

EDIT

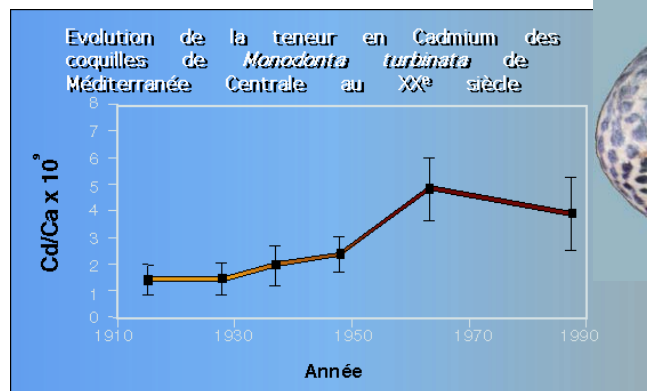
European
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Taxonomy

Species Catalogues and the Systematic Collections

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Why do we need collections?

- Collections are used as
 - A witness of the environment (physical, biological)
 - A source of samples for taxonomic research
 - A witness of taxonomic opinions on species = **a link between names, species concepts and living populations**



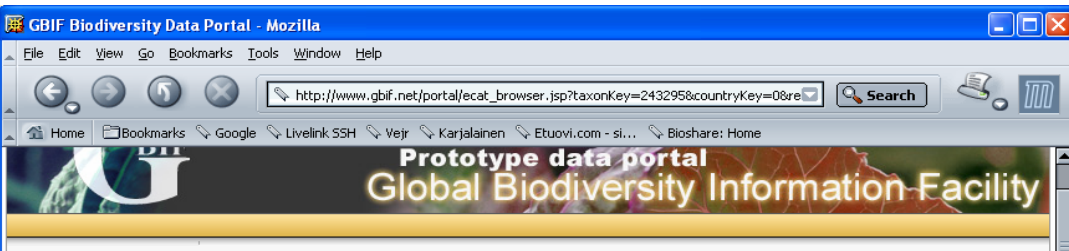
Names, species and collections

- The link between collections and catalogues of valid species works in both directions:
 - a catalogue of species is a key to specimens
 - specimens participate in definition and use of taxonomic concepts which bear species names



Relationship between the Catalogue of Species and collections must be simple for users...

GBIF



Species: *Achillea millefolium* L. Bloodwort / Carpenter's weed / Common yarrow / Hierba de las Plumas / Western yarrow

Status of name

Status: Authority: Catalogue of Life Partnership: [Integrated Taxonomic Information System](#)

Accepted name

Higher taxonomy

Rank	Name	Authority
Kingdom	Plantae	
Division	Magnoliophyta	
Class	Magnoliopsida	
Order	Asterales	
Family	Asteraceae	
Genus	<i>Achillea</i>	

Subordinate taxa

Rank	Name	Authority
Subspecies	<i>Achillea millefolium</i> agg.	Tentative position in taxonomy
Subspecies	<i>Achillea millefolium</i> collina	Tentative position in taxonomy
Subspecies	<i>Achillea millefolium</i> pannonica ((Scheele) Hayek)	Tentative position in taxonomy
Subspecies	<i>Achillea millefolium</i> subsp. collina	Tentative position in taxonomy

Images

Service	Resource	Record	Name	Image	User feedback
Botanischer Garten Ulm (www.biologie.uni-ulm.de)	Botanischer Garten Ulm	332885	<i>Achillea millefolium</i> L.	http://www.biologie.uni-ulm.de/cgi-bin/imgobj.pl?sid=T(=e&id=63662	✉
Botanischer Garten Ulm (www.biologie.uni-ulm.de)	Botanischer Garten Ulm	332885	<i>Achillea millefolium</i> L.	http://www.biologie.uni-ulm.de/cgi-bin/imgobj.pl?sid=T(=e&id=63662	✉
Botanischer Garten Ulm (www.biologie.uni-ulm.de)	Botanischer Garten Ulm	332885	<i>Achillea millefolium</i> L.	http://www.biologie.uni-ulm.de/cgi-bin/imgobj.pl?sid=T(=e&id=63662	✉
HerbarImages (ww3.bgbm.org)	HerbarImages	B 10 0093143	<i>Achillea millefolium</i> var. zellensis Aust.	show image	✉
HerbarImages (ww3.bgbm.org)	HerbarImages	B 10 0066624	<i>Achillea millefolium</i>	show image	✉

Specimens/observations

Including records from: Argentina; Australia; Austria; Bulgaria; Canada; Colombia; Costa Rica; Czech Republic; Denmark; Ecuador; Faroe Islands; Finland; France; Georgia; Germany; Greece; Iceland; Italy; Mexico; Netherlands; New Zealand; Nicaragua; Poland; Portugal; Romania; Spain; Sweden; Switzerland; Ukraine; United Kingdom; United States

Service	Resource	All	LatLong
ANH DiGIR Provider (www.anbg.gov.au)	Australian National Herbarium (CANB)	14	14
Bishop Museum (BPBM) (digir.bishopmuseum.org)	Bishop Museum Natural History Specimen Data	36	2
Botanischer Garten Ulm (www.biologie.uni-ulm.de)	Botanischer Garten Ulm	61	0
Botanischer Garten Ulm (www.biologie.uni-ulm.de)	Okologisch Botanischer Garten Bayreuth	2	0
CBIF DiGIR Provider (www.cbif.gc.ca)	Royal Botanical Gardens Herbarium	28	0
CENPAT (base.cenpat.edu.ar)	Extra-andean Patagonian Herbarium -CONICET- Argentina	1	0
Center for Environmental Studies (ASU) DiGIR Provider (mohave.asu.edu)	University of Arizona Herbarium	84	35
Center for Environmental Studies (ASU) DiGIR Provider (mohave.asu.edu)	Northern Arizona University, Deaver Herbarium	7	0

- Species name provides list of specimens
- Name of specimen provides valid species name

... but relationship of collections, species and names is conceptually complex

- Taxonomists define species concepts from living populations
- They name their concept by a species name
- They attach the name to a single « type specimen »
- They store sample specimens representing the extension of their own concept of the species in collections

WHY?

Collections are needed to understand what species names mean

- The extension of species concepts changes as science progresses:
eg « Homo sapiens » now does not fit any more Linnaeus' concept for this name (1758), but covers several Linnaeus's « species » and names which are therefore « Homo sapiens » synonyms
- Descriptions are not sufficient to understand a species concept extension, because they are context dependent and the context has changed in 2,5 centuries
eg Linnaeus descriptions of species are few lines long, and were sufficient to identify the then known 12000 species from the text and references in the Systema naturae, but it is now impossible to identify any of the now known 1.8 million species from these few lines
- On the long term, and as the cultural and scientific context evolves, specimens identified by a taxonomist are necessary to understand what he/she meant by any species name

The Catalogue of Life and collections

- Our analysis of the evolution of biodiversity on the long term then relies entirely on collections and their link to species names used when they were collected and labelled, and now
- Catalogues of species are needed to manage collections to determine the valid name corresponding to the name from the specimens labels
- Collections are needed to maintain the Catalogue of Life in the long term to understand the extension of a species concept designated by a name by an author at a time

Toward sustainability

- Necessity for long term support and development of Catalogues of Species and Collections
- EDIT aims at both integration and support of databases
- Above institutional network(s), necessity for an integrated, distributed infrastructure linking these catalogues to other data in the GBIF framework, such as LifeWatch

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Thank you

