

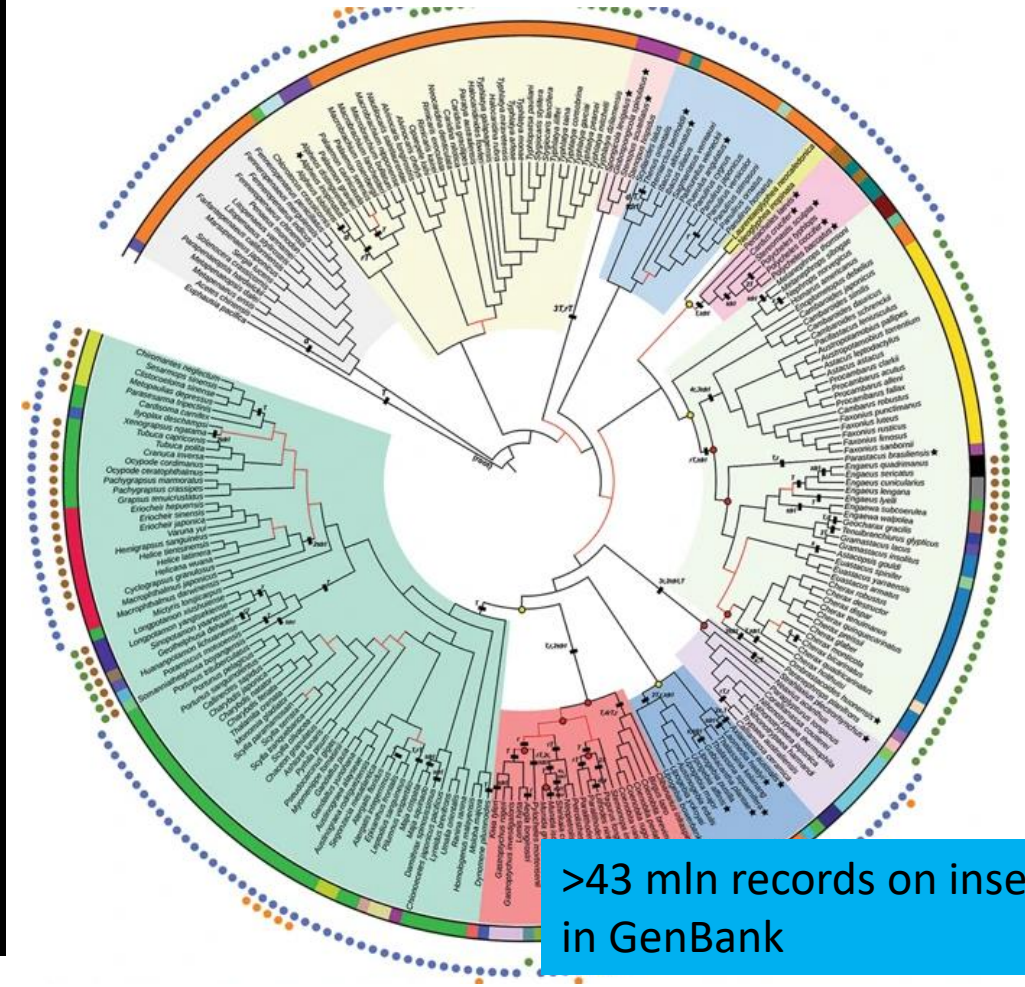
# Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications



## Working on Biodiversity data:

- Objectives
- Action
- Implementation
- Timeline
- Policy
- Strategy
- Documentation
- Facts and Evidences
- Translation of data
- Intelligent dissemination of data

## Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications



There are now around 3,500 registered herbaria in 183 countries totalling nearly 400 mln specimens

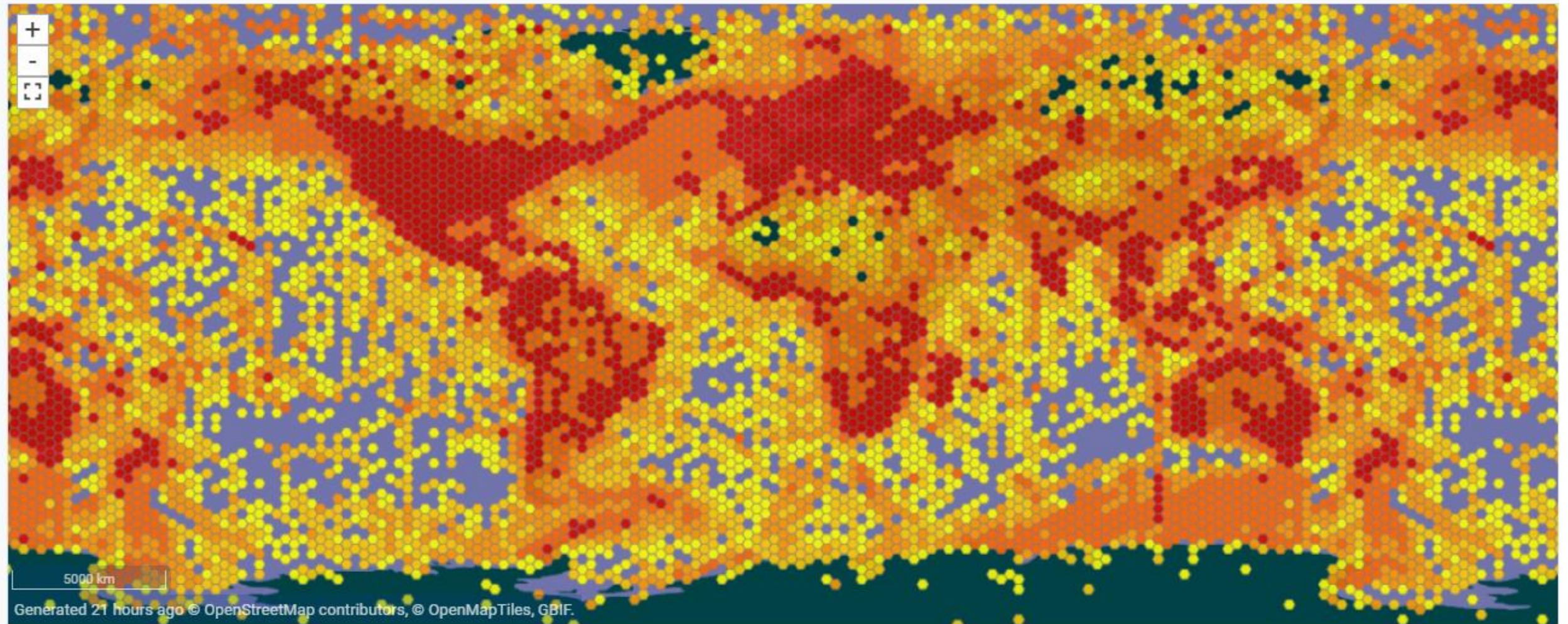
ca. 400 mln specimens of insects in the collections

>43 mln records on insects in GenBank



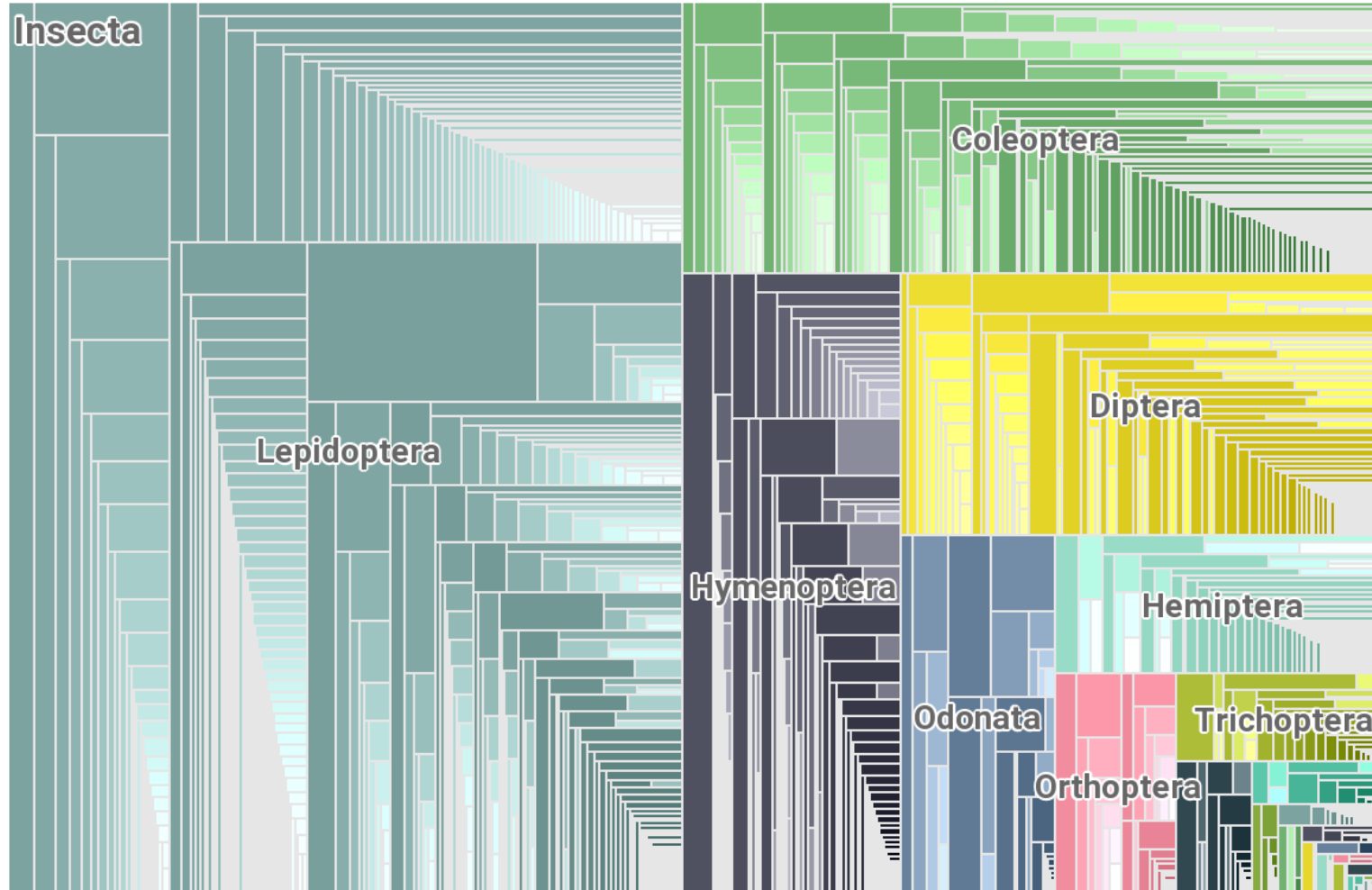
## Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications

232,882,840 GEOREFERENCED RECORDS





## Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications

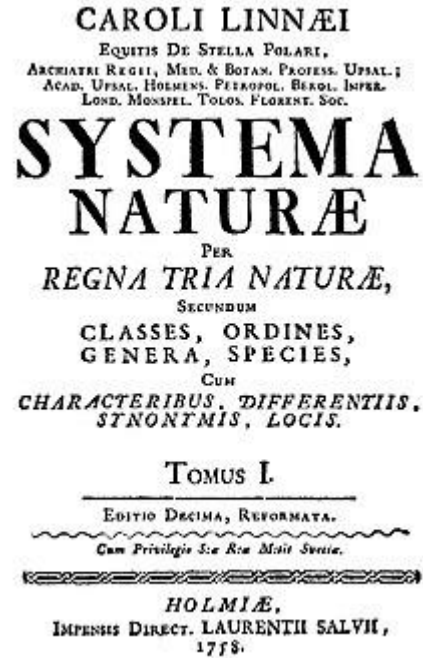
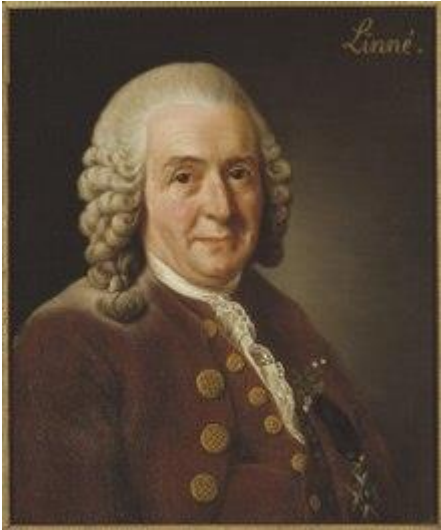


Taxonomic distribution of 98,7 mln insect occurrence data in GBIF  
<https://www.gbif.org/species/216>

Indebt to the Secretariat of GBIF

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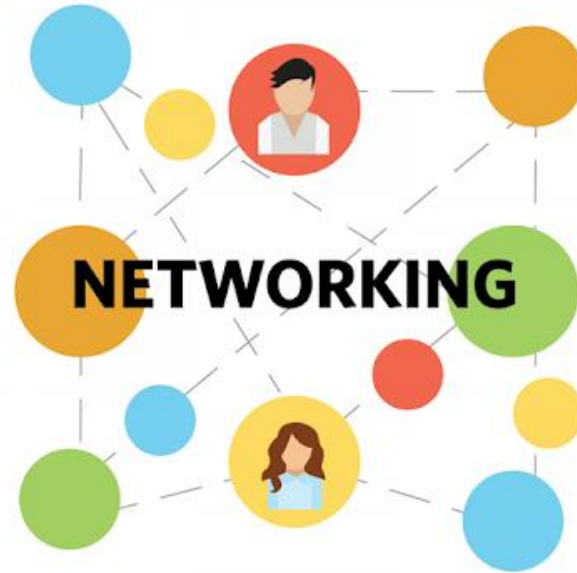
1758



**Static Data**

- ✓ Universal binominal nomenclature in one language
- ✓ Unique taxa names
- ✓ Biodiversity knowledge democratisation and accessibility
- ✓ Unlimited possibilities to continue

2024



**Circular Data, Updatable in real-time**

- ✓ Universal programming in SQL
- ✓ Unique machine-readable coding
- ✓ Biodiversity knowledge accessibility through the internet
- ✓ Unlimited possibilities to add and sort data

**Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications**

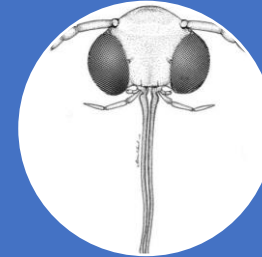
### Ambitions and Aims



to facilitate the access to the biodiversity resources and to present the physical illustration of the Lepidoptera biodiversity knowledge;



to offer solutions to group and specify the biodiversity;



to facilitate the direct and specific communication of collection users by providing a gate to the solid biodiversity platform;

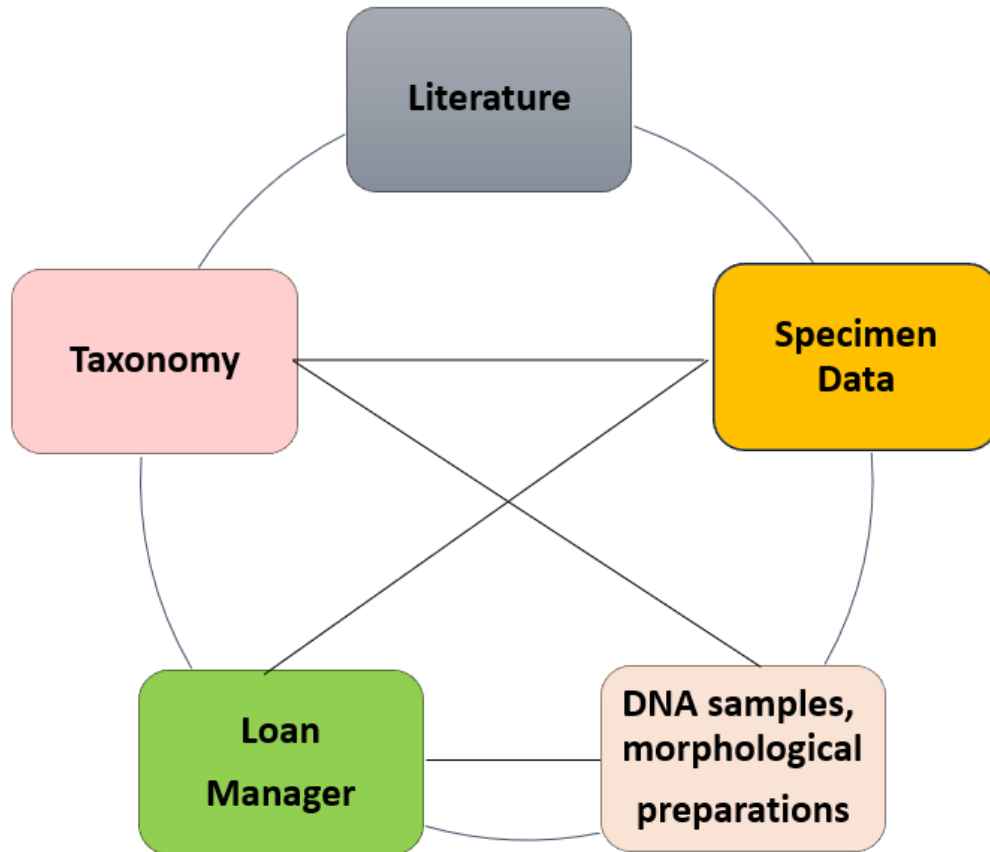


to provide interoperability to data and resources at the highest level and to facilitate discoveries and application of novel methods.



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## DATA STRUCTURE and ARCHITECTURE

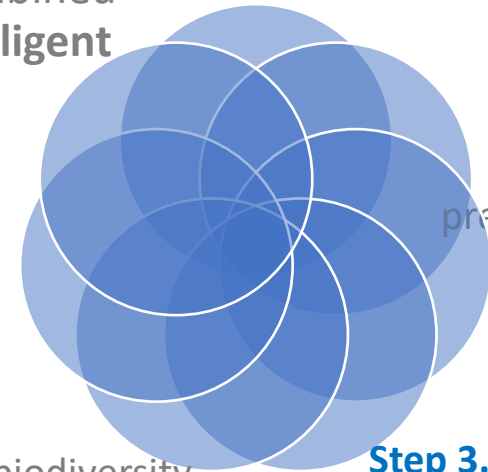


**Step 6.** Data are combined in a network of **intelligent relationships**

**Step 5.** Visualization of data.

**Step 4.** The biodiversity information is **intelligently text and data-mined**

**Step 1.** Data are structured.

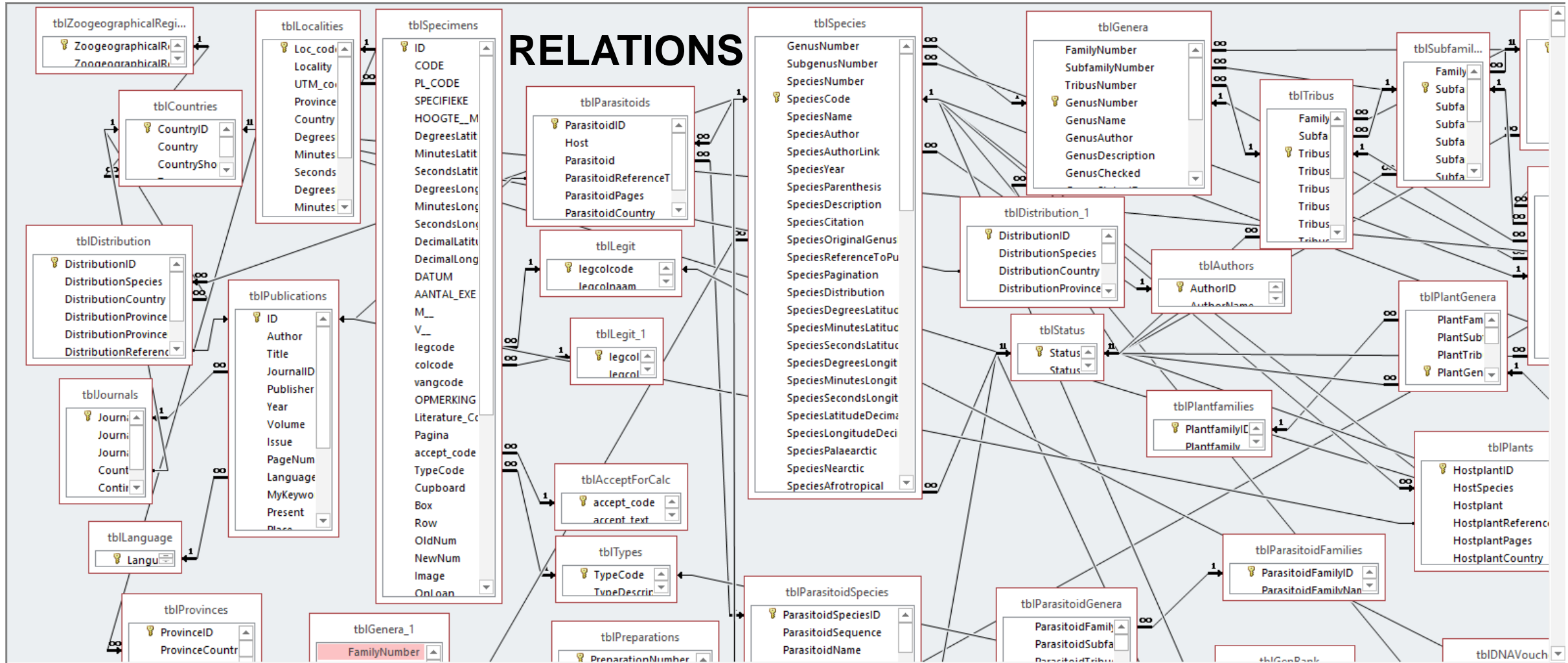


**Step 2.** Data are presented in the same way **consistently**

**Step 3.** Every data unit (species/specimen) should obtain a **unique ID**.



## Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications





Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications

Complex Structure – Simple Use – Offline system



Search for specimen

**Gracillariidae — Start menu**

**Literature data**

- See entire list
- Add new literature
- Add new taxonomic keywords
- Add new geographical keywords
- Add new journals
- Print taxonomic keywords list
- Print geographical keywords list
- Print journals list
- Print missing literature
- Search on keywords

**Taxonomic data**

Families Species

**Faunistic data**

Faunistics

Genitalia preparations

**Loan manager**

Write a new loan form

Check all open loans

Check all loans

Change an open loan

Scantext:

Look for this specimen

**Gracillariidae Taxonomy module — Species group data**

Gracillariidae *Acrocercops* Wallengren, 1881 Genus nr. 100010  
 Acrocercopinae *clinozona* Meyrick, 1920 Species nr. 200010750  
 Species code ACROCLIN Website

Palearctic  Neotropical  Oriental  Holarctic  Australasian  Afrotropical

Type locality: Australia, Queensland, Brisbane

Latitude (South = minus) Longitude Decimal (calculated) Latitude Decimal Longitude Decimal  
 -27 28 0 153 1 -26.533333 153.016667

Type specimens (♂=male, ♀=female):  
 Holotype ♀, coll. Walsingham nr. 19432, BMNH(E) 1855773, BMNH.

Taxonomy

Literature

**Gracillariidae Literature Module — Main form**

Code number 2586

Author Meyrick, E.  
 Year 1920a  
 Title Exotic Microlepidoptera.  
 Journal Exotic Microlepidoptera (Marlborough)  
 Publisher  
 Volume 2 Issue 10 Pages 289-320  
 Language English Present in library  Place Selected  Web

PDF  
 BHL <http://biodiversitylibrary.org/page/3808625>  
 DOI

**Geographical keyword list**

- Afghanistan
- Africa
- Afrotropical
- Albania
- Aldabra Island
- Algeria
- Alps
- Angola
- Antilles
- Appennines
- Argentina
- Armenia
- Asia
- Australia
- Australia (Queensland)
- Austria
- Azerbaijan
- Bahamas
- Bangladesh
- Barbados
- Belarus
- Belgium
- Belize
- Benin
- Bermuda
- Bhutan
- Bolivia
- Burkina Faso

My Keywords: Description Acrocercops eurychalca melanocosma asaphogramma Brazil clinozona contorta ramigera rhyrachroptera osteopa callinacha prospera clytosema chalinopa penographa crucigera lithogramma Gracillaria spiroxantha pneumatica Paroctopa tyrancha Phyllocnistis hagnopa India Spangiptha codicaria neosecta mesocheta Cythostichia centrometra Timodora cyanoxantha aeolastis Australia

**Gracillariidae Faunistic module — Main form**

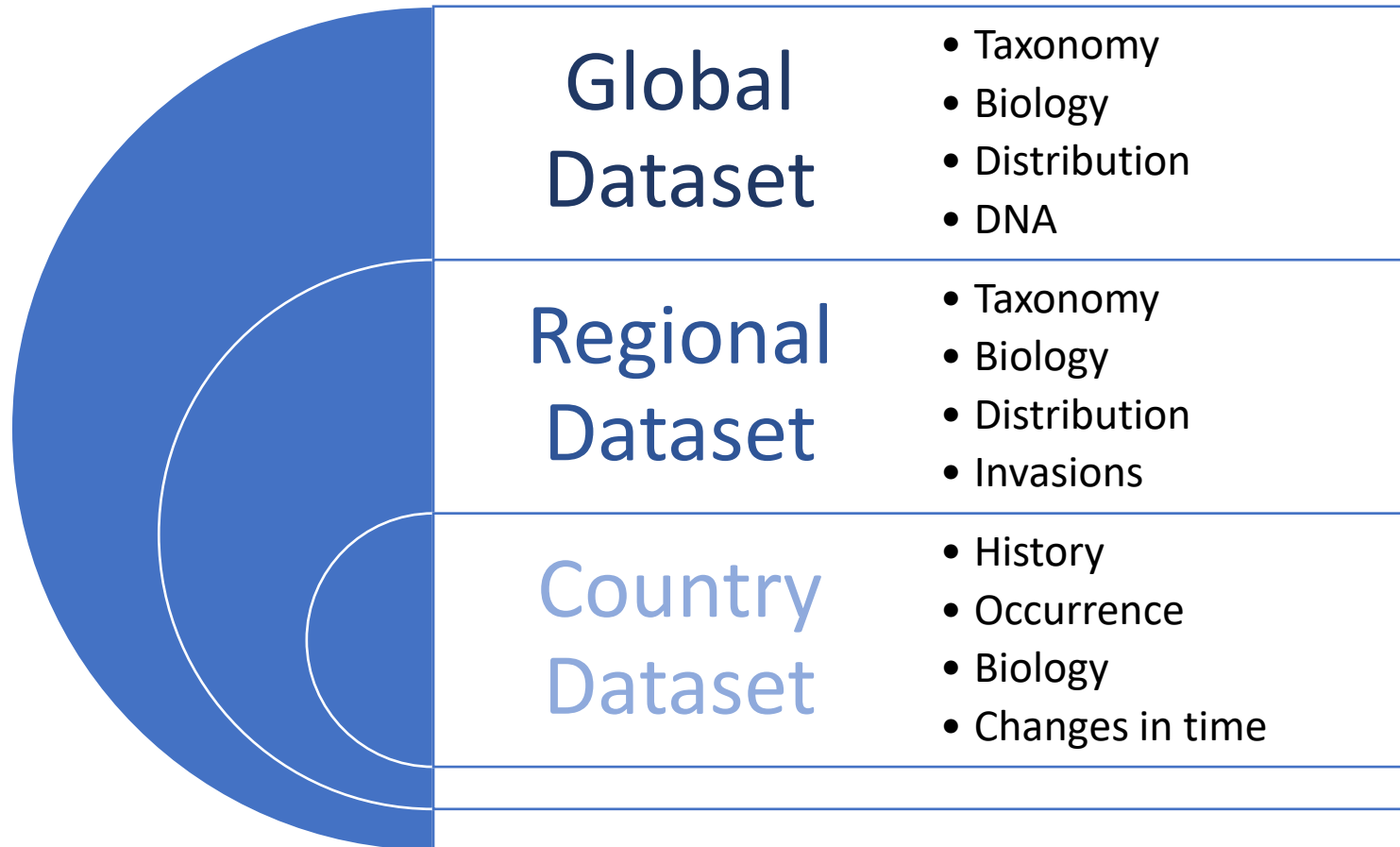
Gracillariidae *Acrocercops* Wallengren, 1881 Cupboard Box Row  
*Bomarmarinatus* (Walsingham, 1897) Old New Cat.  
 Locality Saint Thomas Date 12-03-1894 Type Holotype  
 Specific locality Number of specimens 1  
 Latitude 18 28 0 Longitude -64 55 0  
 Decimal Latitude 18.333333 Decimal Longitude -63.916667  
 UTM code Altitude 420 m  
 Province Virgin Islands, U.S.  
 Country Virgin Islands, U.S.  
 Temp start Remarks  
 Temp stop  
 Clouds  
 Start time Remarks about locality  
 Stop time  
 Literature Page

Legt Hedemann W.  
 Coll. The Trustees of the N.  
 Recording unknown  
 Accept data for calculations Yes  
 Export DNA voucher GenBank Gen. prep. BHMW 31282/ E-code BHMNH(E) 1467836 On loan Loan number  
 Photograph  
 Distribution Cuba Puerto Rico Virgin Islands, U.S. Saint Thomas  
 Hostplants Centrosema plumen (Pers.) Benth. Fabaceae  
 Sida rhombifolia L., 1753 Malvaceae

Faunistics

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Fit for Purpose in Real-time





# Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications

## Back Office – Home page

Moths Back Office
WELCOME, JURATE. [VIEW SITE](#) / [CHANGE PASSWORD](#) / [LOG OUT](#)

Home > Lite > MothSpecies

Start typing to filter...

**AUTHENTICATION AND AUTHORIZATION**

Groups + Add

Users + Add

---

**LITE**

Countries + Add

HigherTaxa + Add

Journals + Add

Languages + Add

Localities + Add

**MothSpecies** + Add

Moths + Add

Museums + Add

Pages + Add

Parasitoids + Add

Photographers + Add

Plants + Add

Provinces + Add

Publications + Add

Sections + Add

Select moth species to change ADD MOTH SPECIES +

Search

Action: --- Go 0 of 100 selected

	SCIENTIFIC NAME	AUTHORSHIP	RANK	STATUS	VISIBLE	CODE
<input type="checkbox"/>	Acrocercops acanthidias	Meyrick, 1934	species	Accepted	✔	ACROACAN
<input type="checkbox"/>	Acrocercops achnodes	Meyrick, 1915	species	Accepted	✔	ACROACHN
<input type="checkbox"/>	Acrocercops aeglophanes	(Turner, 1913)	species	Accepted	✔	ACROAEGL
<input type="checkbox"/>	Acrocercops aeolella	Turner, 1940	species	Misapplied	✔	01ACRAEO
<input type="checkbox"/>	Acrocercops aeolellum	(Meyrick, 1880)	species	Accepted	✔	ACROAEOL
<input type="checkbox"/>	Acrocercops affinis	Braun, 1918	species	Accepted	✔	ACROAFFI
<input type="checkbox"/>	Acrocercops albanotella	(Chambers, 1877)	species	Misapplied	✔	01ACRALB
<input type="checkbox"/>	Acrocercops albida	Turner, 1947	species	Accepted	✔	ACROALBD
<input type="checkbox"/>	Acrocercops albidorsella	Bradley, 1957	species	Accepted	✔	ACROALDO
<input type="checkbox"/>	Acrocercops albimaculella	(Turner, 1896)	species	Synonym	✔	01ACRLBM
<input type="checkbox"/>	Acrocercops albinatella	(Chambers, 1872)	species	Accepted	✔	ACROALBI
<input type="checkbox"/>	Acrocercops albinotella	Meyrick, 1912	species	Synonym	✔	02ACRALB
<input type="checkbox"/>	Acrocercops albofasciella	Yazaki, 1926	species	Accepted	✔	ACROALBF
<input type="checkbox"/>	Acrocercops albomaculella	(Turner, 1894)	species	Accepted	✔	ACROALBM
<input type="checkbox"/>	Acrocercops albomarginata	Forbes, 1930	species	Misapplied	✔	01ACRALM

**FILTER**

**By rank**

All

species

subspecies

---

**By visible**

All

Yes

No

---

**By status**

All

Accepted

Misapplied

Synonym

---

**By family**

All

Gracillariidae

Unassigned

-

# Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications

## Back Office – Museum collection page

Start typing to filter...

**AUTHENTICATION AND AUTHORIZATION**

Groups [+ Add](#)

Users [+ Add](#)

**LITE**

Countries [+ Add](#)

HigherTaxa [+ Add](#)

Journals [+ Add](#)

Languages [+ Add](#)

Localities [+ Add](#)

MothSpecies [+ Add](#)

Moths [+ Add](#)

**Museums** [+ Add](#)

Pages [+ Add](#)

Parasitoids [+ Add](#)

Photographers [+ Add](#)

Plants [+ Add](#)

Provinces [+ Add](#)

Publications [+ Add](#)

Sections [+ Add](#)

Select museum to change

Action: ---  0 of 100 selected

<input type="checkbox"/>	ACRONYM	NAME	COUNTRY
<input type="checkbox"/>	ACIAR	Australian Centre for International Agricultural Research	Fiji
<input type="checkbox"/>	AMNH	American Museum of Natural History, New York	United States, US
<input type="checkbox"/>	AMS	Australian Museum Sydney	Australia
<input type="checkbox"/>	ANIC	Australian National Insect Collection	Australia
<input type="checkbox"/>	ANSP	Academy of Natural Sciences, Philadelphia	United States, US
<input type="checkbox"/>	BIN	Botanical Institute of the Russian Academy of Sciences	Russian Federation
<input type="checkbox"/>	BMNH	The Natural History Museum, London	United Kingdom
<input type="checkbox"/>	BPBM	Bernice P. Bishop Museum	United States, US
<input type="checkbox"/>	CAS	California Academy of Sciences, San Francisco	United States, US
<input type="checkbox"/>	CDRS	Charles Darwin Research Station, Galapagos	Ecuador
<input type="checkbox"/>	CIS	California Insect Survey	United States, US
<input type="checkbox"/>	CMCZ	Cambridge Museum of Comparative Zoology	United States, US
<input type="checkbox"/>	CNC	Canadian National Collection of Insects, Ottawa	Canada
<input type="checkbox"/>	CREG	Instituto Tecnológico de Tlajomulco	Mexico
<input type="checkbox"/>	CU	Cornell University	United States, US
<input type="checkbox"/>	CUMZ	Cambridge University, Zoological Museum	United Kingdom
<input type="checkbox"/>	DMNS	Denver Museum of Nature and Science	United States, US
<input type="checkbox"/>	DZUP	Coleção Padre Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná	Brazil

[ADD MUSEUM +](#)

**FILTER**

By country

All

- Afghanistan
- Albania
- Algeria
- American Samoa
- Andorra
- Angola
- Anguilla
- Antarctica
- Antigua and Barbuda
- Argentina
- Armenia
- Aruba
- Australia
- Austria
- Azerbaijan
- Bahamas
- Bahrain
- Bangladesh
- Barbados
- Belarus
- Belgium
- Belize
- Benin
- Bermuda
- Bhutan
- Bolivia, Plurinational State of
- Bonaire, Sint Eustatius and Saba
- Bosnia and Herzegovina
- Botswana
- Bouvet Island



Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications

Front Office – Home page [www.gracillariidae.net](http://www.gracillariidae.net) – Global Dataset



# Gracillariidae.net



## Global Taxonomic Database of Gracillariidae (Lepidoptera)

[Home](#) [Species](#) [Museums](#) [Photos](#) [Publications](#) [About](#) Looking for names:   [Welcome jdp](#) [Admin](#) [Logout](#)

### Statistics

last_updated	23 Jul 2024
Families	1
Tribes	6
Genera	166
Species(accepted)	2034
Species(synonyms)	413
Species(misapplied)	304
Subspecies	9
Plants	3484
Parasitoids	1250
Photos	4707
Types	3618
Publications	5148



*Cameraria cotinivora*

2mm

Welcome



Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications

Front Office – Home page [www.afromoths.net](http://www.afromoths.net) – Regional Dataset

# Afromoths.net

online database of Afrotropical moth species (Lepidoptera)

[Home](#)
[Species](#)
[Museums](#)
[Photos](#)
[Publications](#)
[About](#)
 Looking for names:

## Statistics

last_updated	25 Jul 2024
Families	137
Tribes	470
Genera	9150
Species(accepted)	29908
Species(synonyms)	6601
Species(misapplied)	2431
Subspecies	1888
Plants	7166
Parasitoids	1365
Photos	47208
Types	53584
Publications	10059



*Thyretarctia didyma*

Welcome



## Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications

Home page <https://projects.biodiversity.be/lepidoptera/> – Country Dataset

### Welcome!

This catalogue, comprising all Lepidoptera species of Belgium, provides information on the systematics and the distribution per province arranged in three time-periods. The biology of the species is treated, information on species is arranged in a fixed pattern. A lot of pictures are provided, they are also arranged in a similar scheme. In this way, any information that the user is looking for can be retrieved fast and easily. The number between brackets after the name of the Family indicates the number of species within that Family in Belgium.

If you have any corrections, additions, information, and/or useful pictures or suggestions please contact [Chris Steeman](#).

### Overview of all families

					
<b>Micropterigidae (6)</b> Oermotten (NL) Mandibulate archaic moths (EN)	<b>Eriocraniidae (8)</b> Purpermotten (NL) Eriocraniid moths (EN)	<b>Hepialidae (5)</b> Wortelboorders (NL) Swift moths (EN)	<b>Nepticulidae (96)</b> Dwergmineermotten (NL) Pygmy leafmining moths (EN)	<b>Opotegidae (3)</b> Oogklepmotten (NL) White eyecap moths (EN)	<b>Heliozelidae (7)</b> Zilvervlekmotten (NL) Shield bearer moths (EN)
					
<b>Adelidae (22)</b> Langsprietmotten (NL) Fairy longhorn moths (EN)	<b>Incurvariidae (6)</b> Witvlekmotten (NL) Leafcutter moths (EN)	<b>Prodoxidae (7)</b> Yuccamotten (NL) Yucca moths (EN)	<b>Tischeriidae (7)</b> Vlekmineermotten (NL) Trumpet leafminer moths (EN)	<b>Meessiidae (13)</b> Ringlijnmotten (NL)	<b>Psychidae (26)</b> Zakdragers (NL) Bagworm moths (EN)

# Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications

Home page <https://projects.biodiversity.be/lepidoptera/> – Country Dataset

## *Phyllonorycter blancardella* (Fabricius, 1781)

**Species**

Last modified: Oct. 3, 2020, 12:17 p.m.

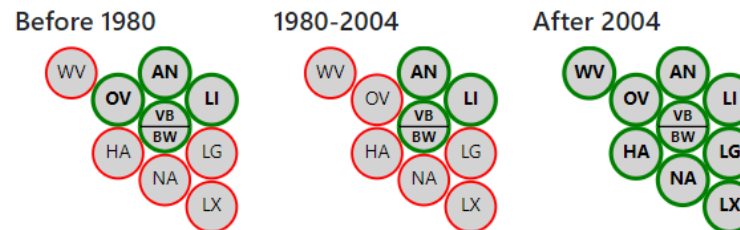
A rather rare but locally common species, mainly found in Flanders.

### Details

<b>Classification</b>	Family: <a href="#">Gracillariidae</a> > Subfamily: <a href="#">Lithocolletinae</a> > Genus: <a href="#">Phyllonorycter</a> > Species: <i>Phyllonorycter blancardella</i>
<b>Vernacular names</b>	Appelvouwmot (NL), Brown apple midget (EN)
<b>Synonyms</b>	<i>Phyllonorycter concomitella</i> (Banks, 1899)
<b>First mention in Belgium</b>	Lambillon L.-J. 1904c. No title. — Revue mensuelle de la Société entomologique namuroise 4: 43–44. On page 43.
<b>Status</b>	<b>Native</b>

### Distribution

Grape view  Table view



## Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications

Home page <https://projects.biodiversity.be/lepidoptera/> – Country Dataset

### *Malus domestica*

Host plant species

From genus: [Malus](#)



▲ Information in this section was automatically retrieved from Wikipedia/Wikidata and is not endorsed by the Flemish Entomological Society.

An apple is a round, edible fruit produced by an apple tree (*Malus* spp., among them the domestic or orchard apple; *Malus domestica*). Apple trees are cultivated worldwide and are the most widely grown species in the genus *Malus*. The tree originated in Central Asia, where its wild ancestor, *Malus sieversii*, is still found. Apples have been grown for thousands of years in Eurasia and were introduced to North America by European colonists. Apples have religious and mythological significance in many cultures, including Norse, Greek, and European Christian tradition. Apples grown from seed tend to be very different from those of their parents, and the resultant fruit frequently lacks desired characteristics. For commercial purposes, including botanical evaluation, apple cultivars are propagated by clonal grafting onto rootstocks. Apple trees grown without rootstocks tend to be larger and much slower to fruit after planting. Rootstocks are used to control the speed of growth and the size of the resulting tree, allowing for easier harvesting. There are more than 7,500 cultivars of apples. Different cultivars are bred for various tastes and uses, including cooking, eating raw, and cider or apple juice production. Trees and fruit are prone to fungal, bacterial, and pest problems, which can be controlled by a number of organic and non-organic means. In 2010, the fruit's genome was sequenced as part of research on disease control and selective breeding in apple production. From 2014 to 2023, there have been an average of 78 million tonnes of apples globally produced per year. In 2023, the worldwide production of apples was 83 million tonnes, with China accounting for nearly half of the total. [Read more at Wikipedia](#)

**Vernacular names:** apple tree (en) Pommier domestique (fr) Pommier commun (fr) Apfelbaum (de)

More details about *Malus domestica* at: [GBIF](#) [Wikipedia](#) [iNaturalist](#)





PHEGEA



Interlinked online databases – a key prerogative for evidence-based decision-making and for AI applications



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