



## EVA Annual report (2021)

Dear EVA friends,

This is the 5th annual report of the European Vegetation Archive (EVA) summarizing the status of our database consortium, projects, and publications.

The number of [EVA databases](#) has reached **99** (updated in April 2021), including **1,804,985 vegetation plots**, of which 87% were georeferenced and 58% were assigned to phytosociological syntaxa. From these plots, 74% may be accessed under the semi-restricted regime and 13% under the restricted regime, while the other 13% are open access. In total, EVA data have been available for **108 research projects** (see the full list [here](#)).

The use of EVA data is continuously increasing, with **24 new projects** since the last annual report (circa 1 year ago). Other five projects have finished or have been cancelled in the same period.

The number of publications of the EVA consortium showed a considerable increase during the last year, with a total of **22 new papers** published in scientific journals, and one new report. A substantial contribution of the whole EVA consortium was the expert-system classification of EUNIS habitats ([Chytrý et al. 2020](#), *Applied Vegetation Science*), providing an assignment of plots to EUNIS typologies for further applications in EVA projects. Other studies published in the same journal focused on classification of European marshes ([Landucci et al. 2020](#)), pine forests ([Bonari et al. 2021](#)) and river-gravel bars ([Kalníková et al. 2021](#)), and the implementation of the EUNIS expert system in R ([Bruelheide et al. 2021](#)).

Other seven papers are part of a special issue on **Macroecology of Vegetation** featured in the *Journal of Vegetation Science*, analyzing patterns of plant invasions ([Axmanová et al. 2021](#), [Cao Pinna et al. 2021](#), [Wagner et al. 2021](#)), beta-diversity of European beech forests ([Padullés Cubino et al. 2021a](#)), richness of plant families across Europe ([Večeřa et al. 2021](#)), plant trait-abundance distributions ([Sporbert et al. 2021](#)) and the taxonomical and functional diversity of European grasslands ([Boonman et al. 2021](#)).

Other two studies in *Global Ecology and Biogeography* focused on the socio-economy of plant naturalizations (Pouteau et al. 2021) and the determinants of alpine species pools in European mountains ([Jiménez-Alfaro et al. 2021](#)), while other two publications in the *Journal of Biogeography* analyzed plant abundance and species range sizes ([Sporbert et al. 2020](#)), and the phylogenetic diversity of European forests ([Padullés Cubino et al. 2021b](#)).

Other EVA papers have addressed the classification of steppes ([Didukh et al. 2021](#), *Hacquetia*); the invasion ([Klisz et al. 2021](#), *Forest Ecology and Management*) and climatic expansion of *Robinia pseudoacacia* ([Puchałka et al. 2020](#), *Global Change Biology*); the diversity of rock-outcrop lime forests ([Zukal et al. 2020](#), *Preslia*); the habitat of *Nuphar pumila* ([Keller et al. 2020](#), *Tuexenia*); the creation of a database on weed vegetation ([Kůzmič et al. 2020](#), *Phytocoenologia*), and a model-based map of groundwater pH and calcium in Europe ([Hájek et al. 2021](#), *Earth System Science Data*).

In total, since its launch, EVA has contributed to **50 journal papers**, one book, 10 technical reports, one bachelor thesis and 73 presentations at conferences or workshops. For an updated list of all publications, please visit [the EVA webpage](#).



We congratulate the EVA project leaders and all data contributors for these achievements, looking forward to seeing new projects and results in the next year!

**Borja Jiménez-Alfaro, Ilona Knollová and the EVA Coordinating Board**

**April 2021**

#### EVA PROJECTS FINISHED

- Large-scale assessment of alien plant invasions in European vegetation (InvasEVe) / Forests – Viktoria Wagner
- Phytocoenological relationship of plant species of the genus *Soldanella* sect. *Soldanella* to vegetation types – Milan Valachovič
- Comparative analysis of petrophytic steppes and outcrops vegetation from Central and Eastern Europe – Yulia Vashenyak
- Ecological and evolutionary determinants of recent diversity in European forests – Josep Padullés Cubino

#### EVA PROJECTS CANCELLED

- Range formation of beech forest understory herbs – Wolfgang Willner (EVA data not needed)
- European forestry & forest pathogens under climate change – Stefan Dullinger
- The use of hemiparasitic plants in orchards and vineyards (Bachelor thesis) – Jakub Těšitel
- Remotely sensed temperature predictors for Habitat Suitability Models – Christian Berg
- Factors driving distribution of two closely related species: *Anthoxanthum odoratum* and *A. alpinum* – Terezie Šimáková (EVA data not needed)
- Biogeography of *Gentianella crispata* – Karl Hülber (EVA data not needed)

#### NEW EVA PUBLICATIONS

##### Journal papers

Axmanová I., Kalusová V., Danihelka J., Dengler J., Pergl J., Pyšek P., Večeřa M., Attorre F., Biurrun I., Boch S., Conradi T., Gavilán R.G., Jiménez-Alfaro B., Knollová I., Kuzemko A., Lenoir J., Leostin A., Medvecká J., Moeslund J. E., Obratov-Petkovic D., Svenning J.-C., Tsiripidis I., Vassilev K. & Chytrý M. (2021) **Neophyte invasions in European grasslands**. *Journal of Vegetation Science* 32: e12994.

Bonari G., Fernández-González F., Çoban S., Monteiro-Henriques T., Bergmeier E., Didukh Ya. P., Xystrakis F., Angiolini C., Chytrý K., Acosta A. T. R., Agrillo E., Costa J. C., Danihelka J., Hennekens S. M., Kavğacı A., Knollová I., Neto C. S., Sağlam C., Škvorc Ž., Tichý L. & Chytrý M. (2021) **Classification of the Mediterranean lowland to submontane pine forest vegetation**. *Applied Vegetation Science* 24: e12544.

Boonman C. C. F., Santini L., Robroek B. J. M., Hoeks S., Kelderman S., Dengler J., Bergamini A., Biurrun I., Carranza M.L., Cerabolini B. E. L., Chytrý M., Jandt U., Lysenko



- T., Stanisci A., Tatarenko I., Rusina S. & Huijbregts M. A. J. (2021) **Plant functional and taxonomic diversity in European grasslands along climatic gradients.** *Journal of Vegetation Science*: e13027.
- Bruelheide H., Tichý L., Chytrý M. & Jansen F. (2021) **Implementing the formal language of the vegetation classification expert systems (ESy) in the statistical computing environment R.** *Applied Vegetation Science* 14: e12562.
- Cao Pinna L., Axmanová I., Chytrý M., Malavasi M., Acosta A. T. R., Giulio S., Attorre F., Bergmeier E., Biurrun I., Campos J. A., Font X., Kůzmič F., Landucci F., Marcenò C., Rodríguez-Rojo M. P. & Carboni M. (2021) **The biogeography of alien plant invasions in the Mediterranean Basin.** *Journal of Vegetation Science* 32: e12980.
- Chytrý M., Tichý L., Hennekens S. M., Knollová I., Janssen J. A. M., Rodwell J. S., Peterka T., Marcenò C., Landucci F., Danihelka J., Hájek M., Dengler J., Novák P., Zukal D., Jiménez-Alfaro B., Mucina L., Abdulhak S., Ačić S., Agrillo E., Attorre F., Bergmeier E., Biurrun I., Boch S., Bölöni J., Bonari G., Braslavskaya T., Bruelheide H., Campos J.A., Čarni A., Casella L., Čuk M., Čušterevska R., De Bie E., Delbosc P., Demina O., Didukh Y., Dítě D., Dziuba T., Ewald J., Gavilán R.G., Gégout J., Giusso del Galdo G. P., Golub V., Goncharova N., Goral F., Graf U., Indreica A., Isermann M., Jandt U., Jansen F., Jansen J., Jašková A., Jiroušek M., Kačák Z., Kalníková V., Kavğacı A., Khanina L., Korolyuk A. Yu., Kozhevnikova M., Kuzemko A., Kůzmič F., Kuznetsov O. L., Laiviņš M., Lavrinenko I., Lavrinenko O., Lebedeva M., Lososová Z., Lysenko T., Maciejewski L., Mardari C., Marinšek A., Napreenko M. G., Onyshchenko V., Pérez-Haase A., Pielech R., Prokhorov V., Rašomavičius V., Rodríguez Rojo M. P., Rūsiņa S., Schrautzer J., Šibík J., Šilc U., Škvorc Ž., Smagin V. A., Stančić Z., Stanisci A., Tikhonova E., Tonteri T., Uogintas D., Valachovič M., Vassilev K., Vynokurov D., Willner W., Yamalov S., Evans D., Palitzsch Lund M., Spyropoulou R., Tryfon E. & Schaminée J. H. J. (2020) **EUNIS Habitat Classification: Expert system, characteristic species combinations and distribution maps of European habitats.** *Applied Vegetation Science* 23: 648–675.
- Didukh Ya., Vasheniak I. & Chusova O. (2021) **Stipo pulcherrimae-Festucetalia pallentis Pop 1968 of calcareous petrophytic steppes in Ukraine.** *Hacquetia*. <https://ojs.zrc-sazu.si/hacquetia/article/view/8832>
- Hájek M., Jiménez-Alfaro B., Hájek O., Brancaloni L., Cantonati M., Carbognani M., Dedić A., Dítě D., Gerdol R., Hájková P., Horsáková V., Jansen F., Kamberović J., Kapfer J., Kolari T.H.M., Lamentowicz M., Lazarević P., Mašić E., Moeslund J.E., Pérez-Haase A., Peterka T., Petraglia A., Pladevall-Izard E., Plesková Z., Segadelli S., Semeniuk Y., Singh P., Šimová A., Šmerdová E., Tahvanainen T., Tomaselli M., Vystavna Y., Bița-Nicolae C., & Horsák M. (2021) **A European map of groundwater pH and calcium.** *Earth System Science Data* 13: 1089–1105.
- Jiménez-Alfaro B., Abdulhak S., Attorre F., Bergamini A., Carranza M.L., Chiarucci A., Čušterevska R., Dullinger S., Gavilán R. G., Giusso del Galdo G., Kuzmanović N., Laiolo P., Loidi J., Malanson G. P., Marcenò C., Milanović D., Pansing E. R., Roces-Díaz J. V., Ruprecht E., Šibík J., Stanisci A., Testolin R., Theurillat J.-P., Vassilev K., Willner W. & Winkler M. (2021) **Post-glacial determinants of regional species pools in alpine grasslands.** *Global Ecology and Biogeography* 30: 1101–1115.
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- Keller S., Babbi M., Widmer S., Gehler J., Hausmann S., Berg C., Landucci F., Schwager P., Šumberová K. & Dengler J. (2020). **Determination of habitat requirements of the glacial relict *Nuphar pumila* as basis for successful (re-) introductions.** *Tuexenia* 40: 309–326.
- Klisz M., Puchałka R., Netsvetov M., Prokopuk Y., Vítková M., Sádlo J., Matisons R., Mionskowski M., Chakraborty D., Olszewski P., Wojda T. & Koprowski M. (2021) **Variability in climate-growth reaction of *Robinia pseudoacacia* in Eastern Europe indicates potential for acclimatisation to future climate.** *Forest Ecology and Management* 492: 119194.
- Küzmič F., Šilc U., Lososová Z., Mucina L., Chytrý M., Knollová I., Hennekens S.M., Berg C., Bergmeier E., Biurrun I., Fanfarillo E., Font X., Iakushenko D., Kovačević Z., Meyer S., Nagy K., Pinke G., Poranen E. & Tereshenko S. (2020) **European Weed Vegetation Database – a gap-focused vegetation-plot database.** *Phytocoenologia* 50: 93–100.
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Sporbert M., Keil P., Bruelheide H., Seidler G., Jandt U., Aćić S., Biurrun I., Campos J. A., Čarni A., Casella L., Chytrý M., Čušterevska R., Dengler J., Golub V., Jansen F., Kuzemko A., Lenoir J., Marcenò C., Moeslund J. E., Pérez-Haase A., Rūsiņa S., Šilc U., Tsiripidis I., Vandvik V., Vassilev K., Virtanen R. & Welk E. (2020) **Testing macroecological abundance patterns: the relationship between local abundance and range size, range position and climatic suitability among European vascular plants.** *Journal of Biogeography* 47: 2210–2222.

Sporbert M., Welk E., Seidler G., Jandt U., Aćić S., Biurrun I., Campos J.A., Čarni A., Cerabolini B. E. L., Chytrý M., Čušterevska R., Dengler J., De Sanctis M., Dziuba T., Fagúndez J., Field R., Golub V., He T., Jansen F., Lenoir J., Marcenò C., Martín-Forés I., Moeslund J. E., Moretti M., Niinemets Ü., Penuelas J., Pérez-Haase A., Vandvik V., Vassilev K., Vynokurov D. & Bruelheide H. (2021) **Different sets of traits explain abundance and distribution patterns of European plants at different spatial scales.** *Journal of Vegetation Science* 32: 13016.

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## Reports

Janssen J.A.M., Bijlsma R.J. & van Delft B. 2021. **Kruipend moerasscherm (*Helosciadium repens*) in Zeeland; ecologie en beheer van een Europees beschermd plantensoort.** Report 3064, Wageningen Environmental Research, Wageningen.