

# EUROSL - A EUROPEAN TAXONOMIC BACKBONE FOR VEGETATION DATABASES AND OTHER TAXON-RELATED DATABASES: VERSION 1.0

Florian Jansen<sup>1</sup>, Jiří Danihelka<sup>2</sup>, Stephan M. Hennekens<sup>3</sup>, Elisabeth Hüllbusch<sup>4</sup>, Riccardo Guarino<sup>5</sup>, Gerhard Karrer<sup>6</sup>, Jean-Paul Theurillat<sup>8,9</sup>, Viktoria Wagner<sup>2</sup>, and Jürgen Dengler<sup>4,10</sup>

<sup>1</sup>Landscape Ecology and Ecosystem Dynamics (LEED), Institute of Botany and Landscape Ecology, University of Greifswald, Germany

<sup>2</sup>Department of Botany and Zoology, Masaryk University, Czech Republic

<sup>3</sup>ALTERRA, Wageningen University and Research Centre, 6700 AA Wageningen, The Netherlands

<sup>4</sup>Plant Ecology, Bayreuth Center of Ecology and Environmental Research (BayCEER), University of Bayreuth, Universitätsstr. 30, 95447 Bayreuth, Germany

<sup>5</sup>Dept. STEBICEF, Botanical Unit, University of Palermo, via Archirafi 38, 90134 Palermo, Italy

<sup>6</sup>Institute of Botany, University of Natural Resources and Life Sciences, Gregor Mendel Str. 33, 1180 Vienna, Austria

<sup>8</sup>Fondation J.-M. Aubert, C.P. 71, 1938 Champex-Lac, Switzerland

<sup>9</sup>Section of Biology, University of Geneva, C. P. 60, 1292 Chambésy, Switzerland

<sup>10</sup>Synthesis Centre (sDiv), German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Deutscher Platz 5e, 04103 Leipzig, Germany

## Aim

To combine widespread taxonomic references as a backbone of European vascular plants and bryophytes for vegetation databases and taxon attributes.

## Background

A taxonomic reference list is an indispensable tool to sample, manage and match biodiversity data from different sources. Merging vegetation databases or combining them with taxon-related attributes needs reliable and consistent information about the taxon concepts used and an appropriate naming.

## Methods

We used the Euro+Med PlantBase (Euro+Med 2006 et seq.), version 2015/04. For all families not yet covered in this version we used taxa from Flora Europaea (Tutin et al. 1968 et seq.). Additionally we included aggregates from the Ehrendorfer (1973) list. For bryophytes we will rely on Grolle & Long (2000) and Hill et al. (2006).

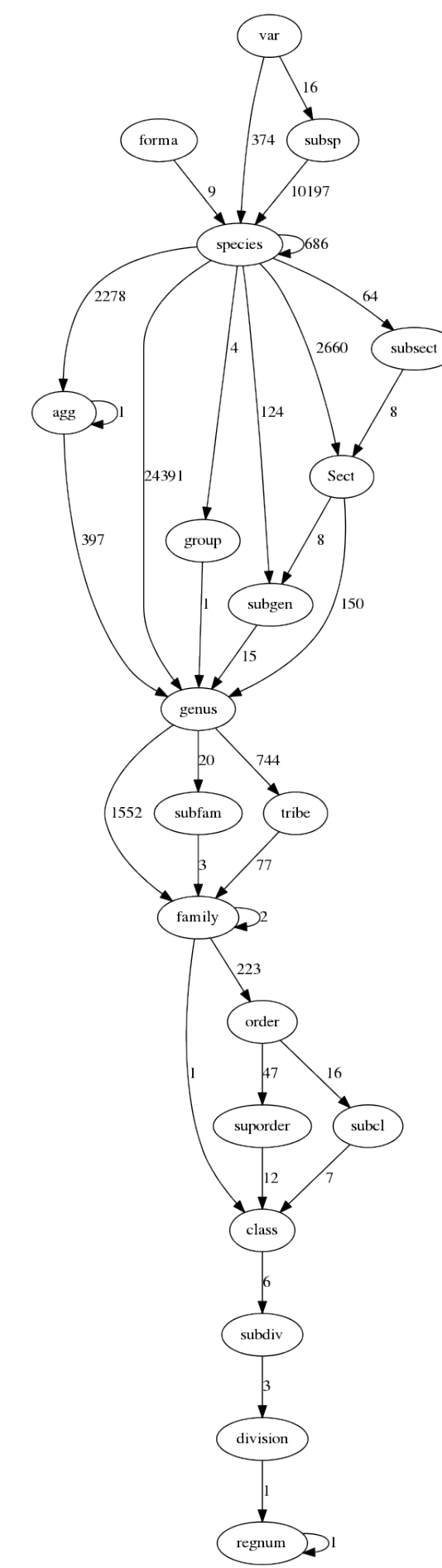
Consistency checks are used to validate the available data.

## Results

EuroSL covers at the moment only vascular plants with > 44,000 accepted taxa and >76,000 synonyms from approximately 300 families.

At the species level this means approx. 30,000 accepted species.

## Hierarchical classification



EuroSL uses a hierarchical classification of taxa (parent - child relationships) to explain taxonomic concepts implicitly. It is checked for consistency. Self-referencing taxa at the species level occur for *Hieracium* taxa where Euro+Med has chosen to use wide and small species concepts in parallel (together with species groups and aggregates) to represent the complicated situation in this genus. The two self-referencing families (*Hydrophyllaceae*, *Myoporaceae*) are necessary to connect different family concepts of Euro+Med and Flora Europaea.

### Names

Accepted taxa: 44102  
Name synonyms: 76397

### Sources for accepted taxa

Euro+Med 2015 95.7 %  
Flora Europaea 3.9 %  
Ehrendorfer (Agg.) 0.4 %

### Most frequent families

Compositae	11614
Poaceae	3113
Fabaceae	2422
Lamiaceae	2210
Caryophyllaceae	2168
Rosaceae	2122
Brassicaceae	2056
Scrophulariaceae	1647
Apiaceae	1523
Ranunculaceae	1462

### Most frequent genera

Hieracium	4461
Taraxacum	1903
Ranunculus	1114
Rubus	780
Centaurea	748
Silene	592
Alchemilla	541
Astragalus	503
Limonium	436
Allium	423

## Matching EIVE

EuroSL will be used as a backbone for the Ecological Indicator Values of Europe. At the moment (preliminary version of EuroSL and preliminary version of EIVE) 75% of all taxa occurring in the source indicator lists of EIVE can be matched to EuroSL. The remaining 25% include 1) non-scientific names (e.g. *Abies hyb. (sans nom 1)*, *Persicaria amphibia écophe terrestre*), 2) misspelled names (e.g. *Acacia karoo* instead of *Acacia karroo*), 3) cultivated plants and alien species not yet accepted as occurring in the wild in Euro+Med (e.g. *Acacia baileyana*). However the greatest group of non-matching taxa are 4) different or at least unknown species concepts (*sensu lato*, *sensu stricto*, *aggregates*).

## Acknowledgement

We would like to thank Eckhard von Raab-Straube and all contributors to Euro+Med PlantBase for providing the data for use in the EuroSL.

## Availability

EuroSL list will be published as an open-access electronic data source to allow referencing and connecting taxon-related databases beyond country borders. Version 1.0 will additionally contain bryophytes. Future releases of EuroSL might contain additional taxonomic groups (algae, including stoneworts [*Characeae*] and lichens), and aggregates or new names as needed. However, a thorough documentation and transparency regarding taxon concepts, i.e. name usage = taxon circumscription, given by citing the source lists, will remain highest priority.

## Literature

- Ehrendorfer (ed.) 1973 Liste der Gefäßpflanzen Mitteleuropas. 2nd ed.
- Euro+Med 2006 et seq. Euro+Med PlantBase – the information resource for Euro-Mediterranean plant diversity. <http://www2.bgbm.org/EuroPlusMed/> [2015/04].
- Grolle & Long 2000 An annotated check-list of the Hepaticae and Anthocerotae of Europe and Macaronesia. J. Bryol. 22: 103–140.
- Hill et al 2006 An annotated ckecklist of the mosses of Europe and Macaronesia. J. Bryol. 28: 198–267.
- Tutin, et al. 1968 et seq. Flora Europaea. 5 Volumes.

## Example

Name ID	Taxon name	Name author	Synonym	Rank	Valid ID	Valid taxon	Parent ID	Secundum (Source)	URI
288143	Aaronsohmia	Warb. & Eig		0	288143	Aaronsohmia	280559	BGBM 2015/04	<a href="http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=D60397E9-7AAB-418A-9C34-62285B81BAE4">http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=D60397E9-7AAB-418A-9C34-62285B81BAE4</a>
288144	Aaronsohmia factorovskyi	Warb. & Eig		0	288144	Aaronsohmia factorovskyi	288143	BGBM 2015/04	<a href="http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=6B876D4C-1B1F-457E-8CD0-C2FC9476147C">http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=6B876D4C-1B1F-457E-8CD0-C2FC9476147C</a>
430304	Aaronsohmia pubescens	(Desf.) K. Bremer & Humphries		0	430304	Aaronsohmia pubescens	288143	BGBM 2015/04	<a href="http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=A66A6E63-CFB1-426C-A010-96F2F8A8B084">http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=A66A6E63-CFB1-426C-A010-96F2F8A8B084</a>
288151	Aaronsohmia pubescens subsp. maroccana	(Ball) Fennane & Ibn Tattou		0	subsp	Aaronsohmia pubescens subsp. maroccana	430304	BGBM 2015/04	<a href="http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=EF0C29EC-252F-4CD3-9C00-75199294D1F3">http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=EF0C29EC-252F-4CD3-9C00-75199294D1F3</a>
430305	Aaronsohmia pubescens subsp. pubescens	(Desf.) K. Bremer & Humphries		0	subsp	Aaronsohmia pubescens subsp. pubescens	430304	BGBM 2015/04	<a href="http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=DD490E40-B0CA-44C1-88BD-6F2EBEC0C76B">http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=DD490E40-B0CA-44C1-88BD-6F2EBEC0C76B</a>
542578	Abacosa dumetorum	Alef.		1	species	Vicia dumetorum		BGBM 2015/04	<a href="http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=D3D39680-8289-4AB6-9188-D13F1FB929E8">http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=D3D39680-8289-4AB6-9188-D13F1FB929E8</a>
530559	Abandium	Adans.		1	genus	Colchicum		BGBM 2015/04	<a href="http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=7D71C09A-66EE-409A-B4BC-30AFC5314240">http://www2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?UID=7D71C09A-66EE-409A-B4BC-30AFC5314240</a>