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Botanical Timeline for Kentucky

By Ron Jones

Introduction

This timeline will give Kentucky history from the viewpoint of botanical highlights: floristic and vegetation changes, new discoveries, role of plants, important publications, etc. Suggestions to the list are welcome, especially those that relate to the last two centuries. Send suggestions to ron.jones@eku.edu.

Years before present

4.5 billion—Earth forms

3.8—3.5 billion—first cells on earth, including some resembling blue green algae (cyanobacteria), and if so, then oxygen produced by the photosynthetic activity of these blue green algae began accumulating in the atmosphere

2—1 billion—first multicellular life in the oceans, including some filamentous algae with nucleated cells (eukaryotic); more oxygen in the atmosphere, but all life still in the oceans.

500 million—Kentucky region covered by a shallow sea. (See Geologic Time Scale to the right)

440—410 million—central Kentucky uplifted, and dry land existed, but no evidence of vascular land plants (present elsewhere in world at about 420 million years ago); Kentucky region located close to Equator and part of the continent of Laurentia.

410—360 million—earliest evidence of vascular land plants in Kentucky, of the genus *Archaeopteris*, a fernlike, early gymnosperm (but Kentucky was underwater at this time, so these fossilized logs must have washed into the Kentucky region from nearby upland areas to the east); Kentucky was part of the continent of Euramerica at this time (after Laurentia colliding with Baltica), and slightly south of the Equator.

360—290 million—fossil evidence suggests that lowland forests of lycopods (club moss relatives), sphenopsids (horsetail relatives), tree ferns, gymnosperms, and seed ferns (including genera such as *Lepidodendron*, *Lepidostrobus*, *Sigillaria*, and *Calamites*) occurred over portions of Kentucky, with many vines, shrubs and small trees (*Alethopteris* and *Neuropteris*); ground cover consisted of ferns and fernlike plants; Euramerica still on the Equator; age of amphibians.

290—250 million—collision of Euamerica and Gondwanaland created the supercontinent Pangea, during this time period; interior of continent became drier and cooler; more complex ferns and gymnosperms became dominant as lycopods and sphenopsids died out, but there is little fossil evidence of these changes in the Kentucky region; Permian extinction occurred 250 million years ago, devastating both marine and terrestrial life, perhaps due to a combination of factors, including volcanic activity, meteorite strikes, and climatic changes; Appalachians still just north of the Equator.

250—65 million—Age of dinosaurs, but no dinosaur fossils have been found in Kentucky, and there is also no fossil evidence of the changes in the plant life during this period in Kentucky; Kentucky was above sea level during this period except for far-western portions of the state, and evidently there were few habitats available for fossilization, and what sediments did form have been eroded away; fossil evidence from elsewhere in the world suggests that flowering plants evolved during this period, probably about 135 million years ago; the end of this period is marked by a major extinction (all dinosaurs, except the ones now referred to as birds, disappeared), most likely triggered by a meteorite (or other celestial body) crashing into the earth in the Yucatan peninsula region; at this time North America had drifted to just south of its present position, and was divided by an interior sea into two large land masses, a western one connected to Asia, and an eastern one connected to Europe; atmospheric carbon dioxide continued to climb, reaching levels 4 to 5 times higher than present.

65—20 million—North America reached its present geographic position during this period, with western Kentucky remaining covered by marine waters until about 50 million years ago; tropical or near tropical conditions prevailed during the first half of this period in eastern North America, and there is fossil evidence from 45 million years ago in Kentucky deposits of such tropical genera as *Caesalpinia*, *Dendropanax*, *Ocotea*, *Philodendron*, *Podocarpus*, and *Sabal*, as well as more temperate plants still in Kentucky today—*Ceratophyllum*, *Fraxinus*, and *Nyssa*; across the southeastern U.S, many other present-day genera were already present, including *Alnus*, *Betula*, *Castanea*, *Fagus*, *Ilex*, *Juglans*, *Quercus*, *Tilia*, and *Ulmus.*

20—2 million—by about 20 million years ago the vegetation of Kentucky latitudes had changed in lowlands from tropical evergreen to warm-temperate deciduous, and in uplands from temperate deciduous to conifer forest, by this time the sunflower family (Asteraceae) and grass family (Poaceae) had evolved, beginning an explosive increase in the numbers of herbaceous species; by 2 million years ago the forests of central Kentucky were mixed deciduous hardwoods, and conifer species (spruce and hemlock) dominated in the Appalachians; climate became cooler and drier during this period, and carbon dioxide levels dropped to near present-day levels.

2 million to 12,000—about 20 glacial/interglacial cycles occurred during this time period, each lasting about 100,000 years, and the last glacier began retreating about 12,000 years ago; during glacial advances, boreal forests and tundra existed in the Kentucky region, with such genera as *Picea* (spruce), *Abies* (fir) , *Larix* (larch), as well as northern pines (*Pinus banksiana*); during glacial retreats the vegetation became dominated by deciduous hardwoods.

12,000 years ago—humans arrived in the Kentucky region.

To be continued in future issues of ***The Lady-Slipper****....*

GEOLOGIC TIME SCALE FROM ORDOVICIAN TO THE PRESENT

from Plant Life of Kentucky by Ron Jones

ERAS	*PERIODS*	*MILLIONS OF YEARS AGO*
Cenozoic Era	*Quarternary Period*	*2*
	Tertiary Period	*65*
Mesozoic Era	*Cretaceous Period*	*140*
	Jurassic Period	*210*
	Triassic Period	*250*
Paleozoic Era	*Permian Period*	*290*
	Pennsylvanian Period	*325*
	Mississippian Period	*360*
	Devonian Period	*410*
	Silurian Period	*440*
	Ordovician Period	*500*

LETTERS TO THE EDITOR

KNPS members are invited to send letters on topics of interest to them to *The Lady-Slipper* editors. Selected letters will be published in a new column, *Letters to the Editor*.

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