Bulletin 3

of the European Dry Grassland Group

Introduction

In this third Bulletin issue, we present you detailed information on this year's EDGG meeting, which will soon start in Halle, Germany, hoping that we will meet many of you there. Additionally, a first announcement of the EDGG meeting in Smolenice (Slovakia) in 2010 is provided. The beauty and diversity of European dry grasslands is illustrated by three contributions from our members, devoted to interesting localities in the southern Ural mountains, south-western Turkey and southern Slovakia. Finally yet importantly, we publish several reviews of relevant books focussing on dry grassland ecosystems. Note that for the first time in our Bulletin we use the winning EDGG logo designed by Anna Kuzemko. We hope that you will spend a pleasant time reading our Bulletin even during the peak of growing season.

Monika Janišová, Jürgen Dengler, Solvita Rūsiņa

Content

June 2009

ISSN 1868-2456

European Dry Grassland Group

The European Dry Grassland Group (EDGG) is a network of dry grassland researchers and conservationists in Europe. As an informal organisation 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 dry grasslands beyond national borders;
- ♠ to stimulate active cooperation among dry grassland scientists (exchanging data, common data standards, joint projects).

To achieve its aims, EDGG provides four facilities for the information exchange among dry grassland researchers and conservationists:

- ♠ **the Bulletin of the EDGG** (published quarterly);
- ♠ **the EDGG homepage** (www.edgg.org);
- ♠ e-mails via our **mailing list** on urgent issues;
- ♠ **the European Dry Grassland Meetings**, organized annually in different places throughout Europe.

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

Responsibilities of the chairs:
Jürgen Dengler dengler@botanik.uni-hamburg.de**:** membership administration, book review editor, contacts to other organisations.
Monika Janišová monika.janisova@savba.sk**:** editorship of the EDGG Bulletin.
Solvita Rūsiņa rusina@lu.lv**:** editorship of the EDGG homepage.

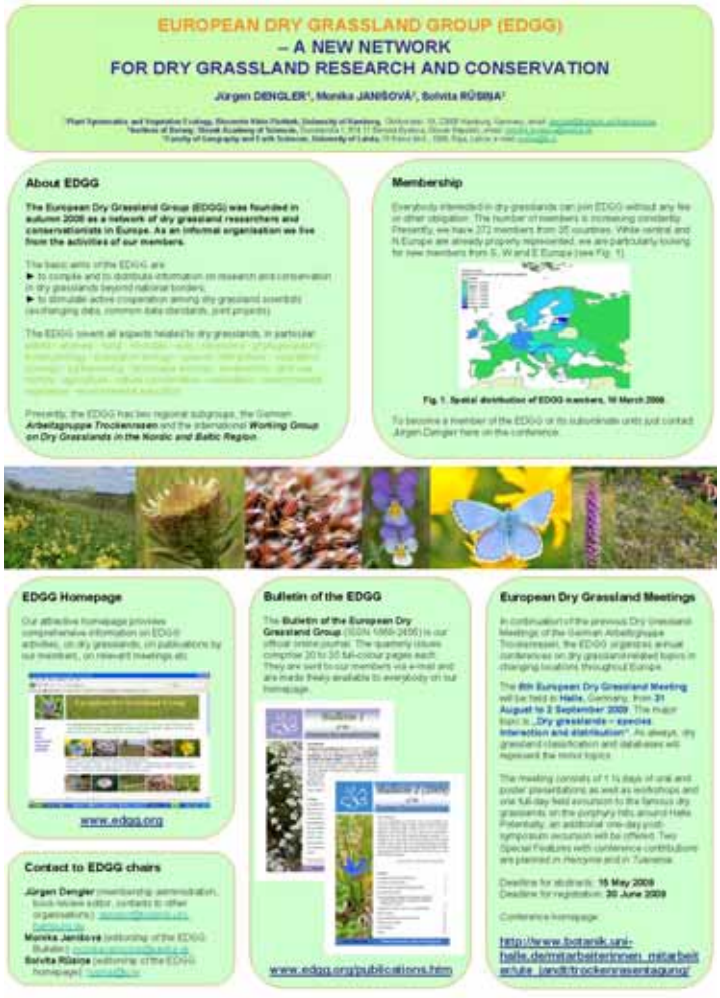
To become a member of the European dry grassland Group or its subordinate units (German Arbeitsgruppe Trockenrasen, Working Group on Dry Grasslands in the Nordic and Baltic Region), please write an e-mail to Jürgen Dengler including your complete address and specifying which of the groups you want to join. The detailed information you can find at: http://www.edgg.org/about_us.htm.

Past activities

18th Workshop of the European Vegetation Survey (EVS) in Rome

Rome, Orto Botanico, location of the EVS workshop. Photo: J. Kochjarová.

In March 25-28 2009 the workshop of the European Vegetation Survey took place in Rome (Italy) focussing on thermophilous vegetation. The mid-workshop excursion led to the Lake of Bracciano Nature Reserve (see photos below). The post-workshop excursion led to the Monte Gargano National Park (see photos on the next page). Alltogether, 149 participants from 24 countries took part in the workshop.



An excellent organisation, friendly atmosphere, high-quality scientific contributions and good weather resulted in a successful and pleasant scientific event. The posters, photos from the excursion and even the songs from the farewell party can be downloaded from: http://www.evsitalia.eu/18°%20EVS%20Workshop.htm. **Our special thanks belong to Francesco Spada and the organizing commitee.**

The EDGG presented a poster (see the previous page) which attracted many readers and several new EDGG members. Several EDGG members presented talks and posters on dry grassland topics.

During the meeting the invitation to the next EVS workshop was presented by Hungarian colleagues. The 19the EVS should take place in Pécs in April 2010.

Dry grasslands in the Gargano Nationalpark with Iris pseudopumila (top of the page), Orchis papillionacea (bottom left) and Ophrys tenthredinifera (bottom right). Photos: J. Dengler.

MARTIN-LUTHER-UNIVERSITÄT
HALLE-WITTENBERG

eDGG

Dry grasslands–
species interactions and distribution

6th European Dry Grassland Meeting:
Monday, 31st of August to Wednesday, 2nd of September 2009
in Halle (Saale), Germany

General information

The meeting organized in the framework of the European Dry Grassland Group will take place in Institute for Geobotany and Botanical Garden in Halle/Saale, located near the city centre. The main topic of the meeting is „dry grasslands – species interactions and distribution". We invite all interested persons from European countries to present talks or posters related to this topic. This includes contributions from small-scale population biology studies at selected dry grassland sites up to large-scale dry grassland vegetation studies covering the whole distribution range of syntaxa or species groups. Our main focus is on plant species occurrences and interactions, but studies involving other organismic groups are also welcome. Additionally, we encourage oral or poster presentations on large-scale classification of dry grasslands and classification methods. Reports on national or regional vegetation databases containing dry grasslands relevés are equally welcome.
Like previous workshops, the conference will start with a workshop about databases and classification of dry grassland vegetation on Monday afternoon. -The meeting will continue on Tuesday with lectures and a poster session dealing with species interactions and distribution in dry grasslands. For the third day, we will organize an excursion to visit different types of dry grassland on porphyry hills in the surroundings of Halle. Participants, who want to present a lecture or a poster are kindly requested to submit a **short abstract until June, 15th 2009**. In case too many applications for oral presentations are submitted, we may ask to present some of the contributions as a poster. The main language of the meeting will be English, but possibly a meeting on the progress of the German working group will be held in German.

Conference fee is **45 Euro** (accomodation not included).

Thanks to financial support of the Geobotanik **"Floristisch-Soziologische Arbeitsgemeinschaft"** we will be able to offer students and researchers with low budget a reduction of fees and/or participation on travel costs. Applicants should send an abstract of the planned contribution to the organisers as soon as possible (latest until **May 31th 2009**).

Floristisch-soziologische Arbeitsgemeinschaft e.V.

Excursion

Dry grassland vegetation of the porphyry outcrops near Halle

The plant cover of the porphyry landscape northwest of Halle forms a mosaic of strongly contrasting vegetation units. These are characterized by a high species diversity and the presence of numerous rare and endangered plants. The vegetation is geobotanically characterized by an overlapping of continental, subatlantic, and widespread Central-European species and consists of atlantic-subatlantic dwarf-shrub heaths (*Euphorbio-Callunetum*) as well as (sub)continental dry and semi-dry grassland communities (*Thymo-Festucetum*, *Filipendulo-Helictotrichetum*, *Festuco-Brachypodietum*, *Festuco-Stipetum* etc.). Many floristic elements prevail outside central Germany and represent outposts of other plant-geographic regions. Especially at porphyry outcrops and the steep slopes on the bank of the Saale river near Halle they form characteristic vegetation types.

Reasons for the high diversity are site-dependent changes in edaphic and microclimatic factors as well as the macroclimate of the rain shadow region southeast of the "Harz" mountain (Central German dry region: mean annual precipitation: 473 mm; mean annual temperature: 9.2 °C). The bedrock is mainly porphyric covered with Loess deposits from the last ice age. Natural and anthropogenic erosion forms a nearly naturally fragmented landscape. The rocky outcrops of different size and origin are embedded within more or less intensively used farmland (fields, fallows, meadows). The different small-scale environmental factors affect the variation in the vegetation mosaic, too. Especially small-sized outcrops show a considerable "edge"-effect, indicated by a high number of ruderal species.

For the protection of species-rich xerothermic vegetation it is necessary to reintroduce the traditional land use by sheep grazing which was stopped due to economical reasons in 1990. A planned biomonitoring of the vulnerable plant communities could be useful to observe the change of vegetation in time and space.

Contact

Dr. Ute Jandt & Dr. Monika Partzsch
Institute for Biology/Geobotany and Botanical Garden
Martin-Luther-University Halle-Wittenberg, Am Kirchtor 1, 06108 Halle
Tel. 0345 55 26412 Fax 0345 55 27228
Email: ute.jandt@botanik.uni-halle.de or monika.partzsch@botanik.uni-halle.de

Homepage with further details:
http://www.botanik.uni-halle.de/mitarbeiterinnen_Mitarbeiter/ute_jandt/trockenrasentagung/

Registration form for download from internet:
http://www2.biologie.uni-halle.de/bot/dry_grasslands/Anmeldung2009_e1.doc

Additional excursion

A post-conference excursion on September, 3rd 2009 will only be offered if a sufficient number of participants is interested. We intend to offer a visit to dry grasslands in the Unstrut area located at about one hour travelling time from Halle. The area is not only famous for species-rich dry grassland types,

Thermophilous grasslands with Dictamnus albus (Neue Göhle Freyburg/Unstrut). Photo: M. Partzsch

Publication opportunities

We have been offered the possibility of submission of selected contributions for publication in Special Features of the two geobotanical journals **Hercynia** (for regional topics) and **Tuexenia** (for supra-regionally relevant topics). Further details on these publication opportunities will be provided at the conference home-

Porphyry outcrops northwest of Halle/Saale. Photo: M. Partzsch

Gagea bohemica (Mücheln); and Pulsatilla vulgaris (Gimritz). Photos U. Jandt

Dry grassland stand with Muscari tenuiflorum (Lunzberge northwest of Halle). Photo: U. Jandt

Registration

6th European Dry Grassland Meeting – species interactions and distribution; Monday, 31st of August to Wednesday, 2nd of September 2009

Halle/Saale

degree	name, first name
institution	
street	
postal code	city
country	phone
email	

I want to participate in the conference on dry grasslands in Halle/Saale from 31/08/2009 to 02/09/2009.
I want to join the following activities:

☐ conference on dry grasslands

☐ Excursion to porphyry hills

☐ guided city tour

☐ I would be interested in participating in an additional whole day excursion on September 3rd, with additional costs of about max. 20 Euro (will be organised only if a sufficient number of people wants to participate)

☐ I have transferred the conference fee of **45 Euro** to the following banc account: bank account owner: Ute Jandt, bank name: CC-Bank Halle, Blz: 31010833, bank account number: 6226207920, purpose "dry grassland 2009 + your name"
IBAN: DE27 3101 0833 6226 2079 20 BIC: CCBADE31

I want to contribute the following scientific presentation

author(s):
title :

☐ poster ☐ oral presentation

a summary must be submitted via email to **ute.jandt@botanik.uni-halle.de** until 15/06/2009

☐ I want to join the EDGG in order to receive the Buletins of the EDGG and its newsletters. My email address is: .....

please return this registration form until 15/06/2009 to
email: ute.jandt@botanik.uni-halle.de or fax: +49-345-5527228 or mail: Dr. Ute Jandt, Institut für Geobotanik und Botanischer Garten, Am Kirchtor 1, D-06108 Halle, Germany

The 7th European Dry Grassland Meeting

28.- 31. May 2010

Smolenice Congress Centre, Slovak Republic

FIRST ANNOUNCEMENT

Organizers: European Dry Grassland Group; DAPHNE - Institute of Applied Ecology, Slovakia; Institute of Botany, Slovak Academy of Sciences, Slovakia.

Main topic of the meeting:
Succession, restoration and management of dry grasslands

Subtopics: a) succession and restoration in dry grassland communities, b) detection of „favourable conditions" of dry grassland habitats, c) management models for grassland habitats, d) species invasions and expansions in dry grasslands, e) classification of successional stages and degraded communities.

The meeting will be held in Smolenice near Trnava (Western Slovakia) located about 60 km from the capital city Bratislava in north-eastern direction on the eastern foothills of the Malé Karpaty Mts. The castle of Smolenice (figure right) shelters the Congress Centre of the Slovak Academy of Sciences where the meeting will take place. The participants can be accommodated directly at the place. In the Congress Centre 82 beds are available (in single-, double- and three-bed rooms). In the restaurant premises, 120 seats for catering are available. Adjacent English park, well included into mountain forest edge, offers numerous possibilities for walking to the visitors.

The castle in Smolenice, place of the 7th EDGG meting in 2010.

Preliminary time schedule:

27.5. arrival and dinner possible
28.5. arrival and registration, lectures and business meetings
29.5. lectures and poster sections
30.5. excursion (Dry grasslands of Považský Inovec, Tematín)
31.5. excursion and departure (Species rich semidry grasslands of Biele Karpaty Mts., Vrbovce)
1.6. breakfast possible, departure, optional lift to Bratislava by bus and short excursion to Devínska Kobyla (3-4 hours) available

Contacts:

Monika Janišová, Institute of Botany, Ďumbierska 1, 974 11 Banská Bystrica, e-mail: monika.janisova@savba.sk

Katarína Hegedüšová, Iveta Škodová, Institute of Botany, Dúbravská cesta 14, 845 23 Bratislava, tel/fax: .+421252968508, +421902319829, e-mail: katarina.hegedusova@savba.sk, iveta.skodova@savba.sk

Locality Bôrovište in the Area of European importance Tematínske vrchy - destination of Excursion 1. Photo: M. Janišová.

Excursion 1: Dry grasslands of Tematínske vrchy (Považský Inovec Mts.)

The Area of European importance Tematínske vrchy is built by calcareous bedrock, mostly triassic dolomites and has a very warm and dry climat with a distinct period of summer draughts limiting for distribution of living organisms. The area hosts a wide variety of dry grassland communities on calcareous bedrock (pannonian rupicolous grasslands, dealpine dry grasslands, etc.) as well as numerous rare and endangered plant and animal species (*Daphne cneorum*, *Onosma visianii*, *Anacamptis pyramidalis*, *Limodorum abortivum*, *Tibicen plebejus,* etc.). At the same time the area is a suitable place for presenting the effects of succession, afforestation by non-native woody species (*Pinus nigra*, *Fraxinus ornus*) and overgrazing by introduced large herbivores (muoflons) on various grassland communities.

Tematínske vrchy, Festuco pallentis-Caricetum humilis association. Photo: M. Janišová.

Tematínske vrchy, Minuartio setaceae-Seslerietum calcariae association with Phyteuma orbiculare. Photo: M. Janišová.

Excursion 2: Species rich semi-dry grasslands of the White Carpathian Mts. (Biele Karpaty Mts.) in Vrbovce

Biele Karpaty Mts. (White Carpathian Mts) are situated along the border between Slovakia and the Czech Republic. Meso- and subxerophilous grasslands of this region are famous especially for their great species richness - up to 80 species of vascular plants may occur in a plot of just 25 m^2. In the surroundings of the village Vrbovce there is a lot of lonely houses called "kopanice" with a mosaic of small arable fields, orchards and grasslands. Near such settlements beautiful species rich meadows occur belonging especially to the association *Brachypodio pinnati-Molinietum arundinaceae* from the alliance *Bromion erecti* (figure left). These stands are very valuable for the occurrence of many endangered and rare plant species, especially of the orchid family (*Orchideaceae*).

Biele Karpaty Mts., Vrbovce - destination of Excursion 2. Species rich meadows of Žalostiná. Photo: J. Košťál.

Excursion 3: Dry grasslans of Devínska Kobyla (Malé Karpaty Mts.)

The unique territory of the Devínksa Kobyla (National Nature Reserve) is situated nearby capital city of Bratislava. It is well known paleontological and geological site with specific, rare and rich species steppic flora and fauna, which represents one of the Natura 2000 sites and Important Plant Areas. From the phytosociological point of view, the prevailing vegetation types are natural and semi-natural communities of sub-mediterranean xero-thermophilous oak woods (*Corno-Quercetum, Pruno mahaleb-Quercetum pubescentis*), colline limestone grasslands (*Poo badensis-Festucetum pallentis*, *Festuco pallentis-Caricetum humilis, Festuco vallesiacae-Stipetum capillatae*, *Polygalo majoris-Brachypodietum pinnati*) and Pannonian fringe vegetation (*Geranio sanguinei-Dictamnetum albae*).

Pulsatilla grandis and Iris pumila in The castle in Smolenice, the National Nature Reserve Devínska Kobyla. Photo: K. Hegedüšová.

Locality Sandberg in the National Nature Reserve Devínska Kobyla - destination of Excursion 3. Photo: K. Hegedüšová

Other forthcoming events

Jahrestagung 2009 der Floristisch-soziologischen Arbeitsgemeinschaft

26–29 June 2009, Salzburg, Austria

Conference homepage: http://www.tuexenia.de/index.php?id=8

European Conference 2009 of the International Association for Landscape Ecology (IALE)

12–16 July 2009, Salzburg, Austria

Main topic: **European Landscapes in Transformation: Challenges for Landscape Ecology and Management**

Conference homepage: http://www.iale2009.eu/

Plant cover evolution in the natural and cultigenic environment

27–30 October 2009, Uman, Ukraine

International Scientific Conference will be held in National dendrological park "Sofiyivka" NAS of Ukraine

Sessions of the conference:

1. Species evolution in the nature and in the conditions of introduction.

2. Evolution of the plant cover.

3. Evolution of the reproductive systems.

4. Evolution of cultivated plants in the breeding experiment.

5. Conjugate evolution in the system "Owner – parasite".

6. Didactic issues of the evolution theory teaching.

Languages: Ukrainian, Russian, English.

Deadline for registration and abstract submission is May 10, 2009

Contact: konf_darvin@ukr.net

9th Meeting on Vegetation Databases

"Vegetation Databases and Climate Change"

24–26 February 2010, Hamburg, Gemany

Biocentre Klein Flottbek, University of Hamburg, Hamburg, Germany

Contact: Jürgen Dengler (dengler@botanik.uni-hamburg.de) and Manfred Finchkh (mfinckh@botaink.uni-hamburg.de).

Iris peudopumila. Photo: J. Dengler

The diversity of steppe communities of South Ural (Republic of Bashkortostan, Russia)

Steppe communities of the South Ural (Fig.1), as well as other areas of Europe, have been kept only in conditions of the relief, inconvenient for arable. The basic areas of them are located in the steppe and forest-steppe zones of the Bashkirian Trans-Ural and connected to gentle slopes of the Ural peneplain. In the region of the Bashkirian Cis-Urals steppes are distributed by small sites in a forest-steppe zone only on slopes of the southern expositions.

The Republic of Bashkortostan (RB) is located between 52-56° latitude and 53-60° longitude, its extent from the north to the south - 550 km, from the west to the east is 450 km, occupying the area of 143 sq.km. The continental climate with sharply expressed difference of monthly average

temperatures with the coldest month of January and the warmest one of July is characteristic for the territory of republic. In the region of the Cis-Urals the climate is warmer and less droughty. The mid-annual temperature varies from 2° up to 2,4°C, the mid-annual quantity of precipitations is reduced from the north (500-600 mm) to the south (410-460 mm).

The study based on 720 relevés of steppes communities from forest-steppes of the Bashkirian Pre-Ural, steppe areas of the Bashkirian Trans-Ural and the forest-mountain zones. The classification of the steppes was carried out using the Braun-Blanquet approach (Westhoff, Maarel, 1978) with use of programs TURBO(VEG) and MEGATAB (Hennekens, 1995).

All steppe communities of the Republic of Bashkortostan, are belonging to the class Festuco-Brometea, with 2 orders, 4 alliances, and 18 associations, listed in the table 1.

Eighth of them represent the zonal meadow steppes (Tab.1, column 9, 10, 15) and zonal true steppes (Tab.1, column 1, 2, 7, 8, 11), the others – petrophyte (Tab.1, column 12, 14-17) calciphyte (Tab.1, column 13) and shrubs variants (Tab.1, column 5, 6) of these steppes.

Steppes of a mountain-forest zone which differ by the presence of a group of meadows and saum species (Tab.1, column 3, 4, 16, 17) are specific extrazonal type of steppe vegetation in the Southern Ural (Fig. 5).

Meadow steppes are referred to order Festucetalia valesiacae, true - to order Helictotricho-Stipetalia. Orders correspond to zonal habitats of the steppe area. So the first order is connected with the forest-steppe zone of Eurasia, the second – with the only

Fig.1 Geographic location of the study area

steppe zone of Western Siberia and Kazakhstan.

Meadow steppes and true steppes differ not only by groups of steppe and meadow-steppe species, but also by dominants species of genus Stipa. Floristic distinctions of the basic edaphic variants of the true and meadow steppes, except for calciphyte, by percipient of the forbs species (Tab.2)

Fig. 2. Association Hedysaro grandiflori-Centauretum marschallianae. Photo: S. Yamalov

References

Hennekens S.M. (1995). TURBO(VEG). Software package for input processing and presentation of phytosociological data USER'S guide. IBN-DLO Wageningen et University of Lancaster. 70 p.

Westhoff V., Maarel E. van der. (1978). The Braun-Blanquet approach. In: Whittaker, R. H. (ed.): Classification of plant communities. The Hague, pp. 287-399.

Fig. 3 (left). Association Amorio montani-Stipetum zalesskii. Photo: S. Yamalov

Fig. 4 Association Galio veri-Stipetum tirsae Photo: S. Yamalov

Table 2. Differentiating species edaphic variants of zonal steppes

True steppes			**Meadow steppes**
Variants			
Calciphyte	**Hyperpetrophyte**	**Petrophyte**	**Petrophyte**
Salvia nutans (Fig. 6) *Stipa korshinskyi*	*Orostachys spinosa* (Fig.7) *Cotoneaster melanocarpus* *Tanacetum millefolium* *Dianthus acicularis*	*Hedysarum grandiflorum* (Fig. 8) *Thymus bashkiriensis* *Artemisia frigida*	*Centaurea marschalliana* *Centaurea sibirica* (Fig. 9)
	Onosma simplicissima, Echinops ritro, Clausia aprica, Carex pediformis, Aster alpinus, Alyssum tortuosum, Silene baschkirorum, Artemisia campestris		

Fig. 5. Mountain steppe in the South Ural. Photo: S. Yamalov

Fig. 6. Salvia nutans. Photo: S. Yamalov

Fig. 7. Orostachys spinosa. Photo: A. Bayanov

Synopsis of steppe vegetation of of South Ural

Class ***Festuco-Brometea*** Br.-Bl. & Tx. ex Klika & Hadac 1944
Order ***Festucetalia valesiacae*** Br.-Bl. & Tx. ex Br.-Bl. 1950.
All. ***Festucion valesiacae*** Klika 1931
Ass. ***Poo angustifoliae-Stipetum pennatae*** ass. nov. prov.
Ass. ***Stipo pennate-Centauretum sibiricae*** ass. nov. prov.
Ass. ***Leucanthemo vulgaris-Stipetum pennatae*** ass. nov. prov.
Order ***Helictotricho-Stipetalia*** Toman 1969
All. ***Amygdalion nanae*** V.Golub in Iljina et al. 1991
Ass. ***Spiraeo crenati-Caraganetum frutex*** ass. nov. prov.
Ass. ***Spiraeo hypericifolia-Amygdaletum nanae*** Solomesch et al. 1994
All. ***Helictotricho-Stipion*** **Toman 1969**
Suball. ***Helictotricho desertori-Stipenion rubentis*** Toman 1969
Ass. ***Diantho acicularis-Orostachietum spinosae*** Schubert et al. 1981
Ass. ***Hedysaro grandiflori -Centauretum marschallianae*** ass. nov. prov. (Fig.2)
Suball. ***Artemisio austriacae-Stipenion zalesskii*** Korolyuk 2007
Ass. ***Stipetum rubentis*** Isacenko et Rackovskaja ex Korolyuk ass. nov. prov.
Ass. ***Artemisio austriacae-Stipetum lessingianae*** ass. nov. prov.
Suball. ?
Ass. ***Astragalo austriacae-Stipetum pulcherrimae*** ass. nov. prov.
Ass. ***Amorio montani-Stipetum zalesskii*** ass. nov. prov. (Fig. 3)
Ass. ***Galio veri-Stipetum tirsae*** ass. nov. prov. (Fig. 4)
Ass. ***Salvio nutanti-Stipetum korshinskyi*** ass. nov. prov.
All. ***Aconogonion alpini*** al. nov. prov.
Ass. ***Myosotido popovii-Festucetum rupicolae*** ass. nov. prov.
Ass. ***Caragano fruticis-Stipetum pennatae*** ass. nov. prov.
Ass. ***Koelerio sclerophyllae-Festucetum valesiacae*** ass. nov. prov.
Ass. ***Centaureo sibiricae-Poetum transbaicalicae*** Filinov et al. 2002

Fig. 8. Hedysarum grandiflorum. Photo: S. Yamalov

Fig. 9. Centaurea sibirica. Photo: S. Yamalov

Table 1. Synoptic table of steppe communities of South Ural

Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Number of releves	**12**	**27**	**70**	**41**	**29**	**14**	**63**	**25**	**57**	**18**	**123**	**12**	**15**	**54**	**37**	**43**	**11**
D.t. ***Stipetum lessingianae***																	
Stipa lessingiana	V	r	.	.	.	+	.	.	.	.	+	.	II	.	.	.	.
D.t. ***Stipetum rubentis***																	
Stipa zalesskii	II	V	II	V	+	.	V	III	.	.	III	II	.	IV	+	IV	.
Tanacetum uralense	.	II	.	.	+	.	+	.	r	.	r	.	.	r	.	.	II
D.t. ***Spiraeo hypericifolia-Amygdaletum nanae***																	
Amygdalus nana	.	I	.	.	V	+	+	I	I	.	+	I	.	.	.	.	.
Cerasus fruticosa	.	r	I	r	IV	II	I	I	+	I	+	.	.	r	+	r	II
Spiraea hypericifolia	.	.	r	I	III	+	r	r	.	.	r	.	.	I	.	I	.
D.t. ***Stipo pennatae- Stipetum zalesskii***																	
Stipa pennata	.	.	IV	V	II	II	V	III	V	V	III	.	+	I	IV	I	.
D.t. ***Galio veri-Stipetum tirsae***																	
Stipa tirsa	.	.	.	.	r	+	II	V	I	.	r	+	.	.	.	.	.
D.t. ***Poo angustifoliae-Stipetum pennatae***																	
Onobrychis arenaria	.	r	.	.	.	.	III	II	III	IV	II	II	+	.	III	.	.
D.t. ***Leucanthemo vulgaris-Stipetum pennatae***																	
Leucanthemum vulgare	.	.	.	.	.	.	.	.	I	IV	+	.	.	.	+	.	.
Filipendula stepposa	.	.	.	.	.	+	I	I	II	IV	r	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	III	r	.	.	.	.	.	.
Rubus saxatilis	.	.	.	.	.	+	+	r	+	III	r	.	.	.	.	.	.
D.t. ***Astragalo austriacae – Stipetum pulcherrimae***																	
Stipa pulcherrima	+	.	.	.	r	.	r	I	I	I	V	V	.	.	I	.	.
Astragalus austriacus	+	+	.	.	.	.	r	r	+	.	IV	IV	III	.	IV	.	.
D.t. ***Hedysaro grandiflori-Stipetum pulcherrimae***																	
Hedysarum grandiflorum	+	.	.	.	.	.	r	.	.	.	II	V	II	.	.	.	.
Ephedra distachya	+	I	.	.	.	.	.	.	.	.	II	III	II	r	r	.	.
D.t. ***Salvio nutans-Stipetum korshinskyi***																	
Stipa korshinskyi	III	.	.	.	.	.	.	r	r	.	II	II	V	.	.	.	.
Salvia nutans	I	.	.	.	.	.	.	.	r	.	II	II	III	.	.	.	.
D.t. ***Diantho acicularis-Orostachietum spinosae***																	
Orostachys spinosa	.	+	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.
Dianthus acicularis	.	.	+	I	.	.	I	.	r	.	+	I	II	V	I	V	.
D.t. ***Stipo pennate-Centauretum sibiricae***																	
Centaurea sibirica	.	.	V	V	.	.	r	I	+	+	II	.	.	+	V	V	V
D.t. ***Centaureo sibiricae-Poetum transbaicalicae***																	
Sedum hybridum	.	+	II	III	III	.	r	.	I	.	.	.	.	II	.	I	V
Polygonatum odoratum	.	.	IV	r	I	+	r	.	II	II	+	.	.	r	II	r	V
Artemisia armeniaca	.	I	I	.	III	II	IV	IV	III	II	+	.	.	II	.	.	V
D.t. ***Helictotricho desertori-Stipenion rubentis***																	
Onosma simplicissima	I	II	+	IV	r	+	IV	II	II	I	IV	V	II	II	V	III	.
Echinops ritro	I	III	II	V	.	.	II	II	II	I	IV	III	III	IV	IV	V	III
Silene baschkirorum	.	r	I	III	r	.	II	+	I	+	II	+	+	II	II	III	I
Potentilla arenaria	I	II	.	.	.	.	r	.	r	.	III	III	IV	+	I	.	.
Centaurea marschalliana	I	II	.	.	.	+	II	.	r	+	III	II	III	III	.	.	.
Allium rubens	.	I	I	II	.	.	I	.	+	I	II	II	I	IV	IV	V	.
Koeleria sclerophylla	.	I	+	.	.	.	I	I	r	.	II	II	II	IV	II	V	+
Euphorbia seguierana	+	+	.	+	r	.	.	.	.	.	II	III	II	II	III	III	.
D.t. ***Helictotricho-Stipeon*** and ***Helictotricho-Stipetalia***																	
Helictotrichon desertorum	I	IV	IV	IV	+	.	IV	III	II	III	V	IV	III	III	V	III	.
Festuca pseudovina	III	IV	V	II	IV	III	IV	III	IV	V	IV	III	V	IV	III	+	.
Potentilla humifusa	I	IV	V	V	.	+	V	IV	III	III	III	.	+	III	III	V	.
Poa transbaicalica	II	IV	V	V	III	II	IV	II	II	.	+	.	.	III	.	V	V
Salvia stepposa	II	II	.	.	I	III	IV	V	III	IV	IV	III	III	r	IV	.	III
Caragana frutex	IV	III	III	V	V	V	IV	III	III	I	IV	IV	IV	III	V	II	V
Spiraea crenata	+	II	.	.	IV	IV	III	II	II	.	+	.	+	II	r	.	V
Medicago romanica	II	III	.	.	.	.	IV	IV	IV	I	III	III	III	I	r	.	.
Artemisia austriaca	IV	II	.	.	I	.	II	II	I	.	II	III	IV	I	II	.	.
Artemisia sericea	.	II	IV	III	III	II	V	IV	IV	IV	II	.	+	+	I	I	IV

Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
D.t. ***Festucetalia valesiacae*** and ***Festuco-Brometea***																	
Galium verum	II	V	V	V	III	V	V	V	V	V	III	.	I	III	I	IV	V
Stipa capillata	IV	II	r	II	I	II	IV	II	II	I	IV	IV	IV	III	IV	II	.
Veronica spicata	.	II	V	V	II	I	IV	IV	IV	IV	IV	III	II	IV	IV	V	V
Festuca valesiaca	III	II	r	I	r	.	I	I	+	II	I	.	I	III	II	V	.
Koeleria cristata	V	III	.	.	.	.	IV	II	II	.	III	III	IV	II	III	.	.
Campanula sibirica	.	I	.	r	.	.	II	r	II	III	IV	III	II	II	V	II	III
Phleum phleoides	.	II	IV	II	+	+	V	IV	V	V	II	.	+	II	+	I	.
Filipendula vulgaris	.	II	V	IV	III	III	V	V	V	V	III	.	I	r	II	I	II
Seseli libanotis	+	II	V	III	III	III	III	IV	IV	IV	II	+	.	II	II	II	I
Plantago urvillei	+	II	.	.	.	.	IV	V	IV	III	III	II	+	.	.	.	.
Fragaria viridis	.	+	III	r	IV	V	V	IV	V	V	III	+	I	r	II	.	III
Amoria montana	.	r	.	.	.	.	IV	III	IV	V	II	.	.	.	I	.	.
Potentilla impolita	.	I	.	.	r	.	III	III	IV	V	I	.	+	I	I	.	I
Phlomoides tuberosa	II	II	II	r	V	V	IV	IV	IV	IV	II	.	.	r	I	.	+
Trommsdorfia maculata	.	II	r	.	.	.	IV	IV	III	IV	II	.	+	r	+	.	.
Centaurea scabiosa	+	+	.	.	r	I	III	III	IV	V	I	.	.	r	+	.	.
Poa angustifolia	.	r	I	r	I	II	II	III	III	IV	II	.	.	.	II	.	.
D.t. ***Molinio-Arrhenatheretea***																	
Elytrigia repens	I	.	II	II	II	IV	IV	III	III	IV	III	II	II	r	II	.	.
Achillea millefolium	.	r	IV	I	III	II	III	III	II	IV	II	.	.	r	I	r	.
Ranunculus polyanthemos	.	.	.	.	.	.	II	III	II	V	+	.	.	.	.	.	.
Bromopsis inermis	+	+	.	.	II	II	II	II	I	II	I	.	+	.	.	.	.
D.t. ***Trifolio-Geranietea***																	
Genista tinctoria	.	+	.	.	r	I	IV	III	III	III	I	.	.	r	II	.	.
Origanum vulgare	.	.	II	+	II	II	I	II	III	III	I	.	.	.	II	.	IV
Veronica teucrium	.	r	.	.	+	+	+	II	II	IV	r	.	.	.	.	.	.
Other species																	
Gypsophila altissima	+	II	r	.	.	.	IV	III	IV	I	IV	III	II	II	V	II	V
Vincetoxicum albowianum	.	I	I	III	II	I	II	II	II	II	II	II	+	IV	IV	I	V
Thalictrum minus	.	I	.	.	III	IV	IV	III	IV	V	IV	III	II	r	IV	.	.
Chamaecytisus ruthenicus	+	III	IV	IV	I	II	III	IV	III	IV	II	.	.	II	I	IV	V
Aconogonon alpinum	.	I	V	V	IV	III	II	II	III	II	r	.	.	+	.	II	.
Pulsatilla patens	.	III	III	+	I	.	III	III	III	II	I	.	.	II	II	.	II
Galium tinctorium	+	+	r	.	I	II	IV	III	III	IV	III	I	+	r	III	.	II
Achillea nobilis	III	III	.	.	I	.	IV	II	II	I	I	+	I	I	.	.	.
Silene chlorantha	.	II	.	.	.	.	III	II	I	.	I	.	I	+	.	.	.
Scorzonera purpurea	.	II	.	.	.	.	IV	III	III	III	II	.	I	r	+	.	.
Galium boreale	.	+	r	.	+	III	III	III	III	V	II	.	.	I	III	.	.

1. *Artemisio austriacae-Stipetum lessingianae*
2. *Stipetum rubentis*
3. *Myosotido popovii-Festucetum rupicolae*
4. *Caragano fruticis-Stipetum pennatae*
5. *Spiraeo hypericifolia-Amygdaletum nanae*
6. *Spiraeo crenati-Caraganetum frutex*
7. *Amorio montani-Stipetum zalesskii*
8. *Galio veri-Stipetum tirsae*
9. *Poo angustifoliae-Stipetum pennatae*
10. *Leucanthemo vulgaris-Stipetum pennatae*
11. *Astragalo austriacae-Stipetum pulcherrimae*
12. *Hedysaro grandiflori-Stipetum pulcherrimae*
13. *Salvio nutans-Stipetum korshinskyi*
14. *Diantho acicularis-Orostachietum spinosae*
15. *Stipo pennate-Centauretum sibiricae*
16. *Koelerio sclerophyllae-Festucetum valesiacae*
17. *Centaureo ibiricae-Poetum transbaicalicae.*

Sergej Yamalov, Bashkir State University, Ufa, Russia, geobotanika@rambler.ru
Artem Bayanov, Bashkir State University, Ufa, Russia, abayanov@bk.ru
Albert Muldashev, Institute of Biology, Russian Academy of Science, Ufa, Russia.

Remarkable dry grassland type/site

In this section, particular grassland communities or grassland sites will be introduced which are from certain point of view interesting for other EDGG members. You are invited to present your favorite grassland associations or those that are attractive in other aspects (their diagnostic species, distribution area, management and conservation), or you can simply present the picture gallery. Remarkable localities of dry grassland habitats can be introduced representing e.g. important research areas, refugies of rare and endangered species or simply places requiring special conservational measures.

In this issue, we will introduce the locality Vrchná hora from south-western part of Slovak Republic. In spite of its high biological value this locality lacks the effective conservation and the maintenance of valuable xerothermophilous communities is thus endangered by commercial activities. This is the reason why the local nature conservationist prepare a project to rescue this locality and search appropriate partners from Germany (see the call in the section Forum).

Devínska Kobyla and Sandberg - National Nature Reserve (Slovak Republic)

Devínska Kobyla and Sandberg, a well known botanical, palaeontological and geological locality, is situated near by Bratislava - the capital city of Slovakia. The protected area of National Nature Reserve (NNR) is 102 ha. It represents one of the NATURA 2000 sites and also Important Plant Area.

In term of geology, Devínska Kobyla represents a very interesting territory, remarkable especially for its Neogene fauna from the surrounding of Devínska Nová Ves village. The unique range of the Carpathians begins by the Devín castle rock on the confluence of two rivers Dunaj and Morava on territory of Slovakia.

Southern slopes of NNR are created mainly by grey limestones, dolomites and carbonate breccia. Strata are 160-180 million years old. The top of the hill Devínska Kobyla (514 m) with the same name, which is outside of reserve, is formed by Mesozoic quartzites. The sand pit Sandberg is a Neogene paleontological locality of the European importance. Its territory represents a stratotype locality for stratigrafical substage called "devín". It was discovered by sand mining. Its area is created by rock remains of Neogene Sea that covered the Vienna basin. More than 300 species of fossil organisms (algae, fungi, marine invertebrates and vertebrates, especially mammals) are known from there. Of the terrestrial ones, rare findings of primates *Dryopithecus* sp., occurs only in this locality within Slovakia (Feráková et al., 1997).

The typical feature of Devínska Kobyla and Sandberg is a high flora and also fauna biodiversity, which is affected by its unique position in the valley of the river Danube, the heterogeneity of its geological substratum, the specific climatic conditions, anthropic influence and the vicinity of the Malé Karpaty Mts.

National Nature Reserve Devínska Kobyla, castle of Devín and Hainburger Berge Mts. Photo: K. Hegedüšová.

According to the phytogeographical division of Slovakia (Futák, 1980) Devínska Kobyla belongs to the region *Pannonicum*, subregion *Eupannonicum* with close phytogeographic relationship to the Hundsheimer hills in Austria. The original vegetation was formed by oak-hornbeam forests, xerotermophilous oak forests with *Quercus pubescens* on a steep slopes with a limestone base and rocky grasslands, which are conserved in spite of anthropic influence (vineyards, orchards, grazing, burning of grasslands, afforestation by non-native trees e.g. *Pinus nigra*, *Fraxinus ornus*).

The present vegetation forms mosaic of rocky and dry grassland – steppe communities along with sub-Mediterranean xerothermophilous oak woods *Corno-Quercetum, Dictamno-Sorbetum* and *Pruno mahaleb-Quercetum pubescentis*. Altogether two thirds of the NNR are covered by forests communities. On the northern slopes beech forests as *Melico uniflorae-Fagetum* and fragments of *Carici pilosae-Fagetum* and *Carici albae-Fagetum* are developed. *Fagus sylvatica* reaches here the lowest altitudes in the Western Carpathians Mts. On screes there are stands with *Tilia cordata* and *Acer campestre,* which belong to the alliance *Tilio-Acerion*. The most frequently occurring community is *Carici pilosae-Carpinetum* with characteristic spring aspect created by *Galantus nivalis,* later replaced by *Corydalis cava*. From the non-native trees *Robinia pseudoacacia* and *Syringa vulgaris* are most common.

Campanula sibirica, Devínska Kobyla, Slovakia. Photo: K. Hegedüšová.

Scorzonera austriaca, Devínska Kobyla, Slovakia. Photo: K. Hegedüšová.

The prevailing vegetation types of the most xerophilous dry grasslands communities on a steep slopes and open sands with shallowest substrat are colline calcareous grasslands belonging to the association *Poo badensis-Festucetum pallentis.* The dominating grass is *Festuca pallens,* which is accompanied by *Fumana procumbens, Linum tenuifolium*, *Potentilla arenaria* and *Scorzonera austriaca*. Community *Festuco pallentis-Caricetum humilis* inhabits gentle slopes. *Carex humilis* is dominant there along with numerous chamaephytes and ephemeral therophytes such as *Allysum montanum, Globularia punctata, Thymus praecox, Teucryum montanum, T. chamaedrys, Jurinea mollis, Helianthemum nummularium*. On the rocky and moderately deep soils stands with *Stipa capillata* and *Festuca vallesiaca* are developed belonging to the association *Festuco vallesiacae-Stipetum capillatae.* It is dominated by-tussock grass *Koeleria macrantha* accompanied by *Bothriochloa ischaemum, Potentilla arenaria, Allium flavum* and *Tithymalus cyparissias*.

The stands with famous spring aspect created by *Adonis vernalis* belong to the association *Polygalo majoris-Brachypodietum pinnati* dominated by *Peucedanum cervaria, Inula ensifolia, Bromus erectus* or *Brachypodium pinnatum*. *Stipa joannis* and *S. pulcherima* are common there. On the southern slopes forest steppes are developed, which contain small islands of steppe, low trees and shrubs such as *Quercus pubescens*, *Q. cerris, Ulmus minor, Berberis vulgaris, Cornus mas, Crataegus monogyna, Euonymus verucosa, R. rubiginosa, Juniperus communis* and *Cerasus mahaleb.*

Ophris apifera, Devínska Kobyla, Slovakia. Photo: D. Senko.

Communities *Prunetum fruticosae* with *Cerasus fruticosa, Rosetum pimpinellifoliae* and Pannonian fringe vegetation *Geranio sanguinei-Dictamnetum albae, Peucedanetum cervariae* represent extrazonal vegetation dependent on edaphic condition and human activities, too. The most common species are *Geranium sanguineum, Dicthamnus albus, Centaurea triumfettii, Anemone sylvestris* and *Tephroseris integrifolia.* These stands are very species-rich and visually attracive, especially *Geranio sanguinei-Dictamnetum albae*. *Clematis recta, Iris variegata, Pyrethrum corymbosum* from the species of wood-steppe stands should be mentioned. On a limestone rocks grows *Rhamnus saxatilis* ssp. *saxatilis*. NNR is the unique and the only locality of this species in Slovakia. The *Poa bulbosa* communities of the open sands influenced by atrophic factors are most common in the part Sandberg. The critical endangered species *Peucedanum arenarium* occurs only here and nowhere else in Slovakia along with *Gypsophila paniculata* which is on the verge of extinction. Another species with occurrence only in the NNR Devínska Kobyla are *Arthemisia austriaca, Conryngia austriaca, Ononis pussila, Orobanche artemisiae-campestris* and *O. teucrii*

In the species composition of vegetation in NNR Devínska Kobyla xerothermophilous and calciphilous elements dominate. All of the communities host a lot of endangered and rare species. Altogether, more than 1100 vascular plant species were recorded here, 25 of them are protected by law, 376 are threatened and 33 categorized as critically endangered (CR), endangered (EN) and vulnerable (VU). 10 species are in category extinct (EX). To mention at least some of them: **CR** – *Himantoglossum adriaticum, Minuartia glaucina, Ononis pussila, Ophrys apifera, O. holoserica, O. sphegodes, Peucedanum arenarium* ssp. *arenarium, Viola ambigua*, **EN** – *Anacamptis pyramidalis, Bupleurum affine, Chrysopogon gryllus, Gypsophila paniculata, Medicago monspeliaca, Orchis tridentata* ssp. *tridentata, O. ustulata* ssp. *ustulata, Orobanche gracilis, Rhamnus saxalitis* ssp. *saxatilis, Silene conica, Stipa pulcherrima, Vinca herbacea* and **VU** – *Adonis vernalis, Cerasus fruticosa, Dictamnus albus, Fumana procumbens, Iris pumila, I. variegata, Lotus borbasii, Ophrys insectifera, Orchis morio, Pulsatilla grandis, P. pratensis* ssp. *nigricans, Scorzonera purpurea, Smyrnium perfoliatum, Stipa joannis*. This area is important also by representation of cryptogams, there are 110 registered lichen species, 100 bryophyte species and 331 fungi. Speciality of NNR is occurrence of various species and crossbreeds of the genus *Viola*.

The present state of vegetation on the Devínska Kobyla NNR is conditioned predominantly by succession. The extensively used pastures have arisen more than 2000 years ago during the Roman colonization. During the state afforestation programme many non-native species were planted, mostly *Pinus nigra*. Due to the changed soils pH many rare and endangered species. That's why volunteers and conservationists partially removed this trees from the most valuable parts of NNR. Now, the absence of grazing resulted in spreading of competitively strong grasses such as *Bromus erectus*, *Arrhenatherum elatius* and shrubs *Crataegus* sp., *Rosa* sp. div. and *Prunus spinosa*.

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Katarína Hegedüšová, Bratislava, Slovak Republic
e-mail: katarina.hegedusova@savba.sk

Kula Volcano (Turkey)

The Kula Volcano (Turkey, 38,58º N and 28,52º E) was active in the Quaternery period and recently it is inactive. The site is located 12 km west of the town of Kula and 1,5 km north of the the Izmir-Ankara highway at altitude of 750 m. This area covers about 400 km^2 and is generally bare. However there is plant cover in some areas. It consists of three basins and the schistose ridges seperating them are covered with volcanic cones and lava streams and fields. The vegetation occuring on the volcanic cone and ıts surrounding area where this survey was performed displays some difference depending on the altitude and aspect. The following succesional stages were observed on the Kula Volcano and the surrounding area: 1. Crustose-lichen stage 2. Foliose lichen stage 3. Moss stage 4. Herbaceous stage 5. Shrub stage 6. Climax. *Pinus brutia* is dominant in the climax stage. In this contribution, the developmental stages of succession and their floristic composition is given according the Braun-Blanquet method (Braun-Blanquet 1964), plant taxa names according to Davis (1965-1988).

The general process of vegetation change is called the succesion. It is the gradual change which occurs in vegetation of a given area of the earth surface on which one population succeeds the other (Tansley, 1920). Kula Volcano is very appropriate region for studying succession. It may seem that the slopes of the volcano remained bare for a long time as they were not fit initially for the occuring of vegetation. But later migrating plants were able to settle there. At the same time, there is also a direct relationship between the age of volcanism and soil forming. These stages are also clearly seen on the Kula volcanic area, E of study area. Here a soil with depth of 30-40 cm is found on the old flat basaltic lava and smoothly volcanic cone in which agricultural activities are carried out, whereas a shallower soil cover is common on the young volcanic cone which was formed 10-1200 B.P. On the other hand, soil forming is directly determined by the slope factor. Namely a soil 15-20 cm deep has been formed on north-facing slopes under the *Pinus brutia* communities in the young volcanic cone named Sandal tepe while on the south-facing slopes there is a thin soil cover 3-5 cm deep.

Climate

The study area covers approximately 400 km^2 and has a typical mediterranean climate, with dry, hot rainless summers and mild and wet winters. The average annual temperature is 14.3ºC and total annual rainfall is 584.7mm. Most rainfall is in January and average annual relative humidity is 54 % in Kula town of the Manisa. Also in the Salihli which is in the vicinity of the study area the average annual temperature is 16.2 ºC and total annual rainfall is 490.6 mm. Most rainfall is in December and annual relative humidity is 63 %. On the other hand, the lowest temperature recorded in January was -11.0 ºC in Kula and -8 ºC in Salihli.

Geology

The investigated area lies between Kula and Salihli towns of in the province of Manisa, the basement rocks consist mainly of gneisses schists and quartzites with Permo Triassic merbles in the uppermost section. Mesozoic units consists of dolomotic limestones of Jurassic and ophiolitic melange of Upper Cretaceous age. Senozoic units consists of fluvial sediments of Pliocene age overlain by andezitic lava flows with interfingering lacustrine limestones towards the top. Kula volcanics of Quaternary age flowed in three mainperiods; the initial products being ejected 1,1 million years ago. The last period of volcanism lasted until historic times. According to petrographic and petrochemical investigations, Kula lavas are alkali bazalts. Their alkali content increases becoming potassichrich first to the third period. Most of the rock types are trachybasalts, alkali olivine bazalts and hawaiites with minor mugearites and tephrites. Kula volcanism has a mantle origin derived from an initial magma rise through plums, and it is a rift volcanism (Ercan 1984).

Succession

As the main goal was to investigate the species of vascular plants of the succession, the cryptogams of

the above stages were not collected and identified. They can be considered as typical elements of the Aegean Region. The characteristics of individual stages are below.

Herbaceous stage

In this stage herbaceous species cover 40-60 % of the area. *Poa bulbosa*, *Bromus rigidus, Arrhenatherum elatius* are dominant. Representative table is below.

Poa bulbosa	22323
Bromus rigidus	11131
Arrhenatherum elatius	12+12
Briza minor	+1+++
Moenchia mantica	1++.+
Bromus tomentollus	++.+1
Trifolium campestre	+++.+
Galium erectum	.++++
Geranium purpureum	.+++.
Lolium multiflorum	+...+
Veronica hederifolia	+.+.+
Cionura erecta	.+++.
Rumex acetosella	..+++

Shrub stage

In this stage scrubby species cover 70-100 % of the area. *Quercus coccifera* is dominant .

Quercus coccifera	45444
Quercus infectoria	1+111
Lonicera etrusca	11+++
Rhus coriaria	1++1+
Ephedra major	1.++1
Jasminum fruticans	11+.+
Rosa canina	1..++
Prunus spinosa	++++.
Calligonum aphyllum	.++++
Origanum spyleum	++++.

Nepeta cadmea Boiss. Photo: E. Ugurlu.

Gypsophyia tubulosa (Jaub. et Spach) Boiss. Photo: E. Ugurlu.

Climax forest

Pinus brutia is dominant in the climax stage Gokceoglu 1988, Oner & Oflas 1977). Cover is 75-100 % of the area.

Pinus brutia	55443
Quercus coccifera	+++11
Quercus infectoria	1++++
Juniperus oxycedrus	1+.++
Salvia fruticosa	..1++
Origanum spyleum	.1+.+
Trifolium campestre	+++++
Galium caudatum	+++++
Geranium lucidum	+++++
Anthemis cretica	..++.

The distribution of plants according to aspect is as follows:

North: *Pinus brutia, Rosa canina, Pistacia terebinthus, Quercus infectoria, Juniperus oxycedrus, Hypericum orientale, Dianthus calocephalus, Poa bulbosa, Potentilla recta.*

South: *Picnomon acarna, Myosotis stricta, Tordylum apulum, Torilis nodosa, Avena sterilis, Poa bulbosa, Centaurea urvillei, Jurinea mollis, Onosma isaurica Scrophularia lucida, Ferula communis, Rhus coriaria, Phlomis armeniaca, Gypsophila tubulosa, Saponaria mesogitana, Anthemis tinctoria, Isatis tinctoria, Papaver rhoeas, Umbilicus horizontalis, Dianthus zonatus, Calligonum aphyllum, Campanula lyrata.*

East: *Cionura erecta, Silene chlorifolia, Isatis tinctoria, Ziziphora taurica, Quercus coccifera, Cynodon dactylon, Vicia cracca, Euphorbia taurinensis.*

Alkanna tubulosa Boiss. Photo: E. Ugurlu.

West: *Hippomarathrum cristatum, Trifolium affine, Dianthus zonatus, Anthemis tinctoria var. discoidea, Rubus ideaus.*

The distribution of plants on the cone according to altitude is as follows:

0-20 m a.s.l: *Medicago orbicularis, Saponaria mesogitana, Tordylum apulum, Torilis nodosa, Picnomon acarna, Bromus tectorum, Filago vulgaris, Minuartia hybrida subsp. hybrida, Myosotis stricta.*

20-200 m a.s.l: *Calligonum aphyllum, Rhus coriaria, Ferula communis, Dianthus zonatus, Silene chlorifolia, Avena sterilis, Cionura erecta, Phlomis armeniaca, Quercus coccifera, Quercus infectoria, Legousia speculum veneris.*

200-400 m a.sl.: *Pinus brutia, Dianthus zonatus, Silene chlorifolia, Verbascum splendiddum, Holoschoenus vulgaris, Papaver rhoeas, Onosma stellatum, Geranium pyrenaicum, Calligonum aphyllum, Hypericum orientale, Alcea pallida, Crepis foetida.*

The pioneer vegetation on Kula Volcano and the surrounding area is formed basically of the representatives of indigenous flora. There are some endemic plants on the volcanic lavas. These plants are *Colutea melanocalyx, Phlomis armeniaca, Onosma isauricum, Trigonella cretica, Anthemis dipsacea, Asperula lilaciflora, Campanula lyrata, Acanthus hirsutus, Alkanna tubulosa, Gypsophila tubulosa, Nepeta cadmea, Stachys tmolea,Crepis macropus, Stachys cretica* subsp. *anatolica, Linaria corifolia, Scrophularia floribunda, Echinophora trichopylla.*

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Emin Ugurlu, Manisa, Turkey
Ozcan Secmen, Izmir, Turkey

Pictures below: Alkanna tubulosa and Colutea melonocalyx. Photo: E. Ugurlu.

Book reviews

In this section, we will publish reviews of recent books relevant for dry grassland research and conservation. Apart from titles particularly dealing with dry grasslands, also more general titles can be included, as for example phytosociological overviews, floras/faunas and field guides of relevant taxa, or text books on methodology, ecology, and conservation/restoration. Jürgen Dengler (dengler@botanik.uni-hamburg.de) serves as coordinator for this section (book review editor). Thus, if you are an author, editor or publisher of a book and want to have it reviewed in the Bulletin of the EDGG, please, contact Jürgen. The same applies to EDGG members who want to review a specific new title.

Baumann, A. (2006). On the Vegetation History of Calcareous Grasslands in the Franconian Jura (Germany) since the Bronze Age – Dissertationes Botanicae 404: 194 pp. J. Cramer in der Gebrüder Borntraeger Verlagsbuchhandlung, Berlin and Stuttgart. ISBN 978-3-443-64317-1. 50,– €.

The main goal of the study was to reconstruct the development of calcareous grasslands since the Bronze Age in the Franconian Jura. Several issues were addressed in the research: the appropriate archaeobotanical indicators for calcareous grasslands; the dynamics of calcareous grassland area in the research area; have indicators for dry grasslands been present continuously after appearance; are there correlations between the vegetation history and socio-economic developments; are there similarities between the regional history of calcareous grasslands and other regions of Europe.

The book is divided into nine chapters. The first chapter is a summary; the second chapter states the aim and tasks of the research and introduces the reader with the survey area which is located in the region of the Central and Southern Franconian Alb, Bavaria, Germany.

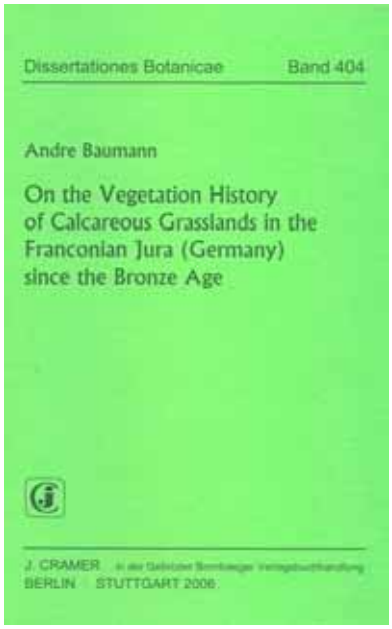
The third chapter is devoted to Central European calcareous grassland history. It is an excellent overview of the state of art in research of calcareous grassland history in Europe and discusses pros and cons of methods used for this purpose. It gives a detailed insight into development of calcareous grasslands since the Last Glacial. The main conclusion is that calcareous grasslands existed in Central Europe as small-scale habitats before the Neolithic times, and started to increase with introduction of herding by humans, but reached their maximum area in the Middle Ages.

The fourth chapter deals with anthracological analysis of prehistoric settlements in the surroundings of Kallmünz in one of the greatest prehistoric settlements in southern Germany. The main conclusion was that the anthracological analysis confirmed a hypothesis that dry calcareous grasslands were present in Kallmünz during the Bronze Age. The local study was further expanded by pollen record of an alluvial sediment core of the River Naab (including the radiocarbon dating) (Chapter 5); and pedoanthracological study (Chapter 6).

The last chapter discusses the history of Franconian Alb calcareous grasslands in modern times. The author concludes that the losses of calcareous grasslands have been less dramatic than in the other parts of Germany. Impressive maps, archive photos and diagrams illustrate these findings.

In conclusion, I highly recommend this book to every person interested in vegetation history (and not only grasslands!) of Europe. You will get a valuable information both on methodological issues and vegetation and landscape history in Central Europe over centuries.

Solvita Rūsiņa, Riga, Latvia



Becker, T. (2003): Auswirkungen langzeitiger Fragmentierung auf Populationen am Beispiel der reliktischen Steppenrasenart Astragalus excapus L. (Fabaceae). [Effect of long-term fragmentation on populations of relict steppe grassland species Astragalus excapus L. (Fabaceae). In German with English summary.]

Dissertationes Botanicae, Band 380, J. Cramer, Berlin, Stuttgart, 210 pages.
ISBN 3-443-64293-4

The reviewed publication represents a broad-spectral study on distribution, sociology, ecology, population biology and population genetics of *Astragalus excapus* L. (stemless milkvetch) which is a relict species in Germany surviving in small populations in several localities and specific steppe grassland habitats. This fragmentation of formally broader distribution area and subsequent isolation of individual populations might have affected the population structure and survival perspective of the species in recent time. Thus the main aims of the reviewed study can be expressed by two questions: 1) What processes endanger the survival of the studied species? 2) Which species properties enable the species to survive in long-term fragmented populations?

The book comprises seven sharply focused chapters which are narrowly related to each other. The detailed introduction, the logical order of individual themes and the summary of the most important results help the reader to follow enormous amount of partial information, to find relationships and to connect all these findings into a consistent knowledge. The first chapter introduces the species and the main questions to be answered. The second chapter deals with historical and recent distribution of *A. excapus* in Germany. Based on distribution data from the last 200 years the potential of species to inhabit new areas is evaluated and hypotheses on distribution history are formulated. The third chapter describes the vegetation and habitat conditions in recent localities of *A. excapus*. Four habitat types are recognized and the degree of their naturalness is evaluated. The fourth chapter focuses on pollination biology of the studied species. The pollination experiments showed that the species is self compatible and obligatorily insect pollinated. Crucial role of pollinators (bumblebees) is stressed. The fifth chapter is devoted to the allozyme analyses of 37 German populations. Even adjacent populations are genetically strongly differentiated. A path analysis shows that the reduced seed set in small populations is presumably a result of inbreeding. In the sixth chapter a synthesis of the results form the previous chapters is made. It is shown that the fitness of the species populations is related to the habitat patch size and the richness of habitat specialists. The highest fitness is found in populations in secondary semi-dry grasslands and not in primary grasslands as previously assumed. The last chapter brings the results of genetical analysis of 24 populations covering the species distribution in Europe and the basis for the general concept for the conservation of species genetical resources.

The book is clearly written and the conclusions are easy to transform into the language of nature conservationists. The main value of the study I see in the direct instructions for species "in situ" conservation which can lead to the maintenance of this "old rare species" at least in recent population sizes. Another value is the inspiration useful in similar studies devoted to other rare and endangered species which need the human assistance to survive in the changing habitat conditions.

The book shows the huge amount of effort and labor necessary for our understanding of complex processes of population functioning and survival in natural ecosystems. On the other hand the study demonstrates how simple experiments can help us to understand single processes (e.g. role of pollinators, extent of inbreeding effect, etc.). This knowledge can not be gained by simple observations and is crucial for preparation of effective conservation measures. Thanks to the author, the huge amount of work has been done and the results are clearly interpreted in the reviewed publication. It can be recommended as necessary source of inspiration especially for ecologists, population biologists and conservationists. I hope the book will reach the people which can directly affect the fate of *Astragalus excapus* in Germany and elsewhere in Europe.

As in most sharply focused studies, the intensive research of a single species offers not only numerous answers to the formulated questions but also invokes further questions which are worth to answer and inspire us to further studies. Here are some of such questions from my side: Is there a single factor responsible for the rarity of *A. excapus* or is it a combination of numerous factors? What are these factors? Which is the most vulnerable life stage considering the ontogenetical structure of the populations? What is the average species life span? Are there some herbivores (especially granivores) affecting the species recruitment?

Monika Janišová, Banská Bystrica, Slovakia

Chytrý, M. [Ed.] (2007): Vegetace Českè republiky. 1. Travinná a keříčková vegetace [Vegetation of the Czech Republic. 1. Grassland and Heathland Vegetation. In Czech, with English summaries.]

528 pp., Academia, Praha. ISBN 978-80-200-1462-7. 550 CZK.

The monograph presents the modern classification of vegetation of the Czech Republic. The set of 21,794 relevés available in the Czech National Phytosociological Database was used to generate sociological species groups with the Cocktail method. Sociological groups and dominances of selected species were used to generate definitions of associations. Then the associations were grouped into alliances and classes on the basis of the subjective evaluation of their mutual similarity, following the Central European phytosociological tradition. The nomenclature of communities adheres to the rules implemented in the International Code of Phytosociological Nomenclature by Weber et al. (2000). Species composition of associations was compared in synoptic tables, which contain the percentage frequency of the occurrence of species in relevés.

The book is divided into several chapters. The first chapter contains the main facts from the history of the Czech phytosociological studies in the period from 1922 to 2005, the technical procedure of defining vegetation units and practical application of the present system of vegetation. This part of the book is written in Czech and English and contains a bilingual glossary of basic key words, which makes this monograph accessible for people not fluent in Czech.

The next part of the book describes the diversity of vegetation in Czech Republic, its determinants and history and contains some maps with the basic geological formations, mean annual temperature, phytogeographical regions and main potential natural vegetation types. The major part of the book (406 pp., 12 chapters) presents descriptions of 12 classes and 111 associations. They are presented in the following order: alpine heathlands, alpine grasslands on base-poor soils and base-rich soils, subalpine tall-forb and deciduous-shrub vegetation, vegetation of annual graminoids in saline habitats, vegetation of annual succulent halophytes, saline grasslands, meadows and mesic pastures, nardus grasslands and heathlands, pioneer vegetation of sandy and shallow soils, sandy steppes and dry grasslands. Also contained in this part of the book are the synoptic tables for all classes. The description of each association includes diagnostic species, habitats, dynamics, distribution, variants, economic importance and endangerment, and is finished with an English summary. Those descriptions are enriched with maps showing the distribution of the associations as well as pictures of the phytocoenoses.

The strongest point of this monograph is the complete and critical way in which the plant associations are shown. It documents the advances in the knowledge about grassland vegetation diversity in Czech Republic and contains contributions by many accomplished botanists. That is why this work is a valuable and practical tool for the identification of plant communities across Czech Republic. It can also be a source of knowledge for researchers from other regions. Thanks to the contained phytosociological tables and detailed introductions and summaries of the informations concerning each of the associations written in English, this book can be helpful even to a reader with no knowledge of the Czech language. The last thing I would like to bring attention to is the the book's interesting graphic design and the very logical way it was edited.

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Barbara Juśkiewicz-Swaczyna, Olsztyn, Poland

van der Maarel, E. (2008) ["2007"] [Ed.]: Structure and dynamics of alvar vegetation on Öland and some related dry grasslands – Dedicated to Ejvind Rosén on his 65th birthday – *Acta Phytogeographica Suecica* 88: 98 pp., Uppsala, Sweden. ISBN 978-91-7210-488-4. 400,– SEK [available from: Opulus Press AB, Gamla vägan 40, 77013 Grangärde, Sweden, www.opuluspress.se]

The 88th issue of Acta Phytogeographica Suecica has been dedicated to Ejvind Rosén on his 65th birthday. The volume witnesses Rosén's "legendary friendship and helpfulness" and celebrates his achievements in ecology and nature management with five papers focussing on the highly interesting and intensively studied dry grasslands of the Swedish island of Öland and two more papers comparing species diversity and fine-scale dynamics in the dry grasslands of Öland with related plant communities of Estonia and Switzerland.

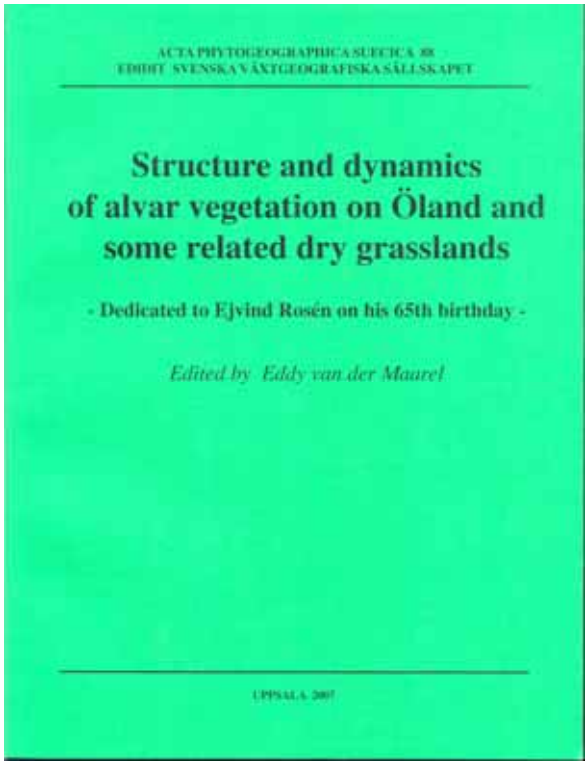
Öland is one of the most titled places of the botanical research, with studies and descriptions dating back to nearly three centuries, as testified by the Linnaeus' "Ölandic and Gotlandic Journey", carried out in 1741. To the long tradition of scientific studies on this island is dedicated the first paper of the volume, written by E. van der Maarel, who is co-author, as well, of the biographical notes on Ejvind Rosén introducing the volume.

The second paper, by S. Löbel & J. Dengler, is an in-depth phytosociological review of the dry grassland communities of Öland, with interesting comments on ecological factors and determinants of the outstanding species richness of such communities, compared with similar vegetation types of Central Europe. The third contribution, by A. Helm, P. Urbas & M. Pärtel, broadens the reflections on ecological factors and floristic diversity up to the closely related Estonian alvar grasslands, that turn out to be very similar to those of Öland in terms of species richness and spatial patterns, in spite of the significant floristic differences.

The fourth paper is focussed on the species turnover under different treatments, by R. Huber & E. van der Maarel, who demonstrate how intense light and lack of nutrient could be the main responsible for the high species diversity in alvar grasslands. Keeping on species mobility and frequency dynamics, the fifth paper, by K. Studer-Ehrensberger & D. M. Newbery, highlights the strong correlation between spatial scales and species turnover, with a comparison between the *Avenetum* of Öland and the *Mesobrometum* of Egerkingen (Swiss Jura Mts.). The last two contributions, by J. Bakker, E. Rosén & K. Steg and by H. C. Prentice *et al.*, respectively, are focussed on the effects of past land-use on the recolonization (the former) and fragmentation (the latter) by/of alvar species-pools.

On the whole, this volume represents an important compendium of methodological approaches and ecological information on *Festuco-Brometea* and *Koelerio-Corynephoretea* dry grasslands, useful to a wide spectrum of research fields: flora, vegetation, small-scale disturbances, spatial patterns, temporal dynamics, inferential analyses, land management... Eje's passions are served!

Riccardo Guarino Palermo, Italy

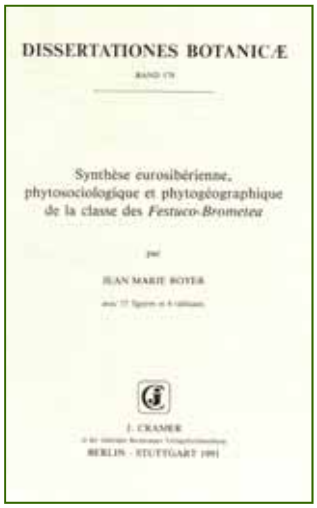


Royer, J. M. (1991): Synthèse eurosiberienne, phytosociologique et phytoéographique de la classe des Festuco-Brometea (Eurosiberian phytosociological and phytogeographic synthesis of the class *Festuco-Brometea*) [In French]. – Dissertationes Botanicae 178: 296 pp. + 8 tables, J. Cramer, Berlin and Stuttgart, Germany. ISBN 3-443-64090-7. 72,– €.

This book comprises the supraregional part of an even more extensive doctoral thesis, defended 1987 at the University of Franche-Comte in Besançon. It is an outstanding and potentially unique publication, as it comprises a synthetic view of a whole vegetation class, covering its global distribution area. If similar attempts have been made in the past, either they dealt with much smaller classes or they were much more superficial.

By contrast, in Royer (1991) the class *Festuco-Brometea* is covered really in a geographically comprehensive manner, from north Spain to the Lake Baikal. The author very extensively evaluated the then existing literature from the whole area, including many publications in regional journals throughout Europe, many of which are hardly accessible from abroad. A reference list of 44 pages testifies his huge effort and in itself is a valuable source of information for any reader dealing with large-scale classification of dry grasslands.

The book is structured into eight chapters: 1. General characterisation and phytogeographic delimitation of the class; 2. major subdivisions of the class; 3.–7. description of those five orders treated in more detail; 8. floristic relationships to related classes. The author proposes to subdivide the class into eight vicariating orders (from west to east) *Festuco-Poetalia ligulatae*, *Ononidetalia striatae*, *Brometalia erecti*, *Festucetalia valesiacae*, *Scorzonero-Chrysopogonetalia*, an unnamed order of Crimea and Caucasus, *Helictrotricho-Stipetalia*, and *Carici-Agropyretalia cristati*. These orders and their subdivision are systematically described down to the level of suballiances, providing information on their distribution, ecology, diagnostic species, and referring the relevant literature. These descriptions are accompanied by various maps on the distribution (based on the relevés included in the synoptic tables in the supplement) and schemas elucidating the classification. Royer proposes to subdivide each of these geographically defined orders on the next lower hierarchical level according to ecological conditions into four groups: mesoxerophilous (meadow steppes), xerophilous (feather grass steppes), rupicolous, and (only for the most continental orders) semideserts. When these ecological groups within one order comprised more than one alliance, Royer suggests to establish suborders, such as the *Mesobromenalia* consisting of the *Potentillo-Brachypodion*, the *Onobrychidion hispanicae*, the *Mesobromion erecti*, and the *Gentianello-Avenulion*.



The book ends with three very useful appendices: (i) a syntaxonomic overview of all syntaxa down to suballiances, with an enumeration of all association-rank syntaxa that are included (the latter have normally not been checked for nomenclatural correctness or potential identity); (ii) nomenclatural novelties (unfortunately these are only partly valid); (iii) a list of 1,246 vascular plant species, for each of which the diagnostic value within the class and its subunits is given. Most important among the supplements is Table 1 that combines synoptic columns for all distinguishes (sub-) alliances of the *Brometalia erecti* and the *Festucetalia valesiacae* in Europe, based on not less than 281 individual sources/syntaxa.

Despite the fact that this book is nearly 20 years old and one may certainly disagree with the author on his concepts for individual syntaxa, his work is still the most important reference with which each new large-scale synthesis of this class has to compete. While it was one of the driving ideas behind the establishment of the EDGG to aim at developing a consistent continent-wide classification of the *Festuco-Brometea* and related classes, we have to concede that it will take at least several more years until we will be able to present a relevé-based classification scheme that really can out-compete this pioneer work based on comprehensive literature overview and partly on compilation of synthetic tables.

Fortunately, this important book is still available from the publisher. However, it is a pity that its high price (in particular in relation to its rather basic outfit) and perhaps also the French language (without English summaries) probably will prevent the desirable wide distribution among our members.

Jürgen Dengler, Hamburg, Germany

Recent publications of our members

With this section, we want to facilitate an overview of dry grassland-related publications throughout Europe and to improve their accessibility because many publications on dry grasslands appear in national or regional journals hardly known to researchers in other countries.

We ask our members therefore to send lists of their recent relevant publications to Monika Janišová: monika.janisova@savba.sk. Please follow the style of a recent issue of the Bulletin and provide an English translation of the title for publications in other languages. Publications of the recent and the three preceeding years will be considered and each publication will be listed only in one Bulletin.

If you would like to have your publications linked from our homepage (http://www.edgg.org), you may send a quotation to Solvita Rūsiņa: rusina@lu.lv. In this case, you should provide access to a pdf of your publication by one of the following three ways: (i) send a pdf to Solvita to be posted directly on the EDGG homepage; (ii) send a link to a URL at which the pdf is being made available permanently; (iii) provide your e-mail contact to allow colleagues to ask you for a pdf (in case you are not allowed to post a pdf openly).

Methodology, classification, databases

Dengler, J., Löbel, S., Dolnik, C. (in press): Species constancy depends on plot size – a problem for vegetation classification and how it can be solved. *J. Veg. Sci.*, Oxford.

Willner, W., Tichý, L. & Chytrý, M. (2009): Effects of different fidelity measures and contexts on the determination of diagnostic species. *J. Veg. Sci.* 20: 130-137.

Regional surveys/monographs

Kovács-Láng, E., Molnár, E., Kröel-Dulay, Gy. & Barabás, S. (2008): The KISKUN LTER: Long-term ecological research in the Kiskunság, Hungary. Institute of Ecology and Botany of the Hungarian Academy of Sciences (IEB HAS), Vácrátót, 82 pp. The full text could be found on the web-site http://www.obki.hu/publikacio/kiskun.shtml

Conservation and resoration

Illyés, E., Botta-Dukát, Z., Molnár, Zs. (2008): Patch and landscape factors affecting the naturalness-based quality of three model grassland habitats in Hungary. *Acta Botanica Hungarica* 50 (Suppl.), pp. 179-197. The paper can be downloaded from http://akkrt.metapress.com/content/35742t2111713r23/fulltext.pdf

Biodiversity

Dengler, J. (2009): A flexible, multi-scale approach for standardised recording of plant species richness patterns. *Ecol. Indic.* 9: 1169–1178, Amsterdam.

Thesium alpinum. Photo: M. Janišová

Forum

Miscellaneous

"Semi-natural grassland as a source for biodiversity improvement (SALVERE)" is the name of a project within the Central Europe program that started on January 1st, 2009. Until December 2011, eight project partners from six EU countries will be working together: University of Padua, Department of Environmental Agronomy and Crop Production (Michele Scotton /lead partner) – Italy; Research and Education Centre for Agriculture Raumberg – Gumpenstein (Bernhard Krautzer) & Kärntner Saatbau GmbH (Christian Tamegger) – both Austria; OSEVA PRO Ltd, Grassland Research Station (Magdalena Sevcikova) – Czech Republic; Anhalt University of Applied Sciences (Sabine Tischew) & Rieger-Hofmann GmbH (Ernst Rieger) – both Germany; Agricultural Research Centre (Miriam Kizeková) – Slovakia; Poznan University (Piotr Golinski) – Poland.

The aim of this project is to promote the use of native plant material in restoration in order to create species-rich grasslands typical for the concerned region. In addition, guidelines for seed production and harvesting on potential donor sites as well as best practise methods for the establishment of species-rich grasslands will be developed to enhance the exchange of knowledge about ecological restoration all over Europe. Further information can be found on our project homepage www.salvereproject.eu.

Anita Kirmer

This section includes announcements of the chairs to the members.

Logo voting –results

The logo competition is now closed. The majority of the EDGG members voted for the logo number 10 designed by Anna Kuzemko, Kiev, Ukraine. Anna was so kind to prepare the colour version of her logo, too. You can see it in the front page of this bulletin issue. Thanks once more for your proposals, thanks for your votes and congratulations to Anna.

English editing - search for volunteers

Is anybody willing to help us with English manuscript corrections of larger contributions into the next bulletin issues? Please, contact me at monika.janisova@savba.sk

Picture below: Rosa pimpinellifolia.
Photo: K.Hegegedüšová

Bulletin of the EDGG, *official organ of the European Dry Grassland Group (EDGG)*

ISSN 1868-2456

The Bulletin is published quarterly at the Biocentre Klein Flottbek, c/o Jürgen Dengler, University of Hamburg, Ohnhorststr. 18, 22609 Hamburg, Germany. It is sent to all members of the organisation (286 members from 35 countries as of 6 June 2009) and alongside with all previous issues it is also freely available at http://www.edgg.org/publications.htm. Bulletin 3 (2009) of the EDGG was published on 6 June 2009.

Editors: *Monika Janišová (managing editor, monika.janisova@savba.sk, Institute of Botany, Slovak Academy of Sciences, Ďumbierska 1, 974 11 Banská Bystrica, Slovak Republic), Jürgen Dengler (Hamburg, Germany), Solvita Rūsiņa (Riga, Latvia).*

Important dates: *The deadline for Bulletin 4 is 31.8.2009.*
Bulletin 4 to appear: September 2009
Bulletin 5 to appear: December 2009