Tuexenia 36: 287–291. Göttingen 2016.
doi: 10.14471/2016.36.021, available online at www.tuexenia.de

# Different approaches in grassland analysis – Editorial to the 11th EDGG Grassland Special Feature

## Unterschiedliche Ansätze in der Graslandanalyse – Vorwort zum 11. EDGG Grasland-Sonderteil

Thomas Becker[1, *], Anikó Csecserits[2], Balázs Deák[3], Monika Janišová[4], Laura Sutcliffe[5] &Viktoria Wagner[6]

[1]*University of Trier, Regional and Environmental Sciences/Geobotany, Behringstr. 21, 54296 Trier, Germany, beckerth@uni-trier.de;*

[2]*MTA Centre for Ecological Research, Institute of Ecology and Botany, Alkotmány u. 2–4, 2163 Vácrátót, Hungary, csecserits.aniko@okologia.mta.hu;*

[3]*MTA-DE Biodiversity and Ecosystem Services Research Group Egyetem sq. 1, 4032 Debrecen, Hungary, debalazs@gmail.com;*

[4]*Slovak Academy of Sciences, Institute of Botany, Ďumbierska 1, 97411 Banská Bystrica, Slovakia, monika.janisova@gmail.com;*

[5]*Georg-August Universität Göttingen, Plant Ecology and Ecosystem Research, Untere Karspüle 2, 37073 Göttingen, Germany, laura.sutcliffe@biologie.uni-goettingen.de;*

[6]*Masaryk University, Department of Botany and Zoology, Kotlářská 2, 611 37 Brno, Czech Republic, Email: wagner@sci.muni.cz*

**Corresponding author*

**Zusammenfassung**

Seit 11 Jahren werden von Mitgliedern der *Eurasian Dry Grassland Group* (EDGG) und deren Vorgängerorganisationen Grasland-Sonderteile in Tuexenia herausgegeben. Der diesjährige Sonderteil präsentiert sechs Artikel mit unterschiedlichen Fragestellungen zu Trockenrasen und verwandten Graslandtypen aus sechs europäischen Ländern: Belgien, Bosnien-Herzegowina, Deutschland, Italien, Serbien und Ungarn. Ein Artikel behandelt syntaxonomische Aspekte der Serpentin-Steppenrasen des Balkans (s. auch Umschlagfoto). Zwei Beiträge untersuchen funktionelle Eigenschaften von Pflanzenarten im Grasland, der eine (in belgischen Trockenrasen) die Variation funktioneller Merkmale in Abhängigkeit von den Umweltbedingungen und der andere die Mengenverhältnisse von funktionellen Merkmalen entlang eines Höhengradienten in den italienischen Alpen. Ein Artikel zeigt mithilfe eines experimentellen Ansatzes, dass artenarmes ungarisches Grasland durch Diasporenzufuhr in artenreiche Wiesen überführt werden kann, während ein anderer Beitrag ökologische Theorien am Grasland in einer ungarischen Stadt überprüft. Der sechste Artikel behandelt schließlich Vegetationsveränderungen von Steppenrasen in Nordostdeutschland nach 20 Jahren.

## 1. Introduction

This Special Feature is the eleventh in a series devoted to grasslands and edited by members of the Eurasian Dry Grassland Group (EDGG; http://www.edgg.org) or its predecessors European Dry Grassland Group and *Arbeitsgruppe Trockenrasen* that has been published in Tuexenia since 2005. In this Special Feature we present six papers about a broad range of

Manuscript received 12 July 2016, accepted 13 July 2016

grassland types ranging from serpentinite grasslands to alpine grasslands and dealing with questions of syntaxonomy, plant functional traits, experimental recruitment, disturbance, and vegetation dynamics of grasslands. Study regions were the Balkan peninsula (i.e. Serbia, Bosnia and Herzegovina), Belgium, Germany, Hungary, and Italy. A total of 38 authors from nine countries contributed to this Special Feature, including authors from Hungary (14 authors), Germany (11), Serbia (6), Belgium (3), Czech Republic (1), Italy (1), Slovakia (1), and Slovenia/Croatia (1), with 19 of the 38 authors publishing in Tuexenia for the first time.

The paper by KUZMANOVIĆ et al. (2016) resumes the former studies by KABAŠ et al. (2013) and AĆIĆ et al. (2014, 2015) by focussing on dry grassland vegetation of the Central Balkan and broadens our knowledge on the syntaxonomical concept and geographical distribution of rocky steppes on serpentine bedrock. The authors gathered the available data on serpentinite outcrops in Bosnia and Herzegovina, Serbia, and Kosovo and revised the classification of the order *Halascyetalia sendtneri* and respective alliances. Their results confirmed the position of the *Halascyetalia sendtneri* within the class *Festuco-Brometea* and pointed to a significant number of obligate endemic serpentinophytes in this vegetation type. The authors identified and provided diagnoses for two alliances, the *Centaureo kosaninii-Bromion fibrosi* distributed in the Scardo-Pindic biogeographical province and the *Potentillion visianii* distributed in the Illyrian biogeographical province. They conclude that future research needs to carve out the precise syntaxonomic position of the alliance *Thymion jankae* and improve the delimitation of the order *Halascyetalia sendtneri*.

The paper by HARZÉ et al. (2016) studied inter-population variation of plant functional traits in calcareous semi-dry grassland plant species. Three functional traits (SLA–specific leaf area, LDMC–leaf dry matter content, and plant vegetative height) were assessed in four grassland species and related to environmental conditions (soil depth and potential direct incident radiation). The authors show that all traits are characterised by considerable variation among populations. Higher plant heights and larger SLAs were found for individuals located in plots with deeper soils or lower potential direct incident radiation, on gentle or on north-facing slopes. The authors conclude that, when using average trait values for ecological research, neglecting intra-population trait variability may be critical, as intraspecific variation strongly depends on local environmental conditions and can be very high at the population scale. Consequently, their results question the resilience of average trait values in ecological research.

BAUMANN et al. (2016) analysed vascular plant diversity patterns along an elevational gradient ranging from c. 1,700 to 3,100 m a.s.l in the Gran Paradiso National Park in the Alps (Italy). They applied a new method, i.e. nested plots (13 altogether in this study), ranging from 0.0001 to 10 m² in size. According to the authors, this is the first study about the relation between vascular plant diversity and environmental conditions at different scales from the Alps. Moreover, they studied the changes of functional composition along the elevation gradient. The species richness of grasslands of the region was similar to other Palaearctic dry grasslands at small scale but poorer at larger scale (from 1 m² upwards). Elevation and soil pH had a significant effect on the diversity only at larger scales; there was a unimodal relationship between the studied parameters in both cases. On smaller scales, inclination, soil depth, and skeleton content had a significant effect on species diversity. On the basis of the overall explanatory power of the models, their study confirmed the hypothesis that at smaller scales biotic rather than abiotic factors drive biodiversity. There are only a few studies that describe the functional changes in a plant community along an elevation gradient (e.g. MAHDAVI et al. 2013). BAUMANN et al. (2016) counter this shortage. They

found that in their study region, the fraction of chamaephytes increased with elevation, and SLA, plant height, and seed mass decreased along the elevation gradient. This phenomenon can be explained by the increase of environmental „harshness" along the elevation, which is similar to other gradients such as soil depth in the Mediterranean (BERNARD-VERDIER et al. 2012).

VALKÓ et al. (2016a) studied novel approaches for enhancing the diversity of sown grasslands in Hungary. Sowing low-diversity seed mixtures is widely used in grassland restoration because of its high predictability, rapid establishment of matrix species, and effective weed suppression (CARBONI et al. 2015, VALKÓ et al. 2016b). However, grasslands restored in this way are often species-poor as sown grasses hamper the colonisation of target forbs. In order to restore biodiversity, restored grasslands are in need of additional conservation measures (SENGL et al. 2015). The authors tested to what extent establishment gaps (rectangles created by destruction of swards) coupled with sowing diverse seed mixtures (seeds of 35 native species) can increase the diversity of restored grasslands. Additional predictors encompassed the size of the establishment gap and the effect of abandonment and grazing. After two years, results were positive: sown species were able to establish across all sites, with larger sites showing a more stable community composition and total cover of sown species. By comparison, weed cover was small. The authors suggest that their approach helped target species to overcome microsite and propagule limitation. In particular, soil preparation has likely increased the availability of microsites, which provided suitable establishment conditions for sown target species via increased niche availability and decreased competition. Based on their results, the authors suggest that establishment gaps, especially large ones, can serve as propagule sources for adjacent areas in the future and amplify species richness. Grazing can effectively support these processes by creating small-scale disturbances in the closed sward of matrix grasses and dispersing propagules of target species (SCHULZE et al. 2014, FREUND et al. 2015).

DEÁK et al. (2016) investigated the vegetation of urban habitats in the city of Debrecen, Hungary. The continual expansion of urban areas makes the role of that habitats an increasingly important area of study, and in this paper, the authors assess their role as refuges for plant species typical to semi-natural grasslands and ruderal assemblages. They compared three types of urban green space: urban parks, vacant lots, and peri-urban grasslands, which represent a gradient in disturbance and distance from the city centre (urban parks being generally more central). They found that the most urbanised habitat (urban parks) harboured the lowest number of species, the lowest Shannon diversity, and the highest proportion of weeds, disturbance-tolerant, and cosmopolitan species. In contrast, the proportion of alien species was higher at the city edges (vacant lots and peri-urban grasslands). The authors conclude that urban green areas are important habitats for the conservation of grassland species in the context of continuing loss of grassland habitats, although they generally do not harbour rare species or high diversity. The urban plant assemblages can also be used as sources of plant species for urban greening projects and may partly compensate the loss of habitats and grassland diversity resulted by land use changes (APOSTOLOVA et al. 2014).

HÜLLBUSCH et al. (2016) studied long-term vegetation changes in semi-natural dry grasslands at the Gabow slopes in NE Brandenburg, Germany. They resampled plots from the alliances *Festucion valesiacae*, *Koelerion glaucae*, *Armerion elongatae* and *Arrhenatherion elatioris* 20 years after the original sampling in 1995. Their results revealed, that although there have not been drastic changes in the vegetation of the studied sites, nutrient enrichment of the last decades had an influential effect on the vegetation composition (see also HAHN et

al. 2013 and MERUNKOVÁ et al. 2014). Interestingly, mean species numbers and number of Red List species increased, and the proportion of neophytes decreased during the last decades. The authors conclude that while the dry grasslands at the Gabow slopes are still in a good state and highly valuable for conservation, they are also vulnerable to future threats and are in need of continuous conservation actions.

## Acknowledgements

We are grateful to the authors of papers in the current Special Feature for contributing interesting articles and to our reviewers (included in the list of all reviewers after the table of contents of this Tuexenia volume) for improving the manuscripts. We thank FlorSoz for supporting the Special Feature financially which enabled us to provide professional linguistic editing for young authors with low income. We further thank Lisa Thill for linguistic help and the editor Thilo Heinken for always supporting this Special Feature.

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Jahr/Year: 2016

Band/Volume: NS_36

Autor(en)/Author(s): Becker Thomas, Csecserits Aniko, Deak Balazs, Janisova Monika, Sutcliffe Laura, Wagner Viktoria

Artikel/Article: Different approaches in grassland analysis - Editorial to the 11th EDGG Grassland Special Feature 287-291