European Vegetation Archive
Data Request Form

To obtain data from the European Vegetation Archive (EVA), including the ReSurveyEurope Database, please first enquire the EVA database administrator Ilona Knollová (ikuzel@sci.muni.cz) whether the data that meet your needs are available. If they are, please fill in the form below and submit it to Ilona or another member of the EVA Coordinating Board (or ReSurveyEurope Board if you ask for data from the ReSurveyEurope Database).

- Applicant's name:

  Prof. Dr. Jürgen Dengler

- Applicant's institutional address:

  ZHAW, Wädenswil, Switzerland

- Applicant's e-mail:

  dr.juergen.dengler@gmail.com

- Project title:

  Broad-scale synthesis of the sandy dry grasslands and rock outcrop communities in Europe (*Koelerio-Corynephoretea* s.l.)

- Are you asking for core EVA data (non-repeated vegetation surveys) or for ReSurveyEurope data (repeated vegetation surveys)?

  Core

- Brief description of the aims and methods of the study:

  The vegetation types of sandy dry grasslands and rocky outcrops (*Koelerio-Corynephoretea* s.l., including the *Sedo-Scleranthetea* and *Festucetea vaginatae*) are widespread from submediterranean to boreal Europe. Apart from specialized vascular plants, they are often rich in bryophytes and lichens. Most of these vegetation types are threatened and of high conservation concern. Accordingly, most of them are listed in the Natura 2000 appendices of the European Union. However, the interpretation and delimitation of these vegetation types are strongly divergent in different countries but also in international syntheses (e.g. Dengler 2003 vs. Mucina et al. 2016). Therefore, the same vegetation type in one country might be considered as protected under European law, but not in a neighbouring country. Moreover, European countries outside the EU, particularly Ukraine, have extensive and diverse stands of the *Koelerio-Corynephoretea* s.l. that were not taken into account when setting up Natura 2000. Finally, in the EUNIS habitat typology floristically indistinguishable stands on inland and coastal dunes might be placed in a completely different habitat group (Chytrý et al. 2020).

  Both for science and for conservation it would thus be useful to overcome these ambiguities by developing a general classification system of these types that is based on a comprehensive, geographically broad, dataset analysed with modern methods.

  Therefore, the aims of this project are:

- To establish floristic criteria to separate the *Koelerio-Corynephoretea* s.l. against related classes, e.g. *Festuco-Brometea*, *Nardetea*, *Ammophiletea*, mediterranean and oromediterranean classes.
- To elaborate whether *Koelerio-Corynephoretea* s.l. (i.e. *Koelerio-Corynephoreta* s.str. and *Sedo-Scleranthetea*) should be united or treated as separate classes (and if so decide which order and alliance belongs where).
- To elaborate a data-driven subdivision of the *Koelerio-Corynephoretea* s.l. into orders and alliances and possibly subclasses (classification system).
- To resolve nomenclatural issues of the resulting units to establish unanimous syntaxon names.
- To translate the classification system into an electronic expert system that allow the unanimous assignment of the majority of plots (> 90%).
- To characterize the syntaxa of the different hierarchical levels in terms of floristic composition (diagnostic, constant and dominant species), biodiversity and structure, site characteristics (based on ecological indicator values [Dengler et al. 2023; Midolo et al. 2023], measured and modelled environmental data) and distribution.

Our methodological approach includes the following major steps:
- Extraction of a dataset from EVA that should comprise all units that have been proposed to be part of the *Koelerio-Corynephoretea* s.l., including some parts of neighboring classes, to be able to establish an optimal separation based on data.
- Adding important new unpublished datasets from the co-author team that are not (yet) in EVA, e.g. from different regions in Ukraine, NE and SE Poland, Gotland and the Alps.
- Narrowing down this combined initial dataset to a limited plot size range (to avoid distorting effects of divergent plot sizes) and possibly restricting it to plots with cryptogam treatment and/or reducing geographic bias by resampling.
- We will use the ICO-HES approach (iterative cluster optimisation for hierarchical expert systems; Vassilev et al. to be submitted in the next few weeks; see also the simplified version in García-Mijangos et al. 2021), but possibly develop it further, to translate an initial unsupervised classification into a classification system accompanied with an electronic expert system (EES). This approach leads to an almost complete convergence of diagnostic taxa and taxa used in the EES.
- The EES will then be applied also to the plots that were not used for its establishment, e.g. because of imprecise coordinates, regional oversampling, plot sizes out of the defined range or lack of cryptogam treatment (if the data coverage allows to establish the classification system only based on plots with cryptogam-treatment).
- Applying the EES to the type relevés of all sandy grassland associations, will allow the unanimous determination of the alliance and order names within our classification scheme.
- Finally, resulting changes in the EuroVegChecklist and in syntaxon names will be formally proposed to the respective committees (EVCC, GPN-CCCN).

Since 1993, Jürgen Dengler has intensively studied these vegetation types across Europe (Germany, Switzerland, Austria, Italy, Sweden, Poland, Estonia, Ukraine, Serbia, Bugaria, Greece, Portugal), resulting in various international (Dengler 2001, 2003: pp. 201 et seq. [9385 relevés from 267 source tables across Europe], Dengler & Löbel 2006, Dengler et al. 2006) and regional syntheses (Dengler 1994, 2004a, 2004b, Boch & Dengler 2006, Dengler & Löbel 2006, Pedashenko et al. 2013, Kuzemko et al. 2014, Krstivojević Ćuk et al. 2015, Vassilev et al. in prep.,…) while more (NE Germany as a whole, NE Poland, SE Poland, Gotland, S Ukraine) are in preparation. Moreover, he has seen *Koelerio-Corynephoretea* s.l. in France, United Kingdom, the Netherlands, Slovakia, Hungary, Latvia, Lithuania and Russia, and thus feels particularly competent to lead this project. Hanna Danko has extensively sampled the class in Ukraine and contributes numerous own unpublished relevés.

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- Will someone else be involved in data editing or analysis in addition to the applicant?

Most likely, **Hanna Danko** will lead one paper as part of her PhD under the supervision of **Sophie Karrenberg** (Uppsala) and **Jürgen Dengler** (Wädenswil).

We welcome **other members of the co-author team** to be established to actively join the analysis of the data and possibly lead separate papers.

We would particularly welcome the active involvement of colleagues who recently sampled Koelerio-Corynephoretea in different parts of Europe (e.g. Iwona Dembicz, Denys Vynokurov, Anna Kuzemko,…), recently published/submitted new syntaxonomic studies of these types (e.g. Kiril Vassilev, Dariia Borovyk) or initiated several years ago unfinished EVA projects on geographic and syntaxonomic subtopics (Mirjana Cuk, Dmytro Iakushenko, Iuliia Vasheniak). Note that this list is inconclusive and most of the tentative partners have not been asked yet.

- Estimated time of delivery of results (e.g., manuscript submission):

We estimate that a first paper will be delivered end of 2024/early 2025.

> Further papers are possible depending mainly on the ideas and the involvement of active co-authors

- Geographic area needed (e.g., countries or range of geographic coordinates):

> All

- Do you need plots to be georeferenced? If so, what is the minimum accuracy of plot location (in metres or kilometres) needed for your project?

> 50 km

- Vegetation types needed (syntaxa):

> Koelerio-Corynephoretea and Sedo-Scleranthetea sensu Mucina et al. (2016) according to the following criteria:
>
> EITHER assignment to one of the following **EUNIS habitat types**:
> N15
> N16
> N17
> R11
> R12
> R13
> R17
> R1G
> R1N
> R1P
> R1Q
> R1R
> R1S
>
> OR presence of **at least three species of the following list**:
> See attached Excel file. We will help to adjust the file to the nomenclature of EVA before applying it.
>
> **The exact application of these criteria (e.g. superior units or synonyms) will be discussed and agreed prior to data delivery with Ilona Knollová.**

- Other data selection criteria:

> None

- Envisaged publications:

> One or several papers in international journals

- **Data deposition.** Some journals require data used for the analysis to be stored in a public repository to ensure the repeatability of the analysis. According to EVA Rules, you are not allowed to store the original

vegetation-plot data obtained from EVA. However, if you plan to publish in such a journal, you may deposit a reduced EVA-derived dataset that (1) would make it possible to repeat the analysis published in the paper and (2) does not contain any information not used in the analysis. For example, such a dataset can contain only a subset of species (e.g., only angiosperms or only neophytes), or replace species names with codes, or replace species cover values with presences/absences, or remove all the header data, or replace the exact plot coordinates by coarse grid-cell coordinates etc. If you plan to deposit reduced information from vegetation plots, please describe here what might be deposited. If the project developed so that you needed to deposit more information than specified here, you would need to ask specific permission from the Custodians of the EVA databases used in your analysis before the dataset is deposited.

> Our target journals (VCS, AVS) do not have such requirements yet. Thus we assume that it will be sufficient to cite the retrieved EVA dataset with its DOI. If that data publication requirements should have changed by the time of publication, we will seek the approval of all data providers to publish a dataset that is reduced to the elements actually used in the project.

- **Plant trait data from the TRY consortium.** If you plan to combine your analysis of vegetation-plot data with plant trait data, you can also request a dataset of 18 gap-filled traits for a large number of plant taxa prepared by the TRY consortium. These traits include Leaf area, Specific leaf area, Leaf fresh mass, Leaf dry matter content, Leaf C, Leaf N, Leaf P, Leaf N per area, Leaf N:P ratio, Leaf delta15N, Seed mass, Seed length, Seed number per reproductive unit, Dispersal unit length, Plant height, Stem specific density, Stem conduit density, and Conduit element length. This dataset can be provided to you by the EVA manager together with the vegetation-plot data. If you use this dataset, you must inform about your project the TRY data contributors who might be potentially interested and invite them as potential co-authors, assuming they will make an intellectual contribution to your paper. The list of the TRY data contributors will be sent to you together with the gap-filled trait dataset.

> No (remove one)

- **Specification of the co-authorship arrangements in publications based on the requested data.** Note that the EVA Rules recommend that co-authorship is offered to a representative of each database providing data that are particularly important for the project (e.g., a relatively large proportion of the final dataset used in the analyses or data from unique vegetation types or under-represented geographic areas). This database representative should be an expert in the topic of the project (not necessarily the custodian or deputy custodian), and this person should contribute to the project more than just by providing the existing data, e.g. by intellectual contribution to the concept of the paper, preparation of new data, or helping with data analysis, interpretation of the results or writing parts of the paper (see the IAVS Code of Professional Ethics: http://iavs.org/Governance/Code-of-Professional-Ethics.aspx). The project leader should enable active participation by regularly informing potential co-authors about the progress of the project from its early stage. The project leader should also make final co-authorship arrangements based on the real input of the individual contributors.

> Generally, we welcome one active co-author from each EVA dataset that contributes at least 1% to the dataset that is finally used for classification.
> Fruther co-authors can be accepted if they contribute significantly to data preparation and analysis or if they contribute relevant new datasets that are not yet in EVA.

- **Eligibility of the applicant to receive EVA or ReSurveyEurope data.** Specify to which EVA or ReSurveyEurope database the applicant has contributed; if the applicant is not the custodian or deputy custodian of an EVA or ReSurveyEurope database, give a name of a custodian or deputy custodian who supports this data request.

> Jürgen Dengler is Custodian or Deputy Custodian of several EVA databases (NGBVD, GrassVeg.DE, GrassPlot Europe) and contributor to many others (e.g. BGD, RGD, UGD, VEGMV)

- I agree with the terms of EVA Data Property and Governance Rules as approved on 26 May 2012 (http://euroveg.org/download/eva-rules.pdf).
- If I ask for ReSurveyEurope data, I agree with the terms of ReSurveyEurope Data Property and Governance Rules as approved on 6 April 2022 (http://euroveg.org/download/resurveyeurope-rules.pdf).
- In any result obtained based on EVA core data (non-repeated vegetation surveys), I will cite the EVA report article (Chytrý et al. 2016; https://doi.org/10.1111/avsc.12191). In any result obtained based on the ReSurveyEurope data (repeated vegetation surveys), I will cite the ReSurveyEurope report article as soon as it is published. In addition, I will cite individual source databases used in my project (if possible, in the list of References; if not possible, at least as a list of databases in the electronic supplementary material).
- If I ask for the plant trait data from TRY, I agree to invite to my project the TRY data contributors following the list received from the EVA database manager.

Wädenswil, 17.07.2023

Jürgen Dengler