



LEGUMES of NORTHERN EURASIA

A CHECK-LIST

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This check-list is printed from the *Legumes of Northern Eurasia* Database prepared at the Komarov Botanical Institute, St Petersburg, Russia, as a contribution to the International Legume Database and Information Service (ILDIS). The database will shortly be incorporated in the *World Database of Legumes* created and operated by ILDIS, to encompass the synonymised checklist, geographical distribution and descriptive information on all legumes of the world. The *World Database of Legumes* presently covers some 19,000 legume taxa and is reasonably complete for all continents, with the exception of datasets still to be incorporated for *Acacia* of Australia, and some species from parts of Asia, Madagascar and the Far East.

ILDIS Regional datasets have been created or are in preparation by a network of regional centres at Kew, St Petersburg, Lucknow, Guangzhou, Lincoln NZ, Canberra and Missouri. These datasets are combined into the World Database and, once in the World Database, the entries are then extensively edited by a worldwide network of taxonomic specialists both for the content and to bring them into taxonomic consistency within each group.

The ILDIS project is co-ordinated by Dr F.A.Bisby (University of Southampton), Dr R.M.Phill (Royal Botanic Gardens, Kew) and Dr J.L.Zarucchi (Missouri Botanical Garden). Institutional sponsors of ILDIS are BIOSIS; Chapman & Hall Scientific Data Division; Royal Botanic Gardens, Kew; V.L.Komarov Research Institute, St Petersburg; National Botanical Research Institute, Lucknow; Missouri Botanical Garden, St Louis; South China Botanical Institute, Guangzhou, and the University of Southampton. Financial support has come from The Leverhulme Trust; The ILDIS Trust; The International (Soros) Science Foundation; The Russian Foundation for Basic Research; CSIR (India); IUBS/UNESCO Botany 2000 Programme and the Commonwealth Science Council. Arrangements for accessing the database, purchase of publications and other enquiries may be made to the ILDIS Co-ordinating Centre, Biodiversity and Bioinformatics Research Group, School of Biological Sciences, University of Southampton, Southampton SO16 7PX, U.K., or by accessing the WorldWide Web at <http://www.soton.ac.uk/~ildis>, and at <http://www.bids.ac.uk/ildis.html>.

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FOREWORD

Nothing gives me greater pleasure than to introduce this Regional Checklist of Legumes of Northern Eurasia. It brings to a happy conclusion the first stage in the participation of the 'ILDIS Russia team' in the worldwide International Legume Database & Information Service (ILDIS) programme. I say a happy conclusion because there are indeed several positive outcomes with which we are all rather pleased:

— this is a uniquely rich and detailed dataset documenting the diversity and distribution of legumes in Northern Eurasia, a valuable resource in its own right. Gennadi Yakovlev, Andrey Sytin, Yuri Roskov and all 73 contributors are to be congratulated. The presentation here using the dissected Russian taxonomy is designed to make the data available as it is used in the region.

— the partnership between ILDIS worldwide and the Russian team has opened up access to a network of specialists in the region, and to the very extensive literature in Russian and other languages of the FSU and Mongolia.

— the partnership has enabled ILDIS to go further in understanding both the nature of the more dissected Russian practice, and in cross-mapping this to the systems in use elsewhere. This is a critically important area, both for ILDIS and all other assessments of species diversity. In the process, a number of us have learned to respect both traditions: there are advantages and disadvantages on either side. These same data will become available in the ILDIS World Database of Legumes in the less-dissected form for comparison with other data worldwide.

It has thus contributed not only this most useful resource book, but also to the international communication and understanding of science.

This has also been a genuinely co-operative programme with strong international working. I recall the tangible excitement when the Russian, Indian, Chinese and European teams met for a week-long workshop to co-ordinate standards and start working together in August 1991. Even now this collaboration seems remarkable: we shall shortly have an integrated and detailed taxonomic catalogue of the legumes of the whole of Eurasia. The Royal Botanic Gardens, Kew has played an important role in furthering this collaboration and we are very pleased that they have agreed both to publish this work and to make copies available within the countries of Northern Eurasia.

Lastly, I know that Gennadi Yakovlev and Andrey Sytin would join me in congratulating Yuri Roskov on his achievement in bringing this project to fruition. Only through his personal vision and determination has this first project come into existence and to this conclusion.

Frank Bisby
ILDIS Project Co-ordinator,
Southampton. March 1996

EDITOR'S PREFACE

This checklist continues the series published by the Royal Botanic Gardens, so far comprising lists for Africa, West Asia and Indo-China, and all produced as contributions to the International Legume Database and Information Service project. This list has, however, been produced (for the same project) at the Komarov Botanical Institute, St. Petersburg and the Chemical-Pharmaceutical Institute, St Petersburg, by three distinguished legume specialists; Kew has only been involved at the publishing stages. The area covered by the list is vast — it spans 160 degrees of longitude, almost half the circumference of the globe — and has seen huge political changes during the compilation of the list.

This list differs in two main ways from earlier ones. First, it contains much more geographical information, down to the level of administrative region (oblast) or district (rayon), rather than just to the country level as has previously been the case. The availability of such detailed information is a tribute to the authors and to the network of local specialists who have provided much of it. The authors have developed a mapping program which, it is hoped, will allow the production in Russia of a second volume containing distribution maps of all taxa.

Secondly, this list differs from earlier ones in its taxonomy. The Russian school of taxonomy tends to recognize taxa at higher levels than is normally the case elsewhere, and no attempt has been made to alter this. Thus three families are recognized, rather than three subfamilies, and several extra tribes are included. Some large genera (such as *Trifolium*) are subdivided, and species are recognized which might in other regions be treated as subspecies or varieties.

Finally, as Editor I have used a fairly light touch. I have altered the wording only where the meaning was obscure and have not attempted to impose a rigid style on all the annotations and introductory notes to the genera. I am certain that this list will be valuable both inside and outside this vast region and may open the eyes of many to its interest and diversity.

J.M.Lock
Kew, 1996

INTRODUCTION

This checklist of the legumes of Northern Eurasia has been compiled at the Komarov Botanical Institute, St.Petersburg, in 1991-1995, as a contribution to the International Legume Database and Information Service (ILDIS).

The area covered by this checklist is the territory of the former Soviet Union (FSU), and Mongolia.

The checklist is based on data from principal and local "Floras" of the region, taxonomic publications, local floristic lists and, importantly, on collections of 73 main, world-known, and small little-known Herbaria of the FSU and Mongolia.

Primary data, in accordance with a method proposed by Dr. J.M.Lock, were accumulated on to check-sheets, and then entered into an IBM-compatible micro-computer using the program ALICE, devised and written by Dr. R.Allkin and Mr. P.J.Winfield (ALICE Software Partnership). Auxiliary resident programs, kindly devised by Mr. M.V.Soloviev, namely Alice Resident Area Selector (AREAS) and Region Map Viewer (REGMAP), were also used in the work. The checklist was produced using the ALICE Report Generator Program (AWRITE), edited on a word processor and typeset at the Royal Botanic Gardens, Kew.

The completed database contained some 2260 native and introduced species. The database contains some extra material not included in this printed version.

Considerable differences exist in the concepts of species and genus between the West European and former Soviet Union (FSU) taxonomic schools. As a rule, FSU botanists use smaller species and genera than their European or American colleagues. A number of the species described in recent years from the territory of FSU and Mongolia are considered by Western colleagues as synonyms or infraspecific taxa, or are unknown to them. The authors have tried to include all the species and genera recognised by FSU taxonomists in this regional database. To facilitate further study by taxonomic experts, questionable or less well-known species are supplied with notes on their relations to generally recognized species, as well as references to alternative opinions on their rank. For the same reason, we placed the nomenclatural citations for all accepted names, in traditional form, in the field "Text". There are, additionally, many notes concerning different accepted names of species having unstable nomenclature in different principal sources.

The circumscription of tribes and genera in this Checklist mainly correspond to those of Polhill and Raven (ref. 1500), and then accepted by Takhtajan (ref. 1501). Minor deviations from this system, when made, are mentioned in brief notes to the taxa. Following the system by Hutchinson (ref. 1506), three families are accepted within the order *Fabales* Nakai, namely *Caesalpiniaceae* R.Br.,

Mimosaceae R.Br. and *Fabaceae* Lindl. (for a discussion on the rank of these taxa, see Yakovlev (ref. 1502)). All taxa in the checklist are arranged in alphabetical order within those families. Brief notes on the genera are based on an account by Yakovlev (ref. 1502), with some additions.

Work on compiling the database was divided among the authors as follows: Prof. Gennadi P. Yakovlev (St.Petersburg Chemical Pharmaceutical Institute) treated the families *Caesalpiniaceae* and *Mimosaceae*, and the tribes *Amorpheae*, *Crotalariaeae*, *Galegeae* (excluding the genera *Astracantha*, *Astragalus* and *Oxytropis*), *Genisteae*, *Indigofereae*, *Psoraleae*, *Robinieae*, *Sophoreae*, *Tephrosieae*, and *Thermopsidaeae* from the family *Fabaceae*; Dr. Andrey K. Sytin (Komarov Botanical Institute) treated the genera *Astracantha*, *Astragalus* and *Oxytropis*; Dr. Yuri R. Roskov (Komarov Botanical Institute) treated the tribes *Aeschynomeneae*, *Cicereae*, *Coronilleae*, *Desmodieae*, *Hedysareae*, *Loteae*, *Lupineae*, *Ononideae*, *Phaseoleae*, *Trifolieae* and *Vicieae*. Yu.R.Roskov was responsible for the management of this database project, and also undertook the task of processing this book.

ACKNOWLEDGEMENTS

We are grateful for initiation of our work, support and help to Dr. F.A.Bisby, Dr. R.M.Pollhill, Dr. J.M.Lock, Dr. S.Hollis, Dr. R.Allkin and Dr. P.J.Winfield.

During compilation of the database, the authors received help and scientific advice from Dr. S.K.Cherepanov†, Dr. V.I.Grubov, Dr. R.V.Kamelin, Dr. M.I.Kirpichnikov†, Dr. V.N.Tikhomirov and Dr. N.N.Tzvelev. Important support for work on the project was rendered by the Director of Komarov Botanical Institute Dr. L.Yu.Budantsev. We express our sincere gratitude to them, noting that our work became possible to a large extent thanks to their help.

We are also very grateful to all regional contributors as well as legume specialists who checked certain taxa: Z.G.Ulle & T.E.Kramina (*Lotus*), T.E.Teplyakova (*Glycine*), I.V.Seferova (*Cicer*), Ch.Sanchir (*Caragana* in Mongolia).

Special thanks go to I.V.Sokolova for her kind help in primary editing and translating the text, to B.R.Adams for taxonomic editing of the dataset, to S.L.Mosyakin and A.P.Davis for particular consultations, to A.D.Romanov and M.V.Soloviev for assistance with computer software in our work. The authors would like to thank Ann Comper for her kind hospitality during their visits to England.

We are most grateful to Dr. J.M.Lock for assistance with final editing, production of camera-ready text, and preparation of the maps.

SPONSORS

This work was supported by the ILDIS Co-ordinating Centre, which provided a computer and software to the working group, and by the Komarov Botanical Institute, which was the main place of work. Different stages of the project were sponsored by special grants from the Russian Foundation for Basic Research (1993-1995, 93-04-07040) and International Science Foundation (1993-1995, NV5000 & NV5300).

Visits to the UK during the work were funded by ILDIS, The Royal Society, and the Royal Botanic Gardens, Kew; their support is gratefully acknowledged.

Production and publishing of the finished book was carried out by the Royal Botanic Gardens, Kew.

THE DATA CATEGORIES

The categories of data, in the main, are those adopted throughout the ILDIS Project (Zarucchi & al. 1993) and defined by Hollis (1990) (ref. 1509). However, the compilers saw fit to extend the structure of categories and the volume of information (ref. 1519, 1521) so as to provide a more detailed regional synthesis, and richer botanical information than the minimum specified by ILDIS.

The following additions were introduced: A nomenclature citation was added for each species as a separate line in the "Text" field. Chromosome numbers of species were gathered in the database as a separate field in the group "Descriptors". The characteristic of "plant climbing" or "plant not climbing" was replaced by a character describing stem orientation in relation to substrate surface. Habitats of species have been described in three fields included in group "Descriptors": "Type of vegetation", "Macrorelief" and "Substrate". Classes of economic importance were also partly changed.

NOMENCLATURE

Accepted Names

These are species names which are, as a rule, accepted in most up-to-date taxonomic and floristic accounts and included in the widely used standard Checklists of FSU flora by Czerepanov (ref. 1866, 2164). Every accepted name is accompanied by a nomenclature citation and a list of references to principal sources for the Northern Eurasia flora in which the name is accepted. Abbreviations in nomenclature citations are in accordance with recommendations of *Taxonomic Literature* (ref. 1510), *BPH/S* (ref. 1511) for non-Russian periodicals and *Flora Europaea* (ref. 1512) for Russian periodicals. Authorities of taxa are abbreviated according to *Authors of plant names* by Brummitt and Powell (ref. 1513).

Synonyms

These are names considered by most of taxonomists to be synonyms of an accepted name. For each species, as complete a list of synonyms as possible is gathered. If necessary, a synonym is accompanied by a brief Latin note giving the nomenclatural characteristics of the epithet. Published orthographic variants or errors are also placed among the synonyms, marked by "ortho".

TRANSLITERATION

Since the great majority of sources are written in Russian, when citing a bibliography, geographic names and vernacular names, a transliteration of the Cyrillic alphabet into Roman was usually necessary. It was made in accordance

with *ISO Recommendations* (ref. 1507). We have chosen a variant without diacritical marks. A difference from *ISO* was that we tried not to use “j” when transliterating the Cyrillic letter “й”, but replaced it by “i” or to omit it altogether. We also did not use the mark “'” when transliterating the letters “ь” & “Ъ”.

BIBLIOGRAPHY

The authors have attempted not only to compile a checklist of legumes of Northern Eurasia, but also to provide a complete data set of Russian-language sources, as these are difficult for many specialists outside Russia to obtain. Our database and this checklist, therefore, differ from previous checklists in this series by the greater number of references for each species. The list of sources cited here includes "Floras" and "Manuals" for large territories, Republics and local regions, taxonomic treatments of separate legume taxa and floristic accounts for some areas.

We have used, as a rule, the second English or Latin title which is given in most Russian publications. If such second title is absent, the Russian title was transliterated into Roman letters, accompanied by its English translation in square brackets. In the bibliography of the checklist, not only the English or Latin titles of sources are cited, but also their original Cyrillic spelling.

Titles of Russian periodicals correspond to a convenient standard accepted in "Flora Europaea", i.e. their Latin titles are cited.

For the convenience of users, the language of references in the bibliography appears as an abbreviation in brackets in the end of the bibliographic citation and the same system is used for vernacular names.

TABLE 1. Abbreviations used for languages.

Arm	- Armenian	Ge	- German	Mong	- Mongolian
Az	- Azerbaijani	Ka	- Kazakh	Rus	- Russian
Be	- Belorussian	Kalm	- Kalmykian	Tadzh	- Tadjik
Bur	- Buryatian	Kar	- Karelian	Tib	- Tibetan
Chuv	- Chuvashian	Kirg	- Kirgizian	Turkm	- Turkmenian
En	- English	Komi	- Komian	Tuv	- Tuvian
Es	- Estonian	Latv	- Latvian	Ukr	- Ukrainian
Fr	- French	Lit	- Lithuanian	Uzb	- Uzbek
Georg	- Georgian	Mold	- Moldavian	Yakut	- Yakutian

In references to "Floras" with many authors, the entries in the main bibliography are given according to the name of the author of a certain taxonomic treatment, not the name of an editor. This follows the practice of taxonomists in citing the particular taxonomist who prepared the treatment.

Two groups of principal floristic publications on the flora of N. Eurasia are always cited for each species for which they contain information.

The foremost source was the most complete account in *Flora URSS* (1945, 1946, 1948) Chief Editor V.L.Komarov, Moscow, Leningrad (Rus). Its complete translation, *Flora of the USSR*, was published in Jerusalem in 1971 (Vol. 11), 1965 (Vol. 12), 1972 (Vol. 13).

Vol. 11 (advance copies printed in 1941, title marked as 1945; Volume Editor B.K.Schischkin) includes the subfamilies *Mimosoideae*, *Caesalpinioideae*, the tribes *Amorpheae*, *Galegeae* (partly), *Genisteae*, *Loteae*, *Lupineae*, *Sophoreae*, *Thermopsidae*, *Trifolieae* from *Papilionoideae* (ref. 614, 1945, 2114, 2120, 2124, 2134, 2149, 2173, 2177, 2182, 2188, 2194, 2195, 2198, 2214);

Vol. 12 (1946; Volume Editor B.K.Schischkin) includes the genus *Astragalus* (ref. 1978, 1982, 1987, 1991, 1995, 2172);

Vol. 13 (1948; Volume Editors B.K.Schischkin & E.G.Bobrov) includes the genus *Oxytropis* and the tribes *Cicereae*, *Coronilleae*, *Desmodieae*, *Hedysareae* of *Papilionoideae* (ref. 1867, 1888, 1892, 1906, 1927, 1948, 1951, 1960, 2030, 2047, 2110, 2240, 2241, 2242).

A no less important source, including all the species of the region, is the nomenclature checklist by Czerepanov (1981) *Plantae Vasculares URSS*, Leningrad (ref. 1866) and its new edition: Czerepanov (1995) *Vascular Plants of Russia and Adjacent States (former USSR)*, Cambridge University Press (ref. 2164).

The second by importance for the territory of FSU is a group of recent critical "Floras" for large regions:

Flora Kavkaza [Flora of Caucasus], Vol.5 by A.A.Grossheim (1952) Moscow, Leningrad (Rus) (ref. 1878).

Conspectus Florae Asiae Mediae, Vol.6 (1981) Volume Editors R.V.Kamelin, S.S.Kovalevskaja, M.M.Nabiev, Tashkent (Rus) (ref. 1923, 1924, 1952, 1957, 1990, 2002, 2003, 2004, 2007, 2013, 2014, 2015, 2036, 2048, 2086, 2111, 2150, 2204, 2230).

Flora Arctica URSS, Vol.9 (1986) Editor B.A.Jurtzev, Leningrad (Rus) (ref. 2006, 2069, 2154).

Flora Partis Europaeae URSS, Vol.6 (1987) Volume Editor N.N.Tzvelev, Leningrad (Rus) (ref. 1873, 1919, 1946, 2058, 2090, 2118, 2127, 2135, 2219).

Plantae Vasculares Orientis Extremi Sovietici, Vol. 4 (1989) Editor S.S.Charkevicz, Leningrad (Rus) (ref. 1868).

Flora Sibiriae, Vol.9 (1994) Editors A.V.Polozhij, L.I.Malyshev, Novosibirsk (Rus) (ref. 2546, 2547, 2548, 2549).

A third group that are sometimes cited include "Floras" of former Republics of the USSR. They are the source of much primary data on species distribution.

Flora Turkmenii, Vol.4 (1949) Volume Editor V.V.Nikitin, Ashkhabad. (Rus) (ref. 1902, 1921, 1938, 1954, 2034, 2057, 2095, 2152).

Flora BSSR [Flora of Belorussia], Vol.3 (1954) Volume Editor M.P.Tomin, Minsk (Rus) (ref. 1886).

Flora URSS [Flora of Ukraine], Vol.6 (1954) Editor D.K.Zerov, Kiev (Ukr) (ref. 1880).

Flora Azerbaijan, Vol.5 (1954) Editor I.I.Karjagin, Baku (Rus) (ref. 1889, 1913, 1964, 2020, 2125, 2155, 2185, 2275).

Flora Uzbekistanica, Vol.3 (1955) Volume Editor A.I.Vvedensky, Tashkent (Rus) (ref. 1887, 1899, 1907, 1955, 2080, 2094, 2130, 2156, 2176, 2179, 2189, 2223, 2233, 2246).

Latvijas PSR Flora, Vol.3 (1957) Editor P.Galenieks, Riga (Latv) (ref. 1881).

Flora Kirgizskoi SSR, Vol.7 (1957) Volume Editor A.I.Vvedensky, Frunze (Rus) (ref. 1883, 1908, 2061, 2153, 2190).

Eesti NSV Floora, Vol.3 (1959) K.Eichwald et al., Tallinn (Es) (ref. 1879).

Flora Kazakhstana, Vol.5. (1961) Editor N.V.Pavlov, Alma-Ata (Rus) (ref. 1882, 1920, 1958, 1997, 2029, 2093, 2115).

Flora Armenii, Vol.4 (1962) Editor A.L.Takhtajan, Jerevan (Rus) (ref. 1898, 1962, 1996, 2079, 2089, 2274).

Lietuvos TSR Flora Vol.4 (1971) Editor M.P.Natkevicaite-Ivanauskiene, Vilnius (Lit) (ref. 1874).

Flora Tadzhikskoi SSR, 2nd ed., Vol.5 (1978) Editor P.N.Ovchinnikov, Leningrad (Rus) (ref. 1900, 1925, 1953, 1966, 2092, 2113, 2157, 2181, 2184, 2220, 2221, 2244, 2248).

Flora Georgiae, 2nd ed., Vol.7 (1981) Volume Editors L.Chinhibidze, Sch.Kuthatheladze, I.Latschaschvili, Tbilisi (Georg) (ref. 1912, 1929, 1949, 1961, 2025, 2027, 2060, 2081, 2126, 2147, 2180).

Opredelitel Vysshikh Rastenii Moldavskoi SSR [Manual of vascular plants of Moldavia], 3rd ed. by T.S.Geideman (1986) Kishinev (Rus) (ref. 1875).

Data on legumes of the Mongolian flora were extracted from the Doctoral Thesis *Bobovye Mongolskoi Narodnoi Respubliki* [Legumes of Mongolian Peoples' Republic], Vols. 1, 2". by N.Ulzhihutag (1989) Leningrad (Rus) (ref. 1876; a copy of the thesis is available in the Library of the Komarov Botanical Institute), and from the monographs *Key to the Vascular Plants of Mongolia* by V.I.Grubov (1982) Leningrad (Rus) (ref. 1911), and *Plantae Asiae Centralis*, Vol. 8A" by G.P.Yakovlev (1988) Leningrad (Rus) (ref. 1904). Much information was also obtained from recent publications in periodicals devoted to the study of the Mongolian flora.

CHARACTERISTICS

Characteristics include habit, lifespan, stem features and chromosome numbers.

HABIT is defined by 7 categories:

Herbs - *Herbae* - Annual or perennial plants with non-woody aerial shoots, dying down annually in the unfavourable season (therophytes, hemicryptophytes and cryptophytes, sensu Raunkiaer, 1905, 1907). Widespread in Northern Eurasia.

Dwarf Semishrubs - *Suffruticuli* - Perennial dwarf plants with the greater part of the aerial shoots dying each year, but with woody bases persisting above ground and bearing buds (chamaephytes).

Semishrubs - *Suffrutices* - Perennials with persistent woody lower parts of their aerial shoots, and herbaceous annual upper parts (chamaephytes). Height up to 80 cm. In Northern Eurasia, found mainly in arid regions.

Dwarf Shrubs - *Fruticuli* - Dwarf (5-60 cm high) perennials with woody much-branched shoots without a distinct main stem (chamaephytes). Frequent in the high mountains and tundra of Northern Eurasia, where they are often of cushion form.

Shrubs - *Frutices* - Woody perennials with shoots branching from the base, without a distinct main stem at maturity (nano- and smaller microphanerophytes). Height 0.8-4 m. Widespread worldwide.

Trees - *Arbores* - Perennial woody plants with a well developed main stem and a crown formed by branching shoots (branches) (microphanerophytes). In Northern Eurasia tree legumes generally occur in moderately-warm and warm climates.

Lianes - Perennial plants with long woody stems which are not self-supporting in a vertical position, and which rely on other plants, rocks, etc. for vertical support.

LIFESPAN is defined by 3 categories:

Annuals - Plants completing their life cycle within one year. Monocarpiacs.

Biennials - Plants completing their life cycle in two years, passing the first year in a vegetative state, and flowering and fruiting during the second. Monocarpiacs.

Perennials - Plants with a life cycle of more than two years. Perennial legumes flower and fruit many times, i.e. polycarpiacs.

Features of the STEM include its orientation to the substrate surface, ability to climb, and extent of its reduction, and fall into 7 categories.

Erect - stems perpendicular to the ground surface or nearly so.

Ascending - stems initially prostrate or nearly so, then turning upwards so that the distal parts of the shoots are perpendicular to the ground surface or nearly so.

Prostrate - stems lying on the ground, sometimes rooting.

Climbing - stems not self-supporting but climbing, twining or clinging.

Caespitose - short and repeatedly branched stems, forming dense clumps or cushions, typical of tundra, alpine and arid regions.

Semirosette - shoots with very short but distinct internodes. The leaves appear to be aggregated into a rosette.

Rosette - shoots with internodes strongly reduced to virtually absent; leaves condensed into a rosette.

Diploid CHROMOSOME NUMBERS are given where known. The main sources of these data are the principal FSU-compiled accounts of plant chromosome numbers (ref. 1871, 1969).

GEOGRAPHY

Countries included here under the name "Northern Eurasia" are those which were included before 1991 in the USSR (namely, Armenia, Azerbaijan, Belorussia, Estonia, Gruzia, Kazakhstan, Kirgizstan, Latvia, Lithuania, Moldavia, Russia, Tadzhikistan, Turkmenistan, Ukraine, Uzbekistan), and Mongolia. The term "Northern Eurasia" has neither political nor phytogeographical connotations.

According to the phytogeographic subdivision of the Earth by A.L.Takhtajan (ref. 1508) this territory belongs to the Holarctic Kingdom, and includes the Circumboreal, Irano-Turanian, and a small northern part of the Eastern Asiatic Region.

As was discussed during an Asian ILDIS planning workshop (Southampton, 1991), subdivision of the former USSR territory to provide information on plant distribution in databases is quite a complicated problem. The main difficulty lies in the large areas of the countries and the complicated hierarchy of subordinate units. The authors were compelled to reject even the modern scheme proposed by

Hollis & Brummit (ref. 1514), because a principle of administrative subdivision is not followed there consistently. By following their own scheme, the authors brought to a logical conclusion the principle of the TDWG standard which only allows the use of real political and administrative units at the levels of "country" and "area". At the top level are 6 macroregions, 5 in the former USSR (East Europe, Caucasus, Middle Asia, Siberia and the Far East), and the sixth, Central Asia, composed here of just Mongolia. The second, or "country" level is composed of Mongolia, each of the now independent states (former Republics of the USSR), and Russia divided into four units, Russia-Europe, Russia-Caucasus, Russia-Siberia, and Russia-Far East. "Countries" are subdivided into "areas", 224 in total, arranged in the checklist in alphabetic order. Most of the "areas" are administrative provinces known as Oblast (Region) in FSU and Aimags in Mongolia. However, some "area" units have the administrative status of Krai (Territory), Avtonomnaya Respublika (Autonomous Republic) or Avtonomnyi Okrug (Autonomous Area). Yakutia Republic in Siberian Russia has a very large area, and was therefore subdivided into units of lower political-administrative rank - Rayon (District). A full listing of all units used is given in Table 2.

During the authors' work on the database, great political-administrative changes have taken place in the USSR. Each of the Soviet Socialist Republics has become an independent State. Autonomous Republics within the USSR now have the status of Republics. Furthermore, the names of some towns have been changed. Changes in status, names, and sometimes boundaries, are still taking place. To provide a stable reference system during compilation, the subdivision of the USSR and Mongolia for January 1st 1991 is accepted as a basis, reflected in the last mass edition of the political-administrative map of the USSR (ref. 1517), and political-administrative map of Mongolia (ref. 1518). However, for the purpose of more detailed subdivision of the territory, some Regions that existed before 1988 have been accepted: Krasnovodsk Region of Turkmenistan, Mangyshlak & Turgaiskaya Regions of Kazakhstan. The macroregions and the states are shown in Map 1. The subdivisions of the macroregions used in the checklist are shown in Maps 2 – 7; the numbers on the maps correspond to the numbers in the left-hand column of Table 2.

Only widely accepted place-names of area units are used, and not the full political-administrative names. For example, Armenia is used rather than Armenian Soviet Socialist Republic (before 1991) or Republic of Armenia (at present). More detailed information is given in the table below. If a region name is different from that of its main city, then the name of this centre is given in notes. This should facilitate identification of a location using maps lacking boundaries and names of regions. English spelling of place-names corresponds to the dictionary of Gorskaya (ref. 1516). English spelling of Aimag names was discussed with Dr. Chinbat Sanchir (Botanical Institute of Mongolian Academy of Sciences, Ulan Bator, Mongolia).

TABLE 2. Units ("macroregions", "countries" and "areas") used in the database and in the checklist.

<i>English name</i>	<i>Russian name</i>	<i>Notes</i>
E East Europe	Восточная Европа	Natural macroregion
Byelorussia	Белоруссия, Беларусь	State. Presently Byelarus
37 Brest	Брестская обл.	Region
39 Gomel	Гомельская обл.	Region
36 Grodno	Гродненская обл.	Region
38 Minsk	Минская обл.	Region
40 Mogilev	Могилевская обл.	Region
22 Vitebsk	Витебская обл.	Region
7 Estonia	Эстония	State
8 Latvia	Латвия	State
21 Lithuania	Литва	State
77 Moldavia	Молдавия, Молдова	State. Presently Moldova
Russia-Europe	Европейская часть России	Part of state
5 Arkhangelsk	Архангельская обл.	Region
76 Astrakhan	Астраханская обл.	Region
35 Bashkiria	Башкирия, Башкортостан	Aut.Rep./Rep., centre is Ufa, presently Bashkortostan
56 Belgorod	Белгородская обл.	Region
41 Bryansk	Брянская обл.	Region
32 Chuvashia	Чувашия	Aut.Rep./Rep., Cheboksary
Frantz Josef Land	Земля Франца Иосифа	Archipelago, belongs to Komi
30 Gorki	Горьковская, Нижегородская обл.	Region, presently Nizhni Novgorod
29 Ivanovo	Ивановская обл.	Region
12 Kalinin	Калининская, Тверская	Region, presently Tver
20 Kaliningrad	Калининградская обл.	Region
75 Kalmykia	Калмыкия	Aut.Rep./Rep., centre is Elista
24 Kaluga	Калужская обл.	Region
4 Karelia	Карелия	Aut.Rep./Rep., centre is Petrozavodsk
16 Kirov	Кировская, Вятская обл.	Region, presently Vyatka
6 Komi	Коми	Aut.Rep./Rep., Syktyvkar
17 Komi-Permyak	Коми-Пермяцкий авт.окр	Aut.Area, centre is Kudym-Kar
15 Kostroma	Костромская обл.	Region
48 Kuibyshev	Куйбышевская, Самарская обл.	Region, presently Samara

43	Kursk	Курская обл.	Region
10	Leningrad	Ленинградская обл.	Region, presently St.Petersburg
44	Lipetsk	Липецкая обл.	Region
33	Mari	Мари, Марий-Эл	Aut.Rep./Rep., centre is Ioshkar-Ola, presently Mari El
31	Mordovia	Мордовия	Aut.Rep./Rep., centre is Saransk
25	Moscow	Московская обл.	Region
2	Murmansk	Мурманская обл.	Region
3	Nenets	Ненецкий авт. округ	Aut.area, centre is Naryan-Mar
1	Novaya Zemlya Is	Новая Земля	Archipelago, belongs to Komi
11	Novgorod	Новгородская	Region
42	Orel	Орловская обл.	Region
49	Orenburg	Оренбургская обл.	Region
46	Penza	Пензенская обл.	Region
19	Perm	Пермская обл.	Region
9	Pskov	Псковская обл.	Region
74	Rostov-Don	Ростовская обл.	Region
27	Ryazan	Рязанская обл.	Region
59	Saratov	Саратовская обл.	Region
23	Smolensk	Смоленская обл.	Region
45	Tambov	Тамбовская обл.	Region
34	Tataria	Татария	Aut.Rep./Rep., centre is Kazan
26	Tula	Тульская обл.	Region
18	Udmurtia	Удмуртия	Aut.Rep./Rep., centre is Izhevsk
47	Ulyanovsk	Ульяновская обл.	Region
28	Vladimir	Владимирская обл.	Region
58	Volgograd	Волгоградская обл.	Region
13	Vologda	Вологодская обл.	Region
57	Voronezh	Воронежская обл.	Region
14	Yaroslavl	Ярославская обл.	Region
	Ukraine	Украина	State
67	Cherkassy	Черкасская обл.	Region
54	Chernigov	Черниговская обл.	Region
63	Chernovtsy	Черновицкая обл.	Region
70	Dnepropetrovsk	Днепропетровская обл.	Region
72	Donetsk	Донецкая обл.	Region
61	Ivano-Frankovsk	Ивано-Франковская обл.	Region
71	Kharkov	Харьковская обл.	Region
80	Kherson	Херсонская обл.	Region
63	Khmelnitski	Хмельницкая обл.	Region
53	Kiev	Киевская обл.	Region
68	Kirovograd	Кировоградская обл.	Region
62	Lvov	Львовская обл.	Region