PLANT TAXONOMY

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ABSTRACTS

Plant Taxonomy at the Twelfth International Botanical Congress, Leningrad. THEODORE J. CROVELLO, Department of Biology, The University of Notre Dame, Notre Dame, Indiana 46556.——The International Botanical Congress was a great success in general, and for plant taxonomy in particular. Over 160 papers were presented in the section, Systematics and Evolutionary Botany, 72 being given in Russian. Of the remaining, 27 were by botanists from the United States, 25 from Western Europe, 22 from the Soviet Union and Eastern Europe, 5 from Canada, etc. In addition, symposia and contributed paper sessions were held on Cultivated Plants, Vascular Plants, Lower Plants, Floristics, and Phytogeography. A special symposium honored Vavilov. Many sessions were lively, and with or without interpreters, communication was effective much of the time. Our Soviet colleagues were most anxious to establish contact with western counterparts. Many Soviet workers reported on conventional approaches to systematics, but also Chemotaxonomic and computer approaches. Among the resolutions passed by the entire Congress was one calling for the creation of an international commission to advise and coordinate efforts in the use of data processing in systematics.

Preliminary Investigations of an Antheridogen System in the Fern Genus *Bommeria*. CHRISTOPHER H. HAUFLER and GERALD J. GASTONY, Department of Plant Sciences, Indiana University, Bloomington, Indiana 47401.——In gametophyte cultures of *Bommeria* species, both meristematic archegonial plants and ameristic antheridial plants occur. The presence of an antheridogen system regulating male sex expression was proposed to explain this observation. Three distinct types of antheridogen (male sex hormone) from ferns have been documented in the literature: antheridogen A from *Pteridium aquilinum*, antheridogen B from *Anemia phyllitidis*, and antheridogen C from *Ceratopteris thalictroides*. Evidence to date indicates that gametophytes of all investigated species of *Bommeria* respond positively to antheridogen A but do not form precocious antheridia in response to antheridogens B or C. In all species investigated, standard assays against the native *Bommeria* antheridogen indicate that it is the same as antheridogen A and that each species responds to the hormone of the other *Bommeria* species. The common occurrence of antheridogen production in the genus unifies this group of species and may isolate *Bommeria* from its close relatives.

Re-examination of a Numerical Taxonomic Study of *Solanum* Species and Hybrids. EDWARD E. SCHILLING, JR., Department of Plant Sciences,

Indiana University, Bloomington, Indiana 47401.——Data gathered by Heiser, Soria, and Burton (Amer. Natur. 99:471, 1965) on species and hybrids in the *Solanum nigrum* complex were re-examined using contemporary techniques of numerical analysis. Application of Gower's coefficient and WPGMA cluster analysis to the data matrix from which hybrid accessions had been removed resulted in OTU clusters which were in fair agreement with previously recognized species, indicating that the distortion of taxa in the original study was due to the influence of the hybrids. Principle components analysis of the complete data matrix revealed that two primary factors were involved in the relative placement of the OTU's: the intermediate character of hybrids relative to parents; and the ploidy level of hybrids and parents. Thus, several anomalous findings of the original study were explained. Hybrids of parents of different ploidy were placed closer to the parent of higher ploidy. The placement of some autopolyploids far from either parent was due to the effect of a ploidy level different from (and higher than) either parent. The positioning of a few hybrids closer to a non-parental species than to either parent was explained by the intermediate position of the non-parental species relative to the parents; in this way a clue to the possible lineage of species of likely hybrid origin might be gained. A final observation was the value of applying several types of numerical analysis to data gathered in studies of this type in extracting the maximum amount of useful information.

Computer Analysis of Selected Indiana Plant Distribution Patterns to Determine Phytogeographic Units. CLIFTON KELLER, Department of Biology, Andrews University, Berrien Springs, Michigan.——All of Deam's county distribution data for each of the approximately 2500 species of vascular plants recognized in 1940 as growing in Indiana have been computerized. Several selected subsets were chosen and analyzed. These ranged from considering species rare for Indiana (arbitrarily defined as those found in only six or less counties), to a "subset" that consisted of all of the species. From any one analysis, one can determine the number of species present in each county that have the chosen total county frequency. Thus, for example, the number of species that occur in St. Joseph County and in no more than five other counties can be determined. When this is done for every county, computer-generated maps can be produced that reflect statewide patterns. Certain results were anticipated, e.g., that the counties with the largest numbers of species rare for Indiana are in the northwest part of the State. Other patterns, after removing the possibility of being artifacts, were unexpected. The presence of three north-south ridges was not anticipated, and possible explanations are suggested. The general potential of such procedures was also presented.

Use of Computers to Determine the Endangered Status of Plant Species. THEODORE J. CROVELLO, Department of Biology, The University of Notre Dame, Notre Dame, Indiana 46556.——The rapidly increasing interest and concern for the fate of plant species possibly being driven to extinction by human activities has caught biologists unprepared. For several reasons, there simply are not enough trained systematists to give reliable

information on the endangered species status of the estimated 20,000 species of vascular plants indigenous to the United States. Endangered status can only be determined after a species' distribution has been determined not just in geographic space, but also over time. Herbaria represent the best reservoir of such information. But retrieving information from herbaria in an efficient way, to answer questions required for endangered species work is not easy, except with computers. Examples from an ongoing project in the mustard genera *Cardamine, Dentaria* and *Streptanthus* illustrate the potential. The current Mustard Data Bank consists of distribution, collection date and other information on 45,000 specimens from 75 museums. Summary tables of the number of specimens found in all combinations of county and decade are easy to prepare via computer. Computerization requires *financial* resources, but it may be the only means to help us to save our *natural* resources!