Preface

South-west Asia, as accepted in this work, includes an enormous area of the Asiatic continent, its surface being over four million square km, and it is characterized by a remarkable differentiation of its configuration – from the depression of the Dead Sea (–394 m) to the highest tops of the Hindukush massif (Tirich Mir in Pakistan 7690 m). The following countries form this area: Turkey (Anatolia), Iran, Afghanistan, Pakistan (its mountainous part), Cyprus, Lebanon, Syria, Israel, Jordan and Iraq. Thus the north limit in south-west Asia is the south boundary of the USSR, the east one is the valley of the Indus river, the south one – the Indian Ocean and the south borders of Iraq and Jordan, and the west one – the Mediterranean and Aegean Seas.

Nearly the whole of this territory is part of the Holarctic Floristic Kingdom, and only the most southern parts of Pakistan, Iran, Iraq and Jordan belong to the Paleotropic Kingdom, or (according to views of different geobotanists) to the transient zone between Holarctis and Paleotropis. Within Holarctis south-west Asia is the most southern part of this kingdom. Four essential regions can be distinguished in it.

1. Euro-Siberian Region – comprising north Anatolia, and north Iran, lying at the Caspian Sea. It is divided into two provinces:

a) Euxine Province which includes, besides Anatolia, eastern Turkey-in-Europe, south-east Bulgaria, the south Crimea, and the western part of the Caucasus at the Black Sea.

b) Hyrcanian Province – enclosing north Iran (Gilan, Mazandaran, Gorgan and north-west Khurasan) and Talish in Azerbaydzhan in the USSR.

2. Mediterranean Region consisting of only one province – East Mediterranean. West and south-west Anatolia, Cyprus, north-west Syria, Lebanon and partly north Israel and north-west Jordan, as well, belong to it.

3. Irano-Turanian Region – the largest of all mentioned regions – spreads from central Anatolia, through Iran and Afghanistan to Pakistan.

4. Sino-Japanese Region – the extreme west end of this region along the Himalayas, reaches north-west Pakistan and east Afghanistan (mainly Nuristan).

The flora and vegetation of south-west Asia has attracted attention of Europeans for a very long time, but though the first information about it had reached Europe in the 4th century B. C., thanks to the expeditions of Alexander of Macedonia, the turning-point was the 16th c. It may be that the first man that began the floristic exploration of the Near East was a French traveller, Pierre Belon, about the latter part of this century. The travel of Leonhard Rauwolff in the years 1573 - 1576 to Arabia, Palestine, Syria, Mesopotamia and Armeniya was very important, too. He was the first collector and explorer who reached Iraq (Baghdad). Unfortunately Rauwolff's herbarium collections were only worked out and published 160 years after his death.

During the following 300 years, thanks to travels and botanical expeditions to different parts of south-west Asia such a great number of floristic information and herbarium collections were compiled that it could be attempted to sum up. This was done by the Swiss botanist E. Boissier (1810 - 1885), who in the years 1857 - 1884 succeded to elaborate the "Flora Orientalis" in five volumes. It gives all the knowledge about vascular plants occuring in the region between Greece and India and between Turkestan and Egypt. In "Flora Orientalis" Boissier described over 11 thousand species, and his work has been the basic source of knowledge about the flora of south-west Asia since then.

Another turning-point were the years around 1960, when critical Floras of different countries or regions were being published. Boissier, however, performed his enormous task by himself, and at present such Floras are mostly worked out in co-operation of specialists from different countries. These Floras can be compared as the botanical nomenclature has been co-ordinated and so they can be utilized in works on plant chorology. They were published in turn:

1960 – Flora of Afghanistan, by S. Kitamura,
1963 – Flora Iranica, edited by K. H. Rechinger in instalments (each part serves one family),
1964 – Flora of Lowland Iraq, by K. H. Rechinger,
1965 – Flora of Turkey, edited by P. H. Davis,
1966 – Nouvelle Flore du Liban et de la Syrie, by P. Mouterde, Flora Palaestina, by M. Zohary and N. Feinbrun-Dothan, Flora of Iraq, edited by C. C. Townsend and E. Guest,
1970 – Flora of West Pakistan, edited by E. Nasir and A. I. Ali (in a similar form as Flora Iranica),
1974 – Flora of Saudi Arabia, by A. M. Migahid and M. A. Hammouda,
1977 – Flora of Cyprus, by R. D. Meikle.

Most of these Floras have not been completed yet, nevertheless they allow to esteem the richness of the floristic composition of the regions. And so it can be supposed that: in Turkey there are about 9000 species of vascular plants, in Iran about 7000, in Pakistan (with Kashmir) about 6000, in Syria and Lebanon about 3000, in Palestine (Israel, Jordan and Gaza Strip) about 2400, in Iraq about 1900 and on the Cyprus about 1300.

A great percentage of these Floras are trees and shrubs, yet it is very difficult to give a precise number of these species, because it is impossible to put a distinct limit between herbaceous and woody plants. There is a whole group of plants with shoots, more or less ligneous (suffruticose plants), being on the fringe of both groups. In the dry climate of south-west Asia suffruticose plants are exceptionally numerous and they often play an important role in plant communities. F. Yaltirik (248) for instance, assumes that there are over 800 woody taxa in Turkey, i.e. about 10% of the whole flora. It can be, however, supposed that suffruticose plants were included in this amount.

The knowledge of trees and shrubs areas is very important from two viewpoints – geobotanic and economic. These plants form not only forest communities and protect the soil from erosion, but also determine the development of forestry, fruit farming, horticulture and agriculture.

One hundred species of trees have been chosen to be worked out. Not only the above factors dictated the choice of the trees but also the necessity of getting such representative information of their localities as to show that the maps show the real situation in nature. Some important species have been omitted in this choice (e.g. from the *Quercus*, *Fraxinus* genus) as their taxonomy is not clear enough to utilize the data from literature, and special herbarium studies are needed. Species of the genus *Pinus* have been also left out as the areas of the representatives of this genus have been precisely described by W. B. Critchfield and E. K. Little, Jr. (1966. Geographic distribution of the pine of the world, U.S. Dep. Agric. Misc. Publ. 991).

Another problem is the naturalness of occurrence of some cultivated species. South-west Asia is a region of old culture, where in the course of some millenia (the beginning of urbanization go back, for instance in Syria, to the seventh millenium B.C.). There were frequent changes of ethnic, political, religious and customary relations. We should look also for the beginning of agriculture and fruit farming, growing of ornamental, aromatic and medicinal plants in this part of Asia. These régions were presumably much more wooded and covered with shrubs then they are now, yet pasturage, nomadism and wasteful exploration during thousands of years caused the decay of forests in many places. Because of that the soil became eroded and dried out, steppe plants invaded the regions and great changes in plant communities followed. At present only casually preserved, single old tree specimens in such degraded regions testify to the different structure of vegetation and climat. A number of species of trees and shrubs, giving valuable products, and fruit above all (e.g. *Juglans*, *Amygdalus*, *Armeniaca*, *Persica*, *Cerasus*, *Prunus*, *Pyrus*, *Malus*, *Crataegus*, *Mespilus*, *Ficus*, *Pistacia*, *Punica*, *Ziziphus*, *etc.*) man did not destroy, but protected then and selected mor or less knowingly and distributed through cultivation. That's why at present it is often rather difficult to define the character of localities of those species – whether natural or artificial.

Moreover, plants from other, often distant, regions were introduced to, and cultivated in south-west.

Asia. The famous "silk route" led over his land; already two thousand years ago it connected the Far East with Europe. By this way the mulberry, together with sericulture was spread, and *Platycladus orientalis* (L.) Franco (= *Biota orientalis* (L.) Endl.) probably came that way to Iran, and so did *Diospyros lotus* L.

From central Asia, far westward, to Asia Minor, and even to the Balcan the pyramidal *Populus* cv. '*Afghanica*' (= *P. afghanica* Schneid) was moved this way, and yet at present it seems to be a native tree (e.g. in Anatolia), commonly planted and naturalized. In like manner, presumably, the elm-tree with a round, dense crown, described as *Ulmus densa* Litw. or *U. androssovii* Litw., became a native of this part.

Though the main purpose of this paper was to work out the areas of trees in south-west Asia, strict limitation to this region would be something artificial. Only a few of the chosen 100 species are endemic in south-west Asia, the others go beyond its borders. To understand better the geographical connections it was decided to spread the work on the neighbouring regions, in the following limits: 19° - 78° E. long. and 23°30′ - - 47°20′ N lat.

When drawing area maps the dot method was used. Each dot on the map conforms to a locality of the given species whether the taxon is represented by one specimen or occurs in groups. The locating of the stands was done by means of different atlasses and maps, both present-day and published in the 19th c. – this was necessary as the names of places in south-west Asia were often changed and their spelling differed in various languages. "The Time Atlas of the World" published in 1959 in 5 volumes was very valuable and helpful. The following maps were used, scale 1 : 250,000 and 1 : 1,000,000, prepared by Army Map Service, Corps of Engineers US Army, Washington; scale 1,500,000 and 1,000,000 edited by D. Survey, War Office and Air Ministry, United Kingdom; segmental tourist maps of different kind, of which the best were edited by the Geographic and Drafting Institute, Sahab, Tehran.

Another great help were lists of places in some countries, as: Gazetteer No. 46, Turkey – Office of Geography, Department of the Interior, Washington DC (1960), Historical Gazetteer of Iran, Tehran and Northwestern Iran, by L. W. Adamec (1976), Historical and Political Gazetteer of Afghanistan, 1-3, by L. W. Adamec (1972 - 1975), Gazetteer of Place-Names in Iraq, by E. R. Guest in "Flora of Iraq" 1 (1966), Index Toponomique, by P. Mouterde in "Nouvelle Flore du Liban et de la Syrie" 1 (1966), Geographical List, by J. E. Dinsmore, in "Flora of Syria, Palestine and Sinai" 1 (1932), Geographical List, by M. Zohary, in "The Arboreal Flora of Israel and Transjordan and its Ecological and Phytogeographical Significance" (1951) and Fundortverzeichnis (Syria, Lebanon), by K. H. Rechinger, in Arkiv för Botanik, Ser. 2., 5, 1 (1959).

In spite of the information given in the above gazetteers the situation of localities could not be fixed, but they were only few in number and had no influence on the result of the work. Moreover, regional dot maps already existing, published in different publications, mainly dot maps prepared by A. A. Grosshiem for the Caucasus (Flora Kavkaza 1 - 7) were utilized. There was a lot of troubles with gathering information about localities of species commonly growing on the Balkans, especially in their north-west confines (Jugoslavia, Albania, partly Romania). In this case the regions known to have the given species are marked with fine parallel lines – the distribution is mainly based on data given in the following books: H. Meusel, E. Jäger, E. Weinert, 1965 - 1978, Vergleichende Chorologie der zentraleuropäischen Flora; J. Jalas, J. Suominen, 1973 - 1976, Atlas Florae Europaeae 2 - 3.

The texts characterizing the area of the different species in south-west Asia were prepared with the help of data taken form herbarium labels, from literature, from our own observations during our stay in Turkey, north-west Iran and Greece in 1973, 1975, 1977 and 1979. In the references to literature at the end of the texts only those are mentioned that helped in preparing maps. These are publications giving data about localities of the different taxa. Not to increase the long list some small, though valuable floristic publications, have been omitted. Therefore the list cannot be treated as a bibliography of woody flora in south-west Asia.

Lately a number of botanical bibliographies of this part of Asia have been published and the following can be of interest:

Aytuğ N., Çakman A. – 1972. Türkiye flora bibliyografyasi, Ankara. Türdok Bibliyografya, 5.

Breckle S.-W., Frey W., Hedge I. C. – 1969. Botanical literature of Afghanistan. Notes Roy. Bot. Gard. Edinb. 29,3: 357 - 371.

Breckle, S.–W., Frey W., Hedge I. C. – 1975. Botanical literature of Afghanistan: Supplement I, Notes Roy. Bot. Gard. Edinb. 33,3: 503 - 521.

Burgess R. L., Mokhtarzadeh A., Cornwallis L. – 1966. A preliminary bibliography of the natural history of Iran, Science Bull. 1. Pahlavi University, Shiraz.

Davis P. H., – 1975. Turkey: Present state of floristic knowledge in "La flore du bassin Méditerranéen", Colloques Internationaux du C.N.R.S.No. 235: 93 - 113.

Davis P. H., Edmondson J. R. – 1979. Flora of Turkey: A floristic bibliography, Notes Roy. Bot. Gard. Edinb. 37,2: 273 - 283.

Field H. – 1953 - 1963. Bibliography on southwestern Asia, 1 - 7. Field Research Projects, Coconut Grove, Miami.

Field H., Larid E. – 1968 - 1972. Supplement to the Bibliography of southwestern Asia 1 - 8, Field Research Projects, Coconut Grove, Miami.

Frey W., Mayr H.-J. – 1971. Botanische Literatur über den Iran. Bot. Jahrb. Syst. 91,2 - 3:348 - 382.

Guest E. R., Blakelock R. A. – 1966. Selected bibliography, in „Flora of Iraq" 1 : 184 - 207. Baghdad.

Kasapligil B. – 1955. A bibliography on the botany and forestry of the Hashemite Kingdom of Jordan. Amman.

Kazmi S. M. A. – 1970 - 1971. Bibliography on the botany of West Pakistan and Kashmir and adjacent regions. 1 - 3. Field Research Projects, Coconut Grove, Miami.

Krause K. – 1927. Die botanische Literatur über die Türkei. Feddes Repert. 24 : 113 - 146.

Krause K. – 1931. Nachträge zur botanischen Literatur über die Türkei. Feddes Repert. 29 : 136 - 141.

Stewart R. R. – 1956. A bibliography of the flowering plants of West Pakistan and Kashmir. Biologia 2,2 : 221 - 230.

Zeybek N. – 1972. A bibliography of the papers on the taxonomy and ecology of Turkish flora. Izmir.

The different items of literature have been marked with numbers, and at the end of each text referring to the given species those numbers of the work have been given that are most important in giving information on the distribution, ecology, taxonomy and nomenclature of the taxon. Wen the work is in more that one volume the number of volumes is given in brackets.

Herbarium collections were, however, the main source of information and therefore the proper materials coming from the following Herbaria were revised: Naturhistorisches Museum, Botanische Abteilung, Wien; Botanisches Institut und Botanischer Garten der Universität, Wien; Dr. F. Sorger – private collection, Wien; Botanical Institut of the Bulgarian Academy of Sciences, Sofia; Botanical Institute, Faculty of Sciences, University, Sofia; Botanical Institute of Czechoslovakian Academy of Sciences, Praha; Botanical Museum and Herbarium, Copenhagen; Herbarium Haussknecht, Sektion Biologie der Friedrich-Schiller-Universität, Jena; Muséum National d'Histoire Naturelle, Labôratoire de Phanérogamie, Paris; British Museum, Natural History, London; Royal Botanic Garden, Edinburgh; Royal Botanic Gardens, Kew; The Goulandris Natural History Museum, Kifissia, Athens; Ariamehr Botanical Garden, nr. Tehran (partly); Plant Pests and Diseases Research Institute, Tehran; Institute of Dendrology, Polish Academy of Sciences, Kórnik nr. Poznań; Naturhistoriska riksmuseet, Stockholm (partly); Botanical Museum, Göteborg (partly); Conservatoire botanique de Genève, Chambésy (partly); Institute of Botany, University of Ankara; Institute of Botany, Hacettepe, Ankara; Institute of Botany, University, Izmir-Bornova; Institute of Forest Botany, University, Büyükdere-Istanbul; Institute of Botany, Department of Sciences, University, Istanbul; Department of Pharmaceutical Botany, University, Istanbul; Institute of Botany, USSR Academy of Sciences, Leningrad; Botanischer Garten und Botanisches Museum, Berlin-Dahlem (partly); Dr. H. Freitag – private collection, Kassel (partly).

The author experss his gratitude to the curators of the Herbaria for giving him the run of their collections. Thanks are also due to Mrs. Jennifer Woods-Lamond of the Royal Botanic Garden, Edinburgh, for linguistic revisions of the English text.

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