

## Book review

---

### **J. SECKBACH (Ed.): Evolutionary Pathways and Enigmatic Algae: *Cyanidium caldarium* (Rhodophyta) and Related Cells.**

Kluwer Academic Publishers, Dordrecht, Boston, London, 1994, 349 pp. Price: US\$ 205.00. ISBN 0-7923-2635-0.

Keys to solution of numerous evolutionary problems are undisputably hidden among algae. Enigmatic algae, or those difficult to classify taxonomically, attract attention. Origin of eucaryotic cells from cyanobacterium is the subject of symbiotic and membrane evolution theories. Glaucocystophyta, the eucaryotic cell with bluish-green chromatophores represent one of the models for symbiogenous evolution. *Nanochlorum eucaryotum* was isolated from terra rossa, but the question is, whether they are originally primitive or represent a reduced form of a higher developed species.

The main subject is an acid hot spring red alga *Cyanidium caldarium*. Several detailed studies are devoted to complicated taxonomic and phylogenetic relations. F. D. Ott and J. Seckbach classify this species with subclass Bangiophycidae, the Cyanidiales, the *Cyanidiaceae*. Physiological and biochemical studies are bringing knowledge about peroxisome function, nitrogen assimilation and natural products (polysaccharides, lipids, polyamines).

Studies of ultrastructure are devoted to cytoplasmatic organelles and chloroplast division. A knowledge on molecular organization and expression of plastid genome and photosynthetic pigments was obtained, too.

The book contains also the comprehensive bibliography on the genus *Cyanidium*.

This publication, written in an excellent way is not only intended for algologists and biologists interested in evolution, but also for cytologists, biochemists and physiologists.

M. REPČÁK

## Book review

---

**G. BRITTON, S. LIAAEN-JENSEN, H. PFANDER (Eds.): Carotenoids.**

**Volume 1A: Isolation and analysis.**

XXXIII+328 pp. Price: sFr. 138.- ISBN 3-7643-2908-4

**Volume 1B: Spectroscopy.**

XVI+360 pp. Price: sFr. 138.- ISBN 3-7643-2910-6

Birkhäuser Verlag, Basel, Boston, Berlin, 1995. Set Volumes 1A and 1B: sFr. 228.-

In the new series under the title "Carotenoids", six volumes are planned. The first volume, published in two parts, provides an introduction to carotenoids and to general methods of isolation and analysis and spectroscopic method as well. Carotenoids represent a group of plant pigments, which, originating from food, are present in animal kingdom, too. 175 year history of carotenoid chemistry is fascinating by its rapid progress. Synthetic carotenoids are produced industrially mainly because of their colouring properties.

High structural diversity of carotenoids is known, more than 600 different structures are derived from basic C<sub>40</sub> isoprenoid skeleton. Carotenoid functions are a consequence of their light-absorbing properties. Major biological importance in coloration, photosynthesis and photoprotection is well established. Carotenoids have proved to be a particularly valuable chemosystematic marker in microalgae.

Topics included in part A volume I are structure (basic skeleton and its diversity, stereochemistry-geometrical, optical and conformational isomerism, and absolute configuration), nomenclature (IUPAC-IUB rules) chemical derivatization (tests for the presence of function group). In the chapter: "Isolation and analysis" methods of extraction of biological material with regards to possibilities of artefacts rise are given.

Methods of chromatography (CC, TLC, HPLC, SFC) are dealt in detail. Separate chapter is devoted to elaborate examples of isolation and analysis.

Part B deals with electronic structure of carotenoids and methods of its elucidation (UV/Visible spectroscopy, circular dichroism, infrared spectroscopy, resonance Raman spectroscopy, NMR spectroscopy, mass spectrometry, X-ray crystallographic studies). Many examples are given in this chapter, too.

The book is intended for phytochemists, but it will be useful also for those, who work in the field of nutrition and medicine, food science, biotechnology, plant physiology, chemotaxonomy.

M. REPČÁK

### **New books received**

---

**HIDEAKI OHBA & SHINOBU AKIYAMA: The Alpine Flora of the Jaljale Himal, East Nepal.**  
The University Museum, The University of Tokyo, Tokyo, Japan; 1992. (Nature and Culture, No. 4) ix+83 pp., 2 text figs., 8 pls. ISSN 0915-6445.

**COPE T. A. & HOSNI H. A.: A Key to Egyptian Grasses.**  
Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, UK; 1991. vi+75 pp. 11 pages of line drawings. Soft cover. Price: GBP 8.00. ISBN 0 947643 35 4.

**ROUBIK D. W. & JORGE ENRIQUE MORENO P.: Pollen and Spores of Barro Colorado Islands.**  
Missouri Botanical Garden, St. Louis, Missouri, USA; 1991. (Monographs in Systematic Botany, vol. 36), iv+270 pp. incl. 97 pls. ISSN 0161-1542.

**RAULERSON L. & RINEHART A. F.: Ferns and Orchids of the Mariana Islands.**  
Lynn Raulerson and Agnes Rinehart, P. O. Box 428, Agana, Guam 96910, USA; 1992. 138 pp. ISBN 1-878453-09-2.

**NAITHANI H. B.: Flowering plants of India, Nepal & Bhutan.**  
Surya Publications, 4-B, Nashville Road, Dehra Dun - 248001 India; 1990. viii+711 pp. ISBN 81-85276-20-X.

**JEANMONOD D. & GAMISANS: Scrophulariaceae. [In: JEANMONOD D. & BURDET H. M. (Eds.): Compléments au Prodrome de la Flore Corse.]**  
Conservatoire et Jardin botaniques, Ville de Geneve, Switzerland; 1992. 234 pp. ISBN 2-8277-0809-4.

**KOHNS P., NEUMANN H., RÜCKBRODT D., SALKOWSKI H.-E. & STARK CH.: Verbreitung und Gefährdung der Orchideen in Rheinland-Pfalz und im Saarland.**  
Arbeitskreis Heimische Orchideen, Rheinland-Pfalz/Saarland e. V., Koblenz, Germany; 1990. 144 pp. ISBN not given.

**RHEINBERGER H.-J. & RHEINBERGER B. [Photos: WALSER K.]: Orchideen des Fürstentums Lichtenstein.**  
Regierung des Fürstentums Liechtenstein, Vaduz, Lichtenstein; 1991. (Naturkundliche Forschung im Fürstentum Liechtenstein, Band 13), 235 pp. ISBN not given.

**GRIEM B., REIDENBACH M. & REINECKE F.: Verbreitung der Orchideen in Schleswig-Holstein.**  
Arbeitsgemeinschaft Heimische Orchideen Schleswig-Holstein, Kiel, Germany; 1989. 95 pp. ISBN not given.

## **New books received**

---

**PANKHURST R. J. & MULLIN J. M.: Flora of the Outer Hebrides.**

HMSO Publications Centre, P.O.Box 276, London SW8 5DT, UK; 1994. vi+186 pp. Price: GBP 22.95. ISBN 0 11 310047 7.

**KENT D. H.: List of Vascular Plants of the British Isles.**

Botanical Society of the British Isles, 24 Glaphorn Road, Oundle, Peterborough PE8 4JQ, UK; 1992. xvi+384 pp. ISBN 0 90115 821 6.

**SCHRÖDER E.: Der Vegetationskomplex der Sandtrockenrasen in der Westfälischen Bucht.**

Westfälisches Museum für Naturkunde, Sentruper Straße, 48161 Münster, Germany; 1989. 95 pp. (Abhandlungen aus dem Westfälischen Museum für Naturkunde, 51. Jahrgang, Heft 2.). ISSN 0175-3495.

**JAKUBOWSKA-GABARA J.: Recesja zespołu świetlistej dąbrowy *Potentillo albae* - *Quercetum* Libb. 1933 w Polsce.**

Wydawnictwo Uniwersytetu Łódzkiego, Łódź, Poland; 1993. 191 pp. ISBN 83 7016 722 5.

**FISCHER E.: Systematik der afrikanischen Lindernieae (Scrophulariaceae) (Tropische und subtropische Pflanzenwelt, Band 81).**

Akademie der Wissenschaften und der Literatur, Mainz. Franz Steiner Verlag Wiesbaden GmbH. Postfach 10 15 26, D-7000 Stuttgart 10, Germany; 1992. 365 pp. Price: Kart. DM 98,-. ISBN 3 315 06235 1.

**GRAYUM M. H.: Comparative External Pollen Ultrastructure of the Araceae and Putatively Related Taxa. (Monographs in Systematic Botany from the Missouri Botanical Garden, vol. 43)**

Missouri Botanical Garden, St. Louis, Missouri 63166-0299, USA; 1992. vi+167 pp. ISSN 0161 1542. ISBN 0 935868 60 7.

**Flora of Australia. Vol. 4. Phytolaccaceae to Chenopodiaceae.**

Australian Government Publishing Service, Wentworth Avenue, Kingston ACT, GPO Box 84, Canberra ACT 2601, Australia; 1984. x+354 pp. ISBN 0 644 03443 2.

**Flora of Australia. Vol. 29. Solanaceae.**

Australian Government Publishing Service, Wentworth Avenue, Kingston ACT, GPO Box 84, Canberra ACT 2601, Australia; 1982. vii+208 pp. ISBN 0 642 07015 6.

**SAXENA M. R.: Palynology.**

Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi, Bombay, Calcutta, India; 1993. viii+127 pp. ISBN 81 204 0803 9.

## Book reviews

---

### **J. B. HARBORNE (Ed.): The Flavonoids. Advances in Research since 1986.**

Chapman & Hall, London, Glasgow, New York, Tokyo, Melbourne, Madras, 1993, xii+ 676 pp. Clothbound. Price: GBP 195.00. ISBN 0-412-48070-0.

Original work "Flavonoids" was published in 1975. Supplements to this work "Advances in Research" covering the period of 1975-1980 were published in 1982 and the period 1981-1985 in 1988. The book under review brings supplements from the period 1986-1991.

Flavonoids are secondary metabolites often present in plant kingdom. In plants that synthesize and accumulate them they have protective function. Knowledge on their distribution contribute considerably to solution of taxonomic problems. Biological activities of flavonoids allow their medicinal use.

The work presented rose through collaboration of a twenty-member collective. The editor of the work is Jeffrey B. Harborne, Professor of Botany at Reading University (UK), who is undisputably the most important specialist in this field nowadays. Knowledge on flavonoid chemistry and biology are found in 15 chapters. The first nine chapters are devoted to particular flavonoid groups. The attention is paid above all to methods of isolation and identification, structural elucidation, natural sources and taxonomic implication, biological properties etc. Proportion is, of course, different in particular groups, related to different degree of research state. Chapter 10 is devoted to one of the most actual analytical methods - <sup>1</sup>H-NMR spectroscopy of flavonoids. Finally, the last four chapters deal with flavonoid biology. Plant species index and subject index help better orientation in the book.

Anthocyanins are water-soluble glycosides and acylglycosides of anthocyanidins, which are polyhydroxyl and polymethoxyl derivatives of 2-phenylbenzopyrylium (flavylium cation). The list of anthocyanidins includes 18 structures and anthocyanins 300 naturally occurring compounds.

Chapters devoted to flavans and proanthocyanidins, c-glycosylflavonoids, biflavonoid and triflavonoids give detailed account of new structures, their distribution and biological properties.

In flavonoids, phytoalexins represent a great group with considerably different structure and limited distribution in plant kingdom. The number of known isoflavonoid aglycones increased up to 870. In most cases they occur in subfamily *Papilionidae* of the *Leguminosae*. It is interesting that, besides sporadic occurrence in another families of Dicotyledones, they are often present in *Iridaceae*.

The book even includes a chapter on neoflavonoids, a group which is not well-known and to which 4-arylcoumarins and neoflavones are included firstly. Data on their synthesis and X ray crystal structures are given in detail.

Flavones and flavonol aglycones are dealt in separate 7<sup>th</sup> chapter and their glycosides in 8<sup>th</sup> chapter. In aglycones within the framework of structural patterns of the known flavones and flavonols both hydroxyl and methoxyl substitution esters and compound with complex substitution (c-methyl-, methylenedioxy-, isoprene-, pyrano- and furanoflavonols) etc. are characterized.

The improvement of methods of separation and purification of flavone and flavonol glycosides, above all high performance liquid chromatography (HPLC) and centrifugal partition

chromatography (CPC) led to isolation and identification of new glycosides (120 flavone, 234 flavonol). Number of structures is increased by acetylated derivatives and sulphur conjugates. Considerable attention is paid to distribution patterns in this chapter. Chalcones, aurones, dihydrochalcones, flavonone and dihydroflavanols are included together in chapter "The minor flavonoids". Knowledge on flavonoid biosyntheses in the period evaluated was increased in several specific steps, e. g. formation of 3-deoxyanthocyanins and 5-deoxyflavonoids, synthesis of pterocarpanes, formation of flavonoid sulfate esters, aromatic acylation of anthocyanins. New enzymes, their induction and regulations were characterized.

In genetics of flavonoids new knowledge on structural genes concerning individual steps in the biosynthesis of the different flavonoid classes and genes controlling individual steps in flavonoid modification was obtained. Genetics of some regulatory genes was characterized and their molecules isolated.

The chapter "Flavonoids and flower colour" belongs to the most interesting ones. Primary, secondary and tertiary structures of anthocyanes are described from the point of view of flower colour. Molecular complexes including the effect of copigmentation are explained in detail.

The last chapter "The impact of plant flavonoids on mammalian biology" brings knowledge about biological activities in the following topics: effect of flavonoids on mammalian enzyme systems, flavonoid modulation of immune and inflammatory cell functions, effects of flavonoids on smooth muscle, antitoxic and hepatoprotective effects of flavonoids, effect of flavonoids on other cells, antiviral effects of flavonoids, endocrine effects of flavonoids, effect of flavonoids on lipid peroxidation and oxyradical production, cancer related properties of flavonoid.

All the chapters are well prepared. As it was given, literature survey on flavonoids covering six-year period is complex. Due to these reasons this book is valuable contribution to libraries of chemists of natural compounds, botanists - taxonomists, biochemists, plant physiologists and also medicinal chemists.

M. REPČÁK

---

#### **D. J. RAWLINS: Light Microscopy.**

Biosis Scientific Publishers, Oxford, 1992, 144 + xii pp, 46 line illus., 3 colour plates, 27 half tones, 7 tables. Paper back. Price: GBP 15, US\$ 30. ISBN 1 872748 11 2.

Nowadays, light microscope is a part of basic equipment in biological sciences. It often happens that scientific workers, users of light microscopy, do not follow, for various reasons, progress in the field of light microscopy, and even do not think much of getting the best image possible, until they study finest structures under highest magnifications.

This useful handbook provides reader with a survey of basic knowledge on modern light microscopy and teaches him to use light microscopy correctly in order to get out of the specimen as much as possible.

The book, especially its first part is intended to novice to light microscopy and this influences its structure. The book is divided in two parts and eleven chapters.

Part 1: "Basic Principles and Methods" begins with a chapter "What Sort of Microscopy Should I Use?". In this chapter a scheme, leading the reader to answer the question given in the chapter title is found. In the chapter 2: "Microscope Optics" principles of magnification, image formation and resolution are explained. In chapter 3: "Components of a Microscope" a compound microscope is described and information on various types of its major parts is given here. Chapter 4: "Types of Imaging With the Light microscopy" provides a survey of particular

imaging methods together with principles how do they work. In the chapter 5: Three-dimensional microscopy the ways of obtaining information on 3-dimensional structure of a specimen are described. Physical sectioning and optical sectioning, a recent method, are compared. Principles of confocal microscopy and two types of confocal microscopes are described. The chapter ends by the notes on possibilities of optical sectioning with conventional microscope and three-dimensional reconstruction.

Part 2: "Techniques and Applications". Since even the most sophisticated microscope cannot make a poor specimen into a good one, in this part the handbook brings some useful advice concerning preparing of a specimen - both unfixed and fixed and basic knowledge of histological techniques is given as well. This is followed by chapter on correct use of microscope controls, and an important chapter on setup procedure for particular types of microscopy together with troubleshooting. Different imaging modes are compared and it is shown that their combination gives enhanced information on specimen over using just a single technique. Chapters on counting and measuring down microscope, basic measurement techniques, equipment needed for counting, types of micrometers, photomicrography and video microscopy are the last chapters in the book and are followed by Appendices and Index. References follow particular chapters.

In the end, I would like to recommend the book both to novice and to experienced workers as a source of information and a practical guide how to avoid various mistakes in light microscopy.

L. MIHOKOVÁ

---

### **C. A. KEARNS & D. W. INOUE : Techniques for Pollination Biologists**

University Press of Colorado, Niwot, Colorado, 1993, 496 pp., Price: US\$ 22.50; ISBN 0-87081-281-5.

Techniques for Pollination Biologists, an excellent handbook useful not only for pollination biologists but everyone dealing with plants, compiles all techniques and practical information needed for experimental studies.

This book is divided into eight chapters (1. Plants, 2. Flowers, 3. Pollen, 4. Nectar, 5. Mating Systems, 6. Animals, 7. Environmental Measurements for Pollination Studies, 8. Experimental Considerations) and four appendices (1. References to the Pollen Literature, 2. Sources of Equipment and Supplies, 3. Chemicals and Stains, 4. Computer Programs, 5. Glossary). Each chapter presents a concise review of the field, basic as well as the newest techniques such as e.g. fluorescence microscopy to examine pollen tube, high-pressure liquid chromatography for nectar analysis, nuclear magnetic resonance spectroscopy for identification of floral odor components, and electrophoresis or DNA fingerprinting allowing to genotype of individual plants, and at the end of the chapter very important advices summarized in "Suggestion for Planning Studies".

All aspects of pollination studies and all sophisticated methods included in this book will be very valuable to evolutionary and behavioral biologists, ecologists as well as population geneticists.

R. BRUTOVSKÁ

## **New books received**

---

**STANFIELD D. P.:** *The flora of Nigeria. Grasses. (Second edition by J. Lowe).*

Ibadan University Press, University of Ibadan, Ibadan, Nigeria; 1989. xxii+326 pp., ISBN 979 121 217 9.

**MUKHERJEE P. K. & CONSTANCE L.:** *Umbelliferae (Apiaceae) of India.*

American Institute of Indian Studies and Oxford & IBH Publishing Co. Pvt.Ltd., 66 Janpath, New Delhi 110 001, India; 1993. viii+279 pp. Price: US\$ 59. ISBN 1 881570 26 6.

**HUNT D. (comp.):** *CITES Cactaceae Checklist.*

Royal Botanic Gardens Kew & International Organization for Succulent Plant Study; 1992. 190 pp. Soft Cover. Price: GBP 10.00. ISBN 0 947643 42 7.

**Flôre de la Nouvelle-Calédonie 19. WHITE F.:** *Ébénacées, VINK W.:* *Wintéracées.*

Muséum National d'Historie Naturelle, Laboratoire de Phanérogamie, 16 rue Buffon, 75005 Paris, France; 1993. 176 pp. ISBN 2 85654 196 8.

**RAULERSON L. & RINEHART A.:** *Trees and Shrubs of the Northern Mariana Islands.*

Coastal Resources Management, Office of the Governor, Commonwealth of the Northern Mariana Islands, Saipan, Northern Mariana Islands 969650; 1991. i+120 pp. ISBN 1 878453 08 4.

**GAMISANS J. & JEANMONOD D.:** *Catalogue des plantes vasculaires de la Corse. (Complements au prodrome de la flore Corse. Annexe no. 3)*

Conservatoire et jardin botaniques de la Ville de Geneve, Switzerland; 1993. 258 pp. ISBN 2 8277 0810 8.

**JERMY C. & CAMUS J.:** *The Illustrated Field Guide to Ferns and Allied Plants of the British Isles.*

Natural History Museum Publications, British Museum (Natural History), Cromwell Road, London SW7 5BD, United Kingdom; 1991. xiv + 194 pp. ISBN 0 565 01172 3.

**GWYNN ELLIS R.:** *Aliens in the British Flora. An account of some of our plant invaders. (British Plant Life, Number 2).*

National Museum of Wales, Cathays Park, Cardiff CF1 3NP, United Kingdom; 1993. 48pp. ISBN 0 7200 0374 1.



**CHAPMAN G. P. (Ed.): Desertified Grasslands. Their Biology and Management.** (Linnean Society Symposium Series, Number 13).

Academic Press for the Linnean Society of London. Academic Press Limited, 24/28 Oval Road, London NW1 7DX, United Kingdom; 1992. xiv+361 pp. ISBN 0 12 168570 5.

**CHING RENCHANG SHING KUNGHISIA (Ed.): Flora Reipublicae Popularis Sinicae. Tomus 3 (1). Pteridophyta.**

Science Press, Beijing, China; 1990. x+307 pp. ISBN 7 03 001521 5.

**SQUIRES V. R. & AYOUB A. T.: Halophytes as a Resource for Livestock and for Rehabilitation of Degraded Lands.** (Tasks for vegetation science 32).

Kluwer Academic Publishers, Marketing Department, P. O. Box 989, 3300 AZ Dordrecht, The Netherlands; 1994. xiv+318 pp. Price: Dfl 375.00, US\$ 215, GBP 142.50. ISBN 0 7923 2664 4.

**PAVLIK B. M., MUICK P. C., JOHNSON S. G. & POPPER M.: Oaks of California.**

Cachuma Press, P. O. Box 560, Los Olivos, California 93441, USA; 1991. 184 pp., 150+ color photos; 15 historic b&w photos; 10 orig. watercolor illustr., 8 color range maps, 7 color oak destination maps. Paper. Price: US\$ 21.95. ISBN 0 9628505 1 9.

**ZULOAGA F. O., NICORA E. G., RÚGOLO DE AGRASAR Z. E., MORRONE O., PENSIERO J. & CIALDELLA A. M.: Catálogo de la Familia Poaceae en la República Argentina.** (Monographs in Systematic Botany from the Missouri Botanical Garden vol. 47).

Missouri Botanical Garden, P. O. Box 299, St. Louis, MO 63166-0299, USA; 1994. xi+178 pp. Hardcover. Price: US\$ 18.00. ISBN 0 915279 21 5. ISSN 0161 1542.

**WADDICK J. W. & YU-TANG Z.: Iris of China.**

Timber Press, Inc., 9999 S. W. Wilshire, Suite 124, Portland, Oregon; 1992. 192 pp. Hardcover. ISBN 0 88192 207 2.

**D'ORIO DE BOLOS & ANGEL M. ROMO: Atlas Corologic de la Flora Vascular dels Paisos Catalans.**

Institut d'Estudis Catalans, Carme 47, Barcelona, Spain; 1991. ISBN 84 7283 175 2.

**GELVIN S. B. & SCHILPEROORT R. A.: Plant Molecular Biology Manual.**

Kluwer Academic Publishers, P. O. Box 17, 3300 Dordrecht, The Netherlands; 1994. ISBN 0 7923 2858 2.