

Book review

M. DANIEL & R. P. PURKAYASTHA (Eds.): Handbook of Phytoalexin Metabolism and Action.

Marcel Dekker, Inc., New York, Basel, Hong Kong; 1995, XII+615 pp. 195 USD. ISBN 0-8247-9269-6.

More than fifty years is studied the role of postinfectional production of phytoalexins in plants. In the introductory chapter of R. P. PURKAYASTHA phytoalexin are defined "...as an antimicrobial, low molecular weight, secondary metabolite formed de novo as a result of physical, chemical, or biological stress which resists or suppresses the activity of invaders, and its rate of production/accumulation depends either on host genotypes or both host and pathogen genotypes."

Elicitation of phytoalexin synthesis is induced by an elicitor, but very little is known about its structure e. g. heptaglucoisides. Relation of phytoalexin and plant antigens to disease resistance differs host-parasite systems. Higher production and accumulation of phytoalexin in the absence of antigens indicated resistance reaction. In a susceptible cultivar sometimes chemical induction alter antigenic pattern of host and also stimulates phytoalexin production. The control of both, production of phytoalexin and host-pathogen antigens of compatible and incompatible interactions depends on specific combination of their genes. On the other hand pathogen can escape the defence reaction of host plant by suppression of the expression of responsible genes.

The "Handbook" comprises twenty five papers written by fifty two contributors, specialist from leading laboratories. A considerable part of monograph is devoted to the methods of study of phytoalexins (biotic and abiotic elicitation, bioassay and biotest, isolation, identification and quantification of phytoalexin, etc.). Many chapters deal with important crops, such as barley, pea, soybean, cotton, groundnut, *Brassica*, *Citrus*, *Vitis*, *Phaseolus*, *Vigna*, lucerne, sweet potato, tea, pepper, sesame, rice and other economically important species.

"Handbook of phytoalexin metabolism and action" represent an important source of information for phytopathologists as well as researchers in plant physiology, plant biochemistry, natural product chemistry, chemotaxonomy and plant breeders.

M. REPČÁK

Book review

S. D. J. PENA, R. CHAKRABORTY, J. T. EPPLEN & A. J. JEFFREYS (Eds.): DNA Fingerprinting: State of Science.

Birkhäuser Verlag AG, Klosterberg 23, P.O. Box 133, CH-4010 Basel, Switzerland; 1993, 480 pp. Price: sFr. 118, DM 136, \$ 93. ISBN 3-7643-2906-8.

The book reviews basic knowledge on the nature, genomic arrangements and variability of tandem repeated DNA sequences and the use of DNA fingerprinting in different research fields of biology and medicine and its applications to concrete biological, medicinal and social problems.

The content of the book is divided into three main parts. The first part deals with basic aspects of DNA fingerprints as genomic organization dynamics and variability of tandemly repeated DNA sequences, especially in mammalian genomes and brings new methodological and technical approaches to the study of genome variation as arbitrary primed PCR fingerprinting and analysis of PCR products by acidic non-gel capillary electrophoresis. The second part is devoted to the application of DNA fingerprinting to the study of human populations and paternity testing and forensic applications. The third part deals with the application of DNA fingerprinting to the study of microorganisms, plants and animals as a sensitive method for detecting genetic variation as a useful tool in population genetics, taxonomy and evolutionary studies.

This book, which reviews and presents new research data, is highly informative in all specific target areas and answers a long-standing need for an authoritative text in DNA fingerprinting.

E. ČELLÁROVÁ

Book review

G. T. PRANCE & A. E. PRANCE: Bark. The formation, characteristics, and uses of bark around the world.

Timber Press Inc., Oregon, USA; in association with The Royal Botanic Gardens, Kew; 1993, 174 pp. incl. many colour photographs, price: US\$ 49,95. ISBN 0-88192-262-5.

Bark is often thought to be a dull, plain covering for trees but in fact it is an amazingly varied and subtly beautiful part of nature that provides humans, insects and animals with a multiple of important products. Authors show bark not to be only the protective covering but an important part of our everyday lives.

The book is divided into 17 chapters in which following topics are discussed. The description of the structure and function of bark is also well-shown in drawings. Bark gives the tree its characteristic appearance and that is the reason of importance of bark for tree identification especially in tropic region. The diversity of pattern, colour and texture found in bark as the result of adaptation to the environmental conditions is astonishing.

In separated chapters bark-derived products such as latexes, resins, tannins, medicines and poisons, hallucinatory compounds, flavouring for food, and cork are briefly described. Creative ways in which bark has been used include making cloth and canoes, providing fibre and fuel as well. Besides describing bark products usage in the past and present, possibilities of utilization in future are also given.

Bark plays an important role as an ecological niche for numerous organisms - fungi, lichens, mosses, ferns, epiphytes, insects, frogs, reptiles, birds and mammals.

Each chapter is completed with many high-quality photographs by K. B. SANDVED. Principles of successful taking photographs of bark are briefly outlined.

Written in an easy-to-read style it is intended for students and all who want to get concise and easy accessible answers to bark concerning questions.

Z. JASENČÁKOVÁ

Book reviews

A. J. BAKER, J. PROCTOR & R. D. REEVES (eds.): The vegetation of ultramafic (serpentine) soils.

Intercept Limited, Andover, 480 pp., GBP 47.50, ISBN 094 6707 62 6.

The book reviewed consists of papers presented at the First International Conference of Serpentine Ecology at University of California in Davis, 19.-22. June 1991. Nowadays, the ultramafic vegetation excites today many evolutionists, florists, ecologists and physiologists of the world. Places with ultramafics are especially interesting for scientists studying mechanisms of resistance to selected elements (magnesium, nickel etc.) and their hyperaccumulation, models of variability in such territories, rich endemic flora following from refugial character of such regions.

The book includes broad spectrum of such studies, issuing from geological problem of serpentinites. (R. G. COLEMAN and C. JOVE). Numerous studies on endemic flora of these territories over the all world are included (Thus A. R. KRUCKEBERG reviews Western North American serpentine biota, A. BORHIDI brings summarization of serpentine flora and vegetation of Cuba, T. JAFFRÉ contributes with the paper on diversity of vegetation of ultramafics of New Caledonia, region especially important and extant area of serpentines. R. D. REEVES deals with New Zealand serpentine flora. Another numerous contributions give picture of many world serpentine floras (e.g. of Scandinavian, South African and Italian).

Great attention is paid to hyperaccumulation phenomena, important for phytoremediation in our contaminated environment, e. g. R. D. REEVES's paper on hyperaccumulation of nickel by serpentine plants. Other paper present study of physiological mechanism of resistance of ultramafic species to toxicity of serpentine site soils, e.g. A. I. ROBERTSON's contribution on nickel toxicity in some Zimbabwean plants or H. SCHAT and W. M. TEN BOOKUM's paper on metal tolerance syndromes studied especially on *Silene vulgaris* and *Agrostis capillaris* examples

Contributions on specific serpentine endemic species are included as well. Thus M. R. MAC NAIR studies serpentine endemic species *Mimulus nudatus* or A. WESTERBERGH and A. SAURA analyse population structure of serpentine populations of *Silene dioica* in Scandinavia. Transplant experiments (paper of C. I. GODWIN-BAILEY, S. R. J. WOODSELL and B. C. LOUGHMAN) were employed to study reaction of *Armeria maritima* accounting for its wide resistance on soils with high concentrations of ions (magnesium, sodium, copper, lead and zinc).

Special contributions are describing ultramafic vegetation in various parts of world with respect to variable ecological factors. Strictly physiological contributions such as paper of R. A.

TIBBETTS and J. A. C. SMITH are present as well. Careful analysis of causes of serpentine tolerance can be found in a paper of P. L. FIEDLER pointing out how little we know about the specifics and circumstances of serpentine adaptation.

Pluralism of approaches can be found in the book reviewed. It indicates the state of today's post-modern science generally with accent to multidisciplinary research and study of interdisciplinary branches of science. Study of ultramafic vegetation in its complexity is a challenge for finding and understanding of many basic processes forming our world. It is also a chance for better understanding extinction phenomena and for nature protection management as well.

V. MIKOLAŠ

A. BLAUFUSS & H. REICHERT: Die Flora des Nahegebietes und Rheinhessens

Selbstverlag der POLLICHIA, Pfalzmuseum für Naturkunde, Hermann Schäferstrasse 17, 6702 Bad Dürkheim, 1992, 1061 pp. Price: 50 DM. ISBN 3-925754-25-3

The publication represents a wide study dealing with the flora of Nahe-Gebiet and Reihessen regions. It has two parts - general and systematic.

The general part is divided in 6 chapters. In the chapter 1 reasons leading to writing of this publication, exactly defined goals of the work and information on large number of co-operators and informants are given. In the next chapters (2, 3 and 4) spatial division of the regions according to nature conditions can be found, geological and geomorphologic structure of the territory and climatic conditions are dealt with in detail. Chapter 5 gives the characteristics of particular biotopes together with typical ecological species groups. Chapter 6, which is written in interesting way, brings historical survey of floristic research of the region from middle ages up to nowadays. It is very nice that the authors devoted special attention to the most important personalities (altogether 75) and they mention not only their work, but short biography as well.

Systematic part is devoted to detailed characteristics of particular plants. It is divided in three chapters. The first one contains introductory information and explanatory notes. The most important part is the chapter 2 with detailed characteristics of indigenous constant plant species (first sporophyte and then spermatophyte plants are given).

The following data are given for each species: scientific name with author of description, German name, number of plants, data on frequency of occurrence for all the area mapped, ecological characteristics (biotope, unavoidable factors of environment), detailed description of current distribution (data not older than 1950), in rare species the list of places of occurrence together with data from finders, or with reference to literature data. In rare species the occurrence before 1950 is mentioned as well, on the basis of literature data. Taxonomic notes do not miss if necessary. However, plant description and determination characters are not present, so the publication cannot serve as a key. Chapter 3 comprises list of ephemerophytes found in the region.

The publication can be evaluated as valuable comprehensive piece of work not only giving the picture of actual species presence but outlining in excellent way the genesis of floristic

research in the respective floristic regions as well. With regards to its high professional level the book is intended exceptionally for specialists from the field of botany and phytocoenology.

The book is illustrated by colour photographs and maps of distribution of particular taxa in the form of additions. The maps are arranged in alphabetical order according to Latin names of the taxa. The list of literature comprises 627 items. The publication is completed by index to names of botanists and index to Latin and German plant names.

P. KELBEL

MOU-TUAN HUANG, TOSHIHIKO OSAWA, CHI-TANG HO, ROBERT T. ROSEN (Eds.): Food Phytochemicals for Cancer Prevention I. Fruits and Vegetables.

ACS Symposium Series, ISSN 0097-6165, 546. American Chemical Society, Washington, DC, USA; 1994, XII+427 pp., clothbound, ISBN 0-8412-2768-3.

Human and animal epidemiological studies have indicated large number of naturally occurring antimutagens and anticarcinogens in food. These compounds can inhibit tumor initiation, promotion and progression in several experimental animal models. Cancer is preventable. Many phytochemicals are protective against initiators, which cause mutation, e. g. micronutrients. Inhibitory effect on chemically induced carcinogenesis have been demonstrated in allylic compounds, isothiocyanates, indoles, monoterpenes, vitamins, carotenoids, chlorophyll, flavonoids and cinnamic acids.

Food phytochemicals may affect the biotransformation of xenobiotics. The action can be selective on specific enzymes, especially on different form of cytochrome P450 enzymes. Dietary chemicals may influence the toxicity and carcinogenicity of environmental chemicals.

Popularity of compounds from garlic, onion and other *Allium* plants as "cure-alls" stimulated investigation of their organosulfur and other compounds. Methods of isolation, identification and analysis and possible mechanisms for the inhibition of tumor formation are described. Individual chapters provide also information about limonoids (triterpene derivatives of *Citrus*), compounds of green coffee bean oil, celery seed oil, citrus flavonoids, coumarins of *Umbelliferous*, chlorophyllin (derivative of chlorophyll), phtalides, polyacetylenes, terpenoids, ellagic acid, gallotannins, ellagitannins, proanthocyanidins, soybean saponin and isoflavonoids etc.

CHI-TANG HO, TOSHIHIKO OSAWA, MOU-TUAN HUANG, ROBERT T. ROSEN (Eds.): Food Phytochemicals for Cancer Prevention II. Teas, Spices, and Herbs.

ACS Symposium Series ISSN 0097-6156, 547. American Chemical Society, Washington, DC, USA; 1994, XII+ 370 pp., clothbound, ISBN 0-8412-2769-1.

Volume II provides recent research data about antimutagens and anticarcinogens in teas, spices and medicinal plants. Green tea is the product from fresh *Camelia sinensis* leaves, containing polyphenols (-)-epicatechin, (-)-epigallocatechin and their gallate conjugates. During the enzymatic oxidation of leaf polyphenols dark theaflavins and thearubigens are formed in black

tea. These polyphenolic compounds have anticarcinogenic activity in many laboratory animal models in vivo. The galloyl moiety is important for their strong inhibitory effect of HIV reverse transcriptase. Prophylactic effect of tea polyphenols especially on colon carcinogenesis is reviewed as well as the effect on blood rheology in rats.

Many hydroxylated and heterocyclic aromatic compounds are anticarcinogenic antioxidants. The major role of these anticarcinogens is inhibition of oxidative processes. Antioxidative compounds were found in tea, rosemary (carnosol, carnosic acid), sage, licorice and other *Compositae* and *Labiatae* herbs. 2''-O-glycosyl isovitexin from green barley leaf was identified to inhibit malonaldehyde formation. Marine edible algae is described as a source of new antioxidants.

The presented two volumes of American Chemical Society Symposium Series provide new valuable information for researchers in food science and oncology as well as in plant chemistry and chemotaxonomy, biochemistry and molecular biology.

M. REPČÁK

D. M. HILLIS & G. MORITZ (Eds.): Molecular systematics.

Sinauer Associates, Inc. Publishers, Sunderland, Massachusetts, USA; 1990, 588 pp. Price: GBP 29.90. ISBN 0-87893-280-1

The multiauthored book on molecular systematics answers a long-standing need for an update information on the principles, applications, and limitations of molecular techniques in systematics in its broad sense.

The book is organized into three main parts. The first part deals with sampling design and the use of molecular approaches in the studies of population structure, species boundaries and hybridization and phylogenetic relationships and describes unique procedures of collection and storage of plants and animals. The second part is devoted to different molecular techniques like isozyme electrophoresis, immunological techniques, molecular cytogenetics, DNA-DNA hybridization, restriction site analysis and DNA sequencing. Description of all these techniques contains general principles and a comparison with other methods, their applications and limitations followed by concrete protocols. The third part of the book deals with intraspecific differentiation. Genetic and statistical sampling, modelling and statistical methods for both, fixed and random populations are involved.

This book will guide beginners all the way through a molecular systematic study and will provide nonmolecular systematists with new ideas, techniques and approaches.

E. ČELLÁROVÁ

D. M. VAN GELDEREN, P. C. DE JONG & H. J. OTERDOOM: Maples of the World.

Timber Press, Portland; 1994, 458 pp., 207 colour pl., numerous illustr., 2 maps, black-white photogr. and diagrams. GBP. 45. ISBN 0-88192-000-2.

A monograph of maples of the world is published. This big book is the first modern account of all maples, both natural and cultivated, including numerous cultivars. Professional nurseryman and coowner D. M. VAN GELDEREN, taxonomist and dendrologist P. C. DE JONG and dendrologist Dr. H. J. OTERDOOM are authors of the book reviewed. Attention is paid to descriptions of species and cultivars. Complete account is thus available for the first time for all horticulturalists, botanists and nature lovers.

Brief information on maple names, native habitats and distribution, some useful products, employment of the species in landscape formation and time of flowering is given in chapter 1. Another chapters assay on propagation of maples, maple diseases and pests and morphology, anatomy, cytology, chemistry and allelopathy of the species.

Very brief information on palaeobotany and evolution of maples and taxonomy and reproductive behaviour of the species of the genus *Acer* is given. A key to the sections and series of the genus is included as well. Basic chapter with careful descriptions and information on the species of 16 sections of the genus, and chapters on maple hybrids and cultivars follows. Descriptions of the species include information on scientific names, synonyms, type, origin of epithet, illustrations and careful description (habit, leaves, inflorescence, flowers, fruits, barks and buds), following information on hardiness, autumn colour, distribution, chromosome number, taxonomy of the species, cultivars and references. There is, of course, some inexactness, e. g. *Acer tataricum* is growing also in Slovakia, bibliographical citations are often somewhat incorrect (e. g. is missing or mutilated name of journal etc.). Taxonomist can be (also) critical to taxonomical account of many species. If we realize the extent of the work included, it is evident that such little mistakes can hardly be missing.

In appendices short account on Japanese names and their meanings (by J. D. VERTREES), spelling of some Chinese localities, information on important nurseries planting maples and Dr. D. O. WIJNANDS's paper on nomenclatural history of *Acer mono* and *Kalopanax septemlobus* and related names are given. Herbarium abbreviations, hardiness zone maps and photograph locations follow. Glossary, bibliography and indexes close the book. Fine illustrations prepared by Mrs. I. LANGEVOORT - DE MAARÉ and beautiful colour photographs of J. R. P. VAN HOEY SMITH complete the book.

The book is indispensable for every horticulturalist, botanist and everybody interested in trees, world of gardens and parks, and nature in general.

V. MIKOLAŠ

B. OLLGAARD & K.TIND: Scandinavian Ferns.

Rhodos, Copenhagen, 1993; 317 pp., 114 colour pl., 103 fig. (illustr. and 4 maps). Price is not given. ISBN 87 7245 532 2.

The book reviewed is of unusually big format attracting by colour plate of *Polypodium vulgare* on a cover of the book. It is written by outstanding Danish pteridologist BENJAMIN OLLGAARD, well known specialist in clubmosses of the world.

After brief information on characteristics of Pteridophyta, their chromosomes and genomes, hybrids, polyploidy, apogamy, scientific names and keys to Scandinavian Pteridophytes - families and genera, the main part of the excellent book follows: description of concrete (17) families, genera and species. In every species careful description is given, followed by variation and relationships, distribution (in Scandinavia and generally), ecology and name etymology and national names. In some cases also reproduction is added. In genera with 2 or more species also a key is present. Fine and congenial illustrations of K. TIND (and also colour plates) often accompany the text.

It is possible to point out unique character of the book reviewed. 72 Scandinavian species are described in detail with much specific features, including much correct information on life histories and specific adaptations of the species, speculating about causes of occurrence of many of them in specific microhabitats in the region, adding also possible histories of the species in the territory of Scandinavia. It is difficult to find some mistakes or inaccuracies in text that is well-balanced and sufficiently scientific, but understandable not only for botanists, but all lovers of nature, as well. The book is ended by glossary, explaining important terms to broad public interested in ferns and allies, bibliography (with attention to Scandinavian literature) and index.

To evaluate the book generally, it is necessary to point out that this is the first Scandinavian pteridological book written in English which in synthetic and understandable form summarizes present state of pteridological research with respect to Scandinavia. I hope the book will be very useful for everybody interested in beautiful world of not only Scandinavian ferns.

V. MIKOLÁŠ

H. HOFMEISTER & E. GARVE: Lebensraum Acker. Pflanzen der Äcker und ihre Ökologie

Verlag Paul Parey, Hamburg und Berlin; 1986, 272 pp., 422 fig., 24 col. phot., 19 tab., ISBN 3-490-17018-0.

The objective of this book is to cover the necessities of the information sources with up-to-date knowledge in botany and ecology. The actual area is presented in a very attracting form and supplemented with illustrations, graphs and photodocumentation.

The publication consists of three basic parts which are divided into several chapters. The introduction part explains in the encyclopaedic form the basic botanical terms, abbreviations and

brings morphological pictures of the diagnostic markers of individual plant parts which are decisive for the determination of the segetal flora. This part also contains a brief taxonomic review of the segetal taxa up to the family level.

The first part contains a taxonomic description of the segetal species within individual families along with pen-drawings on which the important differentiation markers (seeds, flowers, leaves, fruits) are expressed. In the second part the agrocomplex as a system of agriculture is characterized. This part also contains the statistical review of cultivated crops in Germany and a brief information of chorology and characteristic of archaeophytes, neophytes as well as a sorting of segetals on the base of rhizosphaere type.

A very important part of this book is that in which authors describe the segetal communities. On the page 50 the scheme of syntaxa of the segetal vegetation, family *Stellarietea mediae* with 4 orders, 7 alliances and 8 associations. This part is supplemented with association and synoptic tables and with a socio-ecological groups of segetal vegetation which are connected with particular soil substrates. The other part characterizes habitat conditions, climate and pedological conditions and brings categorization of the soil types and soil kinds with drawings of the soil profiles as well as other important factors of an agroecosystem.

The third part contains the problems of the protection of the segetal flora and phytogenofond in the agroecosystem in particular, and brings the red list of segetal taxa. Individual taxa are presented along with ecological factors according to the method of H. ELLENBERG.

The presented publication is, by virtue of its scope and depth, not only a review of the area of segetal flora but also a very good handbook for agriculturists, natural scientists, students and all those who are dealing with the problems of agroecosystems.

S. MOCHNACKÝ

K. BREMER, A. A. ANDERBERG, P. O. KARIS, B. NORDENSTAM, J. LUNDBERG & O. RYDING: Asteraceae. Cladistics and Classification.

Timber Press, Portland, 1994; 752 pp., with numerous illustr., tables and diagrams, 2 maps, USD 79.95. ISBN 0-88192-275-7.

The book reviewed represents one of the most important books in plant systematics of the last years. The family *Compositae* is the largest family of flowering plants and its cladistic classification is a result of numerous studies of outstanding specialist and taxonomist of the family, prof. K. BREMER and another *Asteraceae* specialists.

The book starts with introduction chapters devoted to cladistics, classification, morphology and evolution of the family. The main contribution, systematics of the family, follows. The family is divided into three subfamilies (*Barnadesioideae*, *Cichorioideae* and *Asteroideae*). While the first of them is not further divided, the second one consists of 6 tribes (*Mutisieae*, *Cardueae*, *Lactuceae*, *Vernonieae*, *Liabeae* and *Arctotetaeae*), the third subfamily *Asteroideae* is the greatest one (10 tribes: *Inuleae*, *Plucheae*, *Gnaphalieae*, *Calenduleae*, *Astereae*, *Anthemideae*, *Senecioeae*, *Helenieae*, *Heliantheae* and *Eupatorieae*). Modern cladistic analysis employs computer technology for phylogentic treatment of the family.

All taxonomic units are carefully characterized, altogether 1535 genera included in 3 subfamilies and 17 tribes. Important morphological characters, number of species and complete distribution in all genera are given. Book includes more than 50 cladograms and phylogenetic trees and numerous fine illustrations (habit by P. LIDMARK, details by Z. THUNBERG with assistance of E. PERSSON). The book is ended by long list of bibliography and index

Concrete opinions on systematic classification of the family can be discussed, but so large work can't be perfect and definitive. New classification of the tribe *Astereae* by G. L. NESOM was published in the meantime. Papers on cladistics and phylogenetic relations in the subtribe *Ambrosiinae* published recently (MIAO et al. 1995, KARIS 1995) bring new opinions on genera delimitations in group. But it is clear that detailed delimitation of many genera, subtribes etc. can bring new changes in the coming time, as well, especially with growing number of new, molecular systematic studies. The book, however, evidently introduced new category and standard for future analyses in the family and other systematic work, as well. In this way, the book surely can't be missing from any botanical library in the all world.

V. MIKOLÁŠ