Supporting information to the paper

Chytrý M. *et al.*, EUNIS Habitat Classification: expert system, characteristic species combinations and distribution maps of European habitats. *Applied Vegetation Science.*

Appendix S5. Brief user guide to the classification of vegetation plots by the expert system EUNIS-ESy using the JUICE program.

Brief user guide to the classification of vegetation plots by the expert system EUNIS-ESy using the JUICE program

1. Preparation and upload of input files

EUNIS-ESy is optimized for data files from the European Vegetation Archive (EVA), which are exported from the TURBOVEG 3 program. These files contain taxon concepts and names that correspond to the Euro+Med PlantBase and all the information that is required for the proper functioning of EUNIS-ESy. However, EUNIS-ESy can also be applied to the files exported from TURBOVEG 2 or any other database management program, provided the taxon concepts and names are unified according to Euro+Med, and the required information is present in header data.

1.1. Input files from EVA

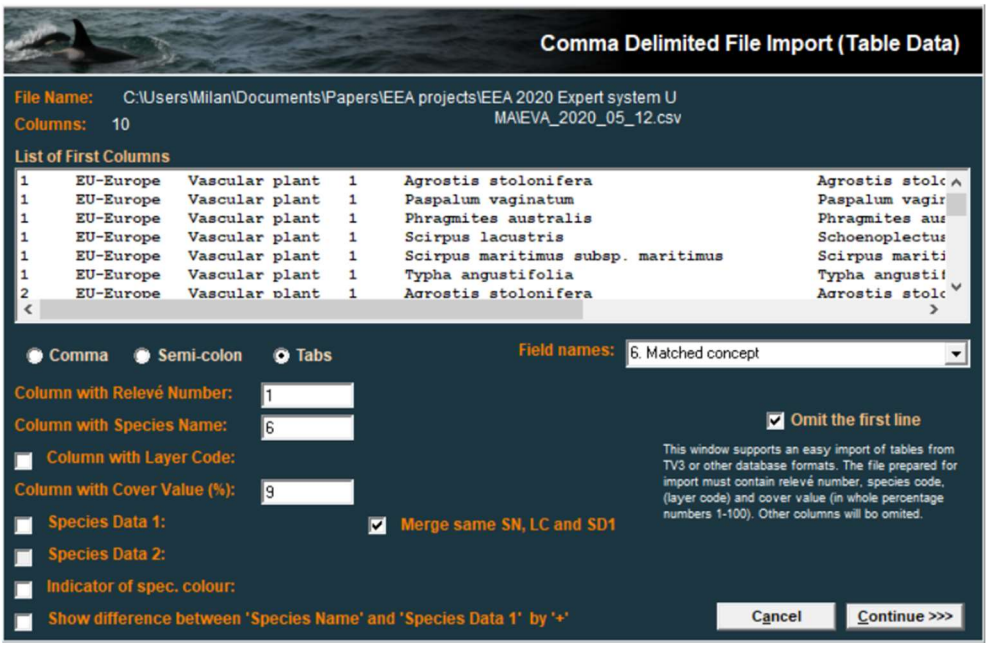
EVA data are stored in the TURBOVEG 3 program and exported in two files with the extensions *.hea and *.csv. These files are imported to JUICE using:

File / Import / Table / from TURBOVEG3 and Simple Text File (Database Records)

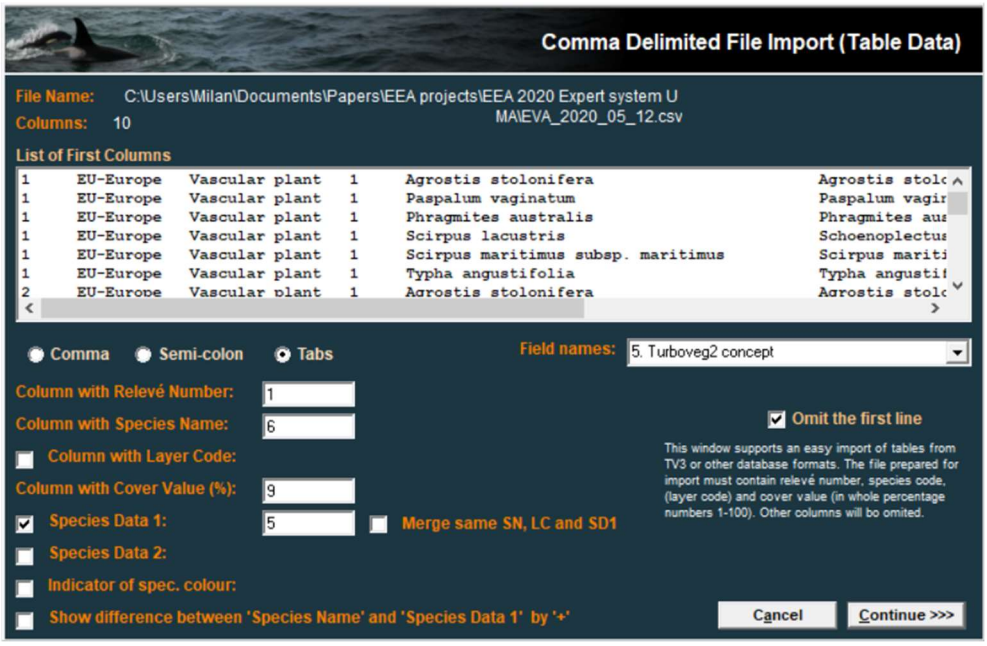
Fill the numbers of columns with the required data in the form (see the screenshot below). The column names can be shown by unticking the box Omit the first line. As a minimum, the following three columns must be imported:

1. Relevé number
2. Matched concept – this column contains the name converted to Euro+Med PlantBase nomenclature
3. Cover value (%)

EUNIS-ESy does not consider information on vegetation layers. Therefore, records of the same taxon in different layers have to be merged by ticking the box Merge same SN (= species name), LC (= layer code) and SD1 (= species data) when importing the data.



If you want to check how original taxon names were translated to Euro+Med, import the original names from the source databases in the column “Turboveg2 concept” to the field with species data in JUICE:



1.2. Input files from TURBOVEG 2 and other databases

Make sure that the file contains information in the following header data fields:

- Country – a qualitative variable containing country names spelled as follows: Albania, Andorra, Armenia, Austria, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Faroe Islands, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Kazakhstan, Kosovo, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russian Federation, San Marino, Serbia, Slovak Republic, Slovenia, Spain, Svalbard and Jan Mayen Is, Sweden, Switzerland, Turkey, Ukraine, United Kingdom
- ECOREG_WWF – containing three-letter codes of terrestrial ecoregions according to Dinerstein et al. (2017; https://ecoregions2017.appspot.com/)
- COAST_EEA – information whether the site is at the coast (including coastal habitats such as dunes, sea cliffs or coastal saltmarshes) with the following categories (explanation in brackets):
  - ARC_COAST (Arctic)
  - ATL_COAST (Atlantic)
  - BAL_COAST (Baltic)
  - BLA_COAST (Black Sea)
  - MED_COAST (Mediterranean)
  - N_COAST (Outside the coastal area)
- DUNES_BOHN – information whether the site is in coastal dunes (including dune scrub and dune forest); the categories are Y_DUNES and N_DUNES for the occurrences in and outside dunes, respectively
- DEG_LAT, DEG_LON – degrees of latitude and longitude of the plot in the coordinate system WGS 84, format DD.DDDD; western longitudes are indicated with a minus sign
- Altitude (m) – a quantitative variable containing the altitude of the plot in metres above sea level

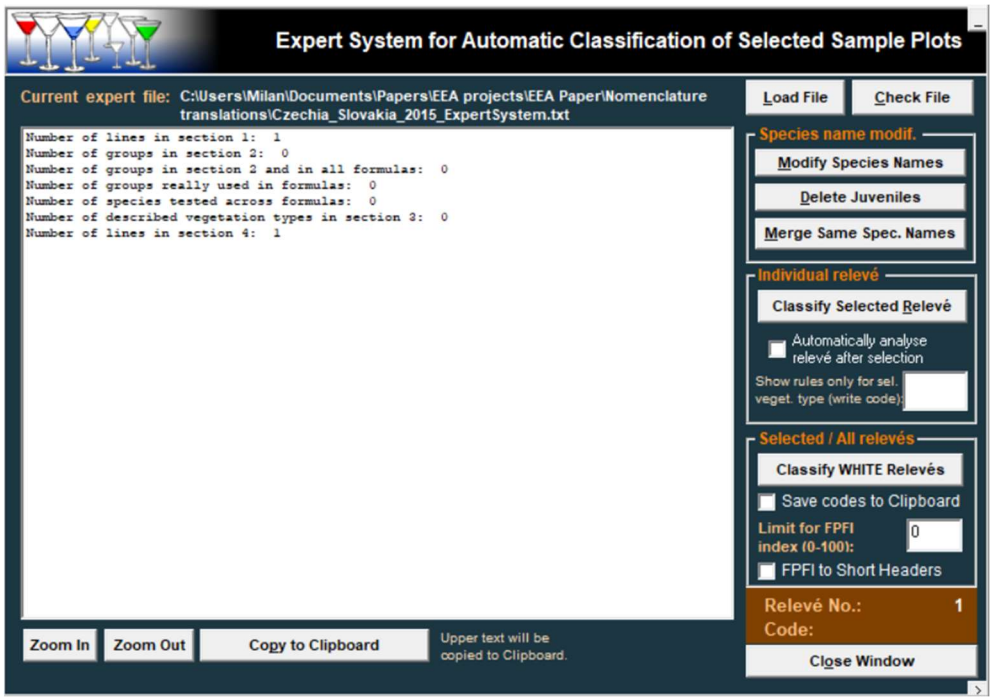
Upload the vegetation-plot dataset to JUICE. Remove layer information for all the taxa by selecting “0” layer in:

Species / Renumber Layers for COLOUR Species

Find a file in Zenodo repository (http://doi.org/10.5281/zenodo.3841729) that corresponds to the species list used in your database. Open this file using:

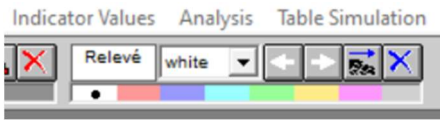
Analysis / Expert System Classificator

Press the button Modify Species Names. After the process finishes, which is indicated by the appearance of the list of modifications in the white window, press Merge Same Spec. Names. The records related to the same species name will be merged, and their covers will be summed using the Jennings–Fischer formula assuming the random overlap of covers (Jennings 2009, *Ecological Monographs*; Fischer 2015, *Applied Vegetation Science*), i.e. the resulting value will never exceed 100%. As a result, each taxon will occur only once in the table.



2. Classification

Check if the colour of plots (Relevés) on the top of the JUICE screen is set to white:



Open:

Analysis / Expert System Classificator

To start the classification, press the button Classify WHITE Relevés. Alternatively, you can colour selected plots and classify only these plots. The classification process can take several minutes. In the case of datasets containing more than 1 million plots, it will take at least two hours or even more, depending on the quality of the processor of your computer. When the process is finished, codes of individual habitats appear in the header of each plot. For further analyses, these headers should be exported to a file using File / Export / Export Short Headers.

The classified plots can be grouped and separated using:

Sorting / Sort Short Headers
Separators / Make Separators / Within Short Headers