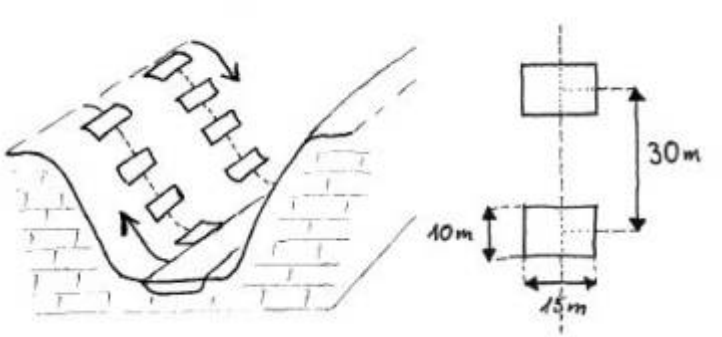
Forest vegetation data from Vltava river valley

Source of data

Zelený & Chytrý (2007)

Description of the dataset



Distribution of plots along transects across the valley.

Vegetation plots, located at even distances along transects following the steep valley slopes of Vltava river valley, collected during 2001-2003. Each transect starts at the valley bottom and ends up at the upper part of the valley slope. Altogether 97 plots located in 27 transects were collected, each of the size 10×15 m. In each plot, all tree, shrub and herb species were recorded and their abundances were estimated using 9-degree ordinal Braun-Blanquette scale (these values were consequently transformed into percentage scale). At each plot, various topographical and soil factors were measured or estimated.

Locality

Vltava river valley close to Zlatá Koruna, Český Krumlov, Czech Republic. The transects follow the slopes of various aspect, and only the sites with natural or semi-natural forest vegetation were selected (no forest plantations).

The file with coordinates, which can be opened in Google Earth: vltava.kml [1)]

Environmental variables

Name of variable	Description
PLOT	plot number
ELEVATION	elevation [m a.s.l.]
SLOPE	slope [°]
ASPSSW	aspect (deviation of plot aspect from 22.5°, reaching the highest values in SSW orientation)
HEAT.LOAD	heat load, calculated from plot slope and aspect (McCune & Keon 2002)
SURFSL	landform shape in the downslope direction (three-degree ordinal scale: -1 concave, 0 flat, 1 convex)

Name of variable	Description
SURFIS	landform shape along the isohypse (three-degree ordinal scale: -1 concave, 0 flat, 1 convex)
LITHIC	lithic leptosols (shallow soils near rock outcrops)
SKELETIC	skeletic and hyperskeletic leptosols (stony soils on scree accumulatons)
CAMBISOL	cambisols (well-developed zonal soils)
FLUVISOL	fluvisols (water-influenced soils formed from alluvial deposits)
SOILDPT	“soil depth [cm], measured by 0.7 m long iron rod (1.5 cm diameter) - average of 5 values measured in 5 places within the plot
pH	soil pH (measured in water solution)
COVERE32	estimated cover of tree and shrub layer [%] (merged tree and shrub estimations, using formula p.tree + p.shrub - p.tree*p.shrub
COVERE3	estimated cover of tree layer [%]
COVERE2	estimated cover of shrub layer [%]
COVERE1	estimated cover of herb layer [%]
COVERE0	estimated cover of moss layer [%]
GROUP	four vegetation types (groups of samples), determined by numerical classification (using Vltava data with herbs + merged trees and shrubs, Ward clustering with Euclidean distance applied on log1p transformed species composition data)
SPEC.NO	number of species per plot (herbs + merged trees and shrubs)
TBV.NO	Turboveg number - unique identifier under which the plot is stored in Czech National Phytosociological Database (http://www.sci.muni.cz/botany/vegsci/dbase.php?lang=en)
TRANSECT	transect number
LIGHT	mean Ellenberg indicator values for light, calculated as unweighted mean from data in Vltava spe (herbs + merged trees and shrubs)
TEMP	mean Ellenberg indicator values for temperature, calculated as unweighted mean from data in Vltava spe (herbs + merged trees and shrubs)
CONT	mean Ellenberg indicator values for continentality, calculated as unweighted mean from data in Vltava spe (herbs + merged trees and shrubs)
MOIST	mean Ellenberg indicator values for moisture, calculated as unweighted mean from data in Vltava spe (herbs + merged trees and shrubs)
REACT	mean Ellenberg indicator values for soil reaction calculated as unweighted mean from data in Vltava spe (herbs + merged trees and shrubs)
NUTR	mean Ellenberg indicator values for nutrients, calculated as unweighted mean from data in Vltava spe (herbs + merged trees and shrubs)

Data for download

File name	File type	Description
vltava.xlsx	Excel file	Contains species × sample matrix, environmental variables, explanation of species abbreviations and metadata
vltava-spe.txt	tab-delimited txt format	Sample × species matrix (97 samples in rows, 274 species in columns)
vltava-env.txt	tab-delimited txt format	Environmental variable matrix (samples in rows, variables in columns)
vltava.cep	canoco condensed file	Species × sample matrix in CANOCO format
vltava.RData	r object file	An R object, a list with six components (see below for detail description)

Script for direct import of data to R

Compositional and environmental data (for all species)

```
vltava.spe <- read.delim
('https://raw.githubusercontent.com/zdealveindy/anadat-r/master/data/vltava-spe.txt
```

```
', row.names = 1)
vltava.env <- read.delim
('https://raw.githubusercontent.com/zdealveindy/anadat-r/master/data/vltava-env.txt
')
```

Ellenberg indicator values for species in the dataset (for all species)

```
vltava.ell <- read.delim
('https://raw.githubusercontent.com/zdealveindy/anadat-r/master/data/vltava-ell.txt
', row.names = 1)
```

All Vltava dataset matrices as a single R object (list ''vltava'')

```
load (url
('https://raw.githubusercontent.com/zdealveindy/anadat-r/master/data/vltava.RData')
)
```

The `vltava` object which will be loaded into the working space is a list with seven components:

- `spe` - Compositional matrix of all species in merged layers (sample x species, percentage cover scale)
- `eiv` - Species Ellenberg indicator values (species x Ellenberg values for light, temperature, continentality, moisture, reaction and nutrients, compiled from Ellenberg et al. 1992).
- `civ` - Species Ellenberg-type indicator values (species x Ellenberg-type values for `light`, `temperature`, `moisture`, `reaction` and `nutrients`, compiled from Chytrý et al. 2018, and also values including generalists - `light_all`, `temp_all`, `moist_all`, `react_all` and `nutr_all`).
- `env` - Environmental variables (see Details above).
- `spnames` - Data frame with two columns: Full.species.name - original species names, and Layer - vegetation layer, in which the species occur (1 - herb layer, 23 - shrub or/and tree layer)
- `herbs` - A list with the following items, related only to the subset of herb species:
    - `spe` - Compositional matrix of herb species (sample x species, percentage cover scale)
    - `eiv` - Species Ellenberg indicator values for herb species (species x Ellenberg values for light, temperature, continentality, moisture, reaction and nutrients)
    - `civ` - Species Ellenberg-type indicator values for herb species (species x Ellenberg-type values for `light`, `temperature`, `moisture`, `reaction` and `nutrients`, compiled from Chytrý et al. 2018, and also values including generalists - `light_all`, `temp_all`, `moist_all`, `react_all` and `nutr_all`).
    - `traits` - Species functional traits for plant height (compiled from Czech flora, Kubat et al. 2002), specific leaf area (SLA) and seed weight (compiled from LEDA database, Kleyer et al. 2008).
    - `spnames` - Data frame with two columns: Full.species.name - original species names, and Layer - vegetation layer, in which the species occur (1 - herb layer)
- `all` - A list with the following items, related to matrix with all species (trees, shrubs, herbs and juveniles)
    - `spe` - Compositional matrix of all species (sample x species, percentage cover scale)
    - `spnames` - Data frame with two columns: Full.species.name - original species names, and Layer - vegetation layer, in which the species occur (3 - tree layer, 2 - shrub layer, 1 - herb layer, J - juveniles of woody species)

References

- Ellenberg, H., Weber, H.E., Düll, R., Wirth, V., Werner, W. & Paulissen, D. 1992. Zeigerwerte von Pflanzen

in Mitteleuropa. Second Edition. *Scripta Geobotanica* 18: 1–248.
- Kleyer, M., Bekker, R.M., Knevel, I.C., Bakker, J.P., Thompson, K., Sonnenschein, M., Poschlod, P., van Groenendael, J.M., Klimes, L., Klimesova, J., Klotz, S., Rusch, G.M., Hermy, M., Adriaens, D., Boedeltje, G., Bossuyt, B., Dannemann, A., Endels, P., Gotzenberger, L., Hodgson, J.G., Jackel, A.K., Kuhn, I., Kunzmann, D., Ozinga, W.A., Romermann, C., Stadler, M., Schlegelmilch, J., Steendam, H.J., Tackenberg, O., Wilmann, B., Cornelissen, J.H.C., Eriksson, O., Garnier, E. & Peco, B. 2008. The LEDA Traitbase: a database of life-history traits of the Northwest European flora. *Journal of Ecology* 96: 1266–1274.
- Zelený, D. & Chytrý, M. 2007. Environmental control of vegetation pattern in deep river valleys of the Bohemian Massif. *Preslia* 79: 205-222. pdf

[1)]
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