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Vegetation and conservation of Central-European grasslands – Editorial to the 12th EDGG Special Feature

Vegetation und Schutz von Grasländern in Mitteleuropa – Vorwort zum 12. EDGG Grasland-Sonderteil

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Zusammenfassung

Seit 12 Jahren werden von Mitgliedern der Eurasian Dry Grassland Group (EDGG) und deren Vorgängerorganisationen Grasland-Sonderteile in Tuexenia herausgegeben. Der diesjährige Sonderteil enthält fünf Artikel, die das Grasland verschiedener mitteleuropäischer Länder mit unterschiedlichen Zielen untersuchen. Der erste Artikel untersucht Auswirkungen von Weide und Mahd auf die Diversität des Graslands in Deutschland in Abhängigkeit von verschiedenen Umweltfaktoren, der zweite die Auswirkung kleiner Büsche auf den Artenreichtum von Gefäßpflanzen in beweideten Wiesensteppen in Ungarn. Der dritte Artikel fragt, ob sich ungarische Sandtrockenrasen mit *Festuca vaginata* von solchen mit *F. pseudovaginata* in ihrer Vegetation und ihren Standortsbedingungen unterscheiden; die letztere war erst kürzlich beschrieben worden. Der vierte Artikel modelliert Auswirkungen des Klimawandels auf geschützte Graslandbestände in Serbien und deren Arten während schließlich der fünfte Artikel die Initiative einer neuen Datenbank des deutschen Graslands (GrassVeg.DE) vorstellt und dazu aufruft, sich daran zu beteiligen. Insgesamt haben zu diesem 12. Grasland-Sonderteil 41 Autoren aus fünf Ländern (Dänemark, Deutschland, Italien, Schweiz, Serbien und Ungarn) beigetragen.

1. Introduction

The 12th EDGG Special Feature, entitled 'Vegetation and conservation of grasslands in Central-Europe', deals with the conservation, management and biodiversity of semi-natural and natural grasslands in Central-Europe. This Special Feature complements the series of special features devoted to Eurasian steppes and semi-natural grasslands (DENGLER et al. 2014, CARBONI et al. 2015, RUPRECHT et al. 2015, BECKER et al. 2016, TÖRÖK et al. 2016, VALKÓ et al. 2016), edited on behalf of the Eurasian Dry Grassland Group (EDGG; http://www.edgg.org). The Special Feature, which has a long tradition in Tuexenia, was edited by the members of the Eurasian Dry Grassland Group and devoted to a better under-

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standing of mechanisms driving grassland biodiversity in Central-Europe. In the present Special Feature there are papers dealing with the effects of grazing and mowing and their interaction with environmental factors on grassland diversity (GILHAUS et al. 2017); facilitative effects of shrubs on vascular plant species in grazed meadow-steppes (KELEMEN et al. 2017); environmental characteristics and species composition of a sandy grassland habitat dominated by the newly discovered *Festuca pseudovaginata* (SZABÓ et al. 2017), and the effects of climate change on protected grasslands in Serbia (ČAVLOVIĆ et al. 2017). We also introduce a novel initiation regarding the German GrassVeg.DE database (DENGLER et al. 2017). The papers are from several regions of Germany, Hungary and Serbia. Altogether 41 authors from 5 countries (Denmark, Germany, Hungary, Italy, Serbia and Switzerland) contributed to the Special Feature.

GILHAUS et al. (2017) studied the effects of grazing, mowing and their interaction on plant diversity and vegetation composition, for which they used a large dataset of 169 grasslands sampled in five regions across Germany. The authors found that management regimes had significant effects on the diversity, structure and functional composition of the vegetation; however the effect of management was considerably influenced by local and regional site conditions (see also TÄLLE et al. 2016). Besides the management scheme, soil fertility, grassland size and land-use history also had a strong effect on vegetation characteristics. They found that species richness was the lowest in year-round pastures, was moderate in meadows and was the highest in seasonal pastures. Despite the low species number of year-round pastures, their conservation value was high, as they harboured the highest number of endangered species. Given the considerable interaction between management regimes and the diverse site conditions it is complicated to provide a universal recommendation for grassland management, it was clearly proven that low-intensity management and absence of fertilisation maintained a higher grassland diversity in pastures compared to meadows and mown pastures.

The contribution by KELEMEN et al. (2017) is part of an increasing number of studies that call for a complex management regime in grasslands. The authors studied to what extent small *Crataegus* shrubs (30–40 cm diameter, 30–50 cm height) increase small-scale vascular plant diversity and flowering success in meadow steppes, in the Great Hungarian Plain. They used a split-plot design to survey 462 plots (10 × 10 cm) in two adjacent areas that differed in their management regime, one area being grazed by cattle and roe deer and the other being non-grazed. Specifically, they addressed how grazing, shrub microsite position (shrub interior, edge of shrub, and control in open vegetation) and the interaction between these two factors affect the density and flowering success of vascular plant species. In general, species density did not differ between the two management regimes and, not surprisingly, flowering success was higher in the ungrazed plots. Interestingly, under grazed conditions, species density was highest at the edge of shrubs and flowering success highest in the shrub interior and at the edge of shrubs than in open control plots. The authors interpreted that small shrubs can increase plant diversity in grazed grasslands by acting as biotic refuges. Furthermore, species density did not differ between shrub interiors and open plots, which indicated that shrubs did not have any competitive effect on nursed plants. The authors argue that the retention of a sparse population of small shrubs can be an effective component of grassland management and conservation.

SZABÓ et al. (2017) studied the differences in the species composition and soil properties of two sandy grassland types (*Festuca vaginata* and *F. pseudovaginata* dominated grasslands), typical to Central-Hungary. Furthermore, the study provides novel information on the

habitat conditions of *F. pseudovaginata*, which is a recently discovered species. Besides coenological relevés they studied the pH, humus, total-N, Ca, P_2O_5 and K_2O content of the 0–15 and 15–30 cm soil layers. They found that vegetation composition of *F. pseudovaginata* and *F. vaginata* grasslands were well separated based on the plant cover and upper 0–15 cm soil layer data. *Festuca pseudovaginata* grasslands were more species rich than *F. vaginata* grasslands; they harboured nearly two times more species. Linear mixed models revealed that *F. vaginata* grasslands were characterised by soils with higher pH, nitrogen, phosphorous and potassium contents compared to *F. pseudovaginata* grasslands. Their results refer to the tight connection of grassland vegetation and soil properties in sandy grasslands (see also KLAUS et al. 2013). In contrast with *F. vaginata* grasslands, which were formed on sandy soils, grasslands dominated by *F. pseudovaginata* were developed on former forest areas with brown forest soil type. They found that differences in vegetation composition might be considered by the different successional stage of the two grassland types, whilst *F. vaginata* grasslands which were in a climax stage and characterised by a low level of disturbance, *F. pseudovaginata* grasslands were formed on formerly forested areas, and are characterised by a high level of anthropogenic disturbance.

The paper of ČAVLOVIĆ et al (2017) represents a simulation about the changes in environmental factors and plant species composition of meadows and *Nardus* grasslands in Serbia until 2100. They used simulation models describing future climate as well as expected environmental, habitat and species composition changes for predicting changes in plant communities. The output of the modelling process was the occurrence probability of species and the habitat suitability index (HSI) of the community for the studied time period. They concluded that plant species of wet habitats are the most threatened by climate change, while cosmopolitans and xerothermic species can get advantage under the altered conditions. Grasses will probably be more resilient to climate change in the studied habitats. In the next future, climate change will probably have a strong effect on the species composition and biodiversity of grasslands in Europe. As the effects of climate change can be different in different regions, thus local studies can considerably contribute to the understanding of global processes.

The report of DENGLER et al. (2017) presents the new collaborative vegetation-plot database GrassVeg.DE (EU-DE-020; http://bit.ly/2qgX208) which collects vegetation-plot records (relevés) from grasslands and other non-woodland and non-aquatic habitats from Germany to make them accessible for ecological research nationally and internationally. Data from GrassVeg.DE are provided to the European Vegetation Archive (EVA) and, in the future, also to the global database "sPlot". GrassVeg.DE follows other EDGG databases regarding its statutes e.g. the Nordic-Baltic Grassland Vegetation Database (EU-00-002), Romanian Grassland Database (EU-RO-008) and Balkan Dry Grassland Database (EU-00-013). Data providers of GrassVeg.DE retain full copyright of their data and become members of the GrassVeg.DE Consortium. Thereby, they profit from their contribution via co-authorships and citations as well as the option to propose own projects using the full GrassVeg.DE or EVA data. In July 2017, the fast-growing GrassVeg.DE database contained 3,181 vegetation plots, originating from eight federal states of Germany. In the future, GrassVeg.DE could facilitate the consistent re-classification of the grassland types within the series *Synopsis der Pflanzengesellschaften Deutschlands*. The paper conclude the report with a call to contribute own relevés and relevés digitised from the literature to GrassVeg.DE.

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References

BECKER, T., CSECSERITS, A., DEÁK, B., JANIŠOVÁ, M., SUTCLIFFE, L.M.E. & WAGNER, V. (2016): Different approaches in grassland analysis – Editorial to the 11th EDGG Grassland Special Feature. – Tuexenia 36: 287–291.

CARBONI, M., DENGLER, J., MANTILLA-CONTRERAS, J., VENN, S. & TÖRÖK, P. (2015): Conservation value, management and restoration of Europe's semi-natural open landscapes. – Hacquetia 14: 5–17.

ČAVLOVIĆ, D., BELOICA, J., OBRATOV-PETKOVIĆ, D., ĐURĐEVIĆ, V. & KOŠANIN, O. (2017): Simulation of long-term changes in environmental factors and grassland composition in three protected areas of Serbia. – Tuexenia 37: 431–446.

DENGLER, J., BECKER, T., CONRADI, T., DOLNIK, T., HEINDL-TENHUNEN, B., JENSEN, K., KAUFMANN, J., KLOTZ, M., KURZBÖCK, C., LAMPE, P., LANGER, N., RAHMLOW, M. & SCHUHMACHER, O. (2017): GrassVeg.DE – die neue kollaborative Vegetationsdatenbank für alle Offenlandhabitate Deutschlands. – Tuexenia 37: 447–455.

DENGLER, J., JANIŠOVÁ, M., TÖRÖK, P. & WELLSTEIN, C. (2014): Biodiversity of Palaearctic grasslands: A synthesis. – Agric. Ecosys. Environ. 182: 1–14.

GILHAUS, K., BOCH, S., FISCHER, M., HÖLZEL, N., KLEINEBECKER, T., PRATI, D., RUPPRECHT, D., SCHMITT, B. & KLAUS, V.H. (2017): Grassland management in Germany: effects on plant diversity and vegetation composition. – Tuexenia 37: 379–397.

KELEMEN, A., TÖLGYESI, C., KUN, R., MOLNÁR, Z., VADÁSZ, C. & TÓTH, K. (2017): Positive small-scale effects of shrubs on diversity and flowering in pastures. – Tuexenia 37: 399–413.

KLAUS, V.H., HÖLZEL, N., BOCH, S., MÜLLER, J., SOCHER, S.A., PRATI, D., FISCHER, M. & KLEINEBECKER, T. (2013): Direct and indirect associations between plant species richness and productivity in grasslands: regional differences preclude simple generalization of productivity-biodiversity relationships. – Preslia 85: 97–112.

RUPRECHT, E., JANIŠOVÁ, M., SUTCLIFFE, L., BOCH, S. & BECKER, T. (2015): Dry grasslands of Central-Eastern and South-Eastern Europe shaped by environmental heterogeneity and human land use – Editorial to the 10th Dry Grassland Special Feature. – Tuexenia 35: 321–328.

SZABÓ, G., ZIMMERMANN, Z., CATORCI, A., CSONTOS, P., WICHMANN, B., SZENTES, S., BARCZI, A. & PENKSZA K. (2017): Comparative study on grasslands dominated by *Festuca vaginata* and *F. pseudovaginata* in the Carpathian Basin – Tuexenia 37: 415–429.

TÄLLE, M., DEÁK, B., POSCHLOD, P., VALKÓ, O., WESTERBERG, L. & MILBERG, P. (2016): Grazing vs. mowing: A meta-analysis of biodiversity benefits for grassland management. – Agric. Ecosyst. Environ. 222: 200–212.

TÖRÖK, P., WESCHE, K., AMBARLI, D., KAMP, J. & DENGLER, J. (2016): Step(pe) up! Raising the profile of the Palaearctic natural grasslands. – Biodivers. Conserv. 25: 2187–2195.

VALKÓ, O., ZMIHORSKI, M., BIURRUN, I., LOOS, J., LABADESSA, R. & VENN, S. 2016: Ecology and conservation of steppes and semi-natural grasslands. – Hacquetia 15: 5–14.