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Figures at the end of the issue.

BOOK REVIEW

HAMEL, G.: ORCHIDEEN. Bildtafeln mitteleuropäischen Arten, Formen und Bastarde. Teil 2. Nach Aquarellen von Hermann Walther. – VEB Gustav Fischer Verlag, Jena 1986. M 20,–, Ausland DM 28,–.

Two years after the edition of the first volume has appeared the second part of 32 full-page orchid plates of aquarelles painted by the same artist, H. Walther. The quality of the reproductions is rather better than in the first volume but some species have not, once again, their natural colour nuance, such as *e.g.* the yellow colour of the white *Cephalanthera damasonium* (syn. *C. alba*), the green colour of the pure white flowers of *Goodyera repens* and *Platanthera chlorantha*, or the white form of *Dactylorhiza incarnata*. More bluish nuance is missing in *Limodorum abortivum*.

The second part presents the more rare species in Central Europe and 7 plates of hybrids, some of which are illustrated for the first time. The same authors as in the first volume accompany the illustrations by good descriptions, focussed mainly on biotopes and areas of location in the whole Europe. With respect to endangered types in the GDR, the hybrids are described in the areas of the parental species. Unfortunately, the numbers of the described species refer to the free filed plates, which, however, are not numbered. The aquarelles on the plates are named only in German, which would be confusing for not German-speaking readers. These shortcomings may be removed by careful editing, especially because the two volumes with representative and valuable illustrations are suitable for the amateurs and nature protection.

DAGMAR DYKYJOVÁ *(Třeboň)*

KOENIG, R. (ed.): THE PLANT VIRUSES, Vol. 3.: POLYHEDRAL VIRIONS WITH MONOPARTITE RNA GENOMES. – Plenum Press, New York–London 1988. 294 pp., US $ 59.50 (+ 20 % outside USA and Canada).

This book is the 3rd volume of the subseries "The Plant Viruses" from the series "The Viruses" (Ser.ed. Fraenkel-Conrat, H., and Wagner, R. R.). The volume focuses on eight established or anticipated groups of polyhedral plant viruses with single-stranded monopartite RNA genomes.

The first chapter (R. Koenig) is the introduction and summary of important properties of polyhedral plant viruses with monopartite RNA genomes. The second chapter (G. P. Martelli, D. Gallitelli, and M. Russo) deals with Tombusviruses, Chapter 3 (T. J. Morris and J. C. Carrington) with Carnation Mottle Virus and Viruses with Similar Properties, Chapter 4 (R. Hull) with Sobemovirus Group, Chapter 5 (H. Fraenkel-Conrat) with Tobacco Necrosis, Satellite Tobacco Necrosis, and Related Viruses, Chapter 6 (L. Hirth and L. Givord) with Tymoviruses, Chapter 7 (R. Gámez and P. León) with Maize Rayado Fino and Related Viruses, Chapter 8 (R. Casper) with Luteoviruses, Chapter 9 (R. E. Gingery) with Maize Chlorotic Dwarf and Related Viruses, and the final chapter (A. F. Murant) with Parsnip Yellow Fleck Virus, Type Member of a Proposed New Plant Virus Group, and a Possible Second Member, Dandelion Yellow Mosaic Virus.

The contemporary research on these viruses is presented by leading experts in the field. This volume differs from the previous volumes in that the layout of all chapters is the same: the history of recognition of the group; host range, geographical distribution; transmission, epidemiology, and control; purification methods; morphological, physical, and chemical properties of the virions and their components; serology and immunochemistry; genome properties and replication; relation with cells and tissues, and specific considerations (inclusion bodies, satellites, cytopathology, symptomatology *etc.*).

The book will be of value to researchers in plant virology, botany, genetics, molecular biology, agronomy, horticulture, and related fields.

L. ŠINDELÁŘ *(Praha)*

MILNE, R. G. (ed.): THE PLANT VIRUSES, VOL. 4.: THE FILAMENTOUS PLANT VIRUSES. – Plenum Press, New York–London 1988. 423 pp. US $ 79.50 (+ 20% outside USA and Canada).

This book is the fourth volume of the subseries "The Plant Viruses" from the series "The Viruses" (Ser. ed. H. Fraenkel-Conrat and R. R. Wagner). The volume contains the basic characteristics concerning the filamentous viruses: potex-, carla-, poty-, clostero-, and capilloviruses.

The first chapter (R. G. Milne) deals with Taxonomy of the Rod-Shaped Filamentous Viruses, Chapter 2 (P. Tollin and H. R. Wilson) with Particle Structure, Chapter 3 (A. A. Brunt) with Purification of Filamentous Viruses and Virus-Induced Noncapsid Proteins, Chapter 4 (R. Koenig) with Serology and Immunochemistry, Chapter 5 (E. Hiebert and W. G. Dougherty) with Organization and Expression of the Viral Genomes, Chapter 6 (D. E. Lesemann) with Cytopathology, Chapter 7 (A. F. Murant, B. Raccah, and T. P. Pirone) with Transmission by Vectors, Chapter 8 (B. W. Falk and J. E. Duffus) with Ecology and Control, Chapter 9 (R. E. Gingery) with the Rice Stripe Virus Group, Chapter 10 with the Economic Impact of Filamentous Plant Viruses (Introduction – R. G. Milne, North America – G. I. Mink, South America – L. F. Salazar, Europe – H. Lecoq, H. Lot, H. Kleinhempel, and H. Kegler, The Mediterranean – G. P. Martelli, The Middle East – A. A. Cook, The Indian Subcontinent – A. Varma, Africa – C. Faquet and M. B. von Wechmar, China – W. F. Chiu, Southeast Asia – T. Inouye, N.Iizuka, and M. Kameya-Iwaki, and Australia and New Zealand – G. D. McLean and D. W. Mossop). The contributions, authored by leading international experts in the field, contain extensive references about this problems, many well-arranged tables and numerous first-rate illustrations.

The publication will be a valuable reference source to plant virologists, molecular biologists, geneticists, and agronomists engaged in the study of filamentous plant viruses.

L. ŠINDELAŘ *(Praha)*

FRAENKEL-CONRAT H.: THE VIRUSES: CATALOGUE, CHARACTERIZATION, AND CLASSIFICATION.– Plenum Press, New York – London 1985. 268 pp., US $ 55.0 (+ 20 % outside USA and Canada).

This book is the first member of the series "The Viruses" (Ser. ed. Fraenkel-Conrat, H. and Wagner, R. R.). It is a definitive catalogue of viruses arranged in alphabetical order of the properties and/or taxonomic relationships for: I. Animal Viruses, Including Protozoal Viruses, II. Plant Viruses, Including Protophytal Viruses, and III. Phages of Prokaryotes (Bacteria and Cyanobacteria). Each of these sections contains extensive references, and most virus families or groups of characteristic shapes are illustrated by electron micrographs. The families, genera, or groups of viruses that have been defined on the basis of such criteria by the International Committee on Taxonomy of Viruses (ICTV) is described in some detail in this catalogue. Virus classification is primarily based on chemical and physical similarities, such as the size and shape of the virion, the nature of the genomic nucleic acid, the number and function of component proteins, the presence of lipids and of additional structural features, such as envelopes, and serological interrelationships.

The volume will be a valuable reference source to researchers involved in microbiology, molecular biology, immunobiology, epidemiology and plant pathology. It will be detailed in the following volumes of the series.

L. ŠINDELÁŘ *(Praha)*

MARAMOROSCH, K., RAYCHAUDHURI, S. P. (ed.): MYCOPLASMA DISEASES OF CROPS. BASIC AND APPLIED ASPECTS. – Springer–Verlag, New York–Berlin–Heidelberg–London–Paris–Tokyo 1988. 456 pp. Hard cover DM 178.–.

This book summarizes basic and applied knowledge of several plant mycoplasma diseases of crops. Although the earliest description of plant mycoplasma disease was given nearly one thousand years ago in China, a breakthrough was made in Japan in 1967, when several plant diseases, earlier considered to be caused by viruses, were found to be associated with mycoplasma-like organisms (MLO). Soon the Japanese finding was confirmed by other researchers in the United States of America and subsequently in many other countries. Now more than one hundred various plant diseases, previously categorized as caused by viruses, are classified as plant mycoplasma diseases.

In Part I of the volume the reader is informed about the new means of detection, characterization, and cultivation of plant mycoplasmas. Part II considers interaction between insect vectors, plant mycoplasmas, and viruses in mixed mycoplasma-virus infection. Part III covers mycoplasma diseases of rice, potato, corn, citrus, eggplant, and other plants. It also presents for the first time a historical account of the earliest description of a plant mycoplasma disease, known in China nearly 1000 years ago. Part IV is devoted to chemotherapy and other methods of current control technologies.

The book resulting from collaboration of leading international scientists will be of interest and importance to plant pathologists, entomologists, horticulturists, and researchers in other branches of agriculture.

L. ŠINDELÁŘ *(Praha)*

DRESSLER, R. L.: DIE ORCHIDEEN. Biologie und Systematik der *Orchidaceae*. (Aus dem Englischen von Dr. Quido J. Braem). – Eugen Ulmer Verlag, Stuttgart 1987. 394 S., 125 Abb., 95 Fotos. DM 98,–.

Das wachsende Interesse, das den Orchideen in den letzten Jahrzehnten gewidmet wird, macht sich natürlich auch auf dem Büchermarkt bemerkbar. Die Mehrzahl der Lesser sind Orchideenliebhaber und Erwerbsgärtner, und deshalb behandeln die meisten Orchideenbücher praktische Aspekte der Orchideenkultur und beschreiben die geeigneten Arten und Hybriden. Theoretische Partien kommen dabei zu kurz und bleiben nur im Hintergrund.

Aber auch die theoretische Seite, vor allem die Systematik, Physiologie und Ökologie der Orchideen, ist in den letzten Jahren nicht stehen geblieben und eine neue Bearbeitung aller dieser Gebiete was schon sehr wünschenswert. Das Buch von Robert L. Dressler füllt diese Lücke gut. Man kann es als Gegenstück, aber zugleich auch als Ergänzung der meisten Orchideenhandbücher betrachten und es wird seine Leser nicht nur unter den Wissenschaftlern, sondern auch unter vielen anspruchsvolleren und fortgeschrittenen Liebhabern finden.

Der Inhalt und die Konzeption des Buches geht aus den Uberschriften der einzelnen Kapitel klar hervor: Systematische Stellung und botanische Merkmale, Geographische Verbreitung, Morphologie, Ökologie und Evolution. Etwa die Hälfte des Buches nehmen die Kapitel Klassifikation, Unterfamilien, Schlüssel zu den Unterfamilien, Triben und Subtriben ein. Am Ende zeigt das Buch noch auf einige offen stehende Fragen hin, behandelt die neuen Erkenntnisse in der Orchideen-Phylogenie und bringt ein Verzeichnis der Fachausdrücke.

Der Autor (und auch der Ubersetzer) haben selbst auf dem Gebiet der Orchideenforschung, vor allem in der Systematik, gearbeitet und so ist die besprochene Monographie keine nur am Schreibtisch zusammengesetzte Kompilation von veralterten Fakten, sondern eine gut fundierte Übersicht des gegenwärtigen Wissensstandes.

J. Gut *(Praha)*

Gloser, J.: Kvetoucí Kameny. (Flowering Stones.) – Academia, Praha 1988. 128 pp., 15 + 12 figs. In Czech.

The family *Mesembryanthemaceae* – African succulents was discovered by European botanists in the 18th century, at the time of the colonization of South Africa. Therefore the introductory chapters of the book are devoted to the history of botanic studies of this family, to a brief description of the climate and vegetation of South Africa, and to the characteristics of the regions richest in these plants (Namaqualand, Namib, Great Karroo and Bushmanland, Little Karroo and South Cape).

In the following chapter the growth and forms of the *Mesembryanthemaceae* are described; special attention is given to the growth cycles and functional adaptations. The botanists will appreciate the section dealing with the flower morphology. After the taxonomic classification of this family, the genera and selected species are characterized. The chapter in which the reader is acquainted in detail with the conditions of their growing is supplemented with lifelike drawings. The full beauty of the flowers is shown in coloured photographs.

The succulent-growers will find in the book a chapter informing on their growing, appropriate emplacement and substrate, and watering. The gardeners will surely welcome the instructions for reproduction of the *Mesembryanthemaceae* both vegetative and by seeds. The book is supplemented by the chapter on diseases and pests, and by a survey of important publications on the *Mesembryanthemaceae*.

On the basis of his many years' investigations and experience the author has succeeded in attaining his purpose: to present a summary view of these succulents and recommend their cultivation to the reader.

F. Pospíšil *(Praha)*

Hart, R. W., Hoerger, E. D. (ed.): Carcinogen Risk Assessment: New Directions in the Qualitative and Quantitative Aspects. Banbury Report 31. – Cold Spring Harbor Laboratory 1988. 359 pp.

There are about 50 000 – 60 000 chemicals of everyday use in significant production (over 1 ton/year), and this number is being increased by about 10 % per year. Public concern about the detection of

carcinogenic chemicals in our environment requires scientific assessment of the carcinogenicity risk of these chemicals. The objectives of the meeting of experts at the Banbury Center was to discuss new results of chemical and biological research that provide new insights into the human risks from carcinogenic agents. The introductory review presents a list of US Federal Laws related to exposures to toxic substances and discusses the main steps in quantitative carcinogenic risk assessment: hazard identification, exposure assessment, dose-response assessment and risk evaluation. Further topics are divided into 5 sections: 1. Structure-activity relationship data, 2. Pharmacokinetic and metabolic activity data, 3. Molecular biological data. 4. Approaches towards integration, and 5. Implication for policy and research. The conclusions (R. W. Hart and D. Hoerger) focus on several results, important for risk assessment. For instance, alkylation of DNA by carcinogens may be important in carcinogenesis, but other properties of the carcinogen decide whether or not tumors arise in a particular organ. The authors also pointed out that concordance between the results of the battery of short-term mutagenicity tests and carcinogenic bioassays is only about 60 %. Special attention is also devoted to a group of chemicals believed to act largely by nongenotoxic mechanisms.

As in all previous Banbury Reports, each section is accompanied by an informal open discussion and by a panel discussion. This publication will prove valuable not only to scientists, but also to legislators.

J. VELEMÍNSKÝ *(Praha)*

IMPROVEMENT OF GRAIN LEGUME PRODUCTION USING INDUCED MUTATIONS. – International Atomic Energy Agency, Vienna 1988. 524 pp.

Grain legumes are indispensable for many parts of the world, especially for Latin America, Africa and Asia because they provide much needed valuable protein in the human diets and in cattle feed. The results of and prospects for applied mutagenesis in grain legume breeding are surveyed in this IAEA publication. It is based on the reports that were presented at a Workshop (Spokane, USA, 1986) attended by participants from 21 countries. The introductory overview presented by A. Micke deals with the importance of legumes as crops, grain legume breeding objectives, the role of induced mutations, and includes a list of cultivars developed with the help of induced mutations. Subsequent presentations focus on mutation breeding of 15 different legume species, *e.g.* groundnut, chick-pea, soybean, lentil, pea, faba bean, black-gram and cowpea. These pulses are mostly low yielding in comparison with cereals. In spite of intensive breeding efforts, their yields have remained comparatively low. Thus, the reports deal with mutation breeding methods to develop high yielding. In addition, several presentations report in detail on research project aims to induce legume mutations with resistance to pests, *e.g.* common blight, golden mosaic virus, rust, aphids, or leaf spot. A particularly intensively studied field of legume breeding refers to the alteration of seed proteins, to some extent also to other storage substances, *e.g.*, lipids and poisonous alkaloids, glycosides and antinutritional factors. This IAEA publication, including the appendix: "Conclusions and Recommendations" will be relevant to all legume breeders.

T. GICHNER *(Praha)*

SWANK, W. T., CROSSLEY, D. A. Jr. (ed.): FOREST HYDROLOGY AND ECOLOGY AT COWEETA. (Ecological Studies, Vol. 66) – Springer Verlag, New York-Berlin-Heidelberg-London-Paris-Tokyo 1988. 151 figs., 98 tabl., 460 pp. Hard cover DM 198,–.

The volume includes 30 most important contributions presented at the Symposium held in Athens, Georgia, in 1984 to commemorate 50 years of research at the Coweeta Hydrologic Laboratory.

The Coweeta area situated in the forested Southern Appalachians in the western part of North Carolina is one of the oldest natural laboratories in the world, where a complex hydrologic-ecological

investigation has been carried out for more than 50 years. Within the individual watersheds used as landscape units of investigations, a wide range of problems is studied: biogeochemical cycling combined with nutrient cycles of forest ecosystems, alterations of terrestrial and stream processes and their interactions with man-made disturbances (species conversions, logging, use of pesticides, atmospheric deposition, *etc.*) and natural damaging (*e.g.* insect infestation). The research is conducted over an area of 2 185 ha in two adjacent bowl-shaped basins (Coweeta and Dryman Fork Basins) at an elevation of 675 to 1 592 m.

The lectures are grouped into 8 sections: Section 1 presents a description of the research area and the history of research works. – Section 2 contains 7 reports dealing with climatology, hydrology, geology and water chemistry of the area. – Section 3 is aimed at the problems of "Forest Dynamics and Nutrient Cycling". – Section 4 gives a survey of Arthropods and Herbivory. – Section 5 includes topics concerning the "Forest Floor Processes", *e.g.* changes in soil chemistry caused by forest clearcutting. – Section 6 discusses "Stream Biota and Nutrient Dynamics". – Section 7 comprises 6 very interesting papers on the "Man and Management of Forested Watersheds", *e.g.* hydrological consequences of forest cutting, species conversions, construction of forest roads, application of pesticides, or acid rains. – Section 8 summarizes perspectives of long-term research of forest hydrology and ecology, and examines the conditions of the forest ecosystem stability.

In conclusion, it can be stated without exaggeration that it is a publication of extreme value as concers both the range of the themes discussed and the approach to and thorough solution of the problems. Much interesting and new information is here offered not only to hydrologists and pedologists but also to the workers in ecology and forest research. The strong point of the work lies in the long duration and continuity of investigations, which in this scientific field are absolutely necessary.

C. ZÁRUBA *(Brandýs n.L.)*

STEFFENS, L. G., RUMSEY, T. S. (ed.): BIOMECHANISMS REGULATING GROWTH AND DEVELOPMENT. – Kluwer Academic Publishers, Dordrecht-Boston-London 1988. 479 pp. Dfl. 250.00; US $ 138.50; UK £ 76.50.

This book brings invited papers presented at the Twelfth Annual Beltsville Symposium held in May 1987 at BARC (Maryland). Six fundamental questions are discussed: 1. Tissue specific gene regulation: cell division and differentiation; 2. mechanisms for regulation hormone concentration; 3. hormonal regulation of growth and development; 4. non-hormonal regulation of growth and development; 5. nutritional regulation of growth and development; 6. pathogenic and symbiotic interactions.

Eleven of 29 contributions are devoted to plants. Regulation of alternative division pathways in yeast was studied by G. Simchen. Differentiation of vegetatively growing cells into meiotic cells evidently depends on the cells' diploidy and on starvation. Results presented by A. Theologis strongly indicate that auxins act at the transcriptional level and rapidly potentiate specific mRNAs. The response is the fastest known for any plant growth regulator and qualifies as a primary hormonal response to auxin. *Agrobacterium tumefaciens* and *Pseudomonas savastanoi* carry genes that specify synthesis of enzymes responsible for cytokinin biosynthesis. Data on their structure, function and control of their expression are presented by R. C. Morris. Using synthetic growth regulators (paclobutrazol, CCC) and mutants with altered GA status P. Hedden and J. R. Lenton studied GA action, their metabolic regulation and role in the control of plant growth and development. A contribution of H. Imaseki *et al.* deals with ACC synthase, especially with its induction by wounding and with control by other plant hormones. Instrumental analysis, genetics and enzymology were applied by J. D. Cohen *et al.* to study the process regulating the level of the naturally occurring indoleacetic acid. W. F. Thompson *et al.* suggest that the molecular mechanisms of phytochrome mediated gene expression differ for different genes. A role of oligosaccharides as possible systemic signals in activating transcription of proteinase inhibitor genes for defense against insects is discussed by C. A. Ryan. Effects of *Rhizobium trifolii* metabolites on the

development and symbiotic infection of clover root hair are described by B. Dazzo *et al.* G. Hadley concluded that ecological importance of mycorrhizae is wide-ranging but its application in agriculture is less useful than predicted formerly. A transfer of genes involved in morphogenesis by *Agrobacterium* vector system and the problem of regenerating soybean plants from transformed cells are described by L. D. Owens and A. C. Smigocki.

All the papers presented are directed to the present state of knowledge, future trend, potential impact and limitations to the progress in basic biological mechanisms.

LIBUŠE PAVLOVÁ *(Praha)*

FURUYA, M (ed.): PHYTOCHROME AND PHOTOREGULATION IN PLANTS – Academic Press, Inc., San Diego-Orlando-New York-Boston-London-Sydney-Tokyo-Toronto 1987. 354 pp. US $ 55.00.

This book contains 26 chapters written by lecturers and chairpersons of the round table discussion sessions of the Sixteen Yamada Conference, held in October 1986 at the Okazaki National Research Institute in Japan.

Chapters are grouped into five parts. Introducing Part I written by M. Furuya is devoted to the history of phytochrome. Seven chapters of Part II deal with molecular approaches to the problems of photoregulation. Phytochrome regulation of greening (W. R. Briggs), photocontrol of gene expression (E. M. Tobin), and control of the phytochrome gene expression (P. H. Quail *et al.*) are reviewed. Structure-function relationship studies show the presence of functional domains also in the carboxyl-terminal half of phytochrome protein (T. Yamamoto), and it is presumed that phytochrome itself may be a protein kinase and/or that the primary signal transmission pathway involves protein phosphorylation (J. C. Lagarias *et al.*). The features of phytochrome from green *Avena* are described by L. H. Pratt. Recent application of immunological techniques to the study of phytochrome is reviewed by A. Nagatami *et al.* Six chapters on Part III deal with spectrophotometrical and biophysical approaches. Phytochrome transformation is the main topic discussed in four chapters (Y. Inoue; W. Rüdiger; P.–S. Song and I. Yamazaki; H. Suzuki *et al.* Useful methods for studying the structure of phytochrome with special attention to small-angle X-ray scattering technique are reviewed by S. Tokutomi *et al.* The action dichroism is shown to be also a useful tool in the efforts to elucidate the mechanism of phytochrome action (Ch. Sundquist and H. Hamaguchi). Part IV consists of contributions using a physiological approach to studying photoregulation. Three contributions written by S. J. Roux, R. Manabe, R. E. Kendrick and M. E. Bossen are focused on problems to the test membrane hypothesis of phytochrome action. W. Haupt's article deals with phytochrome control of intracellular movement. Photo- and polarotropism are the topics of the contribution of M. Wada and A. Kadota. D.Vince-Prue and A. Takimoto focused their attention on the unresolved problems of the role of phytochrome in photoperiodic floral induction. Part V is devoted to photomorphogenetic studies. E. Schaefer's contribution deals with primary action of phytochrome and gene expression. H. Smith and G. Whitelam summarized knowledge of phytochrome action in the natural environment. Effects of the blue and UV-light are mentioned by D. Lipson and H. Senger. H. Mohr suggests that "... the study of morphogenesis is not only molecular biology of the cell and its organelles but also a study of the interactions between cells".

This book excellently summarizing contemporary knowledge on photoregulation in plants is an indispensable tool for workers in the field of photomorphogenesis.

LIBUŠE PAVLOVÁ *(Praha)*