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:

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- Applicant's institutional address:

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- Project title:

  Assessing the contribution of non-native species on ecosystem functioning of several vegetation types in Europe

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

  We ask mainly for core EVA data, but would be happy to additionally receive the most recent ReSurveyEurope data within the period 2001-2020. We will NOT analyse temporal changes, but simply use multiple composition data from the same location in the model.

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

  Invasion by alien species has been one of the five main driving forces behind changes in nature since the 1970's (IPBES, 2019). Yet, only 5.5% of all established alien plant species is known to be invasive (IPBES, 2023b), meaning that they have negative impacts on the recipient ecosystems and potentially also on nature's contributions to people (IPBES, 2023a). These invasive plant species are characterized by significantly higher values for performance-related traits, such as water use efficiency and growth rate, compared to non-invasive species (Pyšek & Richardson, 2008; Van Kleunen et al., 2010). The negative impact of the small fraction of invasive plant species creates a negative image of alien plant species in general. Both scientists and the general public often use the term alien species, when they actually mean invasive species. Additionally, the research on alien species is largely limited to invasive species (Hulme et al., 2013). As a result, little is known about the potentially positive contribution of alien species (or neophytes, a term without the negative connotation) to ecosystem functioning. Therefore, we want to assess how

neophytes already present in Europe, affect the functional diversity of their recipient communities. This reflects their contribution to the functioning of the ecosystem.

Firstly, we want to assess general aspects of the vegetation plots in Europe regarding plant groups of different origin, namely: native species, intra-European and extra-European neophytes. The latter distinction is made as intra-European species are co-evolved with the native species and their natural enemies are likely present in the non-native range, in contrast to extra-European species, which are more likely to behave differently and potentially become invasive. The fraction of plots where neophytes occur will be quantified, as well as the average species richness and cover of the three plant groups in plots where they are present. Additionally, we will calculate several metrics of functional diversity (FD) using the gap-filled trait dataset of TRY (possibly extended with other datasets) to capture the most important ecosystem functions. We will then assess the drivers of FD using a general linear mixed model (GLMM), with a random effect for the vegetation assessment study. Other explanatory variables include species richness, plot area, climatic and edaphic conditions, and human footprint index as a measure of anthropogenic disturbance. As a related analysis, we will quantify the contribution of the different species groups to functional diversity for the plots containing neophytes. Next, the contribution to functional diversity will also be assessed on species level in a phylogenetic regression model with plant status and functional traits as predictor variables. Finally, we will look at differences in trait values between the three origin classes (native, intra-European and extra-European) to be able to explain the effects found in the previous analyses. All analyses will be done separately for the different habitat types present in the dataset, hence trends can be compared.

To conclude, this research will give insights in the contribution of neophytes to ecosystem functioning in Europe and how this relates to the difference in functional traits between native and alien plant species. As such, we broaden the scope of understanding neophytes ecology beyond invasive alien species. This research is part of the ERC-funded FutureNature project, which studies the potential of functional assisted migration to conserve ecosystem functioning under climate change.

References

Hulme, P. E., Pyšek, P., Jarošík, V., Pergl, J., Schaffner, U., & Vilà, M. (2013). Bias and error in understanding plant invasion impacts. *Trends in Ecology and Evolution*, *28*(4), 212–218. https://doi.org/10.1016/j.tree.2012.10.010

IPBES. (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. www.ipbes.net

IPBES. (2023a). *Summary for policymakers of the thematic assessment report on invasive alien species and their control of the Intergovernmental Science-Policy Platform of Biodiversity and Ecosystem Services*. https://doi.org/10.5281/zenodo.7430692

IPBES. (2023b). *Thematic assessment report on invasive alien species and their control of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. https://doi.org/10.5281/zenodo.7430682

Pyšek, P., & Richardson, D. M. (2008). Traits Associated with Invasiveness in Alien Plants: Where Do we Stand? In W. Nentwig (Ed.), *Biological Invasions* (Ecological studies, Vol. 193). Springer.

Van Kleunen, M., Weber, E., & Fischer, M. (2010). A meta-analysis of trait differences between invasive and non-invasive plant species. In *Ecology Letters* (Vol. 13, Issue 2, pp. 235–245). https://doi.org/10.1111/j.1461-0248.2009.01418.x

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

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

end of 2025/early 2025 for the first paper, end of 2026 for the potential second paper

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

All areas included in the database, with exclusion of Russia, the Faroes, and Iceland.

- 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?

Yes, with a minimum accuracy of 300 m.

- Vegetation types needed (syntaxa):

All

- Other data selection criteria:
  - The plot area should be between at least 1 m² and maximum 1000 m²
  - The date should be assigned and spanning over the time period 2001-2020

- Envisaged publications:

One or two papers in peer-reviewed scientific journals. This depends on whether we have sufficient material for two separate papers or not.

- 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.

Depending on the journals, we might need to deposit a reduced dataset, which possibly would comprise species richness, functional trait values, functional diversity, neophyte presences, and if needed also plot sizes and blurred coordinates of the plots used (i.e. aggregated to a coarse spatial resolution). We will NOT publish the species composition of the plots, nor other header data not used in the analyses.

- 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.

  Yes

- 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: https://www.iavs.org/page/governance_code-of-proffesional-ethics). 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.

  Following the guidelines of EVA and ReSurveyEurope, we will offer co-authorship to one representative of each databases of particular importance in our analysis (e.g. those that contribute to at least 1% of the data in the final dataset), but expect intellectual contribution beyond data provision, for example involvement in the data analysis or manuscript writing/ revision. Additionally, representatives of databases showing interest in collaboration are invited to fill in the online form, which will be evaluated on individual request basis.

- 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.

  Koenraad Van Meerbeek contributed to the BE_0001 database of ResurveyEurope

- 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.

Leuven, 10.04.2025

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