

The significance of taxonomic publications to understand biodiversity in the digital world

September 15, 2022

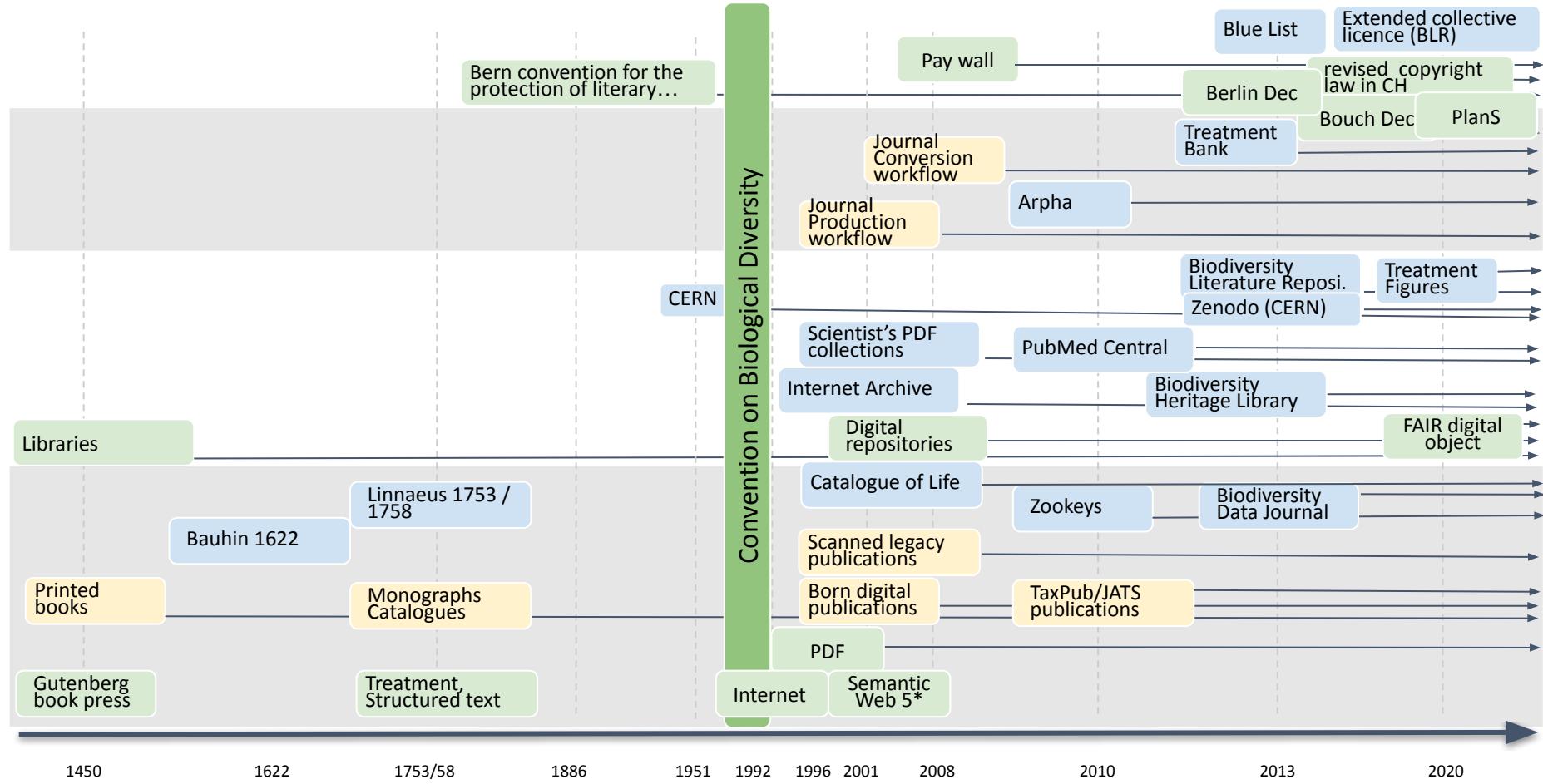
Bauhin 2022 Conference

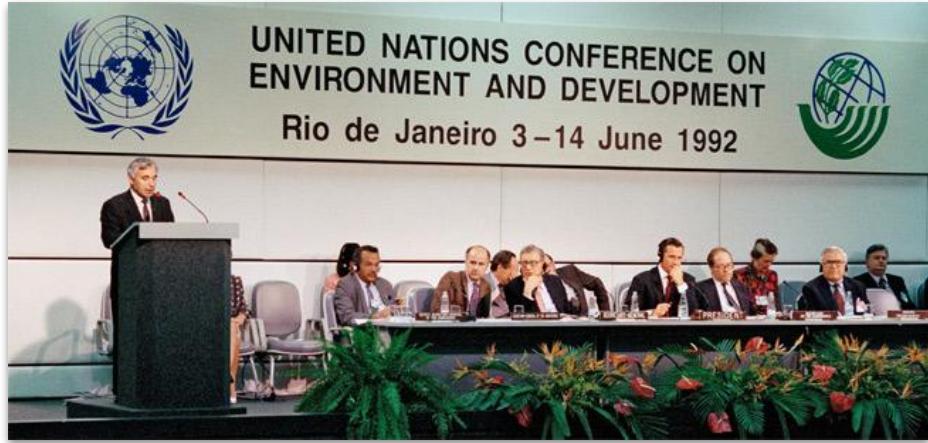
Basel, Switzerland
Donat Agosti

ORCID: [@myrmoteras](https://orcid.org/0000-0001-9286-1200)

Plazi, Switzerland

Brief history of publishing in biodiversity / taxonomy





Article 7. Identification and Monitoring

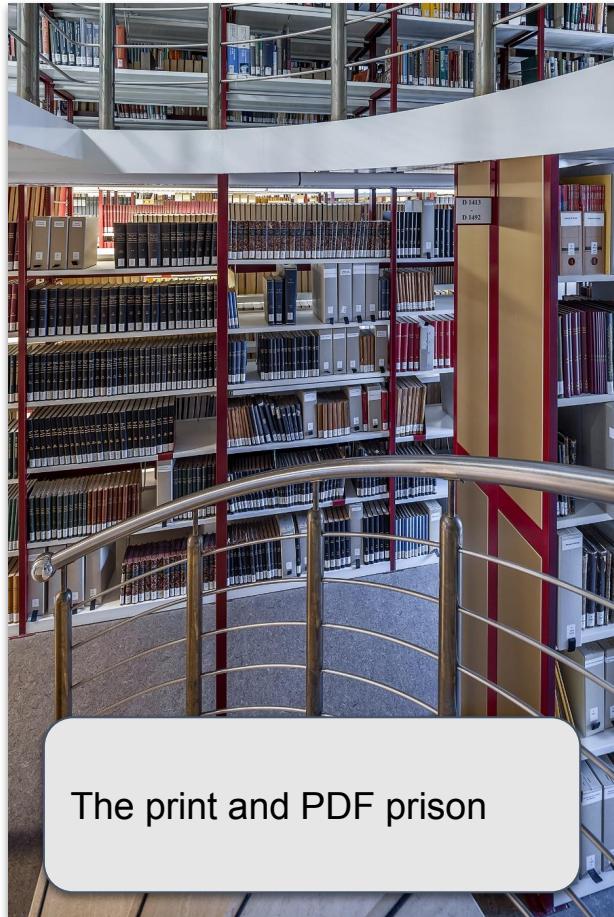
How many species do we lose?

How many species do we know?

How many species are on Earth?

Article 6. General Measures for Conservation and Sustainable Use

What do we know about the species?





Known biodiversity knowledge

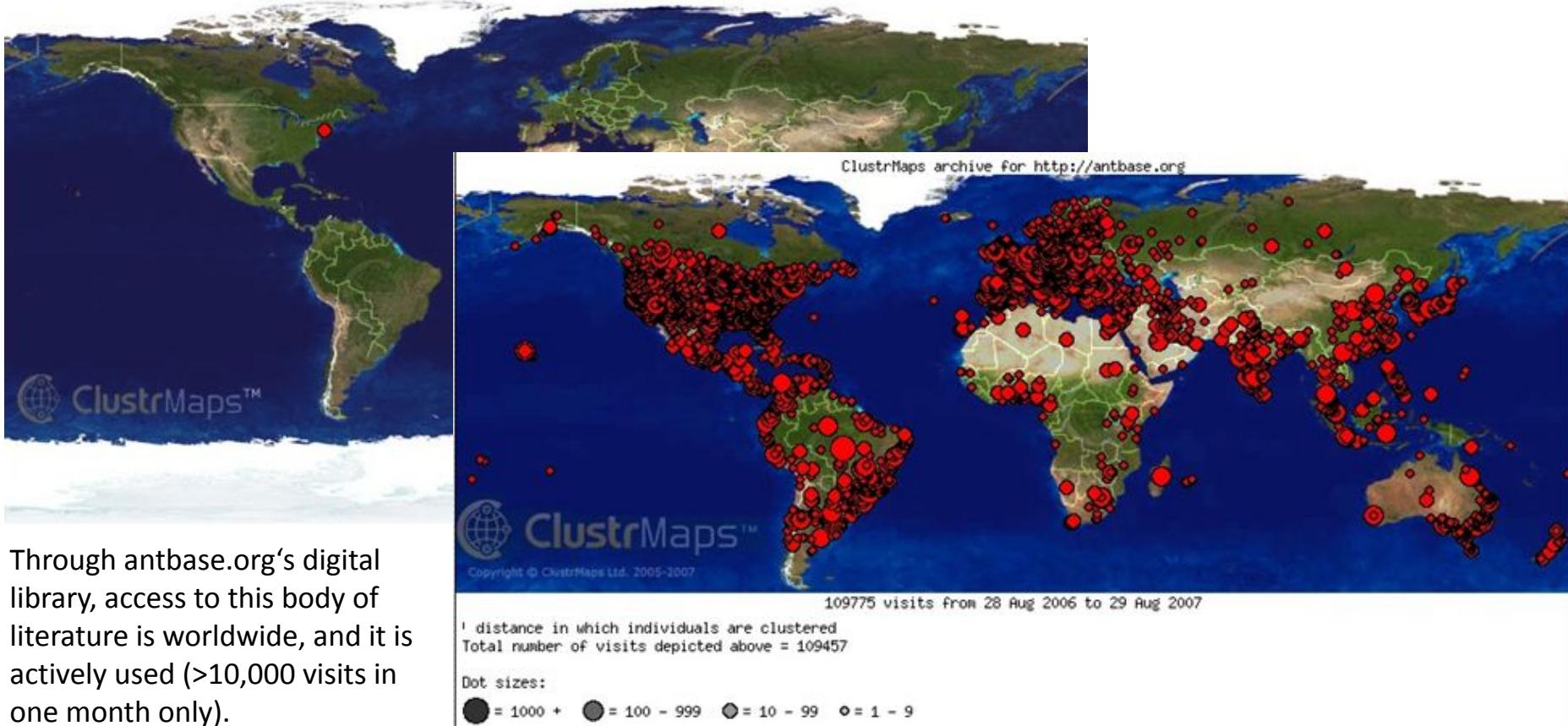
- Empiric science: all results published
- 500,000,000+ printed pages
- >> 1,000 journals publishing taxonomic content
- > 1,900,000 species described
- > 20,000,000+ taxonomic treatments
- approx. 17,000 new species discovered / year
- >> Millions of specimens identified by specialists (material citations)
- Billions of facts

BUT: only ca. 10-30% of the knowledge is digital.
Most is “unknown known knowledge”, not Digital Accessible Knowledge (DAK)



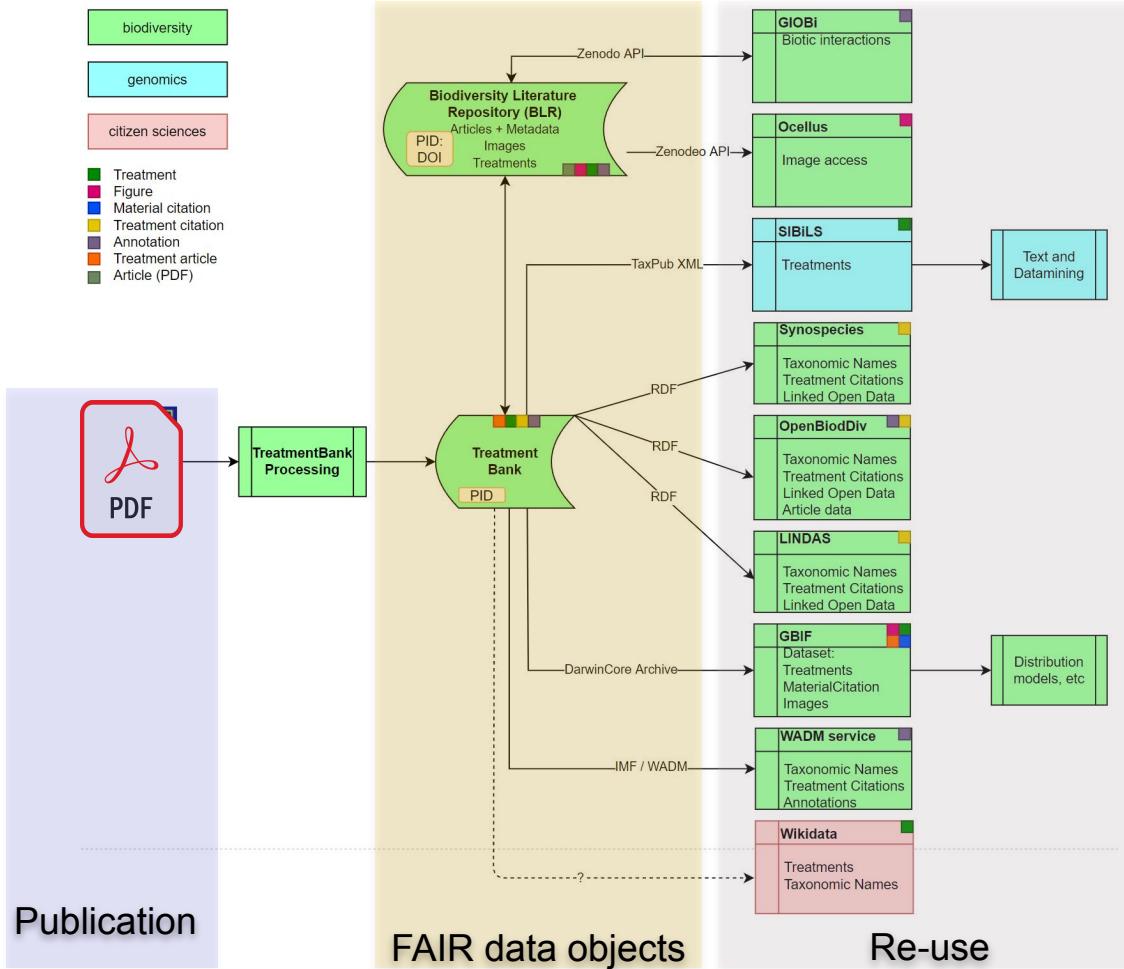
The impact of WWW in the 90ties

Before antbase.org, Harvard's Museum of Comparative Zoology could claim to be the only location with a complete set of ant systematics publications from 1758 - present.



Through antbase.org's digital library, access to this body of literature is worldwide, and it is actively used (>10,000 visits in one month only).

Re-use of scholarly publication's FAIR data





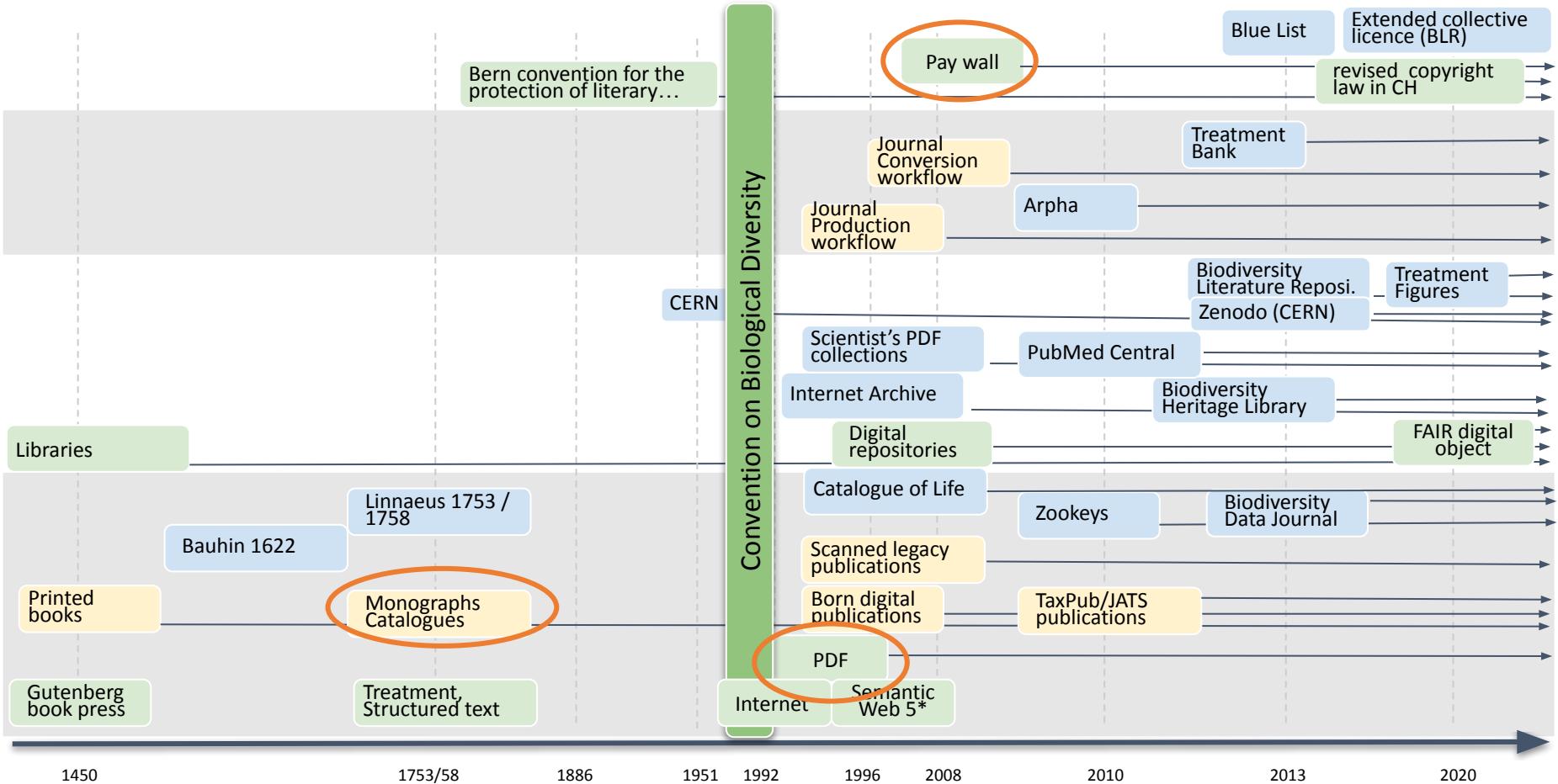
Discovering known biodiversity

Create a list of the Earth' known taxa, and related digital accessible knowledge embedded in scholarly publications as open findable, accessible, interoperable and reusable data about the Earth's species (FAIR digital objects), as input to the biodiversity knowledge graph, liberated from scholarly publications.

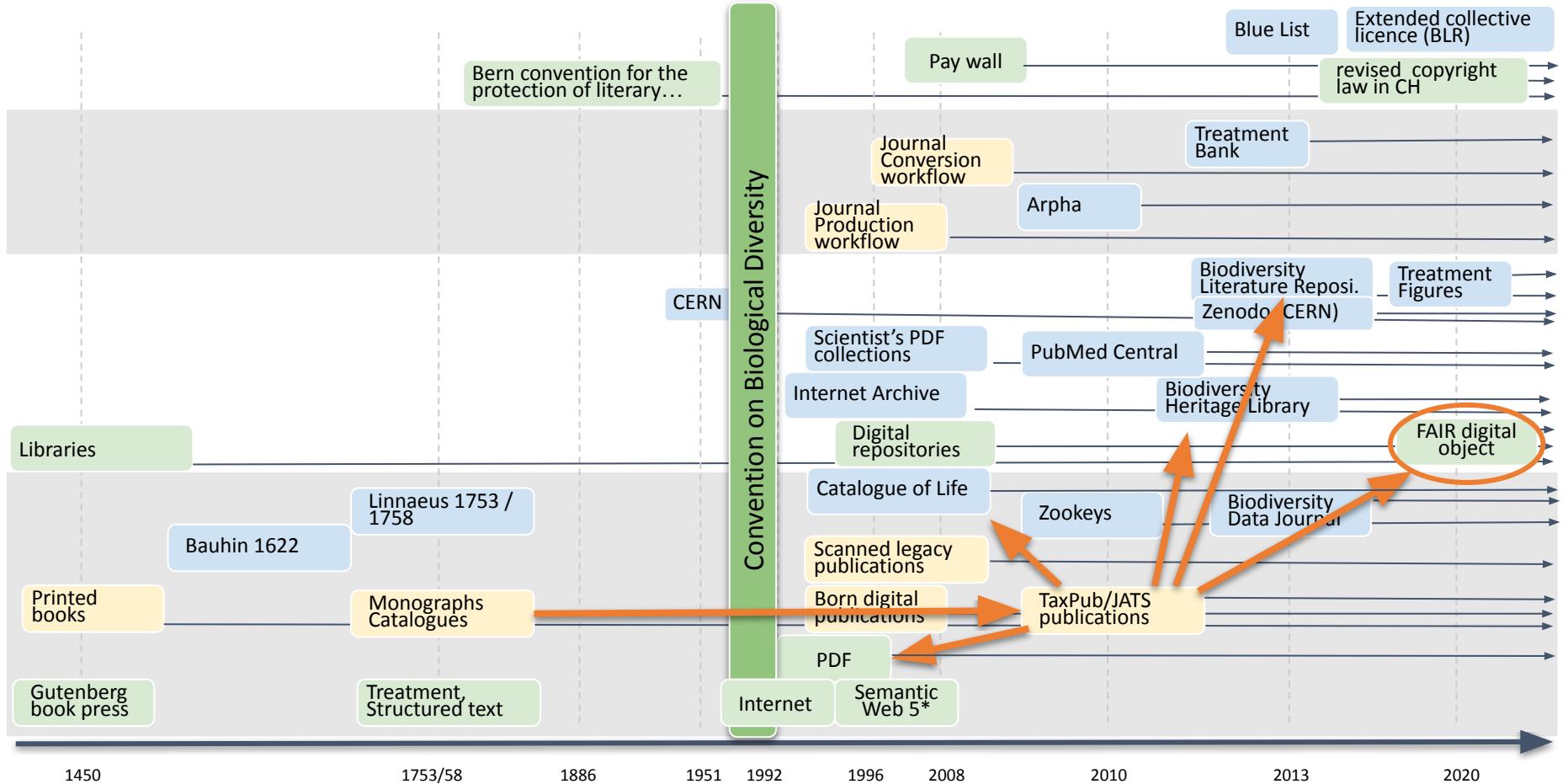
Digital accessible knowledge in biodiversity (DAK)

- Data understandable by human and actionable by machine reflecting the growth of our knowledge and interdependence of biodiversity.
- Editorial structure including textflow, paragraphs, sections such as title, authors and affiliations, materials and methods, etc., tables, figures, bibliographic references and their citations in the text.
- Semantic annotated (e.g. using TDWG standards) data at the base of the biodiversity knowledge graph:
 - data about a taxon (taxonomic treatments with their nomenclature section)
 - cited previous treatments (treatment citations)
 - cited specimens (material citations)
 - named entities (persons, taxonomic names, accession -, collection -, institution - or specimen codes)
 - attributes including their persistent identifiers

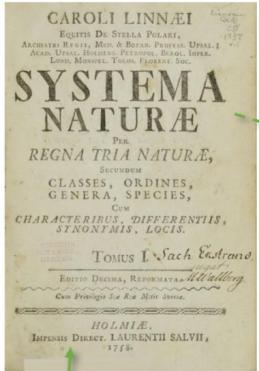
Status of publishing in 2022



Goal and future for publishing: also a reality



Digital Accessible Knowledge: Taxonomic Treatment



Linnaeus, 1758
4,819 taxa

LINNAEUS(2818) 1758
Type of
Apis mellifera L.
European honeybee

Type specimen = Standard

Natural Science Collections:

3.5 Billion objects

10 million types

2 million standards



Apis mellifera L.

Taxonomic treatment

mellifera , 17. Taxonomic name Distribution	<p>INSECTA HYMENOPTERA. Apis.</p> <p>576</p> <p>succin- 14. A. thorace flavescere subvilloso, abdomine nigro : cta. cingulis quatuor albis. <i>Habitat in Terra australibus.</i> <i>Rufrum fabulatum, cornuum, bivalve.</i></p> <p>zonata. 15. A. subpubescens fusca, abdomine cingulis quatuor carunculis. <i>M. L. U.</i> <i>Habitat in Indiis.</i></p> <p>Treatment citations</p> <p><i>Reaumur, inf. 5. t. 21. 23. f. 22. f. 1. operaria.</i> <i>f. 2. mas.</i> <i>f. 3. femina</i></p> <p><i>Swamm. bibl. t. 17. f. 1. operaria.</i> <i>Aldr. inf. 20.</i> <i>f. 3. femina.</i> <i>Jonfi. inf. 1. f. 2.</i> <i>f. 4. mas.</i> <i>Raij. inf. 240.</i></p> <p>subcincta, 16. A. pubescens, vinctore griseo, abdomine fulvo, pedi- bus undique villosis. <i>Habitat in Terra fabulosa fictiore, quam foraminibus</i> <i>pluribus parum remotis penetrant & diffinie adifi- cant plures.</i></p> <p>vittigera, 19. A. thorace abdomineque albo variegato. <i>Habitat in Europa.</i></p> <p>rostrata, 20. A. labio superiore conico inflexo, abdominis fasciis glancis repandis. <i>Fn. fvec. 999.</i> Apis pdibus maxillisque flavis spicis ni- gris, incisuris abdominis glabris margine nigri. <i>It. gal. 326.</i> <i>Habitat in Europa monticulis arenosis.</i></p> <p>manicata, 21. A. nigra, pedibus anteis hirsutissimis, ano multiden- tato, abdomine maculis flavis. <i>Habitat in Europa.</i></p> <p>4-denta, 22. A. fusca abdominis cingulis quinque albidis, ano quadri- dentato: intermedii bindis. <i>Swamm. bibl. t. 26. f. 4.</i> <i>Habitat in Europa.</i></p> <p>florifer- muis, 23. A. nigra, abdomine subcylindrico incurvo apice bi- dentato, tibis posticis apice spinosis. <i>Habitat in Europa, per noctes floribus inbaretur.</i></p> <p>24. A.</p>
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Each type has a published taxonomic treatment
Each taxonomic treatment is multiple times augmented

Tens of millions of treatments exist as part of ca 500
Million published pages of biodiversity literature
Each includes a numerous facts

Treatments as FAIR digital objects in the Biodiversity Literature Repository



The trouts of the upper Kura and Aras rivers in Turkey, with description of three new species (Teleostei: Salmonidae)

Turan, Davut, Kottele, Maurice, Kaya, Cüneyt (2022). The trouts of the upper Kura and Aras rivers in Turkey, with description of three new species (Teleostei: Salmonidae). Zootaxa 5150(1): 43–64. doi: <https://doi.org/10.11646/zootaxa.5150.1.2>

Views 1 □ Views 0 □ downloads See more details...

Part of:

Biodiversity Literature Repository

Publication date: June 8, 2022

DOI: [DOI 10.11646/zootaxa.5150.1.2](https://doi.org/10.11646/zootaxa.5150.1.2)

Keywords:

Zootaxa 5150 (1) pp. 43–64 (1).

Related identifiers:

10.5191/zootaxa.2007.16135 (Publication)

10.3897/zootaxa.471982 (Publication)

10.1111/zootaxa.2008.RLTS.T1354543416971.e (Publication)

10.1111/zootaxa.471986 (Publication)

10.3897/zootaxa.96.5214 (Publication)

10.1111/zootaxa.471987 (Publication)

10.1002/e3.3884 (Publication)

(Publication)

10.1016/j.jmpre.2021.107204 (Publication)

10.35239/zootaxa.10310 (Publication)

10.3897/zootaxa.471988 (Publication)

10.11646/zootaxa.5993.1.2 (Publication)

10.3897/zootaxa.461.8177 (Publication)

10.1002/e3.3885 (Publication)

10.3897/zootaxa.97.7218 (Publication)

Has part

10.5281/zenodo.6009583 (Economic treatment)

<http://nabire.pnat.org/do/zenodo.6009583>

10.5281/zenodo.6009574 (Economic treatment)

<http://nabire.pnat.org/do/zenodo.6009574>

10.5281/zenodo.6009570 (Economic treatment)

<http://nabire.pnat.org/do/zenodo.6009570>

10.5281/zenodo.6009576 (Economic treatment)

<http://nabire.pnat.org/do/zenodo.6009576>

10.5281/zenodo.6009445 (Figure)

<http://nabire.pnat.org/do/zenodo.6009445>

10.5281/zenodo.6009446 (Dataset)

<http://nabire.pnat.org/do/zenodo.6009446>

10.5281/zenodo.6009951 (Figure)

<http://nabire.pnat.org/do/zenodo.6009951>

10.5281/zenodo.6009952 (Figure)

<http://nabire.pnat.org/do/zenodo.6009952>

10.5281/zenodo.6009953 (Figure)

<http://nabire.pnat.org/do/zenodo.6009953>

Source of

https://zenodo.org/record/362608#.X5AqktAzb8A

Identifier: <https://zenodo.org/record/362608#.X5AqktAzb8A>

Alternative identifiers:

https://zenodo.org/record/362608#.X5AqktAzb8A

- Findable
- Accessible
- Interoperable
- Reusable

Treatment [DOI](#)
Journal article BLR [Record](#)
Article [DOI](#)



Published materials citation links

PDF
≡

Type: **Balochistan**, Zhob district, Qamardin Karez, Khutkandai, 31°31'31"N 68°14'38"E, *Nazar Khan Mandokhel*, 24 April, 2020 (RAW101342).

[https://doi.org/10.30848/PJB2021-5\(1\)](https://doi.org/10.30848/PJB2021-5(1))

Published materials citation links



Edit Attributes

materialsCitation Type: Balochistan, Zhob ... April, 2020 (RAW101342)

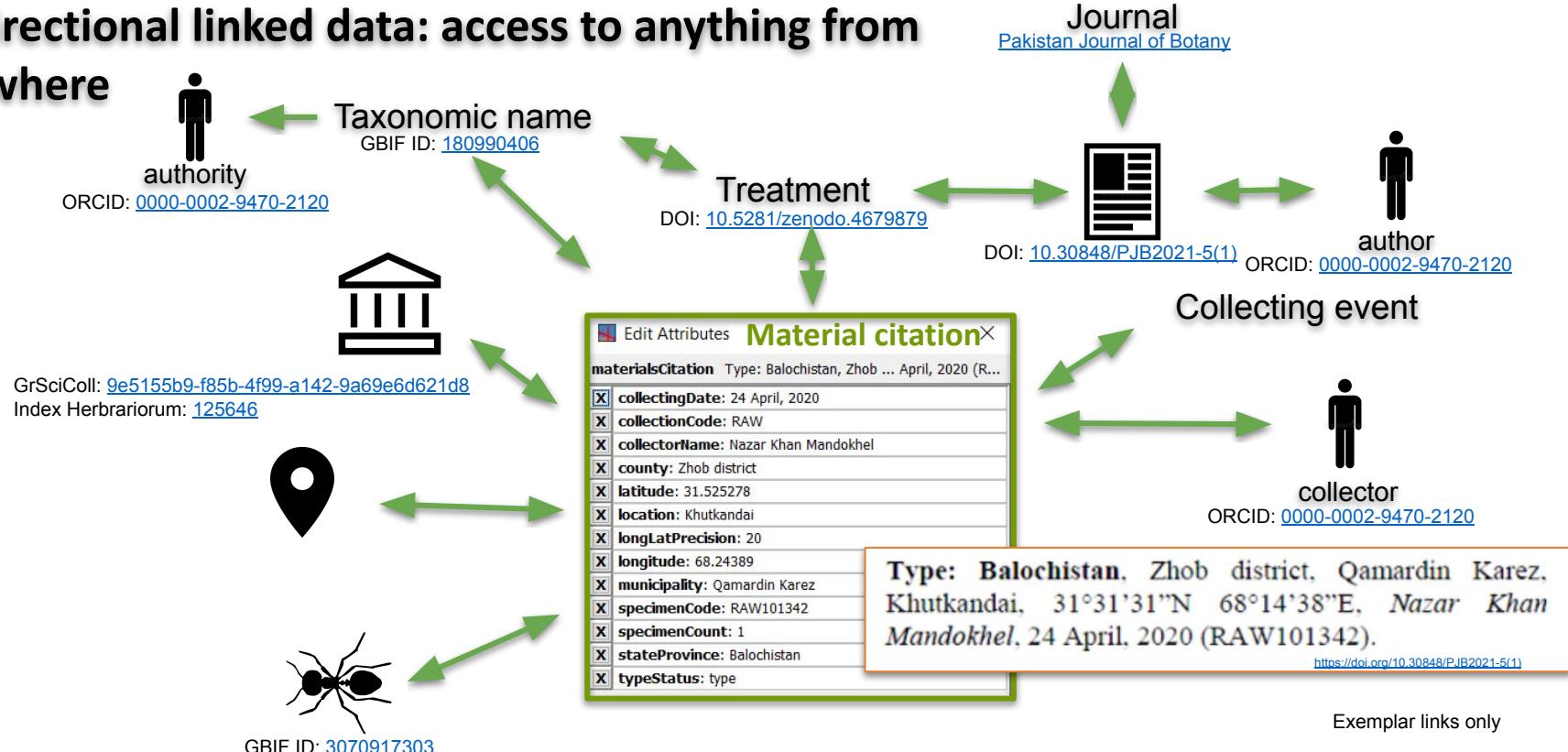
collectingDate:	24 April, 2020
collectionCode:	RAW
collectorName:	Nazar Khan Mandokhel
county:	Zhob district
latitude:	31.525278
location:	Khutkandai
longLatPrecision:	20
longitude:	68.24389
municipality:	Qamardin Karez
specimenCode:	RAW101342
specimenCount:	1
stateProvince:	Balochistan
typeStatus:	type

Type: **Balochistan**, Zhob district, Qamardin Karez, Khutkandai, 31°31'31"N 68°14'38"E, *Nazar Khan Mandokhel*, 24 April, 2020 (RAW101342).



Published materials citation links

Bi-directional linked data: access to anything from anywhere



Imagine the possible applications enabling making use of this big data?
Imagine the time saved if all these links are hyperlinks?

Reuse of taxonomic data: GBIF



A material citation is an identified specimen, linked to the respective treatment

The screenshot shows the Zenodo interface with the following details:

- Header:** zenodo, Search, Upload, Communities, Log in, Sign up.
- Date:** July 27, 2020
- Title:** Review of South African Euryphymineae
- Author:** Tshifilo, Precious (2020). Review of South African Euryphymineae. Zootaxa 4820 (1): 70-104. DOI: <https://doi.org/10.11640/zootaxa.4820.1.4>
- File Type:** PDF
- File Details:** 15 views, 0 downloads, See more details...
- Closed Access:** 0 files are not publicly accessible.
- References:** 0
- Citations:** 0 (Show only Literature (0), Dataset (0), Software (0), Unknown (0), Citations to this version)
- Published in:** Biodiversity Literature Repository
- Publication date:** July 27, 2020
- DOI:** [10.5281/zenodo.4820.1.4](https://doi.org/10.5281/zenodo.4820.1.4)
- Keywords:** Taxonomy, Arachnida, Arthropoda, Insects, Orthoptera, Heteroptera, Asteridae
- Published in:** *Zootaxa* 4820 (1): 70-104 (2020)
- Related identifiers:** Cites 10.11640/zootaxa.3753.5.1 (Publication), 10.1111/zootaxa.3196.1502270.x (Publication), 10.1080/03682929.2014.900424 (Publication), 10.1037/10401.005.20541 (Publication), 10.1080/03682929.2014.900425 (Publication), 10.1111/zootaxa.3196.1502280.x (Publication), 10.1080/03682929.2014.900426 (Publication), 10.1017/bocm.2015.023 (Publication), 10.1080/03682929.2014.900427 (Publication).
- Remarks:** This genus was erected by Dirsh (1956) on the basis of flat pronotum, narrow flagellar base, and ventral tritobite tubular plate of the female. This genus resembles *Calliphymus* by its shape of the male cercus. Its taxonomic status is not satisfactory. The SANIC collection contains a few specimens, which may be unique species.
- Published as part of:** Tshifilo, Precious. 2020. Review of South African Euryphymineae. pp. 70-104 in *Zootaxa* 4820 (1) [pages 85-86]. DOI: 10.11640/zootaxa.4820.1.4. <http://zenodo.org/record/4397915>
- Transferred from:** minimus : Dirsh 1956
- Part of:** Biodiversity Literature Repository
- See more details...**
- Log in, Sign up**
- PDF** (Large red button with a green arrow pointing to it)
- Open Access**
- 5 views, 3 downloads, See more details...**
- OpenAIR**
- Publication date:** July 27, 2020
- DOI:** [10.5281/zenodo.4397915](https://doi.org/10.5281/zenodo.4397915)
- Keywords:** Taxonomy, Arachnida, Arthropoda, Insects, Orthoptera, Heteroptera, Calymmatidae, Calymmatidae reitteri
- Published in:** Review of South African Euryphymineae, pp. 70-104 in *Zootaxa*, 4820, pp. 85-86 (1).
- Related identifiers:** Bibs 10.5281/zenodo.4397923 (Fugue), 10.5281/zenodo.4397925 (Fugue), 10.5281/zenodo.4397926 (Fugue), 10.5281/zenodo.4397924 (Fugue)

The screenshot shows a species page for *Caloptiliumoides minimus* Drish, 1956. The top navigation bar includes 'Get data', 'Home', 'Tools', 'Community', and 'About'. A green arrow points to the 'SPACES I AM PART OF' section, which lists 'SPECIES I AM ACCEPTED' (including *Caloptiliumoides minimus*) and 'PUBLICATIONS I AM RELATED TO' (including 'Published in Drish, 1956'). Below this, a green box highlights 'Little Agile Grasshopper' in English. The main content area shows a map of South Africa with numerous yellow location markers. A legend at the bottom left indicates '20 VERIFIED RECORDS'. The bottom right corner features a green button labeled 'EXPLORE AREA'.

Get Data Home Tools Community About

SOCIOECONOMIC & UNKNOWN DATA

Calliptamuloides minimus Dirsh, 1956

Little Aglae Grassopper In English (1) Collected at unknown location

Arvelidae - Arthropoda - Insecta - Orthoptera - Acridoidea - Calliptamulidae

DATASETS

Species: Calliptamuloides minimus Dirsh, 1956
Strainer: 1
Record type: Preserved specimen
Specimen type: Holotype

Datasource: Review of South African Entomophaga
Publisher: The Royal Entomological Society database
Reference: Holotype and holistic material of *Prosternon fuscum* Tillyard.

Coordinates missing
There is no location information published for this record.

Record
Type
Interpreted
Basis of record
Preserved specimen

Remarks

Guarantee
Terms
Individual record
Documentation ID
Documentation status
Reviewed by

Identification
Title
Type status

Remarks

Taxa
Terms
Heteronym
Phylum
Class
Order

Orthoptera

Orthoptera

Holotype



BF7932511F1084465093
BF19325093730EFT1056
296
See
Remarks

BF7932511F1084465093
BF19325093730EFT1056
296
See
Remarks

Get data Howev Tools Community About DOCUMENTS | 2299999 Calliptamuloides minimus Dirsh, 1956 List of Afrotropical Insects Collected in South Africa Authorship: Arribalzaga, Inaki; Otero, Oscar; Azevedo, Leidiane

DETAILS

Species: Calliptamuloides minimus Dirsh, 1956
Locality: South Africa
Basic name: Specimen specimen
Type locality: South African Zoological Society
Publisher: Research Institute of South African Zoology
Reference: https://doi.org/10.5281/zenodo.4500161

Type: Balochistan, Zhob district, Qamardin Karez, Khukandai. 31°31'31"N 68°14'38"E, Nazar Khan Mandokhel, 24 April, 2020 (RAW101342).

Occurrence = materials citation

GBIF species: <https://www.gbif.org/species/1703942>

GBIF occurrence: <https://www.gbif.org/occurrence/3015409563>

BLR Taxonomic treatment: <https://doi.org/10.5281/zenodo.4397319>

BLR Article: <https://zenodo.org/record/4397315>

PDF: <https://doi.org/10.11646/zootaxa.4820.1.4>

Details about a taxonomic name and link to justification



ChecklistBank

Eight new species and additional records of the Pselaphodes complex from Laos and Vietnam, with a key to known species

Labomimus cavicornis Yin & Li, 2021

[Name details](#) [Login](#)

About Verbatim

Published in Yin, Zi-Wei, Li, Ning (2021): Eight new species and additional records of the Pselaphodes complex from Laos and Vietnam, with a key to known species (Coleoptera: Staphylinidae: Pselaphinae). Acta Entomologica Musei Nationalis Pragae (Acta. Ent. Mus. Natl. Prague) 61 (1): 35-63, DOI: 10.3752/aemnp.2021.002, URL: <http://dx.doi.org/10.3752/aemnp.2021.002>

Type material paratypes: VIETNAM: DÔNG NAI: 5 ♂♂, same label data as for holotype (MHNG, SNUC)

Links: GBIF

holotype: HOLOTYPE: VIETNAM: DÔNG NAI: ♂, 'S-VIETNAM, Nam Cat Tien Nat. Park, 1. - 15.5.1994, Pacholatko & Dembicky' (MHNG)

Links: GBIF

Status accepted species

Classification kingdom: Animalia > phylum: Arthropoda > class: Insecta > order: Coleoptera > family: Staphylinidae > genus: Labomimus 3 species: **Labomimus cavicornis** Yin & Li, 2021

Media

Fig. 1. Dorsal habits of *Labomimus* males. A–L: *cavicornis* sp. nov.; B–L: *cupifluong* sp. nov. Scale bars: 1 mm. © Yin, Zi-Wei/Li, Ning <https://doi.org/10.5281/zenodo.5037466>

Fig. 2. Male diagnostic features of *Labomimus cavicornis* sp. nov.: A – left antennal club, in lateroventral view; B – pronotum; C – metaventral process, in lateral view; D – proctrochite and profemur; E – apex of profibia; F – mesotrochanter and mesofemur; G – metatrochanter and metafemur; H – sternite 7 (IX); I–K – aedeagus, in dorsal (I), lateral (J), and ventral (K) views. Scale bars: 0.3 mm in A, B, D, F; 0.1 mm in C, I, J, K; 0.1 mm in H; 0.05 mm in E. © Yin, Zi-Wei/Li, Ning <https://doi.org/10.5281/zenodo.5037470>

Online resource <https://treatment.plazi.org/id/03D13B6DE802513E7F4BFA6A3BEDFB12>

Related names

Origin source

References

[1] Yin, Zi-Wei, Li, Ning (2021): Eight new species and additional records of the Pselaphodes complex from Laos and Vietnam, with a key to known species (Coleoptera: Staphylinidae: Pselaphinae). Acta Entomologica Musei Nationalis Pragae (Acta. Ent. Mus. Natl. Prague) 61 (1): 35-63, DOI: 10.3752/aemnp.2021.002, URL: <http://dx.doi.org/10.3752/aemnp.2021.002>

<https://www.checklistbank.org/dataset/55892/taxon/03D13B6DE802513E7F4BFA6A3BEDFB12.taxon>

TreatmentBank

TREATMENTBANK **BIODIVERSITY LITERATURE REPOSITORY** **SERVICES** **HOW TO PARTIC**

Labomimus cavicornis, Yin & Li, 2021

Yin, Zi-Wei & Li, Ning, 2021, Eight new species and additional records of the Pselaphodes complex from Laos and Vietnam, with a key to known species (Coleoptera: Staphylinidae: Pselaphinae). *Acta Entomologica Musei Nationalis Pragae (Acta. Ent. Mus. Natl. Prague)* 61 (1), pp. 35-63 : 37

publication ID <https://doi.org/10.3752/aemnp.2021.002>

publication LSID [lsid:zobank.org/pub/0AECCDF1-C71-4636-89A7-DA31D2DB73D6](https://zobank.org/pub/0AECCDF1-C71-4636-89A7-DA31D2DB73D6)

DOI <https://doi.org/10.5281/zenodo.5037454>

persistent identifier <https://treatment.plazi.org/id/03D13B6D-E802-513E-7F4B-FA6A3BEDFB12>

treatment provided by Carolina (2021-06-28 18:05:09, last updated 2022-09-06 20:59:21)

scientific name *Labomimus cavicornis*

status sp. nov.

Show all

Treatment

Labomimus cavicornis sp. nov.

(Figs 1 A [View Fig](#) , 2 [View Fig](#))

Type material (6 specimens). HOLOTYPE: VIETNAM: DÔNG NAI: ♂, 'S-VIETNAM, Nam Cat Tien Nat. Park, 1. - 15.5.1994, Pacholatko & Dembicky' (MHNG). PARATYPES: VIETNAM: DÔNG NAI: 5 ♂♂, same label data as for holotype (MHNG, SNUC).

Diagnosis. Male body length 3.09–3.23 mm. Antennomere 9 with broad depression in apical half, with disc-like impression inside depression; antennomeres 10 broadly depressed and antennomere 11 deeply concave on ventral side. Horn-like metaventral processes in lateral view elongate and bifurcate at apices. Protribia with short, blunt preapical projection; mesotrochanter with acute ventral spine. Median lobe of aedeagus asymmetric, narrowing apically; parameres broad at bases and narrowed in apical halves; endophallus with spine-like structures and one elongate sclerite. Female unknown.

Description. Male (Fig. 1 A [View Fig](#)). Body length 3.09–3.23 mm. Head slightly broader than long, HL 0.56–0.61 mm, HW 0.59–0.63 mm; eyes prominent, each composed of about 41 facets. Antennomeres 2–8 of similar shape, each moniliform; antennomeres 9–11 (Fig. 2 A [View Fig](#)) forming distinct club; antennomere 9 with large depression in apical half, and one disc-like impression inside depression; antennomeres 10 broadly depressed and antennomeres 11 with

<https://tb.plazi.org/GgServer/html/03D13B6DE802513E7F4BFA6A3BEDFB12>



Treatment citation: Catalogue of life



PLAZI
TAKING CARE OF FREEDOM

Home Advanced About Settings view beta

SynoSpecies

Input Genus and species here: Kiotina spatulata Look up

Kiotina spatulata Wu, 1948
Hemacroneuria spatulata Li, 2019
Hemacroneuria spatulata Wu, 1948

2019 2021

Kiotina spatulata Wu, 1948

Defining treatment not yet on Plazi

Augmenting Treatments:

- Du, Yu-Zhou; Zhu, Bin-Qing; Huo, Qing-bo (2021) 3D6DA32CFFA5B65124F7FB445E7F8F50
Deprecates Hemacroneuria spatulata Li, 2019

Deprecating Treatments:

- Murányi, Dávid; Li, Wei-hai; Mo, Raorao (2019) 0384001F4228D396287FB84FB04FA8E
Deprecated by Hemacroneuria spatulata Li, 2019

Hemacroneuria spatulata

Defining treatment not yet on Plazi

Deprecating Treatments:

- Huo, Qing-bo; Zhu, Bin-Q
Deprecated by Kiotina spatulata Wu, 1948

Hemacroneuria spatulata

Defining Treatments:

- Murányi, Dávid; Li, Wei-hai
Deprecated Kiotina spatulata Wu, 1948

Currently accepted name

Synonymized taxonomic name

Original name or new combination

Kiotina spatulata: Wu 1948: 148 . Holotype male: Sichuan, China.

Treatment Citations

Hemacroneuria spatulata: Li et al. 2019: 354 View Cited Treatment Combination.

Remarks: The original description and illustrations of Wu (1948) show that this species has large paraprocts and paired sensilla basiconica patches on the male 10th tergum. However, these characteristics are not unique to **Hemacroneuria** and also exist in the genus **Sinacroneuria** . In

Family Perlidae
Genus Hemacroneuria
Species spatulata

Wikidata Resource: <http://www.wikidata.org/entity/Q6387012>

- Taxon Name Kiotina spatulata
- Is subject of: https://ca.wikipedia.org/wiki/Kiotina_spatulata
- Is subject of: https://ceb.wikipedia.org/wiki/Kiotina_spatulata
- Is subject of: https://nl.wikipedia.org/wiki/Kiotina_spatulata

<https://synospecies.plazi.org/#Kiotina+spatulata>

Open access to FAIR data: A visual index to taxonomic publications



Beyond PDF...

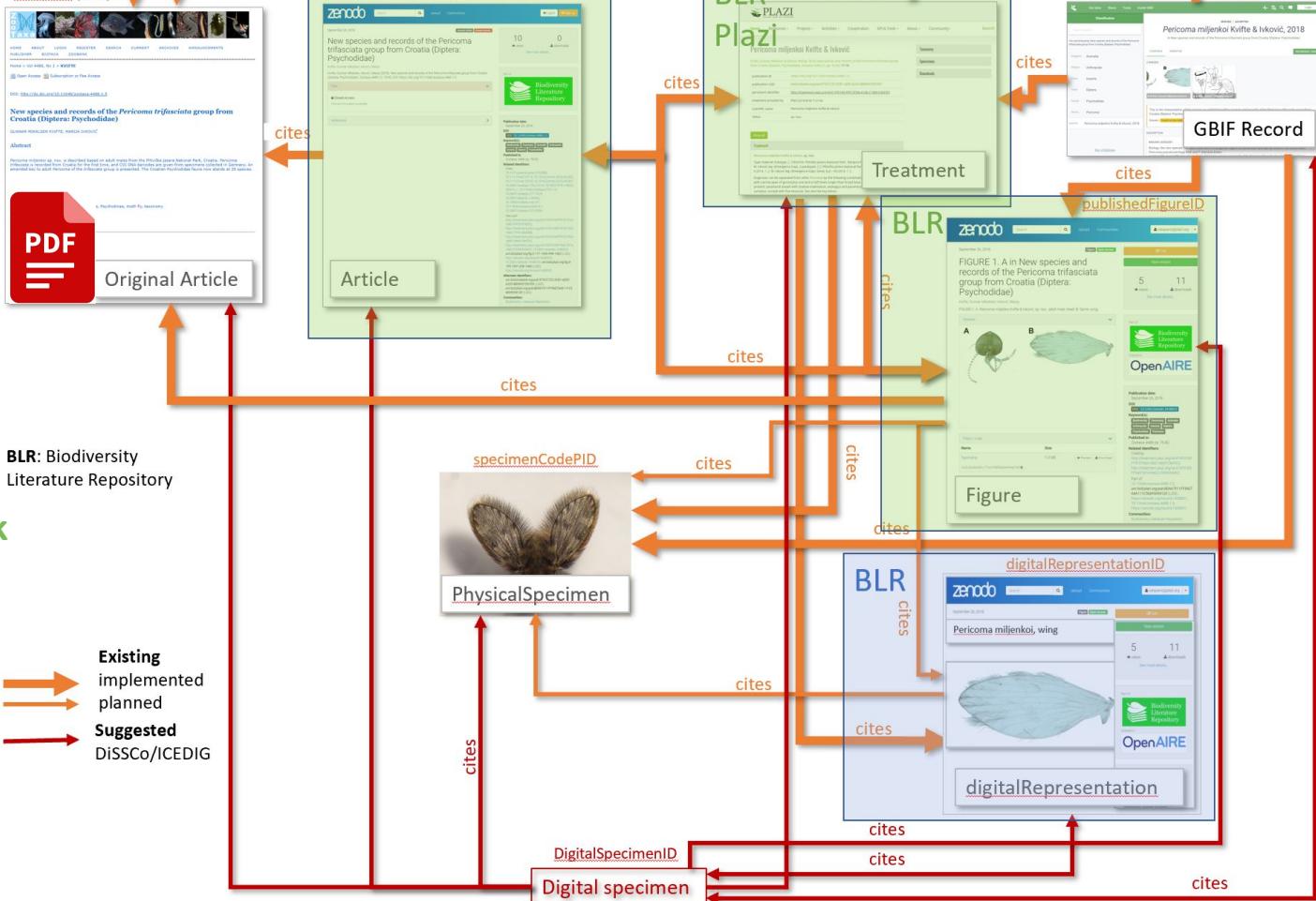
<https://ocellus.info/>



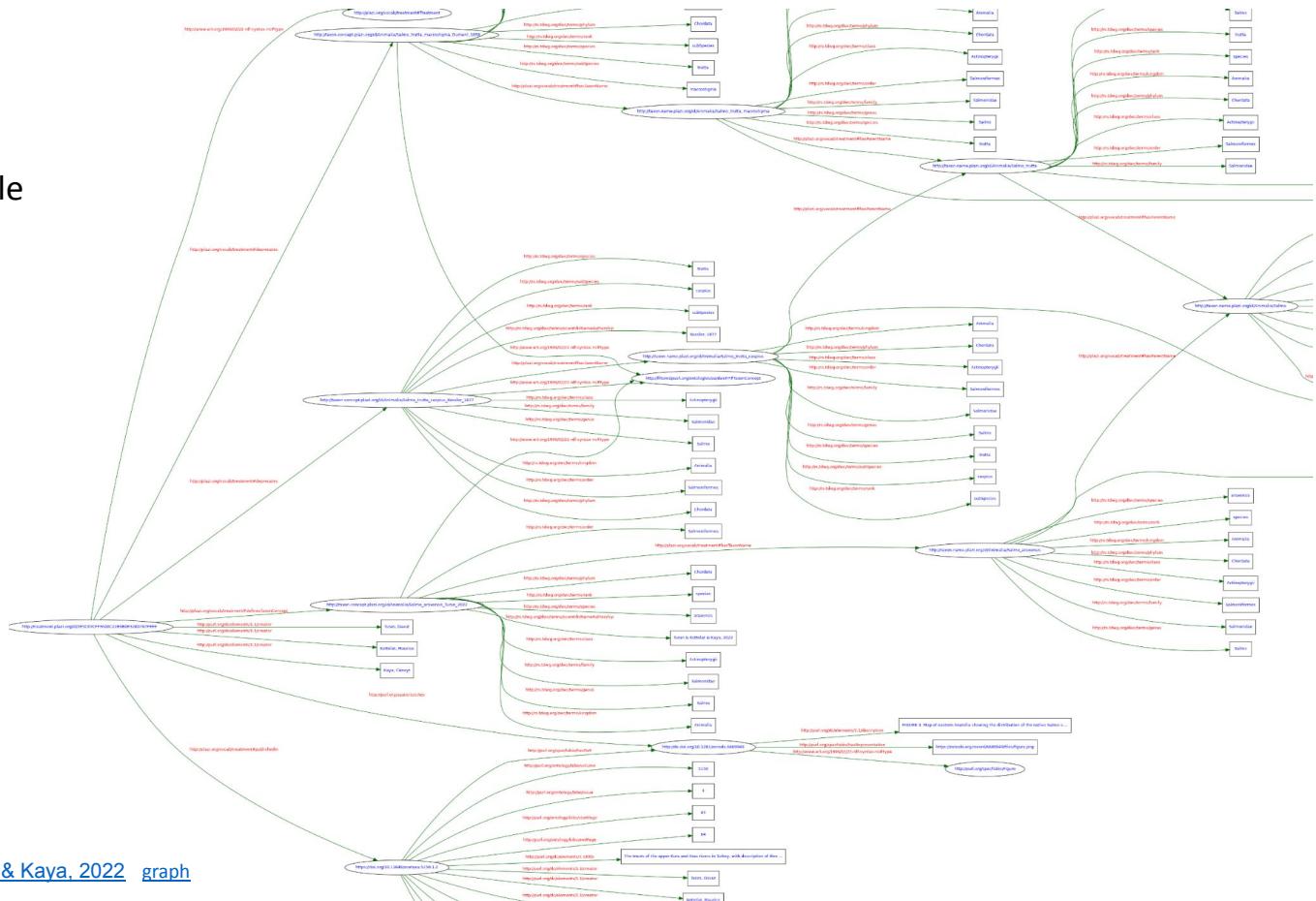
Focus on data in publications: What's inside? Citation network

BLR: Biodiversity
Literature Repository

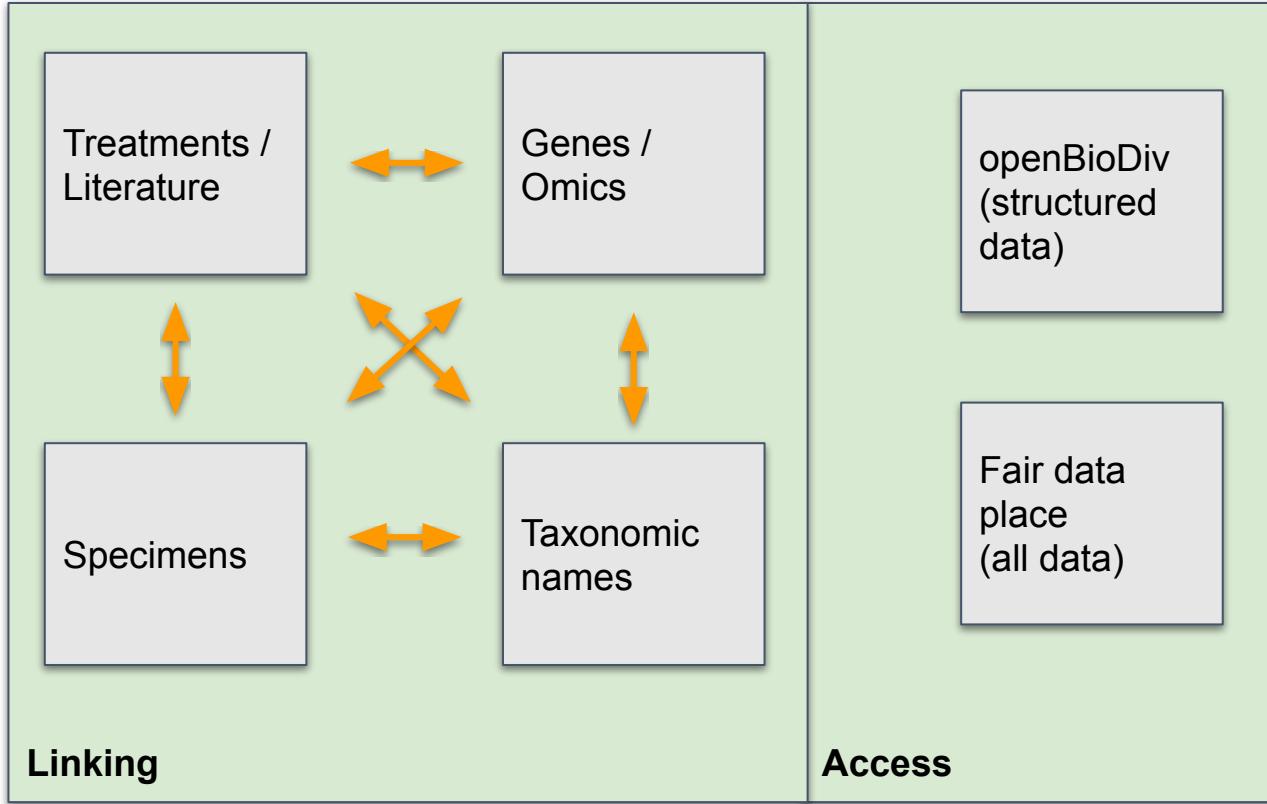
- Existing implemented planned
- Suggested DISSCo/ICEDIG



Treatments as FAIR digital objects in the Biodiversity Literature Repository



Visualization of the knowledge graph of a single treatment (part)



Linking specimens and literature via material citations



Bidirectional linking

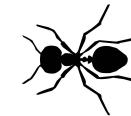
material citations

specimens / occurrences

Edit Attributes

materialCitation Type: Balochistan, Zhob ... April, 2020 (R...)

X	collectingDate: 24 April, 2020
X	collectionCode: RAW
X	collectorName: Nazar Khan Mandokhel
X	country: Zhob district
X	latitude: 31.525278
X	location: Khutkandai
X	longLatPrecision: 20
X	longitude: 68.24389
X	municipality: Qamardin Karez
X	specimenCode: RAW101342
X	specimenCount: 1
X	stateProvince: Balochistan
X	typeStatus: type



Type: **Balochistan**, Zhob district, Qamardin Karez, Khutkandai, 31°31'31"N 68°14'38"E. *Nazar Khan Mandokhel*, 24 April, 2020 (RAW101342).

Linking specimens with material citations via GBIF



Preserved specimen

Caracladus zamoniensis Frick & Muff, 2009
Collected in Switzerland
Dataset: NMBE - Arachnological collection
Publisher: Naturhistorisches Museum Bern - NMBe
Species: Caracladus zamoniensis Frick & Muff, 2009
Location: Switzerland
Elevation: 1960m
Basis of record: Preserved specimen
Specimen type: Paratype

Map showing location in the Alps, spanning from Luxembourg to Italy.

Record

Term	Interpreted	Original	Remarks
Basis of record	Preserved specimen	PreservedSpecimen	
Dataset ID	NMBe-AR	NMBe-AR	
Dataset name	NMBe - Arachnological collection	NMBe - Arachnological collection	
Institution code	NMBe	Naturhistorisches Museum der Universität Basel	
Institution ID	08cc0d76-4a0c-4023-ab55-7a7c4295e93	08cc0d76-4a0c-4023-ab55-7a7c4295e93	Naturhistorisches Museum der Universität Basel
Owner institution code	NMBe	NMBe	

Occurrence

Term	Interpreted	Original	Remarks
Catalogue number	NMBe-AR-6742	NMBe-AR-6742	
Individual count	7	7	
Occurrence ID	NMBe-AR-6742	NMBe-AR-6742	
Occurrence status	PRES	Present	
Recorded by	Frick, Muff, Klopstein	Frick, Muff, Klopstein	
Sex	3M+4F	Excluded	

eBioDiv

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Linking material citations to specimens

Specimens for the material citation 3012376301

Key	Family	Genus	Specific epithet	Latitude/Longitude	Elevation	Locality	Country	Date	Coll code	Catalog nb	Individual nb	Collector (recorded by)
3012376301	Uniphilidae	Caracladus	zamoniensis	46.5163/9.646111	1960	Alp Flix	Switzerland	24/10/2007	NMBe	AR6742	7	H. Frick & P. Muff & S. Klopstein
3712202810	Uniphilidae	Caracladus	zamoniensis	46.5163/9.64607	1960	Sur Alp Flix, Salatagras, Umgebung	Switzerland	24/10/2007	NMBe AR	6742	7	Frick, Muff, Klopstein
3712202847	Uniphilidae	Caracladus	zamoniensis	46.5163/9.64607	1960	Sur Alp Flix, Salatagras, Umgebung	Switzerland	08/05/2008	NMBe AR	6736	1	Patrick Muff
3712202848	Uniphilidae	Caracladus	zamoniensis	46.5163/9.64607	1960	Sur Alp Flix, Salatagras, Umgebung	Switzerland	16/10/2005	NMBe AR	6735	1	Patrick Muff

3 specimens to curate

Key	Family	Genus	Specific epithet	Latitude/Longitude	Elevation	Locality	Country	Date	Coll code	Catalog nb	Individual nb	Collector (recorded by)	Yes	No	Save
3712202810	Uniphilidae	Caracladus	zamoniensis	46.5163/9.64607	1960	Sur Alp Flix, Salatagras, Umgebung	Switzerland	24/10/2007	NMBe AR	6742	7	Frick, Muff, Klopstein	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3712202847	Uniphilidae	Caracladus	zamoniensis	46.5163/9.64607	1960	Sur Alp Flix, Salatagras, Umgebung	Switzerland	08/05/2008	NMBe AR	6736	1	Patrick Muff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3712202848	Uniphilidae	Caracladus	zamoniensis	46.5163/9.64607	1960	Sur Alp Flix, Salatagras, Umgebung	Switzerland	16/10/2005	NMBe AR	6735	1	Patrick Muff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Back to list Save

eBioDiv GBIF PLAZA SIB Hes-SO SIBLS

link

Material citation

Occurrence | 24 OCTOBER 2007

Caracladus zamoniensis Frick & Muff, 2009
Collected in Switzerland
Dataset: Revision of the genus Caracladus with the description of Caracladus zamoniensis Frick & Muff, 2009
Publisher: Plantarum taxonomic treatments database
Species: Caracladus zamoniensis Frick & Muff, 2009
Location: Switzerland
Elevation: 1960m
Basis of record: Preserved specimen
Specimen type: Paratype

Map showing location in the Alps, spanning from Luxembourg to Italy.

Record

Term	Interpreted	Original	Remarks
Basis of record	Preserved specimen	PreservedSpecimen	
Collection code	NMBe	NMBe	

Occurrence

Term	Interpreted	Original	Remarks
Catalogue number	AIR/42	AIR/42	
Individual count	7	7	
Occurrence ID	FRIES10397087-001-001-C497-A09	FRIES10397087-001-001-C497-A09	
Occurrence status	PRES	Present	
Recorded by	H. Frick & P. Muff & S. Klopstein	H. Frick & P. Muff & S. Klopstein	
Sex	MALE	male	

Event

Term	Interpreted	Original	Remarks
Day	24	inferred	
Month	10	inferred	
Year	2007	inferred	
Event date	2007-10-24T00:00:00	2007-10-24	

Identification

Linking specimens with material citations via GBIF; Clusters



Screenshot of a GBIF occurrence page showing five related records for *Caracladus zamonensis*.

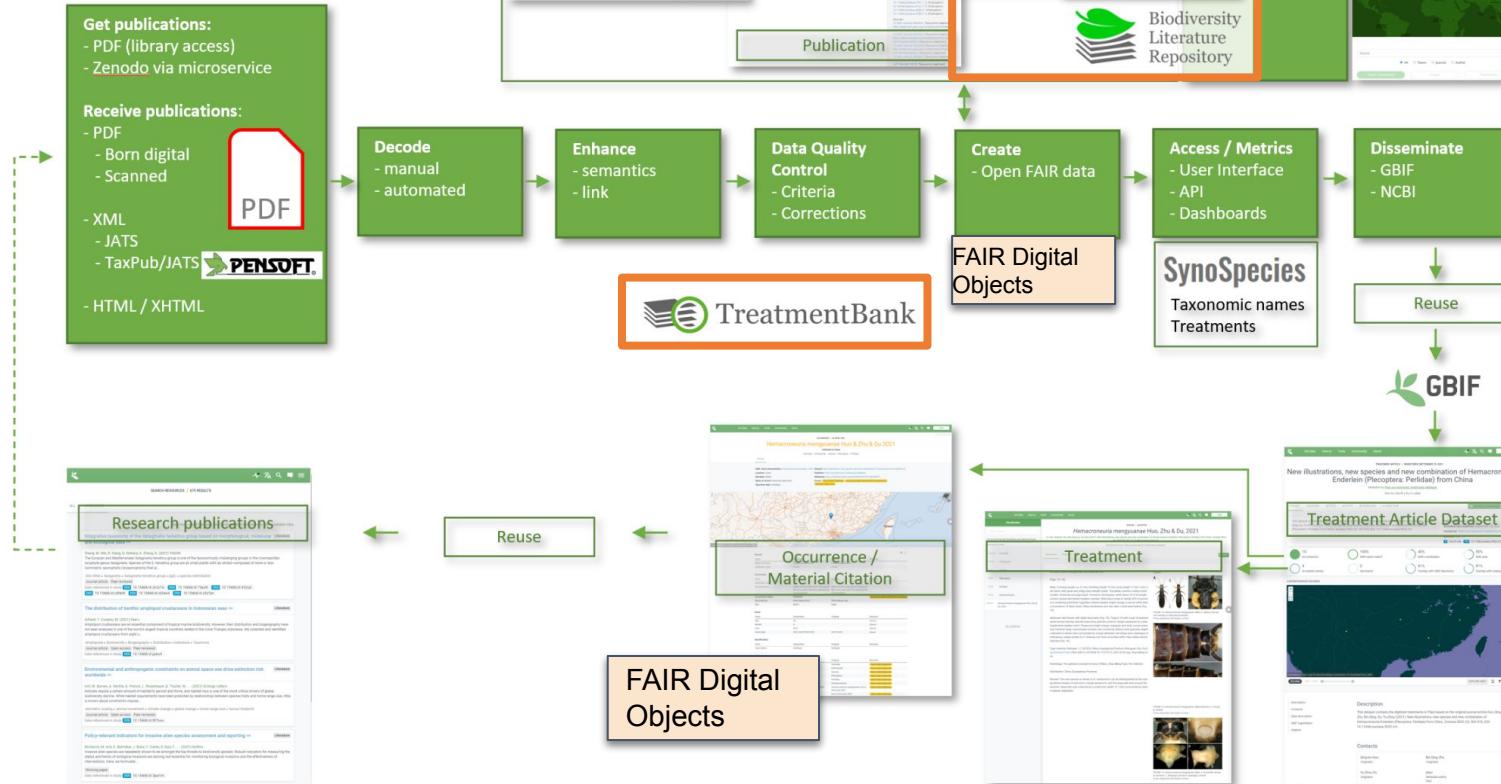
The records are:

- CURRENT:** *Caracladus zamonensis* Frick & Muff, 2009 (Paratype). Collected in Switzerland on October 24, 2007 at 46.5N, 9.6E.
- RELATED OCCURRENCES:** Three additional records for the same species and date, located at the same coordinates (46.5N, 9.6E). These are labeled as "Paratype".
- REVISION:** A record from 2007 describing a revision of the genus *Caracladus*, mentioning the description of *Caracladus zamonensis* spec. nov. (Araneae, Linyphiidae).
- TREATMENT:** A record from 2005 describing a treatment of the genus *Caracladus*, mentioning the description of *Caracladus zamonensis* spec. nov. (Araneae, Linyphiidae).

Preserved specimen

Material citation

Plazi workflow

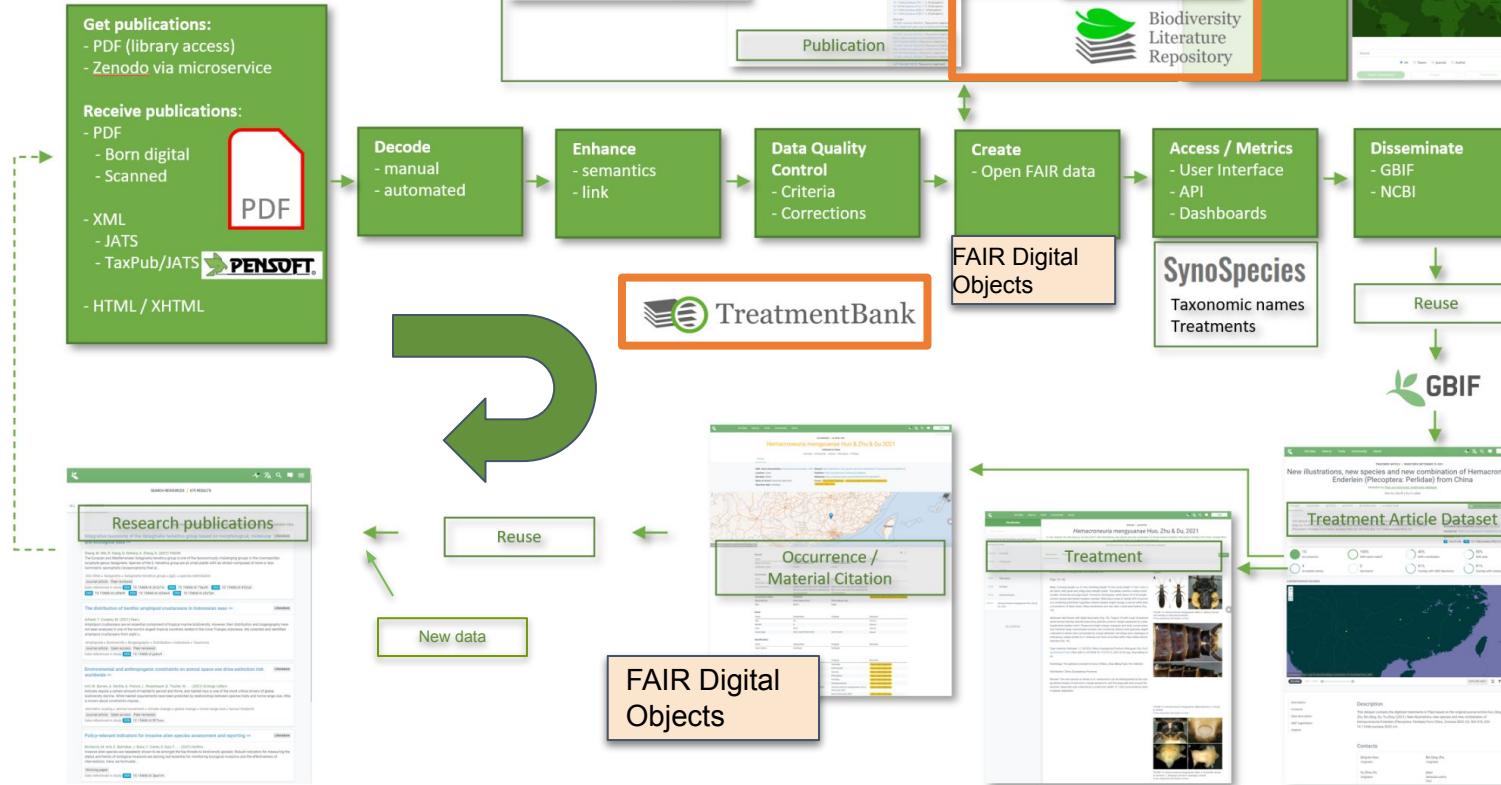




 PENSOFT

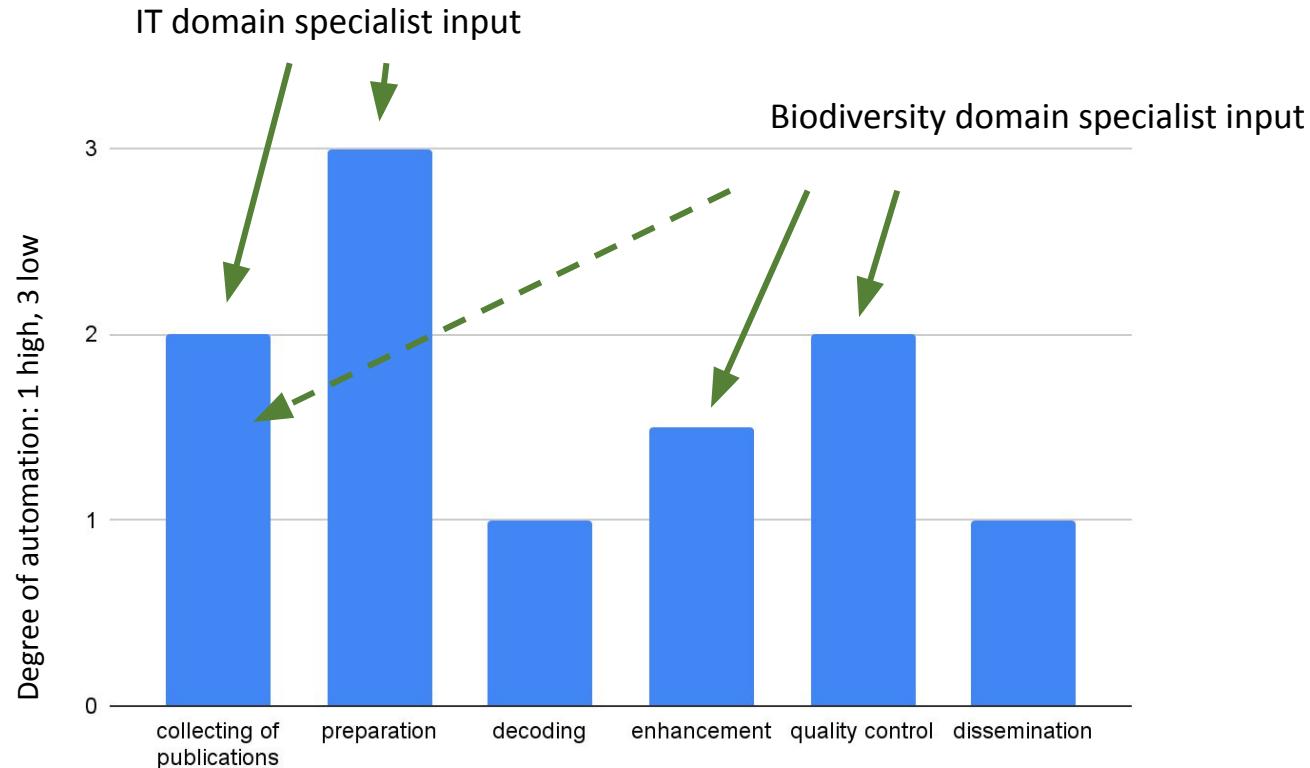


Research Data Life Cycle





Degree of automation / human input



This is a very expensive effort, has to be shared by partners avoiding duplications as much as possible, and needs be avoided by changing the way we publish.



Infrastructures maintained by Plazi

TreatmentBank



Data conversion and access service
73,000 articles
762,000 taxonomic treatments
1,118,000 materials citations
>50% of annually described new species
production in 2021: 25,000 articles, 224,000 treatments, 180,000 images

Biodiversity Literature Repository



Repository for data liberated from publications
453,000 images
72,000 articles
400,000 taxonomic treatments
Collaboration with Zenodo /CERN
Recognized as EU research infrastructure
Mints DOI for treatments and figures

Global Biodiversity Information Facility

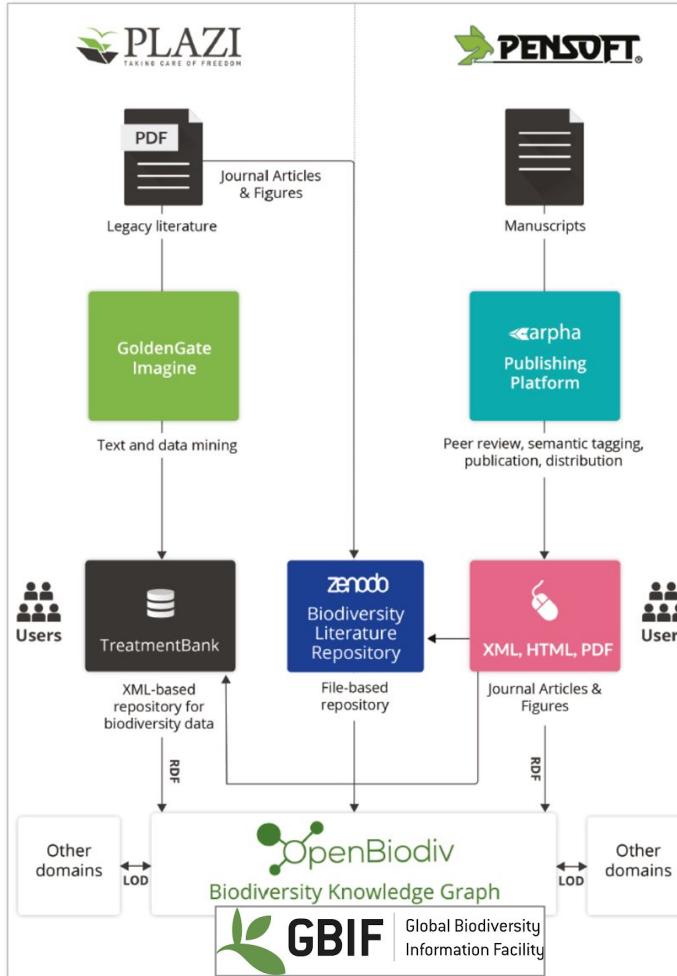


Reuse of treatment articles mediated by Plazi
41,000 treatment article data sets (54% of total data sets in GBIF)
377,000 taxonomic treatments (90,000 unique species)
224,000 figures
632,000 materials citations (occurrences)
The figures are lower in GBIF because of Quality Control measures
800 publications site data from TreatmentBank mediated literature

The future will be open, semantically enhanced publishing



Legacy publications



Prospective publishing



Thank you!

Questions, answers, participation <https://github.com/plazi/community>

Introduction to digitizing taxonomic literature with Plazi [DOI](#)

Donat Agosti

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swissuniversitäten



datafutures



SIBS
SWISS INSTITUTE OF BIOINFORMATICS
LITERATURE SERVICES



Biodiversity
Literature
Repository



TreatmentBank



Further reading:

- Plazi: [further reading](#)
- Pensoft: doi: [10.3897/zookeys.50.543](https://doi.org/10.3897/zookeys.50.543) (e.g. Zookeys, BDJ)
- CETAf: doi: [10.5252/adansonia2018v40a1](https://doi.org/10.5252/adansonia2018v40a1) (e.g. European Journal of Taxonomy)

Data usage:

- Rivera-Quiroz et al. 2020, doi: [10.1038/s41598-020-72549-8](https://doi.org/10.1038/s41598-020-72549-8)
- Dikow & Agosti, 2015, doi: [10.3897/BDJ.3.e5707](https://doi.org/10.3897/BDJ.3.e5707)

Data access:

- Brief introduction into Treatmentbank stats: [PDF](#)
- Treatment statistics: <https://tb.plazi.org/GgServer/srsStats>
- Article statistics: <https://tb.plazi.org/GgServer/dioStats>
- Biodiversity Literature Repository API introduction: <https://developers.zenodo.org/>
- Biodiversity Literature Repository: <https://zenodo.org/communities/biosyslit/search?q=>

Applications based on and reuse of TreatmentBank and BLR data:

- Images via Ocellus: <https://ocellus.info/>
- Treatment citations via Synospecies: <https://synospecies.plazi.org/>
- TreatmentBank data in GBIF: <https://www.gbif.org/publisher/7ce8aef0-9e92-11dc-8738-b8a03c50a862>



[Plazi](#) is a Swiss based international association supporting and promoting the development of persistent and openly accessible scholarly digital taxonomic publications

NGO, SME owned by the NGO; Founded in 2008 as spin-off from a former US/DFG binational digital library award (2003-06); Supported by service contracts, EU-research funding, philanthropic funds, voluntary contributions. Plazi GmbH SME as service provider.

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Support from Arcadia Fund, EU projects, service contracts, and voluntary contributions.

A mission of Plazi is to **discover, make accessible, and disseminate known biodiversity data**, not publications *per se* and to promote semantic enhanced publishing (TaxPub/JATS).