



FloraGREIF

More than a virtual herbarium

Greifswald's Digital Informationssystem on the Flora of Mongolia

Institute of Geography and Geology, Institute of Botany and Landscape Ecology
& Computer Centre, University of Greifswald



Lecture intension

- How to organize a floristic database to facilitate its use by vegetation databases?
 - Data parameters
 - Digital organization (data format, port, gateway, interface)
- Experiences on the digital use of floristic databases by digital vegetation data





FloraGREIF database

- Floristic data on two data level a) TAXON DATA
 - name & synonyms
 - morphological description
 - confuse with further species & advises
 - growth form
 - distribution within Mongolia, habitats
 - Red list status
- b) RECORD DATA
 - species records as herbar specimen data (leg, date, col-nu, det, rev, locality, habitats, herbarium collection...)
 - further species records (literature, vegetation relevés, other sources)
 - image data

FloraGREIF database

- INTERNAL RECORD POOL

- mirror of RECORD DATA for untested data (Quality Control!)

- external users, analyses

- easy data import to RECORD DATA

- Image Data

- habitats

- living species

- herbar sheets (BGBM Berlin, continuously zoom)

- macro scans of taxonomic relevant details

FloraGREIF database

- WebGis application

maps (SRTM, administrative division, vegetation zone, plant geographical regions, soil, hydrography, traffic)

→ distribution map, record map

→ record & distribution analyses

- Further Data

- geographical data (admin. division, geograph. regions, hydrography → lists)

- literature database

TAXON DATA

FloraGreif

Help Profile Data Input Label Printing Literature Homepage

Data Input Taxon Data Record Data Internal Record Pool Locality Listing Leg/Det Listing Index Herb. Listing Import - Export Listings

search by family search by genus Go!

please choose a family or a genus (Please note: all names according to Gubanov 1996)

Current

search by family search by genus search by species Go!

[Adoxa](#) enter new taxon data »

[Alism](#) Currently listed: Apiaceae (34 genus 66 species) acc. to Gubanov 1996

Alliaceae	+	int. comments	tax. comments	Genus	Species	Author	Subspecies	Auth. Subsp.	Synonym (Grubov 1982)		
Amaranthaceae				Aegopodium	alpestre	Ledeb.				edit	delete
Apiaceae				Angelica	czernaevia	(Fisch. et Mey.) Kitag.				edit	delete
Apocynaceae				Angelica	dahurica	(Fisch. ex Hoffm.) Benth. et Hook. fil. ex Franch.				edit	delete
Araceae				Angelica	decurrens	(Ledeb.) B. Fedtsch.			(Ldb.) B. Fedtsch.	edit	delete
Asclepiadaceae				Angelica	sylvestris	L.				edit	delete
Asparagaceae				Angelica	tenuifolia	(Pall. ex Spreng.) Pimenov				edit	delete
Aspidiaceae											

Fertig

TAXON DATA

family	genus	species	author
Polygonaceae	Atraphaxis	spinosa	L.
subfamily	tribe	subspecies	author subspecies
+ <input type="checkbox"/> new in Cubanov (1996)			
distribution (1, ..., 16)		status ---> firstly described from geogr. region	
3,5,6,7,9,10,11,12,13,14,15,16		--	
distribution khangay			
<input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input checked="" type="checkbox"/> VI			
habitat accord. to Grubov (2001)			
Sandy steppes, slopes and bottom of dry riverbeds, pebbles, debris slopes of mountains and hills.			
growth form acc. to Flora of China (1994-) and Grubov (2001)			
Shrubs			
status acc. to Red Data Book (1997)			
rare			
confuse with			
Atraphaxis compacta Ledeb.			
comments			
Leaves of A. compacta are fascicled.			
Polymorph species in terms of growth form, color (tinct), leave size and form, leave color, size of tepals during fructification state. By short growth, A. spinosa is similarly to A. compacta Ledeb. (Rechinger & Schiman-Czeika 1968: 32).			

RECORD DATA

search by family search by genus

Listing all records for family: **Ephedraceae**

[enter new record: Ephedraceae](#)

remarks	record	leg	colno or date			
	Ephedra glauca	E. Jäger	05.07.2004	edit	rename	delete
	Ephedra intermedia	E. Jäger	E233	edit	rename	delete
	Ephedra intermedia	E. Jäger	10.07.2004	edit	rename	delete
	Ephedra intermedia	E. Jäger	10.07.2004	edit	rename	delete
	Ephedra przewalskii	E. Jäger	E233	edit	rename	delete
	Ephedra przewalskii	E. Jäger	E331 bei Aufn. 180	edit	rename	delete
	Ephedra sinica	W. Hilbig	06.07.1985	edit	rename	delete

RECORD DATA

locality

select **country**, **province** (= aimak), **district** (= sum): (province and district acc. to FloraGREIF project map:
XOO)

Mongolia Khovd Myangad

Choose **region** according to province (click on the region in the list to transfer it to the textfield above)

load current list

geogr. region acc. to Akademiya Nauk SSSR & Akademiya Nauk MNR (1990)

Great Lake Basin

geogr. data acc. to herbar label

additional locality description

on the eastern road next to lake Khar-Us-Nuur from Bayankhoshuu (Myangad sum) to Seer
(Dörgön sum) near the big owoo monument. Around 22 km distant from sum centre
Bayankhoshuu and 2-3 km to lake Khar-Us-Nuur.

next important location

name dir dist

coordinates

type Geogr. Coord. lon (E) 92,166724 lat (N) 48,311039 ref WGS 84 unit

GPS 571 prec

altitude

approx. 1176 (m asl) alt. (lower) alt. (upper) exp inc

habitat

habitat

sandy northern shrub desert steppe accord. to Zemirich (2005)

FloraGREIF

Help Profile **Data Input** Label Printing Literature Homepage

Data Input Taxon Data Record Data **Internal Record Pool** Locality Listing Leg/Det Listing Index Herb. Listing Import - Export Listings

get all records where

family genus

collector collection number Go!

Please choose a family or a genus (Numbers refer to given records per family/genus/species)

enter new record

There are 3375 records listed in: 918 species.

family
<u>not identified</u>
Adoxaceae (3 records for 2 species)
Alismataceae (2 records for 2 species)
Alliaceae (89 records for 23 species)
Amaranthaceae
Apiaceae (35 records for 18 species)
Apocynaceae
Araceae (1 record for 1 species)

RECORD related images

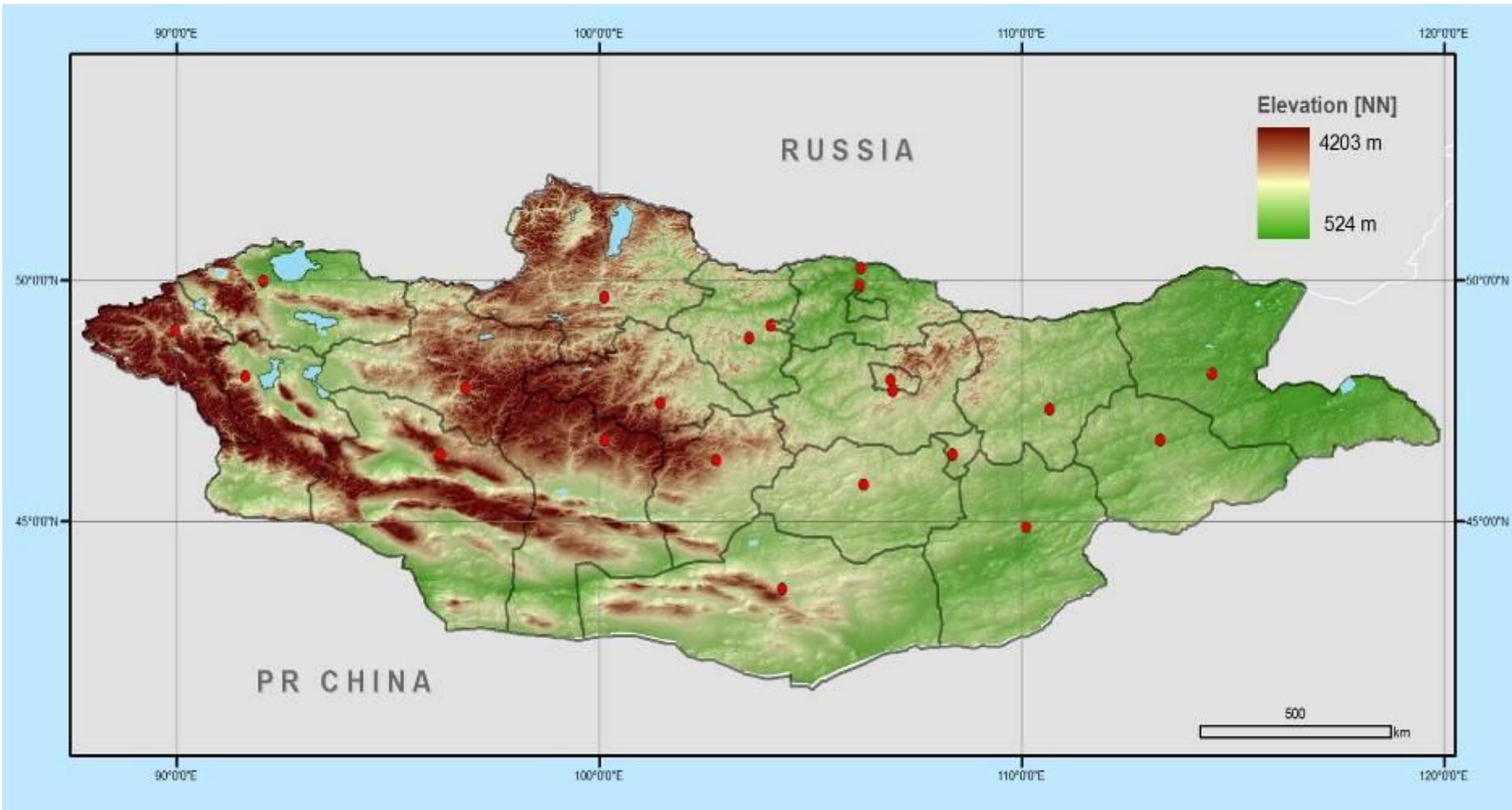
Calligonum mongolicum Turcz. (Polygonaceae) date: 07.12.07



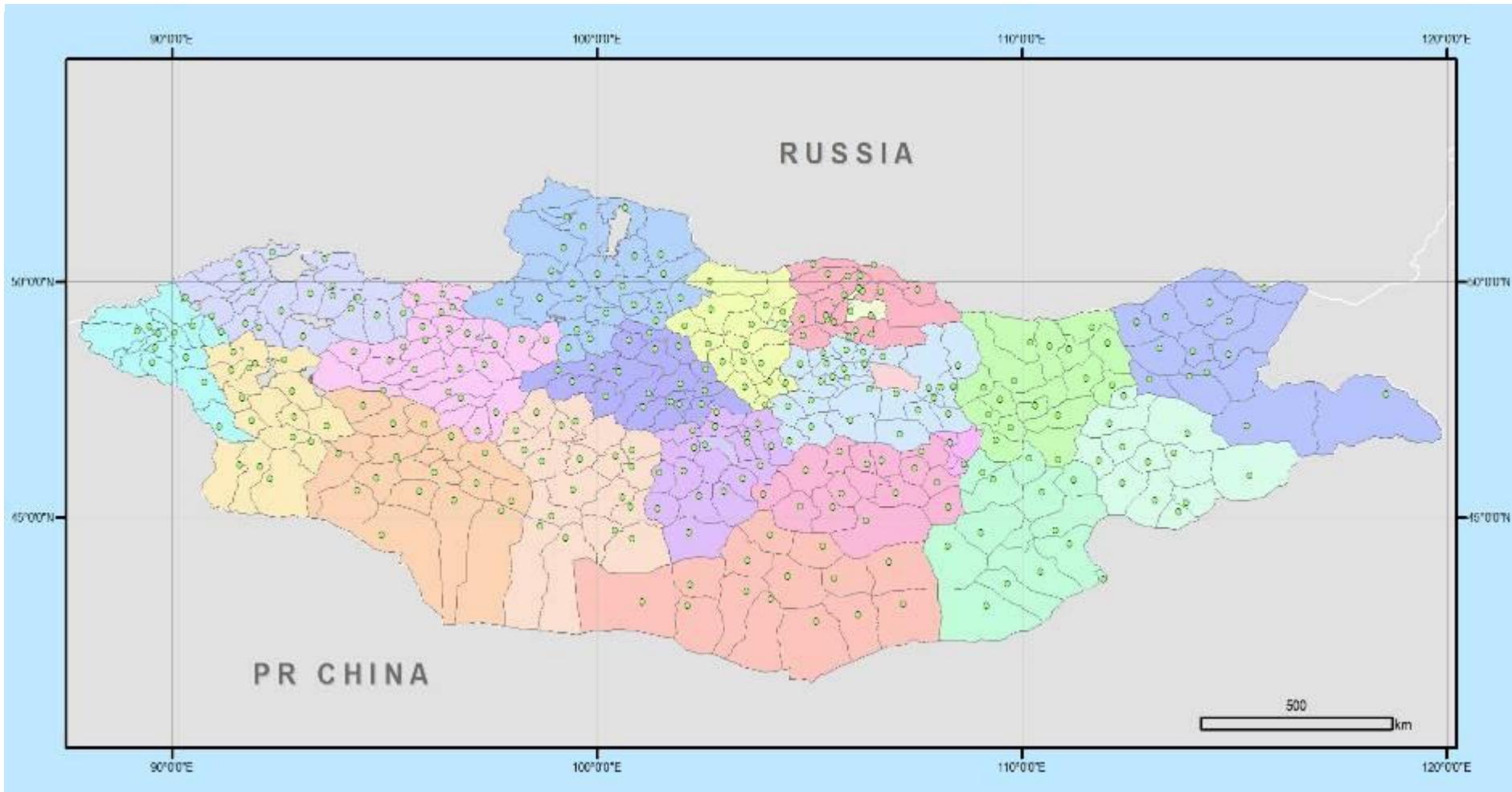
RECORD related images: **habitats,**
habitus,
details



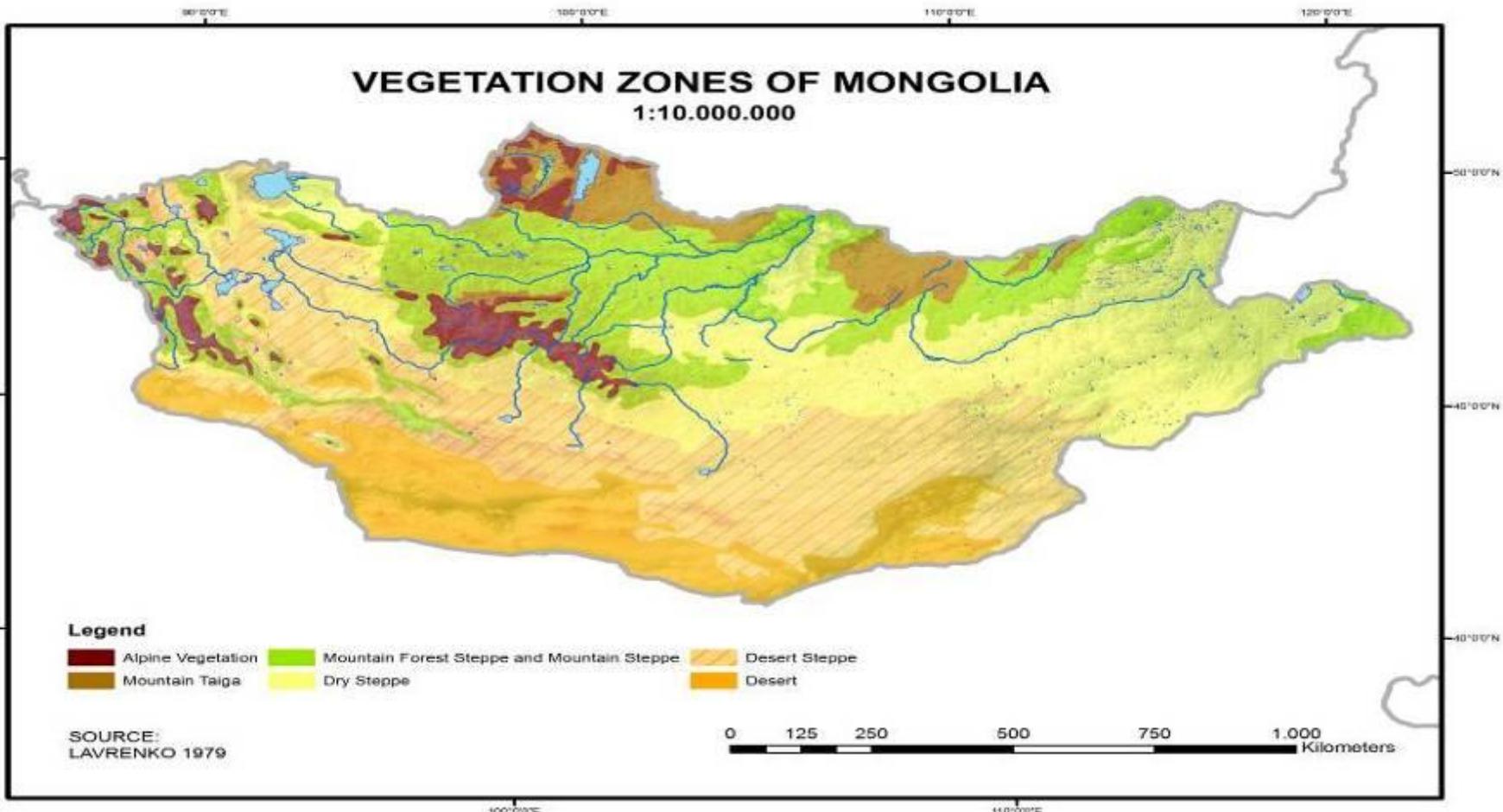
Maps



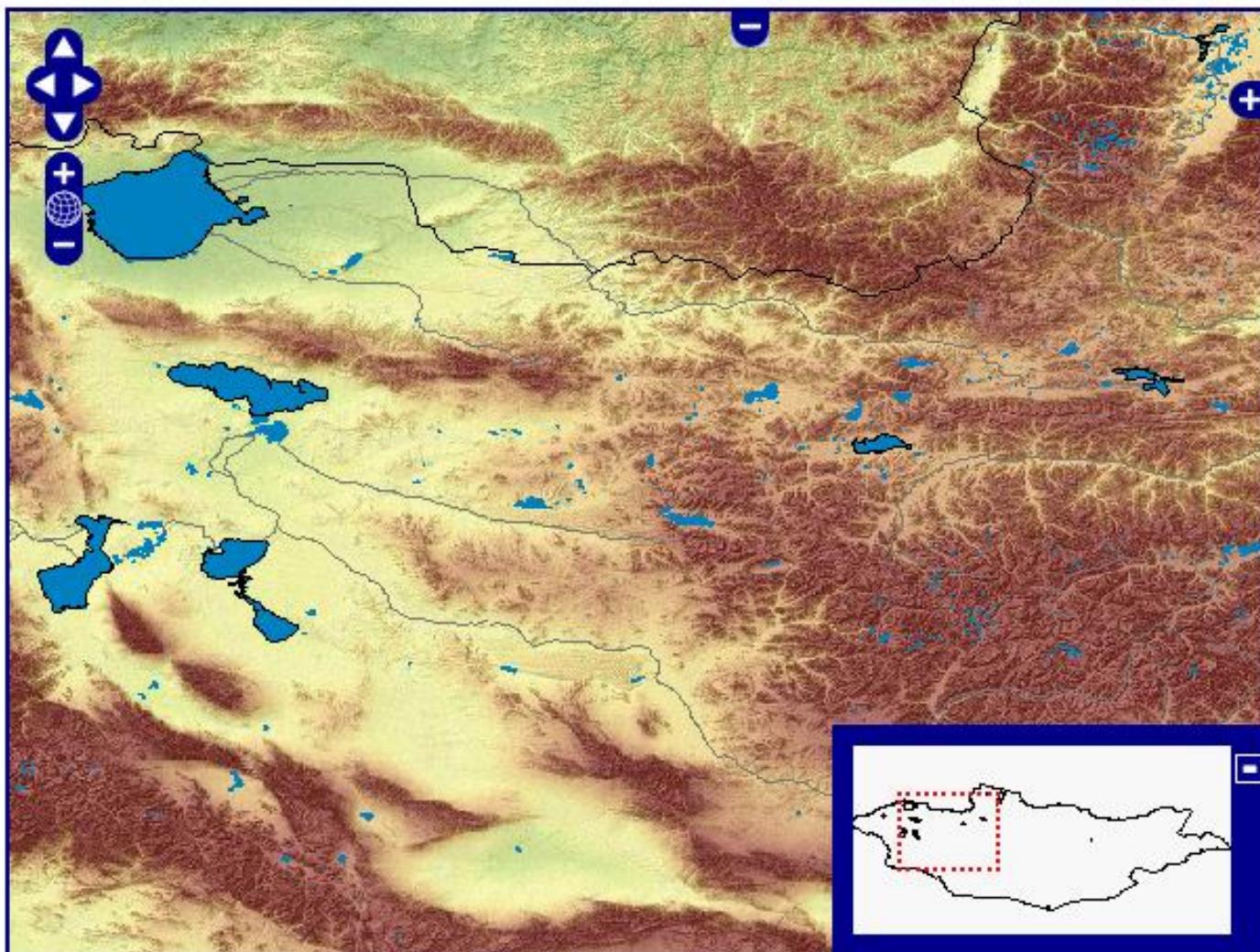
Maps



Maps



WebGis Application



Klicken Sie ein Feld in der Karte an.

Show coordinates on map

Geographical Data

FloraGreif

Help Profile **Data Input** Label Printing Literature Homepage

Data Input Taxon Data Record Data Internal Record Pool **Locality Listing** Leg/Det Listing Index Herb. Listing Import - Export Listings

Mongolia Bayan-Ölgiy

Enter new province

Enter new region...

	Region	Remarks	
	Achit-Nuur	lake	edit
- province unknown	Buche-Myren	river	edit
Arkhangay	Bulgan-Gol	river	edit
Autonomous mur	Burgedtey-Khayrkhan-Uul	mountain	edit
Ömnögov	Buyant-Gol	river	edit
Övörhangay	Chigirtey-Gol	river	edit
Bayan-Ölgiy	Dayan-Nuur	lake	edit
Bayankhongor	Ikh-Turgen-Uul	mountain	edit
Bulgan	Tolbo	Tolbo	edit
	Tsengel	Khöshööt	edit

Search Engine

Home	Search Plants	Project & Schedule	Methods & Standards	Team	Links
FloraGREIF					
targeted search get an overview		Brassicaceae <u>58 genus 135 species</u>			
		Butomaceae <u>1 genus 2 species</u>			
		Callitrichaceae <u>1 genus 2 species</u>			
		Campanulaceae <u>4 genus 16 species</u>			
		Cannabaceae <u>1 genus 1 species</u>			
		Capparidaceae <u>1 genus 1 species</u>			
		Caprifoliaceae <u>4 genus 11 species</u>			
		Caryophyllaceae <u>22 genus 83 species</u>			
		Celastraceae <u>1 genus 1 species</u>			
		Ceratophyllaceae <u>1 genus 1 species</u>			
		Chenopodiaceae <u>25 genus 90 species</u> <u>612 records in 64 species</u>		 	
		Convallariaceae <u>3 genus 7 species</u>			
		Convolvulaceae <u>3 genus 11 species</u>			
		Cornaceae <u>1 genus 1 species</u>			
		Crassulaceae <u>5 genus 17 species</u>			



Search Engine

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FloraGREIF

targeted search
get an overview

Need help?

images for family **Chenopodiaceae** genus **Atriplex** species **all**

Atriplex cana C. A. Mey.	herbar scan	comments: two branches with last fruits
Atriplex fera (L.) Bunge	herbar scan	comments: fruits completely connate
Atriplex fera (L.) Bunge	herbar scan	comments: young flowering plant
Atriplex laevis C. A. Mey.	herbar scan	comments: two young flowering plants
Atriplex laevis C. A. Mey.	herbar scan	comments: one smaller flowering and one fruiting plant; fruiting bracts completely free
Atriplex sibirica L.	herbar scan	
Atriplex sibirica L.	herbar scan	
Atriplex tatarica L.	photo	photo made by: Martin Schnittler; comments: fruits with spiny appendages, typical of A. sibirica
Atriplex tatarica L.	photo	photo made by: Martin Schnittler; comments: fruits with spiny appendages, typical of A. sibirica
Atriplex tatarica L.	herbar scan	

Search Engine

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targeted search
get an overview

Need help?

Chenopodiaceae Atriplex fera (L.) Bunge (View Taxon Information)

leg: K. Pistrick et Ch. Sanchir, 2.8.1987, 106

det: Sanchir, Ch., 1978/88

teste: Rilke, Sabrina , 17.9.08

Herbar sheet

Index.Herb. GAT, Institut für Pflanzengenetik und Kulturpflanzenforschung
Corrensstr. 3 in 06466 Gatersleben

Acc. No. 6099

herbar scan



[view](#)

Locality

country: Mongolia , province of Sükhbaatar , Sükhbaatar district

region as written Solonchaksenke mit Wüstenvegetation zw. d. Steinkohlegrube
on label: Talbulag und dem Aimakzentrum Baruun-urt

Habitat

habitat as Solonchaksenke mit Wüstenvegetation
written on label:

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Need help?

name: **Chenopodiaceae Atriplex fera (L.) Bunge** (acc. to Gubanov)

description: leaves oblong-ovate to ovate lanceolate, entire; flowers in glomerules in leaf axils and end of spicate; fruiting bracts entirely connate, 2-6 mm long, highly convex, ovate, glabrous or infrequent with few appendages in middle portion

confuse with: A. laevis C.A.Mey.

comments: plants with spiny appendages on fruits are described as var. cornuta Hand.-Mazz. (see ** & Schnittler 2463)

habitat: Moist clayey and puffy solonchaks, saline bottom and coasts of intermittent lakes, subsaline chee-grass communities, alkaline steppe depressions. (acc. to Grubov 2001)

growthform: herbs annual (acc. to flora of china (1994 -) and grubov (2001))

herbar:  [5 records](#)

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targeted search

get an overview

Need help?

What are looking for?

Enter the taxon name:

family

Chenopodiaceae (612 rec) *

genus

Atriplex (42 rec) *

species

—

[taxon](#)

[record](#)

[image](#)

Enter additional information and refine your search:

[Taxon Information](#) [Herbar Records](#) [Images](#)

distribution:

[Choose distribution](#)

distribution khangay: I II III IV V VI

habitat:

[Choose habitat](#)

[advanced search](#)



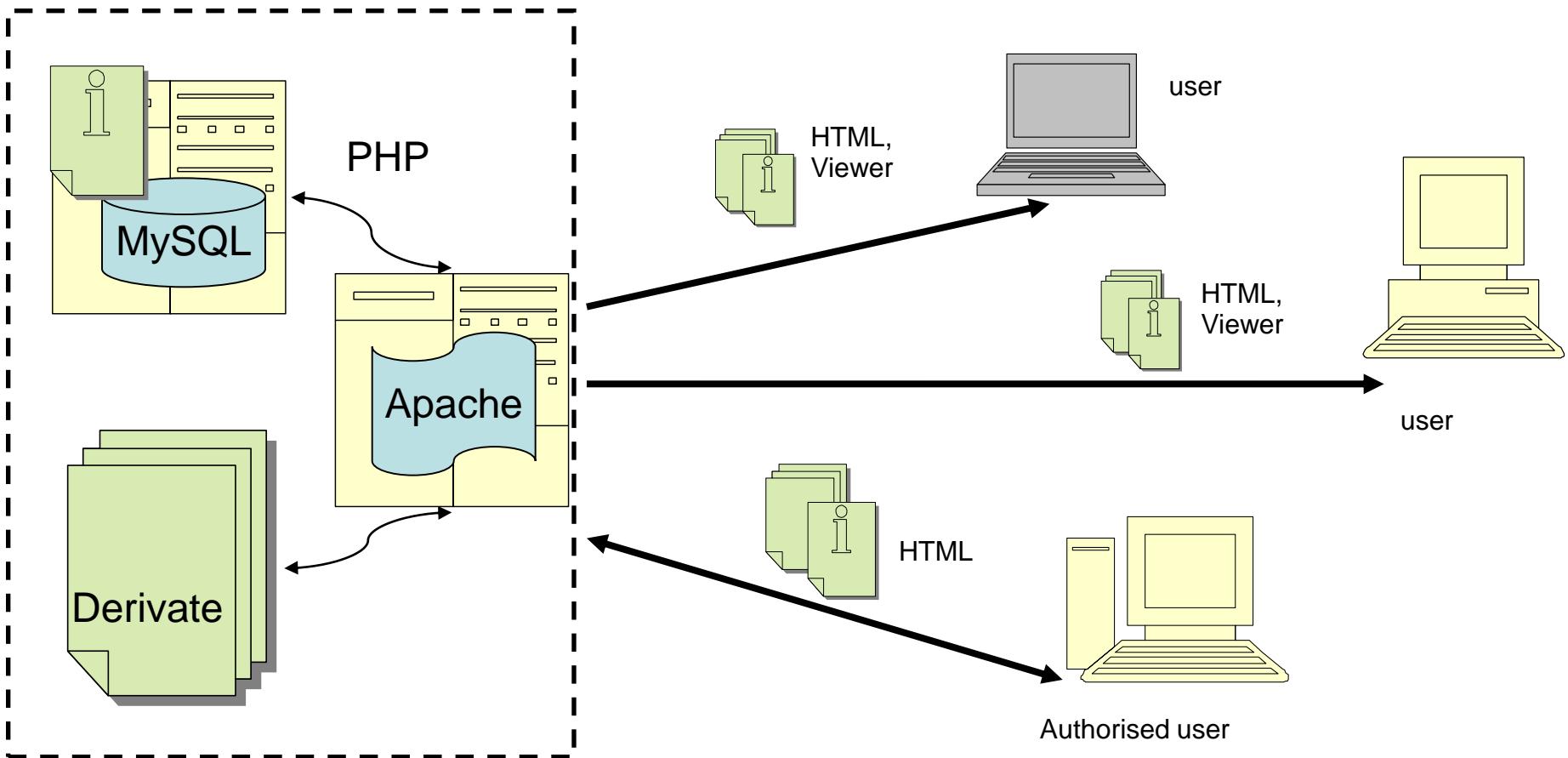
Analysis by WebGis Application



Prerequisites

- CMS GREIF
 - project „Digitales Archiv zur Schwedischen Landesaufnahme von Vorpommern 1692 – 1709“, funded by DFG from 11/2004 till 11/2006
 - <http://greif.uni-greifswald.de/geogreif>
- specifications
 - Apache web server
 - MySQL, Option: Oracle
 - data access via PHP
 - html templates

CMS GREIF



Implementation

- Extend CMS GREIF to FloraGREIF
 - Add subject-specific components: taxon, record, image data
 - Search engine → choose an adequate viewer (file size of ca. 200 MB)
 - Integrate WebGIS functionality

Lecture intension

- How to organize a floristic database to facilitate its use by vegetation database?
 - export of all / compiled data
 - standard list format (txt, csv, xml, xls)
 - Further advises ???
- Further experiences on the digital use of floristic databases by digital vegetation data?

A close-up photograph of a plant stem, likely a legume, showing several young, green, pointed seed pods or flower structures. The surface of the stem and these structures is covered in a dense, light-colored, fuzzy hair-like texture. Some reddish-brown, more rigid hairs are also visible.

Thank you very much for your attention!

<http://floragreif.uni-greifswald.de>

Aims & Applications

- Infrastructure of a virtual flora
- Plant species determination
- Generate knowledge
- Information pool
- Visualises information
- Analysis tool

Cooperation with

- Chair of General and Special Botany, Institute for Botany and Landscape Ecology, University of Greifswald (M. Schnittler)
- Computer centre, University of Greifswald (J. Formella)
- Botanical Garden and Botanical Museum Berlin-Dahlem (international GBIF network)
- Herbaria of Halle, Gatersleben and Jena
- Institute of Biology, Geobotany and Botanical Garden, University of Halle
- Institute of Geography, University of Hamburg
- Institute of Botany Ulaanbaatar, Academy of Science of Mongolia
- State University of Khovd, Western Mongolia