INTRODUCTION

This manual of the vascular plants of Franklin County presents 154 vascular plant families under five plant divisions whose phylogenetic sequence follows Gleason and Cronquist (1991). The summary of these families and their order of arrangement are listed in Table 1, where totals are given for the number of native and alien plants determined in Franklin County for 12 fern/fern-relative families, 5 gymnosperm families, and 113 dicotyledonous versus 24 monocotyledonous flowering plant families. The widely accepted Cronquist System for flowering plant families (Magnoliophyta) differs from the conventional taxonomic system of Engler and Prantl in that the monocotyledons (Liliopsida) whose line of evolution culminates with the highly specialized and modified flowers in the orchids (Orchidaceae) is considered to be more evolved than the dicotyledons (Magnoliopsida) which apparently has less reductions in number of floral parts and greatest diversity of species in the composites (Asteraceae). In general, the manual's 674 genera (incl. 43 informally treated) and 1,818 species (incl. 166 informally treated) are cited in like order (Gleason & Cronquist, 1991), and numbered. Taxa informally treated here are those that receive casual mention in keys or after descriptions of families, genera, or species. An additional 65 varieties, 15 hybrids, 3 forms, and 2 other variants below the species rank are recognized.

Since certain family names might easily be overlooked due to acceptable alternative names or dispositions, for convenience sake, these names are highlighted as follows: Nelumbonaceae (Lotus-Lily Family) and Cabombaceae (Water-Shield Family) apart from Nymphaeaceae (Water-Lily Family); Clusiaceae (Mangosteen Family) for Hypericaceae (St. John's-Wort Family; Guttiferae); Brassicaceae (Mustard Family) for Cruciferae; Hydrangeaceae (Hydrangea Family) and Grossulariaceae (Gooseberry Family) apart from Saxifragaceae (Saxifrage Family, incl. *Penthorum*); Mimosaceae (Mimosa Family), Caesalpiniaceae (Caesalpinia Family) and Fabaceae (Pea or Bean Family) for Leguminosae; Cornaceae (Dogwood Family) includes Nyssaceae (*Nyssa*, Sour-gum); Apiaceae (Carrot Family) for Umbelliferae; Lamiaceae (Mint Family) for Labiatae; Asteraceae (Composite or Aster Family) for Compositae; Potamogetonaceae (Pondweed Family) and Zannichelliaceae (Horned Pondweed Family) apart from Zosteraceae; Poaceae (Grass Family) for Gramineae; and Agavaceae (Agave Family) and Smilacaceae (Catbrier Family) apart from Liliaceae (Lily Family, incl. Amaryllidaceae-Amaryllis Family). Delimited in the manual's text are 5 families of ferns treated under the Polypodiaceae (incl. Dennstaedtiaceae-Bracken, Adiantaceae-Maidenhair Fern, Aspleniaceae-Spleenwort, Onocleaceae-Sensitive Fern and Blechnaceae-Deer Fern Families), 9 tribes for the Composite Family (Asteraceae), and 29 species-groups (sections) under the genus *Carex*. Tribes in the Grass Family (Poaceae) are not indicated since they are in a state of flux.

In Franklin County the greatest number of species occur in the Composite Family (Asteraceae 213), Grass Family (Poaceae 149), Sedge Family (Cyperaceae 116), Rose Family (Rosaceae 77), Pea or Bean Family (Fabaceae 63), Mustard Family (Brassicaceae 58), and Mint Family (Lamiaceae 54). These same families are represented in like order in the Ohio flora. Other outstanding families having more than twenty species in Franklin County include the Figwort Family (Scrophulariaceae 43), Lily Family (Liliaceae 42), Buttercup Family (Ranunculaceae 40), Carrot Family (Apiaceae 30), Willow Family (Salicaceae 30), Orchid Family (Orchidaceae 29), Pink Family (Caryophyllaceae 28), Smartweed Family (Polygonaceae 27), Honeysuckle Family (Caprifoliaceae 23), and Violet Family (Violaceae 22). The present survey of Franklin County's vascular flora (Table 1) reveals 28.6% of the flora is non-indigenous, most largely represented in seven dicotyledonous families (Asteraceae, Brassicaceae, Fabaceae, Rosaceae, Lamiaceae, Scrophulariaceae and Caryophyllaceae) and two monocotyledonous families (Poaceae and Liliaceae). At present, the origin of Franklin County's alien flora is predominantly European (35%), Eurasian (32%), and Asian (10%). However, 14% comes from the United States, 5% from Middle & South America, and 4% is unknown (mostly cultivated). Half (52%) of the county's alien flora has been considered naturalized.

The information given in this manual for the 1,652 formally treated species follows a similar format. Throughout the text accepted scientific names are bold faced. Brummitt and Powell (1992) was used to standardize abbreviations of authors after scientific names. All species names (binomial names) are printed in italics. In general, the order of plant figures is the same as their textual descriptions. Species without an asterisk before the binomial name are considered native, those with an asterisk are alien. Status and geographical origin are also given for non-indigenous taxa. The dagger sign (†) before a species represents a rare or endangered species, etc., for which Appendix IV should be consulted for exact reference and status. Common or vernacular names are given for most species. Diagnostic features distinguish one taxon from another, and are followed with pertinent

synonymy, habitat(s), and month(s) of flowering. References elucidate copied or paraphrased facts about nomenclature, habitats, localities, specific collections, blooming dates, and/or plant collectors. Herbarium records cite all plant collections reviewed as scientific vouchers that represent the actual proof of dates, localities, flowering times, and collectors of Franklin County's vascular plants. In all, a total of 14,080 vascular plant specimens from the following herbaria were inspected using the dissecting microscope:

Bowling Green State University (Bowling Green, BGSU)	40
Cleveland Museum of Natural History (Cleveland, CLM)	444
College of Wooster (Wooster, WOOS)	171
Denison University (Granville, DEN)	2
Kent State University (Kent, KE)	117
Miami University (Oxford, MU)	62
Muskingum College (New Concord, MUS)	3
Ohio University (Athens, BHO)	22
Ohio Wesleyan University (Delaware, OWU)	289
University of Cincinnati (Cincinnati, CINC)	43
University of Illinois (Urbana, ILL)	124
The Ohio State University (Columbus, OS)	12,674
Urbana University (Urbana, URB)	89

During the progress of this project, the herbaria of Oberlin College (Oberlin) and Otterbein College (Westerville), having 95 and 609 vascular specimens from Franklin County, respectively, were acquired by The Ohio State University. Consequently, these totals have been included under The Ohio State University Herbarium (OS). At Marietta College (Marietta) no vascular specimens were located from Franklin County. All identifications of specimens have been checked and cited as herbarium records after their corresponding specific determinations in the manual portion of this flora. If not otherwise indicated, all collections not accompanied with a herbarium abbreviation are deposited at The Ohio State University Herbarium (OS), Museum of Biological Diversity, Columbus. Additional information is given in notes for some species.

The abbreviations, glossary, explanation of diagrams, and keys were adopted from Clara Weishaupt's *Vascular Plants of Ohio*. Keys for some taxa not treated by Weishaupt were added, e.g., the genus *Crataegus* (adapted from Braun, 1961, and Gleason & Cronquist, 1991), *Cardamine flexuosa* (adapted from Voss, 1985), varieties of *Juncus tenuis* (adapted from Braun, 1967), and the genus *Lemna* (adapted from Landolt, 1986). Some family names and leads in Weishaupt's key to the families of vascular plants were adjusted according to their accepted family names used under the Cronquist System. Modifications include the omission of such words as "Ohio Species", "our", and "in ours" used by Weishaupt, and the term "ovulary" was replaced with ovary. Keys to families, genera, and species are for the most part dichotomous. When not so, the lead to follow is clearly indicated in parenthesis at the end of the corresponding lead. All key leads are lettered for tracing purposes, thus permitting easy backtracking of the route taken for identifying a plant. The fact that some leads to keys are not dichotomous, and some do not express prefect contrasts, should not diminish their importance as selected characters used to separate the given group of taxa under consideration. The user should keep in mind that these keys are artificial; they are not meant to reflect evolutionary pathways or relationships.

It is only normal that the beginner might find it difficult, perhaps frustrating, to understand and even appreciate the phylogenetic relationships that systematists use to place plants into hierarchical groupings, i.e. divisions, classes, orders, families, genera, species, varieties, and forms. More perplexing still is the lack of fossil evidence in angiosperm evolution that makes it difficult, if not impossible, to discern these natural relationships existing between living organisms. Modern revisionary treatments compensate for this lack by employing biochemical, genetic, and cladistic analyses that reveal sufficient data to substantiate or modify our present knowledge of plant evolution beyond that of our basic understanding of observed morphological states in plant specimens. The importance of these biological collections (Williams, 1994) should not be underestimated, since "without such collections there can never be an honest and complete appraisal of biological reality."

Accuracy in making plant identifications requires time, a good dissecting microscope, and a working knowledge

of a relatively few morphological characters. The critical observer will discern differences between species quickly, deriving great satisfaction and self confidence from this learning situation. As one advances in the knowledge of morphological characters, a whole new world of conditions and relationships reveals the complexity of biological diversity. When this understanding is achieved, taxonomy is even more appreciated as the tool that discloses new evolutionary patterns.

Table 1. Summary of the number of vascular species in Franklin Country

Taxonomic Group	Native	Alien	Taxonomic Group	Native	Alien
LYCOPODIOPHYTA			DICOTYLEDONS (cont.)		
Lycopodiaceae	4		Nyctaginaceae		2
Selaginellaceae	1		Chenopodiaceae	2	9
EQUISETOPHYTA			Amaranthaceae	2	4
Equisetaceae	5		Portulacaceae	2	2
POLYPODIOPHYTA			Molluginaceae		1
Ophioglossaceae	4		Caryophyllaceae	12	16
Osmundaceae	3		Polygonaceae	16	11
Dennstaedtiaceae	2		Clusiaceae	8	1
Adiantaceae	3	1	Tiliaceae	2	
Aspleniaceae	18		Malvaceae	2	10
Onocleaceae	1	1	Sarraceniaceae	1	
Blechnaceae	1		Droseraceae	1	
Marsileaceae		1	Cistaceae	1	
Salviniaceae		1	Violaceae	19	3
PINOPHYTA			Passifloraceae	1	
Ginkgoaceae		1	Cucurbitaceae	2	1
Taxaceae	1		Salicaceae	20	10
Pinaceae	3	3	Capparaceae	1	1
Taxodiaceae		1	Brassicaceae	20	38
Cupressaceae	2		Ericaceae	10	
MAGNOLIOPHYTA:			Pyrolaceae	4	
DICOTYLEDONS			Monotropaceae	2	
Magnoliaceae	2		Ebenaceae	1	
Annonaceae	1		Styracaceae		1
Calycanthaceae		1	Primulaceae	8	2
Lauraceae	2		Hydrangeaceae	1	2
Saururaceae	1		Grossulariaceae	3	2
Aristolochiaceae	2		Crassulaceae	2	3
Nelumbonaceae	1		Saxifragaceae	8	
Nymphaeaceae	2		Rosaceae	55	22
Cabombaceae	1		Mimosaceae		1
Ceratophyllaceae	2		Caesalpiniaceae	7	
Ranunculaceae	33	7	Fabaceae	36	27
Berberidaceae	3	1	Elaeagnaceae		2
Menispermaceae	1		Haloragaceae	3	
Papaveraceae	2	3	Lythraceae	6	1
Fumariaceae	3	1	Thymelaeaceae	1	
Platanaceae	1	1	Onagraceae	11	2
Hamamelidaceae	1	1	Cornaceae	10	
Ulmaceae	4		Santalaceae	1	
Cannabaceae		3	Celastraceae	3	2
Moraceae	1	2	Aquifoliaceae	2	
Urticaceae	5	1	Euphorbiaceae	7	8
Juglandaceae	8	1	Rhamnaceae	3	1
Fagaceae	15		Vitaceae	5	1
Betulaceae	4	1	Linaceae	2	1
Phytolaccaceae	1		Polygalaceae	3	

(Cont. Table 1)

Taxonomic Group	Native	Alien	Taxonomic Group	Native	Alien
DICOTYLEDONS (cont.)			DICOTYLEDONS (cont.)		
Staphyleaceae	1		Lentibulariaceae	4	
Sapindaceae		2	Campanulaceae	9	1
Hippocastanaceae	2	1	Rubiaceae	16	1
Aceraceae	6	1	Caprifoliaceae	14	9
Anacardiaceae	6	1	Valerianaceae	4	3
Simaroubaceae		1	Dipsacaceae		2
Rutaceae	2		Asteraceae	148	65
Zygophyllaceae		1	MAGNOLIOPHYTA:		
Oxalidaceae	4	1	MONOCOTYLEDONS		
Geraniaceae	3	3	Butomaceae		1
Limnanthaceae	1		Alismataceae	6	
Balsaminaceae	2	1	Hydrocharitaceae	2	
Araliaceae	4		Juncaginaceae	2	
Apiaceae	23	7	Potamogetonaceae	9	1
Gentianaceae	5		Najadaceae	2	1
Apocynaceae	3	1	Zannichelliaceae	1	
Asclepiadaceae	13	1	Acoraceae	1	
Solanaceae	5	13	Araceae	5	
Convolvulaceae	4	4	Lemnaceae	8	
Cuscutaceae	4	1	Xyridaceae	1	
Menyanthaceae	1		Commelinaceae	1	1
Polemoniaceae	8		Juncaceae	12	2
Hydrophyllaceae	6		Cyperaceae	115	1
Boraginaceae	7	7	Poaceae	94	55
Verbenaceae	6	2	Sparganiaceae	4	
Lamiaceae	36	18	Typhaceae	2	
Callitrichaceae	3		Pontederiaceae	3	
Plantaginaceae	3	4	Liliaceae	30	12
Oleaceae	6	5	Agavaceae		1
Scrophulariaceae	25	18	Smilacaceae	5	
Orobanchaceae	3		Dioscoreaceae	1	
Acanthaceae	3		Iridaceae	5	2
Pedaliaceae		1	Orchidaceae	29	
Bignoniaceae	1	2			

Taxonomic Group	Native	Alien	Totals
CLUBMOSS & SPIKEMOSS (LYCOPODIOPHYTA)	5		5
HORSETAILS (EQUISETOPHYTA)	5		5
FERNS (POLYPODIOPHYTA)	32	4	36
GYMNOSPERMS (PINOPHYTA)	6	5	11
FLOWERING PLANTS (MAGNOLIOPHYTA):			
DICOTYLEDONS (MAGNOLIOPSIDA)	793	387	1180
MONOCOTYLEDONS (LILIOPSIDA)	338	77	415
TOTALS	1179	473	1652