

## BOOK REVIEWS AND ANNOUNCEMENTS

E. KITS VAN WAVEREN: *The Dutch, French and British species of Psathyrella*. Persoonia, supplement volume 2. Rijksherbarium Leiden 1985. 300 pp., 448 figs. Soft cover. Price: Df 85.– if paid into postal account 11 17 68, Rijksherbarium, Leiden; Df 92.50 if paid by cheque to: The administrator, Rijksherbarium, P.O. Box 9514, 2300 RA Leiden. The Netherlands. ISBN 90-71236-01-03.

*Psathyrella* is one of the largest and most "difficult" genera of the Agaricales (Basidiomycota, Fungi). It is related to the well known genus *Coprinus* (ink caps) and differs mainly by the not inking lamellae. *Psathyrella* species are not coprophilous (as are many *Coprinus* species), but are humicolous and occur in forests, lawns, marshes, dunes or burnt soils, or on wood. They are characterized by small or medium sized, umbrella-like caps often on relatively long and delicate stipes. The present study is based exclusively on specimens collected in the Netherlands, France and the British Isles. Species known from Germany or other parts of Europe are neglected. The author accepts 123 taxa as species or varieties. Useful keys, adequate descriptions and clear line drawings are provided. The genus is accepted in its classical delimitation and is subdivided into two subgenera and several partly new or newly delimited sections. This subdivision, based on easily recognizable characters, appears to be "natural" and without doubt is very useful.

Several treatments on *Psathyrella* exist, but the identification of the European species has been, up to now, difficult or nearly impossible. Therefore the genus has often been neglected. This new treatment will improve this situation. The publication is printed on good, glossy paper and paperbound. New names and other new taxa are listed separately with the latin diagnoses. An index to all fungus names is given. The price of the book is reasonable.

Dr. Kits van Waveren is a retired medical doctor and a well known amateur mycologist. His revision of a difficult group of fungi, however, is an exemplary professional work, useful for all interested in macrofungi.

J.A. VON ARX

S. S. BHOJWANI and M.K. RAZDAN: *Plant tissue culture: Theory and practice*. Developments in Crop Science Vol. 5. Elsevier, Amsterdam, Oxford, New York, Tokyo 1983. viii + 502 pp., 93 figs. 60 tables. Cloth. Df 295.–; U.S. and Canada (from Elsevier Science Publishing Co., P.O. Box 1663, New York, NY 10163) US\$ 125.50. ISBN 0-444-42164-5.

The title 'Plant tissue culture' covers protoplast, cell, tissue and organ culture. The book is written as an introductory for students and research workers in all fields of in vitro culture. Moreover it contains sufficient links to the practical application of in vitro culture to be of value for commercial plant propagators.

The first three chapters are devoted to the history of tissue culture and give a survey of the practical aspects as laboratory requirements, general techniques and culture media. The following 13 chapters are concentrated on the subjects: cell culture, cellular totipotency, somatic embryogenesis, production of haploids and triploids, cytogenetic studies, in vitro pollination, zygotic embryo culture, protoplast isolation and culture, somatic hybridisation, production of pathogen-free plants, clonal propagation and germplasm storage. At the end of the chapters appendices are included containing concise information that might be useful in practicals and lectures. More than 100 pages of the

book are spent to a glossary of terms used in plant tissue culture, an extensive list of references, an author index, and a subject and plant index.

Plant tissue culture is not only regarded by reviewer to be an excellent handbook but even to be the best published so far. As such it has been used in several international introductory and advanced courses on in vitro culture and recommended to the participants. The appreciation of the book was unanimous. However, because of the exorbitant price none of the participants could afford to buy this excellent book.

Taking into account the price the paper and printing quality of the book are certainly below standard.

To the reviewers point of view it is regrettable that such an excellent book as "Plant tissue culture" is out of the reach of potential users because of the exorbitant price and thus hampering the dispersal it deserves.

G. STARITSKY

N.S. MARGARIS, M. ARIANOUSTOU-FARAGGITAKI and W.C. OECHEL (Ed.): *Being alive on land*. Tasks for vegetation science vol. 13. Dr. W. Junk, publishers, The Hague, Boston, Lancaster, 1984. 334 pp., ill. Cloth. Df 175.-; US\$ 72.-; £ 44.50. ISBN 90-6193-953-4.

The 34 papers in this book were presented at a symposium on adaptations to the terrestrial environment held in Greece, 1982. The first section on ecosystem adaptations includes some rather general papers on mediterranean and tundra vegetations. Furthermore, a critical evaluation of the estimation of paleoclimate by the foliar physiognomy method is given. In the section on adaptations to waterstress a paper is presented that indicates the significance of sand sheaths surrounding roots of arid zone grasses for the conservation of water. It is concluded that proline accumulation cannot be used as an indicator for stress tolerance in plant breeding. The section on adaptations to temperature further includes a paper on the significance of high day temperatures for CAM in Macronesian Sempervivoidae. Adaptations to light are illustrated in a contribution that describes the difference in adaptability to shade between two grass species that replace each other in a successional series.

The section that is called "interactions" is very diverse and includes a lengthy paper on the branching pattern of columnar cacti with a discussion on their adaptive significance. The section on pollution mostly concentrates on heavy metals with among others discussions of methods to determine their effect under field conditions.

Some concentration of the papers on mediterranean type ecosystems can be recognised (8 papers), but as the title does suggest, the majority of the contributions cover a very wide field. This is a serious disadvantage. Moreover, the quality of the papers varies considerably, both from a scientific and an editorial point of view. The system of collecting camera ready manuscripts from the authors, which cannot be edited thoroughly afterwards, should be reconsidered. Although some papers are interesting enough, I think that there is better value for this money!

T.L. PONS

W.J. CRAM, K. JANÁČEK, R. RYBOVÁ and K. SIGLER (Eds.): *Membrane transport in plants*. John Wiley & Sons, Publ., Chichester, 1984. Cloth. £ 22.50. ISBN 0-471-90467-8.

This book contains 33 papers and 165 abstracts of posters presented at the symposium on Membrane Transport in Plants, held in Prague in 1983. The reader will find short papers and abstracts covering various topics such as mathematical models and theories of membrane transport, water transport, stomatal movement, electrophysiology of plant cells and organelles, properties and regulation of transport in lower and higher plants, transport enzymes. Included are also a brief summary of round

table discussions on "Mathematics in the study of transport in Plants" and on "Practical implications of Plant transport studies, especially for agriculture and food production".

This book certainly is valuable for biologists and plant physiologists who work in a field in which structural, functional and regulatory aspects of transport processes are considered. They will not find detailed information but they can use this book as a good information source which opens a gate to further relevant literature.

W.J. VREDENBERG

J.P. GUSTAFSON: *Gene manipulation in plant improvement*. 16th Stadler Genetics Symposium. Plenum Publishing Corp. New York and London 1984. xi + 668 pp., many figs. and tables. U.S.\$ 90.-; United States: \$ 75.-. ISBN 0-306-41883-5.

In this book highly qualified scientists present 24 review papers in the field of plant breeding, crop physiology, plant pathology and cytogenetics at the plant, cellular and molecular levels. The authors were successful in creating an overall balance between realism and imagination. The information presented is highly valuable to plant breeders, but equally important – though for other reasons – to biotechnologists and genetic engineers.

The first paper is a scientific autobiography by the breeder/scientist Burton, who gives as his opinion that genetic engineering at best can be only a plant breeding tool. Duvick discusses the continued progress of grain yield from 1930–1980. He suggests avoidance of the term "conventional" plant breeding, because "plant breeding is essentially unconventional". The methodology and philosophy of two international breeding programmes, viz wheat breeding at CIMMYT and rice breeding at IRRI, are described by Rajaram et al. and Khush respectively. Rasmusson reports on not very successful research on ideal plants ("ideotypes") described in terms of individual plant characters which would be yield promoting. A highly informative and critical paper is by Evans on physiological aspects and variety improvement. Amenability of genetic engineering in breeding for adaptation, yield, stress tolerance and disease resistance is discussed. Baker in his contribution demonstrates that the study of quantitative genetics is closely allied to the practice of plant breeding. Biology and genetics of host-parasite interactions are treated by Hooker together with programs and practices to manipulate the interactions to the advantage of man. An extensive study by Dewey on intergeneric hybridization with the perennial *Triticeae* as it is guided by genome classification covers more than 70 pages of the book.

The highly sophisticated techniques of chromosome manipulation were reviewed by the pioneers in this field: Sears, Riley and Law, Kimber. These techniques have been worked out for wheat as a model crop but basically apply to all allopolyploid species. Bennett reports about his analysis of nuclear architecture and the implications of the occupation by chromosomes of the peripheral or inner domains in the nucleus for gene activity and effectiveness.

Several papers are devoted to different in vitro cell/tissue/organ manipulations ("biotechnology" in the terminology by Simmonds). Collins et al. discuss in detail embryo and ovule culture with their refinements, in vitro pollination and fertilization, and somatic hybridization (300 references); Baenziger et al. describe theory and practice of the use of doubled haploid variation; Cocking considers the potentials and progress in the use of protoplasts with emphasis on novel variation, limited gene transfer and direct DNA-transfer via isolated plasmids; Orton presents in a rather optimistic way some theoretical and practical considerations on somaclonal variation; Meredith finally offers a critical discussion on potentials and limitations of selection in vitro.

Appels and Moran report on their molecular analysis of alien chromatin introduced from rye into wheat. Genetic aspects of symbiotic nitrogen fixation are reviewed by Long. Rochaix et al. discuss a potential model system for chloroplast gene manipulation (*Chlamydomonas reinhardtii*). Beachy reports on research in the complex series of biochemical steps which control the expression of genes in plants and in factors able to modify these processes. Bedbrook documents recent progress in genetic engineering of plants, summarizes likely progress in the near future and discusses the

prospects of genetic engineering as a new technology in plant breeding.

In the final summarizing paper Simmonds gives a thorough and realistic review on plant breeding at the macro-level (manipulation of polygenes), at the micro-level (manipulation of major genes) and at the molecular level. He clearly defines and discriminates between genetic engineering ("has not yet touched the practice of plant breeding") and biotechnology ("has already enhanced plant breeding technology...and potential for further enhancement is good"). And his final conclusion: "...the mainstream of plant breeding is likely to continue as it is (and has been) and...it is not about to be transformed by any single area of scientific endeavour".

Plant breeders and genetic engineers could interact and be interfaced with one another during the symposium. Those who have not been able to attend have an excellent opportunity to experience the value of such interaction by reading this excellent book.

J.G.TH. HERMSEN

P.R. BELL and C.L.F. WOODCOCK: *The diversity of green plants*. Third edition, 1983. Contemporary Biology Series, Edward Arnold (Publishers) Ltd., London. 360 pp., 272 figs. 4 tables. Price £ 9.95, paperbound. ISBN 0-7131-2866-6.

It is quite difficult to write a more or less objective review of a book with such a misleading title. The title of the present book suggests that it contains a synopsis of the Regnum Plantae- the true (green) plants. However, the book contains a survey of all photoautotrophic organisms, commonly considered to belong to the botanical world, including all groups of Algae with their different colours. Thus, the Fungi are excluded.

The first edition of this book was published in 1968. Despite serious efforts to update it by adding new information, this third edition gives the impression of being an old-fashioned book on plant taxonomy. For example, terms or names as "Cyanobacteria", "Whittaker's five-regnum system", "Stachyspory", "Cladistics" or "Dasycladales" are not mentioned. A modern book about diversity, one of the most interesting themes in Biology, should also discuss new methods and new theories and give reasons for the accepted phylogeny and classification. If these topics are included, one can show students the joy of making decisions on basis of all available information.

Of course "The Diversity of Green Plants" contains a large quantity of useful information in text and figures. However, the quality of several of the original figures (and of some of the badly copied ones) is not better than those figures produced by students taking a general course in Systematic Botany.

W.F. PRUD'HOMME VAN REINE

K. NAPP-ZINN: *Blattanatomie der Angiospermen B. Experimentelle und ökologische Anatomie des Angiospermenblattes*, 1e Lieferung. Handbuch der Pflanzenanatomie VIII, 2B1. Gebr. Borntraeger, Berlin, Stuttgart 1984 (1985). xv + 519 pp., 129 figs, 168 tables. Cloth. DM 196.-. ISBN 3-433-14014-9.

This is the first of two bulky volumes on experimental and ecological leaf anatomy of the angiosperms. It follows the two volumes in the Handbuch der Pflanzenanatomie series on leaf ontogeny and histology with which the author enriched our libraries so significantly in 1973 and 1974.

The lay-out of the present volumes is carefully planned. The first one deals with the relationships between external conditions and leaf structure. It begins with an extensive review of the salient microstructural features in major biotope categories such as tropical rainforests, mangroves, the aquatic environment, arid regions, and alpine and arctic vegetations. Subsequently the effects of garden and greenhouse cultivation and seasonal differences in leaf structure are dealt with. The remaining part of the book deals with the effects of single environmental factors: light (intensity, direction, photoperiodicity, wavelength), temperature, water, various atmospheric factors (wind,

chemical composition, pollution), nutrients (with sections on parasitic, saprophytic, carnivorous and leaf symbiotic angiosperms as well as on single organic and mineral nutrients of autotrophic plants), and mechanical factors. The forthcoming second volume will concentrate on the genetic factors controlling leaf structure and on internal factors (nucleic acids, proteins, hormones) interacting with external factors to result in specific morphogenetic processes. The inspiration to treat the subject matter in this way comes from the ideas put forward by the German botanist Klebs in the beginning of this century: external factors and specific structure (i.e., genotype) act on the internal conditions and thus affect organo- and histogenesis. This is not the only instance where Dr. Napp-Zinn takes his cue from the older, elsewhere rather neglected literature.

In the first place this book is a comprehensive chronicle of well over a century of highly diverse research on ecological and experimental leaf anatomy. As such it is a tremendously valuable source of information.

In his preface the author protests the superficial arrogance of contemporaries who ignore the work of their predecessors, and in the same vein he criticises budget cuts for scientific libraries and the illusion that it is possible to be a good scientist without speaking a single language beyond one's own. Although no direct accusations are made, one may safely assume that the latter criticism is largely aimed at English writing botanists who ignore the earlier German literature to such an incredible extent. However, one can only fear that the present Handbuch volume will suffer the same fate, because the reluctance to enter foreign language classes will probably remain a more persistent fact of life than the desire to be a good scientist.

The very faithful accounts of early and recent literature (over 3000 references are cited) constitute the strength and at the same time the weakness of this volume. Respect for the results of others has often induced the author to refrain from voicing his own opinion or from taking sides on controversial issues. So the reader is sometimes disappointed after reading a very detailed account on a special topic to find no conclusions at the end. Perhaps the forthcoming second volume will contain more synthesis in this respect. In any event it would be marvellous if the author, after completing these *encyclopedic* volumes, could yet write a shorter text (about 100 pp.) as a teaching manual or idea book on the same subject which is so central in plant biology and evolution. Dr. Napp-Zinn would be better qualified to write such a balanced text than anyone else after having digested critically so many and such diverse studies. Although the Philistines do not deserve it, he might even consider to write it in English in order to reach a wider audience.

Meanwhile the present Handbuch instalment is a must for everyone who takes leaf structure and function seriously.

P. BAAS

A. FREY-WYSSLING: *Lehre und Forschung, autobiographische Erinnerungen*. Grosse Naturforscher Bd. 44. Wissenschaftliche Verlagsgesellschaft MBH, Stuttgart 1984. 192 pp., 25 figs. DM 32.-. ISBN 3-8047-0695-9.

In this well-written, fascinating book professor Frey-Wyssling describes his development from a noisy urchin to an accomplished investigator, teacher and leader of an institute of international fame. From the chapter "Jugend, 1900-1919" one gets the impression of an intelligent and studious youth with many-sided interests growing up in an almost ideal setting. His parents as well as a number of excellent teachers, gratefully remembered, must have greatly influenced him.

In 1919 Frey entered the science division of the Zürich Technical University (Eidgenössische Technische Hochschule, ETH), with seven fellow-students, a number allowing good contacts between the students and their professors. Characteristics of the professors with their photographs (and autographs) enliven the chapter on the years of study.

After completion of his study in the ETH Frey investigated the different types of calcium oxalate crystals in plants, which led to his thesis (1925), but also to the use of the polarisation microscope, not only for the study of crystalline objects of microscopic dimensions, but also to penetrate into the "submicroscopic structure of protoplasm and its derivatives". Before his ideas about these ultrastructures matured a four year intermezzo as a plant physiologist in the rubber experiment station

in Medan (Sumatra) brought him in contact with the rich flora of the tropics and with the application of his science to practical problems.

After his return to Zürich the theories about the submicroscopic structure of protoplasm and of its derivatives were formulated. They met with considerable opposition (chapter "Akademische Laufbahn") until after the war the electron microscope became available and the submicroscopic structures could be made visible, and proved to be of the nature professor Frey-Wyssling had postulated from his polarisation microscopic studies. His institute then developed into an important centre of electron microscopy, where several new techniques were developed and scientists from many countries came to learn those techniques.

In the last (and largest) chapter, "Akademisches Amt 1938–1970", professor Frey-Wyssling (appointed in 1938) gives characteristics of his colleagues, describes the development of his institute and gives a vivid description of his travels to and through many countries all over the world to give lectures and attend congresses, adding many anecdotes, all, as the whole book, pervaded with a mild humor and, occasionally, an even milder criticism.

A few minor errors on p. 123 should be corrected: Baas Becking did not evade the German invasion of Holland by going to Australia, but stayed in Holland until his imprisonment by the Germans in 1944, was in 1945–1948 in Java and only in 1950 went to Australia; A.N.J. Heyn and P.A. Roelofsen graduated in Utrecht, pupils of F.A.F.C. Went, not of G. van Iterson (Delft).

An impressive list of books and papers of which Frey-Wyssling is the author or one of the authors, 226 in all, concludes the book.

In an introduction the author explains the title of the book: Lehre und Forschung, teaching and investigation, and gives his views on the mutual relation between these sides of the professional activities of teachers of science. His own successful career shows the correctness of his views.

H.P. BOTTETIER

**R. FLINDT: *Biologie in Zahlen*. Eine Datensammlung in Tabellen mit über 9000 Einzelwerten. Gustav Fischer Verlag, Stuttgart 1985. xiv + 280 pp., flexible cover. DM 39.—. ISBN 3-437-30446-6.**

A collection of quantitative data on different aspects of the morphology, anatomy, physiology, and general biology of man, animals, plants, and micro-organisms. Apparently it is in the first place intended for school teachers to have a good reply ready for the many questions their pupils may ask, and to be able to add quantitative data to their lessons, whenever appropriate.

Botanical topics are well represented; they cover about a quarter of the text. The author has not aimed at completeness, either with regard to the topics treated or to the organisms mentioned, but in the available space had to make a choice, after his own preferences.

The book will undoubtedly be a welcome addition to the library of every German school teacher in biology; for non-Germans its utility is less obvious, as with few exceptions only German names of the organisms are mentioned, the scientific equivalents of which are not always easily found. E.g.: table 2.4.7 gives the flowering time of some 200 plants; 40 of the names are not found in the index of Garcke's "illustrierte Flora von Deutschland" (21st ed.), 17 of them not in the flora's text either. In the majority of tables there is ample room for the addition of scientific names without increasing the number of pages.

H.P. BOTTETIER

H. WALTER and S.W. BRECKLE: *Ecological systems of the geobiosphere. 1. Ecological principles in global perspective*. Springer Verlag, Berlin, Heidelberg, New York, Tokyo 1985. xi + 212 pp., 130 ill. Hard cover. DM 98.-. ISBN 3-540-13792-0.

This book is just a translation by Sheila Gruber into English of Walter and Breckle's (1983) *Ökologie der Erde, Band 1: Ökologische Grundlagen in globaler Sicht*, which has been reviewed by me in *Acta Bot. Neerl.* 34(1): 44.

Thus no scientific results are added to this book.

However there are some changes in the lay-out making it still better! The sequence of some chapters is improved, less small letters are used in the text and the excellent figures are still more readable now since the assessor text is now under or to the right of the figures.

The subject index is a bit more expanded, but still far from complete. The price is more than twice as high as that of the German version. Therefore it can be recommended only for ecologists who are not able to understand the German language. Those who do are recommended to buy the German version.

F.J.A. DANIELS

W. WIESSNER, D.G. ROBINSON and R.C. STARR (Eds.): *Compartments in algal cells and their interaction*. Proceedings in life sciences. Springer Verlag, Berlin, Heidelberg, New York, Tokyo 1984. xi + 241 pp., 141 figs. Cloth. DM 98.-, c. US\$ 35.70.

This book contains all papers presented at a symposium that took place in Göttingen, W. Germany, in September 1983. The participants were predominantly Europeans. The symposium was organized because, as the editors explain, "in recent years unicellular algae have become increasingly recognized as favoured objects for studies on structural, biochemical and developmental aspects of compartmentation".

The theoretical basis of the concept of compartmentation, i.e., the subdivision of cells by biomembranes into plasmatic and non-plasmatic compartments is presented by Schnepf in the first contribution. Although, as the author admits, the underlying principles are at present quite trivial indeed, various ultrastructural observations seem incompatible with the so-called rules of compartmentation.

Each of the following papers is a specialized report on the molecular genetics, biochemistry, ultrastructure, development, and interactions of one or more compartments. The photosynthetic pigments-containing compartment (chloroplasts, cyanelles) is dealt with in nine papers (five on the molecular genetics, four on the interaction between chloroplasts and other compartments). Other topics are the genetic control and/or functioning of flagella, flagellar apparatus components, contractile vacuoles, mitochondria, Golgi apparatus, and microbodies. The last two contributions deal with blue-green algae (respiratory and photosynthetic electron transport, and heterocyst biochemistry and differentiation, respectively).

The title of the book is somewhat misleading in that some contributed papers have nothing to do with algae: *Pisum sativum*, whose chloroplast genetics are discussed by Kloppstech et al. is not generally considered an alga (unless one adheres to the view that all higher plants are advanced chlorophytes; blue-green algae, the subject of the papers by Kies, by Sandmann et al., and by Bothe et al., are better not referred to as algae but as Cyanobacteria, and De Priester's paper "Mitochondria and their interaction with other cell compartments" does not specifically relate to algae. Furthermore, the flagellar apparatus, discussed in four contributions, is not a separate compartment but, in Melkonian's words, "a local specialization of the cytoplasmic compartment".

Since essentially all investigations on the ultrastructure, biochemistry, and molecular genetics of any cellular organism deal with one or more "compartments", it is clear that an extremely large

and varied area of cell science is covered under the heading "Compartmentation", as is demonstrated by the highly heterogeneous collection of papers in this book. Therefore, although the choice of "Compartmentation" as a general theme for a symposium may have some attraction in that researchers from widely different disciplines may be brought together, I am afraid that few researchers (cell biologists, biochemists, phycologists) will find sufficient new information relating to their respective specializations that would make the book as a whole an attractive bargain, despite its reasonable price.

H.J. SLUIMAN

**F.G. BARTH:** *Insects and Flowers. The Biology of a Partnership.* George Allen & Unwin, London, Sydney, 1985. IX + 297 pp., 97 figs., 40 plates. Cloth. £ 12.95. ISBN 0-04-574029-1.

Insect-plant relationships receive much attention nowadays. This is confirmed by publications in 1983: two English and one German book on this topic. This review concerns the English translation of the German one.

The story of the encounter between insects and flowers is told in 30 chapters, to make it easier to understand. Each chapter can be read separately and also references at the end of the book are arranged according chapters. The author provides a variety of examples of the interdependence of flowers and insects, a 'transaction' worked out over a period of 135 million years of evolution: pollination for food. From the relationship of fig and fig wasp through the dance language of bees to the way an orchid deceives its insect visitors, the author brings together recent discoveries about the coevolution of plants and insects. Regularly the reader comes across line drawings of testing arrangements or testing devices. Such an arrangement varies from panes of glass, with in between flowers of *Linaria vulgaris* mounted, to demonstrate the effectiveness of the nectar guides (Knoll 1926) to an automatic testing device to determine whether the bee can discriminate the odor to which it has been trained from various alternative odors. Although the encounter is considered particularly from the viewpoint of the insects, the plants are just as intricately involved (the author cited). This viewpoint appears in the assays to reveal both flower structures and the impressive sensory, navigational, and communication abilities of pollinating insects. (The author has specialized in sensory physiology, the neurobiology of lower animals, and biomechanics).

The edition of this attractively produced and clearly written book could be of interest to everyone involved in insects and flowers. It is illustrated with photographs in full color, full-page photographs made with an electron microscope, and very good line drawings.

M.M. KWAK

**A. SLACK:** *Karnivoren. Biologie und Kultur der insektenfangenden Pflanzen.* Verlag Eugen Ulmer, Stuttgart, 1985. 272 pp., 16 plates, 106 photos. Cloth. DM 88.—. ISBN 3-8001-6158-3.

This book is of special interest for those who are fascinated by carnivorous plants: both amateur and professional botanists, high school teachers in biology and plant breeders. It contains descriptions of many species of all known carnivorous vascular plant genera. Geographical distribution, habitat, taxonomy, mythical and economic significance, catching mechanisms and many other aspects are treated. A special chapter is dedicated to the cultivation, propagation and hybridization of diverse species; mainly based on Slack's own extensive experiences.

The book is rather discursive, but well-illustrated with drawings and with photographs (partly full size in colour). The German title is misleading: only plants are described and carnivorousness and insect catching is far from synonymous. The glossary is removed, but a possible new carnivorous species and some notes are added.

If you can afford it, you will forget the prize and enjoy the book. Alternatives are: the original english edition, the well-treated dutch translation or possible other translations.

H.H. VAN GENDEREN

R. DOUCE and D. A. DAY (Ed.); *Higher plant cell respiration*. Encyclopedia of Plant Physiology, New Series, Vol. 18. Springer Verlag, Berlin, Heidelberg, New York, Tokyo, 1985 XVI + 522 p.p., 81 figs. Hard cover. DM 298.—. ISBN 3-540-13935-4.

In this volume expert authors give excellent reviews covering the literature up to 1984. Careful editing resulted in a very readable and coherent discussion of the present knowledge and the remaining problems in this field. Enormous progress has been achieved during the last 25 years, especially on the (sub)cellular and biochemical level, with great consequences for a better understanding of respiratory energy- and carbohydrate metabolism *in vivo*.

In a volume of ca. 500 pages it is impossible to discuss extensively all aspects of respiration, the cellular organelles involved and the regulating mechanisms. Many subjects have only been discussed briefly with adequate reference to recent reviews in literature.

More than half of the book is concerned with the structure and the functional components of plant mitochondria and their participation in cell respiration. Special attention has been paid to problems in the isolation of functional mitochondria from plant tissue (20 pages). Separate chapters discuss the occurrence of cyanide-resistant electron transport in many plant mitochondria (40 pages) and the oxidation of 'external' NADH by plant mitochondria (25 pages). The fact that plant cells function under a wide variety of metabolic conditions and that electron transport can bypass most or even all energy conservation sites raises many new questions on function and regulation of the participation of the electron transport routes and their components (the Q-pool model).

The remaining part of the book is dedicated to metabolic aspects of respiration with the intention of extrapolating what is known to the intact cell and tissue. Starting from the TCA-cycle in plant mitochondria (chapter 10) and the special function of leaf mitochondria in photosynthetic cells (including photorespiration) (chapter 11), discussion switches to mainly carbohydrate metabolism and production of respiratory substrates. How intracellular carbon fluxes from starch or sucrose toward respiration and other metabolic pathways are adjusted under various physiological conditions (chapter 12) is an important topic of dispute. Even with regard to settled pathways such as glycolysis and PP-pathway, several questions as to the exact pathway, intracellular localization and regulation are still open. The recent discovery of pyrophosphate:F6P-phosphotransferase and the role of fructose-2,6-bisphosphate is a complicating factor. Knowledge of carbohydrate metabolism in plastids is still fragmentary.

Finally, the regulation of respiration in intact plants and tissues and its dependence on environmental factors (including invading organisms) is discussed (chapter 14). Interesting topics are respiration associated with growth and maintenance, and the physiological significance of the energetically inefficient cyanide-resistant respiration ('energy overflow model').

This volume presents an impressive body of evidence on the progress made in the field of Cell Respiration. It is stimulative in that it also exposes many uncertainties and new developments. It should be at hand for everybody interested or working in this field.

J.D. VERLEUR

## ANNOUNCEMENTS

M. KEDDAM-MALPLANCHE: *Le pollen et les stomates des Gardénieés (Rubiaceés) du Gabon. Morphologie et tendances évolutives*. Editions du Muséum National d'Histoire Naturelle. Memoires du Muséum, Série B. Botanique. Tome 29. Paris, 1985. 109 pp., 45 figs., 16 plates. 220 F.

In an attempt to establish evolutive trends a detailed analysis of pollen and stomata was performed for 40 species of Gardenieae from Gabon (12 genera). Correlations between these data incorporating a few additional macro-morphologic features allowed to elaborate some hypotheses concerning the evolutive levels of the taxons investigated. Phenetic and cladistic analysis using numerical techniques were applied to the study of *Rothmannia*.

From these observations the tribe appears as highly heterogeneous and can be hardly delimited. These findings support the literature view of a primitive tribe in the Rubiaceae.

Finally, affinities among the Rubiaceae and the relative families were investigated.

INTERNATIONAL SYMPOSIUM ON GRASS SYSTEMATICS AND EVOLUTION, 27 – 31 July, 1986. Smithsonian Institution, Washington, D.C., U.S.A.

The Smithsonian Institution in conjunction with the American Institute of biological Sciences and the National Science Foundation is sponsoring an international symposium on grass systematics and evolution at the Smithsonian in Washington, DC, from 27 – 31 July 1986. At this meeting more than 40 of the world's authorities on grass biology will present papers on structural diversity, reproductive biology, biochemical diversity, evolution, and systematics. These presentations will summarize recent research, identify current problems, stimulate new research, and facilitate the international and interdisciplinary exchange of ideas and data.

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