

PLANT TAXONOMY

Chair: JOHN W. MCCAIN
Department of Plant Pathology
University of Minnesota
St. Paul, Minnesota 55108

Chair-Elect: CLIFTON KELLER
Director of Academic Computing
Andrews University
Berrien Springs, Michigan 49102 (616) 471-3129

ABSTRACTS

Two Decades of Change in the Tree Stratum of Hoot Woods, Owen County, Indiana. D. BRIAN ABRELL, Division of Nature Preserves, Indiana Department of Natural Resources, Indianapolis, Indiana 46204 AND MARION T. JACKSON, Department of Life Sciences, Indiana State University, Terre Haute, Indiana 47809.—All trees (≥ 10 Cm dbh) were measured and mapped in 1966 in a 6.6 hectare southern portion of Hoot Woods, a 25 hectare mature upland forest dominated by American beech and sugar maple. In August 1979 extensive light gaps were created by tornadic winds which produced three major storm tracts across the sample area, plus several other isolated tree falls. Mapped trees were re-measured in 1986 to determine changes in forest composition due to the usual growth and replacement of individual trees during 20 years, plus comparisons between full canopy areas and light gaps resulting from recent wind damage.

Leatherleaf Bogs of Indiana. JAMES R. ALDRICH AND LEE A. CASEBERE, Indiana Department of Natural Resources, Indianapolis, Indiana 46204.—The occurrence of leatherleaf bogs in Indiana is limited to the Northwestern Morainal and Northern Lakes Natural Regions. Several sites were field checked to determine their natural quality and those that were found to be relatively undisturbed were further studied. Many of the species that occur in leatherleaf bogs such as *Andromeda glaucophylla*, *Xyris caroliniana*, *Calla palustris*, *Vaccinium oxycoccos* and *Scheuchzeria palustris* var. *americana* are rare or otherwise noteworthy species for the Indiana flora. The vegetation and ecology of this wetland type is discussed and a species list presented.

New Artificial Hybrids in *Helianthus*. CHARLES HEISER, Indiana University, Bloomington, Indiana 47405.—In an attempt to learn more about evolution in *Helianthus* and to develop material for improving the domesticated sunflower, several new artificial hybrids have been produced. (1) *H. hirsutus* (4n) \times *H. decapetalus* (2n). This hybrid proved to be tetraploid. (2,3) *H. grosseserratus* (2n) \times *H. tuberosus* (6n) and *H. tuberosus* (6n) \times *H. divaricatus* (2n). Both of these hybrids proved to be pentaploid. The ploidy level of the above three hybrids can be explained if an unreduced gamete of the diploid parent was involved. (4) A hybrid of *H. tuberosus* (6n) \times *H. grosseserratus* (2n) was tetraploid as expected. The hybrid showed 34_{II} , 32_{II} 1_{IV} , and 30_{II} 2_{IV} . (5) *H. annuus* (2n) \times *H. hirsutus* (4n). The two hybrids of this combination were doubled with colchicine to produce hexaploids. Some multivalents and univalents were observed at diakinesis. (6) Several triploid hybrids between perennial diploid and tetraploid species were obtained but so far attempts at doubling these with colchicine have been unsuccessful. The significance of these results is to be discussed.

Within Tree Leaf Variability and Evidence for a Developmental Difference Between Pin Oak and Black Oak. RICHARD J. JENSEN, Saint Mary's College, Notre Dame, Indiana 46556.—Leaf morphology was analyzed for within and between tree differences in pin oaks (*Quercus palustris*) and black oaks (*Q. velutina*) in northern Indiana. Four-way factorial ANOVA was used to assess positional and seasonal variation in quantitative features, including counts, angles, linear measurements, and areal measurements. While each tree revealed a different pattern of effects, a general observation is that counts and angles are less variable than linear and areal measurements. The use of a transformation to correct for size demonstrated that some seasonal differences reflect simple change in overall size while others reflect differential rates of change in the measured traits. Of particular interest is evidence that the two species illustrate a pronounced seasonal difference in petiole growth.

Preliminary Polyacrylamide Gel Electrophoresis (PAGE) Survey of Isozymes in Populations of the Bean Rust Fungus. JOHN W. MCCAIN AND JAMES V. GROTH, Department of Plant Pathology, The University of Minnesota, St. Paul, Minnesota 55108.—Preliminary surveys of mass field collections and single-uredial isolates of *Uromyces appendiculatus* (Pers.) Unger, the causal agent of bean rust, indicate the existence of isozymic polymorphism for several enzymes that are not related to virulence. We are attempting PAGE of isozymes extracted from germinated uredospores. Most enzymes tested so far show up as 1-2 bands on stained disc gels but 6-11 bands have been observed on gels stained for nonspecific esterases or for 6-phosphogluconic acid dehydrogenase. Mass field collections, which are mixtures of phenotypes, are highly polymorphic; isolates show fewer bands. The isolate W73-2 has never been induced to reproduce sexually. As a result, gene recombination is probably less frequent. We are presently investigating how frequent sexual reproduction affects isozyme variation.

Progress toward a Photographic Field Guide to Indiana Wildflowers. KAY McCRARY YATSKIEVICH, Herbarium, Department of Biology, Indiana University, Bloomington, Indiana 47405.—Amateur botanists, park naturalists, and others often have difficulty accurately identifying Indiana wildflowers because of inadequacies of currently available field guides (the three most commonly used guides lack 20-35% of Indiana species). Intensive photographic field work during the past two years toward a complete and up-to-date field guide to Indiana wildflowers has resulted in slides of approximately 800 species (excluding trees, grasses, sedges, and rushes) and a like number of pressed voucher specimens. A computerized data base has been assembled from herbarium data and the literature, containing information on ranges, habitats, flowering dates, and characters for field identification of all species reported for the state. Continuing work is addressing such problems as methods of familial separation and recognition of species in problem genera. Individual generic treatments will consist of photographs illustrating the immediate visual impact of major morphological groups, supplemented with line drawings and short descriptive summaries of critical characters that separate each species.