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Flora of the Indian Desert

M. M. Bhandari

MPS Repros, Jodhpur, 1990 (rev. ed.), VIII + 459 p., 136 illus. + 114 col. pl., Rs.600/-,
US \$ 60, ₹ 40.

After 12 years a revised edition of the *Flora of Indian Desert* by Emeritus Professor at Jodhpur University, M. M. Bhandari, a plant taxonomist, an outstanding specialist in desert flora, appeared.

The area of flora is situated in northwestern part of Indian state of Rajasthan and amounts to about 25,000 km². Age of the desert is estimated on mere 5 - 10,000 years. Usually sandy surface of desert lies about 100 m a. s. l. Climate is extreme, temperature exceptionally (in January) sinking below freezing point and in May reaching the maximum of 39 - 42°C. There are great diurnal temperature changes, too. Precipitations oscillate between 200 and 300 mm per year and they are usually coming with eastern monsoon winds in June to September.

The desert is sparsely inhabited by nomads who support the desertification of the area especially by excessive pasturage.

Bases of Flora of this area can be found in E. J. Blatter's & F. Hallberg's *The Flora of the Indian Desert* (1918-21) and G. S. Puri's et al. *Flora of Rajasthan* (1964).

Bhandari's Flora is based on a long-time field study and careful examination of herbarium specimens from many Indian and world herbaria. In the Flora, autochthonous and naturalized flora is included. All of the species are described in detail and often also illustrated. Considerable attention is paid to nomenclature and exact scientific names. Time of flowering and fruiting is given. Local names of plants are included. Dichotomic keys are compiled especially on the basis of macrocharacters. In addition to field notes on individual taxa, it is necessary to point out the quotation of specimens examined by the author. Precise descriptions of species distribution in the area of the Flora, and the general distribution in India and in the whole of the world are included.

The flora analysed consists of 682 species, 63 of them are introduced. Families *Poaceae*, *Fabaceae*, *Asteraceae*, *Cyperaceae*, *Convolvulaceae* and *Malvaceae* dominate by species number. Analysed flora is composed of cosmopolitan, tropical, African, Iranian, Sindo-Rajasthanian (= endemic), oriental, and Australasian elements. African (37,0%) and oriental ones (20,6%) have the largest representation. Links between the desert floras of Africa and India also are confirmed by the presence of the genus *Dactyliandra* (*Cucurbitaceae*), known before only from southwestern Africa. High number of endemics (9,4%) is interesting in view of the low age of the desert.

For a Central European reader it is interesting to mention some of the species distributed in desert flora of India that are also known from Central Europe, such as *Stellaria media*, *Anagallis arvensis*, *Chenopodium album*, *Juncus bufonius*, *Potamogeton crispus*, *Wolffia arrhiza*, *Cynodon dactylon* etc. Naturalized weedy taxa, hygrophytes and hydrophytes belong to this group. A considerable number of naturalized species is of American origin, especially from Central and South America, as *Alternanthera pungens*, *Amaranthus spinosus*, *Peperomia pellucida*, *Scoparia dulcis*, *Prosopis chilensis*, *Tridax procumbens*, etc.

Of the few deficiencies found in the book, the following one can be mentioned: incomplete general distribution of some species, such as *Tribulus terrestris* that occurs also outside tropical countries, and other species, e.g., *Potentilla supina*, *Potamogeton pectinatus*, *Lycium barbarum* etc. are distributed in Europe as well. This negligible incompleteness can in no way derogate the importance of the book under review.

In some cases there is too wide concept of some species, e.g. *Solanum nigrum* (evidently includes *Solanum villosum*). Also the concept of some genera is wide, e.g. *Oxalis*, *Scirpus*, *Cyperus*, etc. The couple of species *Veronica agrestis* - *V. polita* is problematized by referring to intermediate character of Indian desert plants. It is, however, a question for future research.

The book reviewed contains a list of literature cited and an index of local and scientific plant names.

It is necessary to mention that the book is printed on high-quality paper, the text is well arranged, colour photographs are of relatively high quality.

The book is indispensable for everybody studying desert flora of the Old World and it should not be absent from any more important botanical library.

V. Mikoláš

Bioecology of rare plant species (on the example of Carpathian ephemeroïds)

Editors : Krichfalushy V. V., Komendar V. I.

Svit, Lvov State University, 1990, 43 figures, 34 tables, 156 pages, 2 rub. 40 kop.

The monograph deals with the main aspects of study and protection of rare plant species as components of natural ecosystems. Complex biocenological approach to the study of the plants, that require protection, is concentrated on the population and species level. On the basis of the studies of *Narcissus angustifolius* Curt. and other plants a program concerning ecological and phylogenetic position of species, structure and demography of their populations, biomorphological differentiation and monitoring studies has been formulated. Scientific principles of protection of the biodiversity of the rare and disappearing species of wild flora are suggested.

As a result of this investigation one of the possible variants of the population analysis of the threatened wild flora species, is suggested. Only a profound knowledge of bioecology of the rare plant species gives the possibility to elaborate the scientific basis of biodiversity protection.

The book is intendend for biologists, experts in nature protection, teachers and university students.

S. Mochnacký

Kosmos 34: 924-992.

ZARZYCKI K. (1963): Lasy Bieszczadów Zachodnich. - The forests of the Western Bieszczady Mts. (Polish Eastern Carpathians). - Acta Agrar. Silvestr., Ser. Silv. 3: 4-132.

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Red Data Book of Armenian SSR

E. Tz. Gabrielyan (ed.), V. E. Avetisyan, A. M. Barsegyan, P. A. Gandilyan, K. G. Tamanyan, G. M. Fayvush

Ayastan, Yerevan, 1989, 284 p. + 63 illus. + 59 col. pl. + 8 bl. wh. pl. + 325 maps, 6 rub. 90 kop.

Reviewed Red Data Book of Armenia is, together with uncompleted edition of Flora of Armenia, the most important collective botanical work coming from Botanical Institute of Academy of Sciences of Armenian Soviet Republic in Yerevan, led by Dr. E. Tz. Gabrielyan, an outstanding plant taxonomist not only in Armenia.

Armenia lies on northern edge of volcanic Armenian Highlands within the height span of 450 to 4095 m a. s. l. The republic is situated at the junction of three floristic

provinces : mesophilous Caucasian, xerophilous Anatolian and Armeno-Iranian province. This exceptional location causes the fact that, on a relatively small area of 29,965 km², about 3,200 species of vascular plants occurs.

Various types of vegetation from sagebrush or sandy semi-desert to carpet-like alpine meadows can be found within small area close to each other. In the north, broad-leaved forests, Juniper woodlands, beard-grass steppes, subalpine tall herbaceous vegetation, etc. are found. In south and central Armenia, halophyte, hygrophyte, psammophyte, ephemeral semi-desert, and other vegetation dominates. This rich mosaic of vegetation includes large number of species that are often distributed over very small areas. That's why the plant protection of Armenia is of significant importance.

Armenia is rich in ancestral and related ancient species of many economic plants as pears, apples, cherries, plums, grapes, almonds, and, especially, also of many cereals. In this country, there is considerable polymorphism of these species.

The main part of reviewed book is formed by 387 selected species (12% of total Armenian flora) and, for each of them, the following data are given: a) status (in the book adopted categories of Survival Service Commission of IUCN were accepted : 0 - apparently disappearing {36 sp.}, 1 - endangered {130 sp.}, 2 - rare {154 sp.}, 3 - reducing {59 sp.}, 4 - indefinite {8 sp.}), b) distribution (in Armenia, Soviet Union and world distribution), c) habitat and ecology, d) biology and potential utilization, e) the ways of protection. Most of the species texts are accompanied by maps of distribution and some of them by illustrations and photographs.

From the view of Central-European reader, inclusion of some species is interesting, e.g. *Botrychium lunaria*, *Thelypteris palustris*, *Juniperus sabina*, *Taxus baccata*, *Sternbergia colchiciflora*, *Carex bohemica*, *Empetrum hermaphroditum*, *Iris pumila*, *Spirodella polyrhiza*, *Menyanthes trifoliata*, *Nymphaea candida*, *Corallorhiza trifida*, *Orchis coriophora*, *Clematis vitalba*, *Staphylea pinnata*, *Vitis sylvestris*, etc.

In separate chapters noticeable attention is paid to the protection of vegetation and the landscape, to protected areas, to related species of cultivated plants and to protection of palaeontological and archeological localities and materials.

The book is closed by the list of rare and endangered species arranged according to floristic regions (with determined status of its endangerment), list of important literature and an index of Russian, Armenian and scientific plant names.

The book can be recommended for everybody interested in rich flora of this region and for botanical garden specialists who work in the field of endangered flora preservation as well.

V. Mikoláš