



Encyclopedia of Life

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Encyclopedia of Life

eol.org

all species, genera, etc.  
text, media, literature  
names infrastructure  
content curation/annotation  
human/machine interfaces

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Encyclopedia of Life

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Global access to knowledge about life on Earth

Search EOL ... GO

*Limnodromus griseus*  
Short-billed Dowitcher

**EOL News** [see more](#)

**Community Activity** [see more](#)

**Announcing the GGI Knowledge Portal**  
EOL recently launched the [Global Genome Initiative Knowledge Portal](#), essential infrastructure for the [Smithsonian-led initiative](#) to archive genomics-quality tissue across the tree of life. The G... [more](#)  
JULY 15, 2014 13:26

**One Species at a Time Podcast: Ants**  
A recent article from North Carolina State University explains how scientists have combined cookies and citizen science to track the diversity of ant species across the United States. Ants are the topic of this One Species at a Time podcast, featuring an inte... [more](#)  
JULY 09, 2014 13:57

**E.O. Wilson's Life on Earth iBooks Textbook and iTunes U Course**  
E. O. Wilson's Life on Earth is an innovative new iBooks Textbook for high school biology students created by the [E. O. Wilson Biodiversity Foundation](#). Available for free on the iBooks Store, Life on Earth is... [more](#)  
JULY 02, 2014 17:48

**One Species at a Time Podcast: Ravens**  
A recent large-scale genomic study suggests that genes might be responsible for telling species in the *Corvus* genus (Crows) to choose mates that look like they do. The social behavior of crows is the subject of the One Species at a Time Ravens podcas... [more](#)  
JUNE 25, 2014 14:52

**Announcing the Bouchout Declaration**  
EOL is one of the original 74 signatories to the Bouchout Declaration, a firm commitment... [more](#)  
JUNE 13, 2014 03:31

**The Digital Urban BioKit - a modern naturalist's observation notebook**  
A BioKit is a digital book that invites people to explore the fauna and flora of urban parks in Canada. This interactive tool makes it possible to note one's observations and also allows the integration of photos, videos, drawings and quizzes. Participa... [more](#)  
JUNE 12, 2014 12:13

**Michael Thomas** added "[Annulohypoxylon archeri](#) (Berk.) Y.M. Ju, J.D. Rogers & H.M. Hsieh 2005" to the collection "[Fungi of Tonga](#)".  
1 MINUTE AGO  
[reply](#)

**Eduard Solà** added the Catalan common name "Garsa de bec groc" to "[Pica nuttalli](#)".  
36 MINUTES AGO  
[reply](#)

**Valter Jacinto** marked "[File:Green Parakeet From The Crossley ID Guide Eastern Birds.jpg](#)" as trusted on the "[Aratinga holochlora \(Scalzer, 1859\)](#)" page.  
43 MINUTES AGO  
[reply](#)

**Hans-Martin Braun** added the German common name "Weißgraue Wieseneule" to "[Phoebastria extrema Hübner, 1809](#)".  
ABOUT 1 HOUR AGO  
[reply](#)

**Nathan Wilson** changed the thumbnail image of "[File:Gaboon Viper \(rhinoceros\).01.jpg](#)".  
ABOUT 2 HOURS AGO  
[reply](#)

**Klanphier** added "[Megalops atlanticus Valenciennes, 1847](#)" to the collection "[Fish I Have Seen or Caught](#)".  
ABOUT 3 HOURS AGO  
[reply](#)

**Currently in the Encyclopedia of Life** [see more](#)

1,241,453 Pages	75,843 Members like you	7,464 Collections	230 Communities	2,765,582 Images	300 Content Partners
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1.3 M pages with content

2.8 M text contributions

2.7 M images

300 content partners


1,400 volunteer curators

75,000 members

5.8 M visitors/year





*Arnica cordifolia*  
Heartleaf Arnica [learn more about names for this taxon](#)
add to a collection

Overview
Detail
Data
54 Media
5 Maps
Names
Community
Resources
Literature
Updates



*Arnica cordifolia* [WIKIMEDIA]  
[CC BY-NC-SA] © 2012 Barry Breckling  
Source: CallProton

[see all media](#)  
[see all maps](#)

IUCN threat status: **Not evaluated**

**Brief Summary** [read full entry](#)

[learn more about this article](#)

*Arnica cordifolia* is a species of [arnica](#) known by the common name [heartleaf arnica](#). It is native to western North America from [Alaska](#) to [California](#) to [New Mexico](#), and it is distributed as far east as [Ontario](#) and [Michigan](#). It is a plant of many habitat types, including [coniferous forests](#) and mountain meadows.

This is a [rhizomatous](#) perennial herb producing one or more erect stems reaching a maximum height near half a meter. It has two to four pairs of leaves on the stem, each on a long [petiole](#). The leaves are heart-shaped to arrowhead-shaped and finely toothed along the edges. The [inflorescence](#) bears one or more daisylike [flower heads](#) lined with white-haired [phyllaries](#) and sometimes studded with resin glands. The center of each head contains golden yellow disc florets and a fringe of bright golden ray florets approaching 3 centimeters in maximum length.




The fruit is a hairy [achene](#) up to a centimeter long, not counting its off-white pappus. Seeds are [dispersed](#) on the wind. An individual plant can live twelve years, surviving periodic [wildfire](#) by resprouting from its long, slender rhizome afterward.<sup>[1]</sup>

**References**

- <sup>1</sup>. <sup>▲</sup> [Ecology Fire Ecology](#)

UNREVIEWED [CC BY-NC] • Source: [Wikipedia](#)

**Present in 31 collections** [see all](#)

-  [Rocky Mountain National Park Wildflowers](#)  
19 other items
-  [EOL Hotlist of High Priority Taxa](#)  
92006 other items
-  [Plants of Economic Significance Comprehensive List](#)  
11757 other items

This taxon hasn't been featured in any communities yet.

[Learn more about Communities](#)

**Belongs to 0 communities**

**EOL has data for 64 traits** [see all](#)


Native range includes	Alaska, USA Canada Lower 48 United States of America <a href="#">more</a>
Flower color	yellow
Leaf color	green
Fruit or seed color	white
Life cycle habit	perennial
Plant growth habit	forb/herb forb/herb
Plant height	45.72 cm (median, mature)
Shedability	deciduous

**Found in 4 classifications** [see all](#)


Species recognized by [Integrated Taxonomic Information System](#).

- Plantae <sup>+</sup>
- Viridiplantae <sup>+</sup>
- Streptophyta <sup>+</sup>
- Tracheophyta <sup>+</sup>
- Spermatophytina <sup>+</sup>
- Angiospermae <sup>+</sup>
- Magnoliopsida <sup>+</sup>
- Asteranae <sup>+</sup>
- Asterales <sup>+</sup>
- Asteraceae <sup>+</sup>
- Arnica* L. <sup>+</sup>
- Arnica cordifolia* Hook.
- [Arnica acaulis](#) (Walter) Britton, Sterns & Pog.
- [Arnica alpina](#) (L.) Olin
- [Arnica angustifolia](#) Vahl <sup>+</sup>
- [Arnica cernua](#) Howell
- [Arnica chamissonis](#) Less.
- [Arnica dealbata](#) (A. Gray) B.G. Balw.
- [Arnica discolora](#) Benth.
- [Arnica fulgens](#) Pursh
- [Arnica gracilis](#) Rydb.
- 18 more... [show full tree...](#)

**Reviewed by 2 curators** [learn how to curate](#)




**C. Michael Hogan**  
Physicist




**Jason Sharp**  
Florida naturalist

**Latest updates** [see all](#)

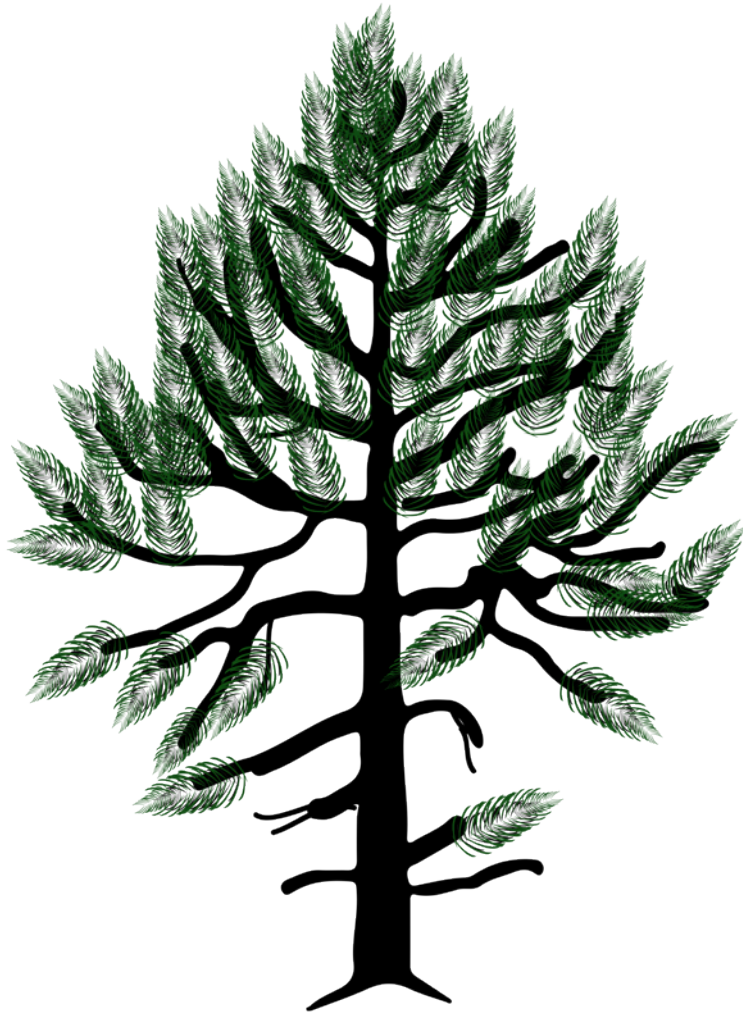


**Katja Schulz** selected "*Arnica cordifolia*" to show in Overview on "[Arnica cordifolia](#) Hook."  
ABOUT 6 HOURS AGO  
[reply](#)



[post comment](#)

# TraitBank - [eol.org/traitbank](http://eol.org/traitbank)



Soil pH (min): 6.5

Flower Color: Yellow

Plant Height: 15.24 m

Plant Growth Habit: Tree

Wood Density: 0.5 g/cm<sup>3</sup>

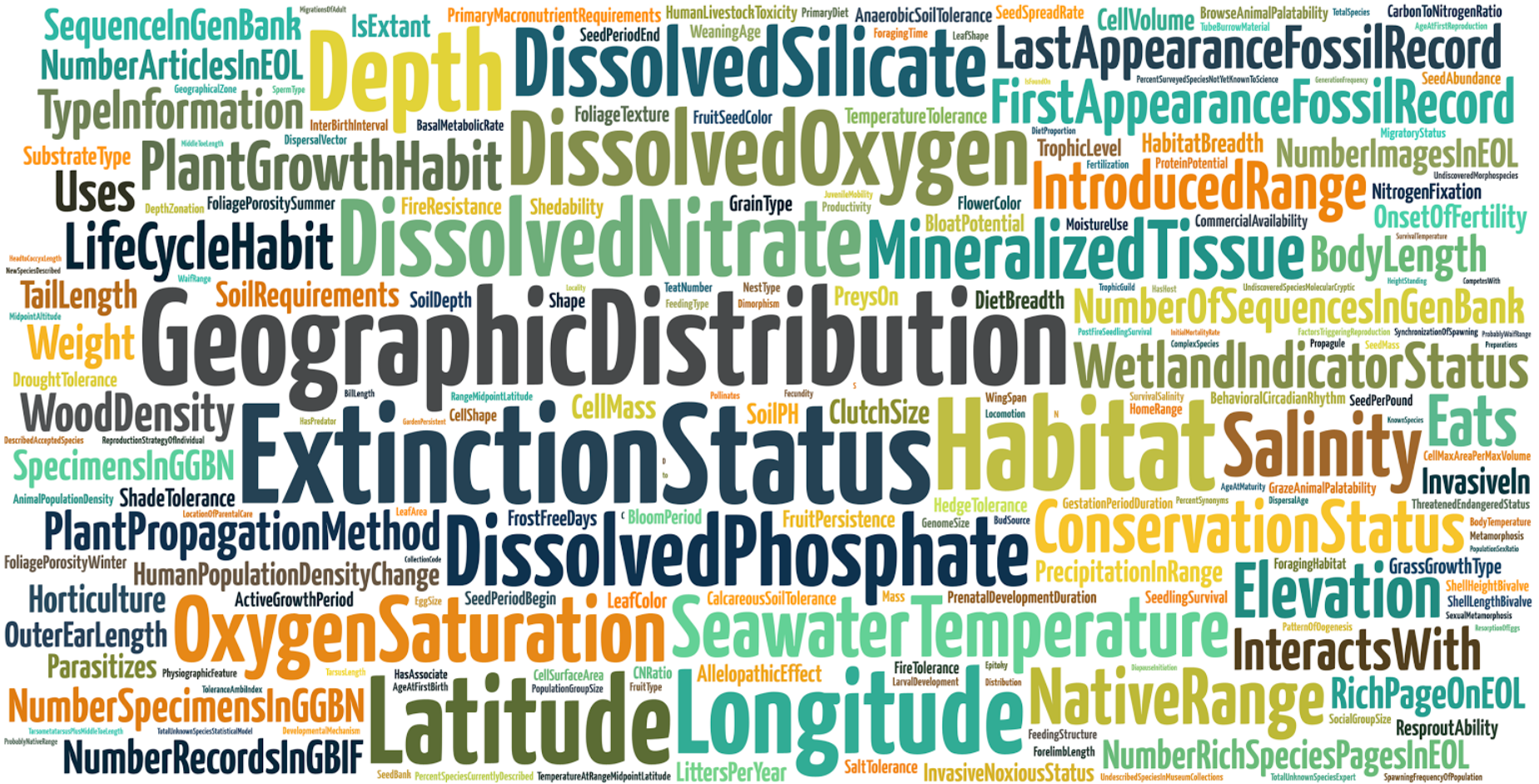
Life Cycle Habit: Perennial

Human/livestock toxicity: None

Habitat: Pinyon-Juniper Woodland

Conservation Status: Least Concern

# What is a trait?



# TraitBank data sources

## Databases

USDA Plants, OBIS, PaleobiologyDB, Phenoscope

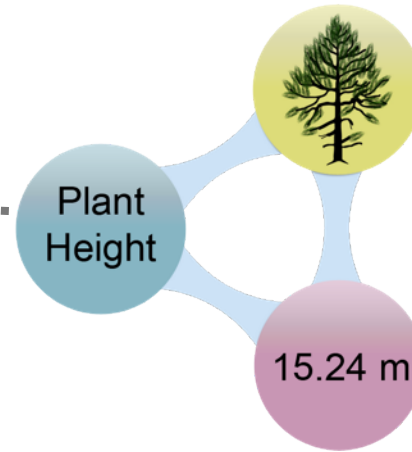
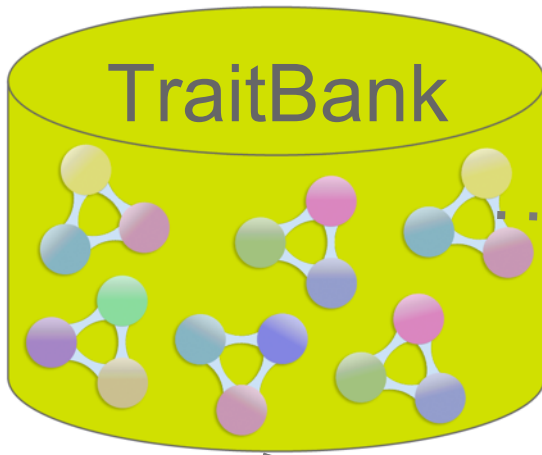
## Literature

Dryad, Pangaea, PLOS One, Ecological Archives

## Natural History Collections

Label data, measurement logs

## Legacy/unpublished data



Trait Data

EOL Taxon Pages

Data Search

JSON-LD Service

Pinus edulis  
Colorado Piñon

Overview | Detail | Data | HD Media | Maps | Names | Community | Resources | Literature | Updates | Workflow

**EOL has data for 89 traits**

Native range	Lower 48 United States of America, United States (USA)
Population trend	Stable
Flower color	yellow
Leaf color	green
Fruit or seed color	brown
Wood density	0.3 g/cm <sup>3</sup>
Life cycle habit	perennial
Plant growth habit	tree

**Classification**

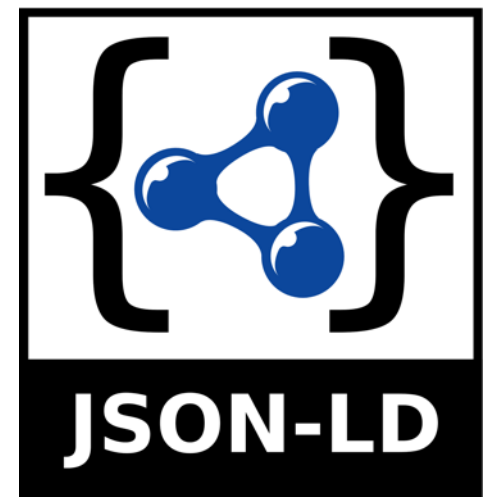
Classification from Species 2000 & ITIS Catalogue at July 14th 2013, retrieved by e-Science/Open Access

- Kingdom: Eukarya
- Phylum: Tracheophyta
- Class: Equisetopsida
- Order: Equisetales
- Family: Pinaceae
- Genus: Pinus
- Species: Pinus edulis Engelm.

Which plants have blue flowers?

Which grasses grow well in acidic soil?

What do green turtles eat?



# TraitBank data on taxon pages

*Robinia pseudoacacia*

Black Locust [learn more about names for this taxon](#)

Overview

Detail

Data

288 Media

7 Maps

Names

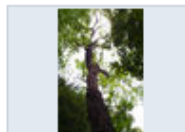
Community

Resources

Literature

Updates

Worklist



*Robinia pseudoacacia* **TRUSTED**

© Tamara Horová

Source: [BioLib.cz](#)

[see all media](#)  
[see all maps](#)

EOL has data for 73 traits

[see all](#)

Native range includes Lower 48 United States of America

Population trend Increasing

Flower color white

Leaf color green

Wood density 0.65 g/cm<sup>3</sup>

Plant height 18.29 m (median, mature)

Has parasite [Microsphaera pseudacaciae](#)

Elevation 76 m (median)

## Classification

Classification from [NCBI Taxonomy](#) selected by [Michael Wunderli](#) - [see more](#).

[Cellular organisms](#) ±

[Eukaryota](#) ±



# TraitBank data tab

*Robinia pseudoacacia*

add to a collection

Black Locust [learn more about names for this taxon](#)

Overview

Detail

Data

288 Media

7 Maps

Names

Community

Resources

Literature

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All

Distribution

Physical Description

Ecology

Life History and Behavior

Physiology and Cell Biology

Conservation

Relevance to Humans and Ecosystems

Glossary

About

[TraitBank](#) assembles data records from many providers. Select a row for more details about the record, or [search within Robinia pseudoacacia](#).

## Physical Description

Flower color	▷ white	USDA NRCS PLANTS Datab...
Leaf color	▷ green	USDA NRCS PLANTS Datab...
Fruit or seed color	▷ black	USDA NRCS PLANTS Datab...
Wood density	▷ 0.65 g/cm <sup>3</sup>	Global Wood Density Database
	▷ 0.66 g/cm <sup>3</sup>	Global Wood Density Database
	▷ 0.68 g/cm <sup>3</sup>	Global Wood Density Database
	▷ 0.68 g/cm <sup>3</sup>	Global Wood Density Database
	▷ 0.7 g/cm <sup>3</sup>	Global Wood Density Database
Plant growth habit	▷ tree	US Forest Service Fire Effects...
	▷ tree	USDA NRCS PLANTS Datab...
Plant height (max)	▷ 12.19 m (base age)	USDA NRCS PLANTS Datab...
(median)	▷ 18.29 m (mature)	USDA NRCS PLANTS Datab...

# TraitBank metadata

Wood density

▼ 0.65 g/cm<sup>3</sup>

Global Wood Density Database

## Data about this record

Source	Zanne AE, Lopez-Gonzalez G, Coomes DA, Ilic J, Jansen S, Lewis SL, Miller RB, Swenson NG, Wiemann MC, Chave J (2009) Data from: Towards a worldwide wood economics spectrum. Dryad Digital Repository. <a href="https://doi.org/10.5061/dryad.234">doi:10.5061/dryad.234</a>
Citation	Chave J, Coomes D, Jansen S, Lewis SL, Swenson NG, Zanne AE (2009) Towards a worldwide wood economics spectrum. Ecology Letters 12: 351-366. <a href="https://doi.org/10.1111/j.1461-0248.2009.01285.x">doi:10.1111/j.1461-0248.2009.01285.x</a>
Measurement Method	oven dry mass/fresh volume
Locality	China
Scientific name	Robinia pseudoacacia
Reference	Cheng, J.C., Yang, J. and Liu, P. 1992. Anatomy and Properties of Chinese Woods. Chinese Forestry Publishing, Beijing, China. 820 pp.
Link to this record	<a href="http://eol.org/pages/704089/data#data_point_674052">http://eol.org/pages/704089/data#data_point_674052</a>

Supplier: [Global Wood Density Database](#) • [see this record in Virtuoso](#)

# TraitBank links to ontologies

Wood density  ▾ 0.65 g/cm<sup>3</sup>

Global Wood Density Database

## Wood density

Secondary xylem volumetric density. Any measurable or observable characteristic related to the volumetric density of a secondary xylem.

[http://purl.obolibrary.org/obo/OBA\\_1000040](http://purl.obolibrary.org/obo/OBA_1000040)

[see all taxa with this attribute](#) • [explore full data glossary](#)

	<p>spectrum. Ecology Letters 12: 351-366. <a href="https://doi.org/10.1111/j.1461-0248.2009.01285.x">doi:10.1111/j.1461-0248.2009.01285.x</a></p>
Measurement Method	oven dry mass/fresh volume
Locality	China
Scientific name	Robinia pseudoacacia
Reference	Cheng, J.C., Yang, J. and Liu, P. 1992. Anatomy and Properties of Chinese Woods. Chinese Forestry Publishing, Beijing, China. 820 pp.
Link to this record	<a href="http://eol.org/pages/704089/data#data_point_674052">http://eol.org/pages/704089/data#data_point_674052</a>

Supplier: [Global Wood Density Database](#) • [see this record in Virtuoso](#)

# TraitBank links to ontologies

Flower color	?	▶ white	USDA NRCS PLANTS Database
Leaf color		▶ green	USDA NRCS PLANTS Database
Fruit or seed color			USDA NRCS PLANTS Database
Wood density			USDA NRCS PLANTS Database

**Flower color**

A flower anatomy and morphology trait (TO:0000499) which is associated with the color of the flower (PO:0009046).

[http://purl.obolibrary.org/obo/TO\\_0000537](http://purl.obolibrary.org/obo/TO_0000537)

[see all taxa with this attribute](#) • [explore full data glossary](#)

Flower color		▶ white	?	USDA NRCS PLANTS Database
Leaf color		▶ green		USDA NRCS PLANTS Database
Fruit or seed color		▶ black		USDA NRCS PLANTS Database
Wood density		▶ 0.65 g/cm		USDA NRCS PLANTS Database
		▶ 0.66 g/cm		USDA NRCS PLANTS Database
		▶ 0.68 g/cm		USDA NRCS PLANTS Database

**White**

An achromatic color of maximum brightness; the color of objects that reflect nearly all light of all visible wavelengths.

[http://purl.obolibrary.org/obo/PATO\\_0000323](http://purl.obolibrary.org/obo/PATO_0000323)

[explore full data glossary](#)

# TraitBank plant trait ontologies

ENVO - Environment Ontology

GO - Gene Ontology

OBA - Ontology of Biological Attributes

PATO - Phenotypic Quality Ontology

PO - Plant Ontology

RO - OBO Relation Ontology

TO - Plant Trait Ontologies

# TraitBank data glossary

## Data Glossary

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#) <#>

### Filter by subject

- |  |   |
|--|---|
| <input type="checkbox"/> Distribution                | <input type="checkbox"/> Molecular Biology and Genetics     |
| <input type="checkbox"/> Physical Description        | <input type="checkbox"/> Conservation                       |
| <input type="checkbox"/> Ecology                     | <input type="checkbox"/> Relevance to Humans and Ecosystems |
| <input type="checkbox"/> Life History and Behavior   | <input type="checkbox"/> Notes                              |
| <input type="checkbox"/> Evolution and Systematics   | <input type="checkbox"/> Names and Taxonomy                 |
| <input type="checkbox"/> Physiology and Cell Biology | <input type="checkbox"/> Database and Repository Coverage   |

## A

### Above ground dwelling

An organism that spends most of its time above ground.

<http://eol.org/schema/terms/aboveGroundDwelling>

[link to this term](#) • [top](#)

### Absent

A quality denoting the lack of an entity.

from Phenotype and Trait Ontology

[http://purl.obolibrary.org/obo/PATO\\_0000462](http://purl.obolibrary.org/obo/PATO_0000462)

[link to this term](#) • [top](#)

### Abyssal zone (4000-6000m)

[http://polytraits.lifewatchgreece.eu/terms/DZ\\_ABY](http://polytraits.lifewatchgreece.eu/terms/DZ_ABY)

[link to this term](#) • [top](#)

### Accessory feeding structures

[http://polytraits.lifewatchgreece.eu/terms/STRUCT\\_ACC](http://polytraits.lifewatchgreece.eu/terms/STRUCT_ACC)

[link to this term](#) • [top](#)

### Acicular (needle-like)

Slender and pointed, needle-like

<http://eol.org/schema/terms/acicular>

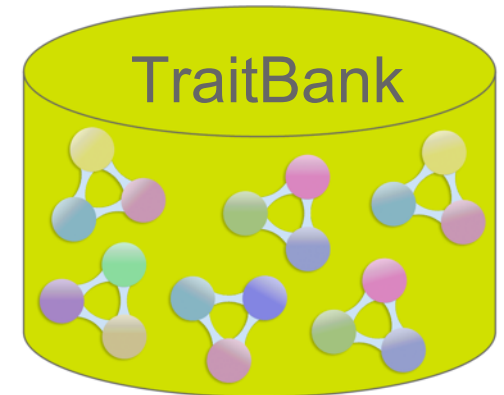
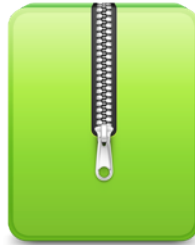
[link to this term](#) • [top](#)

# TraitBank data import



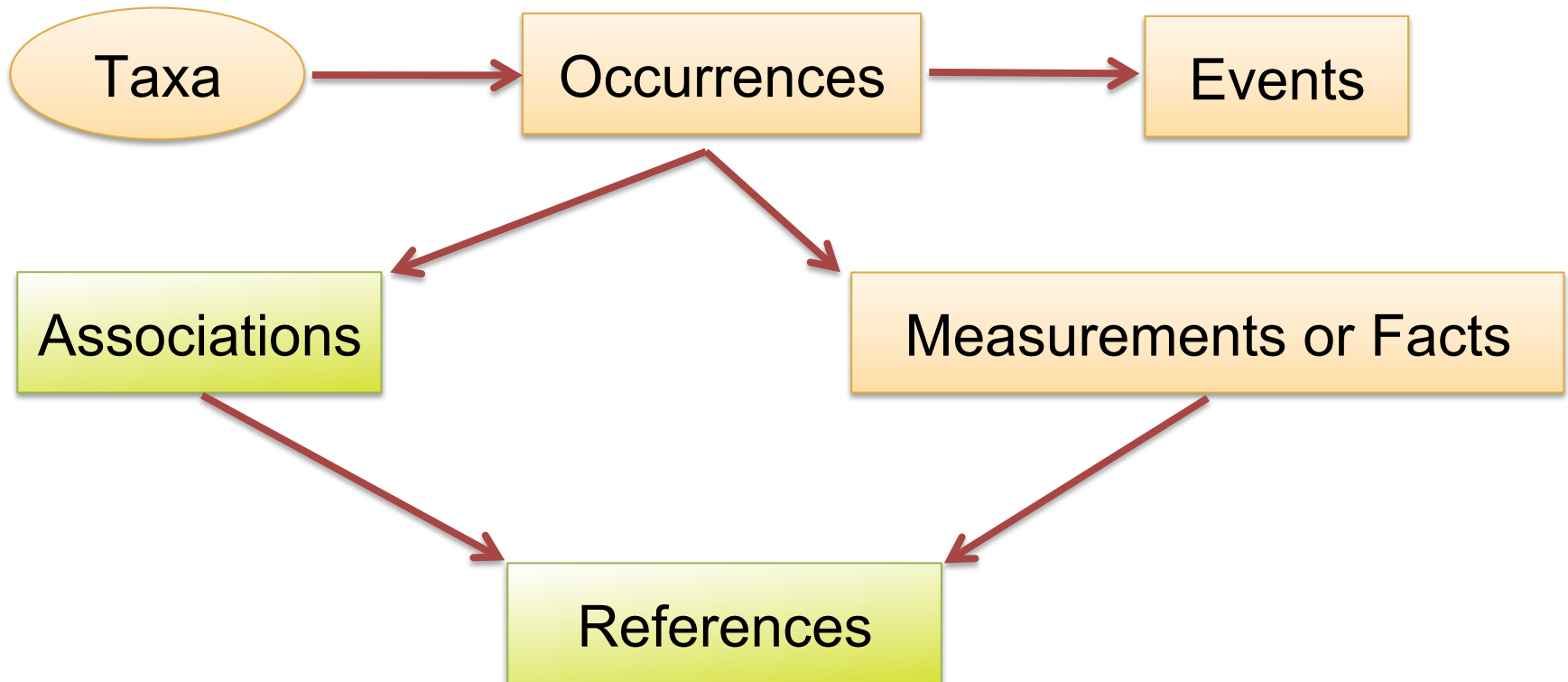
Smithsonian

Darwin Core  
Archive



# TraitBank data import

## Darwin Core Extensions





# TraitBank current status

1.4 M taxa with data

7.8 M data records

300 traits

40 data sets

[eol.org/traitbank](http://eol.org/traitbank)

[eol.org/statistics/data](http://eol.org/statistics/data)



# TraitBank data summaries

## Salicaceae Willows

- Overview
- Detail
- Data
- 7578 Media
- 2 Maps
- Names
- Community
- Resources
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- Updates
- Worklist

### Data summaries

- All
- Distribution
- Ecology
- Evolution and Systematics
- Conservation
- Database and Repository Coverage
- Data summaries
- Glossary
- About

Trait	Values	Record Count	Taxa Count
<a href="#">Precipitation tolerance</a>	10.16 cm to 5.08 m	104	52
<a href="#">Soil pH</a>	2.1 to 9.0	108	54
<a href="#">Elevation</a>	1.0 to 7,400.0 m	386	119
<a href="#">Wood density</a>	0.28 to 0.92 g/cm <sup>3</sup>	152	80
<a href="#">Plant height</a>	6.1 cm to 57.91 m	110	56
<a href="#">Latitude</a>	-22.7 to 22.6 degrees	4	2
<a href="#">Longitude</a>	-43 to 69.5 degrees	4	2
<a href="#">Low temperature tolerance</a>	-61.7 to 4.44 degrees Celsius	55	55

# TraitBank data summaries

## TraitBank Search Results

[download data](#)

110 results for *Plant height* within [Salicaceae](#)

Select an attribute

Plant height

[Show search options](#)

search

Selected search options—Taxon group: Salicaceae

### Plant height

A stature and vigor trait (TO:0000133) which is associated with the height of a whole plant (PO:0000003).

[http://purl.obolibrary.org/obo/TO\\_0000207](http://purl.obolibrary.org/obo/TO_0000207)

[explore full data glossary](#)

Displaying 1 – 30 of 110 records on EOL

[see next 30](#)

	<b>Populus nigra</b> <a href="#">Black Poplar</a>	Plant height (median)	▶ 57.91 m (mature)	USDA NRCS ...
	<b>Populus deltoides</b> <a href="#">Eastern Cottonwood</a>	Plant height (median)	▶ 57.91 m (mature)	USDA NRCS ...
	<b>Salix nigra</b> <a href="#">Black Willow</a>	Plant height (median)	▶ 30.48 m (mature)	USDA NRCS ...
	<b>Populus trichocarpa</b> <a href="#">Black Cottonwood</a>	Plant height (median)	▶ 30.48 m (mature)	USDA NRCS ...
	<b>Populus alba</b> <a href="#">White Poplar</a>	Plant height (median)	▶ 30.48 m (mature)	USDA NRCS ...
	<b>Populus heterophylla</b> <a href="#">Swamp Cottonwood</a>	Plant height (median)	▶ 30.48 m (mature)	USDA NRCS ...

# TraitBank search & download

Select an attribute  [Hide search options](#)

### Refine your search (optional)

Search within a taxon group

Searching within a taxon group is currently limited to groups with fewer than 60,000 taxa. [Contact us](#) to find out more about searching larger groups.

**TAXON GROUP**

For example, enter Trochilidae or Whales and select the matching group.

Search for a specific value or range

**SPECIFIC VALUE**

For example, heterotrophic.

**OR**

<b>LOWEST VALUE</b>	<b>HIGHEST VALUE</b>	<b>UNIT OF MEASURE</b>
<input type="text" value="Enter a number"/>	<input type="text" value="Enter a number"/>	<input type="text" value="not specified"/>

Sort the results

### Not sure where to start?

Try one of the following data searches:

- [Which whales weigh more than 10,000 kg?](#)
- [Which species build cavity nests?](#)
- [What are the various shapes of diatoms?](#)
- [Which plants have blue flowers?](#)

# TraitBank search & download

## TraitBank Search Results

110 results for *Plant height* within [Salicaceae](#)

[download data](#)

Select an attribute

Plant height

[Show search options](#)

[search](#)

Selected search options—Taxon group: Salicaceae

### Plant height




A stature and vigor trait (TO:0000133) which is associated with the height of a whole plant (PO:0000003).

[http://purl.obolibrary.org/obo/TO\\_0000207](http://purl.obolibrary.org/obo/TO_0000207)

[explore full data glossary](#)

Displaying 1 – 30 of 110 records on EOL

[see next 30](#)

	<b>Populus nigra</b> <a href="#">Black Poplar</a>	Plant height (median)	▶ 57.91 m (mature)	USDA NRCS ...
	<b>Populus deltoides</b> <a href="#">Eastern Cottonwood</a>	Plant height (median)	▶ 57.91 m (mature)	USDA NRCS ...
	<b>Salix nigra</b> <a href="#">Black Willow</a>	Plant height (median)	▶ 30.48 m (mature)	USDA NRCS ...
	<b>Populus trichocarpa</b> <a href="#">Black Cottonwood</a>	Plant height (median)	▶ 30.48 m (mature)	USDA NRCS ...
	<b>Populus alba</b> <a href="#">White Poplar</a>	Plant height (median)	▶ 30.48 m (mature)	USDA NRCS ...
	<b>Populus heterophylla</b> <a href="#">Swamp Cottonwood</a>	Plant height (median)	▶ 30.48 m (mature)	USDA NRCS ...

# TraitBank search & download

EOL page ID	Scientific Name	Common Name	Measurement	Value	Measurement URI	Value URI	Units (normalized)	Units URI (normalized)	Raw Value (direct from source)	Raw Units
584265	Populus nigra	Black Poplar	Plant height	57.912	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	5791.2	cm
584296	Populus deltoides	Eastern Cottonwood	Plant height	57.912	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	5791.2	cm
585446	Salix nigra	Black Willow	Plant height	30.48	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	3048	cm
1276830	Populus trichocarpa	Black Cottonwood	Plant height	30.48	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	3048	cm
592441	Populus alba	White Poplar	Plant height	30.48	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	3048	cm
584264	Populus heterophylla	Swamp Cottonwood	Plant height	30.48	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	3048	cm
584262	Populus fremontii	Fremont's Cottonwood	Plant height	27.432	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	2743.2	cm
1276837	Populus deltoides	Plains Cottonwood	Plant height	25.908	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	2590.8	cm
584265	Populus nigra	Black Poplar	Plant height	24.384	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	2438.4	cm
584296	Populus deltoides	Eastern Cottonwood	Plant height	24.384	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	2438.4	cm
592441	Populus alba	White Poplar	Plant height	24.384	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	2438.4	cm
584254	Populus balsamifera	Balsam Poplar	Plant height	24.384	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	2438.4	cm
5602917	Salix lasiandra var.	Pacific Willow	Plant height	24.384	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	2438.4	cm
8671774	Salix alba	White Willow	Plant height	21.336	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	2133.6	cm
1276837	Populus deltoides	Plains Cottonwood	Plant height	21.336	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	2133.6	cm
485322	Salix sepulcralis	Weeping Willow	Plant height	21.336	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	2133.6	cm
584241	Salix prolixa	Mackenzie's Willow	Plant height	20.7264	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	2072.64	cm
466982	Populus tremuloides	Quaking Aspen	Plant height	19.812	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1981.2	cm
584261	Populus grandidentata	Bigtooth Aspen	Plant height	19.812	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1981.2	cm
584256	Populus angustifolia	Willow-leaved Populus	Plant height	18.288	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1828.8	cm
584237	Salix pentandra	Bay Willow	Plant height	18.288	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1828.8	cm
585415	Salix amygdaloides	Peachleaf Willow	Plant height	18.288	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1828.8	cm
584256	Populus angustifolia	Willow-leaved Populus	Plant height	18.288	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1828.8	cm
5602917	Salix lasiandra var.	Pacific Willow	Plant height	16.1544	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1615.44	cm
592438	Salix eriocephala	Missouri River Willow	Plant height	15.8496	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1584.96	cm
584185	Salix taxifolia	Yewleaf Willow	Plant height	15.24	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1524	cm
585446	Salix nigra	Black Willow	Plant height	15.24	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1524	cm
584262	Populus fremontii	Fremont's Cottonwood	Plant height	15.24	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1524	cm
584377	Salix bonplandiana	Bonpland's Willow	Plant height	15.24	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1524	cm
584264	Populus heterophylla	Swamp Cottonwood	Plant height	15.24	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1524	cm
485321	Salix scouleriana	Scouler's Willow	Plant height	15.24	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1524	cm
392800	Salix interior	Sandbar Willow	Plant height	13.716	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1371.6	cm
585415	Salix amygdaloides	Peachleaf Willow	Plant height	13.716	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1371.6	cm
8671774	Salix alba	White Willow	Plant height	13.716	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1371.6	cm
485322	Salix sepulcralis	Weeping Willow	Plant height	13.716	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1371.6	cm
584241	Salix prolixa	Mackenzie's Willow	Plant height	13.716	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1371.6	cm
585060	Salix gooddingii	Goodding's Willow	Plant height	12.192	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1219.2	cm
585060	Salix gooddingii	Goodding's Willow	Plant height	12.192	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1219.2	cm
466982	Populus tremuloides	Quaking Aspen	Plant height	12.192	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1219.2	cm
584261	Populus grandidentata	Bigtooth Aspen	Plant height	12.192	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1219.2	cm
1276830	Populus trichocarpa	Black Cottonwood	Plant height	12.192	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1219.2	cm
584185	Salix taxifolia	Yewleaf Willow	Plant height	12.192	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>		m	<a href="http://purl.obolibrary.org/obo/TO_0000207">http://purl.obolibrary.org/obo/TO_0000207</a>	1219.2	cm

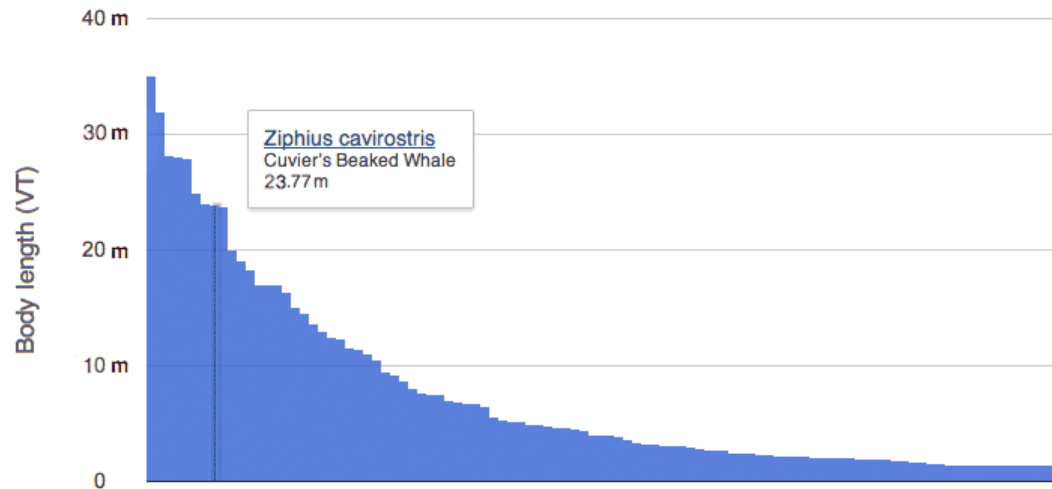
# TraitBank search & download

## Body length (VT)

The distance from point to point along the longest axis of the body of an organism.

[http://purl.obolibrary.org/obo/VT\\_0001256](http://purl.obolibrary.org/obo/VT_0001256)

[explore full data glossary](#)



Displaying 1 – 30 of 7553 records on EOL

[see next 30](#)



**Balaenoptera musculus**  
[Blue Whale](#)

Body length (VT) > 30.48 m (adult)  
(average)

PanTHERIA



**Balaenoptera physalus**  
[Fin Whale](#)

Body length (VT) > 20.64 m (adult)  
(average)

PanTHERIA



**Balaenoptera borealis**  
[Sei Whale](#)

Body length (VT) > 18.38 m (adult)  
(average)

PanTHERIA



**Eubalaena australis**  
[Southern Right Whale](#)

Body length (VT) > 14.15 m (adult)  
(average)

PanTHERIA

# TraitBank interaction data

Has predator

▼ [African Clouded Yellow](#)

GloBI

## Data about this record

Source	Papilionoidea of the World. Available at <a href="http://papilionoidea.myspecies.info/">http://papilionoidea.myspecies.info/</a> .
Scientific name	Colias electo
Reference	Jose R. Ferrer Paris Ferrer-Paris JR, Sánchez-Mercado AY, Lozano C, Zambrano L, Soto J, Baettig J, Ortega P, Leal M. Using web-content for the assessment of macroecological patterns in butterfly-hostplant associations at a global scale. March 2013 - January 2014. Unpublished results.
Link to this record	<a href="http://eol.org/pages/704089/data#data_point_10273240">http://eol.org/pages/704089/data#data_point_10273240</a>

Has parasite

▼ [Microsphaera pseudacaciae](#)

GloBI

## Data about this record

Source	Food Webs and Species Interactions in the Biodiversity of UK and Ireland (Online). 2013. Data provided by Malcolm Storey. Also available from <a href="http://bioinfo.org.uk">http://bioinfo.org.uk</a> .
Scientific name	Microsphaera pseudacaciae
Reference	Malcolm Storey Food webs and species interactions in the Biodiversity of UK and Ireland.
Link to this record	<a href="http://eol.org/pages/704089/data#data_point_10232231">http://eol.org/pages/704089/data#data_point_10232231</a>





What do  eat?

American Bison (*Bison bison*) eat ... plenty of things!

Jorrit Poelen, Chris Mungall,  
James Simons, Robert Reiz



Sedges  
(*Carex*)



Prairie Grass  
(*Sporobolus cryptandrus*)



Western Wheatgrass  
(*Elymus smithii*)



Slender 8-flowered Fescue  
(*Vulpia octoflora*)



Long-Headed Coneflower  
(*Ratibida columnifera*)



Buffalo Grass  
(*Buchloe dactyloides*)



Blue Grama  
(*Chondrosum gracile*)



Purple Threeawn  
(*Aristida purpurea*)



Red Globemallow  
(*Sphaeralcea coccinea*)



SCURFY PEA  
(*Psoralea tenuiflora*)

# globalbioticinteractions.org



Jorrit Poelen, Chris Mungall,  
James Simons, Robert Reiz



# Environments-EOL



Evangelos Pafilis

This species breeds in mature deciduous or **mixed forest** and **plantations** on low hills and **mountains**, up to 100 m. In central Japan, wooded **valleys** at lower elevations are preferred. On the wintering grounds, records are from various **forest** habitats up to 700 m, including **mangroves**. On migration, it is also recorded from open **woodland**, suburban parks and **gardens** in lowlands.



## Mangrove biome



A mangrove biome is a terrestrial biome which includes, across its spatial extent, mangrove plants (Rhizophoraceae). Mangrove plants are able to withstand high levels of salinity as well as regions of anoxia and frequent tidal inundation. Mangrove biomes often occur near tropical and sub-tropical estuaries and depositional marine coastal environments where fine sediments (often with high organic content) collect in areas protected from high energy wave action.

[http://purl.obolibrary.org/obo/ENVO\\_01000181](http://purl.obolibrary.org/obo/ENVO_01000181)

edit • see in glossary tab

**491,616 habitat terms for 136,548 taxa**

# Environments-EOL



Evangelos Pafilis



**Stenella coeruleoalba**

Striped Dolphin

Habitat ▼ blowhole

## Data about this record

Source	<a href="http://eol.org/pages/129553/details#trophic_strategy">http://eol.org/pages/129553/details#trophic_strategy</a>
Measurement Method	text mining
Contributor	<a href="#">Environments-EOL</a>
Measurement Remarks	source text: "blowhole"
Link to this record	<a href="http://eol.org/pages/129553/data#data_point_1036895">http://eol.org/pages/129553/data#data_point_1036895</a>

## Blowhole



A hole in coastal rock through which sea water is forced by a rising tide or waves and spurted through an outlet into the air.

[http://purl.obolibrary.org/obo/ENVO\\_00000168](http://purl.obolibrary.org/obo/ENVO_00000168)

[explore full data glossary](#)

# Unlocking the label data treasure chest

UNIVERSITY OF MICHIGAN 227743 <sup>skin + partial skeleton</sup> MUSEUM OF ZOOLOGY

VENEZUELA: Estado Zulia, ca 1 km NE town of  
(LOCALITY) Ancon de Torre; alt. sea level SEX - ♀

DATE 9 February 1989 COLLECTOR - Nedra K. Klein 367

*Dendroica petechia chrysoides* NKK

ovary: 4.5 x 4 mm, ova minute, oviduct: 1 mm, no brood patch present  
skull: 100% oss.; iris dark brown, maxilla dark gray, mandible medium  
13.5 g., trace fat. pearl gray, tarsi + toes yellow/brown, pale yellow pads  
stomach saved: insect parts; no remige, rectrix molt, light malar molt, trace head molt  
keel: 14.3 mm interorbital distance: 2.8 mm  
left wing chord: 64.2 mm, arcs 66 mm, tail: 52 mm; probable mate of NKK 366  
shot in beach area 200 m from mangrove, foraging in isolated *Avicennia*

# Unlocking the label data treasure chest



**Feeds on: insects**

**Tail length: 52 mm**

**Ovary width: 4 mm**

**Ovary length: 4.5 mm**

**Iris color: dark-brown**

**Keel length: 14.3 mm**

**Maxilla color: dark-gray**

**Interorbital distance: 2.8 mm**

**Reproductive condition: no brood patch**

# Unlocking the label data treasure chest

Elevation (min)	▶ 1,280 m	Smithsonian National Museum...	
(median)	▼ 1,490.5 m	Smithsonian National Museum...	
<b>Data about this record</b>			
Source	<a href="http://collections.mnh.si.edu/search/botany/?irn=10250862">http://collections.mnh.si.edu/search/botany/?irn=10250862;</a> <a href="http://collections.mnh.si.edu/search/botany/?irn=11015351">http://collections.mnh.si.edu/search/botany/?irn=11015351;</a> <a href="http://collections.mnh.si.edu/search/botany/?irn=11015352">http://collections.mnh.si.edu/search/botany/?irn=11015352;</a> <a href="http://collections.mnh.si.edu/search/botany/?irn=11015353">http://collections.mnh.si.edu/search/botany/?irn=11015353</a>		
Citation	Smithsonian Institution, National Museum of Natural History, Department of Botany <a href="http://collections.mnh.si.edu/search/botany/">http://collections.mnh.si.edu/search/botany/</a>		
Statistical Method	median		
Measurement Remarks	Exact Values: 1920 m; 1280 m; 1280 m; 1701 m		
Institution Code	USNM		
Scientific name	Caloplaca decipiens (Arnold) Blomb. & Forssell		
Link to this record	<a href="http://eol.org/pages/305744/data#data_point_10455585">http://eol.org/pages/305744/data#data_point_10455585</a>		
Supplier: <a href="#">Smithsonian National Museum of Natural History Department of Botany</a> • <a href="#">see this record in Virtuoso</a>			
<input type="text" value="add a question or comment ..."/>		<input type="button" value="post comment"/>	
<input type="button" value="add to overview"/>		<input type="button" value="remove from overview"/>	<input type="button" value="hide row"/>
(max)	▶ 1,920 m	Smithsonian National Museum...	

# Citizen science contributions

*Nallachus americanus* observed by [treegrow](#) at 05:02 PM EDT on Jul 5, 2014



► [View all 8 photos](#)

Photo © Katja Schulz, some rights reserved

[Add more photos](#)

## Description

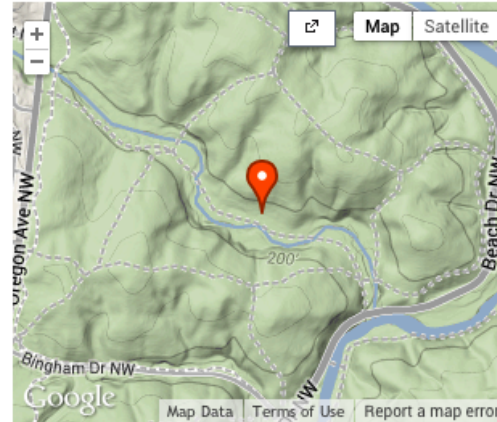
**Behavior:** ovipositing

**Insect Host Plant:**  **Tulip Tree** (*Liriodendron tulipifera*)

**Sex:** female

**Length (mm):** 3

[Add/edit more fields](#)



**Location:** Washington, District of Columbia, United States (Google, OSM)

**Places:** District of Columbia, US-DC, US, NA [More...](#)

Lat 38.973425, Lon -77.046744

Geoprivacy: [open](#) [Edit](#)

## Identification Summary



Your ID:

***Nallachus americanus***, a member of **Pleasing Lacewings** (Family Dilaridae) [Remove](#)

Need ID help?

[Add to ID Please](#)

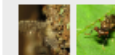
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## Projects



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# EOL-BHL Research Sprint



# EOL-BHL Research Sprint

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## TraitBank: Practical semantics for organism attribute data

Submitted by Cynthia Sims Parr on 03/28/2014 - 12:51

**Tracking #: 650-1860**

**Authors:**

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**Tags:**

Under Review

**Responsible editor:**

Guest Editors *Semantics for Biodiversity*

**Abstract:**

Encyclopedia of Life (EOL) has developed a new web-accessible repository, TraitBank (<http://eol.org/traitbank>), to better serve scientific discovery. EOL's TraitBank aggregates and manages attribute (trait) data across the tree of life including morphological descriptors, life history characteristics, habitat preferences, and interactions with other organisms. This paper describes how TraitBank uses Darwin Core and other standards to ingest and subsequently manage trait data in a Virtuoso triple store in a way that leverages EOL's extensive existing infrastructure. We add to and improve the semantics of both data and metadata in order to improve interoperability across the domains of morphology, ecology, and genomics. The system takes a semantic approach and also emphasizes practicality and ease of use for experts and non-experts. In addition to aggregating trait data in existing literature or databases, TraitBank contributes to community-based ontologies and sets the stage for a rapid rise in annotations about attributes on specimens and citizen science observations.

**Submission type:**

Tool/System Report

**Full PDF Version:**

 [swj650.pdf](#)



Encyclopedia of Life

# TraitBank

Structured Data in the Encyclopedia of Life

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