

PLANT TAXONOMY

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ABSTRACTS

Floristic Regions of the World: Doctor Armen Takhtajan's Recent Floristic System. THEODORE J. CROVELLO, Department of Biology, The University of Notre Dame, Notre Dame, Indiana 46556.—In 1978 Takhtajan's book, "Floristic Regions Of The World," appeared in Russian. Motivated partly by a desire to help save the world's plant diversity from extinction, Takhtajan created a worldwide floristic system, based on his lifelong studies of the plant world. It consists of 6 kingdoms divided into 34 regions, which in turn are divided into almost 150 provinces. Building on Turrill's (1958) term *chorion*, (a term analogous to *taxon*, but for biogeographic or floristic units), Takhtajan defines *chorionomy* to include knowledge about *choria*, and the methods and principles of their study and classification. Takhtajan subscribes to the well-established principles that define each. These include primarily the amount of endemism at species and other taxonomic levels, but also the relationship between absolute size of an area and its level of floristic distinctness. In addition, floristic classification must be kept separate from geobotanical (vegetation) classification. In his Introduction, Takhtajan also addresses the question of whether a worldwide chorionomic system, embracing both animals or plants, is either possible or desirable. Highlights of his floristic system will be presented. Finally, the relationship of such a system (and the data on which it is based) to the approaches of vicariance biogeography and of Crovello's "integrated biogeogeography", will be explored.

Phylogeny, Character Trends, and Distribution Patterns in the Thelypodieae Tribe (Brassicaceae). LARRY A. HAUSER, and THEODORE J. CROVELLO, Department of Biology, The University of Notre Dame, Notre Dame, Indiana 47556.—The phylogenetic and phytogeographic relationships among the taxa of the Thelypodieae tribe were studied. The tribe, as presently delimited, includes eight genera of western North America, one genus of southeastern United States, and one genus of temperate eastern Asia. In addition, several taxa of uncertain relationships were included in the study. The difficulty in understanding these relationships and patterns among taxa, at both the generic and specific levels, is evidenced by the lack of agreement among systematic treatments to date. Boundaries delimiting Thelypodium, Thelypodiopsis, Caulanthus and Streptanthus are especially elusive. Through the analysis of many characters and distribution patterns, insight into these relationships were obtained. Data were collected on over fifty morphological characters and studied for patterns and trends within and among genera. Numerical techniques used include discriminant, principal components, cluster analysis and phylogenetic analyses, such as the Wagner method. These techniques were useful to help elucidate both phylogenetic patterns and relationships as well as of similarities among taxa. Results of this study illustrate many character patterns and trends including reversals and parallelisms.

Phylogenetic hypotheses describing probable species relationship were made for each genus. The distributions of each taxon were also recorded and analyzed among approximately fifty physiographic and floristic regions. Relationships among these taxa, can be better understood in the context of their phytogeographic patterns. Hypotheses involving both vicariance and dispersal are used to explain these distribution patterns as well as other more general floristic patterns.

Was the Type Population of *Quercus ellipsoidalis* E.J. Hill a Hybrid Swarm?

RICHARD J. JENSEN, Department of Biology, Saint Mary's College, Notre Dame, Indiana 46556.—*Quercus ellipsoidalis*, the northern pin oak, was first described in 1899. The locality of the type population also contained at least two other taxa closely related to the new species: *Q. palustris* and *Q. velutina*. A third taxon, *Q. coccinea*, may have been present and a fourth, *Q. rubra*, is known to occur in the same general vicinity. Studies of patterns of leaf variation in a number of populations containing one or more of these taxa revealed that individual trees of each taxon formed statistically distinct entities. The analyses were based on eleven variables and were performed by discriminant analysis. Invariably, the discriminant functions generated yielded very high ($\geq 90\%$) levels of assignment of leaves to the trees from which they came. Analysis of several populations known to contain hybrids resulted in significantly lower levels of correct assignment. A similar analysis of E. J. Hill's type specimens of *Q. ellipsoidalis*, in which each specimen was treated as an individual tree, yielded less than 65% correct assignment of leaves to specimens; a statistically significant reduction when compared to 19 (individual species populations and hybrid-containing populations) other analyses. These results suggest that the type specimens may represent collections from a hybrid swarm involving the several taxa present.

***Conium maculatum* L. (Poison Hemlock) in Indiana.** PHILIP A. ORPURT, Department of Biology, Manchester College, North Manchester, Indiana 46962.—According to Deam's Flora of Indiana there are 36 species of Umbelliferae (Apiaceae) presently occurring in our state. Of these, 6 species are naturalized. The poison hemlock, *C. maculatum* L. is one of the naturalized species which has become widely distributed throughout the state. The earliest report of its occurrence in Indiana, is that of J. Shenk in 1875 with the notation that it was found in, "fields, rare". In the 24th Annual Report of the Geological Survey (1899) Stanley Coulter notes that *Conium* is, "Chiefly found in the southern counties in waste places; but nowhere abundant". In Deam's Flora (1940) it is shown as occurring in only 14 counties. Deam comments, "Local along roadsides and alluvial banks of streams and locally abundant along the old canal in Huntington, Wabash, and Miami Counties and found, no doubt, farther down the canal". Very probably it now occurs in every county of the state. Furthermore, in some localities and in particular along the route of the old Wabash-Erie Canal from Allen County through Huntington, Wabash, Miami, and Cass Counties it often forms large colonies of plants of considerable density. Its widespread distribution and the extensive formations are particularly disturbing in view of the fact that *Conium* contains two of the most potent toxic alkaloids known (coniine and γ -coniceine). Although the plant is not generally thought to be toxic as a result of contact, it nevertheless represents a real hazard should even small amounts of the plant be consumed by humans or by domesticated animals.

Two New Sedges (Cyperaceae) for Indiana. HELENE STARCS, Indianapolis, Indiana.—Field work with the Indiana Natural Heritage Program during 1981 gave two new plant distribution records for the state of Indiana.

1. *Carex socialis* Mohlenbr. and Schwegm. was found while checking some

endangered plant species with botanist James Aldrich in Posey county July 7. The site is located in Halfmoon Woods, just south of Halfmoon Lake, 10 miles SW of Mt. Vernon, and belongs to the lower Wabash Natural Division as stated by A. Lindsey et al. in *Natural Areas in Indiana*. The lowland oak-hickory woods form here the post oak flat on a high alluvial terrace. It has many floral elements of the southern states, as *Quercus stellata*, *Forestiera acuminata*, *Spigelia marilandica*, *Hymenocallis occidentalis*, *Agave virginica*, *Cocculus carolinus*. The new sedge is growing on a slightly elevated area with a coralberry bush (*Symphoricarpos orbiculatus*). The very loose light green clump is 30 cm diam., the culms about 35 cm high. *C. socialis* was recently described from southern Illinois.¹ It has been found in four counties there, also in Missouri and Kentucky. It belongs to the subgenus *Vignea* sect. *Bracteosae*, in the complex with *C. rosea* and *C. convoluta*. From these it differs by very narrow perigynia (0.7-0.8 mm) and by long creeping rhizomes, also the scales are more mucronate. Voucher specimens are deposited at Southern Illinois University Herbarium and Indiana University herbarium.

2. *Scirpus hallii* Gray was found with botanist Kenneth Dritz on a field trip to the Calumet Lake Plain Division, August 9. The small bulrush grows in an excavation in the sandpit south of West Beach, Porter county, with *Eleocharis elliptica*, *E. engelmannii*, *Hemicarpha micrantha*. *S. hallii* is a rare species, very local also in some other states. It is closely related to *S. smithii* Fern. and *S. purshianus* Gray. With *S. hallii* the achenes are transversally ridged, plano convex, it has no bristles, and the scales are awned. The voucher specimens are deposited at Indiana University herbarium and Morton Arboretum, Illinois.

The Taxonomy of Some Southeastern Sunflowers (*Helianthus* Ser. *Microcephali*). TIMOTHY STORBECK, Department of Biology, Indiana University, Bloomington, Indiana 47405.—The series *Microcephali* of the genus *Helianthus* consists of three to five species. These are small-headed, mostly perennial plants found primarily in the southeastern United States. The species that have been included in this series are: *H. microcephalus* (n = 17), *H. glaucophyllus* (n = 17), *H. laeviagatus* (n = 34), *H. smithii* (n = 34) and *H. porteri* (n = 17). While there has been little argument over the taxonomic status of the first three species, the latter two are currently the subject of some disagreement. *Helianthus smithii* is considered by Cronquist to be a tetraploid race of *H. microcephalus*. *Helianthus porteri* was recently placed in this genus by Yates and Heiser. Previously it was included in *Viguiera* and later in the segregate of that genus, *Heliomeris*. *Helianthus porteri* is a species whose affinities are not yet understood.

As part of an ongoing study to test the integrity of the *Microcephali*, chemical characters including foliar and floral flavonoids and floral carotenoids have been analyzed chromatographically. Morphological characters were also analyzed by various numerical taxonomic procedures. The results of these analyses indicate that *H. smithii*, while closely related to other members of this series, is morphologically and chemically distinct from *H. microcephalus*. Also, *H. porteri* does not appear to be closely related to any other members of the *Microcephali*. It is suggested that this species be treated as a separate section of *Helianthus* or as a monotypic genus.

¹ Mohlenbrock, R. H., and J. Schwegman. 1969. A new species of *Carex* sect. *Bracteosae*. *Brittonia* 21 : 77-79.