SHAUKAT ALI CHAUDHARY: Grasses of Saudi Arabia.

Safir Press, Riyadh, 1989, 8+446+74 p., 207 fig., price not given.

Professor Chaudhary, a prominent specialist in grasses and the flora of Arabic Peninsula on the whole, wrote the useful handbook for determining of grasses of Saudi Arabia. The book is written in English, brief summary text in Arabic is added. In the introduction, a glossary of important terms, illustration summary and the survey of the grass system according to Clayton and Renvoize (1986) can be found. A key to the genera (and tribus) and also separate keys according to important characters to information groups and the key to the genera within these groups follow.

The main part of the work includes the survey of species with illustrations (often with details of flower), information about the genus, description of species (the species in genera are given keys as well) and their distribution in Saudi Arabia and (briefly) general distribution. The distribution of the taxa, main synonyms, references on important (for Arabic Peninsula) floras, English and Arabic names and, as the case may be, further notes are given as well.

Altogether 113 genera and about 280 species are classified. The author widely cooperated with outstanding specialists from western Europe and studied material in large European herbaria. This fact secures high standard of the work, reliable determination and modern nomenclature.

The book in hard covers is printed on high quality paper, the text and the division of the book are well-arranged, illustrations have a very good standard.

Grasses are of a decisive importance in the flora of Saudi Arabia. With regard to its area and position, the migration elements characteristic of southwestern Asia and the elements of eastern (tropical and subtropical) Africa meet here. Adventive species that are characteristic for subtropics and tropics are numerous.

General distribution of many species could be completed, e.g. *Digitaria ciliaris* occurs adventively in number of European countries as well, the distribution of *Eragrostis minor*, *E. ciliarensis* and *E. pilosa* is not reduced to tropics and subtropics. However, these negligible insufficiencies can in no way derogate the importance of the book under review.

The system of grasses and the generic division accepted are sometimes different from recent approaches (e.g. wide conception of the genus *Bromus*, lately often divided into more natural, minute genera). But in this work it can't be done in other way, as far as the author keeps a certain conception and system. After all, premature disintegration and changes in taxonomical status of many plant groups is rather undesirable in such works.

The book will be undisputably a great contribution not only for every expert in graminology and for those, who are interested in flora of southwestern Asia or eastern Africa, but, with regard to the importance of grasses in territory, for agronomists, foresters, nature protectors and amateur botanists as well. Therefore, it can be recommended to every important library, but also for specialists in agriculture, forestry and nature conservancy. Because of high expansion capacity of grasses it will find practical application not only in the countries of Arabic Peninsula and East Africa, but in tropics and subtropics of the whole world as well.

Vlastimil Mikoláš

K. KUBITZKI (Ed.): The Families and Genera of Vascular Plants. Vol. I.

K. U. KRAMER & P. S. GREEN (volume eds.), assisted by E. GÖTZ (illustrations): Pteridophytes and Gymnosperms.

Springer Verlag, Berlin et Heidelberg, 1990, XIII+404 pp., 216 figs., Price DEM 298,-.
ISBN 3-540-51794-4

New methods in systematic botany and rapid diversification of botanical knowledge stimulated the idea to produce a modern, complete encyclopaedia of vascular plant taxonomy at the generic level. It was proposed during a symposium held at the University of Hamburg in 1976.

"Pteridophytes and Gymnosperms" is the first volume of the encyclopaedia, representing an inventory of the diversity of ferns and seed plants. It is dedicated to memory of Rolf Dahlgren (1932-1987), Professor of Botany at the University of Copenhagen, "who had an especially important share in developing the ideas leading to the present work" (K. KUBITZKI).

Major classification of Pteridophytes and Gymnosperms, as adopted in the book, is a middle course between conservative view and new knowledge: *Pteridophyta (Psilotatae, Lycopodiatae, Equisetatae, Filicatae), Gymnospermae: Coniferophytina (Ginkgoatae, Pinatae)* and *Cycadophytina (Cycadatae, Gnetatae).* The families are arranged in alphabetical order within each class of plants.

Information on the families of Pteridophytes is divided into several paragraphs: nomenclature, family description, data on morphology and anatomy, gametophyte, karyology and hybridization, ecology and distribution, key to the genera, description of genera and selected bibliography. In addition, notes on affinity and subdivision, chemotaxonomy, characters of rare occurence, floristic studies, spore morphology, pharmaceutical use, physiology, and palaeontology are often provided as well.

The most frequent paragraphs for Gymnosperms are as follows: nomenclature, description, vegetative anatomy and morphology, pollen morphology, karyology, reproductive biology, subdivision and relationships within the family, distribution and ecology, key to the genera, description of genera, selected bibliography. Various additional information for *Gnetales* is not missing, either.

The taxonomic conception of individual families and genera is relative wide. For example: the genus *Huperzia* (and family *Huperziaceae*) is included in family *Lycopodiaceae*.The genus *Equisetum* includes the genus *Hippochaete* (as subgenus), the genus *Thelypteris* includes genera *Amauropelta, Parathelypteris, Lastrea, Metathelypteris* and *Coryphopteris* as subgenera. In contrary, *Campyloneurum, Pecluma* and *Niphidium* are separated from *Polypodium* (while *Pleopeltis* and *Microgramma* are included in *Polypodium).*

The chapter 'Chemosystematic Overview of Pteridophytes and Gymnosperms' is remarkable. It gives information on distribution of flavonoids, terpenoids and additional compound classes. Data are summarized in 3 tables. In conclusion, the chemical evolution of present Tracheophyte groups is outlined.

Very selective information is completed by 216 figures - pen drawings from various sources as well as numerous black-and-white photographs. Pen drawing illustrate plant habits and important diagnostic characters. Photographs show plants in their natural environment, and excellent scanning micrographs of spores and pollen grains complete the data. It is necessary to mention that book is printed on high-quality paper by good printing techniques, especially the photographs are perfectly reproduced.

All in all, the book is one of the most valuable sources of information about Pteridophytes and Gymnosperms. Editors succeeded to prepare publication, that will take, despite it's high price, an important place in the libraries of taxonomists, teachers and other botanists that need well-arranged information about plant diversity.

Pavol Mártonfi

L. Bertová (ed.): Flora of Slovakia IV/3. *Angiospermophytina. Dicotyledonopsida. Rosales.*

Authors: T. Baranec, L. Bertová, K. Goliášová, J. Holub, J. Chrtek, E. Kmeťová, J. Májovský, K. Marhold, M. Peniašteková, A. Plocek, V. Skalický, H. Šípošová, M. Šourková, V. Větvička, J. J. Wójcicki, K. Zahradníková.

Veda, Bratislava, 1992, 566 p., 57 maps, 35 tables, Price 100 Kčs. ISBN 80-224-0077-7

New volume of the Flora of Slovakia appears after the band IV/4 has come out and it includes the only family *Rosaceae*, with the exception of the genus *Rubus*, that is not included.

Presentation of most taxa has a good standard. Many species are illustrated and the distribution of a number of species in Slovakia is given on 57 maps. Like the other vols. of the Flora, the work contains keys to the taxa, descriptions of species with the most important synonyms, data on chromosome numbers, sometimes data on taxonomy, biology, ecology and phytocoenology and the distribution in Slovakia and the volume is closed by index of abbreviations of authors names and index of scientific and national names.

Specific ways of reproduction of some species of the genus *Rosa* were reflected by by V. Větvička essentially on the basis of the approach of J. Zielinski (1985), who classified taxa that do not have a specific ecology or their own distribution range to the synonymics of the respective taxa.

The genus *Potentilla* by K. Goliášová, belongs to the group of complicated genera characterized by polyploidy and apomixis. The text is based on present knowledge that is only fragmentary at the biosystematic level (especially in central Europe). Therefore, the elaboration of the genus is rather preliminary and it will require further studies (e.g., in the complex of *Potentilla argentea*, or in the hybridogenous aggregate of *P. collina*).

The genus *Alchemilla* is compiled almost monographically. It is the result of a many years' study of A. Plocek, the prominent specialist in the genus. It differs somehow from the other parts by its extent (more than 100 pages!). Almost 100 species grow on the territory of Slovakia, and also many intraspecific taxa were described by the author (mainly in *A. incisa*, *A. smaragdina*, *A. subconnivens*). A new species, *A. ludovitiana*, distributed in Branisko Mts., is described in the work, but, on the contrary, the species *A. chalarodesma*, recently described by Plocek from Belanské Tatry Mts. is missing here (reasons?). Data on distribution, phytocoenological classification and ecology are provided in detail, usually a very detailed description is given. Unfortunately illustrations are almost completely absent. The status of many taxa described by Plocek can be inspected with suspicion (e.g. *A. reversantha*, *A. anceps*, *A. mollifolia*, *A. acrostegia*, *A. longidens*, *A. laevipes*, *A. sejuncta*, *A. rhodobasis*, *A. laxa*, and numerous species of the series *Calicinae* a *Venosae* and further numerous varieties described by him, e.g. in *A. incisa* and *A. subconnivens* are disputable), and their classification is merely the expression of the author's opinion. Questionable nature of many of them follows from obligatory apomixis of the genus in Carpathians and any taxonomic evaluation of such groups is usually very inconsistent, in most cases dependent on the authority of the particular author. Many of the species described by Polish alchemilologist B. Pawlowski, as e. g. *A. acquidens* or *A. ladislai* remained vague as well. Other species of Pawlowski were included in synonyms by the author - *A. erythropoides* in *A. erythropoda*, *A. versipiloides* in *A. versipila*, *A. kotulae* in *A. straminea*, *A. znudae* in *A. stanislaae*, *A. sokolowskii* and *A. polonica* to *A. pseudoincisa* (the latter as a variety) and in the same way Froehner's *A. obsoleta* in *A. obtusa* (on the contrary, in this species he distinguished 2 chionophilous mutants, that can be surely formed polytopically).

In comparison with other genera that include apomictic species, the acceptance of strictly stenotopic taxa as *A. patens* (Králička, the Nízke Tatry Mts.), *A. chilitricha* (Priehyba Pass, the Chočské vrchy Mts.), *A. subsessilis* (from the only place in Slovakia on the eastern slope of Pilsko in the Slovenské Beskydy Mts.), or numerous taxa from the series *Calicinae* and *Venosae* is striking. When compared, for instance, with the genus *Rubus*, in which prof. Weber doesn't accept local species, the situation differs in *Alchemila*. While in *Rubus* numerous microtaxa arise by means of hybridization and following stabilization by apomixis, the genus *Alchemilla* (at least in the Carpathians) is probably evolutionary dead and the disjunctivity of many taxa can be increased by local extinctions. As far as the intrageneric division used is concerned, the author uses his own system originating from Buser's division, because Froehner's conception (Froehner 1986) does not accomodate a number of taxa.

From the point of view of an ordinary user of the Flora, a key including only common species (e.g. *A. monticola* or *A. micans* [*A. gracilis* Opiz belongs to the synonym of *A. monticola*]) is missing in the genus. Large key is thus difficult to use for those who are not specialists and many of specific morphological terms are not explained sufficiently.

Also the genus *Aphanes* (compiled by J. Holub) is presented almost in the style of monograph. The name *A. australis* Rydb. is used for the taxon formerly known as *A. microcarpa* (Boiss. et Reuter) Rothm. that is endemic to the Iberian Peninsula, Macaronesia and adjacent North Africa in original conception (author included the species *A. inexpectata*, recently described by Lippert, to synonyms of former species as well).

The genus *Sorbus* (by J. Májovský) is based on his present studies of the genus and on the monograph of Kárpáti (1961). Already in previous studies Májovský evaluated *S. hazslinszkyana* as a separate species, the distribution of which he confined speculatively to the eastern part of Slovakia (and the adjacent part of Hungary). *S. tuzsoniana* is evaluated as a primary hybrid, but in this case it should rather be indicated as *S. x tuzsoniana*. He includes stenoendemic *S. scepusiensis*, recently described by Kovanda, among the hybrids of subgenera *Aucuparia* and *Aria* as well. Numerous, so called intermediate species in accordance with Kárpáti (1961) were substantially taken over from the above monograph of Kárpáti. The question (if they actually have the value of species) requires further investigation. Considerable attention is paid to hybrid taxa resulting from the hybridization of subgenera *Aria* and *Torminaria*. New taxa are not described (but the author knows stabilized hybrid populations from the Silická planina Plain and the Strážovské vrchy Mts.). The conception of microspecies needs critical re-evaluation in future, because many microspecies can indisputably arise from more or less same parental species in different areas. The possibility of polytopic origin of many microtaxa is rejected a priori, but it will require modern biosystematic revision (first of all isozyme study is desirable). Some of the taxa classified here remain doubtful (*S. kmetiana*, *S. joannis*, *S. klasterskyana*, in which descriptions of fruits are absent as well), it is not sure here, whether they are not primary hybrids. Biosystematic study, that Kovanda has started in cooperation with Jankun (Kraków), a karyologist and embryologist and Challice (Bristol), a chemotaxonomist, is the only approach to the taxonomy of the genus.

The elaboration of the genus *Amelanchier* by Peniašteková does not include data on the naturalization of the species *A. spicata* on the territory of eastern Slovakia, published by L. Dostál (1985).

The genus *Crataegus* by T. Baranec is based essentially on his Ph.D. thesis (1986). The fact that the author compiled only his own material and didn't use rich material of other herbaria (first of all BRNU, numerous collections of A. Hrabětová-Uhrová) is a great shortcoming of this part. In the case of sexual species like *C. laevigata* and *C. monogyna* taxonomic division to subspecies and varieties remains doubtful (provided ecological specificity or geographic isolation is absent). *Crataegus monogyna* evidently hasn't been typified (and the type

variety is not reported from the territory). In the case of apomictic taxa, as e.g. *C. ovalis* Kit., their acceptance may be justifiable (though research, first of all embryological, is desirable). Many taxa evaluated as interspecific stabilized hybrids may be primary hybrids. Further research is needed here as well.

The compilation of the genus *Cerasus* by Marhold and Wójcicki (the latter is well-known for his works dealing with this genus) is very successful. Beside the acceptance of Terpó's subsp. *simonkai* of *C. mahaleb* as an indigenous taxon on the territory of Slovakia, detailed survey of hybrids excels. In the study large amount of material from herbaria in the Czech Republic was used.

In the end I would like to mention the disunity of the literature quotation. Thus e.g. Holub quotes almost all literature dealing with the genus *Aphanes*. On the contrary, the literature concerning the genus *Potentilla*, especially the newer literature, is quoted absolutely insufficiently. Wider quotation is surely no harm, especially when newer literature is concerned.

New volume of the Flora of Slovakia should not be absent from any more important botanical library. Because its price is relatively low, it will be available for general botanical public in Czechoslovakia.

Vlastimil Mikoláš

A. FARJON: *Pinaceae*. Drawings and Descriptions of the genera *Abies*, *Pseudolarix*, *Keteleeria*, *Nothotsuga*, *Tsuga*, *Cathaya*, *Pseudotsuga*, *Larix* and *Picea*

Koeltz Scientific Books, Koenigstein 1990, 118 pls., 123 distribution maps in the text., 330 pp., ISBN 3-87429-298-3, Price: 260.00 DM.

Contents: Preface/ *Pinaceae*/ *Abies*/ *Cedrus*/ *Pseudolarix*/ *Keeteleria*/ *Nothotsuga*/ *Tsuga*/ *Cathaya*/ *Pseudotsuga*/ *Larix*/ *Picea*/ Transverse sections of leaves in *Pinaceae*/ Glossary of botanical and ecological terms/ References/ Index of botanical names.

Among the coniferous trees of the world, those belonging to the Pine family are most prominent and, in several regions, even dominant. It not only represents the largest coniferous family, counting species, but also the family with species that are at the present time the major constituents of the coniferous forests in the Northern Hemis phere.

The work under review aims at the description and representation in drawings of the taxa here recognized in *Pinaceae*, excluding the genus *Pinus*, which has been treated in an earlier publication. This book deals exclusively with taxa in a botanical sense, in other words, the species, subspecies and varieties occurring in the nature. Most of them need active protection, since many taxa have not been grown sufficiently in cultivation to ensure future existence. Without the conservation effort, the wild populations are likely disappear. Most books on conifers used as reference works today deal with cultivated trees, either botanical taxa or cultivars or both. Their value is undisputed. The emphasis in the present work, however, is on the trees in their natural environment. The author endeavoured to present all the taxa having that basic

principle in mind. Virtually all general habit drawings are taken from photographs of trees in the wild, some, such as those made by E. H. WILSON, associated with the original herbarium material collected, others obtained from a variety of sources. Many represent rare material never published before. Herbarium material prevailed over arboretum material, both in preparation of the drawings and the descriptions, but in many cases living material from arboreta was indispensable.

The genera and species in this book are arranged in taxonomic order. It is based on views developed while working on this volume and involved in discussions with colleagues abroad. Some of these views, notably a classification of *Abies* and a revision of *Keteleeria*, have abready been published elsewhere. Consequently, related species are grouped together as much as possible, beginning with the type species of a section or subsection. The arrangement of the genera reflects the views developed by Michael P. FRANKIS, U.K., and A. FARJON (formally published by the former). In the descriptions, the name of the species is followed by the basionym (if any), the most important synonyms and the vernacular names in English and often in languages of the countries where the species occurs. The main botanical description refers to the typical form of the species. Subspecies and varieties are described only with their diacritical chracters. Ecology and distribution are given for the species, and cover the taxa of lower rank, unless explicitly stated otherwise.

Ladislav Greguss

ULF MOLAU: **The genus *Bartsia* (*Scrophulariaceae* - *Rhinanthoideae*).**

Opera Botanica 102: 1-99, 1990, Copenhagen, price is not given. ISBN 87-88702-47-2

One of the new volumes of Opera Botanica is devoted to the taxonomic revision of the genus *Bartsia*. U. Molau of the University in Göteborg (Sweden), famous for his works dealing with the genus *Calceolaria*, has written brilliant, brief and accurate revision, which is worth approbation. The work, as it is characteristic for taxonomists of Scandinavian school, is not only a classical taxonomic revision but also a modern biosystematic work. Molau's work stems (beside the study of many world herbaria and literature) primarily from his own collections and observations during four expeditions to the territory of the Andes in the 1970-1980s. There he collected large material containing a number of new taxa (described in the study under review). In 1986-9, as a head of The International Tundra Experiment (ITEX), he analysed in detail a number of biosystematic characters of the most wide-spread species of the genus - *Bartsia alpina* in northern Sweden.

The genus *Bartsia* is represented by hemiparasitic herbs and subshrubs, in most cases perennials of open habitats of alpine grasslands and clearings in mountain scrub, some of the species grow in cloud forests in lower altitudes.

After the revision, the genus is presented to contain 49 species and several subspecies, which are mainly distributed in Andes of South America, 2 species grow in the mountains of

tropical East Africa, two species are wide-spread in Eurasia, one of them (*B. alpina*) has wide arctic-alpine distribution reaching North America as well, and the second, *B. trixago*, is indigenous to the Mediterranean and it was introduced in a number of tropical and subtropical countries as a weedy species.

The genus has not been studied sufficiently so far (leaving alone *B. alpina*), and the only (Bentham's) monograph of the genus dates back to 1846.

In the general part, the author briefly describes morphological characters of the genus, hemiparasitism, cytology, pollination systems, dispersal, phytogeography and phylogenesis. Also the problems of the generic division of the subtribe *Euphrasineae*, where the genus studied belongs, were outlined. The author pays considerable attention to the modes of pollination - there are three pollination systems in the genus: melittophily, ornithophily and autogamy. Melittophily is characterized by the pollination by bumble-bees of the genus *Bombus* and it is typical for outcrossing proterogynic species. Ornithophilous species are pollinated by humming birds. Autogamous species developed in high elevations of the Andes, where the number of pollinators is insufficient. They are often tetraploid and, similarly as in other pollination systems, complete pollination syndrome of associated characters has developed in these species. The genus developed most likely in the mountains of eastern tropical Africa, where the most primitive section of the genus - the sect. *Longiflorae* and a primitive (close relative) genus *Hedbergia* occurs. The secondary evolutionary centre developed in the Andes. The author proposed 5 hypotheses on the origin of the South-American species and endorses the opinion, that it was long-distance dispersal, perhaps ornithochory, in prepliocene era (when the continents were not separated so widely). The author divides South-American species in 4 (new) sections, the most primitive of them is the sect. *Laxae*, particularly *B. flava*. On the other hand, the species *B. alpina* and *B. trixago*, occurring also in Europe, are considerably advanced, especially the annual species *B. trixago*, and both species were included in monotypical sections. All the species in the section *Strictae* but *B. stricta* are tetraploid and, at the same time, probably facultatively autogamous. Autogamy has similarly evolved, e.g., in the minute-flowered representatives of the genus *Euphrasia* (e.g. *E. tatrae* and *E. minima*) as a possible consequence of the lack of suitable pollinators in an alpine environment. Apomixis often evolving in polyploid complexes has not been known in the genus so far.

In the original key to sections (as well as in the key to species in particular sections) every species is supplied with its description, data on chromosome number, distribution, notes and the survey of the specimens studied, in some of them also further data are given (nomenclatural data, habitat, pollination, host plants). *B. alpina* is analysed in detail. Mating system, seed predation and the ways of the species spreading were studied as well. Author supposes two ways of the species spreading: zoochory and hydrochory. By means of the study of thousands of specimens, the author has discovered two morphotypes that he doesn't evaluate taxonomically. The arctic type grows in Scotland, northern England, northern Scandinavia and in Canada, the alpine type reaches southern Scandinavia. Author assumes that these facts support the theory that some species survived glaciation in Scandinavia on nunataks or in ice-free refuges along the Norwegian coast.

The work is closed by the survey of literature, list of exsicates (South-American species) and the index of scientific names. It is not necessary to point out that, as well as other works in the Opera Botanica series, Molau's work is supplied with a number of illustrations, and maps of distribution.

New Molau's revision of the genus *Bartsia* contributes considerably to the knowledge of the subtribus *Euphrasinae*. After numerous works concerning the genus *Euphrasia* (recently mainly Barker, Vitek and Karlsson) and *Odontites* (Bolliger at the present time) it puts the fundamental stone to the understanding of the whole subtribus. Author (together with Bolliger) goes on

studying of the subtribe, recently they have described a new genus *Nothobartsia* and decided to analyse phylogenetic links, which show the relations of the subtribe to the genus *Lathraea*, to some *Orobanchaceae* (which are probably paraphyletic) and *Rhynchocorys*.

In the book under review a lot of new knowledge is compiled together with what has been known until now, and the final synthesis brings convincing biosystematic revision of the genus. Not only specialists and those who are interested in the genus studied or the subtribe *Euphrasinae* but every plant biosystematist, phytogeographist and ecologist will be pleased to read the work as well.

Vlastimil Mikoláš