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Woody Plants of South Arkansas: Computer Aided Instruction in Dendrology

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General Notes

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NEW COUNTY RECORDS OF ARKANSAS VASCULAR FLORA FROM THE UNIVERSITY OF CENTRAL ARKANSAS HERBARIUM

A search of specimens in the Vascular Plant Herbarium of the University of Central Arkansas was conducted from 1983 to the present to compile records not documented by Smith (1978) in his *Atlas and Annotated List of the Vascular Plants of Arkansas* nor in his five supplements (Smith, 1986). As a result, 916 new county records were located. They represent 650 species in 112 families located in 46 counties throughout Arkansas. Most records, however, are from Faulkner County or the central part of the state. Of special note is one specimen, *Lathyrus aphaca* L. from Pulaski County. This is an Asian species which Smith (pers. communication) says may represent a waif and may not persist. This yellow flowered legume was collected from a field near a house in Little Rock where it was growing profusely on May 16, 1971.

These species/county occurrence records add to the plant distribution of a geographical area and are important steps toward the publication of a manual of vascular plants, a work that is yet to be completed for Arkansas. This listing of records can be found in the Arkansas Native Plant Society Occasional Papers No. 7.

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WOODY PLANTS OF SOUTH ARKANSAS: COMPUTER AIDED INSTRUCTION IN DENDROLOGY

The objective of this paper is to introduce a program for Apple II computers designed to supplement existing instruction in the identification of woody plants and their corresponding common and scientific names. At many universities dendrology is a sophomore level course introducing majors to the identification, classification, and nomenclature of woody plants of the forest. Laboratory field exercises reinforce concepts presented during lecture and introduce advanced concepts from upper level courses. In this manner, dendrology establishes a foundation through formal and informal instruction leading to the successful completion of the dendrology course and subsequent upper level courses. For example, at the University of Arkansas at Monticello, each weekly trip introduces students to one of Arkansas' many varied habitats and approximately 15 forest species of woody plants. These species are described botanically, related to the unique characteristics of the site, and presented as a member of a dynamic and complex forest community valued for its products and intangible amenities. After a few weeks of study, students have (1) acquired an appreciation of forest species as members of the broader plant community, (2) participated in the consumptive and nonconsumptive uses of the forest, and (3) observed patterns in phenotypic variation explained by concepts from synecology, autecology, and genetics which are applied to forest management during courses in silviculture, tree improvement, and forest recreation. For these reasons dendrology initiates the foundation for advanced study in forest resources management and is the base on which professional careers are built. The ability to recognize and identify the forest resource is fundamental to appreciation, advanced study, and professional development in forestry.

Laboratory exercises in dendrology are designed to encompass as many different habitats, forest communities, and species as possible. Sometimes sites selected for field study require traveling 40 or more miles from campus. Students needing additional out-of-class review with limited available time for study or lacking personal transportation may encounter difficulty returning to a laboratory site. Consequently, an inexpensive and effective

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tive means of collectively presenting species from diverse habitats for review and study by students is needed. Computer graphics offer a partial solution to this problem.

Woody Plants of South Arkansas presents graphic images of leaf silhouettes from 120 species of woody plants native to southern Arkansas. All leaf images and botanical characteristics needed for identification were created with Computer Colorworks' Digital Paintbrush System (Figure 1). These images were incorporated into a BASIC program which presents questions requiring students to enter both a common and a scientific name.

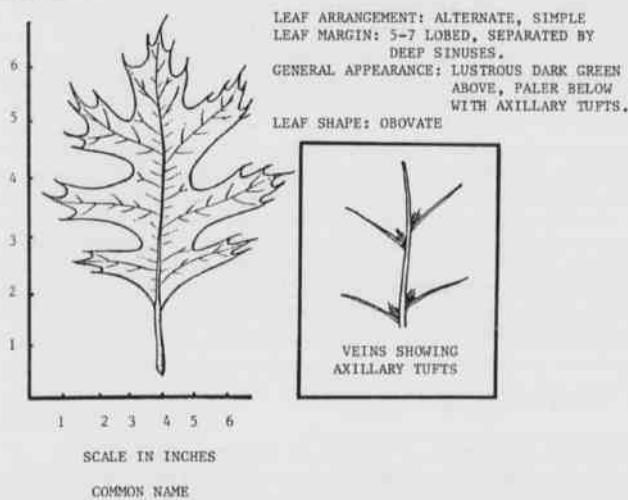


Figure 1. Monitor screen showing common name inquiry prior to user input.

Table 1. Editorial symbols employed by *Woody Plants of South Arkansas* to aid students in correcting their response.

Symbol	Error explanation
x	Extra character
.	Wrong character
S	Transposed letters
^	Missing character before here
⌋	Missing character after here
X	Wrong word
▲	Word missing here

The program begins when the diskette is placed in the disk drive and the computer is turned on. The instructions for operation are then displayed. Once the student has read the instructions he is prompted to press the RETURN key to begin. As with many other programs designed for use on Apple computers, the RETURN key signifies the end of a user input. A randomly selected leaf slide is displayed and the student is asked to input the common name of the species. The student's response is evaluated for accuracy and, if the response is correct, adds a point to his score. If the answer is incorrect the computer will allow a second or third attempt. However, if the first response is incorrect the student cannot change the score by a correct second or third response. If the answer is spelled incorrectly, editorial symbols (Table 1) appear on the screen to aid the student in correcting the answer. The same series of questions and responses are then repeated substituting Latin names for common names. After three attempts the computer provides the correct answer and advances to the next species. The same sequence is repeated for all species on the diskette. After all of the species have been attempted, the student's score is displayed along with instructions for more study of the same diskette or another of the 13 diskettes.

The program has many strengths as well as weaknesses. This program is user friendly and encourages computer literacy early in the students' collegiate career. The program is not only applicable to forestry students taking dendrology, but also botany students, plant taxonomy students, vo-tech students, and even Boy Scouts and Girl Scouts. A major strength is that the program will check the student's spelling for mistakes, and uses editorial symbols to mark the mistakes. The student is then given the opportunity to enter the correct answer. Another strength of the program is that it scores the student's first response, as it would be graded on a laboratory quiz. The student is allowed three chances at correct identification of the species before he is given the correct spelling of the common or scientific name. The program is written such that an infinite number of questions may be substituted for the current questions, however, the space on the video screen limits the length of questions. Another advantage is that the program was developed for the Apple II series computers, which are reasonably inexpensive, come with graphics capabilities standard, and are found in many high schools and universities.

One of the major weaknesses of the program is the resolution deficiency of the Apple II series of personal computers. This lack of resolution limits the amount of detail that may be shown in the leaf silhouettes. This is a particular problem for finely serrate leaf margins or elliptical leaf shapes. Since the program is written for a 5¼ inch disk drive system, space on a given disk is limited to approximately 10 individual "slides", which is an inconvenience if the student wishes to review all of the species at one time. Since all of the species cannot be contained on one disk, a cumulative score is not possible. More information than just leaf characteristics is needed to identify many species such as ashes and hickories; however, the lack of resolution makes the inclusion of twig or bark characteristics on the slide very difficult.

In conclusion, *Woody Plants of South Arkansas* is a user friendly computer program written for the Apple II series of personal computers. This program is intended to supplement formal instruction in woody plant identification. Programmed instruction enables infrequent users of the computer to easily access over 120 species for study. Leaf shapes and botanical descriptions are computer generated and the user queried for the appropriate name. The program may be adapted to present a variety of questions pertaining to the species.

This program is available to the public. Interested individuals may acquire this program by sending 13, 5¼ inch diskettes to Yeiser at the address which follows.

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