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Каталог редких и уязвимых сосудистых растений Монголии

A catalogue of rare and threatened vascular plants of Mongolia

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Реферат. В этом каталоге представлено 1472 вида и подвида редких и уязвимых сосудистых растений Монголии, принадлежащих к 456 родам и 96 семействам. Эти виды были определены как нуждающиеся в сохранении. Для каждого вида приводится латинское название, синонимы, данные о местообитании, правовой статус, группа охраны и статус видов, находящихся под угрозой, занесенных в МСОП и Красную книгу Монголии. Это первая всеобъемлющая и полная инвентаризация сосудистых растений Монголии, находящихся под угрозой исчезновения. Информация была собрана и проанализирована из более чем 150 ссылок и учитывает 64,500 листов оцифрованных коллекций нашего Гербария (UBA).

Summary. In this catalogue, a total 1472 species and subspecies belonged to 456 genera and 96 families to rare and threatened vascular plants of Mongolia comprises it. These species contains are near threatened and vulnerable as they have been identified as being in need of conservation status attention. In each species included information such as scientific and synonymic names, global, regional and national distribution data, legal status, conservation groups and threatened statuses, The International Union for Conservation of Nature (IUCN) habitat types and Mongolian Red Book and Red List. It is the first comprehensive and complete inventory of the Mongolia's threatened species to the vascular flora. It synthesizes information from more than 150 references and take into account 64,500 sheets digitalized collections of our Herbarium (UBA).

Introduction

Mongolia is situated in the temperate zone and lie between longitudes 87°52' and 119°58' to the east and latitudes 41°45' and 51°05' to the north within the territory of the East Asia. Mongolia is a landlocked country in East and Central Asia. The area of the country is mostly covered by steppes, with mountains to the north and west and the Gobi Desert to the south.

The first work on vascular flora and plant diversity of Mongolia was made by Russian scientist Grubov in 1982, since then the findings of flora surveys in Mongolia can be found in the following scientific books, and literatures (Ulziykhutag, 1989; Gubanov, 1996; Ganbold, 2010; Dariimaa, 2014, 2017; Nyambayar, 2009; Urgamal, 2009, 2017; Urgamal, Oyuntsetseg 2017; Urgamal et al., 2014, 2016, 2017).

Materials and Methods

At the present time, the main funds of the *Herbarium (UBA) in Institute of General and Experimental Biology (IGEB) of Mongolian Academy of Sciences (MAS)* include 126,000 specimens. The material was checked for new findings and was partly critically revised. It was a revision of the vascular flora of Mongolia, which was based on main publications for Grubov (1982), Ulziykhutag (1989), Gubanov (1996), Urgamal et al. (2014) and "Flora of Mongolia, 1, 10, 17, 14a, 14b volumes" (2015, 2009, 2009, 2014, 2017), also we present an updated list of the endemic taxa of vascular plants of Mongolia (Urgamal, Oyuntsetseg, 2017). Electronic data from the *Database of the Mongolian Flora* (<http://www.eic.mn/flora/>) were frequently accessed.

It is based on the previous books, articles, and investigations produced by the researchers on rare and endangered vascular plants in Mongolia (Grubov, 1984; Ulziykhutag, 1989, 2003; Pyak et al., 2008; Dariimaa, 2014, 2017; Ganbold, 2010; Ligaa et al., 2008, 2009; Mongolian Red Book, 2013; Nyambayar et al., 2011; Ur-

gamal, 2017; Urgamal et al., 2014, 2016, 2017; Urgama, Oyuntsetseg, 2017).

Species selection. The catalog contains the following international conventions, legislation, documents, and conservation groups.

- The Global, Regional and National IUCN Red List of Threatened Species
- The Council Directive 92/43/EEC (Habitats Directive)
- The Convention on the Conservation of European Wildlife and Natural Habitats
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora
- The Ramsar Convention on Wetlands (1975)
- The Endemic and Sub-endemic species to Mongolia (Urgamal & Oyuntsetseg 2017)
- The Very Rare and Rare species to Mongolia (Law on Natural Plants 1995, 2004)
- The Aquatic (Water) and Alpine Plant species
- The species included in Mongolian Red Book (2013) and Red List (2011)
- The species are distributed in only one botanic-geographical region of Mongolia
- The Relict species of Mongolia
- The Species of Sensitivity (Susceptibility) to Climate Change

Nomenclature and Taxonomy. Nomenclature and systematic placement of the vascular plant species are based on *Angiosperm Phylogeny Group* (APG IV, 2016), and Stevens (2001) on the *Angiosperm Phylogeny Website*. The author citations for all plant taxa follow Brummitt and Powell (1992). The scientific names of species are ordered according to of the International Plant Names Index (IPNI), and “*Conspectus of the Vascular Plants of Mongolia*” (Urgamal et al., 2014) directly applied from this book. All species are in alphabetical order.

Regional and World distribution. We show the regional distribution according 16 botanic-geographical regions of Mongolia (Grubov, 1982), and the *World Geographical Scheme for Recording Plant Distributions* (Brummitt, 2001.) (WGSRPD) and most practical approach for the application of IUCN criteria.

IUCN Red List. Based on the following information, sources, and books. (“*IUCN 2017. Red List of Threatened Species. Version 2017-3*”, “*European Red List of Vascular Plants*”(Bilz et al., 2011). “*Mongolian Red List and Conservation Action Plans of PLANTS*” (Nyambayar et al., 2011).

Habitat type. We have used the main habitats included in the IUCN Red List database, written in the shortened number format (*IUCN Habitats Classification Scheme. Version 3.1*).

Results

Recently according to plant diversity Mongolia has 7,350 native species and intraspecific taxa of plants belonging to 1,523 genera, 388 families, 116 orders 37 classes and 19 phyla. Of these, 3160 vascular plant species are known in Mongolia (Urgamal et al. 2016).

We have selected to the catalogue 1,472 rare and threatened species (46 % of total amount of species) from all vascular flora of Mongolia using many criteria. In particular, 120 species are endemic to Mongolia, 532 species are sub-endemic, 178 species are relatives listed under the IUCN Global Red List assessed, 427 species are listed under the IUCN Regional Red List (Asia and European) and 148 species are assessed of Mongolian Red List, 134 species are included Mongolian Red Book, 128 species are very rare and 332 species are rare included in Mongolian Law on Natural Plants, 8 species are in CITES, 186 species are aquatic plants, 484 species are susceptibility to climate change, 418 species are alpine plants, 618 species are only distributed in one botanic-geographical region of Mongolia, 70 species are relict plants and 54 species are overused plants it comprises (Table 1). These species are near threatened and vulnerable as they have been identified as being in need of conservation status attention.

In the catalogue 178 species are listed in the IUCN Global Red List assessed, 427 species are listed under the IUCN Regional Red List (Asia and European) and 148 species are assessed of Mongolian Red List comprises (Table 2). Of these, 16 species are categorized as Critically Endangered, 39 species as Endangered and 55 species as Vulnerable (Nyambayar et al., 2011).

Discussion and Conclusion

This catalogue of rare and threatened species covers about 46,8 % of Mongolia’s total flora, we are at the starting point of understanding the threat status of Mongolian plants. Potentially at least about 1,000

Table 1

Statistics for the conservation groups to the vascular flora of Mongolia

Conservation groups	Families	Genera	Species	Percent of total	Data sources
Endemic plants	19	49	120	3.79	Urgamal & Oyuntsetseg (2017)
Sub-endemic plants	43	174	523	16.55	in this catalog
Very rare plants	56	108	133	4.20	Law of Natural plants (1995)
Rare plants	64	211	356	11.26	Law of Natural plants (1995)
Alien (Invasive) plants	23	48	51	1.61	Urgamal (2017)
Antrophilus plants	49	212	438	13.86	Tserenbaljid (2002)
Aquatic (Water) plants	40	83	186	5.88	in this catalog
Relict plants	23	36	70	2.21	Urgamal & Oyuntsetseg (2017)
Wilding crops	12	39	47	1.48	Urgamal et al. (2014)
Red Book	49	103	135	4.27	Mongolian Red Book (2013)
in II annex of CITES	2	6	8	0.25	CITES (2008)
Mongolian Red List (IUCN)	53	116	148	4.68	
Extinct (EX)	-	-	-	-	
Extinct in the Wild (EW)	-	-	-	-	
Regionally Extinct (RE)	-	-	-	-	
Critically Endangered (CR)	10	14	16	0.51	
Endangered (EN)	22	35	39	1.24	Nyambayar et al. (2011)
Vulnerable (VU)	27	50	55	1.74	
Near Threatened (NT)	15	21	23	0.72	
Least Concern (LC)	10	10	10	0.31	
Data Deficient (DD)	3	4	4	0.12	
Not Applicable (NA)	1	1	1	0.03	

Table 2

The number of Mongolian vascular plant taxa assessed in IUCN Red List category

IUCN Red List / categories	Total	EX	EW	RE	CR	EN	VU	NT	LC	DD	NA	NE
Global (IUCN 2017)	178	-	-	-	-	1	-	1	169	7	-	1294
Regional and National	427	12	-	-	50	74	124	66	79	11	11	1045
Asian countries	238	5	-	-	28	46	94	43	32	9	5	1234
European (2011, 2014)	189	7	-	-	32	28	30	23	47	2	6	1283
Mongolian (Nyambayar et al. 2011)	148	-	-	-	16	39	55	22	10	4	2	1324
total (double count)	753	12	0	0	66	114	179	89	258	22	13	719

species have been assessed, careful planning is needed to priorities next groups of plants. The conservation of this catalog are intended to highlight species of particular concern and to alert policy-makers, conservationists, and government and planning authorities of actions that will help to ensure that all rare and threatened vascular plants of Mongolia maintain viable species into the future. For these rare and threatened plants species, conservation action plans were also composed, defining the dominant threats and required conservation measures and evaluation in particular on Mongolian endemic, aquatic and alpine plant species according to Red Listing guidelines for IUCN in the future.

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