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Restoration, monitoring, conservation and phytosociology of semi-natural and natural grasslands in Central Europe – Editorial to the 14th EDGG Special Feature

Renaturierung, Überwachung, Schutz und Soziologie von halb-natürlichem und natürlichem Grasland in Mitteleuropa – Vorwort zum 14. EDGG Grasland-Sonderteil

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Zusammenfassung

Seit 14 Jahren werden von Mitgliedern der *Eurasian Dry Grassland Group* (EDGG) und deren Vorgängerorganisationen Grasland-Sonderteile (*Special Features*) in Tuexenia herausgegeben. Das diesjährige *Special Feature* mit dem Titel *Renaturierung, Überwachung, Schutz und Soziologie von halbnatürlichen und natürlichen Graslands in Mitteleuropa* umfasst sechs Artikel: Boch et al. untersuchen die Eignung von Quasidauerflächen zur Interpretation von Veränderungen in Trockenwiesen und -weiden von nationaler Bedeutung in der Schweiz. Chytrý et al. beschreiben die Vegetation der Trockenrasen des Tieflands der Transkarpaten und gleichzeitig drei neue Assoziationen für die Ukraine. Erdős et al. zeigen Trends in der Artenzusammensetzung und dem Artenreichtum entlang eines Gradienten vom Zentrum zum Rand in Waldsteppen im südlichen Karpatenbecken. Gheza et al. beschreiben die Syntaxonomie, Ökologie und den Naturschutzwert der Erdflechtengesellschaften bodensaurer *Thero-Airion*-Pionierrasen in der Poebene in Italien. Mardari et al. untersuchen die Populationsstruktur und Lebensraumeigenschaften von *Arnica montana* in den Karpaten. Roleček et al. berichten über neue Maxima des kleinräumigen Gefäßpflanzenartenreichtums rumänischer und ukrainischer Halbtrockenrasen. Insgesamt haben 40 Autoren zum 14. *Special Feature* beigetragen.

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1. Introduction

The 14th EDGG Special Feature 'Restoration, monitoring, conservation and phytosociology of semi-natural and natural grasslands in Central Europe' follows a long tradition of published grassland studies in *Tuexenia*. It is part of the series of Special Features and Issues organised by the Eurasian Dry Grassland Group (BECKER et al. 2016, DEÁK et al. 2017, 2018, TÖRÖK et al. 2016, VALKÓ et al. 2016, 2018, 2019). The Eurasian Dry Grassland Group (EDGG; http://www.edgg.org) is a network of researchers and conservationists interested in the classification, ecology, conservation and restoration of Palaearctic natural and semi-natural grasslands (VENN et al. 2018, DENGLER et al. 2019). The main aims of the EDGG are to facilitate research and scientific discussions on any aspect of Palaearctic natural and semi-natural grasslands by organising conferences and field workshops, to support the publication of grassland research results, to compile a grassland vegetation plot database (GrassPlot; DENGLER et al. 2017, 2018) and to promote policies and legislation towards protection, adequate management, and restoration of Palaearctic grasslands.

2. Contributions

The present Special Feature highlights many aspects of grasslands involving different study organisms and scales. BOCH et al. (2019) investigate the feasibility of quasi-permanent plots in monitoring programmes for the interpretation of vegetation changes using mean indicator values, species composition and turnover in dry grasslands of Switzerland. CHYTRÝ et al. (2019) describe dry grassland vegetation in the Transcarpathian Lowland and report three new associations for Ukraine. ERDŐS et al. (2019) reveal trends in species composition and richness along a centre-to-periphery gradient in forest-steppes of the southern Carpathian Basin. GHEZA et al. (2019) provide detailed description on the syntaxonomy, ecology and conservation value of terricolous lichen communities in pioneer acidic *Thero-Airion* dry grasslands of the Po Plain in Northern Italy. MARDARI et al. (2019) study the population structure and habitat characteristics of *Arnica montana* in the Carpathians. ROLEČEK et al. (2019) report new maxima of fine-scale vascular plant species richness from Romanian and Ukrainian semi-dry grasslands. A total of 40 authors from six countries contributed to the Special Feature.

BOCH et al. (2019) studied vegetation change in dry grasslands of Switzerland, using quasi-permanent plots. Within a single decade, they found that mean indicator values for nutrients, moisture and ruderality increased and those of light and stress decreased. These results support results of previous studies (JANDT et al. 2011, HÜLLBUSCH et al. 2016). Interestingly, some of the changes were more pronounced at higher elevations. A potential major bias of any resurvey study is the imprecise relocation of plots (e.g. KAPFER et al. 2017). However, the authors showed that while species turnover indeed increased with decreasing GPS accuracy, this was hardly the case for mean indicator values, which supports the latter as a robust metric for tracking environmental change.

CHYTRÝ et al. (2019) characterised the dry grasslands of the Transcarpathian Lowlands in the westernmost part of Ukraine. While dry grasslands in other parts of Ukraine are quite well studied (e.g. KUZEMKO 2009, KUZEMKO et al. 2014, KOLOMIYCHUK & VYNOKUROV 2016), those from Transcapathia were hardly known so far. Given this fact and because of the atypical bedrock (acidic andesite) for Ukraine, it is not surprising that the authors found new syntaxa for the country. They assign their four associations to four different alliances (*Cirsio-Brachypodion*, *Festucion valesiacae*, *Koelerio-Phleion phleoidis*, *Thero-Airion*), of

which only the *Scabioso-Brachypodietum* from the first alliance was known from Ukraine before. By contrast, the *Festucetum pseudodalmaticae*, *Astero linosyris-Festucetum rupicolae* and *Airo-Vulpietum* are reported for the first time from Ukraine.

The forest-steppe ecotone is a species-rich mosaic of grassland and forest patches in temperate Eurasia (ERDŐS et al. 2018). Given its high soil fertility and moderate climate, much of its area has been converted to arable land. Because of this, there is a strong interest in understanding the species composition and functioning of its remaining vegetation and to estimate its resilience to climate change. In this issue, ERDŐS et al. (2019) examined the forest-steppe ecotone in Hungary along a centre to periphery gradient in the Carpathian Basin, which corresponds to a transition from steppe to closed forest (144 plots sampled in five sites, total gradient length: 70 km). The authors analysed how plant species composition and richness of five grassland and forest types change in response to macroclimate, soil and land-use history. Species richness increased towards the periphery in forest patches, and in north- and south-facing forest edges, but not in medium and large forest patches, which might be able to buffer macroclimatic change. The authors argue that the forest-steppe ecotone should be protected as a full landscape mosaic given that some of its habitat types would not be able to buffer macroclimatic change.

GHEZA et al. (2019) studied terricolous lichen communities in the rare *Thero-Airion* grasslands of the Po Plain of Northern Italy. They conducted 288 vegetation relevés which were classified into four different lichen communities including nine facies. While the vegetation types were clearly separated by their species composition, they did only slightly differ ecologically. The different lichen communities therefore rather reflect different microclimatic conditions and succession gradients within the *Thero-Airion* communities. The authors further discuss their findings on lichen communities in *Thero-Airion* dry grasslands from a European perspective. They highlight the national importance of the *Thero-Airion* dry grasslands for the conservation of rare lichen species in Italy. The authors further point out encroachment of woody species (in this case mainly invasive alien species) and land-use intensification as major threats for these communities. To maintain and promote such pioneer stands they suggest management actions including mechanical disturbances to create open patches within a mosaic of different successional stages.

MARDARI et al. (2019) studied habitats and population structure of the threatened *Arnica montana* along an altitudinal gradient in the north-east Carpathians (Romania) in order to characterize its habitat preferences. In Romania, *A. montana* still occurs relatively frequently and is excessively collected for pharmaceutical and cosmetic purposes. The authors found *A. montana* in dwarf grasslands and Alpine heathland, but best growing in nutrient-poor mountain hay meadows of the *Festuco rubrae-Agrostietum capillaris nardetosum strictae* (alliance *Cynosurion cristati*), where plant density and flowering activity of the species were highest. The authors conclude that maintaining these anthropogenic hay meadows by traditional land-use practices will be the most effective measure for maintaining large populations of *A. montana* for conservation and also for collecting purposes.

ROLEČEK et al. (2019) report new maxima of fine-scale vascular plant species richness recorded in East-Central European semi-dry grasslands. Two records are from sites where world record species numbers were reported before, but from different plot size or from plots with different management regime. The authors found 119 species in a 16-m^2 sized plot in the Chernivtsi region (Ukraine) and 106 species in a 10-m^2 sized plot in the Cluj region (Romania). The results of the study support the assumption that extreme species richness is

a temporally stable attribute of the managed East-Central European semi-dry grasslands. The authors found that low to medium-intensity grazing may support species-rich vegetation similarly to mowing, at least in the short run.

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References

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

BOCH, S., BEDOLLA, A., ECKER, K.T., GRAF, U., KÜCHLER, H., KÜCHLER, M., HOLDEREGGER, R. & BERGAMINI A. (2019): Mean indicator values suggest decreasing habitat quality in Swiss dry grasslands and are robust to relocation error. – Tuexenia 39: 315–334.

CHYTRÝ, K., NOVÁK, P., KALNÍKOVÁ, V., VEČEŘA, M., PROKEŠOVÁ, H., DŘEVOJAN, P. & CHYTRÝ, M. (2019): Dry grassland vegetation in the Transcarpathian Lowland (western Ukraine). – Tuexenia 39: 335–355.

DEÁK, B., BECKER, T., BOCH, S. & WAGNER, V. (2018): Conservation, management and restoration of semi-natural and natural grasslands in Central Europe – Editorial to the 13th EDGG Special Feature. – Tuexenia 38: 305–310.

DEÁK, B., WAGNER, V., CSECSERITS, A. & BECKER, T. (2017): Vegetation and conservation of Central-European grasslands – Editorial to the 12th EDGG Special Feature. – Tuexenia 37: 375–378.

DENGLER, J., ALEKSANYAN, A., AMBARLI, D., BIURRUN, I., DEMBICZ, I., KUZEMKO, A., TÖRÖK, P., VENN, S. & VRAHNAKIS, M. (2019): The Eurasian Dry Grassland Group (EDGG) in 2018–2019. – Hacquetia 18: 147–154.

DENGLER, J., BECKER, T., CONRADI, T. … SCHUHMACHER, O. (2017): GrassVeg.DE – die neue kollaborative Vegetationsdatenbank für alle Offenlandhabitate Deutschlands. – Tuexenia 37: 447–455.

DENGLER, J., WAGNER, V., DEMBICZ, I. … BIURRUN, I. (2018): GrassPlot – a database of multi-scale plant diversity in Palaearctic grasslands. – Phytocoenologia 48: 331–347.

ERDŐS, L., AMBARLI, D., ANENKHONOV, O.A. … TÖRÖK, P. (2018): The edge of two worlds: A new review and synthesis on Eurasian forest-steppes. – Appl. Veg. Sci. 21: 345–362.

ERDŐS, L., BÁTORI, Z., BEDE-FAZEKAS, Á. … KRÖEL-DULAY, G. (2019): Trends in species composition and richness along a centre-to-periphery gradient in forest-steppes of the southern Carpathian Basin. – Tuexenia 39: 357–375.

GHEZA, G., BARCELLA, M. & ASSINI, S. (2019): Terricolous lichen communities in *Thero-Airion* dry grasslands of the Po Plain (Northern Italy): syntaxonomy, ecology and conservation value. – Tuexenia 39: 377–400.

HÜLLBUSCH, E., BRANDT, L.M., ENDE, P. & DENGLER, J. (2016): Little vegetation change during two decades in a dry grassland complex in the Biosphere Reserve Schorfheide-Chorin (NE Germany). – Tuexenia 36: 395−412.

JANDT, U., VON WEHRDEN, H. & BRUELHEIDE, H. (2011): Exploring large vegetation databases to detect temporal trends in species occurrences. – J. Veg. Sci. 22: 957–972.

KAPFER, J., HÉDL, R., JURASINSKI, G., KOPECKÝ, M., SCHEI, F.H. & GRYTNES, J.-A. (2017): Resurveying historical vegetation data – opportunities and challenges. – Appl. Veg. Sci. 20: 164–171.

KOLOMIYCHUK, V. & VYNOKUROV, D. (2016): Syntaxonomy of the *Festuco-Brometea* class vegetation of the Azov sea coastal zone. – Hacquetia 15: 79–104.

KUZEMKO, A. (2009): Dry grasslands on sandy soils in the forest and forest-steppe zones of the plains part of Ukraine: present state of syntaxonomy. – Tuexenia 29: 369–390.

KUZEMKO, A.A., BECKER, T., DIDUKH, Y.P. … DENGLER, J. (2014): Dry grassland vegetation of Central Podolia (Ukraine) – a preliminary overview of its syntaxonomy, ecology and biodiversity. – Tuexenia 34: 391–430.

MARDARI, C., BÎRSAN, C., ȘTEFANACHE, C., ȘCHIOPU, R., GRIGORAȘ, V., BALAEȘ, T., DĂNILĂ, D. & TĂNASE, C. (2019): Population structure and habitat characteristics of *Arnica montana* L. in the NE Carpathians (Romania). – Tuexenia 39: 401–421.

ROLEČEK, J., DŘEVOJAN, P., HÁJKOVÁ, P. & HÁJEK, M. (2019): Report of new maxima of fine-scale vascular plant species richness recorded in East-Central European semi-dry grasslands. – Tuexenia 39: 423–431.

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., LABADESSA, R., PALPURINA, S., BURRASCANO, S., USHIMARU, A. & VENN, S. (2019): Conservation and diversity of Palaearctic grasslands – Editorial to the 5th EDGG special issue in *Hacquetia*. – Hacquetia 18: 143–146.

VALKÓ, O., VENN, S., ZMIHORSKI, M., BIURRUN, I., LABADESSA, R. & LOOS, J. (2018): The challenge of abandonment for the sustainable management of Palaearctic natural and semi-natural grasslands. – Hacquetia 17: 5–16.

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.

VENN, S., AMBARLI, D., BIURRUN, I, DENGLER, J., KUZEMKO, A., TÖRÖK, P. & VRAHNAKIS, M. (2018): The Eurasian Dry Grassland Group (EDGG) in 2016–2017. – Hacquetia 17: 17–24.