

## of the Eurasian Dry Grassland Group

*Dear members of the Eurasian Dry Grassland Group,*

*We are pleased to present to you the new issue of the EDGG Bulletin, now with a new version of our logo in the upper left corner, which integrates our motto "Grassland research and conservation". The main items in this Bulletin are the invitation to the next EDGG Field Workshop in Serbia, a scientific paper on Italian grasslands, a book review and information about forthcoming events. We intend to have scientific papers of all types (Research Papers, Forum Papers, Reviews or Reports) regularly in the central part of the Bulletins. We believe that this is an attractive way for our members to publish open access and highly visible articles of interest to other researchers, but based on too small or too local data than would be required for a peer-reviewed international journal. The articles in the Bulletin are non-peer-reviewed but linguistically edited free of charge by the EDGG. While all submissions are welcome, we particularly encourage those dealing with currently underrepresented topics from our scope, e.g. animals and non-vascular plants, Asia and North Africa, or wet, mesic, saline and alpine grasslands.*

*As 2015 draws to a close, we invite you to recall the brightest, most pleasant and funniest moments of events related to the activities of our group in the compilation of photos kindly provided by our members. Finally, we continue our section "EDGG songs" and wish our readers a happy Christmas and New Year with the traditional Ukrainian New-Year's song "Shchedryk."*

*Anna Kuzemko, with Monika Janisova, Idoia Biurrun & the Editorial Board*

### Content

Eurasian Dry Grassland Group.....	2
9th EDGG Field Workshop .....	3
Wiesner L., Baumann E., Weiser F. , Beierkuhnlein C., Jentsch A. & Dengler J. Scale-dependent species diversity in two contrasting dry grassland types of an inner alpine dry valley (Cogne, Aosta Valley, Italy) .....	11
Book review.....	18
Forum.....	19
Forthcoming events.....	21
EDGG in 2015.....	22
EDGG songs.....	27

*Left: Artemisia hololeuca, the species from IUCN Red List, National Nature Park "Dvurechansky" Khar'kov Region, Ukraine Photo: Anna Kuzemko*

**December 2015**

<http://www.edgg.org>

# Eurasian Dry Grassland Group

The **Eurasian Dry Grassland Group (EDGG)** is a network of researchers and conservationists interested in Palearctic natural and semi-natural grasslands. It is an official subgroup of IAVS (<http://www.iavs.org>) but one can join our group without being IAVS member. We live from the activities of our members. Everybody can join EDGG without any fee or other obligation.

## The basic aims of the EDGG are:

- ♠ to compile and to distribute information on research and conservation in natural and semi-natural grasslands beyond national borders;
- ♠ to stimulate active cooperation among grassland scientists (exchanging data, common data standards, joint projects).

To achieve its aims, EDGG provides seven instruments for the information exchange among grassland researchers and conservationists:

- ♠ the **Bulletin of the EDGG** (published quarterly);
- ♠ the **EDGG homepage** ([www.edgg.org](http://www.edgg.org));
- ♠ e-mails via our **mailing list** on urgent issues;
- ♠ the **Europasian Dry Grassland Conference** - organized annually at different locations throughout Europe;
- ♠ **EDGG research expeditions and field workshops** to sample baseline data of underrepresented regions of Europe;
- ♠ **EDGG vegetation databases**;
- ♠ **Special Features** on dry grassland-related topics in various peer-reviewed journals.

**The EDGG covers all aspects related to dry grasslands, in particular:** plants — animals — fungi — microbia — soils — taxonomy — phylogeography — ecophysiology — population biology — species' interactions — vegetation ecology — syntaxonomy — landscape ecology — biodiversity — land use history — agriculture — nature conservation — restoration — environmental legislation — environmental education.

Anyone can join the EDGG without any fee or other obligation. To become a member of the Eurasian Dry Grassland Group or its subordinate units, please, send an e-mail to Idoia Biurrun, including your name and complete address, and specify any of the groups you wish to join. More detailed information can be found at: [http://www.edgg.org/about\\_us.htm](http://www.edgg.org/about_us.htm).

As of 23 December 2015 the EDGG had 1127 members from 64 countries all over the world. While we are well-represented in most European countries, few European countries are still not or hardly covered by members. Moreover, the extra-European part of the Palearctic realm (which according to our Bylaws is the geographic scope of EDGG!) is still grossly underrepresented.

## EDGG Subgroups

**Regional Subgroup** of the region in which they reside. If you additionally wish to join the **Topical Subgroup Grassland Conservation and Restoration** just send an e-mail to the Membership Administrator

([idoia.biurrun@ehu.es](mailto:idoia.biurrun@ehu.es) or [Stephen.Venn@Helsinki.Fi](mailto:Stephen.Venn@Helsinki.Fi)).

**Arbeitsgruppe Trockenrasen** (Germany) (contact: Thomas Becker - [beckerth@uni-trier.de](mailto:beckerth@uni-trier.de)), Ute Jandt—[jandt@botanik.uni-halle.de](mailto:jandt@botanik.uni-halle.de) : 238 members

**Working Group on Dry Grasslands in the Nordic and Baltic Region** (contact: Jürgen Dengler - [juergen.dengler@uni-bayreuth.de](mailto:juergen.dengler@uni-bayreuth.de)): 92 members

**South-East European Dry Grasslands (SEEDGG)** (contact: Iva Apostolova - [iva@bio.bas.bg](mailto:iva@bio.bas.bg)): 277 members

**Mediterranean Dry Grasslands (Med-DG)** (contact: Michael Vrahnakis - [mvrahnak@teilar.gr](mailto:mvrahnak@teilar.gr)): 308 members

**Topical Subgroup Grassland Conservation and Restoration** (contact: Péter Török—[molinia@gmail.com](mailto:molinia@gmail.com)): 70 members

## EDGG Executive Committee and responsibilities of its members

**Didem Ambarlı:** Editor-in-Chief of homepage, Deputy Conferences Coordinator, [didem.ambarli@gmail.com](mailto:didem.ambarli@gmail.com)

**Idoia Biurrun:** Membership Administrator, Deputy Editor-in-Chief of Bulletin, Deputy Field Workshop Coordinator, Deputy IAVS Representative [idoia.biurrun@ehu.es](mailto:idoia.biurrun@ehu.es)

**Jürgen Dengler:** Coordinator for Special Features; Field Workshop Coordinator, [juergen.dengler@uni-bayreuth.de](mailto:juergen.dengler@uni-bayreuth.de)

**Monika Janišová:** Deputy Editor-in-Chief of the EDGG Bulletin; [monika.janisova@gmail.com](mailto:monika.janisova@gmail.com)

**Anna Kuzemko:** Editor-in-Chief of Bulletin, Book Review Editor, Facebook Group Administrator, Deputy Editor-in-Chief of homepage, [anya\\_meadow@i.ua](mailto:anya_meadow@i.ua)

**Péter Török:** IAVS Representative, Contact Officer to other organisations, Deputy Coordinator of Species Features, Deputy Secretary-General, Deputy Book Review Editor, [molinia@gmail.com](mailto:molinia@gmail.com)

**Stephen Venn:** Secretary-General, Deputy Membership Administrator, Deputy Policy Officer, Deputy Facebook Group Administrator, [Stephen.Venn@Helsinki.Fi](mailto:Stephen.Venn@Helsinki.Fi)

**Michael Vrahnakis:** Conferences Coordinator, Policy Officer, Deputy Contact Officer to other organizations, [mvrahnak@teilar.gr](mailto:mvrahnak@teilar.gr)



# 9th EDGG Field Workshop

## *Biodiversity patterns of dry grasslands at the meeting point of Central Europe and the Balkans*

Serbia, 2–9 July 2016

### *Invitation*

#### **Introduction**

EDGG Research Expeditions have been carried out since 2009, when the first one was conducted in Transylvania, Romania (Dengler et al. 2009, 2012a). The 2nd expedition 2010 went to Central Podolia, Ukraine (see Bulletin 8: 15–16), the 3rd 2011 to the Western Bulgarian Mts. (see Bulletin 12: 10–14). In 2012, there were two such expeditions, one to Sicily, Italy (Guarino et al. 2012), and one to Northern Greece (see Bulletin 16: 18–20). In 2013 the expedition reached Central Asia, in the foreland of the Altai mountains (Janišová et al. 2013). In 2014 and 2015, already under then new name „Field Workshop“, the expeditions took place in Navarre (northern Spain) (Biurrun et al. 2014) and Poland (see Bulletin 24/25: 26–34). The aims of these international expeditions are to sample high-quality data on species composition and diversity of dry grasslands and related communities in understudied regions of the Palaearctic, to use these data for joint publications in international journals, and to exchange knowledge (species determination, field sampling, analytical methods) among participants with different background.

The basic idea to use the data from the EDGG Field Workshops to produce high-quality publications is developing well. Two ISI papers from the first expedition have already been published (Dengler et al. 2012a, Turtureanu et al. 2014) as well as one on the second (Kuzemko et al. 2014) and third (Pedashenko et al. 2013) each; several other papers from various expeditions are in preparation or under review. Some of the plots sampled during the EDGG Research Expedition in Transylvania carry the world records of vascular plant species richness, published very prominently by Wilson et al. (2012).

After having carried out the EDGG Research Expeditions in various places of East, Southeast and South Europe, Central Asia and Iberian Peninsula, we will have the next Field Workshop in Serbia.

#### **Philosophy of the EDGG Field Workshops**

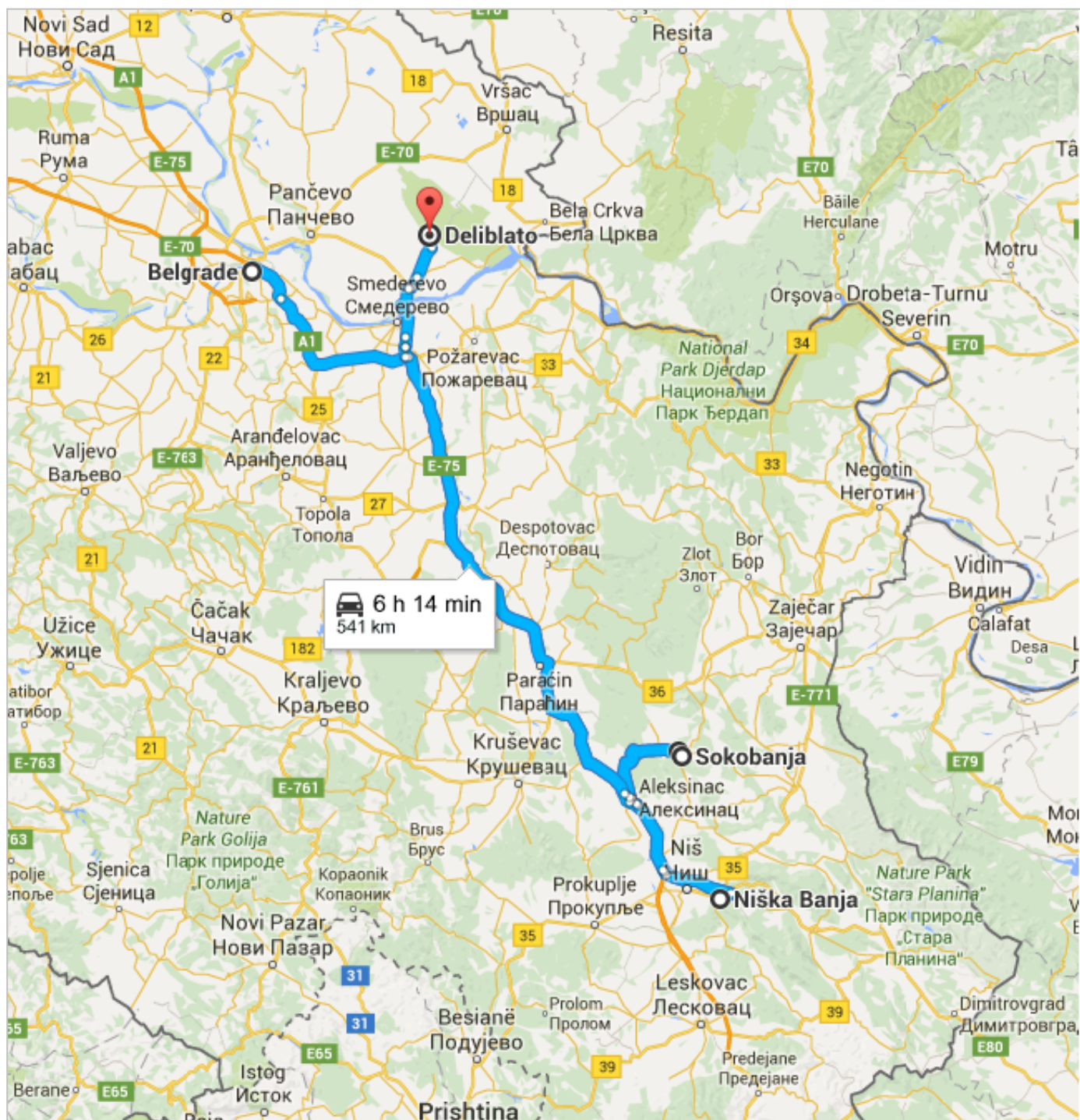
The general philosophy of the EDGG Field Workshops is similar to that of summer schools and workshops held by other scientific organizations. However, while summer schools are normally restricted to M.Sc. and or Ph.D. students, EDGG Field Workshops are open to EDGG members at any academic level who either want to deepen their methodological knowledge or contribute to an advancement of methodological approaches by discussion with other colleagues interested in similar topics. Particularly welcome are PhD students and young Postdocs

who plan to do field sampling of grassland vegetation and wish to discuss their sampling ideas before they start.

The EDGG Field Workshops are very intensive events of typically 7–12 days duration, restricted to a small group of highly motivated participants. They contain a mixture of oral presentations, methodological discussions, and joint field sampling with advanced sampling methods. The core aims of the EDGG Field Workshops are knowledge exchange and capacity building among scientists from various countries regarding planning of observational studies on biodiversity patterns, species determination, field/statistical techniques, vegetation classification approaches and scientific writing. There are three types of oral presentations: (1) key note lectures by the Workshop organizers on the study area and on sampling methodology; (2) presentations by participants about results from similar studies (10 min presentation + 5 min discussion); (3) presentations about concepts/methods of emerging studies (e.g. PhD projects) at early stages (10 min presentation + 15 min discussion). Presentations of methodological approaches in the field are also welcome.

The field data collected will subsequently be used for joint publications by the participants, which will be planned during the Field Workshop. Later they will be added to publically accessible vegetation-plot databases (Database Species-Area Relationships in Palaearctic Grasslands; GIVD ID EU-00-003; Dengler et al. 2012b; Balkan Dry Grassland Database; GIVD ID EU-00-013; Vassilev et al. 2012; GIVD ID EU-RS-002 Vegetation Database Grassland Vegetation of Serbia; Aćić et al. 2012). The sampling design is the same as that of the seven former EDGG Research Expeditions/Field Workshops (and several other studies) to allow large-scale comparisons. Its core points have been proposed by Dengler (2009). We use on the one hand intensive nested-plot sampling covering plot sizes of 0.0001, 0.001, 0.01, 0.1, 1, 10 and 100 m<sup>2</sup> and on the other hand supplementary 10-m<sup>2</sup> plots (for details, see Dengler et al. 2012a). In both cases, all terricolous vascular plants, bryophytes and lichens are recorded, and for the 10-m<sup>2</sup> (sub-) plots also percentage cover of species and environmental data (slope, aspect, microrelief, soil depth), a mixed soil sample to be analysed in the lab and biomass samples.

Suggestions from participants regarding additional data collection and fieldwork that could be incorporated into the workshop programme are welcome and can be discussed with the organizers (such as trait measurements) or sample further taxa on the same plots (e.g. snails, grasshoppers, etc.).



*Preliminary route map of 9<sup>th</sup> EDGG Field Workshop in Serbia.*

## 9th EDGG Field Workshop to Serbia

The 9th EDGG Field Workshop will take place in Serbia from 2nd to 9th July 2016. This event is organised by Zora Dajić Stevanović (University of Belgrade, Faculty of Agriculture) and Mirjana Krstivojević Ćuk (University of Novi Sad, Faculty of Sciences, Biology and Ecology Department) in cooperation with Jürgen Dengler (EDGG Executive Committee, University of Bayreuth & German Centre for Integrative Biodiversity Research) and Idoia Biurrun (University of the Basque Country). There are 12 places for EDGG members to join this expedition (in addition to the five organisers). Participants from any country and any academic level (BSc student to professor)

are welcome. In order to ease the subsequent analytical work, we particularly appreciate the participation of people experienced in any of the following fields: good knowledge in bryophytes/lichens/critical vascular plants; experience in high-quality field sampling or advanced analytical methods of biodiversity patterns.

Currently costs are approximately 350-400 €, including transport, meals and accommodation from arrival in Belgrade until departure from Belgrade. This price is to be considered the possible maximum, while the organisers will apply for general project funding that can reduce the per-capita costs significantly. The exact price will be communicated later to those who pre-registered to the workshop. Moreover, it is possible to apply for financial support for participation (travel grants, see below).



## Preliminary schedule

Day 1 (02. July): Arrival to Belgrade, meeting at Faculty of Agriculture, in the afternoon transfer to Soko Banja, accomodation in the hotel.

Day 2 (03. July): Visit to mountain Rtanj and field research, return to Soko Banja

Day 3 (04. July): Visit to mountain Ozren and field research, return to Soko Banja

Day 4 (05. July): Leaving Soko Banja, visit to Sićevačka klisura and field research, accomodation at Niška banja

Day 5 (06. July): Visit to Suva Planina and field research, return to Niška Banja.

Day 6 (07. July): Leaving Niška Banja transfer to Deliblatska Peščara, accomodation in Vojvodina šume facilities, in the afternoon field research

Day 7 (08. July): Field research in Deliblatska peščara, in the afternoon leaving for Belgrade and accomodating in the Hotel

Day 8 (09. July): End of meeting and transfer to the Airport

## How to register

If you are interested in participating and want to be informed about further details (e.g. the exact price) you can preregister via e-mail to both of the following persons:

Zora Dajić Stevanović (dajic@agrif.bg.ac.rs)

Jürgen Dengler (juergen.dengler@uni-bayreuth.de)

Formal applications to participate should be sent **not later than 28 February 2016** to the same two persons (this applies also to all your subsequent e-mails):

Please give as subject of your e-mail “EDGG Field Workshop 2016” and provide your gender, name, surname, affiliation, address, e-mail, academic degree/position and age. For persons participating for the first time in an EDGG Field Workshop, we need a short statement of interest and competences (approx. 10 lines), in which you should explain why you wish to participate in the Workshop, what you would contribute to its success (including any subsequent publications, e.g. knowledge of Central European/Balkan flora, of bryophyte and lichens or of analytical methods or additional ideas for field sampling) and what you would like to gain from your participation. Please also indicate in your application if you have special dietary requirements.

If you wish to give an oral presentation, please attach, in a separate Word document, a half-page abstract and indicate whether this presentation belongs to category 1, 2 or 3 (see details above).

If there are more applications for participation than available places, the organizers will make a selection based on the information provided by you. Notification of acceptance (or otherwise) will be sent by approx. 15 April 2016.

## Application for IAVS travel grants

With your application to participate, you can also apply for IAVS travel grants that can cover part of your workshop fee and/or travel costs. Application for IAVS travel grants is possibly **until 28 February 2016** and only if you are an IAVS member in 2016 (for many countries free or reduced

membership is available, see <http://www.iavs.org/AwardsFinancial.aspx>) and give a presentation during the Field Workshop.

To apply for travel grants, please send us a Word document that is labelled „Application for IAVS travel grant“ that in addition to the information required for all participants contains/repeats the following items:

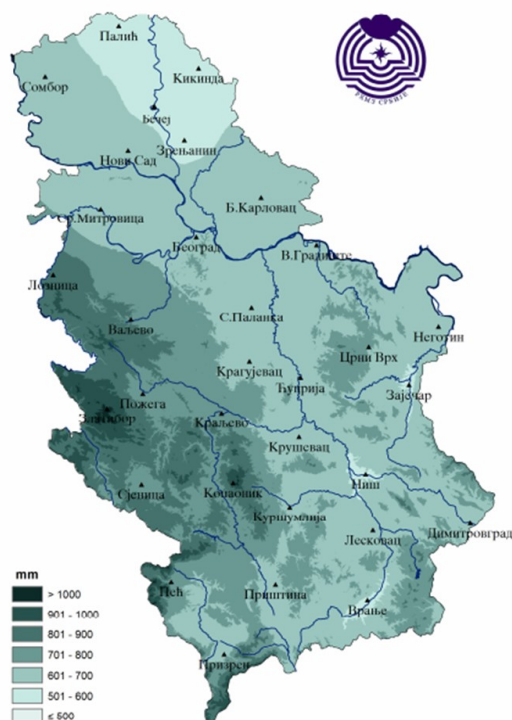
- your name
- title and type of your presentation
- specification that you are IAVS member in 2016;
- estimated costs of travel to and from Belgrade;
- information whether you receive other funding;
- whether your participation is only possible with financial support;
- whether you are also applying for financial support to attend the European Dry Grassland Conference in Sigishoara 2016, the EVS workshop in Rome 2016 or the IAVS Symposium in Brazil 2016 (you can normally receive financial support for only one of these meetings and therefore have to indicate your preference).

The decision on travel grants and the amount of money awarded to each of the scholars will be made by the EDGG Executive Committee in consultation with the IAVS Global Sponsorship Committee. Applicants will be notified about the decision until approx. 15 April 2016.

## The study area

Grasslands in Serbia occupy about 1.4 million hectares, distributed within a wide altitudinal range from lowland areas to the highest alpine zone. Semi natural grasslands (hay meadows and pastures) in Serbia are recognised for their high species diversity and significant conservation value (Lakušić & Saboljjević 2005, Dajić Stevanović et al. 2010, Tomović et al. 2014). However, many grassland communities are at present threatened by rapid changes in agricultural practices, especially related to the effects of either land abandonment or eutrophication (Dajić Stevanović et al. 2010). Phytocoenological studies of the vegetation of Serbia have a long tradition and vegetation investigation of grassland biodiversity in Serbia has been conducted using the Braun-Blanquet methodological approach, resulting in many publications on flora and vegetation of various geographic areas of the country (reviewed by Kojić et al. 1998, 2004). On the basis of these reviews, dry grasslands in Serbia have been classified within the classes *Festuco-Brometea* and *Festucetea vaginatae*. Recent phytocoenological study of dry grassland vegetation in Serbia was published in Aćić et al. (2015).

Serbia is located in the north-central part of the Balkan Peninsula and covers an area of 88,361 km<sup>2</sup>. The northern part of Serbia (Vojvodina) includes the south-eastern part of the Pannonian plain, where broad alluvial lowlands and adjacent loess plateaus extend along the rivers Danube, Tisa, Sava, Begej and Tamiš. Southern Serbia ends with the long, almost meridionally extending massif of Mt. Šar Planina, which is part of the Scardo-Pindhian mountain system. Serbia is bordered to the east by the mountains of the Carpathian-Balkan and Rhodope systems; the west and southwest borders are formed by the river Drina with the eastern Dinaric Alps and Mt. Prokletije (which also belongs to the Dinaric Alps), respectively.



**Main climate characteristics of Serbia. Average precipitation for the period 1981–2010.**

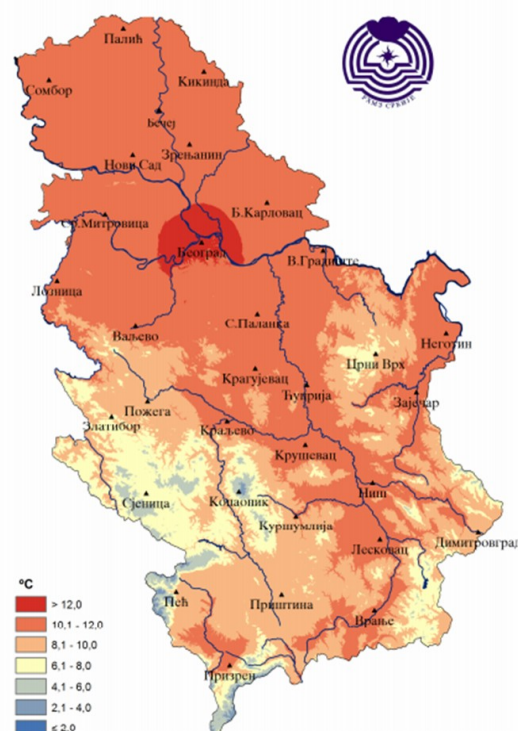
The climate is continental in the northern and south-eastern parts, with cold winter periods and semi arid summer. In the western and south-western regions, the climate is humid temperate, while in the central and eastern parts it is sub-continental or semi-arid temperate continental, with transitional sub-Mediterranean parts (Stevanović & Šinžar-Sekulić 2009). Four basic groups of geological substrata are present in the Central Balkans: 1. silicate rocks alkaline to ultra alkaline reaction (serpentinites and peridotites, ophiolitic belt); 2. carbonate rocks neutral to alkaline reactions (sedimentary, clastic); 3. silicate rocks acidic to neutral pH (sedimentary, igneous, metamorphic); 4. loess and pleistocene sediments and deposits (sands, alluvial fans) (Stevanović & Stevanović 1995). Due to such dissimilar climatic, geological and edaphic conditions, the flora and vegetation of the territory of Serbia are highly diverse.

During EDGG Field Workshop, we plan to visit several locations of vegetation interest. Rtanj, Ozren, Suva Planina and Sićevačka Klisura are located in south east part of Serbia and are in continental biogeographic region of Europe, while Deliblatska Peščara is in the northern province of Vojvodina and belongs to Pannonian biogeographical region of Europe.

## Description of the sites to be visited

### Rtanj

The Mountain Rtanj is located in eastern Serbia, in the southwestern part of the Carpathian-Balkan mountain system.



**Main climate characteristics of Serbia. Average temperature for the period 1981–2010.**

The Special Nature Reserve “Rtanj” comprises an area of a remarkable geomorphologic and biological value. The relief of the mountain Rtanj has an intensive dynamics. The cone-shaped peak Šiljak, with mountain slopes inclined at different angles, dominates over entire area. Karst relief structures, with numerous deep pits and various forms of the exhumed subcutaneous karst, are particularly interesting.

The north facing slopes are mainly overgrown with forests. The mixed community of the silver fir (*Abies alba*) and Balkan beech (*Fagus moesiaca*), which spreads out as far as to the peak Šiljak, is especially beautiful and very old.

The south facing slopes are overgrown with communities of rocky terrains, pastures and shrubs. These communities are floristically very rich and diverse. The relic dwarf Russian almond (*Prunus tenella*), as well as many species of orchids, protected in Serbia as natural rarities, are particularly important. However, the symbol of the Rtanj are the well-known Rtanj savoury (*Satureja kitaibelii*) and Rtanj catmint (*Nepeta rtanjensis*). These species are strict local endemites of the mountain Rtanj, and, due to their limited distribution, are included in the national, European and global Red Lists of the flora.

Rtanj is listed as IPA locality.

### Ozren

The Ozren Mountain rises above Sokobanja. The road from Sokobanja to Ozren is about 5 km long. The highest point of Ozren is Leskovik, 1174 m a.s.l.

The Ripaljka waterfall was the first monument protected by the state in 1948. The total height of the waterfall is 40 m.





*Community with Stipa pulcherrima at Rtanj mountain*



*Chrysopogono-Danthonion at Ozren mountain*



*Stipo-Festucetalia pallentis at Suva planina.*



*Panoramic view of Sićevačka klisura*

The waterfall should be visited in spring, when the flow of water is greatest. During the summer months the amount of water significantly decreases.

"Ozren Meadows" is a region of outstanding natural features and is under state protection and it is the habitat of the protected endemic coral peony (*Paeonia coralina*).

#### **Suva Planina**

The Suva Planina is a mountain located in eastern Serbia, namely, in the southwestern part of the Carpathian-Balkan mountain system. It represents a massif with exceptional occurrences and forms of the karstic relief, and a treasure of sediments of different age, rich in fossil flora and fauna.

This Reserve is inhabited by 1261 plant species and it is listed as IPA locality. The flora is mainly endemic and relic or protected according to many national and international criteria. For example, two local endemics are present, Pančić's columbine (*Aquilegia pancicii*) and Serbian rose (*Rosa serbica*). Like the flora, the vegetation is very diverse. The forest vegetation, consisting of many deciduous and coniferous species, is present along with the communities of meadows, pastures, rock creeps and rocks. Shrubby belt of the dwarf mountain pine (*Pinus mugo*) is present at the much lower altitudes here than in other parts of Europe.

#### **Sićevačka klisura**

The imposing limestone Sićevačka gorge in eastern Serbia has been cut by the activity of the Nisava river. The gorge is a composite one formed by the Prosečka gorge, the

Ostrovička vally and the Gradištanski canyon. Numerous caves, rock shelters, boulders, and imposing escarpments of Kusača, arranged in an arched amphitheatrical sequence are a particular mark of this area.

The most attractive part of the gorge is the grandiose Gradištanski canyon with closely positioned sides, mostly in the form of vertical, gradually sloping rock cliffs. The width of the canyon at its bottom is the width of the riverbed of river Nišava that runs through it. It is exactly on these inaccessible cliffs where one of the last pairs of the Imperial Eagle in Serbia nests.

The hill Oblik is located at the exit of the canyon. It is significant since it represents besides Jelašnica gorge, the only shared habitat of two Tertiary relicts and Balkan endemics *Ramonda serbica* and *Ramonda nathaliae*. On these two locations they build the community *Ramondetum nathaliae-serbicae*, that is very significant.

Sićevačka klisura is listed as IPA locality.

#### **Deliblatska peščara**

These largest European continental sands are located at the southern ridge of the Pannonian plane in southern Banat. They stretch between the Danube and the slopes of the Carpathian Mountains. Deliblatska Sands IPA represents the greatest sandy area in the south east of the Pannonian plain covering 900 km<sup>2</sup> with an altitude of 75-230 m a.s.l. 34,829 ha is under protection as a nature reserve. Sand-steppe, steppe, hawthorn and common juniper scrubs, mixed silver lime and downy oak forests are present at this IPA, as well

as the flooded river islands and marshes of the Danube - the "Labudovo okno" Ramsar site. Huge tracts are under cultivation as forests of black and scots pine and false acacia. The total number of vascular plants is approx. 900 taxa including criterion A species *Artemisia pancicii*, *Astragalus dasyanthus*, *Colchicum arenarium*, *Fritillaria montana* (= *F. degeniana*), *Paeonia officinalis* subsp. *banatica*, *Paeonia tenuifolia*, *Pulsatilla vulgaris* subsp. *grandis*. Deliblatska Sands is the richest part of Vojvodina province in terms of rare steppic plants. *Rindera umbellata*, *Iris pumila*, *Adonis vernalis*, *Stipa sabulosa*, *Hesperis tristis*, *Prunus tenella*, *Astragalus asper*, *Centaurea sadlerana*, *Echinops ruthenicus*, *Peucedanum arenarium*, *Alyssum tortuosum*, *Senecio integrifolius*, *Festuca vaginata* are some of those present. The main natural type of vegetation is forest-steppe on sandy soils, the succession of vegetation is closely related to the evolution of these soils, pioneer vegetation on sands, *Festuca vaginata* on sandy steppe, well developed steppe communities on sandy chernozem e.g. *Chrysopogon gryllus* communities. Natural forests are restricted to north facing dunes. In the last hundred years, the vegetation cover has been changed by intensive planting of pine and false acacia forest and the elimination of grazing. A detailed introduction to the vegetation of the area and a first biodiversity plot from the sandy dry grasslands there is provided by Krstivojević Ćuk et al. (2015).

## Overview of the main syntaxa of the study sites

- Festuco Brometea* Br.-Bl. & Tx. ex Klika & Hadač 1944
- Cirsio-Brachypodium pinnati* Hadač & Klika in Klika & Hadač 1944
- Lamio gargarici-Brometum erecti* Jovanović-Dunjić 1955
- Chrysopogono grylli-Danthonion alpinae* Kojić 1957
- Asperulo hungarorum-Agrostietum capillaris* Jovanović-Dunjić 1956
- Teucrio chamaedrydis-Chrysopogonetum grylli* Jovanović-Dunjić 1954
- Danthonietum alpinae* Cincović & Kojić 1962
- Trifolio incarnati-Festucetum valesiacae* Diklić & Nikolić 1972
- Sanguisorbo minoris-Festucetum valesiacae* Danon 1960
- Galio purpurei-Festucetum valesiacae* Jovanović-Dunjić 1956
- Nepeto rtanjensis-Festucetum valesiacae* Diklić et Milojević 1976
- Euphorbio myrsinitae-Andropogonetum ischaemi* Jovanović-Dunjić 1955
- Koelerietum montanae* Pavlović 1951
- Saturejon montanae* Horvat in Horvat et al. 1974
- Peucedano cervariae-Stipetum tirsae* (Less 1998) Borhidi 2012
- Potentillo tommasinianae-Caricetum humilis* Jovanović-Dunjić 1955
- Carici humilis-Stipetum grafiarum* Jovanović-Dunjić 1955
- Seslerion rigidae* Zólyomi 1936
- Seslerietum filifoliae* Zólyomi 1939
- Chrysopogono-Saturejon subspicatae* Horvat & Horvatić 1934
- Artemisietum albae-Salvietum officinalis* Grebenščikov 1950
- Koelerio-Corynephoretea* Klika in Klika & V. Novák 1941
- Festucion vaginatae* Soó 1929
- Alyssum gmelini-Festucetum vaginatae* Stjepanović-Veselić 1956

## References

- Ačić, S., Petrović, M., Šilc, U. & Dajić Stevanović, Z. 2012. Vegetation Database Grassland Vegetation of Serbia. *Biodiversity & Ecology* 4: 418–418.
- Ačić, S., Šilc, U., Petrović, M., Tomović, G. & Dajić Stevanović, Z. 2015. Classification, ecology and biodiversity of Central Balkan dry grasslands. *Tuexenia* 35: 329–353.
- Biurrun, I., García-Mijangos, I., Berastegi, A., Ambarli, D., Dembicz, I., Filibeck, G., Jandt, U., Janišová, M., Jaunatre, R., (...) & Dengler, J. 2014. Diversity of dry grasslands in Navarre (Spain): Experiences from the 7th EDGG Field Workshop, 15–24 June 2014. *Bulletin of the European Dry Grassland Group* 24/25: 4–21.
- Dajić Stevanović, Z., Lazarević, D., Petrović, M., Ačić, S. & Tomović, G. 2010. Biodiversity of natural grasslands of Serbia: state and prospects of utilization. Biotechnology in Animal Husbandry. In: *XII International Symposium on Forage Crops of Republic of Serbia "Forage Crops Basis of Sustainable Animal Husbandry Development"*: pp. 235–247. Kruševac, RS.
- Dengler, J. 2009. A flexible multi-scale approach for standardised recording of plant species richness patterns. *Ecological Indicators* 9: 1169–1178.
- Dengler, J., Ruprecht, E., Szabó, A., Turtureanu, D., Beldean, M., Uğurlu, E., Pedashenko, H., Dolnik, C. & Jones, A. 2009. EDGG cooperation on syntaxonomy and biodiversity of *Festuco-Brometea* communities in Transylvania (Romania): report and preliminary results. *Bulletin of the European Dry Grassland Group* 4: 13–19.
- Dengler, J., Becker, T., Ruprecht, E., Szabó, A., Becker, U., Beldean, M., Bita-Nicolae, C., Dolnik, C., Goia, I., (...) & Uğurlu, E. 2012a. *Festuco-Brometea* communities of the Transylvanian Plateau (Romania) – a preliminary overview on syntaxonomy, ecology, and biodiversity. *Tuexenia* 32: 319–359.
- Dengler, J., Todorova, S., Becker, T., Boch, S., Chytrý, M., Diekmann, M., Dolnik, C., Dupré, C., Giusso del Galdo, G.P., (...) & Vassilev, K. 2012b. Database Species-Area Relationships in Palaearctic Grasslands. *Biodiversity & Ecology* 4: 321–322.
- Guarino, R., Becker, T., Dembicz, I., Dolnik, C., Kacki, Z., Kozub, Ł., Rejžek, M. & Dengler, J. 2012. Impressions from the 4th EDGG Research Expedition to Sicily: community composition and diversity of Mediterranean grasslands. *Bulletin of the European Dry Grassland Group* 15: 12–22.
- Janišová, M., Becker, T., Becker, U., Demina, O., Dembicz, I., Ermakov, N., Filibeck, G., Frank, D., Guarino, R., (...) & Dengler, J. 2013. Steppes of Southern Siberia – Experiences from the 6th EDGG Research Expedition to Khakassia, Russia (22 July – 1 August 2013). *Bulletin of the European Dry Grassland Group* 19/20: 31–48.
- Kojić, M., Mrfat-Vukelić, S., Dajić, Z. & Đjordjević-Milošević, S. 1998. *Sintaksonomski pregled vegetacije Srbije* (Syntaxonomical review of vegetation in Serbia) [in Serbian]. Institut za biološka istraživanja "Siniša Stanković", Beograd, RS.
- Kojić, M., Mrfat-Vukelić, S., Dajić, Z. & Đjordjević-Milošević, S. 2004. *Livade i pašnjaci Srbije* (Meadows and pastures in Serbia) [in Serbian]. Institut za istraživanja u poljoprivredi Srbija, Beograd, RS
- Krstivojević Ćuk, M., Šošarić, I. & Dengler, J. 2015. Scale-dependent species diversity in a sandy dry grassland (*Festucion vaginatae*) of Vojvodina (Serbia). *Bulletin of the Eurasian Dry Grassland Group* 28: 16–22.
- Kuzemko, A.A., Becker, T., Didukh, Y.P., Ardelean, I.A., Becker, U., Beldean, M., Dolnik, C., Jeschke, M., Naqinezhad, A., (...)



- & Dengler, J. 2014. Dry grassland vegetation of Central Podolia (Ukraine) – a preliminary overview of its syntaxonomy, ecology and biodiversity. *Tuexenia* 34: 391–430.
- Lakušić, D. & Saboljvejić, M. 2005. Fitocenološka klasifikacija staništa (Phytocoenological classification of vegetation) [in Serbian]. In: Lakušić, D. (ed.) *Staništa Srbije, Rezultati projekta "Harmonizacija nacionalne nomenklature u klasifikaciji staništa sa standardima međunarodne zajednice"* (Habitats in Serbia, results of the project "Harmonization of national nomenclature in the classification of habitats with the international standards") [in Serbian]. Institut za Botaniku i Botanička Bašta "Jevremovac", Biološki fakultet, Univerzitet u Beogradu, Ministarstvo za nauku i zaštitu životne sredine Republike Srbije. URL: [http://habitat.bio.bg.ac.rs/nacionalne\\_klasifikacije\\_stanista.htm](http://habitat.bio.bg.ac.rs/nacionalne_klasifikacije_stanista.htm) [accessed 2015–05–29].
- Pedashenko, H., Apostolova, I., Boch, S., Ganeva, A., Janisová, M., Sopotlieva, D., Todorova, S., Ūnal, A., Vassilev, K., Velev, N. & Dengler, J. 2013. Dry grasslands of NW Bulgarian mountains: first insights into diversity, ecology and syntaxonomy. *Tuexenia* 33: 309–346.
- Stevanović, V. & Stevanović, B. (1995): Osnovni klimatski, geološki i edološki činioci biodiverziteta kopnenih ekosistema Jugoslavije (The main climatic, geological and pedological factors of biodiversity of the terrestrial ecosystems of Yugoslavia) [in Serbian]. In: Stevanović, V. & Vasić, V. (eds.) *Biodiverzitet Jugoslavije sa pregledom vrsta od međunarodnog značaja*: pp. 75–95. Ecolibri, Biološki fakultet, Beograd, RS.
- Stevanović, V. & Šinžar-Sekulić, J. 2009. Serbia. In: Radford, E.A. & Odé, B. (eds.) *Conserving Important Plant Areas: investing in the green Gold of South East Europe*: pp. 63–68. Plantlife International, Salisbury, UK.
- Tomović, G., Niketić, M., Lakušić, D., Randelović, V. & Stevanović, V. 2014. Balkan endemic plants in Central Serbia and Kosovo regions: distribution patterns, ecological characteristics and centres of diversity. *Botanical Journal of the Linnean Society* 176: 73–202.
- Turtureanu, P.D., Palpurina, S., Becker, T., Dolnik, C., Ruprecht, E., Sutcliffe, L.M.E., Szabó, A. & Dengler, J. 2014. Scale- and taxon-dependent biodiversity patterns of dry grassland vegetation in Transylvania (Romania). *Agriculture, Ecosystems and Environment* 182: 15–24.
- Vassilev, K., Dajić, Z., Cušterevska, R. Bergmeier, E. & Apostolova, I. 2012. Database Species-Area Relationships in Palearctic Grasslands. *Biodiversity & Ecology* 4: 330–330.
- Wilson, J.B., Peet, R.K., Dengler, J. & Pärtel, M. 2012. Plant species richness: the world records. *Journal of Vegetation Science* 23: 796–802.



*Nepeta rtanjensis* — endemic species of Serbian rocky grasslands

Zora Dajić Stevanović, Local Organiser ([dajic@agrif.bg.ac.rs](mailto:dajic@agrif.bg.ac.rs))

Ivan Šoštarić, Local Organiser ([sostaric@agrif.bg.ac.rs](mailto:sostaric@agrif.bg.ac.rs))

Mirjana Krstivojević Ćuk, Local Organiser ([mirjana.krstivojevic@dbe.uns.ac.rs](mailto:mirjana.krstivojevic@dbe.uns.ac.rs),  
[mirjana.krstivojevic@dbe.uns.ac.rs](mailto:mirjana.krstivojevic@dbe.uns.ac.rs))

Jürgen Dengler, EDGG Coordinator for Field Workshops ([juergen.dengler@uni-bayreuth.de](mailto:juergen.dengler@uni-bayreuth.de))

Idoia Biurrun, EDGG Deputy Coordinator for Field Workshops ([idoia.biurrun@ehu.es](mailto:idoia.biurrun@ehu.es))

# Scale-dependent species diversity in two contrasting dry grassland types of an inner alpine dry valley (Cogne, Aosta Valley, Italy)

Lukas Wiesner<sup>1</sup>, Esther Baumann<sup>2</sup>, Frank Weiser<sup>2</sup>, Carl Beierkuhnlein<sup>3</sup>, Anke Jentsch<sup>4</sup> & Jürgen Dengler<sup>\*,5,6</sup>

<sup>1</sup> Raumersgasse 22b, 91257 Pegnitz, GERMANY; wiesnerlukas@posteo.de

<sup>2</sup> Fichtestraße 16, 95445 Bayreuth, GERMANY; esther\_baumann@gmx.de, frank\_weiser@gmx.de

<sup>3</sup> Biogeography, Bayreuth Center of Ecology and Environmental Research (BayCEER), University of Bayreuth, Universitätsstr. 30, 95447 Bayreuth, GERMANY; carl.beierkuhnlein@uni-bayreuth.de

<sup>4</sup> Disturbance Ecology, Bayreuth Center of Ecology and Environmental Research (BayCEER), University of Bayreuth, Universitätsstr. 30, 95447 Bayreuth, GERMANY; anke.jentsch@uni-bayreuth.de

<sup>5</sup> Plant Ecology, Bayreuth Center of Ecology and Environmental Research (BayCEER), University of Bayreuth, Universitätsstr. 30, 95447 Bayreuth, GERMANY; juergen.dengler@uni-bayreuth.de

<sup>6</sup> Synthesis Centre (sDiv), German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Deutscher Platz 5e, 04103 Leipzig, GERMANY

\* Corresponding author

Bulletin of the Eurasian Grassland Group 29 (2015): 10-17

**Abstract:** We sampled vascular plant composition and diversity of a meso-xeric and a xeric basiphilous grassland (class *Festuco-Brometea*) in Cogne, located in a side valley of the Aosta Valley (NW Italy) at an elevation of about 1900 m a.s.l. Using the standard method of the EDGG Field Workshops, we recorded species occurrence at seven spatial grain sizes from 0.0001 to 100 m<sup>2</sup> and at 10 m<sup>2</sup> additionally species-specific cover, structural and environmental data. We placed the meso-xeric grassland type in the alliance *Cirsio-Brachypodium pinnati* (order *Brachypodietalia pinnati*). The xeric type belongs to the alliance *Stipo-Poion xerophilae* s.l., but based on its ecology and floristic composition we ask whether this alliance should not better be placed in the order *Stipo eriocaulis-Festucetalia pallentis* than in the *Festucetalia valesiacae*, where it was traditionally included. With mean richness values of only 30.5 and 25.0 on 10 m<sup>2</sup> for the meso-xeric and the xeric types, respectively, the stands were relatively poor compared to other *Festuco-Brometea* communities. By contrast, the species-area relationships, with z-values of the power-law function of 0.20–0.24, were in the typical range known for dry grasslands. The very unclear syntaxonomic position and the unexpectedly low diversity call for more extensive studies of the dry grasslands in the Aosta valley and the inner alpine dry valleys in general, using standardised modern sampling methods.

**Keywords:** alpha diversity; beta diversity; biodiversity; *Cirsio-Brachypodium pinnati*; *Festuco-Brometea*; species-area relationship (SAR); species richness; *Stipo eriocaulis-Festucetalia pallentis*; *Stipo-Poion xerophilae*; syntaxonomy; z-value.

## Introduction

Palaeartic dry grasslands always have attracted researchers to study them with respect to ecology, syntaxonomy, conservation and management. They are of particular interest because they include most of the vascular plant species richness world records for grain sizes below 100 m<sup>2</sup> (Wilson et al. 2012; Chytrý et al. 2015) and they generally belong to the vegetation types in Europe richest in plant species at any scale (Hobohm 1998; Dengler 2004). The main aim of the Eurasian Dry Grassland Group (EDGG; <http://www.edgg.org>) is to study the ecology and diversity of Palaeartic grasslands, and to this end, this IAVS working group regularly conducts own research

expeditions (Vrahnakis et al. 2013). A series of papers based on the outcomes from such expeditions and similar studies has already been published for Öland (Löbel et al. 2006; Löbel & Dengler 2008), Estonia (Boch & Dengler 2007; Dengler & Boch 2008), NE Germany (Dengler et al. 2004), Transylvania (Dengler et al. 2012a; Turtureanu et al. 2014), Ukraine (Kuzemko et al. 2014), Bulgaria (Pedashenko et al. 2013) and is under way, for example, for Sicily (see Guarino et al. 2012), Spain (see Biurrun et al. 2014) and Siberia (see Janišová et al. 2013). To achieve a general understanding of the riddle of the extreme species richness in some of these types (Dengler et al. 2014), more data from other regions, sampled with the same or similar approaches are needed. Therefore, the EDGG Bulletin has recently started to make such small





**Fig. 1:** Sampling at Biodiversity subplot AO01SE (Photo: J. Dengler, 2014/08).

datasets of good quality available to the scientific public, which would probably be difficult to get published elsewhere (Hopp & Dengler 2015; Krstivojević Ćuk et al. 2015).

The inner alpine dry valleys are well-known for their diverse and isolated steppic vegetation, but since the seminal book by Braun-Blanquet (1961) they have not been analysed in a comprehensive manner, except for some regional studies (e.g. Zoller 1995; Schwabe & Kratochwil 2004; Pignatti & Pignatti 2014). The knowledge on the xerothermic vegetation of the Aosta valley in NW Italy appears to be particularly poor, despite the fact that this valley is considered as one of the most extreme steppic areas in the Alps (Braun-Blanquet 1961). We therefore took the opportunity of a student field course in the Gran Paradiso National Park to sample also some xeric grasslands outside the park borders with the standardised methodology of the EDGG expeditions (see Turtureanu et al. 2014), about which we report here briefly.

### Study area

The study site is located in the Cogne valley, Southern Alps, politically belonging to the Aosta Valley semi-autonomous region of Italy. The plots were located on the south-facing slopes above the town of Cogne, approximately 1 km northwest of the village of Gimillan (45.62° N, 7.35° E, 1878 m a.s.l.), only about 1 km north of the borders of the Gran Paradiso National Park.

The Aosta valley itself is one of the driest of the inner alpine dry valleys, next to the Valais in Switzerland

and the Vintschgau in South Tyrol, NW Italy (Braun-Blanquet 1961). In Aymaville, at 700 m a.s.l., only 520 mm of annual precipitation occur, but even at much higher altitude in Cogne (1550 m a.s.l.) no more than 700 mm are assumed by Braun-Blanquet (1961). The soils of the study site are developed from calcareous schists of the Mesozoic Era (Di Pasquale 1961; Bovio et al. 2008).

According to the monographic treatment of the Italian vegetation by Blasi (2010), the natural vegetation of the area is the Geosigmatum 10b (“Geosigmeto endalpico centro-occidentale acidofilo degli arbusti prostrate e dei larici-cembreti (*Empetro-Vaccinio sigmetum*, *Rhodendro ferruginei sigmetum*, *Junipero-Arctostaphylo uva-ursi sigmetum*, *Larici-Pino cembrae sigmetum*)”). The study site is grazed at low intensity and forms part of a mosaic of steppic grasslands, dry stone walls, *Juniperus sabina* and *Berberidion* shrublands, groups of trees and small forest patches (mostly *Larix decidua*).

### Methods

Sampling was conducted by a student field course of the geoecology study program of the University of Bayreuth on 2 August 2014. To document the species composition and phytodiversity patterns, we selected two contrasting dry grassland stands on the same slope, only separated by a few metres distance, the upper one with gentle inclination and rather dense vegetation, the lower one with much steeper inclination and more open vegetation. In each type, one 100-m<sup>2</sup> plot of relatively homogenous vegetation was sampled (Figs.





**Fig. 2:** Biodiversity plot AO01 (*Cirsio-Brachypodium pinnati*; photo: A. Jentsch, 2014/08).

1, 2 and 3), using the modified nested-plot sampling proposed by Dengler (2009b) in the variant of Turtureanu et al. (2014; “EDGG biodiversity plot”). Each biodiversity plot consisted of nested plot series of 0.0001, 0.001, 0.01, 0.1, 1 and 10 m<sup>2</sup> in the NW and SE corners as well as the whole 100 m<sup>2</sup>. For each of these plots all vascular plants were recorded with the any-part-system (“shoot presence”; see Dengler 2008). Additionally, for the 10-m<sup>2</sup> plots, species cover (in %) was estimated, environmental values were recorded (e.g. inclination, aspect, rock cover), and a mixed soil sample from the top 10 cm of soil was taken for further analysis (pH, C/N). Moreover, total aboveground biomass was sampled, dried and weighed for the 1-m<sup>2</sup> subplot located directly in the corners. The vegetation-plot data (AO01 and AO02) are stored in and available from the *Database Species-Area Relationships in Palaearctic Grasslands* (GIVD ID EU-00-003; Dengler et al. 2012b) and will also be provided to *VegItaly* (GIVD ID EU-IT-001; Venanzoni et al. 2012).

Species composition was compared to that of described vegetation types in the Alps and elsewhere in Europe. The species richness data for the seven different grain sizes were related to literature data and used to construct a species-area relationship, as power-law function in the linearized version ( $\log_{10} S \sim \log_{10} A$ , where  $S$  is the species richness and  $A$  the area in m<sup>2</sup>; Dengler 2009a).

## Results and discussion

### Syntaxonomy

As evidenced by the strong prevalence of diagnostic species of that class (Fig. 4), all plots clearly belong to the *Festuco-Brometea*, albeit there is an admixture of some *Koelerio-Corynepherea* species, particularly in the more open patches (Table 1). The two 100-m<sup>2</sup> plots clearly differed from each other in terms of species composition. The plot AO01 plot on the gentle slope had a much more meso-xeric character, while the plot AO02 on the steeper slope was more xeric.

Braun-Blanquet (1961: pp 144–147), who sampled vegetation on the same slopes above Cogne, but at a slightly lower elevation (1400–1720 m a.s.l.), described only one association *Silenotitae-Koelerietum vallesianae* (“*Sileneto-Koelerietum vallesianae*”), placed within the alliance *Stipo-Poion carniolicae* of the order *Festucetalia valesiaca*, but his vegetation table is quite heterogeneous. According to current syntaxonomic viewpoints, however, the two types recorded are so different that they should even be placed in different orders.

The meso-xeric unit (Fig. 5) clearly belongs to the order *Brachypodietalia pinnati* (= *Brometalia erecti* nom. ambig. propos.), which comprises all meso-xeric *Festuco-Brometea* types across Europe (e.g. Korneck 1974; Mucina & Kolbek 1993; Dengler 2003; Pedashenko et al. 2013). The alliance is less clear because Braun-Blanquet (1961) generally did not separate meso-xeric *Festuco-Brometea* types at higher syntaxonomic level, and since then no broad-scale classification of the dry grasslands of the Alps or



**Fig. 3:** Biodiversity plot AO02 (*Stipo-Poion xerophilae* s.l.) (Photo: J. Dengler, 2014/08).



**Tab.1:** Vegetation table of the four 10-m<sup>2</sup> plots in the NW and SE corners of the two 100-m<sup>2</sup> biodiversity plots. Performance of species is given in percentage cover. Character and differential species are indicated with C and D, respectively.

Plot	AO01	AO01	AO02	AO02
Subplot	NW	SE	NW	SE
Latitude (° N)	45.62	45.62	45.62	45.62
	077	069	065	053
	7.348	7.348	7.348	7.348
Longitude (° E)	25	33	13	26
Altitude (m a.s.l.)	1882	1878	1877	1875
Aspect (°)	236	230	291	210
Inclination (°)	9	13	26	30
Microrelief (cm)	7	4	21	7
Soil depth mean (cm)	37	31	35	11
Soil depth SD (cm)	12	7	12	18
Skeleton content (%)	26	32	26	15
pH (in 0.02 M CaCl <sub>2</sub> )	6.20	6.28	7.29	6.06
C (%)	7.60	7.57	2.11	9.86
N (%)	0.63	0.64	0.20	0.83
C/N ratio	12.0	11.9	10.7	11.9
Aboveground dry mass (g m <sup>-2</sup> )	366	198	346	222
Cover vegetation (%)	90	95	45	80
Cover litter (%)	60	40	20	80
Cover dead wood (%)	0.5	0	1	0
Cover stones and rocks (%)	5	0	3	5
Cover gravel (%)	0	0	20	2
Cover fine soil (%)	95	100	77	93
Species richness (10 m <sup>2</sup> ; vascular plants)	35	26	19	31
<b>Order: Brachypodietalia pinnati: Alliance Cirsio-Brachypodion pinnati</b>				
C Onobrychis montana	20	25	1	15
C Plantago media	0.01	1	.	.
C Oxytropis pilosa	0.5	0.01	.	.
C Carex cf. caryophylla	0.5	.	.	.
C Allium lineare	0.1	0.01	.	.
C Primula veris	.	0.01	.	.
C Ranunculus bulbosus	.	0.01	.	.
D Hieracium pilosella agg.	30	40	.	3
D Achillea millefolium agg.	10	3	.	2
D Poa angustifolia	3	5	.	1
D Dactylis glomerata	3	2	.	.
D Trifolium pratense subsp. pratense	2	0.01	.	.
D Silene vulgaris	0.1	0.01	.	.
<b>Orders: Festucetalia valesiaca and Stipo pulcherrimae-Festucetalia pallentis, Alliance Stipo-Poion xerophilae</b>				
C Festuca scabriculum	5	.	.	30
C Galium lucidum	4	.	0.5	15
C Stipa eriocalis	.	.	.	15
C Koeleria valesiana	3	.	15	.
C Festuca acuminata	.	.	.	5
C Lactuca perennis	.	0.01	.	2
C Silene valesia	.	.	0.01	1
D Laserpitium siler	0.5	.	2	3
D Sedum rupestre agg.	.	.	.	2
<b>Class: Festuco-Brometea</b>				
Festuca valesiaca subsp. valesiaca	35	30	30	40
Phleum phleoides	15	10	10	15
Centaurea scabiosa	1	5	0.01	5
Artemisia campestris	1	3	1.5	2
Euphorbia cyparissias	1	0.01	0.01	1
Silene otites	0.5	0.01	0.01	1
Potentilla neumanniana	1.5	.	.	2
Medicago lupulina	2	.	.	1
Trifolium montanum	.	.	.	3
Bromus erectus	2	.	.	.
Arabis hirsuta	.	.	.	1
Sanguisorba minor	.	.	.	1
Dianthus carthusianorum	.	1	.	.
Armeria arenaria subsp. arenaria	0.5	.	.	.

Dianthus sylvestris subsp. sylvestris	0.1	.	.	.
Thalictrum minus	.	0.05	.	.
<b>Koelerio-Coryneporetea</b>				
Sempervivum tectorum	0.3	2	3	4
Poa bulbosa	.	0.01	.	1
Veronica verna	.	0.01	0.01	.
Sempervivum arachnoideum	.	.	.	1
Androsace septentrionalis	0.01	.	.	.
Sedum annuum	.	.	0.01	.
<b>Other species</b>				
Lotus corniculatus	0.1	.	0.01	2
Bupleurum ranunculoides	0.3	.	.	2
Thesium alpinum	1	.	.	1
Colchicum alpinum	0.01	.	.	1
Verbascum thapsus	.	1	.	.
Juniperus sabina	.	.	1	.
Lotus alpinus	.	.	.	1
Artemisia absinthium	.	.	0.5	.
Erysimum cheiranthoides	0.1	.	.	.
Taraxacum sp.	0.1	.	.	.
Dianthus sp.	.	.	0.1	.
Plantago maritima agg.	.	.	0.01	.
Helictotrichon versicolor	0.01	.	.	.
Knautia arvensis	.	0.01	.	.

larger parts thereof has been attempted. More recent overviews of Austria (Mucina & Kolbek 1993) and Switzerland (Delarze & Gonsseth 2008) suggest placing the inner alpine semi-dry grasslands in the sub-continental alliance *Cirsio-Brachypodion pinnati*, whose main distribution is in eastern central Europe (e.g. Chytrý 2007; Dengler et al. 2012a). Although this alliance has rarely been considered to occur in Italy (but see <http://www.prodrorno-vegetazione-italia.org/scheda/cirsio-brachypodion-pinnati/573>), and the Aosta valley is geographically far away from the closed distribution range, inclusion of our meso-xeric plots into the *Cirsio-Brachypodion pinnati* currently seems to be the most plausible option.

For the xeric stands (Fig. 6) the situation is reversed. There is little doubt about the alliance: it is the *Stipo-Poion carniolicae* described by Braun-Blanquet (1961) for the inner alpine valleys of the western Alps. The only question is whether its separation from a vicariant alliance *Stipo-Poion xerophilae* of the eastern Alps as proposed by Braun-Blanquet (1961) is justified. Recent authors rather suggest combining both units because of their floristic and ecological similarity into a single alliance, which then bears the older name *Stipo-Poion xerophilae* Br.-Bl. & Tx. ex Br.-Bl. 1950 (Theurillat et al. 1995; Dengler 2004; Delarze & Gonsseth 2008). By contrast, the placement of the *Stipo-Poion xerophilae* s.l. into an order is rather unclear. Braun-Blanquet (1961) placed it in the *Festucetalia valesiaca*, which at that time were considered to comprise all continental alliances of the *Festuco-Brometea*, irrespective whether they are xeric, meso-xeric or rupicolous, and this schema is still followed by some more traditional overviews of syntaxa, such as Royer (1991), Theurillat et al. (1995) or the *Prodrorno della vegetazione d'Italia* (<http://www.prodrorno-vegetazione-italia.org/schema-sintassonomico>). By contrast, more recent overviews, and particularly those based on the analysis of large amounts of plot data (e.g. Mucina & Kolbek 1993; Rodwell et al. 2002; Dengler 2004; Dengler et al. 2012a; Škodová et al. 2014; Willner et al. subm.)



**Fig. 4:** Some typical *Festuco-Brometea* species from inside the plots or nearby, from left to right: *Laserpitium siler*, *Onobrychis montana*, *Campanula spicata* and *Armeria arenaria* (Photos: J. Dengler, 2014/08).

accept three ecologically different *Festuco-Brometea* orders in the subcontinental to continental parts of Europe: the meso-xeric *Brachypodietalia pinnati* (= *Brometalia erecti*), the xeric *Festucetalia valesiacae* and the rupicolous *Stipo eriocaulis-Festucetalia pallentis*. Ecologically, the rocky grasslands of the *Stipo-Poion xerophilae* s.l. („Inneralpine Felsensteppe“ in Delarze & Gonseth 2008) would fit much better to the order *Stipo eriocaulis-Festucetalia pallentis* than to the *Festucetalia valesiacae*, which comprise zonal steppes on loess and other deep and soft sediments. Still, even Mucina & Kolbek (1993) and Dengler (2004), who accept the order *Stipo eriocaulis-Festucetalia pallentis*, retained the *Stipo-Poion xerophilae* in the order *Festucetalia valesiacae*, which appears inconsequent. Actually, in our stand from the Cogne valley, there are three species considered diagnostic of the first order (*Stipa eriocaulis*, *Lactuca perennis*, *Thesium alpinum*; see Mucina & Kolbek 1993; Willner et al. subm.), but only one, albeit a dominant one for the second order (*Festuca valesiaca* itself).

### Species richness

The vascular plant species richness was at about ½ of the known European maxima at the two smallest grain sizes (0.0001 and 0.001 m<sup>2</sup>) (Table 2). With “only” nine species on 0.1 m<sup>2</sup> it fell to 1/5 of the European maxima, to rise again to about 2/5 for the largest grain sizes (Table 2). At all spatial scales, the xeric stand was poorer in species than the meso-xeric one (Fig. 7). While the xeric grassland reached only 50% of the richness of the meso-xeric one at the two smallest grain sizes, with 3–25% fewer species, the difference was much smaller at the grain sizes from 0.01 to 100 m<sup>2</sup>. It is generally known that the meso-xeric *Festuco-Brometea* communities are richer at all scales than the xeric ones (Dengler 2005; Dengler et al. 2012a), but usually the difference is more pronounced than for the larger grain sizes in Cogne. This might be attributable to the fact that our meso-xeric stand was already relatively dry, as indicated by the high cover of *Festuca valesiaca*.



**Fig. 5:** *Cirsio-Brachypodion pinnati* with *Hieracium pilosella* and *Centaurea scabiosa* (Photo: J. Dengler, 2014/08).



**Fig. 6:** *Stipo-Poion xerophilae* s.l. with *Stipa eriocaulis*, *Phleum phleoides* and *Laserpitium siler* (Photo: J. Dengler, 2014/08).



**Tab.2:** Maximum richness values found in this study (AO) compared to the documented maximum richness values in European grasslands (EU).

Plot size [m <sup>2</sup> ]	AO vascular plants	EU vascular plants	Ratio AO / EU	Country	Alliance	Reference
0.0001	4	7	57%	Ukraine	<i>Agrostio-Avenulion schellianae</i> & <i>Stipion lessingianae</i>	Kuzemko et al. (2014)
0.001	6	12	50%	Sweden	<i>Filipendulo-Helictotrichion</i>	van der Maarel & Sykes (1993)
0.01	7	25	28%	Estonia	<i>Filipendulo-Helictotrichion</i>	Kull & Zobel (1991)
0.1	9	43	21%	Romania	<i>Cirsio-Brachypodion</i>	Dengler et al. (2012a)
1	20	82	24%	Czechia	<i>Cirsio-Brachypodion</i>	Chytrý et al. (2015)
10	35	98	36%	Romania	<i>Cirsio-Brachypodion</i>	Dengler et al. (2012a)
100	52	133	39%	Czechia	<i>Cirsio-Brachypodion</i>	Chytrý et al. (2015)

### Species-area relationships

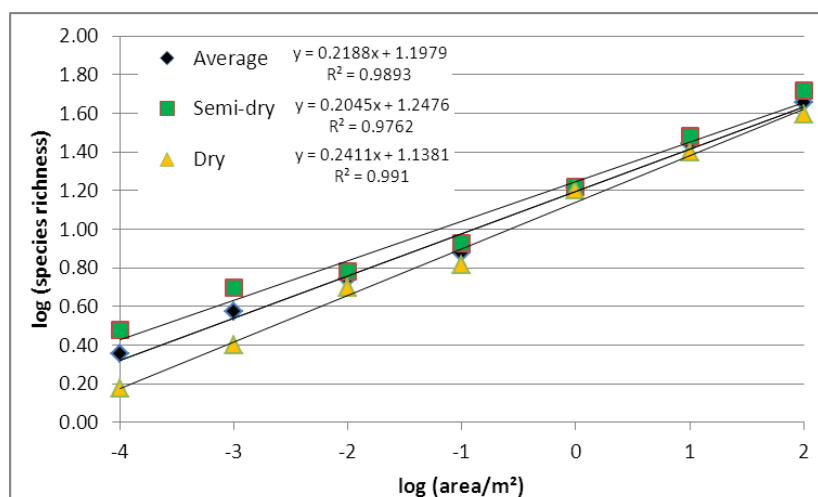
The species-area relationships could reasonably well be described by power laws (Fig. 7), despite we used only means of two subplots for the smaller grain sizes, which leads to random noise (see Dengler & Boch 2008). The  $z$ -values (exponents of the power law relationship) were between 0.20 and 0.24, which is in the normal range known for dry grasslands (Dengler 2005; Dengler et al. 2012a). A closer look at the curve shape (Fig. 7) indicates that the species turn-over in both grasslands had its minimum for the transitions 0.001–0.1 m<sup>2</sup>, with local  $z$ -values of 0.13 and 0.08 only (not shown). This is an interesting finding because in other grasslands local  $z$ -values were either very constant (e.g. in Estonia: Dengler & Boch 2008) or reached a maximum at intermediate grain sizes (e.g. in Transylvania: Turtureanu et al. 2014).

### Outlook

Our paper is mainly meant to provide scale-dependent species richness data of dry grasslands from a region so far not covered by the huge data compilation of such data led by the senior author within the framework of EDGG (see Dengler et al. 2012b; Vrahnakis et al. 2013). With only two biodiversity plots, the data are certainly not enough to draw conclusions based on them alone. However, some unusual patterns (overall rather low richness, local minimum of  $z$ -values at grain sizes where in other regions a maximum was found), call for more extensive sampling. Moreover, our study pointed to the fact that, while broad-scale scale classifications of *Festuco-Brometea* communities based on large datasets have been done or are under way in other parts of Europe (e.g. Chytrý 2007; Škodová et al. 2014; Willner et al. subm.), the situation in the Alps, where

some of the classical studies were conducted (e.g. Braun-Blanquet 1961) is rather unclear because no data-based revision has been undertaken since then. Most doubtful is the syntaxonomic position of the rocky steppic grasslands of the inner alpine valleys (*Stipo-Poion xerophilae* s.l.), which traditionally have been placed in the *Festucetalia valesiacae*, but ecology and floristic composition point more towards inclusion into the *Stipo eriocaulis-Festucetalia pallentis*. While the long-neglected meso-xeric, subcontinental grasslands of the inner alpine valleys now are generally separated from the xeric types and often are placed in the eastern European alliance *Cirsio-Brachypodion pinnati*, this assignment is also in need of validation through the analysis of a comprehensive dataset.

The main aim of the EDGG Field Workshops (formerly called: EDGG Research Expeditions) always has been and still is to provide standardised high-quality data on floristic diversity and composition as



**Fig. 7:** Species-area relationships in double-log representation for vascular plants together with linear regression functions (equivalent to power laws). The values represent mean values of both corners in each of the two biodiversity plots (AO01 = semi-dry; AO02 = dry) and the overall mean.

well as site conditions of (dry) grasslands from under-sampled areas in the Palaearctic (Vrahnakis et al. 2013). While in recent years we mainly focused on “marginal” areas of Europe or even in Siberia, it might now be time to consider also the Alps in the core of Europe as a proper target. Actually, EDGG has just started to develop plans of a series of two to three such longer international Field Workshops to be conducted “on the tracks” of Braun-Blanquet throughout the inner alpine dry valleys. It appears that the first of such expeditions, following next year’s expedition in Serbia (see announcement in this Bulletin) and that of 2017 planned for Central Italy (Abruzzo National Park), could take place in 2018, starting with the eastern Alps. But at one point certainly also the dry valleys of the western Alps (Valais, Aosta, Susa, Durance) should be re-visited and re-analysed by an international team of experts.

## Acknowledgements

We thank the participants of the student field course for help with the data collection and Marga Wartinger for carrying out the soil analyses.

## References

- Aeschimann, D., Lauber, K., Moser, D. M. & Theurillat, J.-P. 2004. *Flora alpina*. Haupt, Bern, CH.
- Biurrun, I., García-Mijangos, I., Berastegi, A., Ambarli, D., Dembicz, I., Filibeck, G., Jandt, U., Janišová, M., Jaunatre, R., (...) & Dengler, J. 2014. Diversity of dry grasslands in Navarre (Spain): Experiences from the 7th EDGG Field Workshop, 15–24 June 2014. *Bulletin of the European Dry Grassland Group* 24/25: 4–21.
- Blasi, C. (ed.) 2010. *La vegetazione d'Italia – con Carta delle Serie di Vegetazione in scala 1 : 500 000*. Palombi Editori, Roma, IT.
- Boch, S. & Dengler, J. 2006. Floristische und ökologische Charakterisierung sowie Phytodiversität der Trockenrasen auf der Insel Saaremaa (Estland). *Arbeiten aus dem Institut für Landschaftsökologie Münster* 15: 55–71.
- Bovio, M., Broglio, M. & Poggio, L. 2008. *Guida alla flora della Valle d'Aosta*. Blu Edizioni, Torino, IT.
- Braun-Blanquet, J. s61. *Die inneralpine Trockenvegetation. Von der Provence bis zur Steiermark*. Gustav Fischer, Stuttgart, DE.
- Chytrý, M. (ed.) 2007. *Vegetation of the Czech Republic – 1. Grassland and heathland vegetation* [in Czech, with English summary]. Academia, Praha, CZ.
- Chytrý, M., Dražil, T., Hájek, M., Kalnóková, V., Preslerová, Z., Šibík, J., Ujházy, K., Axmanová, I., Bernátová, D., (...) & Vymazalová, M. 2015. The most species-rich plant communities in the Czech Republic and Slovakia (with new world records). *Preslia* 87: 217–278.
- Delarze, R. & Gonsseth, Y. 2008. *Lebensräume der Schweiz. Ökologie – Gefährdung – Kennarten*. 2nd ed. Ott, Bern, CH.
- Dengler, J. 2003. Entwicklung und Bewertung neuer Ansätze in der Pflanzensoziologie unter besonderer Berücksichtigung der Vegetationsklassifikation. *Archiv naturwissenschaftlicher Dissertationen* 14: 1–297.
- Dengler, J. 2004. Klasse: *Festuco-Brometea* Br.-Bl. & Tx. ex Klika & Hadač 1944 – Basiphile Magerrasen und Steppen im Bereich der submeridionalen und temperaten Zone. In: Berg, C., Dengler, J., Abdank, A. & Isermann, M. (eds.) *Die Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung – Textband*: pp. 327–335, Weissdorn, Jena, DE.
- Dengler, J. 2005. Zwischen Estland und Portugal – Gemeinsamkeiten und Unterschiede der Phytodiversitätsmuster europäischer Trockenrasen. *Tuexenia* 25: 387–405.
- Dengler, J. 2008. Pitfalls in small-scale species-area sampling and analysis. *Folia Geobotanica* 43: 269–287.
- Dengler, J. 2009a. Which function describes the species-area relationship best? – A review and empirical evaluation. *Journal of Biogeography* 36: 728–744.
- Dengler, J. 2009b. A flexible multi-scale approach for standardised recording of plant species richness patterns. *Ecological Indicators* 9: 1169–1178.
- Dengler, J. & Boch, S. 2008. Sampling-design effects on properties of species-area curves – A case study from Estonian dry grassland communities. *Folia Geobotanica* 43: 289–304.
- Dengler, J., Bedall, P., Bruchmann, I., Hoeft, I. & Lang, A. 2004. Artenzahl-Areal-Beziehungen in uckermärkischen Trockenrasen unter Berücksichtigung von Kleinstflächen – eine neue Methode und erste Ergebnisse. *Kieler Notizen zur Pflanzenkunde in Schleswig-Holstein und Hamburg* 32: 20–25.
- Dengler, J., Becker, T., Ruprecht, E., Szabó, A., Becker, U., Beldean, M., Bită-Nicolae, C., Dolnik, C., Goia, I., (...) & Uğurlu, E. 2012a. *Festuco-Brometea* communities of the Transylvanian Plateau (Romania) – a preliminary overview on syntaxonomy, ecology, and biodiversity. *Tuexenia* 32: 319–359.
- Dengler, J., Todorova, S., Becker, T., Boch, S., Chytrý, M., Diekmann, M., Dolnik, C., Dupré, C., Giusso del Galdo, G.P., (...) & Vassilev, K. 2012b. Database Species-Area Relationships in Palaearctic Grasslands. *Biodiversity & Ecology* 4: 321–322.
- Dengler, J., Janišová, M., Török, P. & Wellstein, C. 2014. Biodiversity of Palaearctic grasslands: a synthesis. *Agriculture, Ecosystems and Environment* 182: 1–14.
- Di Pasquale, A. (ed.) 1961. *Carta geologica d'Italia. Scala 1:1.000.000*. Servizio Geologico, Roma, IT.
- Guarino, R., Becker, T., Dembicz, I., Dolnik, C., Kacki, Z., Kozub, L., Rejček, M. & Dengler, J. 2012. Impressions from the 4th EDGG Research Expedition to Sicily: community composition and diversity of Mediterranean grasslands. *Bulletin of the European Dry Grassland Group* 15: 12–22.
- Hobohm, C. 1998. Pflanzensoziologie und die Erforschung der Artenvielfalt – Überarbeitete und erweiterte Fassung der an der Universität Lüneburg eingereichten und angenommenen Habilitationsschrift. *Archiv naturwissenschaftlicher Dissertationen* 5: 1–231.
- Hopp, D. & Dengler, J. 2015. Scale-dependent species diversity in a semi-dry basiphilous grassland (*Bromion erecti*) of Upper Franconia (Germany). *Bulletin of the Eurasian Dry Grassland Group* 28: 10–15.
- Janišová, M., Becker, T., Becker, U., Demina, O., Dembicz, I., Ermakov, N., Filibeck, G., Frank, D., Guarino, R., (...) & Dengler, J. 2013. Steppes of Southern Siberia – Experiences from the 6th EDGG Research Expedition to Khakassia, Russia (22 July – 1 August 2013). *Bulletin of the European Dry Grassland Group* 19/20: 31–48.
- Korneck, D. 1974. Xerothermvegetation von Rheinland-Pfalz und Nachbargebieten. *Schriftenreihe für Vegetationskunde* 7: 1–196 + 158 tables.
- Krstivojević Ćuk, M., Šoštarić, I. & Dengler, J. 2015. Scale-dependent species diversity in a sandy dry grassland (*Festucion vaginatae*) of Vojvodina (Serbia). *Bulletin of the Eurasian Dry Grassland Group* 28: 16–22.
- Kull, K. & Zobel, M. 1991. High species richness in an Estonian wooded meadow. *Journal of Vegetation Science* 2: 711–714.



- Kuzemko, A.A., Becker, T., Didukh, Y.P., Ardelean, I.A., Becker, U., Beldean, M., Dolnik, C., Jeschke, M., Naqinezhad, A., (...) & Dengler, J. 2014. Dry grassland vegetation of Central Podolia (Ukraine) – a preliminary overview of its syntaxonomy, ecology and biodiversity. *Tuexenia* 34: 391–430.
- Löbel, S. & Dengler, J. 2008 [“2007”]. Dry grassland communities on southern Öland: phytosociology, ecology, and diversity. *Acta Phytogeographica Suecica* 88: 13–31.
- Löbel, S., Dengler, J. & Hobohm, C. 2006. Species richness of vascular plants, bryophytes and lichens in dry grasslands: The effects of environment, landscape structure and competition. *Folia Geobotanica* 41: 377–393.
- Mucina, L. & Kolbek, J. 1993. *Festuco-Brometea*. In: Mucina, L., Grabherr, G. & Ellmauer, T. (eds.) *Die Pflanzengesellschaften Österreichs – Teil I: Anthropogene Vegetation*: pp. 420–492, Fischer, Jena, DE.
- Pedashenko, H., Apostolova, I., Boch, S., Ganeva, A., Janisová, M., Sopotlieva, D., Todorova, S., Ünal, A., Vassilev, K., Velev, N. & Dengler, J. 2013. Dry grasslands of NW Bulgarian mountains: first insights into diversity, ecology and syntaxonomy. *Tuexenia* 33: 309–346.
- Pignatti, E. & Pignatti, S. 2014. *Plant life of the Dolomites: Vegetation structure and ecology*. Springer, Heidelberg, DE.
- Rodwell, J.S., Schaminée, J.H.J., Mucina, L., Pignatti, S., Dring, J. & Moss, D. 2002. *The diversity of European vegetation – An overview of phytosociological alliances and their relationships to EUNIS habitats*. National Reference Centre for Agriculture, Nature and Fisheries [Report No. EC-LNV 2002(054)], Wageningen, NL.
- Royer, J.-M. 1991. Synthèse eurosibérienne, phytosociologique et phytogéographique de la classe des *Festuco-Brometea*. *Dissertationes Botanicae* 178: 1–296.
- Schwabe, A. & Kratochwil, A. 2004. *Festucetalia valesiacae* communities and xerothermic vegetation complexes in the Central Alps related to environmental factors *Phytocoenologia* 34: 329–446.
- Škodová, I., Janišová, M., Dúbraková, D. & Ujházy, K. 2014. *Festuco-Brometea*. In: Hegedúsová Vantarová, K. & Škodová, I. (eds.) *Plant communities of Slovakia. 5. Grassland vegetation* [in Slovak, with English summaries]: pp. 35–146. Veda, Bratislava, SK.
- Theurillat, J.-P., Aeschmann, D., Küpper, P. & Spichinger, R. 1995. The higher vegetation units of the Alps. *Colloques Phytosociologiques* 23: 189–239.
- Turtureanu, P.D., Palpurina, S., Becker, T., Dolnik, C., Ruprecht, E., Sutcliffe, L.M.E., Szabó, A. & Dengler, J. 2014. Scale- and taxon-dependent biodiversity patterns of dry grassland vegetation in Transylvania (Romania). *Agriculture, Ecosystems and Environment* 182: 15–24.
- van der Maarel, E. & Sykes, M.T. 1993. Small-scale plant species turnover in a limestone grassland: the carousel model and some comments on the niche concept. *Journal of Vegetation Science* 4: 179–188.
- Venanzoni, R., Landucci, F., Panfili, E. & Gigante, D. 2012. Toward an Italian national vegetation database: VegItaly. *Biodiversity & Ecology* 4: 185–190.
- Vrahnakis, M.S., Janišová, M., Rüşina, S., Török, P., Venn, S. & Dengler, J. 2013. The European Dry Grassland Group (EDGG): stewarding Europe’s most diverse habitat type. In: Baumbach, H., Pfützenreuter, S. (eds.): *Steppenlebensräume Europas – Gefährdung, Erhaltungsmaßnahmen und Schutz*: pp. 417–434, Thüringer Ministerium für Landwirtschaft, Forsten, Umwelt und Naturschutz, Erfurt, DE.
- Willner, W., Kuzemko, A., Dengler, J., Chytrý, M., Bauer, N., Becker, T., Bita-Nicolae, C., Botta-Dukát, Z., Čarni, A., (...) & Janišová, M. subm. A higher-level classification of the Pannonian and western Pontic steppe grasslands (Central and Eastern Europe). Manuscript for *Applied Vegetation Science*.
- Wilson, J.B., Peet, R.K., Dengler, J. & Pärtel, M. 2012. Plant species richness: the world records. *Journal of Vegetation Science* 23: 796–802.
- Wisskirchen, R. & Haeupler, H. 1998. *Standardliste der Farn- und Blütenpflanzen Deutschlands*. Ulmer, Stuttgart, DE: 765 pp.
- Zoller, H. 1995. *Vegetationskarte des Schweizerischen Nationalparks – Erläuterungen*. Flück-Wirth [Nationalpark-Forschung in der Schweiz No. 85], Zerne, CH.



**Fig. 8:** Waiting in the steppic grasslands above Cogne after completion of the sampling and before the thunderstorm started (Photo: J. Dengler, 2014/08).

# Book review

Here we present recently published books that might be relevant for grassland scientists and conservationists, both specific grassland titles as well as faunas, floras, or general books on ecology and conservation biology. If you (as an author, editor or publisher) would like to propose a certain title for review, or if you (as an EDGG member) would like to write a review (or reviews in general), please contact the Book Review Editors Anna Kuzemko ([anya\\_meadow@i.ua](mailto:anya_meadow@i.ua)) and Péter Török: ([molinia@gmail.com](mailto:molinia@gmail.com)).

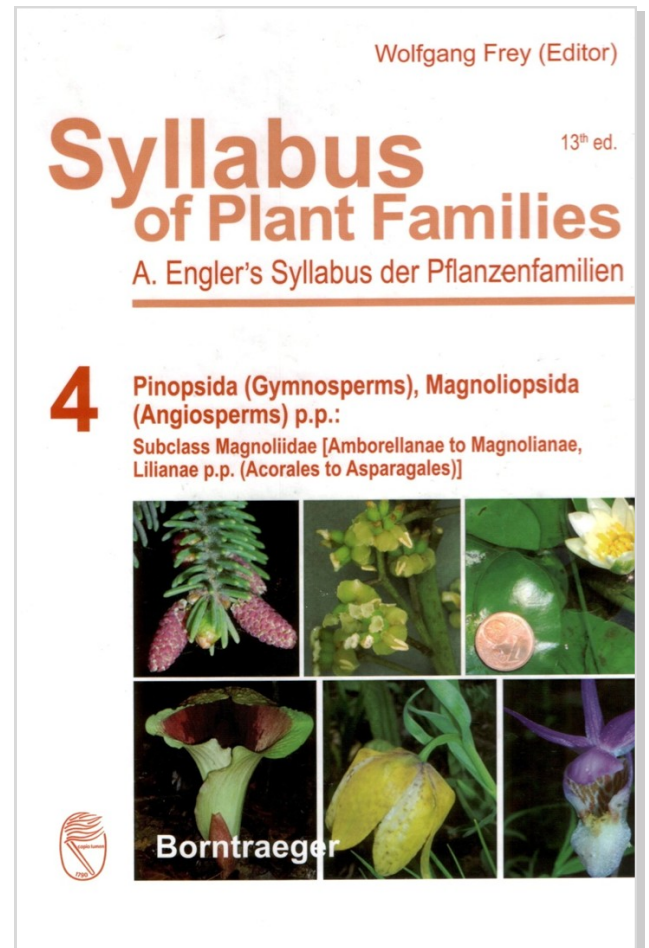
Fischer, E., Frey, W. & Theisen, I. (2015) [Eds.]: **Syllabus of Plant Families –Adolf Engler’s Syllabus der Pflanzenfamilien. Part 4: Pinopsida (Gymnosperms) Magnoliopsida (Angiosperms) p.p.: Subclass Magnoliidae [Amborellanae to Magnolianae, Liliaceae p.p. (Acorales to Asparagales)]. Orchidaceae.** 13. edition, XI + 495 pages, Borntraeger, Berlin. Price: 139.00 € (hardcover). ISBN 978-3-443-01087-4.

The book under review is a new volume of the 13th edition of the “Syllabus of Plant Families”. It restart took place in 2009 after a long break from the part 3 “Bryophytes and seedless Vascular Plants”\*. In 2012 it followed by Part 1/1 “Blue-green Algae, Myxomycetes and Myxomycete-like organisms, Phytoparasitic protists, Heterotrophic Heterokontobionta and Fungi p.p.” and in 2015 by Part 2/1 “Eukaryotic Algae [Glaucobionta, Heterokontobionta p.p., Chlorarachniophyta, Euglenophyta, Chlorophyta, Streptophyta p.p. (except Rhodobionta)]”.

The present volume contains detailed information of the world-wide morphological and molecular diversity of the Gymnosperms and the first part of the Angiosperms [Magnoliidae: Amborellanae to Magnolianae, Liliaceae p.p. (Acorales to Asparagales)].

In describing the Gymnosperms, including a wide variety of extinct organisms, the classic anatomical and morphological data are supplemented with the results of modern molecular studies, as well as the numerous new discoveries of fossils made during the last decade.

With regard to the Angiosperms, Engler’s Syllabus is an attempt to provide comprehensive survey covering all families and genera of angiosperms in two volumes arranged according to the most recent phylogenetic system of APG III (2009). In this first volume (Part 4 of the Syllabus) all families and genera of Magnoliids are described. The monocotyledonous families are covered by the orders Acorales and Alismatales as well as all groups of Liliids orders and families (Petrosaviales, Dioscoreales, Pandanales, Liliales and Asparagales). It should be noted that the last two groups include a large number of rare and endangered species of the Eurasian grasslands, which attract special attention of researchers. Many taxonomic groups in the present system have undergone substantial revision. This is especially true for the Orchidaceae family, one of the two most species-rich families of plants. The remaining monocotyledonous



groups (Arecales, Commelinales, Poales, Zingiberales and Dasypogonales) and the core eudicotyledons will be treated in Part 5 of the Syllabus of Plant Families.

Syllabus of Plant Families is a mandatory reference for students, experts and researchers from all fields of biological sciences, particularly botany. This is not only an excellent reference book, but also the fundamental work, allows a better understanding the relationship between different groups of organisms in the historical, evolutionary, environmental and many other aspects.

Anna Kuzemko, Uman' Ukraine

[anya\\_meadow@i.ua](mailto:anya_meadow@i.ua)

\* A review of this book was published by Jürgen Dengler in the EDGG Bulletin #21 (December 2013).



# Forum

## Ukraine has created a new national park – “Nyzhnodniprovskiy”

A striking result of work in the environmental sector in Ukraine in 2015 was the creation of Nyzhnodniprovskiy National Park. Given the high value of this area for nature, this event is not only of great importance for Ukraine, but also of international importance.

Nyzhnodniprovskiy National Park was established by the Decree of the President of Ukraine on Nov. 24, 2015 (Decree № 657/2015). Now the technical work will be carried out to arrange the organization of the park.

The new National Park has a total area of 80,177.8 ha, including 14,479.8 hectares owned by the National Park and 65,698.0 hectares that are managed by the National Park whilst remaining the property of their original landowners. The National Park are located in the territories of Beryslav, Bilozerska, Gola Prystan and Tsiurupynsk districts, as well as the cities of Kherson and Nova Kakhovka of Kherson region.



*Semidesert steppe on the Loess outcrops of the right bank terrace of the Dnipro. Photo: Ivan Moysienko*

The National park stretches 120 km west to east from the dams of the Kakhovka Power Plant to the confluence of the Southern Bug into the estuary (lyman) of the Dnipro River

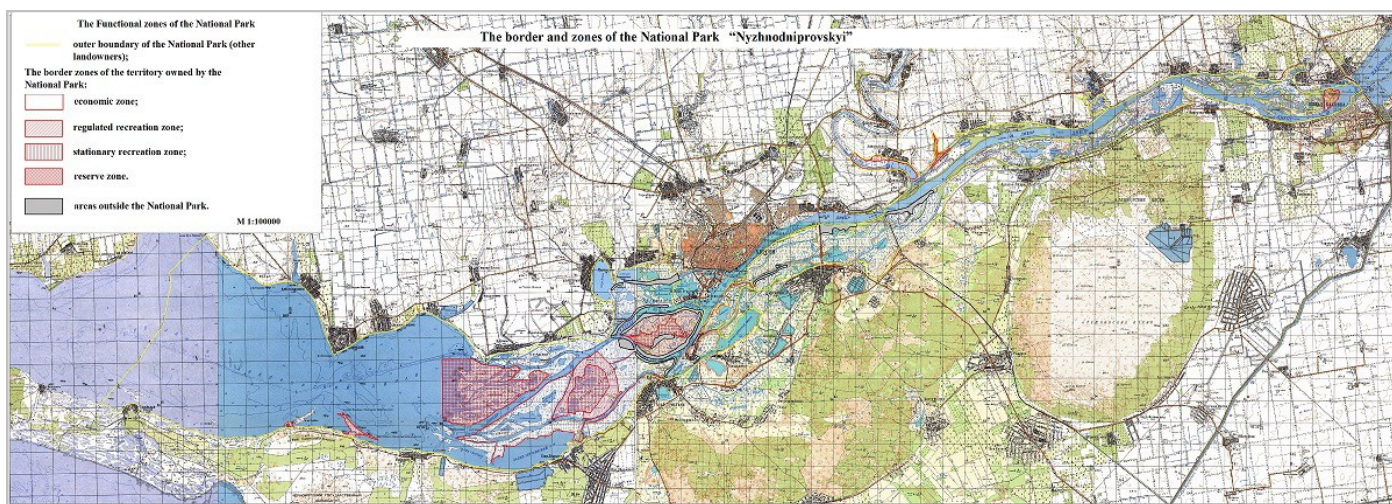


*Steppe slope with limestone outcrop on the terrace of the right bank of the Dnipro. Photo: Ivan Moysienko*

(the western boundary of the Park runs along the Dniprovskiy lyman on the border of the Kherson and Mykolaiv regions). Three types of wetlands can be found along the length of the river: the floodplain of the Dnipro about 50 km long and 2.5-4 km wide, the delta of the Dnipro is about 50 km long and 4-11 km wide and the Dnipro river lyman is over 25 km long, 7- 17 km in width. The Dnipro floodplain wetlands contain several large and numerous small river branches (local name `ieryk`), as well as many large and small lakes and islands.

The park is characterized by a considerable variety of natural ecosystems. The Dnipro wetland ecosystems (various ponds, marshes, meadows, floodplain forests) are replaced on the eastern bank of the Dnipro by terraces with true steppe and limestone outcrops, and on the western bank by sand steppes and forest groves (Ukrainian name `kolky`). The National Park was created on the basis of scientific evidence collected by Kherson State University back in 2009. In search of a compromise with the landowners, the planned area of the park changed repeatedly during these 6 years. The 2009 surveys showed that there are more than 1500 species of vascular plants, more than 1,000 invertebrate aquatic animals, 67 species of fish, 9 species of amphibians, 9 species of reptiles, 258 species of birds, and 40 species of mammals within the area of the park (these and other figures are as of 2009 for an area of 105 700, 06 ha, and require clarification due to changes in the area of the park). 350 representatives of biota are included in different





*The map of the Nyzhnodniprovskyi National Park* (<http://ecology.ks.ua/inc/editor/spaw2/uploads/images/>)

lists of protected species, including 62 species of plants and mushrooms, and 288 species - animals. Of the species present in the National Park, 147 are listed in the Red Book of Ukraine, including 29 species of plants and mushrooms, and 118 species of animals. These include *Aldrovanda vesiculosa*, *Nymphoides peltata*, *Epipactis palustris*, *Anacamptis palustris*, *Salvinia natans*, *Stipa borysthena*, and *Trapa natans*. Of the plant communities in the park, 21 are listed in the Green Book of Ukraine, including *Aldrovandeta vesiculosae*, *Trapeta natantis*, *Batrachietia rioni*, *Nymphaeeta albae*, *Nuphareta lutea*, *Ceratophylleta tanaitici*, *Ceratophylleta submersii*, *Nymphoideta peltatae*, *Potamogetoneta sarmatici*, *Lemneta gibbae*, and *Salvinieteta natantis* (Khodosovtsev et al. 2011).

The National Park is part of the Dnipro ecological corridor of the National Ecological Network of Ukraine. The area of the park includes a Ramsar site (site 3UA009 - Dnipro Delta area of 33,630 hectares), an Important Bird Area (land IBA - Kosak island area of 1000 ha), and important areas for fish conservation (two areas of 12,800 ha and 40,000 ha).

The Dnipro River is very important for the region. The wetland of Dnipro is a favorite spot for locals and visitors to

the region. The creation of the park will improve conditions for tourism and recreation, facilitate the creation of new jobs for local people, and contribute to sustainable economic activity in the region.

*Ivan Moysienko, Kherson, Ukraine*

[ivan.moysiienko@gmail.com](mailto:ivan.moysiienko@gmail.com)

## Reference

Khodosovtsev O.Ye., Boiko M.F., Moysienko I.I., Ponomariova A.A., Malchikova D.S. & Pylypenko I.O. 2011. The territorial aspects of the projected national park "Nyzhnodniprovskyi". *Regional problems of Ukraine: geographical analysis and search for solutions*. Coll. Science. works. PP Vyshehmyrskyi, Kherson: 348-351.



*Leucojum aestivum*. Photo: Ivan Moysienko



*Anacamptis palustris*. Photo: Ivan Moysienko



# Forthcoming events

## 15th Meeting of the Working Group on Vegetation Databases *Vegetation databases and Resurveys*

**2-4 March 2016, Potsdam, Germany**

Meeting homepage (available from 15 January 2016): <http://www.uni-potsdam.de/vegetationdatabases2016>

## 25th European Vegetation Survey (EVS) Meeting

**13-16 April 2016, Rome, Italy**

The meeting will be hosted by Università di Roma "La Sapienza" (Emiliano Agrillo, Fabio Attorre, Laura Casella, Francesco Spada and colleagues).

Meeting homepage: <http://www.evsmeeeting2016.it/>

## Special Meeting of International Biogeography Society (IBS)

**5-6 May 2016, Beijing, China**

Meeting homepage: <http://www.biogeography.org/html/Meetings/index.html>

## 4th International Conference "Rare Plants and Fungi of Ukraine and Adjacent Areas: Implementing Conservation Strategies"

**16-20 May, Kyiv, Ukraine**

The conference will be hosted by O.V. Fomin Botanical Garden of Taras Shevchenko National University of Kyiv

e-mail: [redbookconference@i.ua](mailto:redbookconference@i.ua)

## 59th Symposium of the International Association for Vegetation Science (IAVS)

*Conservation of Plant Communities: From Environmental Drivers to Ecosystem Services*

**12-17 June 2016, Pirenópolis, Brazil**

The venue is in the central region of Brazil, in a Cerrado (savanna) landscape.

Conference homepage: <http://iavs2016.org/59th-Annual-Symposium/Home.aspx>

## 9th Eurasian Dry Grassland Field Workshop

*Biodiversity patterns of dry grasslands at the meeting point of Central Europe and the Balkans*

**2-9 July Serbia, 2016**

More information at the pages 3-9

## 46th Annual Meeting of the Ecological Society for Germany, Austria and Switzerland (GfÖ)

*150 years of ecology - lessons for the future*

**5-9 September 2016, Marburg, Germany**

Meeting homepage: <http://www.gfoe-2016.de/>

## 13th Eurasian Dry Grassland Conference

*Management and Conservation of Semi-natural Grasslands: from Theory to Practice*

**20-24 September 2016, Sighişoara, Romania**

The meeting will be hosted by Fundația ADEPT and Babes-Bolyai University

(first call of the conference published in the EDGG Bulletin#28)

## 8th Biennial International Biogeography Society (IBS) Conference

**9-13 January 2017, Bahia, Brazil**

Conference homepage: <http://www.biogeography.org/html/Meetings/index.html>

## 26th European Vegetation Survey Meeting

**spring 2017, Bilbao, Spain**

The meeting will be hosted by University of the Basque Country (Javier Loidi and colleagues).

The meeting webpage is not yet available.

## 60th Symposium of the International Association for Vegetation Science (IAVS)

**20-25 June 2017, Palermo, Italy**

The meeting webpage is not yet available.

## 27th European Vegetation Survey Meeting

**spring 2018, Wrocław, Poland**

The meeting will be hosted by University of Wrocław (Zygmunt Kącki and colleagues).

## 61th Symposium of the International Association for Vegetation Science (IAVS)

**23-27 July 2018, Bozeman (Montana), U.S.A.**

The meeting webpage is not yet available.



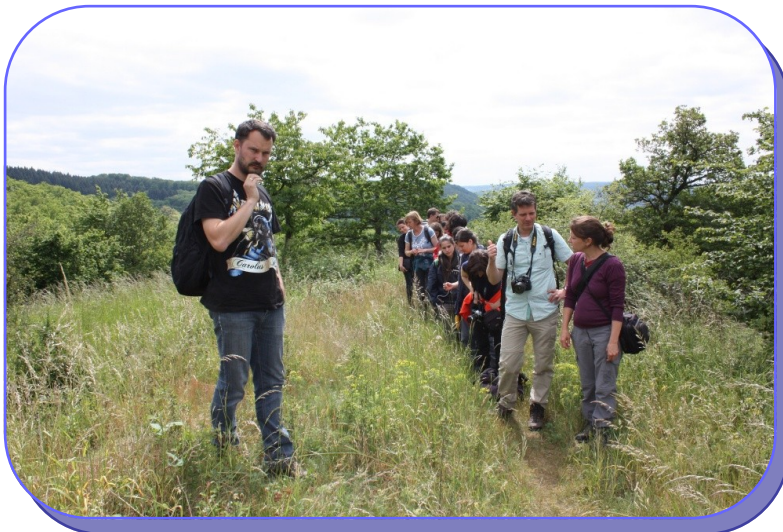
*Subalpine meadow with *Leucanthemum magaritae*, *Knautia arvensis* and *Phleum hirsutum* in the Malá Fatra National Park, Slovakia. Photo: Jürgen Dengler*



# EDGG in 2015

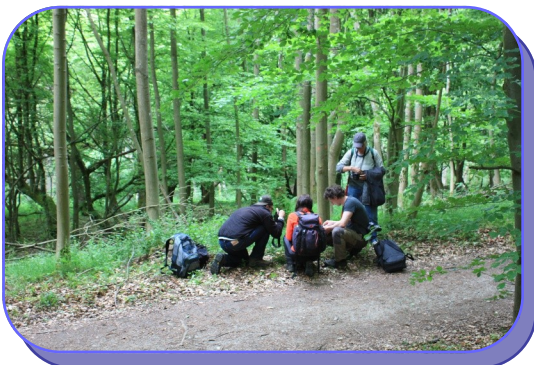
*The year 2015 was full of events that took place within the framework of EDGG. To remember some of them, we offer you a series of snapshots taken by Piotr Chmielewski, Jürgen Dengler, Itziar García, Natalya Ivanova, Monika Janišová, Zygmunt Kącki, Anna Kuzemko & Denys Vynokurov.*

## *EDGG Meeting in Germany*



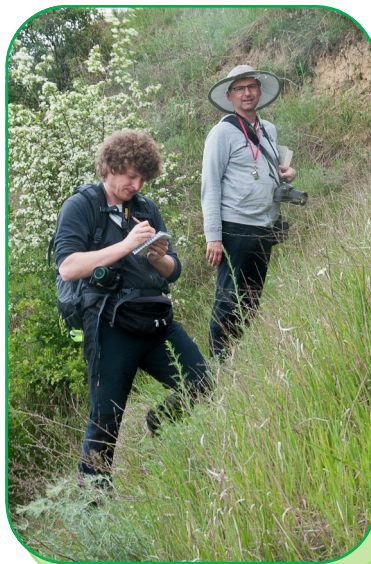


## *EDGG Meeting in Germany*





## *EDGG Pre-expedition in Poland*





## EDGG Field Workshop in Poland





## *EDGG Field Workshop in Poland*





# EDGG songs

With this section, the contents of which can also be found in conjunction with the video published in our Facebook group, we want to provide the lyrics and the melody of nice and easy songs of diverse origins, somehow connected with grasslands or our activities of the Eurasian Dry Grassland Group (mainly the EDGG Field Workshops). We also plan to sing these songs again and again during our future activities and meetings. You are invited to send us your suggestions (just use the e-mails of the editors) what would you like to sing or hear, and to provide lyrics and audiorecords for the Bulletin and Facebook.

## Щедрик

Щедрик, щедрик, щедрівочка,\*  
Прилетіла ластівочка,  
Стала собі щебетати,  
Господаря викликати:

"Вийди, вийди, господарю,  
Подивися на кошару,  
Там овечки покотились,  
А ягнички народились.

В тебе товар весь хороший,  
Будеш мати мірку грошей.  
В тебе товар весь хороший,  
Будеш мати мірку грошей.

Хоч не гроші, то полова,  
В тебе жінка чорноброва".  
Щедрик, щедрик, щедрівочка,  
Прилетіла ластівочка.

\* the custom in Ukrainian celebration of New Year, when girls visit houses, praise masters in songs (shchedrivochka) and get gifts for it. Still practicing today

## Shchedryk (Carol of the Bells)

from: <http://lyricstranslate.com/>

Shchedryk shchedryk shchedrivochka \*  
a little swallow flew  
began twittering  
calling the master

"come out, come out, master,  
look on the shelter to sheep,  
sheep have yeanned  
lambs were born

you have all the good commodity  
you will have a lot of money  
you have all the good commodity  
you will have a lot of money

but money is nothing,  
cause you have a wife with black brows"  
Shchedryk shchedryk shchedrivochka \*  
a little swallow flew

*The video record of this Ukrainian song recorded during the EDGG Field Workshop in Navarra (June 2015)  
you can find at: <https://www.facebook.com/monika.janisova.1/videos/10205742654668643/?theater>*



*Grassland bells. Photos: Jürgen Dengler*





*Winter grasslands with frozen forbs waiting for their researchers. Photo: Jürgen Dengler*

**Bulletin of the EDGG**, official organ of the Eurasian Dry Grassland Group (EDGG)  
ISSN 1868-2456

The Bulletin is published quarterly at the Biocentre Klein Flottbek, University of Hamburg, c/o Jürgen Dengler, Ohnhorststr. 18, 22609 Hamburg, Germany. It is sent to all members of the group (1127 members from 64 countries as of 23 December 2015) and together with all previous issues, it is also freely available at <http://www.edgg.org/publications.htm>. Bulletin 29 (2015) of the EDGG was published on 23 December 2015.

**Editors-in-Chief:** Anna Kuzemko (Uman', Ukraine, [anya\\_meadow@i.ua](mailto:anya_meadow@i.ua)), Monika Janišová (Banská Bystrica, Slovak Republic, [monika.janisova@gmail.com](mailto:monika.janisova@gmail.com)), Idoia Biurrun (Bilbao, Spain, [idoia.biurrun@ehu.eus](mailto:idoia.biurrun@ehu.eus)),

**Members of the Editorial Board:** Didem Ambarlı (Düzce, Turkey), Jürgen Dengler (Bayreuth, Germany), Laura Sutcliffe (Göttingen, Germany), Péter Török (Debrecen, Hungary), Stephen Venn (Helsinki, Finland), Michael Vrahnakis (Karditsa, Greece)

The copyright of the included texts, photographs, and other figures remains with their authors. If you wish to re-use them or parts of them, please, obtain the written consent of the authors first.

**Important dates:** The deadline for Bulletin 30 is 29 February 2016

Bulletin 30 to appear: March 2016

Bulletin 31 to appear: June 2016