by which time nearly 80 percent of the original forest wilderness had been converted to either field or pasture (Howe, 1902). The present population, according to the 1970 census, is 23,024.

The county's native forest is practically nonexistent. Only 28 percent of the county is wooded (Hurley, 1969). Most of this woodland, is concentrated in the rugged southwestern quarter of the county, and is seral from some disturbance. The richest original native woodlands of the county, those to the north and east, have been replaced by cultivated fields and upland pastures.

The smaller native-plant communities of Holmes County—relict boreal woodlands, sphagnum bogs, and fens—have also been reduced, disturbed, and in most cases, completely eliminated. The sphagnum bogs discussed by Dachnowski (1912) have been drained and dredged; the extensive Cranberry Plains north of Berlin, once a vast bog area, are now drained and under cultivation. Original fens mapped by Gordon (1966) in Washington Township have been reduced to an area of less than one-half acre. Until recent times, relict populations of hemlock in the county had been at least partially protected by the rough topography they occupied, but these rugged valleys are now being developed as recreation areas.

The elimination, reduction, and disturbance of native-plant communities in Holmes County have apparently brought about an increase rather than a decrease in the area's diversity of vascular plant species. Nearly 30 percent of the species represented in the following summary were evidently not present when the first Europeans began to decimate the area's native forest. Many of these plants, mostly native to Europe and Asia according to Fernald (1950), were well adapted to open, disturbed areas of human occupation in their native lands (Anderson, 1952). They quickly occupied equivalent areas in North America when they were introduced, often unintentionally, by migrating Europeans. Today, many of Holmes County's most common plants are part of this highly successful non-indigenous community.

The following table summarizes those vascular plant taxa represented in the catalog compiled during the course of this study.

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TABLE 1
Statistical summary of the Vascular Plants found in Holmes County, Ohio, 1970-1971

Major groups	Species		Genera		Families	
	Native	Introduced	Native	Introduced	Native	Introduced
Sphenopsida	4	0	1	0	1	0
Lycopsida	3	0	1	0	1	0
Filicinac	29	0	14	0	3	0
Gymnospermac	4	0	4	0	3	0
Monocotyledoneac	224	50	79	22	17	0
Dicotyledoneac	553	194	255	90	93	3
TOTALS	817	244	354	112	118	3
GRAND TOTALS		1,061		466		121

extensive knowledge of the Ohio flora. Mr. Cusick, Dr. Cooperrider, Dr. Clara G. Weishaupt, Mr. Robert Haynes, and Mrs. Orié Oswald provided assistance in the identification of difficult taxa. Information concerning collecting locations was acquired with the help of Mr. Robert Hawes, Miss Marilyn Shearer, Mrs. Rosabel Reno, Mr. Paul Gorby, and Mr. Cletus Rang. Thanks are also extended to The Ohio Academy of Science and the Department of Biological Sciences, Kent State University for financial support, and to Dr. Ronald L. Stuckey, curator of The Ohio State Herbarium, for permission to examine Holmes County specimens in that collection. Thanks are also due my wife, Toni Wilson, for her valuable help with many aspects of the study.

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