

# DARWIN

Project CANATHIST –  
COEB Huye (Rwanda)

# Darwin

- Open source
- Joint project RBINS (Brussels Natural Sciences) / Africamuseum
  - (PostgreSQL + PHP)
- Runnable on desktop computer (Docker)
- Available on GitHub  
[https://github.com/naturalsciences/natural\\_heritage\\_darwin](https://github.com/naturalsciences/natural_heritage_darwin)

# Technicalities

- Focus on geographical and taxonomic data
- Batch import from CSV with quality-check
- Integration with DNA workflow and labbook (work in progress)
- Integrated reporting (extraction to CSV) tool
- Compliance with web services
  - JSON GET APIs
  - GeoServer WMS/WFS
  - CETAF stable and permanent identifiers (allocated by Darwin)
  - IIIF client for images

# Tools and languages used

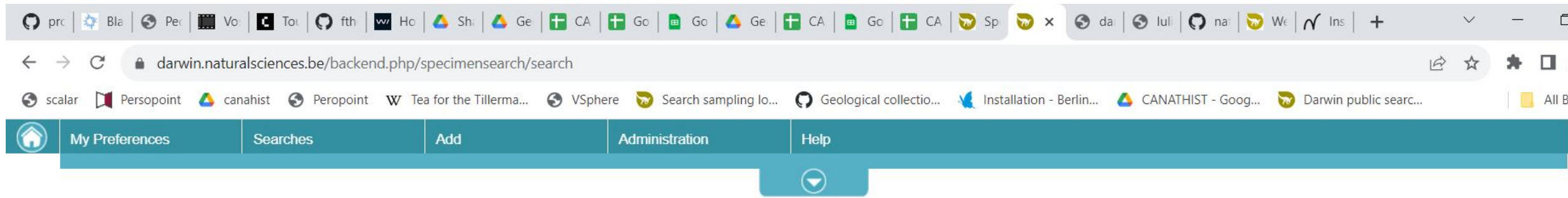
- Darwin :
  - PHP (programming)
  - PostgreSQL
- GIS
  - QGIS (creation of maps)
  - Python (ANACONDA) (processing and desktop tools with GUI)
  - Google sheet with JavaScript Engine (APIs to query Darwin)

# Taxonomic management

- Tag taxa and collections as sensitive
  - (coordinates hidden and/or replication in public interface blocked)
- Possible to define synonymies
- Taxonomical check to avoid duplicates and conflicting hierarchies (upper ranks)

# Figures

- Darwin
  - RBINS :



## Specimens Search Result

Show URL

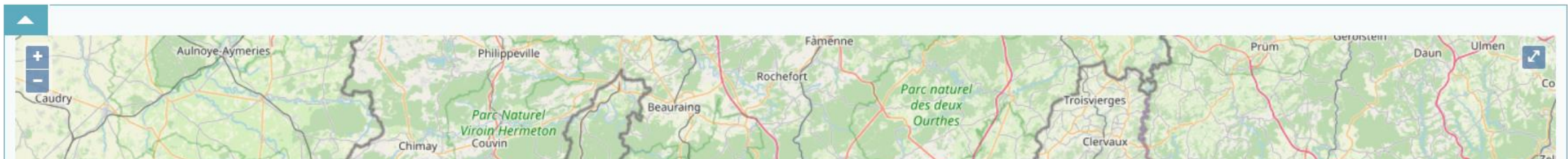
« < [1] :: 2 :: 3 :: 4 :: 5 > » 1 /76534 go

Your query retrieved :

- 765331 records
- 592259 distinct records based on I.G. and main collection tag
- 3520301 physical records (minimal estimate)
- 3623910 physical records (maximal estimate)

- MIDS 0 : 73973 records, 205571 physical records (minimal estimate), 205802 physical records (maximal estimate)
- MIDS 1 : 609183 records, 3135972 physical records (minimal estimate), 3236549 physical records (maximal estimate)
- MIDS 2 : 82175 records, 178758 physical records (minimal estimate), 181559 physical records (maximal estimate)
- MIDS 3 : 0 records, 0 physical records (minimal estimate), 0 physical records (maximal estimate)

Records per page: 10



# Figures

- Darwin
  - RMCA :



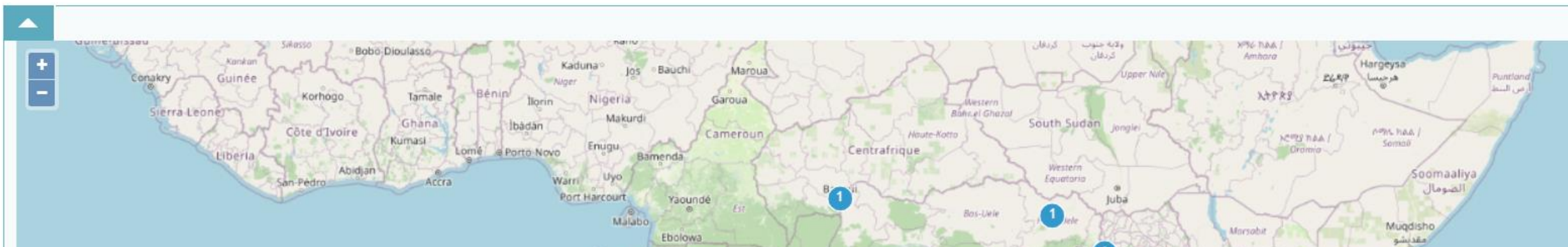
## Résultat de recherche d'échantillons

[Retour aux critères](#) [Print](#) [Thermic print](#)

« < [1] :: 2 :: 3 :: 4 :: 5 :: 6 :: 7 :: 8 :: 9 :: 10 :: 11 :: 12 :: 13 :: 14 :: 15 > » 1 /16699 go

Your query retrieved :

- 834933 records
- 44895 distinct records based on I.G.
- 2148780 physical records (minimal estimate)
- 2149028 physical records (maximal estimate)



# Figures (types in Darwin)

- 45 818 types (RBINS)
- 60 530 types (RMCA)



# Rwanda

- 30 978 records (Africamuseum – Tervuren)
- 8 645 records (RBINS – Brussels)

## Types

- 1681 Types (RMCA)
- 751 Types (RBINS)

# Rwanda – records by collection (Africamuseum)

Collection	Amount records
2019_BUL_DNA	89
Acari	5
AMPHIBIANS	582
ARA	194
ARA_AMBLYPYGI	2
ARA_ARANEAE	2288
BE_RMCA.ARA.Aca	1114
BE_RMCA_ARA.Par	478
BE_RMCA_AVES_EGG	22
BE_RMCA_BRY.Phy	7
BE_RMCA_INS.Hym	16
BE_RMCA_INS.Neu.	5
BE_RMCA_INS.Tri	16
BE_RMCA_MOL.Gas	15
BE_RMCA_PORIFERA	2
COE	14
CRUSTACAE	303
ICHTYO	3109
MAMMA_RMCA	14716
MYRIAPODA	363
RMCA_COLEO	12
RMCA_DIPT_FRUITFLY_DRY	42
RMCA_LEPI	32
RMCA_Vert_Aves	6188
WOOD	384
VERMES	286
VERT_R	681
Art objects- fibers	1
Total	30976

# Rwanda – records by collection (Brussels RBINS)

collection_code	Total
acari 2	4870
BE-RBINS INV-INS Types (Virtual Collections)	15
BE-RBINS VER-AMP	126
BE-RBINS VER-BIR	1571
BE-RBINS VER-FIS	535
BE-RBINS VER-MAM	1001
BE-RBINS VER-REP	195
BE-RBINS-IZ-ENT-Acari	7
BE-RBINS-VZ-AMPHIBIA-TYPES	22
BE-RBINS-VZ-REPTILIA-TYPES	3
Branchiopoda	3
coll gen rhopa	2
General collection/Buyle	2
hyd	22
INVERTEBRATES-MOLLUSCA-GENERAL COLLECTION	12
Malacostraca	9
Maxillopoda	3
MINDRUG	5
MINGEN	218
Ostracoda	15
POP.	8
Total	8644

# Rwanda Types By collections (RMCA)

Collection code	Total
Acari	4
AMPHIBIANS	65
ARA	16
ARA_ARANEAE	45
BE_RMCA.ARA.Aca	700
BE_RMCA_ARA.Par	179
BE_RMCA_BRY.Phy	3
BE_RMCA_INS.Hym	16
BE_RMCA_VER_A	16
CRUSTACAE	1
ICHTYO	158
MAMMA_RMCA	127
MYRIAPODA	15
RMCA_COLEO	2
RMCA_DIPT_FRUITFLY_DRY	2
RMCA_LEPI	29
VERMES	286
VERT_R	17
Total	1681

# Rwanda Types By collections (RBINS)

Collections	Amount
acari 2	705
BE-RBINS INV-INS Types (Virtual Collections)	14
BE-RBINS VER-AMP	2
BE-RBINS VER-REP	3
BE-RBINS-VZ-AMPHIBIA-TYPES	22
BE-RBINS-VZ-REPTILIA-TYPES	3
coll gen rhopa	2
Total	751

# Labelling

- Standard or sticker paper on regular printer (grid on A4 sheet to cut)
- Compliant with thermic paper (paper with ink can be put inside of ethanol/formaline jars)
  - drivers for Zebra and Avery Dennison printers

# Labelling



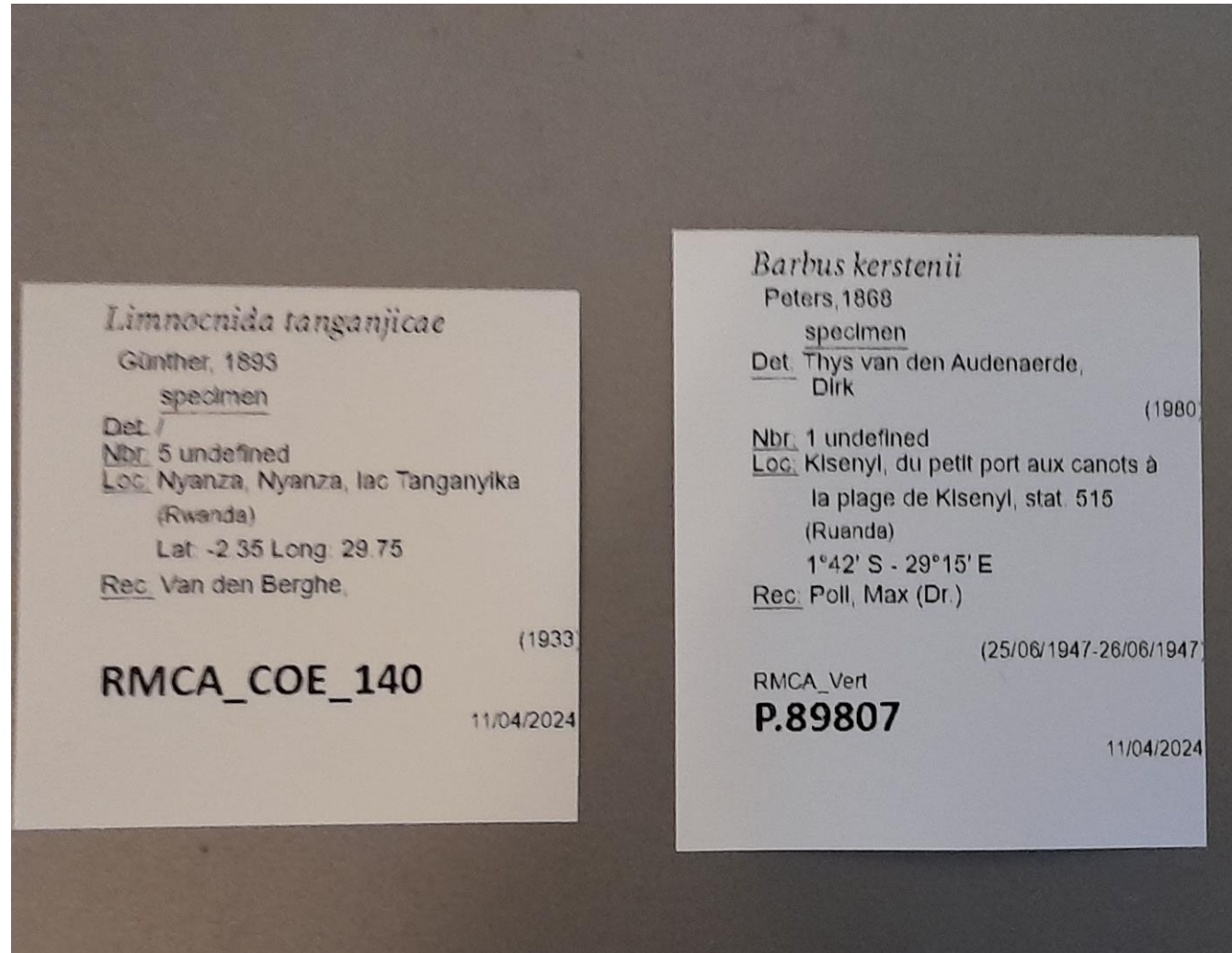
Zebra ZT 411 (ca. 1000 / 1200 \$)

# Labelling





# Labelling



Example of "thermic labels" (Darwin - Zebra)

# Darwin – Public Interface

- <https://darwin.naturalsciences.be/> (RBINS – Natural Sciences Museum, Brussels)
- <https://darwinweb.africamuseum.be/> (Africamuseum, Tervuren)
- Search interface publicly available on the Internet
  - Daily Replication of the core scientific database
  - Interactive maps
  - Links to IIF (hi-res zoomable images), image catalogues (CollectiveAccess/VirtualCol) and 3D viewers (Sketchfab)

# Darwin – Public Interface

Possibility to search in collections by combining text criteria (taxonomy, localities, collection numbers, type information) and geographic actions in interactive maps

Enter a genus...

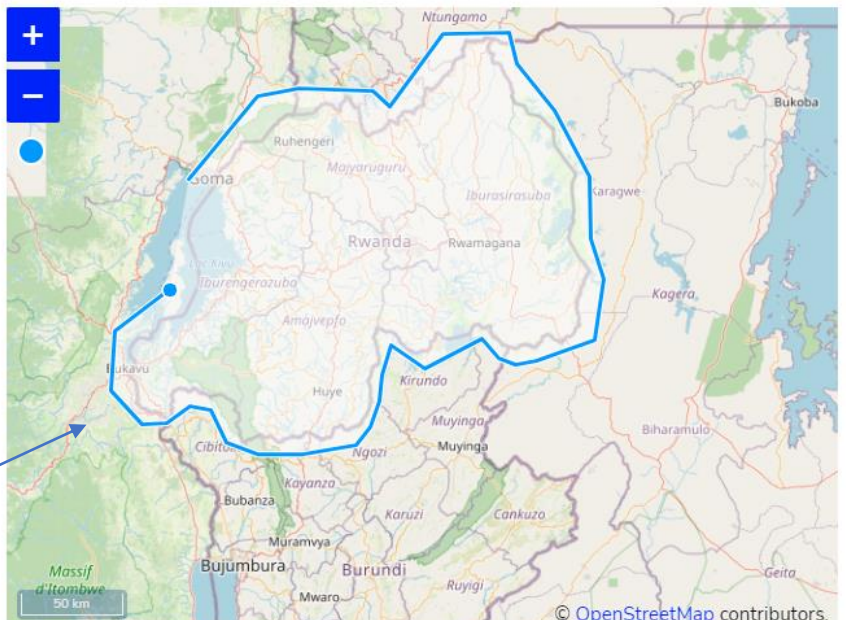
Enter a Country...

Collectors:  
Enter a collector...

Geographic search:  
[Show/Hide map](#)

N  
90  
W -180 180 E  
-90  
S  
N  
90°0'0"  
W 180°0'0" 180°0'0" E  
90°0'0"  
S

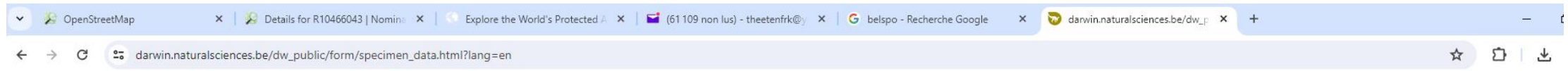
Move map Free polygon Clean selection



© OpenStreetMap contributors.  
29.0445, -2.1567

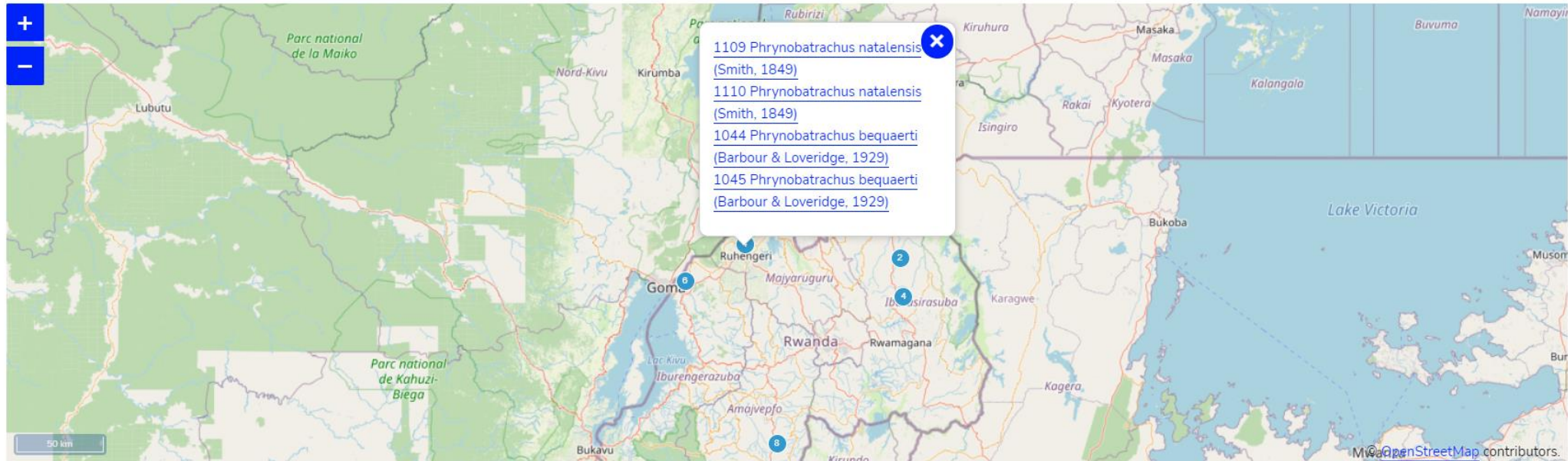
Dynamic drawing of a bounding box

# Darwin – Public Interface



NL FR EN

[Search](#) [Data management interface](#)



29.6771, -1.1144

**2565 found specimens**

Page 1 / 103

(25 specimens in page)

25 specimens with coordinates (page)

2565 specimens with coordinates (total)

First Previous **1** 2 3 4 5 6 7 8 9 10 Next Last

Interactive map with result and list of specimens



# Darwin – Public Interface

← → ↻ darwin.naturalsciences.be/dw\_public/form/specimen\_result.html

NL FR EN

[Search](#) [Data management interface](#)

**Collection:**

▼

Class: Enter a class...	Species or subspecies: Enter a species...	Collected after: ▼ / ▼ / ▼
Order: Enter an order...	I.G. Number: Enter an ig number...	Collected before: ▼ / ▼ / ▼
Family: Enter a family...	Specimen number: Enter a specimen number...	Types: <input checked="" type="checkbox"/> types <input checked="" type="checkbox"/> non-type
Genus: Enter a genus...	Countries: rwanda	<input checked="" type="checkbox"/> With images <input type="checkbox"/> With 3D <input type="checkbox"/> Only with geographical coordinates: <input type="checkbox"/>

Geographic search: [Show/Hide map](#)

SEARCH CLEAN

Search of data having images

# Darwin – Public Interface

← → ↻ [darwinweb.africamuseum.be/dw\\_public\\_angular/form/specimen\\_detail.html?uuid=24aec40-8ea5-4583-adf7-c58835182216&lang=en&frame=false](https://darwinweb.africamuseum.be/dw_public_angular/form/specimen_detail.html?uuid=24aec40-8ea5-4583-adf7-c58835182216&lang=en&frame=false)

**AFRICA**  
DARWIN Collections **museum** NL FR EN

[Search](#) [Data management interface](#)

## Marconia kivuensis

BE\_RMCA\_MOL.Gas.17490

> [Stable CETAF identifier \(permalink\)](#)  
> [Image link](#)

Collection: /Invertebrates/Mollusca/Gastropoda/ Country: .

Specimen number: BE\_RMCA\_MOL.Gas.17490 Locality:

Taxonomical name: *Marconia kivuensis* • other:  
◦ Populated place: Lac Kivu

Class: **Gastropoda** Latitude:

Order: Longitude:

Family: **Streptaxidae**

Begin of collecting period: 1935

End of collecting period:

Collectors: Ex. coll. Putz. ex preston

Donator:

History of scientific identifications:  
• xxxx-xx-xx: *Marconia kivuensis*


Zoological type: **Type**

Specimen count: 1

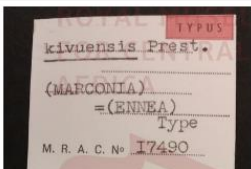
Specimen count (males): 0

Specimen count (females): 0


**Results with links to IIF viewers**



[To viewer](#)  
Contributor: Jonathan Brecko



[To viewer](#)  
Contributor: Jonathan Brecko



[To viewer](#)  
Contributor: Jonathan Brecko

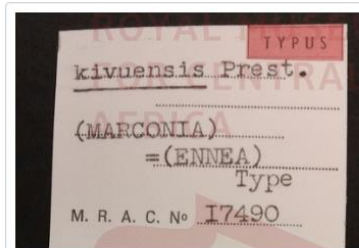
# Darwin – Public Interface

← → ↻ 📄 darwinweb.africamuseum.be/dw\_public\_angular/form/specimen\_detail.html?uuid=24aec40-8ea5-4583-adf7-c58835182216&lang=en&frame=false



[To viewer](#)

Contributor: Jonathan Brecko



[To viewer](#)

Contributor: Jonathan Brecko



[To viewer](#)

Contributor: Jonathan Brecko



Hi-res embedded IIF viewer

<https://virtualcol.africamuseum.be/providence/pawtucket/service.php/IIF/represent>



# URLS

- <https://canathist.naturalheritage.be>
- <https://darwin.naturalsciences.be> (RBINS)
- <https://darwinweb.africamuseum.be> (RMCA)
- <https://www.naturalheritage.be/>
  - (join portal with Meise data)
  - (projet 2018-2022)

# URL

- Historical maps Geology (database)
  - <https://geocatalogue.africamuseum.be/>
  - Contact maps@africamuseum.be