

Book review

J. H. DICKSON: *Wild Plants of Glasgow. Conservation in the City and Countryside.*

The Mercat Press (reprint), Edinburgh, 1992, 208 pp., 22 col. pl., 29 col. fig., 10 maps, 2 b&w ph., 3 tab., price no given, ISBN 187 364 4094.

The book of Jim Dickson, a botany lecturer at the University in Glasgow (and the president of Botanical society of Scotland) deals shortly and in rather popular way with the flora of this large industrial centre of Scotland and its surrounding districts (total area of 360 km²) with 3/5 of the territory lying below 50 m a.s.l. The highest peak reaches 213 m.

Sediments prevail in the territory and glaciers shaped the landscape considerably. This territory has been inhabited for a long time and so natural forests cover only its small part. Nowadays, this area has been much urbanised.

Author outlines brief history of botanical research since JOHN HOPE up to culmination period when Atlas of British Flora was published (1962). Up to now, about 1200 species have been found. On 10 selected maps the author shows some part of geographic pattern diversity in the territory. Reasons for different chorotypes are explained briefly.

In the second part an attention is paid to special habitats: to bank of rivers, canals, railways, motorways, rubble wasteground, heaps, rubbish tips, golf courses, heaths, cemeteries, churchyards, gardens, woodlands, wetlands. At the same time, some of their characteristic plants, both indigenous and naturalised are presented (e.g. on river banks the following plants are found: naturalized *Allium paradoxum*, *Heracleum mantegazzianum*, *Impatiens glandulifera* and even *Ficus carica*, as well as indigenous but very rare *Limosella aquatica*, or *Nuphar x spennerana*).

Finally, in the 3rd part, conservation of city and countryside plants is outlined. An attention is devoted to orchids and reasons of their receding. Particular habitats analyzed in the 2nd part are characterized from the point of view of nature protection. In today's Glasgow, about 100 plant species became extinct, but the interest of its inhabitants in nature can be a source of hopes for the future.

The book is ended by bibliography and information on further literature for study, and, finally, by index. Regarding to the fact that this book is popular one, English plant names in text and on figures are not a fault, however, they make it difficult for non-English reader to orient in the text. I can recommend the book to everybody interested in plants and their world. It is a good introduction which is able to provide information and direct especially young readers. This is, perhaps, its main sense. The book is supplemented with colour photographs of T. N. TAIT and with paintings of E. HARRIGAN.

V. MIKOLÁŠ

Book review

R. I. BURDA: *Antropogennaya transformatsiya flory.*

Naukova dumka, Kiev, 1991, 169pp., 12 figs., 22 tabs., 56 col. ph., 3,40 rub., ISBN 5 12 002068 2.

R. I. BURDA from Donetsk Botanical Garden deals with genesis problems of SE Ukrainian flora, its phytogeographical division and anthropogenous transformation. The territory comprises the area of 53.2 thousand km² with quite complicated geological composition and the surface variability within the range of 0 to 369 m a.s.l.

After a short history of botanical research the author analyses species composition of the flora. There are 1839 species in the territory. Several species are new for the whole of Ukraine and 44 species are new for its SE part. 80 species are excluded. Geographical analysis of the flora follows (palearctic, Black Sea region species prevail). 110 (5.9 %) species are adventive. Endemism is then analysed in detail. 279 (15.3 %) species are endemics, 93 of them are regional. The endemics are geographically subdivided and their phylogenetic relations, isolation, florogenetic relations and age are multilaterally analysed.

In the next chapter, partially linked to the previous one, the genesis of SE Ukrainian flora is analysed. The age of petrophyton (rock flora) is discussed. Its greatest part is very old. The origin of psammophyton lies obviously in older flora formed probably on sands. In the recent era, the influence of human activities is characterised by cosmopolitisation and unification of flora.

The chapter about the spatial differentiation of flora is based on flora-isolates (analysed floras-isolates didn't exceed 25 km²). Within the framework of 150 floras-isolates studied 28 partial floras belonging to 7 macroecotope classes were singled out. The largest ecotopologic variability is characteristic for elevated macroecotopes. The chapter is ended by detailed floristic zonation of the territory belonging to three complexes (Donetsk, North-Priazovsk and North-Donetsk-Don).

The sixth chapter deals with anthropogenous transformation of the flora. From the whole of flora 44 species are extinct (not found since 1930, e. g. *Agrostemma githago*, *Calla palustris*, with *Veronica persica* obviously placed as a mistake here), the occurrence of 236 species (12.8 %) is sporadic (up to 3 localities), 306 (16.8 %) species have sparse occurrence with the maximum of 10 localities.

The number of adventive species (110) is low. However, many species expand in recent decades (e.g. *Bidens frondosa*, *Chenopodium botrys*, etc.). Detailed analysis of adventive flora (naturalisation degree, origin, introduction time and way) follows. Ergasiophyte ephemerophytes (escaped decorative species) are excluded from the analysis. Apophytes were not included among adventive species. Anthropogenous transformation of flora comprises three processes: indigenous flora impoverishing, alien flora expansion and evolution of new types in deteriorized environment.

In the next chapter the author deals with transformed flora types. She distinguishes six types: nature reserve flora, slightly deteriorized ecotope flora, semi-natural ecotope flora (planted woods are included here first of all), agrophytocoenose flora, urban flora and technogene ecotope flora.

The last, 8th chapter deals with phytosociological questions of the conservation of the biodiversity of regional flora in connection with anthropogenous processes. A list of rare, endangered and extinct species (257 species) was compiled with five categories of endangerment used. Nowadays in this territory, there are 90 nature reserves, covering 0.04 % of area.

The book is ended by the list of references and an appendix (including specific species of macroecotope partial flora according to floristic regions). On the whole, the new book is interesting contribution to flora analyses, especially with regards to the methodical approach. A lot of material has been evaluated, however, not always sufficiently exploited for further analysis. The conclusions following from these tables should be better abstracted. Reproduction of colour photographs (author V. A. Pashtchenko) is, unfortunately, of a very low quality. The tables are numerous, but the text should be better arranged and made more varied by pictures, graphic representation of some analyses executed. The book doesn't solve management of flora and vegetation protection as an active form of approach to sozicology.

I can recommend the book to everybody interested in phytogeographic division of Earth surface, in problems of florogenesis, endemism, flora analyses and also flora synanthropization and sozicological questions.

V. MIKOLÁŠ

Book review

PETER BERNHARDT: Natural Affairs. A Botanist Looks at the Attachments Between Plants and People.

Villard Books, New York, 1993, 226 pp, 17 col. phot., 7 b&w phot., 27 fig., 1 tab., price: US \$25, Canada \$31.50, ISBN 0-679-41316-2.

First contact with this captivating masterpiece on its arrival to our editorial office, glimpse both at its look and contents made me sure that its an extraordinary book I want to read through. First thing about the book that attracts your attention is its lovely design. Both paper cover and hard back are made in blue. If you remove modern glossy paper cover with fascinating passion flower photo in its middle part, you will hold a thing reminding you of ancient book not only by its hard back, but by its title page and unusual page margin trimming looking like that of historical workpieces as well. But much more important than the look of the book is its proper contents reflecting both author's large overview ranging through various fields of interests from history to presence and high writer's qualities.

Author of the book, PETER BERNHARDT, who teaches at St. Louis University, studied adaptation, pollination and other phenomena of plant life. In a lively and entertaining way he provides reader with much new information, reveals many facts about the attachments between plant and people.

The book is divided in 5 parts and 14 chapters. Each chapter begins with a passage from a poem or a novel, as a motif, introduction to the chapter. The first part "The Artist's Vision" (2 chapters) reveals that plant world is a Muse to inspire artists from the very beginning, especially a Muse under glass (greenhouse plants). In Part Two: "Tasteful Botany in Three Courses" (3 chapters) author views some plants related to our nutrition. He makes thoughts over salad traditions, geography, species composition and their maturity when harvested, reminds reader that some plants are poisonous before harvesting time, some inedible after harvesting time many die virgins in harvesting time and that we eat them for only one of their tissues (parenchyma). In the next chapters we can learn how saffron threads, often worth more than their weight in gold, are gained, used and faked and may be surprised that passion flower was considered as an evidence of sacred inspiration. In Part Three: "Scientific Obsessions" (3 chapters) besides some interesting facts about heterostyly (pin and thrum systems), nectar formation, composition, destination, and availability, reader is shocked that even honey can be poisonous! In the story about marijuana problems we have the pleasure to realize how inventive the author is in naming of his chapters. In Part Four "In Pursuit of the Beautiful" (3 chapters) we get acquainted with wattle (*Acacia*) biology, Lycaste species, their relations with pollinators and with humans as well, long history of magnolias. In Part Five: "The People's Plants" (3 chapters) we meet unfaithful columbines (that hybridise easily), daffodils with their strange name formation and real professor of botany, PETER BERNHARDT, searching for ground orchids in Kara-Kara cemetery.

Despite the fact the author's intention was to point out the attachments of plant and people from the point of view of botanist, the book is often penetrated by author's interest in pollination systems and flower biology as a whole allowing him to reveal the complexity of flower and plant adaptations to pollinators.

Text structure of the book is closer to that of a novel than that of strictly scientific literature. No references occur in proper text and the main part is followed by Annotated Bibliography. Then it is only Index and note About the Author to close the book.

In the end of the review I would like to recommend this highly readable book not only to professional botanists and biologists as a lovely blend of new knowledge and entertainment, but also to students and everybody interested in nature as a source of motivation of further interests. Since besides the basic knowledge of botanical terminology the reading of this book requires knowledge of English language, I can state that it is worth translation to national languages so that the spectrum of its readers could widen.

L. MIHOKOVÁ

Book reviews

MICHAEL MOGIE: The Evolution of Asexual Reproduction in Plants.

Chapman and Hall, London, Glasgow, New York, Tokyo, Melbourne, Madras, 1992, 276 pp., 11 fig., 20 tab., 84 USD, ISBN 0-412-44 220-5.

MICHAEL MOGIE of the Bath University, stimulated by A. J. RICHARDS of Newcastle upon Tyne was studying many evolutionary aspects of the genus *Taraxacum* for a long time. He went on clarifying many problems of reproduction, first of all asexual. These efforts led to writing this book in which he tried to summarize and complete the questions of asexual reproduction into integrate conception which puts together many different aspects - embryological, karyological, genetic, biochemical, physiological, ontogenic, phylogenetic, ecological etc. by evolutionary framework. Without a demand of textbook completeness he outlines "only those aspects of asexuality that were central to the development of my arguments on the evolution, establishment and maintenance of asexual reproduction". The book begins by new definitions of reproduction and growth, the former being viewed as ontogeny recapitulation while growth is the process, which "causes ontogeny to progress from its earliest to its latest stage". Therefore, vegetative reproduction is evaluated as growth. In author's opinion, the difference between sexual and asexual reproduction is determined by zygote being formed by syngamy or not.

After this introduction, author discusses reproduction models of oogamic eucaryots characteristic by formation of ovules in archegonium. Further to ZANDER 1984 he distinguishes between dioicous and dioecious organisms (all the seed plants are dioicous, only several are dioecious). In the following analysis of bryophyte and tracheophyte asexual reproduction author marks out four basic concepts: parthenogenesis, apogamy, apospory and diplospory. While in bryophytes and gymnosperms no effective asexual reproduction has been known, in homosporic pteridophytes apogamy occurs very often. The most widespread form of asexual reproduction in angiosperms is generative (diplosporous) apomixis (gametophyte develops from meiospore which arose without meiotic reduction) and aposporic apomixis (gametophyte arises from sporophyte vegetative tissue), less polyembryony. The two prevailing types are further looked into. For both types, parthenogenetic ovule development is characteristic. Besides this, pseudogamy, in which the formation of fertilized endosperm influencing the embryo nutrition and growth is a condition of further development of embryo, is relatively frequent. Apomixis in angiosperms is most widespread in *Asteraceae* and *Poaceae* families, less in *Rosaceae*, otherwise it is utterly rare.

In the next chapter author follows causes and circumstances leading to asexual reproduction, and limitations which make its occurrence impossible, or considerably difficult, as well. In homosporic pteridophytes asexual reproduction develops as an escape from female sterility conditional on hybridization and polyploidization. It is further due to ecological isolation and realized by means of apogamy. This is explained from the position of homosporic ovule chromatin working and function. Nevertheless gene(s) for asexual reproduction may be present, but they can be expressed no sooner than after hybrid coming into being, e.g. by dosage effect. In gymnosperms, pollination occurs long time before fertilization and thus the way undertaken by angiosperms (avoid fertilization by precocious oogenesis or embryony) is lost and another effective way to prevent an ovule from fertilization hasn't been found (in gymnosperms an effective way of asexual reproduction is not known).

In heterosporic angiosperms obligate asexuality is an alternative to sexual reproduction. Simple mutation can prevent fertilization by means of precocious oogenesis or embryony. This can be caused by pleiotropic effect of mutation preventing meiotic reduction (by means of development shortening). The ability of angiosperms to use parthenogenetic development follows from the fact that functional ovule is homologous to fern ventral canal cell which retains the ability of mitosis. In pseudogamous apomicts polar nucleus (it is cell homologous to homosporic ovule in pteridophytes) fertilization with the consequence of endosperm formation becomes necessary. Many problems outlined here have speculative character with the purpose to point out ontogenetic and phylogenetic background of asexual reproduction evolution.

Next chapter is devoted to the neglected male role in asexual reproduction. This role is exercised directly in mixed populations of diploid sexuals and apomicts (pollen bearing), when at least limited gene transfer from apomicts to sexuals is possible, in the case of facultative asexuality certain mutual gene exchange can occur. Further the male role is important in pseudogamous taxa, where the pollination is inevitable for successful embryo development. Very little has been known about compatibility evolution in pseudogams arisen so far. Further the author newly explains the reason for apomicts enforcement in deglaciated territories (it is demonstrated on example of the genus *Taraxacum*): while incompatible sexual diploid is fully dependent on insects, apomict is independent. This explanation is different from up to this time prevailing genetic and ecological hypotheses about apomict advantages in such environment.

In this chapter author spares a thought for a success of polyploids as well. He considers it probable that their successful expansion in deglaciated environment may be caused by incompatibility system decomposition in passing to polyploidy, which allows rapid invasion in new environment. Thus sexual polyploid and apomict penetration in new environment is obviously analogous.

In the next chapter about genetic control of apomixis after historical introduction author passes to analysis of components which take part in apomixis control and completes it by general model for generative and aposporous apomixis genetic control.

If parthenogenesis is innate capacity of angiosperm ovule (homologous to ventral canal cell of ferns capable of mitosis), only recessive meiotic mutation, which will cause also precocious embryony or oogenesis, is needed. Many taxa are obviously genetically pre-adapted for asexual reproduction by presence of the above mentioned recessive genes, which could, by dosage effects ensure reaching of asexual reproduction in polyploids. In aposporous apomicts such mutation evidently leads to megaspore degeneration and aposporous embryo sac development. The existence of diploid apomicts can be accounted for by influenced locus amplification. Thus analogous effect to that in polyploids is reached in spite of the fact this process is obviously very rare. Ultimately, the influence of these mutations in vegetative cells must be evidently blocked (because of the necessity to ensure their growth and further development), which may be, in author's opinion, ensured by different biochemical inner environment of these cells. This inner regulation may influence facultative apomixis occurrence as well. Author further verifies his model in several specific cases and points out the problems connected with available data analysis. Another problems can complicate genetic analysis of apomixis control, e.g. the existence of meiotic mutations in more loci, the existence of facultative apomixis or the possibility of cumulative effect of presumably existing modifying genes.

Lastly, in sixth chapter author pays attention to genetic recombination importance in sexual organisms, possible advantages of genetic recombination over asexual reproduction, he deals with two main models of gene combination by crossing-over process. He ends speculating, that "the primary role of crossing-over in many taxa is to provide the mechanism through which allozygosity is maintained during the dyad chromosome stage at loci involved in the control of reductional meiosis". Following speculations about evolutionary potential of apomicts, which, besides actual apomictic complexes including facultative apomicts or even close sexual species,

demonstrate on the example of the genus *Taraxacum* the existence of high chromosome instability which can be reflected by morphological and biochemical divergence increasing evolutionary possibilities of apomicts.

Reflexions in the end of the book underline several important aspects. The first is the pre-adaptation of some sexual organisms for transition to asexual reproduction (the presence of recessive meiotic mutations), further pre-adaptation in many flowering plants is innate capacity for parthenogenesis, arisen in evolution from homospority to heterospority. Ontogenetic and phylogenetic apomixis evolution consequences and male role importance are summarized. Author expresses the idea, that non-pre-adaptation for transition to asexuality in most sexual taxa is therefore the reason for their remaining exclusively sexual. Asexuality is thus the way found only seldom, but this is not the reason for its being worse.

At the end of the book review it is necessary to mark out the stimulating force of the book for understanding of apomixis role in plants, causes and consequences of its evolution, its rarity, advantages and disadvantages. This complicated picture of asexual reproduction evolution, in which various, often antagonistic evolutionary tendencies are meeting, viewed from various aspects, with the stress to ontogenetic and phylogenetic organism integrity, suggest, how little is known about causal consequences of sex evolution at all, and asexual reproduction evolution in particular.

Reading of this book is not easy at all. But it is worth comprehending its chapters. Besides embryologists, geneticians, evolutionists it provides much useful reading for taxonomists, karyologists, ecologists. It is a challenge built up from many outlined connections and provocative speculations connected with asexual reproduction evolution. Everybody willing to look for answers to questions about the reasons of apomicts existence and evolution should read it and think over its suggestions.

V. MIKOLAŠ

PETER BOYCE: The genus *Arum*.

HMSO, London, 1993, 196 pp., 16 col. pl., 27 figs., 1 tab., 25 maps, GBP 30, ISBN 0 11 250085 4.

In this monograph PETER BOYCE from the Royal Botanic Gardens, Kew, a prominent specialist in *Araceae* family summarizes the knowledge about the genus *Arum*, with which he classifies 25 species occurring from the Azores to W.China.

After the introductory history of the genus and its taxonomic classification author deals with morphology, and pays attention especially to tuber, and the inflorescence with characteristic spathe. The latter is very important in the genus taxonomy, together with spadix. Seed sculpture is significant from the taxonomic point of view as well. The evolution of two different seed germination strategies in the genus connected with the different geographical origin of related taxa is another interesting phenomenon.

Short chapters are then devoted to anatomy, chemistry and cytology. Several chemical compounds from tuber and especially the composition of odour, developing inside appendix of spadix in the course of blooming and evolutionarily connected with pollination, are probably very important. In the genus there are three chromosome numbers. Rhizomatous polyploid species are the most widespread in most cases, with the important exception - diploid *A. alpinum*.

Traditionally, pollination attracts much attention in *Araceae* family. In the genus *Arum* there are two inflorescence types related to certain ecology and certain scent presence or absence. But,

there are some other cases, which require further research. In the whole of this remarkable pollination syndrome attention was paid also to thermogenesis process in which certain odour compounds are released to attract insects just in the period of increased stigma receptivity. Thermogenesis process is probably initiated by salicylic acid production in staminate primordia. The insects allured are desoriented and thus kept in spathum for the time long enough to ensure pollination. It is interesting that characteristic staminode morphology on spadix probably prevents big insects, which cannot ensure the pollination, from getting in.

Ecologically the species of the genus *Arum* grow in five defined vegetation types. Among them garrigue in Mediterranean area is the most widespread and related species start growing even during the autumn or mild mediterranean winter. The author devoted much attention to cultivation, both outdoor and under glass. He describes substrata, position, irrigation, cultivation pot use, etc. in detail, propagation both vegetative and by seeds is summarized (period from germination to first blooming takes 4-5 years). The pests and diseases are mentioned briefly. Information on population biology and ontogeny, breeding systems, embryology, incompatibility systems, data on phylogenesis as well knowledge from the field of new, intensively developing molecular systematics are missing. Implicitly, the absence of these chapters is the evidence that no, or almost no attention was devoted to them in the genus *Arum*.

Proper taxonomic part follows with the key to subtribe *Arinae* genera, genus *Arum* subgenera, sections, subsections and species, infrageneric division and then systematic account of particular taxa with complete synonymy, detailed description and illustration of inflorescence critical characters, distribution map (a bit schematic), data on illustrations, time of blooming, habitat and distribution. In selected species colour table is attached.

The opinions on classification within the genus, particular species definition may be, of course, different, however, in some cases they reflect not only the knowledge state, but frequency of confusions and misinterpretations in this genus as well. Thus on the map of *Arum maculatum* the occurrence of this species on the territory of Slovakia and adjacent part of Ukraine is surely wrongly marked (the species *A. alpinum* and *A. besserianum* grow here). On the other hand, on the distribution map of *A. alpinum* its occurrence in Czech Republic is, with exclusion of its easternmost part, mistaken for *A. maculatum*. The occurrence of *A. orientale* in Poland, given in the text (but on the distribution map 6a, p. 95 it is absent) surely belongs to *A. besserianum*. This species doesn't grow in Hungary and adjacent part of Austria, either (it is *A. maculatum*). The source of the data on *A. elongatum* occurrence in Byelorussia is not clear (but on the map 15, p. 128 it is missing), it is an evident mistake. *Arum besserianum* SCHOTT is included among incompletely known and dubious species. Greater part of Schott's material of many taxa in the genus *Arum* described by himself was destroyed during World War II. This is one of the sources of confusion in his species interpretation. *A. besserianum* is, however, obviously a good species of the *A. alpinum* group. In the following chapter about hybrids four known interspecific hybrids are mentioned. Hybridization is surely more frequent, but, it is generally neglected.

The literature cited and Index to Plant names are closing this book, which is, despite some inaccuracies and mistakes, the basic stone for future scientific research of this genus. This book is sure to find favour and, owing to use of new, biosystematic methods at the genus study a new era of research of this captivating and fascinating genus of *Araceae* will begin. In the end of the review I would like to point out that this bound book is printed on high-quality paper, illustrations (by P. SELLARS, A. FARRER, T. GALLOWAY) excel by clear, refined execution and sense of scientific detail, colour plates are beautiful. I can only recommend the book to all interested in this genus, the *Araceae*, as well as to all nature lovers, and, certainly, it cannot be absent from any important botanical library.

V. MIKOLÁŠ

H. R. REINHARD, P. GÖLZ, R. PETER et H. WILDERMUTH: Die Orchideen der Schweiz und angrenzenden Gebiete.

Fotorotar AG, Druck et Verlag, Egg, 1991, 348 pp., ca. 160 figs., 764 col. ph., 2 b&w ph., 67 species distrib. maps, SFr. 89-, ISBN 3 905647 01 0.

A new orchid book written by well-known orchideologists and further associates brings a summarisation of knowledge about Swiss species with logically concise introductory chapters, detailed survey of all species, and, in addition, excellent print on a high-quality paper. At present, when a number of orchid books have been published, the book under review ranks among the best of them. It synthesizes state of knowledge of the species in the territory in comprehensible, apt and logically well built form completed with a great number of figures, maps, diagrams, and, first of all, fascinating colour photographs.

In the introductory chapter, reader can get acquainted with classification of orchids in plant system, flower parts structure and theories on labellum origin in orchids as well. All the basic characters that characterize and define orchids are summarised here. Gynandrium structure is outlined here and all the Swiss species are classified in system, in which *Cypripedium calceolus* is placed in a separate family *Cypripediaceae* and all the other species in *Orchidaceae*, divided (in the case of Swiss orchids) in four subfamilies (*Neottioideae*, *Orchidoideae*, *Epidendro-noideae* and *Vandoideae*). Inclusion of the recently described species *Nigritella rhelicani* to *N. nigra*, or earmarking of separate *Anteriorchis* genus which includes *Orchis coriophora*, or recognition of two *Orchis ustullata* subspecies and the species *Ophrys tetraloniae* deserve attention.

The following chapter characterizes orchid distribution with several typical distribution examples. In addition, the phytogeographical division of Switzerland and a survey of vertical zonation of vegetation in the territory are given. In the third chapter the attention is paid to the vegetation types in which orchids are found in Switzerland and it is accompanied by the selected colour photographs. This chapter particularly excels by precise, brief and clear explication and it is just an example for presentation of scientific information to wider public.

In the following chapter problems of orchid endangerment and protection, reasons for their decline are summarized. Here we can again admire the uncommon harmony with which the authors synthesize the knowledge about orchid vanishing accompanied by well-arranged diagrams, figures and maps. An attention is paid to immissions, meliorations, hiking and other activities contributing to the species decline as well. In the species protection an attention is devoted to whole biotope conservation, succession stages stabilization by means of certain management.

In the chapter about morphological aspects, vegetative and generative orchid organs are briefly described and clearly illustrated. Special attention is paid to the structure of flower and especially that of gynandrium, an organ very important and evolutionarily very significant for the species determination.

The chapter on individual ontogeny phases begins with seed, followed by mycorrhiza, germination, growth and particular ontogenetic phases in the course of year. It would be, perhaps, useful to complete the chapter with brief survey of stages within the life cycle (from juvenile to senile), which is very important especially in conservation practice. Seventh chapter about flower biology is worked out in a brilliant way with a great number of colour photographs and figures. In this chapter allogamous species, with either delusive flowers (genera *Orchis* and *Dactylorhiza*), flowers with nectar, flowers providing insect with protection against enemy or bad weather, flowers, in which the insects collect pollen, or the most interesting flowers imitating females of

certain insect taxa prompting males to copulation are dealt with. The genus *Cypripedium* possesses flowers which the insect falls into like to a trap and on its way up it pollinates the flower. Besides the allogamy an autogamy, either obligate (*Ophrys apifera* or some *Epipactis* species) or facultative (*Limodorum abortivum*), is less distributed. Apomictic reproduction mode is present as well - in allopolyploid species *Nigritella rubra*.

Then proper core of the book follows: It includes all the Swiss species (68), abbreviations used are explained here, they are completed with blooming calendar and survey of altitudinal distribution, frequency of distribution, ecological behaviour and endangerment. A key to the genera determination follows. Almost every species is accompanied by many colour photographs of the plants and characteristic biotope, map of distribution in Switzerland, flower drawing, name etymology, scientific name and synonyms, Swiss names, detailed description, distribution, data on frequency of distribution, biotope, cytology, hybrids, sometimes together with other remarks. In genera their characteristics, comparisons with relatives, keys to species are given. All this part excels by scientific exactness, briefness and is rich in illustrations. In the case of disputable aggregates and unclear species or other taxa authors remain properly conservative, as it is shown e.g. in *Dactylorhiza maculata* aggregate.

Ninth chapter is devoted to hybrids. Questions of their identification, heterosis effect, their nomenclature and also hybridization barriers (pre- and postzygotic mechanisms) are dealt with. The survey of hybrids is selective and accompanied by great number of colour photographs. The importance of flower analysis for hybrid identification is shown on several figures.

Tenth chapter deals with the occurrence of variably deformed flowers, fasciations, pelories etc. Then the chapter about orchid vernacular names, orchids in mythology, folk customs connected with these plants, their use in medicine. The last chapter concerns reports on orchids in history, research history of these plants, information on important scholars in orchid science. These parts are followed Glossary, excerpt of Swiss law on nature protection, survey of authors of orchid scientific names, persons after whom the genera and species were described, survey of German and scientific names and this excellent book is ended by references.

At the end I can much recommend the book to everyone dealing with orchid research and to every larger botanical library. Its qualities - both scientific and aesthetic, its elaboration with proper degree of simplification and high quality of figures and photographs are giving the book the character of both indispensable source of knowledge and piece of work in which we can, time and again, discover the beauty enriching in an exceptional way our heart overloaded by technocracy. Simply, it is a book for everybody willing to get acquainted with the present state of (not only) Swiss orchid science and for every true lover of these amazing plants and nature in general.

V. MIKOLÁŠ

Book information

(edited by P. MÁRTONFI and M. REPČÁK)

M. G. PIMENOV & M. V. LEONOV: The Genera of the Umbelliferae

Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, UK; Botanical Garden of Moscow University, Russia; 1993. viii+156 pp. Soft cover. Price: 12.00 GBP. ISBN 0-947643-58-3.

The Umbelliferae is a flowering plant family in which generic delimitation is particularly complicated. This is connected with the mode of evolution of the Umbelliferae which includes extensive homoplasy (parallel and/or convergent events). A nomenclator for the family Umbelliferae, listing all generic names. Place, date and author of publication, typification information, subfamilial classification, distribution by sub-continent, number of species, literature references, and synonymy are listed for each accepted genus. There is a bibliography with over 600 references.

Other titles from Royal Botanic Gardens, Kew:

F. N. HEPPER & I. FRIIS: *The Plants of Pehr Forsskal's Flora Aegyptiaco-Arabica*. (1994)

MATS THULIN: *Flora of Somalia - Volume I* (1993)

C. L. CHAN, A. LAMB, P. S. SHIM & J. J. WOOD: *Orchids of Borneo Vol. 1. Introduction and a Selection of Species*. (1994) - The Sabah Society and The Royal Botanic Gardens, Kew.

M. H. KURMANN & J. A. DOYLE: *Ultrastructure of Fossil Spores and Pollen*. (1994)

JOSEPH F. DUFT & ROBERT K. MOSELEY: Alpine Wildflowers of the Rocky Mountains.

Mountain Press Publishing Co., P. O. Box 2399, Missoula, MT 598066, USA; 1989 (Third Printing September 1992). vi+200 pp. Many colour photographs. Paper. Price: 12.00 USD. ISBN 0-87842-238-2.

This guide covers the alpine zone along the Rocky Mountain crest from the Canadian Rockies, south to northern New Mexico. The Rocky Mountain influence extends across the plateaus and ranges of Utah to the Ruby Mountains of northeastern Nevada and the San Francisco Peaks of northern Arizona. Worldwide, alpine floras are more homogeneous than in other life zones, with many species having circumboreal or circumpolar distribution. A relatively large number of species found in the Rockies will also be encountered in the Cascade Range of Washington, the Canadian arctic or even the Himalayas.

STEPHEN O. DUKE, JULIUS J. MENN & JACK R. PLIMMER (Eds.): Pest Control with Enhanced Environmental Safety.

(ACS Symposium Series, ISSN 0097-6156, 524.) American Chemical Society, Washington, DC; U. S. A.; 1993. x+357 pp. Clothbound, ISBN 0-8412-2638-5.

Symposium sponsored by the Division of Agrochemicals at 203rd National Meeting of the American Chemical Society dealt with recent advances in the research and development of new synthetic and natural pest management agents and technologies. Introductory chapter summarizes the current state of pest control and the increased pressures to develop safer and more environmentally benign pesticides and pest control technologies.

Wide scope of the Symposium led to dividing of the papers in 3 sections: weed, insect and plant pathogen management. Within each section there are chapters on synthetic compounds, biotechnology and natural products.

ROY TERANISHI, RON G. BUTTERY & HIROSHI SUGISAWA (Eds.): Bioactive Volatile Compounds from Plants.

(ACS Symposium Series, ISSN 0097-6156, 525.) American Chemical Society, Washington, DC; U. S. A.; 1993. x+309 pp. Clothbound, ISBN 0-8412-2639-3.

This symposium at 203rd National Meeting of the American Chemical Society which was sponsored by the Division of Agricultural and Food Chemistry dealt with volatile compounds from plants especially from flowers and fruit. Headspace isolation methods and high resolution analytical instruments enable the research of compounds that are responsible for the aromatic living plants.

The bioactivity evoked by plant volatiles is important for chemical communication (interactions) among organisms. This book pays much attention to the methods developed for isolating volatiles from living plants. Several papers deal with biogenesis and formations of volatile components. Much attention is devoted to essential oils and volatile compounds from flowers, fruits, vegetables and medicinal plants.
