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Book review

P. VIDHYASEKARAN: Bacterial Disease Resistance in Plants: Molecular Biology and Biotechnological Applications.

Food Products Press, An Imprint of The Haworth Press, Inc., New York, London, Oxford, 2002. 452 pp. with Index. ISBN: 1-56022-924-1 hard (1-56022-925-X soft). Price: 110.95 USD hard (59.95 USD soft). URL: http://www.haworthpressinc.com.

Bacterial diseases are undoubtedly a serious problem for production of various crops. Effective chemical control is unknown-application of antibiotics is not recommended due to risk of induction of new resistant clones of human diseases bacteria. Gene crop resistance to bacterial diseases is limited due to possible co-occurrence of several different strains of respective bacterial pathogens. Progress in molecular biology of bacterial pathogenesis, especially study of signal transduction system involved in plant defense reaction to pathogen metabolites have led to hopeful results in disease management.

Six chapters show in detail theoretical and practical aspects of molecular biology of bacterial pathogenesis and biotechnological applications of the latest results in this area: 1. Molecular Recognition Processes Between Plant and Bacterial Pathogens, 2. Host Defence Mechanisms: The Cell Wall – the First Barrier and Source of Defence Signal Molecules, 3. Active Oxygen Species, 4. Inducible Plant Proteins, 5. Inducible Secondary Metabolites, 6. Biotechnological Applications: Molecular Manipulation of Bacterial Disease Resistance.

The presented book is very valuable source for specialists and also students in such branches of plant science as plant pathology, plant physiology, plant molecular biology, plant biochemistry and others.

M. SUVÁK

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Book reviews

W. Czechowski, A. Radchenko, W. Czechowska: The Ants (Hymenoptera, Formicidae) of Poland.

Museum and Institute of Zoology PAS, Warszawa 2002. 200 pp. with 101 figures (maps), 6 tables and 20 plates of drawings. ISBN 83-85192-98. Price: 25.00 USD. URL: http://www.miiz.waw.pl/books/ants/index.php?lk=ind&jk=en.

The significance of ants in terrestrial ecosystems is unquestionable. They are considered as the ultimate and most complex group in insect development. This social insect is very widespread on Earth, adapted to various environmental conditions. Its impact to other animals, plants and abiotic components of ecosystems is remarkable. Nevertheless actual myrmecological literature dealing with ant species of Central Europe is difficult to find. Therefore this complex book of polish myrmecofauna is very valuable.

This work is divided into Introduction, Survey of species, Characteristics and regional diversity of the myrmecofauna, Key for identification and References.

The survey of species shows 98 ant species occuring in Poland. Description of each species include synonyms of valid name, general distribution and distribution in Poland and short description of biology. Maps illustrate distribution of each respective species in Europe, Palearctic, and in Poland (divided into 20 geographical regions). Occurence of each species in Poland is documented by all relevant faunistic literature data since 1780.

The second part discusses distribution of polish myrmecofauna from the viewpoint of zoogeographical and ecological classification.

Key for identification enables determination of all 98 ant species occuring in Poland. It consists of text and 20 plates of illustrations. Missing only is data on males in species of genus *Leptothorax* and *Lasius*.

The ants of Poland is based on the latest taxonomical revisions and tries to use complete data on ant species occurence in Poland. Moreover it contains taxonomic keys applicable not only in Poland but in other countries of Central Europe too. So this work is a very helpful tool for myrmecologists and all people interested in this noteworthy group of social insects.

M. Suvák

R. ENNOS & E. SHEFFILD: Plant Life.

Blackwell Publishing, 350 Main Streed, Malden, MA 02148, U.S.A., 108 Cowley Road, Oxford, 0X4 1 JF, UK, 2000. 217 pp. ISBN: 0-865-42737-2. Price: 22.99 GBP. URL: http://www.blackwellscience.com.

Publication Plant Life presents a basic reference book for plant study. It is designed in order to familiarize the reader with basal information about plants, which compose the primary element in the system of living nature. In three sections with 11 chapters, provided is information about the main living history of plants in various evolutional and organizational stages from benthonic organisms, through algae, mosses to chorioid plants. In the third section of the publication there is information about individual terrestrial and aquatic ecosystems on our earth surface. The eighth chapter provides information about tropical forest biotopes, the ninth about biotopes with seasonal climatic conditions, in the tenth there are deserts and semi-deserts and the eleventh chapter comments on freshwater and sea biotopes.

At the end of each chapter there are questions in the discussion and a list of recommended literature. Plant Life contains a lot of pen-drawings, pictures and diagrams. It is appropriate for students, teachers and people interested in plant world.

S. MOCHNACKÝ

A.K. SHARMA & A. SHARMA (eds.): Chromosome painting. Principles, strategies and scope.

Kluwer academic publishers, Dordrecht, Boston, London, 2002. 179 pp. ISBN 0792370090. Price: 95 Eur, 88 USD, 60 GBP. URL: http://wkap.nl.

The presented book is composed of 18 chapters, each of them in the form of an article simultaneously published in special issue of the journal Methods in Cell Science, 23 (2001). The papers are written by recognised specialists and represent the reviews of current knowledge on the techniques of chromosome painting. This powerful method combines the classical karyology with novel DNA method based on hybridization of differentially coloured DNA probes of specific DNA with target gene(s) on the chromosomes. Large portions of some contributions are devoted to the protocols for chromosome preparation, DNA preparation, and hybridization. This novel and modern technique of *in-situ* hybridization (FISH) and its alternatives (Q-FISH, GISH, PRINS, C-PRINS) provide large application in animal, human and plant science, in precise identification of genetic diseases, in transgenesis and in evolutionary studies.

P. MRÁZ

A. LOGRIECO, J.A. BAILEY, L. CORAZZA & B.M. COOKE: Mycotoxins in Plant Disease.

Kluwer Academic Publishers, P.O. Box 17, 3300 AA Dordrecht, The Netherlands. Reprinted from European Journal of Plant Pathology, Volume 108, Issue 7, 2002, hard cover printing 2002. vii + 137 pp. (597-734) with 31 tables and 45 figures (13 drawings, 19 graphs and 13 bw photos). ISBN 0-4020-0871-6. Price: 68.00 EUR, 65.50 USD, 43.50 GBP. URL: http://www.wkap.nl.

Many fungi taxa are parasites and saprophytes on economically important plants. Some of them are responsible for significant economic losses and their toxins in food products threaten both human health and the health of animals. This publication gathers specialist updated reviews based on papers originally presented during a Workshop of EU Cost Action 835 entitled 'Agriculturally Important Toxigenic Fungi', held in Rome, 7-8 October 1999 at the Plant Pathology Research Institute.

There are 16 independent works of many world plant pathology specialists from Italy, Poland, Finland, Germany, Hungary, UK, USA, Austria, Denmark and Netherlands. Each separate work is unattached to the others, with its own references. Therefore some parts of contributions overlap in generalities but the whole publication presents interesting and important new information on this area. Authors deal mainly with toxins of *Fusarium* sp. (trichothecenes, zearalenones, fumonisins, moniliformin, beauvericin, fusaproliferin), *Aspergillus* sp. (ochratoxin A) and *Penicillium* sp. Most authors discuss diseases of small-grain cereals (maize ear rot, head blight), some of them deal with grapes and muskmelon diseases. Other interesting themes are biochemical processes of toxin creation, metabolical pathways and role of membrane components in resistance of plants to fungal toxins and resistance of fungi to toxins and fungicides. Genetics of virulence and resistence of fungal pathogens and molecular mechanisms involved in resistance of plants to toxins are discussed too.

Actual information in this book could help specialists who deal plant pathological fungi, production of mycotoxins and toxin effects in plants.

M. SUVÁK

Z. RENGEL (ed.): Nutrient Use in Crop Production.

Food Product Press, an imprint of The Haworth Press, Inc., 10 Alice Street, Binghamton, New York, 1998. 267 pp. ISBN 1-56022-061-9 hard, 1-56022-76-7 soft. Price: 84.95 USD hard, 42.95 USD soft. URL: http://www.haworthpressinc.com.

The book consists of 10 chapters written by authors-specialists from research institutions and universities in Australia, USA, the Netherlands, and Germany. It presents a summary of various aspects of optimum use of nutrients in modern agricultural production.

The introductory Chapter predicts that human population on the Earth will reach about 8 billion by 2020, in order to provide food for all people it is necessary to increase the production of foodstuffs by about 50% in comparison with the present level. This will result in appropriate increase of demands of the agricultural production on nutrients (to approximately 2.5-fold of the present needs). On the other hand, as it is discussed in the 2nd Chapter, the natural fertility of soil decreases due to excessive requirements on production of foodstuffs resulting from increasing population and also due to losses from

agricultural systems (volatilisation, various forms of leaching, uptake by crops, non-labile pools, e.g. phosphate fixation, various forms of erosion, and others). The fertility of soil can be maintained by consistent implementation of measures that ensure appropriate replacement of plant nutrients, suppression of soil acidity, observation of plant rotation system, and prevention of a range of soil erosion. We cannot envisage modern plant production without employing chemical analyses.

Chapter 3 deals with the aspects of determining the status of nutrients in the soil and plants and evaluation of analyses that ensure optimum nutrition of plants. Chapter 4 concentrates on various nitrogen fertilisers with regard to different ways of nitrogen losses-volatilisation of ammonia, dinitrogen and nitrogen oxide emissions, and nitrate leaching. It discusses also the importance of biological immobilisation of nitrogen, fixation of ammonia and, finally, impact of nitrate versus ammonium uptake on crop and yield. In addition to chemical fertilizers, atmospheric dinitrogen is also an important source of nitrogen. Chapter 5 deals with biological fixation of nitrogen in agricultural systems, prospects, and expected progress in molecular biology and genetics with respect to inoculation on non-legumes (including cereals). Chapter 6 presents basic information about phosphate fertilisers, their agronomic effectiveness and adsorption of soluble phosphorus in the soil. The following 7th Chapter contains basic information about sources and bio-availability of essential micro-nutrients.

In many cases it appears effective to supply nutrients by soaking the seeds in a fertiliser solution or coating them with nutrients or by other methods, e.g. incorporation of rhizobia, insecticidal preparations, or stimulators of growth. This fertilising strategy has been used for many years and is discussed in Chapter 8 of this book.

The selection and development of high-yield varieties in combination with good management of nutrients can constitute a suitable way towards increased production of foodstuffs. The need for future research in this area and its orientation are discussed in Chapter 9.

The concluding Chapter 10 discusses the role of nutrient-efficient crops (genotypes that are superior in taking up and utilising nutrients) in modern agricultural production. Special attention is paid to nutrient-efficiency problems with respect to cultivation systems in various sectors of modern agriculture.

The abundant references that are clearly arranged at the end of individual chapters constitute suitable resources for readers who wish to study special problems in greater detail. With regard to its contents and the form of presentation the book is intended for a wide range of readers: environmentalists, farmers, soil scientists and agronomists, students of life sciences, agronomy, nutrition, ecology and environmental quality, and many other related expertises.

A. GREJTOVSKÝ

F. HOFFMANN & M. MANNING: Herbal Medicine and Botanical Medical Fads.

The Haworth Press, Inc., New York, London, Oxford, 2002. 254 pp. with Index. ISBN: 0-7890-1148-4 hard (0-7890-1149-2 soft). Price: 49.95 USD hard (24.95 USD soft). URL: http://www.haworthpressinc.com.

Many people use herbs, spices and other botanicals for dietary, medicinal, therapeutic, cosmetic or ornamental purposes every day. This subject is very popular nowadays. Numerous herbs, herbal products and related terms are presented in this book in alphabetical order. Interesting information from history, folklore, medicine and other areas related to exotic and commonplace herbs and spices are discussed in respective topics. Short lists of literature refer to every theme.

Everyone interested in herbal medicine will be satisfied with this book. It can be used as everyday handbook for experts and hobbyists dealing with herbs and spices.

M. SUVÁK

S.S. BHOJWANI & W.Y. SOH (eds.): Current trends in the embryology of angiosperms.

Kluwer academic publishers, Dordrecht, Boston, London, 2001. 533 pp. ISBN 0792368886. Price: 220 Eur, 190 USD, 135 GBP. URL: http://www.wkap.nl.

There is the newest and very useful monograph on Angiosperms embryology. Using the novel techniques, like electron microscopy, biochemistry, immunology, molecular biology and genetic engineering during last 50 years, the "classical" descriptive embryology has changed to modern experimental and applied science. A huge amount of information, which has been generated during last decade, is summarized in 21 chapters written by recognized specialists. The progress in our knowledge is presented in following chapters: Male gametogenesis; Sperm and generative cell; Pollen germination and pollen tube growth; Female gametogenesis; Embryo sac; *In vivo* fertilization; *In vitro* fertilization; Sexual incompatibility; Zygotic embryogenesis (Structural aspects, Hormonal control of embryo development and Development genetics); Somatic embryogenesis; Synthetic seeds of *Asparagus officinalis* L.; Endosperm development; Seed maturation, Germination and dormancy; Gametophytic apomixis; Parthenocarpy; Androgenesis in *Brassica*; Androgenesis in Cereals; *In vitro* gynogenesis; Inheritance of cytoplasmatic traits – embryological perspectives.

P. MRÁZ

Z. RENGEL (ed.): Mineral Nutrition of Crops: Fundamental Mechanisms and Implications.

Food Product Press, an imprint of The Haworth Press, Inc., 10 Alice Street, Binghampton, New York, 1999. 399 pp. ISBN 1-56022-880-6 hard (1-56022-900-4 soft). Price: 149.95 USD hard, 59.95 USD soft. URL: http://haworthpressinc.com.

The book consists of 12 chapters written by well known scientists from research institutes and universities in Australia, the USA, Germany, the Netherlands, Israel and Turkey. The book deals with a complex of interactions soil-water-plant-microbes that control the uptake of nutrients by plants and their utilization.

The introductory Chapter 1 (Biology and Chemistry of Nutrient Availability in the Rhizosphere) considers the influence of root exudates and rhizodeposition on nutrient availability in soils and the importance of root-microbial interactions that affect plant nutrition. Chapter 2 (Kinetics of Nutrient Uptake by Plant Cells) gives a review of the present opinions on the meaning and value of kinetic descriptions of nutrient transport in plants. Molecular aspects of the transport of nutrients across plasmatic membranes of root cells are discussed in Chapter 3 (Molecular Biology of Nutrient Transporters in Plant Membranes). This chapter also deals with the consequences to agriculture and the environment as the increased efficiency of nutrient utilization by crop plants may reduce the problems arising from the use of artificial fertilizers. Plants that exhibit high capacity for uptake and accumulation of nutrients and heavy metals may play a role in reclaiming contaminated sites. On the other hand, plants with increased sensitivity to accumulation of nutrients may be used to monitor environmental problems. The subsequent Chapter 4 (Long-Distance Nutrient Transport in Plants and Movement into Developing Grains) is concerned with two existing ways of transport of water and solutes in vascular plants, xylem and phloem. Nutrient transport into developing grains is strongly dependent on the phloem transport and exchange between xylem and phloem and re-mobilization from the senescent parts of the mother plant. The chapter is concluded by the statement that our body of information about transport of micronutrients is not as complete as that about transport of macronutrients, metal complexation in transport fluids may be an important characteristic of micronutrient transport. Agricultural experience with intensively irrigated and fertilized plants has shown that even small root systems may ensure maximum growth of plants provided that optimum supply of water and nutrients is ensured. The Significance of Root Size for Plant Nutrition in Intensive Horticulture is the theme of Chapter 5 of this book. Chapter 6 (Role of Mineral Nutrients in Photosynthesis and Yield Formation) refers to the role of mineral nutrients in photosynthetic CO_2 reduction, synthesis and partitioning of photosynthates, and metabolic activity of sources and sink organs. The mineral nutrient status of plants is the essential determinant of production of dry matter and productivity of crop plants. Nutrients are a part of the "environment" of growing plants and micro-organisms and are an important factor in the control of diseases. The respective relationships are discussed extensively and supported with experimental data in Chapter 7 of this book (The Role of Nutrition in Crop Resistance and Tolerance to Diseases). Along with the characteristic basic nutrient-disease relationships (e.g. diseases affected by N-form and pH, factors affecting nitrification, and others), strategies leading to alleviation of diseases through nutrition adjustment are stressed and mechanisms of disease control are discussed. The information on the relationship between nutrition and diseases provides a basis for adjustment of everyday agricultural practice towards reduction of seriousness of diseases in the integrated systems of crop production. The first precondition of good growth and productivity of crops is high quality seed with full-strength energy and viability. Each factor which negatively influences the

energy and viability of seeds during their development has detrimental affects on crop growth. The importance of reserves of mineral nutrients in seeds, as components of seed vigor and its viability, which can affect seedling establishment, crop growth and productivity is stressed in Chapter 8 (Importance of Seed Mineral Nutrient Reserves in Crop Growth and Development). Some plants and genotypes are able to utilize specific physiological mechanisms that allow them to grow well and produce even on low fertility soils. Such nutrient-efficient genotypes may be used effectively in modern agricultural production, particularly in areas in which nutrients are not supplied effectively by fertilization. These topical questions, concerning genotype differences in physiological mechanisms of plants with varying capacity to take up and utilize Zn, Fe, Mn, and P, are dealt with in Chapter 9 (Physiological Mechanisms Underlying Differential Nutrient Efficiency of Crop Genotypes). Chapter 10 (Breeding Crops for Improved Nutrient Efficiency: Soybean and Wheat as Case Studies) summarizes the available knowledge about heredity of nutrient efficiency traits, breeding strategies that have been used to improve these traits, and screening techniques used to evaluate efficiency of micronutrient utilization by respective genotypes. The concentration of ions in soil solution is an important determinant in nutrient uptake by plants. The amount of each ion present in the solution depends on the balance between input and output processes.

Methods that can be used to monitor the movement of water and nutrients in the soil profile are described in Chapter 11 (Monitoring Water and Nutrient Fluxes Down the Profile: Closing the Nutrient Budget). Uptake of nutrients is a complex process affected by many parameters. The use of models can contribute to better understanding of this process. The problems associated with modelling are referred to in the last Chapter 12 (Mechanistic Simulation Models for a Better Understanding of Nutrient Uptake from Soil). Its authors describe experiences and knowledge gained by applying specific models of varying complexity from the theoretical and practical points of view. The chapter is concluded by complex evaluation of modelling and its importance for the improvement of knowledge of basic processes involved in the uptake of nutrients by roots.

Mineral nutrition of Crops covers a wide range of themes that extend to several scientific disciplines. Chapters of the book are arranged logically and pursue one goal: effective utilization of mineral nutrients oriented on increased production of dry matter and productivity of crop plants. Each chapter is supplied with a well-arranged list of references.

In accordance with its professional orientation and contents, the book is intended for research scientists, extension workers, teachers and students.

A. GREJTOVSKÝ

M. HANF: Ackerunkäuter Europas mit ihren Keimlingen und Samen.

Verlags Union Agrar, BLV Verlagsgesellschaft mbH, München, 1999. ISBN: 3-405-14118-4. 496 pp. Price: 49.90 EUR. URL: http://www.ulmer.de.

This is a very precious publication, which in its fourth re-formatted and completed edition, comments on weeds spread in European agro centers. Apart from the introductory part, where the basic conception of weed, communities, demands on climatic, hydrological and pedological factors, there are very useful further sections, where individual species are schematically introduced. There are 569 color and black and white photographs of germinating plants with schematic drawings in the publication. The pictures are on high professional level and quality.

In the section, where individual species and their expansion are introduced, there are also short readings about their main information. The individual species are introduced on 716 colored photographs, on which the plant is in optimal evolutional stage, there are its seeds and pen-and-ink drawings of diacritical signs.

The publication is very nice. It is a valuable information source and a helpmate with its contents and graphical format for students, educationists and for practical needs in agriculture and forest management.

S. MOCHNACKÝ

M.R. EMERY & R.J. MCLAIN (eds.): Non-Timber Forest Products: Medicinal Herbs, Fungi, Edible Fruits and Nuts, and Other Natural Products from the Forest.

Food Products Press, An Imprint of The Haworth Press, Inc., New York, London, Oxford, 2001. 176 pp. with Index. ISBN: 1-56022-088-0 hard (1-56022-089-9 soft). Price: 39.95 USD or 27.60 GBP hard (29.95 USD or 20.70 GBP soft). URL: http://www.haworthpressinc.com.

Non-timber products of forests always have played an important role in the life of people living in woodland. These products are utilized all over the world nowadays, but continuing analyses of such sources and new alternatives to forest management are necessary.

The presented book has been co-published simultaneously as Journal of Sustainable Forestry, Volume 13, Number 3/4 2001. There are 3 sections: I. Non-Timber Forest Products, Past and Present, II. Research on Non-Timber Forest Products in The Pacific Northwest and III. Socio-Political Considerations for Non-Timber Forest Product Management. 16 authors in 13 integrated contributions deal with various aspects of non-timber forest products in such diverse disciplines as anthropology, ecology, economics, forestry, geography, mycology and policy science. Every chapter ends with references related to discussed partial problems.

Authors have focused to the regions of The United States, especially to the Pacific northwest. This book could be very interesting to all people dealing with various aspects of natural sources utilization.

M. SUVÁK

G.A. SLAFER, J.L. MOLINA-CANO, R. SAVIN, J.L. ARAUS & I. ROMAGOSA (eds.): Barley Science: Recent Advances from Molecular Biology to Agronomy of Yield and Quality.

Food Products Press, An Imprint of The Haworth Press, Inc., New York, London, Oxford, 2002. 565 pp. with Index. ISBN: 1-56022-909-8 hard (1-56022-910-1 soft). Price: 129.95 USD, 89.70 GBP hard (69.95 USD, 48.30 GBP soft). URL: http://www.haworthpressinc.com.

The presented book deals with many aspects of barley — the fourth most important cereal crop in the world. 41 contributors in 19 chapters show recent knowledge about this plant. History of barley cultivation, genetics, breeding, reproduction, physiology, simulation of growth, environment interactions and agronomy are main topics of this

comprehensive book. Especially recent successes in the field of molecular biology have been reflected in current research of barley and is reflected in this book too. Numerous graphs, diagrams, tables and some colour photos illustrate discussed problems.

This book is valuable source of information for all concerned not only with this crop but with research and cultivation of other cereals or plants in general too.

M. SUVÁK

CD review

P. DIETZE, H. BEER, B. BOHNE & S. DIETZE: Gehölze für Garten und Landschaft. Woody species for Garden and Landscape.

Verlag Eugen Ulmer GmbH & Co., Wollgrasweg 41, 70599 Stuttgart (Hohenheim), Germany, 2000. CD-ROM and guidebook (70 pp.), texts in German. ISBN 3-8001-3187-0. Price: 39.90 EUR. URL: http://www.ulmer.de.

This CD ROM contains approximately 5000 colour photos and much more information on more than 1800 woody plant taxa. Photos show overall habit of individual species or detailed shots of leaves, buds, blooms, fruits, and bark structures. These pictures can be enlarged, moved to the plate to compare with other taxa and printed. There are detailed text information on respective species too – description of geographic distribution, characters of flowers, fruits, leaves or needles, soil requirements, growth and some additional comments. Simple symbols give immediate substantial information on respective species (tree or shrub, time of blooming, flowers, fruits, leaves, light recquirements). The user can search information in this dataset by names of species in German or Latin (on the level of family, species or lower categories). It is possible to find plants on the basis of following pre-defined groups of search criteria such as: general, growth, flowers, fruits, leaves, needles, toxicity, soil, site conditions, possible use. Search results can be saved in files, arranged and printed. The program enables change of properties of the user environment and contains a help menu too.

This product is a very good tool for education in dendrology and gardening. Numerous information and quality photographs will be appreciated by everyone interested in this area.

M. SUVÁK