PLANT TAXONOMY

Chairman: Donald L. Burton
Indiana University, Bloomington, Indiana 47405

Chairman-Elect: John Bacone
Indiana Department of Natural Resources, Indianapolis, Indiana 47306

A Numerical Analysis of the Tribes of the Brassicaceae. Larry A. Hauser, Department of Biology, University of Notre Dame, Notre Dame, Indiana.——Understanding of the relationships among the tribes of Brassicaceae has been problematic. Many tribes are artificial and based on few characters. An investigation of the tribes of the family was conducted by elucidating relationships among exemplar genera in several of the tribes. Representative genera from each tribe were selected to obtain a diverse sampling throughout the family. Many of these genera, and much of the data obtained, were gathered from information biased toward North American sources. Data were collected on each of these genera and studied using such numerical techniques as ordination (e.g. principal components analysis) and summarization graphics. Using these techniques provided insights into the tribal problem. Analysis of relations among the characters used was another important aspect of the study. Its purpose was to determine multivariate adaptive character complexes found both in terms of geographic distribution, and ecological classification. The study also involved evaluation of the cladistic relationships among the genera studied. Results of the analysis of taxonomic structure revealed clusters of genera along tribal lines, but also some exceptions. Results of multivariate character analysis included delimitation of several character clusters that could be related to evolutionary adaptive functions. Finally, correlating among character clusters themselves were found to be important.

Relationships Between Area And Number Of Taxa Of The Brassicaceae In The Soviet Union. Theodore J. Crovello, Department of Biology, University of Notre Dame, Notre Dame, Indiana.——The relationship between the geographic areas occupied by taxa has long been of interest. At first interest had to be confined to the creation of distribution maps for each taxon, a task still incomplete, but essential for other types of biologic studies. Research on the distribution of taxa of the Brassicaceae, the mustard family, in the Soviet Union reveals that biogeographic study is a multistage decision process, with our conclusions being affected greatly by decisions made at various points, e.g., choice of the level of the taxonomic hierarchy at which to do the analysis. A prose equation explaining the relation between area and number of taxa will be presented. The Soviet mustard data and analyses will be used to discuss the equation.

A Botanical Expedition to Mexico. Clifton Keller, University of Notre Dame and Andrews University.——A seven-thousand-mile study tour sponsored by the biology department of Andrews University and directed

by Dr. Richard Ritland, provided an optimal environment for a survey expedition. Differences between floristic expectations and observations were described. First-hand systematic study of Mexico's flora and vegetation was encouraged.

Patterns of Morphological and Phenolic Variation in a Hybridizing Population of *Quercus*. RICHARD J. JENSEN,* Department of Biology, Saint Mary's College and JUDITH F. KNOPS, Department of Biological Sciences, Wright State University.——Previous study of a population of red oaks in New Jersey had provided evidence of hybridization involving all three species present: *Quercus ilicifolia*, *Q. marilandica*, and *Q. velutina*. The research reported here was undertaken to a) further clarify the extent and direction of hybridization and b) determine if patterns detected with morphologically and chromatograpically based data sets illustrated congruence. Twenty-two morphological characters for each of eighty-seven trees were analyzed by analysis of variance, principal components analysis, and discriminant analysis. The results of these studies, allowing recognition of three statistically defined species groups and intermediately positioned putative hybrids, suggested that hybridization is restricted to crosses of *Q. ilicifolia*-*Q. marilandica* and *Q. marilandica*-*Q. velutina*. Chromatographic profiles of the same trees, derived from methanolic leaf extracts, revealed distinctive profiles for each species and allowed detection of putative hybrids. Principal coordinate analysis of a similarity matrix based on the presence/absence of thirty phenolic compounds produced a two dimensional plot very similar to that produced with principal components analysis of the morphological data. Further, a discriminant analysis of phenolic characters, in which the individual trees were assigned to groups defined by the morphological analyses, resulted in no misclassifications. The patterns of phenolic variation strengthened the conclusion that hybridization is not occurring between *Q. ilicifolia* and *Q. velutina* Additionally, the overall relationships suggest that both *Q. velutina* and *Q. ilicifolia* may be derived from a *Q. marilandica*-like ancestor.

The Rediscovery of Noteworthy Plants in Indiana. JAMES R. ALDRICH and HENRY WOOLSEY, Department of Natural Resources, 612 State Office Building, Indianapoils, Indiana.——This report focuses on the field-reverification data gathered for special plant species as identified by the preliminary list of Indiana vascular plant species of special concern compiled by Mr. John A. Bacone. Data, most of which has been gleaned from the literature and Indiana's major herbaria, was used to catalogue previously known occurrence sites of these species by the Indiana Natural Heritage Program. Subsequently, many of these sites were visited during the past year. Discussed herein are the percentage and types of sites found to be still intact or destroyed, as well as the number of special plant species that were rediscovered.

Present Status of Certain Recent Additions to our Natural Flora. SAMUEL W. WITMER, Goshen College.——The 1979 condition of each of several species of seed plants is compared with its condition at the time of finding. The following species are treated:

Ornithogalum nutans
Bellis perennis
Juniperus sabina
Iliamna remota
Rhamnus Frangula
Butomus umbellatus
Lotus corniculatus
Artemisia vulgaris
Chloris verticillata
Polygonum Sieboldii
Elaeagnus umbellatus

These are illustrated with color slides.

New Plant Records For Wayne County, Indiana. ROBERT D. WALTZ and ELAINE G. HENDRICKS, Hayes Regional Arboretum, Richmond, Indiana. ——The following species, *Spiranthes lucida* (H.H. Eat.) Ames, *Corallorhiza odontorhiza* (Willd.) Nutt. (ORCHIDACEAE); and *Carduus nutans* L. (ASTERACEAE), are herein reported as the first published records of these species relative to the flora of Wayne County, Indiana. Voucher specimens are deposited in the herbarium of the Hayes Regional Arboretum, Richmond, Indiana. Annotations: *Spiranthes lucida* (H.H. Eat.) Ames., spike collected, June 13, 1978. Elaine G. Hendricks, collector; calcareous margin of swamp near Elliott's Mill Bog, Wayne County, Richmond, Indiana: *Corallorhiza odontorhiza* (Willd.) Nutt., raceme collected September 21, 1973. Elaine G. Hendricks, collector; oak woods, Hayes Arboretum, Wayne County, Richmond, Indiana: *Carduus nutans* L., specimen collected, June 17, 1977. Robert D. Waltz, collector; dry, calcareous soil, near Elliott's Mill Bog, Wayne County, Richmond, Indiana.

Distribution And Boundaries Of Trees In Several Midwestern States. THOMAS P. SEASLY,* THEODORE J. CROVELLO, and BARBARA J. HELLENTHAL. Department of Biology, The University of Notre Dame, Notre Dame, Indiana.——E. L. Little's Atlas Of United States Trees served as the source of distribution data for all tree species occurring in at least one of the following states: Michigan; Illinois; Indiana; Ohio; or Kentucky. For each such species its status in each of the states was recorded as possessing one of the following properties: a range boundary in the direction of one of the eight principal compass points (states 1-8); a disjunct boundary; no boundary because it is not found in the state; or no boundary because it is found throughout the state. Of the 93 trees occurring in at least one of the above states, 17 are conifers. Tabular, graphic and cluster analyses were used to answer three questions: 1) what are the biogeographic relations among the states based on tree distributions; 2) do the data suggest that Indiana should be considered more of a tension zone state than any of its four neighbors; and 3) do the data provide insights into the history of recolonization of these states since the last glacier? Results indicate that relations among the states change with the subgroup of trees being considered (conifers versus hardwoods; northern versus

southern). Indiana has no more tree range boundaries than its neighbors, and sometimes less, so it should not be considered more of a tension zone state than some of its neighbors. At present, the available methods and data helped to provide several hypotheses about the biogeographic history of Indiana, but no evidence that clearly supported a particular hypothesis.

Indiana Plant Distribution Records, Clark County. R. H. MAXWELL, Indiana University Southeast Herbarium, New Albany, Indiana.—— Collections of vascular plants within the Indiana Army Ammunition Plant near Charlestown in Clark County have yielded a new state distribution record: *Dioscorea batatas* Dcne. The voucher specimen is *Maxwell 1590*, 22 September, 1977 (IND, JEF). The twining vines were common along the Ohio River at the bottom of the rocky bluff about 100 m south of the mouth of Fourteen Mile Creek.

The survey within the Ammunition Plant is being conducted with permission of the Department of the Army and ICI Americas, Inc.