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Dry grasslands of Germany – call to support an initiative for a consistent, plot-based classification

Abstract

We present the plans for a comprehensive, national dry grassland database for Germany, in which vegetation-plot records from different databases will be collected. These data will particularly be used for a plot-based, consistent classification of dry grassland vegetation in Germany. The results of the classification project will then be published in a special feature contribution to *Applied Vegetation Science* and in the series *Synopsis der Pflanzengesellschaften Deutschlands*. We warmly invite persons who have dry grassland relevés to participate in this project by contributing data and/or helping with data analysis.

Trockenrasen in Deutschland – Aufruf zur Mithilfe bei einer Initiative für eine einheitliche, Aufnahme-basierte Klassifikation

Zusammenfassung

Es werden die Pläne für eine einheitliche, nationale Datenbank der Trockenrasen Deutschlands vorgestellt, in der die Vegetations-Daten aus verschiedenen Datenbanken zusammengeführt werden sollen. Hiermit soll zunächst eine Aufnahme-basierte, einheitliche Klassifikation der Trockenrasen-Vegetation in Deutschland erstellt werden. Wir beabsichtigen, die Ergebnisse des Klassifikations-Projektes in der Zeitschrift *Applied Vegetation Science* sowie in der Reihe *Synopsis der Pflanzengesellschaften Deutschlands* zu veröffentlichen. Eigentümer von Vegetationsaufnahmen von Trockenrasen bitten wir hiermit herzlich um Mithilfe bei der Realisierung dieses Projektes.

1 Introduction

Dry grasslands are in the focus of nature conservation throughout Central Europe, as they are extremely diverse and at the same time highly endangered. However, the conservation and protection of dry grassland habitats in Germany is largely based on traditional subjective classification schemes developed decades ago (e.g. Krausch 1961, 1968, Korneck 1974, 1975, Oberdorfer 1978, Jeckel 1984). In general, these studies were based on limited datasets both in terms of geographic coverage and numbers of relevés, and could not rely on the numerical methods available today. More recently, there have been a few plot-based studies with transparent numerical methods, such as Jandt (1999) for the Harz and Kyffhäuser regions and Dengler (2004a, 2004b) for Mecklenburg-Vorpommern, but none covered the whole of Germany. Accordingly, the available country-wide classifications (Pott 1995, Schubert et al. 2001, Rennwald 2002) are basically amalgamations of different, often incompatible concepts. There is therefore a great need for a consistent syntaxonomic classification of dry grasslands in Germany to meet the standards of neighbouring countries (e.g. Mucina et al. 1993, Schaminée et al. 1996, Chytrý 2007, Janišová 2007). There is also evidence that the discreteness of some syntaxa is overrated while other units are largely underestimated or even overlooked (e.g. the acidophilous semi-dry grasslands of the lower mountain ranges in southern Germany; see Becker et al. 2012).

With the initiative of the German *Arbeitsgruppe Trockenrasen* presented in this article, we intend to classify the syntaxa of dry grasslands based on a comprehensive vegetation database covering the whole territory of Germany and all dry grassland types, characterise the derived syntaxa floristically and ecologically, and analyse their geographical distribution (for photographic examples of syntaxa see Figures 2–17). Further, we plan to compile conservation-relevant information for each distinguished syntaxon, e.g. appropriate conservation measures and information on historical development. For the future, we envision the establishment of an internet-platform, which will enable anyone interested in dry grassland vegetation to share their data, analytical methods and results. The German Dry Grassland Database will be part of the GVRD (German Vegetation Reference Database; GIVD-ID EU-DE-014, Jandt & Bruelheide 2012), which is the vegetation data research platform of the newly established German Centre for Integrative Biodiversity Research, iDiv (http://www.idiv-biodiversity.de/). This database initiative of the German *Arbeitsgruppe Trockenrasen* within the *European Dry Grassland Group* (EDGG; see Vrahnakis et al. 2013) is meant to support nature conservation as well as research on biodiversity patterns and other ecological topics. Its success relies on the willingness of persons with dry grassland vegetation data to contribute them to a joint database.

The common database format of the already existing database is TURBOVEG (Hᴇɴɴᴇᴋᴇɴs & Scʜᴀ-ᴍɪɴéᴇ 2001), which enables easy data exchange via the comprehensive species reference list Ger-manSL (Jᴀɴsᴇɴ & Dᴇɴɢʟᴇʀ 2008). Presently, databases managed by the three initiators comprise approx. 26,000 dry grassland relevés from Germany (Table 1), mainly from the vegetation classes *Festuco-Brometea*, *Koelerio-Corynephoretea* (incl. *Sedo-Scleranthetea*), *Violetea calaminariae*, *Trifolio-Geranietea*, and *Elyno-Seslerietea*. However, the spatial coverage is still incomplete, es-pecially for the Northwest German lowlands (Northrhine-Westphalia, Lower Saxony and Schles-wig-Holstein), Saxony and South Germany except the Swabian-Franconian Alb (Fig. 1). Therefore, further efforts are needed to include data from other (public or private) databases and to digitize relevés from undersampled regions.

Table 1:
Contributing databases with dry grassland relevés from Germany. Database identifiers and names are given according to the *Global Index of Vegetation-Plot Databases* (GIVD; http://www.givd.info/; Dᴇɴɢʟᴇʀ et al. 2011, 2012).

Database identifier in GIVD	Database name in GIVD	Number of German dry grassland plots contained
EU-00-002	Database Dry Grasslands in the Nordic and Baltic Region	ca. 3,500
EU-00-007	VIOLETEA – heavy metal grasslands	ca. 600
EU-DE-001	VegMV – the vegetation database of Mecklenburg-Vorpommern	ca. 2,000
EU-DE-013	VegetWeb – the national online-repository of vegetation plots from Germany	ca. 1,000
EU-DE-014	German Vegetation Reference Database (GVRD)	ca. 17,000
EU-DE-034	Dry Grassland Central Germany Database	ca. 3,000

Fig. 1:
Distribution of the approx. 18.000 dry grassland vegetation plots with geographic coordinates in the con-tributing databases. Occurrences were pooled to central points of the topographical map grid of Germany.
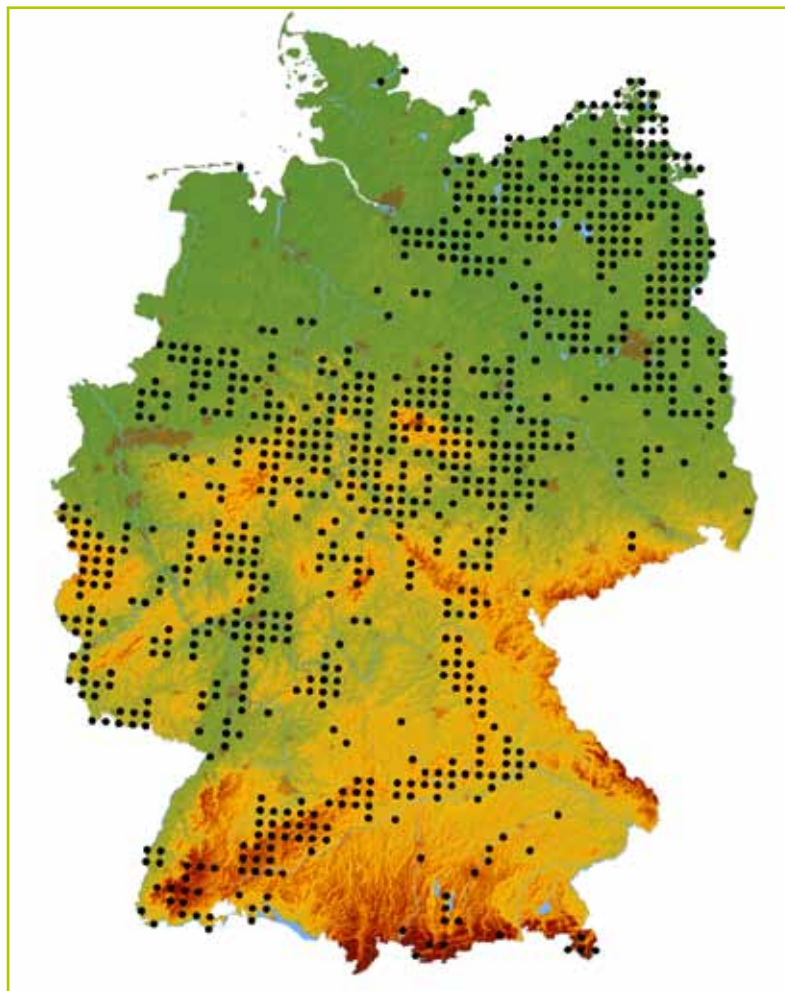
Fig. 2:
Bromion erecti, Swabian Alb, Baden-Württemberg
(Photo: J. Dengler, JD080712).

Fig. 3:
Xero-Bromion erecti, Unstrut Valley, Saxony-Anhalt
(Photo: T. Becker).

Fig. 4:
Cirsio-Brachypodion pinnati with *Adonis vernalis*,
Kyffhäuser, Thuringia (Photo: U. Jandt).

Fig. 5:
Festucion valesiacae, Mainz Basin, Rhineland-Palatinate
(Photo: J. Dengler, JD125289).

Fig. 6:
Armerion elongatae, Upper Rhine Valley, Hesse
(Photo: J. Dengler, JD103044).

Fig. 7:
De-alpine grasslands with *Sesleria albicans*, Franconian Alb,
Bavaria (Photo: J. Dengler, JD093884)

Fig. 8:
Koelerio-Phleion phleoidis. Rheinhesse, Rhineland-Palatinate
(Photo: J. Dengler, JD125060).

Fig. 9:
Festucion pallentis. Southern Harz, Saxony-Anhalt
(Photo: U. Jandt).

Fig. 10:
Koelerion glaucae, Mainz Basin, Rhineland-Palatinate (Photo: T. Becker).

Fig. 11:
Alysso alyssoidis-Sedion, Unstrut Valley, Saxony-Anhalt (Photo: T. Becker).

Fig. 12:
Hyperico perforati-Scleranthion perennis, Lahn-Dill Highlands, Hesse (Photo: J. Dengler, JD102744).

Fig. 13:
Corynephorion canescentis, Elbe Valley, Lower Saxony (Photo: J. Dengler, JD080650).

Fig. 14:
Armerion halleri, Harz Mts., Lower Saxony (Photo: T. Becker).

Fig. 15.:
Veronicion dillenii, Unstrut Valley, Thuringia (Photo: T. Becker).

Fig. 16:
Sileno conicae-Cerastion semidecandri, Upper Rhine Valley, Hesse (Photo: J. Dengler, JD102903).

Fig. 17:
Thero-Airion, Upper Rhine Valley, Hesse (Photo: J. Dengler, JD103011).

We would like to encourage colleagues who have dry grassland relevés not yet in our databases (check with author search on the GVRD homepage, http://www.biologie.uni-halle.de/bot/vegetation_db/ or ask authors), to enter contribute to the database project. Interested researchers may also join the classification project. Numerical methods will be applied for data classification, like cluster analysis (e.g. Roleček et al. 2009), and fidelity analyses (e.g. Chytrý et al. 2002, Tichý & Chytrý 2006), and definition of species groups with the Cocktail method (Bruelheide 1995). We intend to publish the results in a special feature contribution in *Applied Vegetation Science* (Dengler et al. 2013) and in the German series *Synopsis der Pflanzengesellschaften Deutschlands* (http://www.tuexenia.de/index.php?id=58). Vegetation-plot data gathered within the German Dry Grassland Database will be made available for further research, environment protection and teaching purposes via iDiv's database portal (under construction).

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