

## Book review

### **W. S. JUDD, CH. S. CAMPBELL, E. A. KELLOGG & P. F. STEVENS: Plant Systematics. A Phylogenetic Approach.**

Sinauer Associates, Inc., 23 Plumtree Road, Sunderland, MA 01375-0407, USA; 1999, ISBN 0-87893-404-9 (cloth).

Publishing house Sinauer Associates, Inc. completed the series of their recently edited textbooks (for example: D. J. Futuyma: *Evolutionary Biology*, Third Edition, 1997; J. H. Brown & M. V. Lomolino: *Biogeography*, Second edition, 1998; L. Taiz & E. Zeiger: *Plant Physiology*, Second Edition, 1998) with another one, devoted to plant systematics.

Plant systematics underwent considerable changes during recent decade. Besides the other characters using DNA sequences in phylogeny reconstruction and large exploitation of cladistics in evolutionary history determination influenced this.

The book is divided into eight chapters completed by two appendices and CD with hundreds of plant photos and three PDF files listing the families covered in the book according to the taxonomic systems of the Angiosperm Phylogeny Group, Arthur Cronquist and Robert Thorne. The eight chapters are of different extent, the first three ones are devoted to general problems of plant taxonomy (1. The Science of Plant Systematics, 2. Methods and Principles of Biological Systematics, 3. Classification and System in Flowering Plants: The Historical Background), the second three ones to the question of taxonomic evidence and speciation (4. Taxonomic Evidence: Structural and Biochemical Characters, 5. Molecular Systematics, 6. The Evolution of Plant Systematic Diversity). These chapters are written in exact and clear style, completed with numerous illustrations. The main part of the book deals with the survey of plant system (7. Phylogenetic Relationships of Major Groups of Tracheophytes, Excluding Angiosperms, 8. Phylogenetic Relationships of Angiosperm). Appendices are devoted to botanical nomenclature and specimen preparation and identification.

Phylogenetic overview (chapters 7. and 8.) does not adopt any of the systems used up to-date. On the one hand, the new system tries to keep clear and well arranged (which I, as a teacher of plant systematics, appreciate much); on the other hand it is open to new knowledge, which is continually published in scientific journals. In the description of particular families typographic possibilities are used, useful identifying characters are indicated in italic print and synapomorphies that also may be useful for identification, in boldface. The descriptions are completed brief summary of distribution and ecology, the estimated number of genera and species, a listing of major economic plants and products, and a discussion (includes information regarding characters supporting the group's monophyly).

Besides the expected changes on higher ranks, several different approaches are included from the point of view of the students from the Central Europe, as follows: broadly accepted Polypodiaceae (even if narrower families concept is mentioned in discussion); new concept of the families Plantaginaceae, Scrophulariaceae, Orobanchaceae, Bignoniaceae within Lamiales; Dipsacales include Adoxaceae and an expanded Caprifoliaceae (incl. Valerianaceae and Dipsacaceae, but excluding Sambucus and Viburnum, which are referred to Adoxaceae); and some others.

Although the selection of representatives of particular families is made above all respecting United States and Canada, I am very glad that I can recommend this excellently written and illustrated new modern (phylogenetic approach) textbook of plant systematics to my students and to all other people interested in plant world.

P. MÁRTONFI

## Book review

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### **B. WOLF: The Fertile Triangle: The Interrelationship of Air, Water, and Nutrients in Maximizing Soil Productivity.**

Food Products Press, an imprint of The Haworth Press, Inc., 10 Alice Street, Binghamton, N.Y., 1999, pp. 463, ISBN 1-56022-878-4

Dr. BENJAMIN WOLF presented in this book results of his lifetime research of soil, plants, water and crop production. The book consists of five sections, which are further divided into 17 chapters:

Section I: Sides of the triangle deals with three sides of a triangle – air, water, and nutrients – and their importance to the production of crop, some interrelationships between the three components, amounts of each of the components present in the soil at different times, and amounts needed for optimum health and growth.

Section II: Characteristics of soil or other media affecting the fertile triangle. Some characteristics of soil or other media can affect significantly the length of individual sides of the fertile triangle. The importance of these soil parameters is reflected in the extent of this section. The author presents some physical properties of soil (texture, structure, porosity, bulk density, and compaction), which dominate the water and air sides. He stresses the importance of organic matter, which not only provides nutrients to plants but also serves as an energy source for various microorganisms and is beneficial to physical properties of soil. The plant nutrition is affected significantly by chemical properties of soil. In this context the author discusses particularly the soil reaction, sensitivity of plants to pH and discloses the consequences of unfavourable soil reaction on plants. In addition to that the importance of cation exchange capacity and influence of this soil characteristic on the fertile triangle is discussed. The final part of this section deals with the harmful effect of high salinity of soil on soil processes and the health and growth of plants.

Some measures, which are commonly taken in the farming practice, are discussed in the Section III: The effects of farm practices on the fertile triangle. The questions related to the influence of both the tillage and non-tillage machinery are discussed in this



section. One of the inevitable and all the time topical farming measures leading to preservation of soil fertility is (in addition to supplying organic matter) the regulation of pH. The reader of the book finds in this part a review of calcareous materials, their relative effectiveness and quantities (according to the present soil pH) recommended to buffer the soil acidity, and also direct practical instructions oriented towards decrease of pH in alkaline soils (e.g. sodic soils).

The Chapter Regulating Salts discusses the possibility of adjusting low or high levels of salts, which can affect adversely the nutrient side of the triangle. Finally, one of frequent farming measures is the regulation of excess water.

The modern high-yield agriculture cannot be envisaged without a direct input of nutrients and probably also of water into majority of soils. The issues related to water and nutrients are summarized in the Section IV: Direct input to triangle sides. The author used a clear and intelligible form to summarize the basic principles, which should be known to the producer in order to reach maximum profit due to correct application of irrigation. Profitable crop production cannot usually be attained, and certainly not maintained without proper management of nutrients. Nutrient management involves not only the replacement of nutrients used but also their addition in such a manner that sufficient quantities are available as the plants need them. According to the author, this complex problem cannot be managed without respective soil tests conducted together with the leaf analysis. Furthermore, fertilizers are discussed in general paying attention to their forms, fertilizer ingredients and methods of their application.

The final Section V: Maximum lengths of the triangle sides deals with various special amendments to field soils, adjustment of soil properties resulting in maximum yields of sensitive crops or required for growing grass in high-traffic areas (playing fields, golf greens, etc.). The author also discusses modifications of soil and materials for preparation of soil mixes for container use and soil mixes for growing a number of ornamental or foliage plants. The final part of this section is devoted to hydroponics. It presents a review of the present hydroponic systems and preparation of complete nutrient solutions used in the USDA system.

All sections of this book contain sufficient material needed to gain basic understanding of the topic and of the potential for practical applications. The abundant references sorted according to individual chapters allow the reader to find suitable sources for detailed studies of special problems. However, the use of American units (in, lb, oz, gal, ft, ac) distracts somewhat the European reader who is accustomed to the SI units.

The book has been written with excellent professional knowledge of facts and the practical and technical information supplied to the wide circle of its readers, the agricultural students, farmers, managers and consultants, will allow them to understand better the role and interrelationship of the three main components (air, water, nutrients) which determine the optimum yield of crops.

A. GREJTOVSKÝ

### **Book information**

(edited by M. BAČKOR)

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#### **C. W. DIEFFENBACH & G. S. DVEKSLER [eds.]: PCR primer: a laboratory manual.**

Cold Spring Harbor Laboratory Press, 10 Skyline Drive, Plainview, New York 11803-2500, 1995, ISBN 0-87969-447-5 (ISBN 0-87969-448-3).

This polymerase chain reaction manual contains original protocols, which were reorganised, revised and updated by their authors. Additional protocols and appendices were added.

**Contents:** introduction to PCR, sample preparation, primer design, detection of PCR products: quantitation and analysis, PCR starting from RNA, PCR-mediated cloning, PCR sequencing, cloning of PCR products, mutagenesis by PCR, alternative amplification technology and useful appendices.

#### **R. BIJLSMA & V. LOESCHCKE [eds.]: Environmental stress, adaptation and evolution.**

Birkhäuser Verlag, P. O. Box 133, CH-4010 Basel, Switzerland, 1997, ISBN 3-7643-5695-2.

**Contents:** extreme environments and adaptation, genetic variation and environmental stress, acclimation and response to thermal stress, stress, selection and extinction, evolution and stress. The book contains reviews and novel scientific results on the subject. It will be of interest to both researchers and graduate students and may serve as a text for graduate courses.



**H. J. NOLTIE: Flora of Bhutan, including a record of plants from Sikkim and Darjeeling. Volume 3, Part 1.**

Royal Botanic Garden Edinburgh, Inverleith Row, Edinburgh EH3 5LR, UK, 1994, ISBN 1 872291 11 2.

This volume forms Volume 3 Part 1 of Grierson & Long's Flora of Bhutan and covers the monocotyledons with the exception of grasses (Poaceae) and orchids (Orchidaceae), which form Volume 3 Part 2 and Part 3 respectively.

**L. A. HANSSON & E. BERGMAN [eds.]: Nutrient reduction and biomanipulation as tools to improve water quality: The Lake Ringsjön story, Developments in Hydrobiology 140.**

Kluwer Academic Publishers, P.O. Box 17, 3300 AA Dordrecht, The Netherlands, 1999, ISBN 0-7923-5955-0.

The papers in this volume are reprinted from *Hydrobiologia*, volume 404 (1999).

**Contents:** introduction, Lake Ringsjön: its catchment area, its history and its importance, changes in nutrient load and lake water chemistry from 1966 to 1996, internal phosphorus loading, qualitative and quantitative investigations of phytoplankton, autumn waterfowl abundance, biomanipulation in a theoretical and historical perspective, planning and execution of the fish reduction, the effects of cyprinid reduction on the fish community, lack of a top-down effect on the zooplankton community after a cyprinid reduction, juvenile fish expansion following biomanipulation and its effect on zooplankton, impact of cyprinid reduction on the benthic macroinvertebrate community and implications for increased nitrogen retention, the development of submerged macrophytes in Lake Ringsjön after biomanipulation, occurrence of toxic blue-green algae despite nutrient reduction and fish biomanipulation, simulating the effects of biomanipulation on the food web of Lake Ringsjön, synthesis of theoretical and empirical experiences from nutrient and cyprinid reductions in Lake Ringsjön.

**M. F. CLARIDGE, H. A. DAWAH & M. R. WILSON [eds.]: Species: The units of biodiversity.**

Chapman & Hall, 2-6 Boundary Row, London SE1 8HN, UK, 1997, ISBN 0 412 63120 2.

This Systematics Association Special Volume brings together an international team of experts to give an account of their ideas on the species concept for the particular group of organisms of their interest. The contributors represent expertise on a wide diversity of living organisms, and chapters are included on viruses through to mammals, in addition to general reviews of species concepts.

This book should be read by all biologists and is of special interest to those working in the fields of taxonomy, systematics and biodiversity, ecology and conservation.

**G. SHENK: Moss gardening: including lichens, liverworts, and other miniatures.**

Timber Press, Inc., The Haseltine Building 133 S.W. Second Avenue, Suite 450  
Portland, Oregon 97204, 1997, ISBN 0-88192-370-2.

This book with lovely pictures is dedicated to the person who pauses to study of these "small things in nature".

**Contents:** as one moss gardener to another, definitions, in the gardens of Japan, gardens of the west, mossy rocks, the camp followers, moss carpets, in alpine gardens, mosses and lichens in winter, in containers, bonsai mosses, transportable trophies, bugaboos, portraits, potential nursery plants, further reading, index of mosses and other bryophytes.

**M. D. CRISP & J. J. DOYLE [eds.]: Advances in legume systematics: Part 7, phylogeny.**

The Trustees of The Royal Botanic Gardens, Kew, 1995, ISBN 0 947643 79 6.

**Contents:** cladistic analysis of the Leguminosae: the development of an explicit hypothesis, DNA data and legume phylogeny: a progress report, use of polymerase chain reaction to survey for the loss of the inverted repeat in the legume chloroplast genome, a reappraisal of the *Caesalpinia* group using phylogenetic analysis, the boundary between Amherstieae and Detarieae (Caesalpinioideae), a phylogenetic analysis of the *Dichrostachys* group, a phylogenetic assessment of tribe Acacieae, generic relationships of Mimosoideae tribe Ingeae, with emphasis on the New World *Pithecellobium* complex, Phylogenetic relationships of the tribe Swartzieae, phylogeny and biogeography of *Spatholobus*, *Butea*, and *Kunstleria* (Papilionoideae), tribe Robinieae and allies: model groups for assessing Early Tertiary northern latitude diversification of tropical legumes, evolution of the tribe Indigofereae, Mirbelieae, phylogenetic relationships in the tribes Podalyrieae, Liparieae and Crotalarieae, phylogenetic relationships in Phaseoleae: evidence from chloroplast DNA restriction site characters, molecular phylogenetic systematics of Galegeae, with special reference to *Astragalus*, phylogeny of *Lespedeza* and its allied genera (Desmodieae: Lespedezinae).

**W. B. ZOMLEFER: Guide to Flowering Plant Families.**

The University of North Carolina Press, Post Office Box 2288, Chapel Hill, NC 27515-2288, USA; 1994, ISBN 0-8078-2160-8.

Understanding the flowering plants of any region begins with the recognition of families. This remarkable volume, created to serve students, professionals and other plant enthusiasts, covers 130 temperate to tropical families common to the United States, using detailed illustrations and modern referenced commentaries. Each family discussion includes a diagnosis and summary of characteristics, distribution data, important economic members, and pollination ecology. The book's most striking feature is Wendy Zomlefer's 158 original pen-and-ink plates depicting intricate dissections of 312 species.



The content of the family discussions is geared to readers who have completed one introductory biology course. For readers less familiar with botanical terminology, Zomlefer provides an illustrated glossary of 551 terms with more than 300 drawings. Other important tutorial features are twenty-two detailed charts that compare pertinent characteristics of certain related plant groups and a general chart that summarizes the salient features of the families covered in the text. Both amateurs and professionals will particularly enjoy the chapter on examining, dissecting, and sketching live material.

**J. K. AGEE: Fire ecology of Pacific Northwest forests.**

Island Press, Suite 300, 1718 Connecticut Avenue, NW, Washington, DC, 20009, 1993, ISBN 1-55963-229-1.

This book began as a source book for natural area managers interested in restoring or maintaining fire in the natural areas of the Pacific Northwest. The geographical coverage of this volume is applicable to much of the western United States, although the focus is on forest types found in Oregon, northern California, and Washington. However, this book is helpful for everybody interested in subject of fire ecology.

**J. R. PRESS & M.J. SHORT [eds.]: Flora of Madeira.**

HMSO Publications Centre, P.O. Box 276, London, SW8 5DT, 1994, ISBN 0-11-310017-5.

Flora of Madeira is the first book to describe fully all of the vascular plants of the Madeiran and Salvage Islands. It covers over 1360 species of native and naturalized plants. High proportion taxa (about 16%) are endemic to the islands. This book provides descriptions and keys for taxa at all levels, as well as information on habitats, distributions and flowering times. It is the only fully comprehensive publication on the wild flora of the Madeiran and Salvage Islands, for use as both a reference work and a field guide.

**J. J. WIENS [ed.]: Phylogenetic analysis of morphological data.**

Smithsonian Institution Press, 470 L'Enfant Plaza, Suite 7100, Washington, DC 20560-0950, July 2000, ISBN(cloth) 1-56098-841-X, ISBN(paper) 1-56098-816-9.

Title from the series: Smithsonian series in comparative evolutionary biology. The book is dedicated to morphological phylogenetics. It derived from a symposium entitled: "Morphological Data in Phylogenetic Analysis: Recent Progress and Unresolved Problems," which was held in Saint Louis, Missouri, at the 1996 annual meeting of the Society of Systematic Biologists. It will be a valuable synthesis for all phylogenetic biologists, including molecular and morphological systematists, paleontologists and neontologists, and botanists and zoologists.

**A. STRID & K. TAN [eds.]: Flora Hellenica. Volume One.**

Koeltz Scientific Books, D-6240 Königstein, Germany, 1997, ISBN 3-87429-390-4.

Flora Hellenica covers the whole of Greece as politically constituted today. It attempts to be a comprehensive national Flora and to include all species of wild-growing vascular plants in the country, currently estimated to number c. 5,700. The taxonomic categories recognized are, as a rule, only families, genera, species and subspecies. Families are generally presented in the same sequence as in Flora Europaea.

**A. STRID [ed.]: Flora Hellenica bibliography**

W. Szafer Institute of Botany, Polish Academy of Sciences, Lubicz 46, PL-31-512, Kraków, Poland, 1996, ISBN 83-85444-44-0.

**Contents:** A critical survey of floristic, taxonomic and phytogeographical literature relevant to the vascular plants of Greece, 1753-1994.

**R. KELLER: Identification of tropical woody plants in the absence of flowers and fruits: a field guide.**

Birkhäuser Verlag, P. O. Box 133, CH-4010 Basel, Switzerland, 1996, ISBN 3-7643-5184-5.

This field guide presents a new identification system, permitting recognition of plant families in all seasons by means of morphological and macroanatomical features which are easily observed, permanent, and which provide a great deal of taxonomic information.

**C. D. PRESTON: Pondweeds of Great Britain and Ireland.**

Botanical Society of the British Isles c/o Natural History Museum, Cromwell Road, London SW7 5BD, UK, 1995, ISBN 0-901158-24-0.

**Contents:** history of pondweed studies in Britain and Ireland, nomenclature, synopsis of classification and arrangement of taxa, classification and evolution, hybridisation in *Potamogeton*, variation, chromosome numbers, structure, life history, ecology, the major pondweed habitats, pondweeds and birds, pondweeds and other organisms, distribution, pondweeds in horticulture, collection and preservation of material, keys, species accounts, guide to the literature, bibliography and glossary.



**R. KAUL: Johanniskraut. Botanik. Inhaltsstoffe. Qualitätskontrolle. Pharmakologie. Toxikologie und Klinik.**

Wissenschaftliche Verlagsgesellschaft mbH, Birkenwaldstrasse 44, D-70191 Stuttgart, Germany, 2000, ISBN 3-8047-1704-7.

St John's-wort, *Hypericum perforatum* became very popular medicinal plant in last decade above all due to its anti-depressive and anti-retroviral effects. This monograph by Ravindernath Kaul represents an attempt to provide the complex view on this plant. Only 14 pages are devoted to botany (especially pharmaceutical botany). However, the survey of secondary metabolites, quality control of drug, pharmacology, toxicology and clinical use is circumstantial. Valuable handbook for physicians, pharmacists and natural historians.

**P. M. A. TIGERSTED [ed.]: Adaptation in Plant Breeding. (Developments in Plant Breeding, vol. 4)**

Kluwer Academic Publishers, P. O. Box 17, AA Dordrecht, The Netherlands; 1997, ISBN 0-7923-4062-0.

Selected papers from the XIV EUCARPIA Congress on Adaptation in Plant Breeding held at Jyväskylä, Sweden from July 31 to August 4, 1995. Partly reprinted from *Euphytica*, vol. 92, Nos. 1-2, 1996. Papers are divided into ten groups: Genetic basis of adaptation, Climatic and edaphic adaptation, Mechanisms of adaptation, Host-parasite coevolution, Plant mixtures, Stress conditions, Breeding for wide adaptation, Breeding for low/high input, Breeding in case of global warming, Genetics resources for adaptation.