

## Grassland ecology and conservation in Europe: Editorial to the 18<sup>th</sup> EDGG Special Feature in *Tuexenia*

### Graslandökologie und -schutz in Europa: Vorwort zum 18. EDGG-Sonderteil in *Tuexenia*

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### Abstract

Members of the *Eurasian Dry Grassland Group* (EDGG) and its predecessor organizations have been publishing grassland Special Features in *Tuexenia* since 2005. This year's Special Feature includes five articles highlighting different aspects of grassland research in Europe.

In grasslands across different European countries, Seiler et al. (2025) investigated whether the occurrence of mycotoxins produced by grass endophytes are affected by environmental conditions and plant diversity. Boch et al. (2025) experimentally tested the effects of disturbance and seed addition on bryophyte communities along a gradient in land-use intensity in 72 agricultural grasslands in Germany. Blank-Pachlatko et al. (2025) investigated how restoration success in alpine grasslands is related to soil alterations. Genuchi et al. (2025) studied the potential impact of increasing cover of *Erigeron annuus* on native plant diversity in Switzerland. Finally, Dembicz et al. (2025) provide a syntaxonomic synthesis of the *Koelerio-Corynephoretea* and *Festuco-Brometea* communities of the Lesser Polish Upland.

### Zusammenfassung

Mitglieder der *Eurasian Dry Grassland Group* (EDGG) und deren Vorgängerorganisationen geben seit 2005 Grasland-Sonderteile (Special Features) in *Tuexenia* heraus. Das diesjährige Special Feature umfasst fünf Artikel, die verschiedene Aspekte der Graslandforschung in Europa beleuchten: In verschiedenen europäischen Ländern untersuchten Seiler et al. (2025), ob das Vorkommen von Mykotoxinen, die von Endophyten in Gräsern produziert werden, durch Umweltbedingungen und Pflanzenvielfalt von Grasländern beeinflusst wird. Boch et al. (2025) testeten experimentell die Auswirkungen

von Störungen und Saatgutzugaben auf Moosgemeinschaften entlang eines Gradienten der Landnutzungsintensität in 72 landwirtschaftlich genutzten Grasländern in Deutschland. Blank-Pachlatko et al. (2025) untersuchten, wie der Erfolg der Renaturierung von alpinen Grasländern mit Bodenveränderungen zusammenhängt. Genuchi et al. (2025) untersuchten den potenziellen Einfluss von *Erigeron annuus* auf die Vielfalt einheimischer Pflanzen in der Schweiz. Dembicz et al. (2025) präsentieren eine syntaxonomische Synthese der *Koelerio-Corynephoretea*- und *Festuco-Brometea*-Gesellschaften der Kleinpolnischen Hochebene.

**Keywords:** biodiversity, bryophyte, conservation, endophyte, Eurasian Dry Grassland Group (EDGG), grassland, management, neophyte, restoration, syntaxonomy

## 1. Introduction

Since its foundation under the original name Arbeitsgruppe Trockenrasen (Dengler & Jandt 2005), the Eurasian Grassland Group (EDGG; [www.edgg.org](http://www.edgg.org)) has widened its scope over the years. It now encompasses the ecology and conservation of all grasslands in a broader sense in the Palaearctic biogeographic realm. Starting in the year 2005 with the first Special Feature in *Tuexenia*, EDGG has published numerous Special Features in international journals as well as edited parts of two global monographs on grassland ecology (Török & Dengler 2018) and biomes (Dengler et al. 2020b). With these Special Features and book chapters, EDGG aims at providing high-quality information relevant to research on and conservation of grassland habitats, and at the same time to connect researchers from many countries working on these topics.

The Special Feature at hand celebrates the 20<sup>th</sup> anniversary of the first Special Feature in *Tuexenia*, albeit it is “only” the 18<sup>th</sup> edition because in two years there were not enough submissions to fill a Special Feature. While *Tuexenia* originally focussed on Central Europe and later the nemoral zonobiome in Europe, it has recently adopted the new subtitle “A European journal of vegetation science”. Thus, while in 2024 the EDGG-edited Special Feature was still focussed on the nemoral zonobiome (Boch et al. 2024), this year EDGG called for submissions on any topic related to grassland vegetation and flora across Europe.

In this Editorial, we provide an overview on the EDGG activities since the last Special Feature and introduce the five papers of this year’s EDGG Special Feature, written by 29 authors from five countries.

## 2. EDGG activities from November 2024 to September 2025

The Eurasian Dry Grassland Group (EDGG; [www.edgg.org](http://www.edgg.org)) is a network of researchers and conservationists interested in the biodiversity, ecology, conservation and restoration of Palaearctic natural and semi-natural grasslands (Dengler et al. 2021a). With 1566 members from 67 countries, EDGG is one of the largest working groups of the International Association for Vegetation Science (IAVS; [www.iasv.org](http://www.iasv.org)). The main aims of the EDGG are to facilitate research and scientific discussions on any aspect of Palaearctic grasslands by organising conferences and field workshops, to support the publication of grassland research, to establish grassland vegetation-plot databases and to promote policies and legislation towards the protection, adequate management and restoration of Palaearctic grasslands. In spring 2025, the new Executive Committee for the period 2025–2027 was elected, consisting of eight members: Airi Asada (Japan), Idoia Biurrun (Spain), Jürgen Dengler (Switzerland), Rocco Labadessa (Italy), Alireza Naqinezhad (UK & Iran), Oksana Tyshchenko (Ukraine), Stephen Venn (Finland) and Denys Vynokurov (Germany & Ukraine).

The main events of EDGG are the **Eurasian Grassland Conferences (EGCs)**. The 20<sup>th</sup> EGC took place from 6–10 July 2025 at the University of Oulu, Northern Finland. The topic of the conference was '*Broadening the horizons of grassland science for the Anthropocene*'. The conference was enriched by six keynote talks, workshops, a mid-symposium and a post-symposium excursion. During the “grassland party”, in addition to good food, drinks, and live music from a local ensemble, there was also the famous EDGG auction where two skilled auctioneers managed to collect a lot of money from participants for grassland-related products. The 21<sup>st</sup> EGC will take place in Sofia, the capital of Bulgaria, from 20–24 July 2025.

Since 2009, the second main event of EDGG are the regularly organised research expeditions, called “**Field Workshops**”. In these events, researchers from various countries and career stages meet to collect standardised vegetation-plot data of grasslands and other open habitats in the Palaearctic biogeographic realm. The sampling focuses on standard plot sizes (10 m<sup>2</sup> “normal plots”, nested-plot series of 0.0001–100 (1000) m<sup>2</sup>), including terricolous bryophytes and lichens as well as soil samples (Dengler et al. 2016, 2021b). If specialists are available, the multi-taxon approach is sometimes expanded to orthoptera, spiders or leafhoppers, sampled in the same plots or their direct surroundings. In 2025, we had two such Field Workshops: The 20<sup>th</sup> Field Workshop (1–10 June) took place in the Maritime and Ligurian Alps and expanded the series of hitherto five events on dry grasslands (*Festuco-Brometea*, *Koelerio-Corynephoretea*, *Sedo-Scleranthetea*) of the valleys of the Alps (Boch et al. 2024) to the southernmost part of the Alpine arc, which were not included in the seminal book of Braun-Blanquet (1961). A total of 13 participants and four local organisers sampled 25 “EDGG Biodiversity Plots” and 87 “normal 10-m<sup>2</sup> plots”. Thus, we now have a large pool of almost 1,000 standardised 10-m<sup>2</sup> plots and almost 200 nested plot series enabling a comprehensive analysis of the biodiversity patterns and their drivers, as well as the development of a data-driven modern syntaxonomic classification system. The 21<sup>st</sup> Field Workshop (28 June – 6 July) took place in the Turku Archipelago in SW Finland (Fig. 1). We had 10 participants and four local organisers and sampled on 10 different islands as well as the adjacent mainland. The focus was broader than in previous Field Workshops and included all natural and semi-natural open habitats occurring in the region, not only dry grasslands, but also mesic and wet grasslands, mires, forest-edges and coastal habitats (dunes, salt marshes, drift lines). Given the small-scale heterogeneity, we also slightly modified the sampling strategy and were able to collect 38 full “EDGG Biodiversity Plots” and 88 half “EDGG Biodiversity Plots” (i.e. nested plots from 0.0001 to 10 m<sup>2</sup>), always with comprehensive treatment of bryophytes and lichens. The 22<sup>nd</sup> Field Workshop will take place just before the 21<sup>st</sup> EGC (mid-July 2026) in the mountains of Southern Bulgaria, covering all types of open subalpine and alpine vegetation.

The data derived from the Field Workshops form the backbone of EDGG’s database of high-quality, multi-scale plot data from Palaearctic grasslands and other non-forest vegetation types, known as **GrassPlot** (Dengler et al. 2018, Biurrun et al. 2019, see <https://edgg.org/databases/GrassPlot>). GrassPlot is a self-governed consortium and other data meeting our quality standards are also welcome (see Dengler & Biurrun 2024). GrassPlot focuses on nested plots and plots with carefully curated in situ environmental data, making it a valuable complement to the much larger European Vegetation Archive (EVA; Chytrý et al. 2016), which collects all types of plots without quality assessment. Thanks to its high data quality, GrassPlot data is increasingly being used in scientific studies that exploit these unique features (e.g. Dengler et al. 2020a, Graco-Roza et al. 2022). In addition,



**Fig. 1.** Sampling a nested plot in a stand of the *Filipendulo vulgaris-Helictotrichloion pratensis* in the Turku Archipelago, SW Finland, during the 21<sup>st</sup> EDGG Field Workshop (Photo: J. Dengler, 2025).

**Abb. 1.** Erfassung einer geschachtelten Aufnahmefläche in einem Bestand des *Filipendulo vulgaris-Helictotrichloion pratensis* in den Turkuer Schären, SW Finnland, während des 21. EDGG Field Workshop (Foto: J. Dengler, 2025).

GrassPlot offers an online dashboard that provides benchmarks of species richness for different Palaearctic open vegetation types, regions, grain sizes and taxonomic groups (<https://edgg.org/databases/GrasslandDiversityExplorer>; see Biurrun et al. 2021). Apart from GrassPlot, EDGG has also initiated several regional all-purpose vegetation databases for open habitats in regions with a data deficit in EVA, including for instance GrassVeg.DE from Germany (Pätsch & Dengler 2022) and NBGVD from the Nordic and Baltic region (Skobel et al. 2024). GrassVeg.DE is currently working on the digitisation of historical plot data published in *Tuexenia* and is also happy to incorporate more contemporary relevés provided by FlorSoz members in digital format. An overview of EDGG-associated regional databases is available at <https://edgg.org/databases/regional-databases>: Data contributions to GrassPlot and these regional databases are highly welcome.

EDGG publishes its own journal *Palaearctic Grasslands*, which occurs with three issues per year (<https://edgg.org/publications/pg-journal>). Like *Tuexenia*, it is a diamond open-access, online-only journal. It offers a unique combination of a “newsletter” on EDGG activities, a “photo magazine” with elements such as Photo Stories and Photo Competitions and a “peer-reviewed scientific journal”, particularly suitable for publication of regional studies based on small datasets. During the reporting period, the issues 62–64 were published and sent to all members. Beyond *Palaearctic Grasslands*, EDGG also regularly organises **grassland-related special features** in journals that are indexed in the Web of Science. Apart from our regular special features in *Tuexenia*, one other was completed and a new one started. The Special Collection “Grasslands of Asia” together with the IAVS

Regional Section for Asia in *Vegetation Classification and Survey* comprises seven articles and synthesising editorial (Naqinezhad et al. 2025). The Special Feature “Conservation of Palaearctic steppes and semi-natural grasslands: challenges and solutions” in *Biological Conservation* is on a good way to be completed in 2025. More than half a dozen papers have already been published or accepted, including one showing that, despite the drastic biodiversity loss in Switzerland over the past 120 years, locally there are still stands that resemble those widespread around 1900 (Riedel et al. 2025). Another paper studied recent changes in dry grasslands of Brandenburg (both *Festuco-Brometea* and *Koelerio-Corynephoretea*), with a special focus also on bryophytes and lichens (Danko et al. 2025).

Plenty of further information on EDGG activities can be found on our website at <http://www.edgg.org>. You can become a member free of charge by sending an email to [idoia.biurrun@ehu.es](mailto:idoia.biurrun@ehu.es). If you are interested in hosting a future Eurasian Grassland Conference or an EDGG Field Workshop, please contact the Executive Committee.

### 3. Contributions to the 18<sup>th</sup> EDGG Special Feature

This year’s EDGG Special Feature highlights different aspects of grassland research, with a particular focus on diversity patterns across different, often neglected organisms, as well as across spatial scales, including topics related to plant–fungus–animal interactions and grassland restoration.

In France, Germany, Austria, and Hungary **Seiler et al. (2025)** sampled vegetation plots in grasslands used for horse husbandry. In a subset of 204 plots of 10 m<sup>2</sup>, the authors investigated grass endophytes, i.e. *Epichloe* fungi which can occur in grasses of the genera *Festuca*, *Lolium*, and *Schedonorus*, and produce mycotoxins that might affect livestock. The aim of this study was to explore whether the prevalence of these mycotoxins is related to environmental conditions (by means of ecological indicator values) and plant diversity. While mycotoxins occurred at all seven sites under a broad range of environmental conditions, infection was associated with higher soil moisture and lower nitrogen indicator values. Grass cover and host dominance showed contrasting effects on mycotoxin prevalence in host species. Interestingly, there was no relationship between mycotoxin prevalence and temperature indicator value, biodiversity, or land-use type. The authors concluded that endophyte infection is common in semi-natural grasslands in temperate Europe but appears to currently present only a limited risk to livestock.

Sward disturbances and sowing of seed mixtures are widely used for grassland restoration purposes. However, the effects of these measures on bryophyte communities remain largely unclear. Therefore, **Boch et al. (2025)** tested in a full-factorial experiment the short-term effects of disturbance and seed addition on bryophyte species richness and cover along a gradient in land-use intensity in 72 agricultural grasslands in Germany. In general, species richness and cover strongly decreased with increasing land-use intensity. Disturbances initially strongly decreased bryophyte richness and cover and resulted in high Sørensen dissimilarity between disturbed and undisturbed subplots. However, in the second year of the experiment, species richness no longer differed between disturbed and undisturbed subplots, and species composition became more similar, indicating a recovery of the communities. But bryophyte cover did not recover in the short term. Moreover, land-use intensity and seeding in general had no significant effect on the recovery of bryophyte communities. The quick recovery of bryophyte species richness indicates that grassland-restoration measures, including disturbances and seed addition, have no detrimental effects on bryophyte diversity.

The effectiveness of various nature restoration methods often depends on local conditions, and assessments of this effectiveness usually focus on one selected aspect, typically vegetation parameters. **Blank-Pachlatko et al. (2025)** compared the effectiveness of two grassland restoration methods in terms of their impact on vegetation, soil parameters and microbial communities in areas near the summit station of the Curtinella chairlift (2535 m a.s.l.) at Piz Corvatsch, Switzerland. The original vegetation in these areas was severely damaged by earthworks related to the construction of the chairlift and snowmaking infrastructure. For the study, the authors selected a reference site with undisturbed alpine grassland and two disturbed sites that had been treated with a seed mixture in 2017 or transplanted turf in 2020. Nine 10 m<sup>2</sup> plots were established at each of the three sites for vegetation surveys and soil sampling. Soil samples were analysed for physicochemical and microbial properties, including bacterial 16S rRNA gene amplicon sequencing (NGS). Several years after the restoration management, the vegetation was still significantly different from that of the reference grassland. The seeded plots showed reduced species diversity, richness and dominance by competitively strong non-native species. Although turf transplantation enhanced the establishment of native species, this method does not allow for complete coverage of the area with vegetation within a studied period of time. The soil in the restored sites was shallower and had lower microbial biomass and a different bacterial community to that in undisturbed sites. The authors identified eight bacterial genera as potential indicators of undisturbed alpine soils. In light of these results, they recommend prioritising the preservation of topsoil in restoration projects and allowing for spontaneous regeneration where soil erosion control is not the primary concern, and seeding would be a better choice.

In Switzerland, the neophyte *Erigeron annuus* is considered to be harmful to the environment, particularly to native plant diversity and thus is listed as “invasive alien species”. As the evidence for this listing is limited and contradictory, **Genucchi et al. (2025)** studied the potential impact of increasing cover of *Erigeron annuus* on native plant diversity in Switzerland. The authors therefore sampled clusters of four 1-m<sup>2</sup> plots in 10 different grasslands sites around Zurich, Northern Switzerland. Each cluster represented a local “invasion gradient” from no (or very low) to a high *Erigeron annuus* cover. They then tested whether plant diversity, mean ecological indicator values (temperature, light, moisture, reaction, nutrients) and CSR strategy types are influenced by the cover of *Erigeron annuus*. Interestingly, the authors found that the cover of *Erigeron annuus* did not affect species richness, Shannon evenness, Shannon diversity, mean ecological indicator values or CSR strategies significantly. Although the species regularly invades relatively species rich grassland communities, its effect on the resident vascular plant community remained negligible in the study region. This was consistent with a literature review according to which other studies with sound methodology either found no or even a positive effect of *Erigeron annuus* on native plant diversity. The authors concluded that the determination of “invasive alien neophytes” should be based on solid scientific evidence to spend conservation money effectively on measures that improve the state of native biodiversity.

The paper by **Dembicz et al. (2025)** contributes to the understanding of Poland’s dry grassland diversity by providing the first comprehensive syntaxonomic synthesis of these communities in the Lesser Polish Upland, a biogeographically complex transition zone between the Central European lowlands and the Carpathians. This study fills a critical gap in Central European grassland research by documenting the largely neglected *Koelerio-Corynephoretea* grasslands alongside the better-known *Festuco-Brometea* types. Beyond its

syntaxonomic and ecological insights, the work has significant conservation implications, drawing attention to habitats that are both exceptionally diverse and increasingly threatened by land-use change and abandonment. Despite many *Koelerio-Corynephoretea* communities correspond to EU priority habitats, yet these remain underrepresented, compared to their counterparts from *Festuco-Brometea*, in protection and monitoring schemes. The findings thus call for a renewed focus on the full spectrum of dry grassland diversity, from calcareous slopes to sandy river terraces, within national and European conservation policies.

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