From liberating imprisoned data in publications to publishing linked open data

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Swiss Research Data Day 2018, 12 June 2018, Zürich

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How many species are on planet Earth?

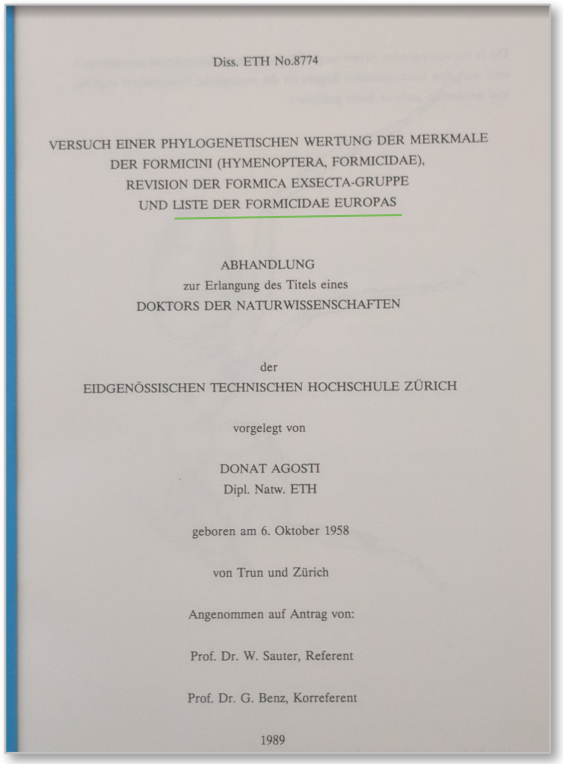
1989 How many ants in Europe?
1992 Rio Earth Summit: How many species on planet Earth?
2002 Online catalogue of the ants of world
2018 Half Earth: how many species?

A scientific challenge as well as a crucial question for a sustainable life on planet Earth.

We depend on biodiversity.

We depend on the understanding of species and its traits.

We don't know how many species there are.
We don't know, how many we know.



Diss. ETH No.8774

VERSUCH EINER PHYLOGENETISCHEN WERTUNG DER MERKMALE DER FORMICINI (HYMENOPTERA, FORMICIDAE), REVISION DER FORMICA EXSECTA-GRUPPE UND LISTE DER FORMICIDAE EUROPAS

ABHANDLUNG
zur Erlangung des Titels eines
DOKTORS DER NATURWISSENSCHAFTEN

der
EIDGENÖSSISCHEN TECHNISCHEN HOCHSCHULE ZÜRICH

vorgelegt von

DONAT AGOSTI
Dipl. Natw. ETH

geboren am 6. Oktober 1958

von Trun und Zürich

Angenommen auf Antrag von:

Prof. Dr. W. Sauter, Referent

Prof. Dr. G. Benz, Korreferent

1989

The challenge

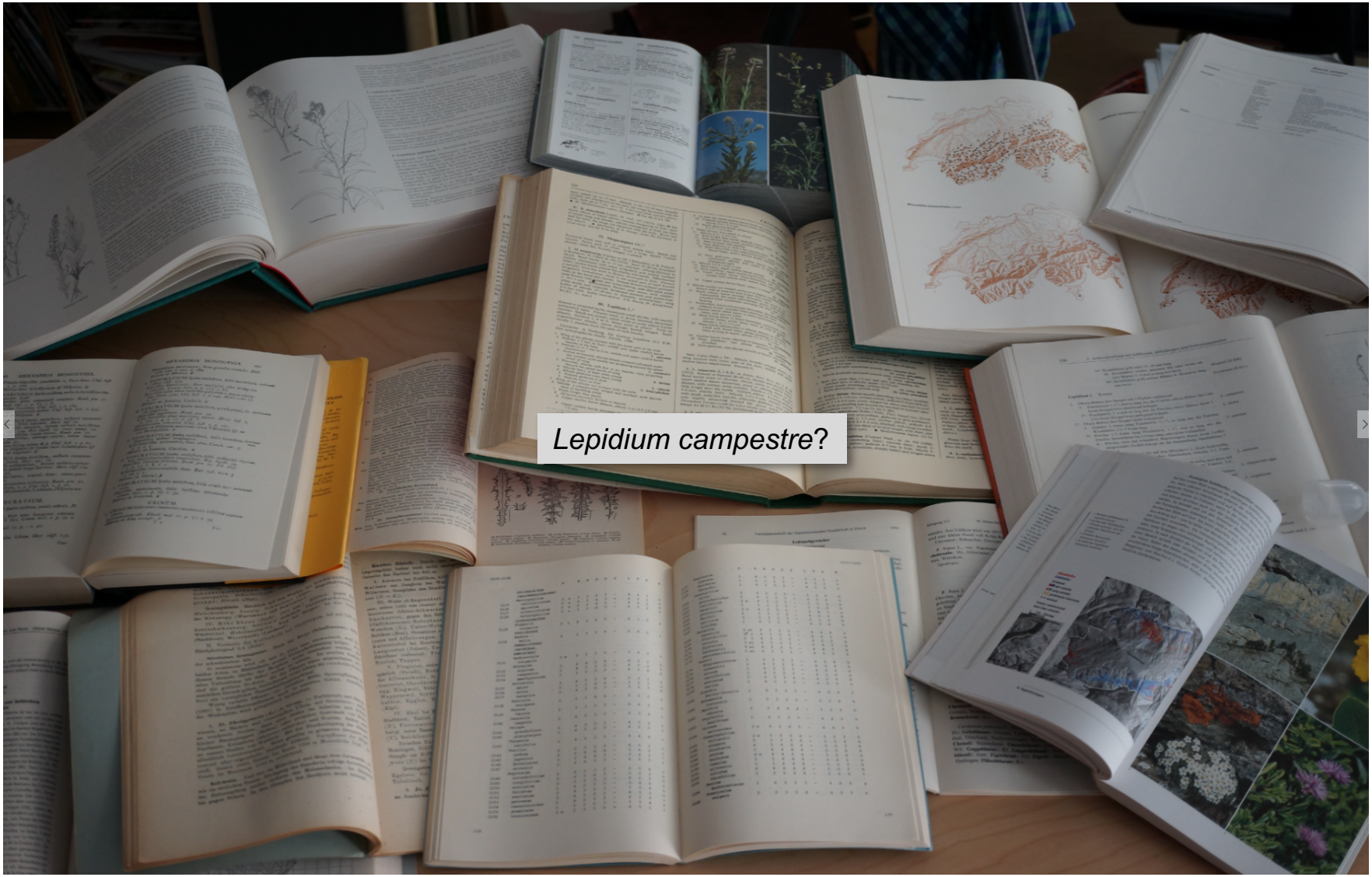
500,000,000+ printed pages
1,900,000 species described
20,000,000+ species treatments
18,000 new species discovered / year

BUT: Data are hidden

- Incomplete digitization
- Publications are not semantically enhanced
- Data are not linked
- Most data are not open

How can we query our accumulated biodiversity knowledge?

Biodiversity Knowledge: 20 years ago, and still today



TreatmentBank: Visualization of data from one article

PLAZI
TAKING CARE OF FREEDOM

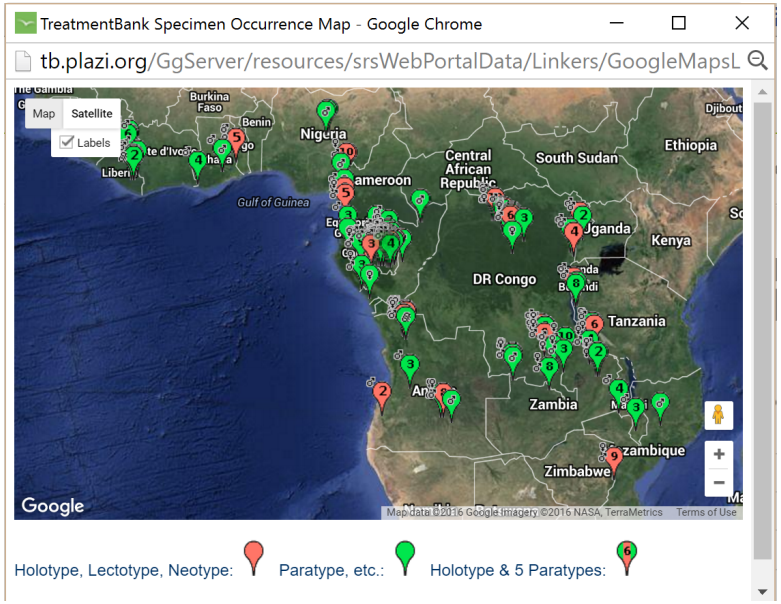
News | Resources | Projects | Activities | Cooperation | Developers | About | Search

Dijkstra, Klaas-Douwe B., Kipping, Jens & Mézière, Nicolas, 2015, Sixty new dragonfly and damselfly species from Africa (Odonata)

Dijkstra, Klaas-Douwe B., Kipping, Jens & Mézière, Nicolas, 2015, Sixty new dragonfly and damselfly species from Africa (Odonata), Odonatologica 44 (4), pp. 447-678

publication ID	http://dx.doi.org/10.5281/zenodo.35388
link to original document	http://dx.doi.org/10.5281/zenodo.35388
document provided by	Donat (2015-12-11 15:22:31, last updated by Admin 2015-12-18 12:58:08)

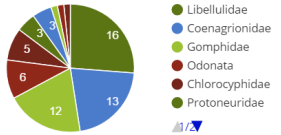
Treatments (61)



Distribution Map

Specimens

Article: Treatments by Family (n=61)



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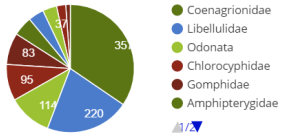

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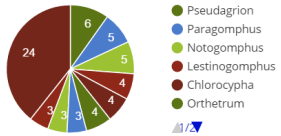

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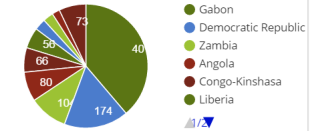
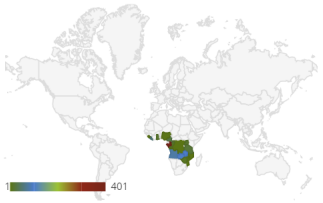
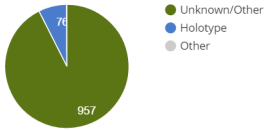
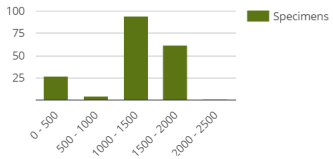




Article: Specimens by Type Status (n=1034)



Article: Specimens by Elevation (n=1034)



Explicit links

Profundiconus puillandrei sp. nov.
urn:lsid:zoobank.org:act:55807BF8-D984-42C1-B039-F3EBD8EB2C13
Figs 12A–J, 13A–D, 14

Conus ikedai – Poppe 2008: pl. 615, fig. 1a–b (non *C. ikedai* Ninomiya, 1987).
Conus smirna – Marshall 1981: 499, fig. 3j (non *C. smirna* Bartsch & Rehder, 1943).
Conus sp. C – Röckel *et al.* 1995b: 585, fig. 49.
Profundiconus n. sp. g. – Puillandre *et al.* 2014: Supplementary Material 1 (unfigured).

Etymology

This new species is dedicated to Dr. Nicolas Puillandre, mollusc curator at the MNHN. Dr. Puil
has a long and outstanding trajectory in the study of the phylogeny of the Conoidea. The nam
the new species after him recognises his important contributions to the taxonomy of Conoidea
molecular level.

Type material examined

Holotype
NEW CALEDONIA: 43.2 × 18.0 mm, R/V *Alis*, NORFOLK 1 Expedition, st. DW 1707, Banc J
Est, Norfolk Ridge, 23°43' S, 168°16' E, 381–493 m (MNHN IM-2000-30771; Fig. 12A).

Paratypes
NEW CALEDONIA: 39.6 × 17.3 mm, R/
Norfolk Ridge, 25°21' S, 168°57' E, 100

28

MNHN-IM-2007-30772

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MUSÉUM
NATIONAL D'HISTOIRE NATURELLE

MNHN / Molluscs (IM) / 2007-30772

Conus frigidus Reeve, 1848

SPECIMEN

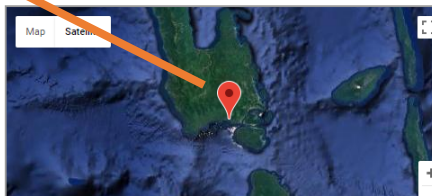
ALCOOL95	MNHN-IM-2007-30772
Size	37.3

TAXONOMY

Phylum	Mollusca
Class	Gastropoda
Order	Neogastropoda
Family	Conidae
Genus	Conus
Species	Conus frigidus
Name	*Conus frigidus* Reeve, 1848

ORIGIN

Country label	VANUATU
Locality	Baldwin Core
Expedition	SANTO 2006
Station number	VM02
Collection date	2006-09-10
Depth (meters)	0 -1
Geographic	15° 34' 51.9996" S ; 167° 2' 23.5248" E



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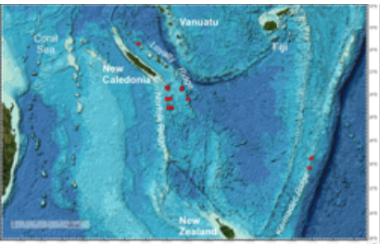
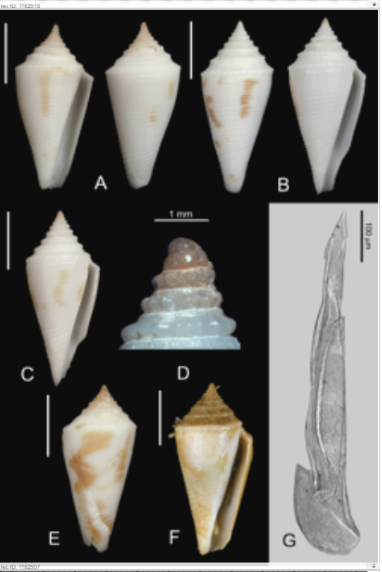
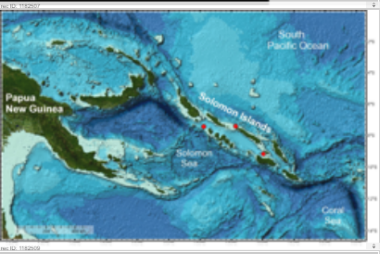

Coral Sea
Vanuatu
Fiji
New Caledonia
New Zealand

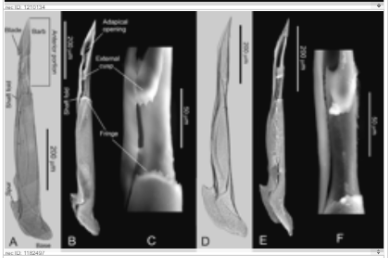

A
B
1 mm
C
D
E
F
G

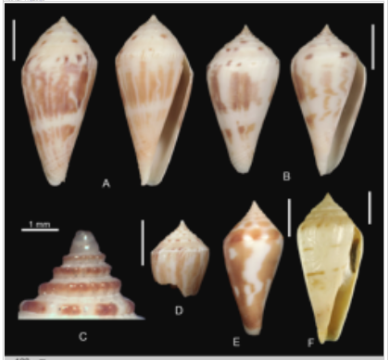

South Pacific Ocean
Papua New Guinea
Solomon Islands
Solomon Sea
Coral Sea


100 µm
A

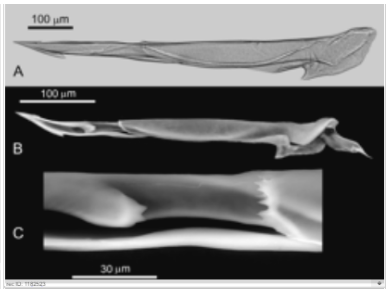

100 µm
B

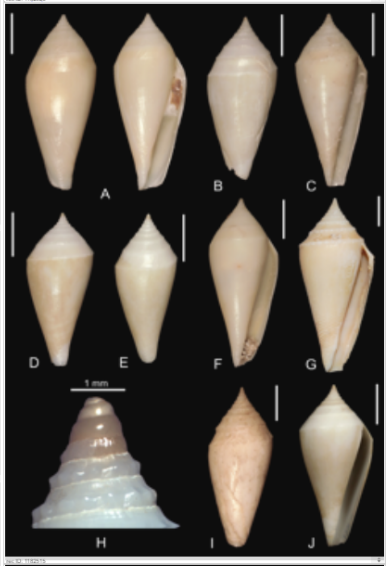

© MNHN Paris, France


Adapical opening
External cord
Fringe
A
B
C
D
E
F

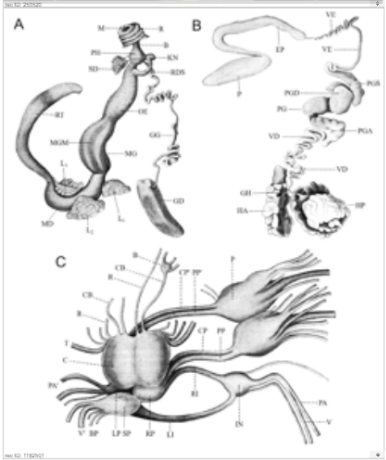

A
B
1 mm
C
D
E
F

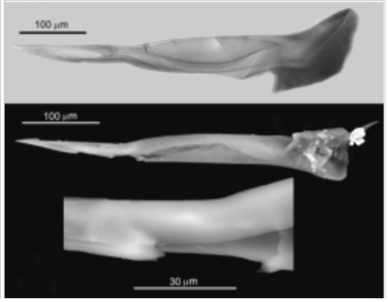

100 µm
G
100 µm

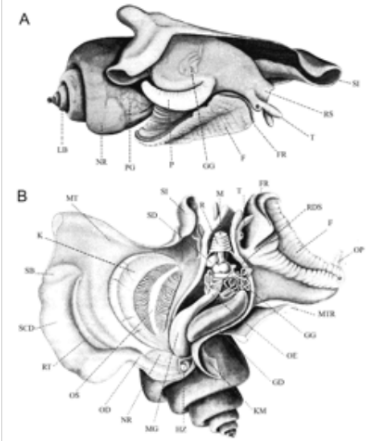

100 µm
A
100 µm
B
C
30 µm

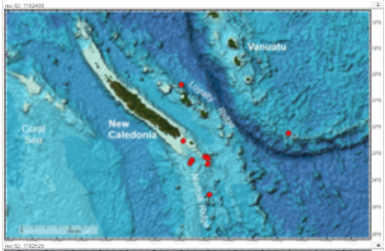

A
B
C
D
E
F
G
1 mm
H
I
J

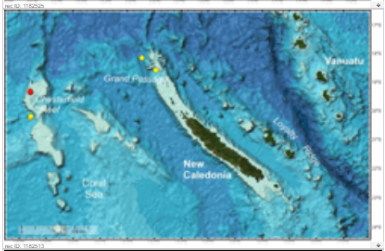

A
B
C
1 mm
D
E
F

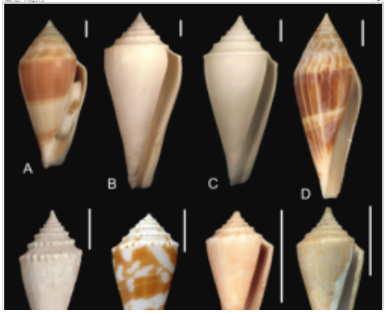

A
B
C


100 µm
100 µm
30 µm


A
B


Vanuatu
New Caledonia
Coral Sea


Vanuatu
Grand Passage
New Caledonia
Coral Sea


A
B
C
D

Dissemination

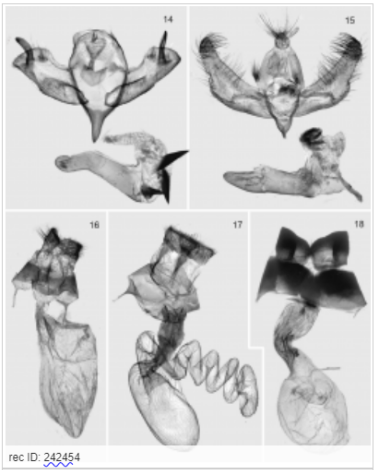
Reuse of **subarticle** parts

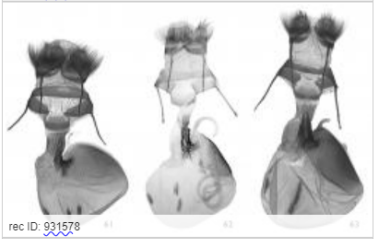
Novel applications, novel access to publications

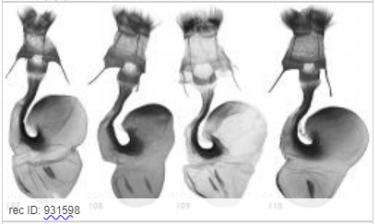
OCELLUS

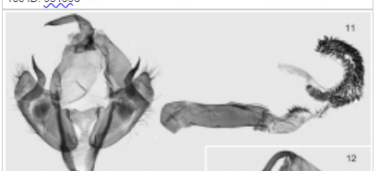
noctuidae+genitalia GO

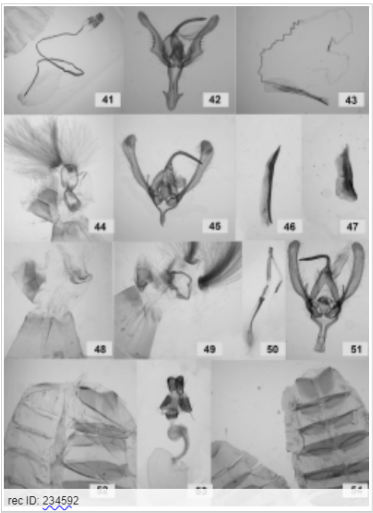
13111 records found

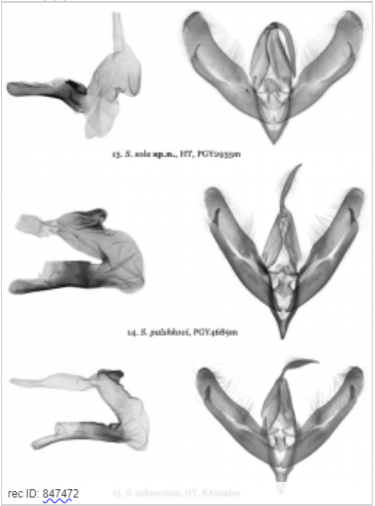


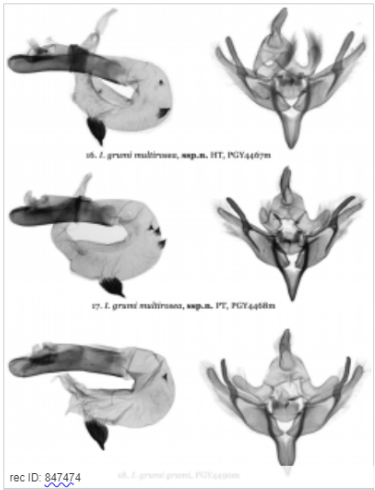


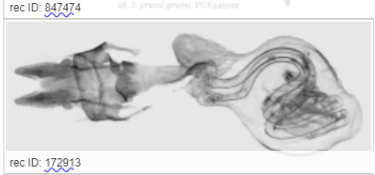


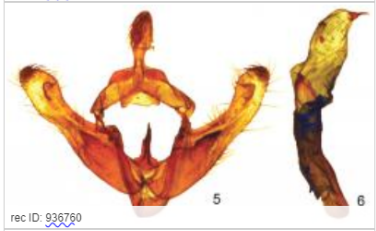


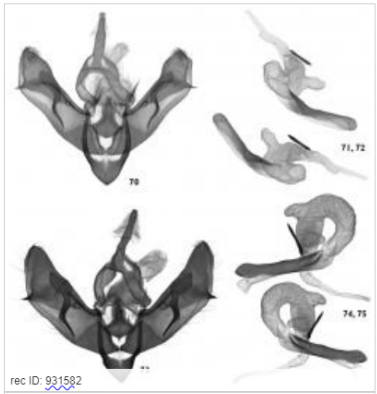


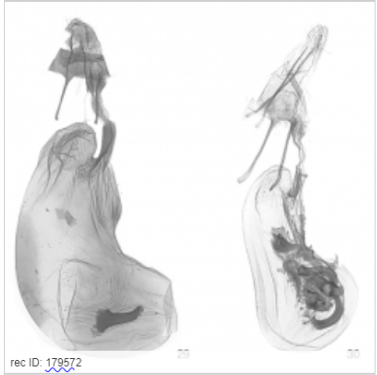


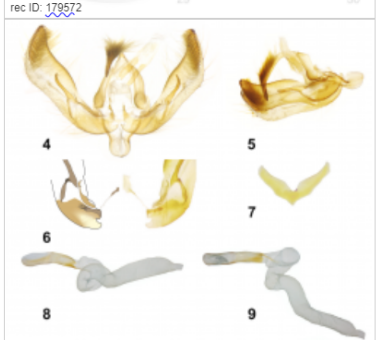




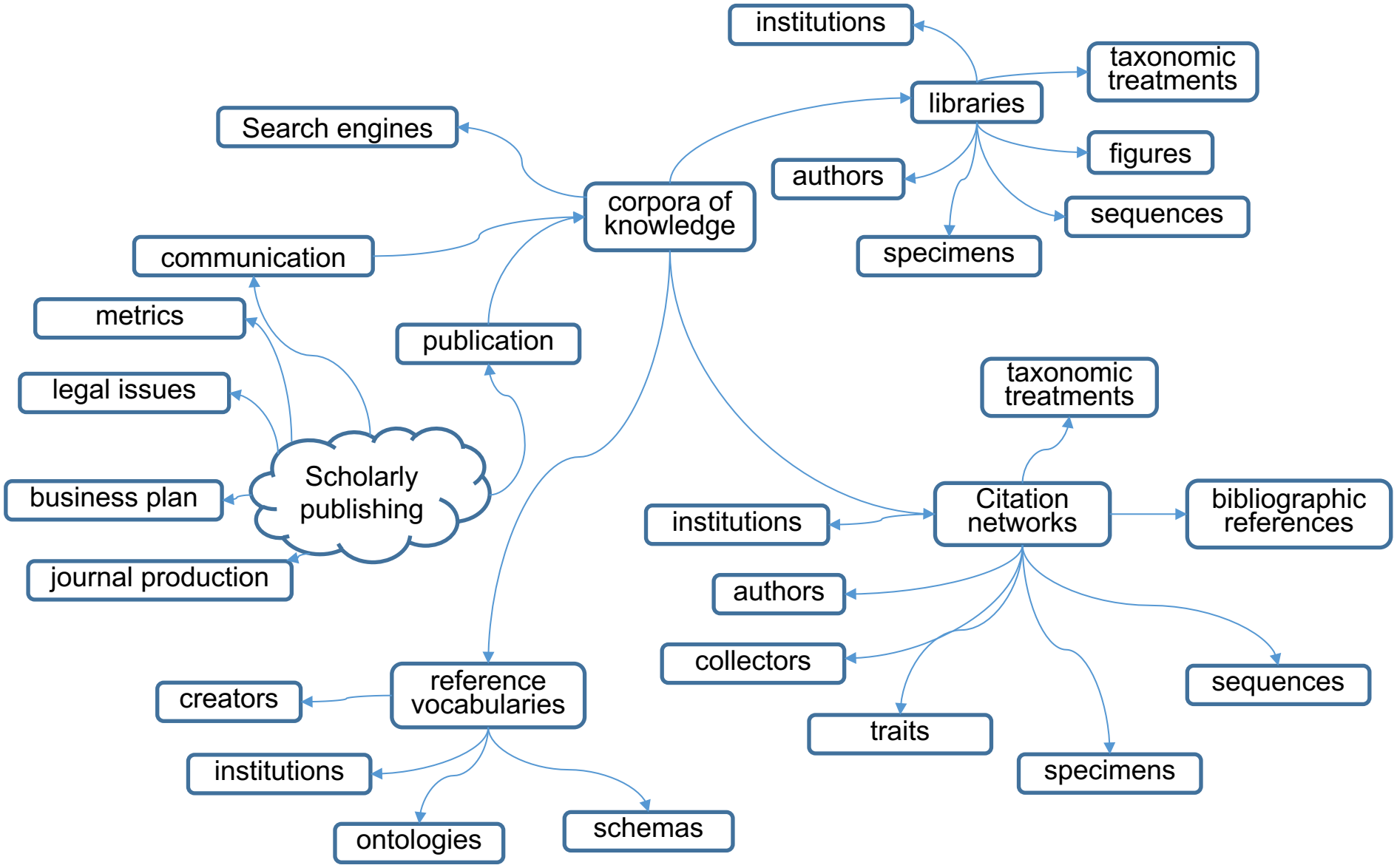




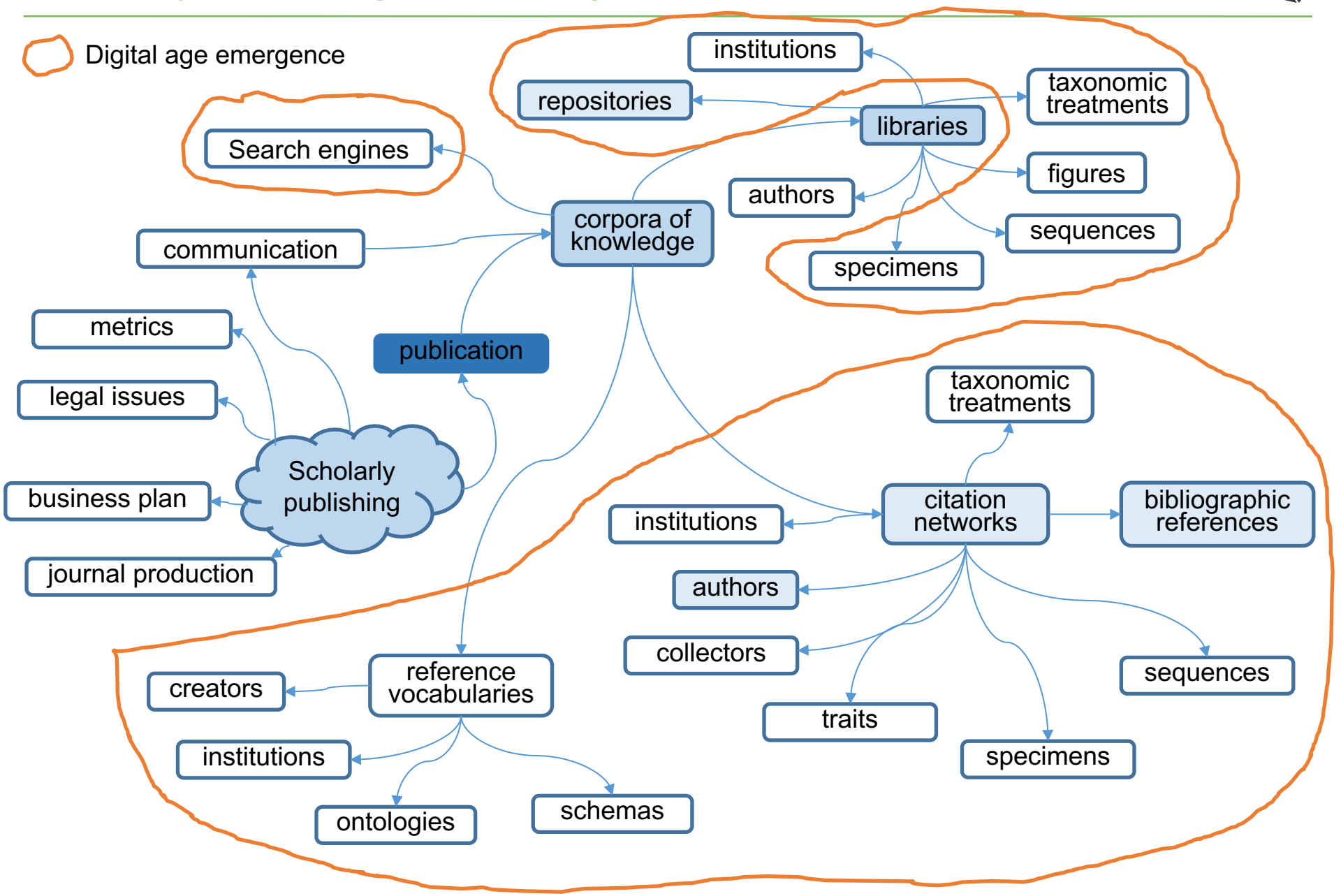




Scholarly publishing



Scholarly publishing: a daunting task



The PDF prison

Highly **structured** research data

publishing

Semantically **unstructured** text

data mining

Semantically enhanced, **structured** data

Beyond the PDF – unstructured to structured publications …

From an article to data and knowledge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One article = thousands of facts

Modeling scientific domains

Development of

- Standards vocabularies
- Ontologies
- Schemas

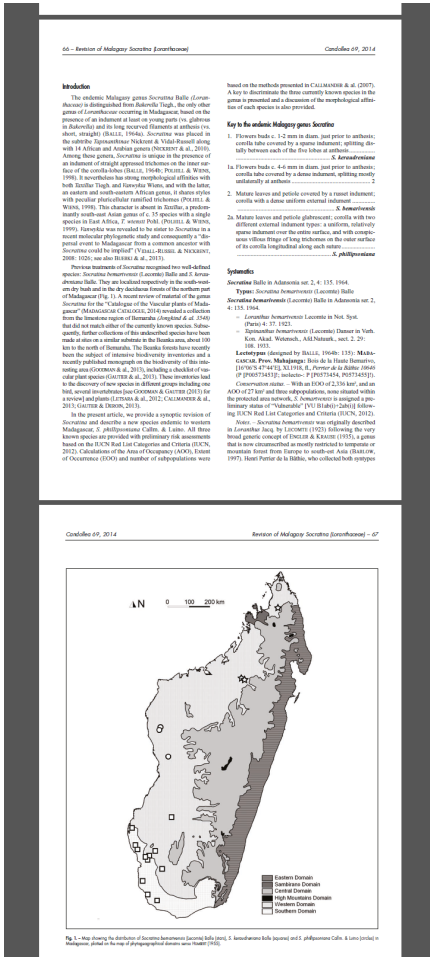
- Tools to mine and semantically enhance publications

- Repositories for semantical enhanced entities to make them FAIR

- Search engines

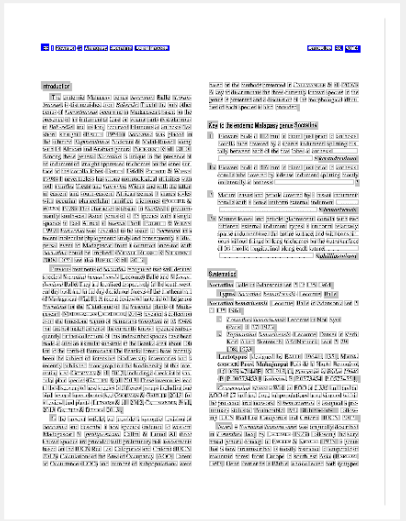
Plazi: conversion: extracting text streams and other elements

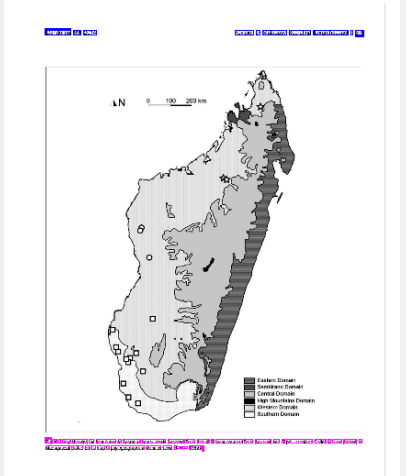
Re-creating a semantically enhanced publication



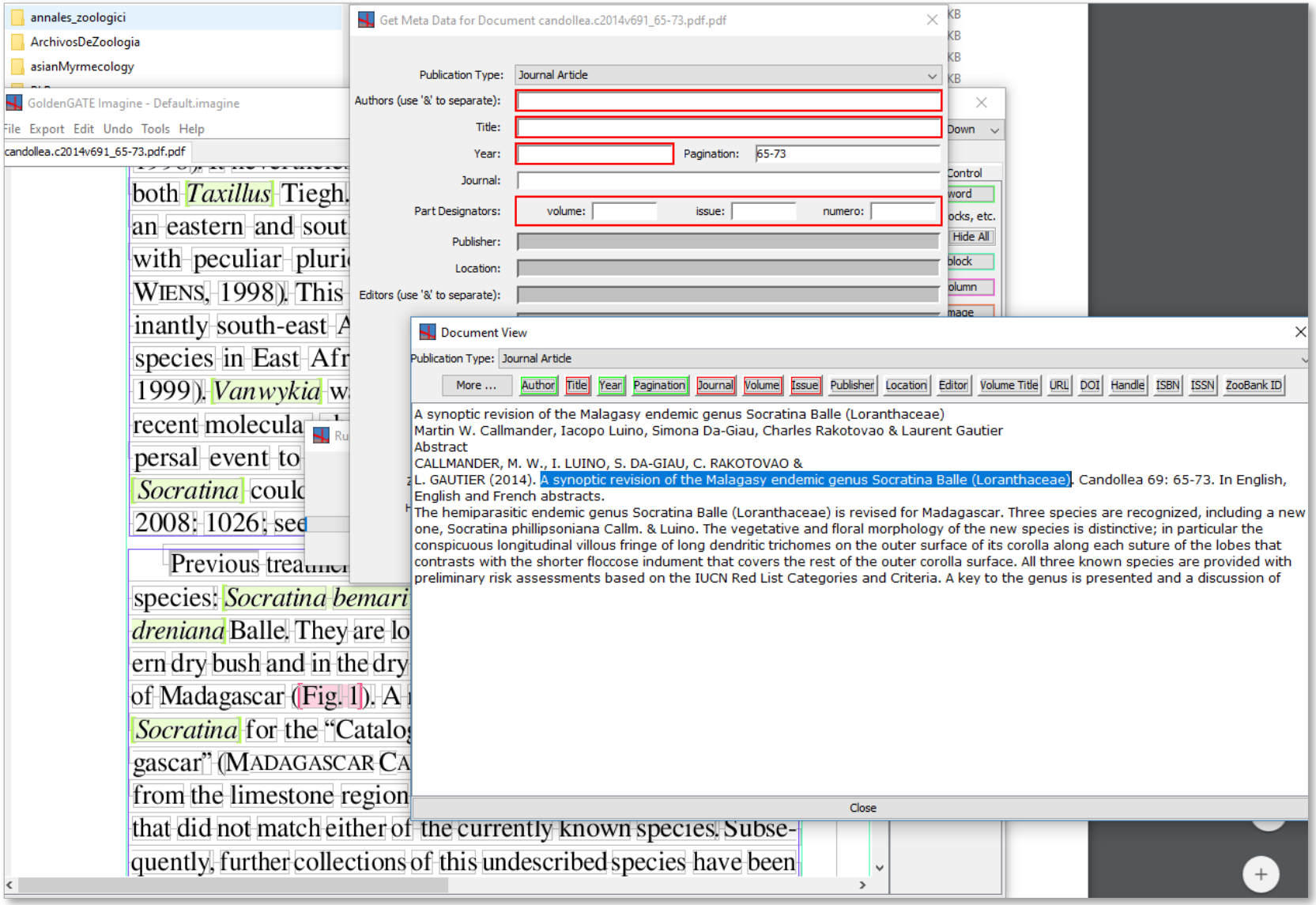
preparation

Extraction of text
text stream
various digital elements

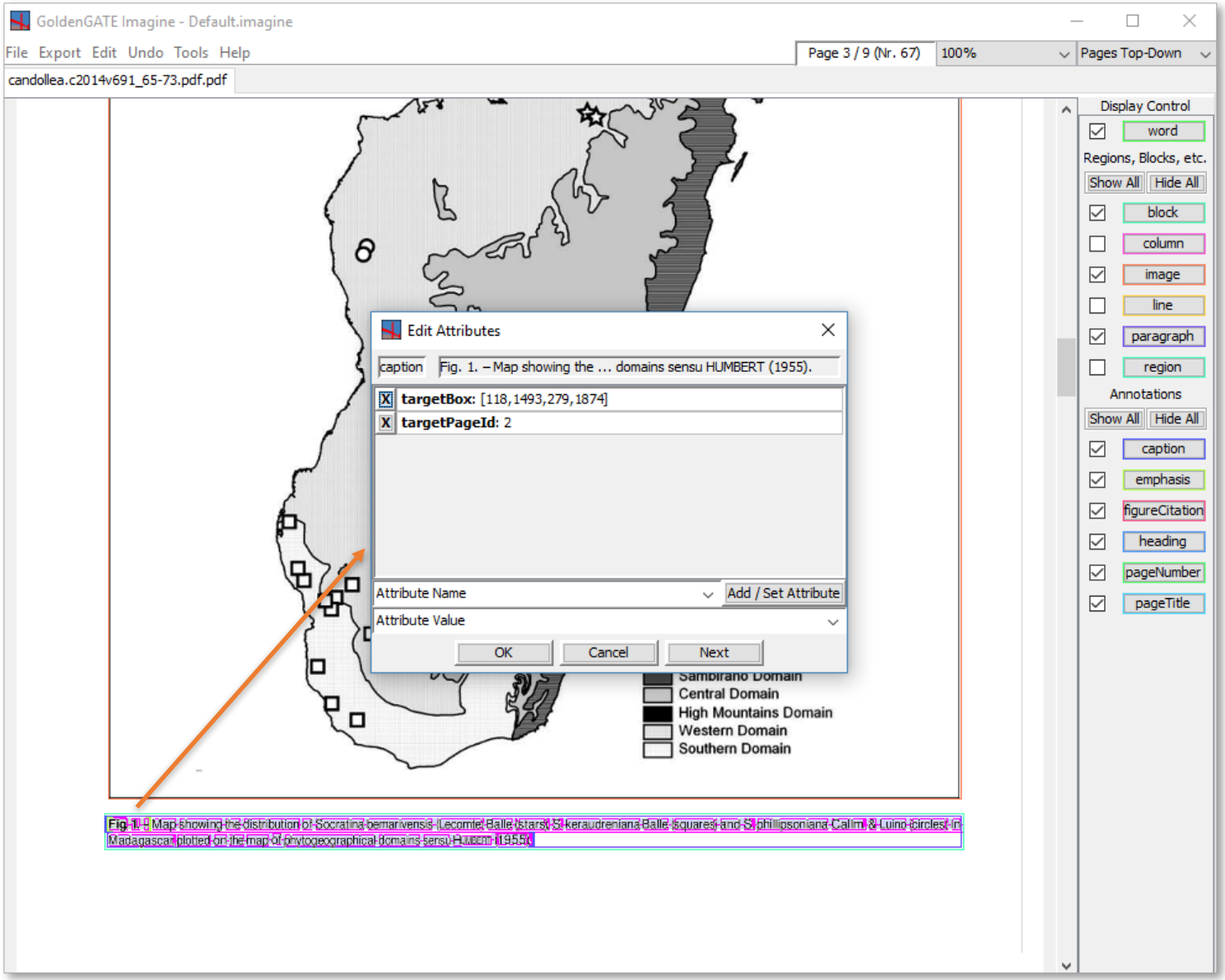




Plazi: conversion: keep the provenience



Plazi: conversion: discovering images



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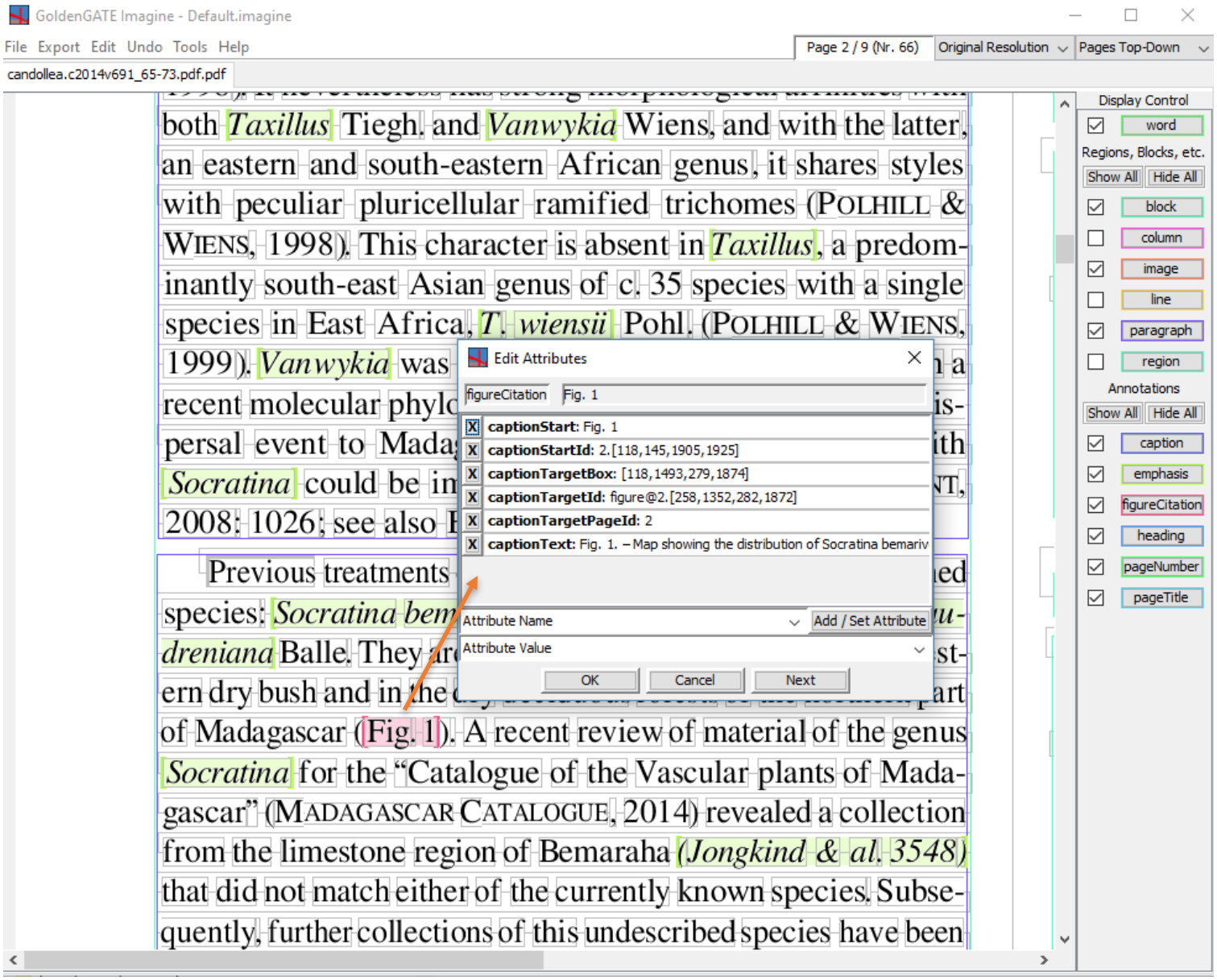

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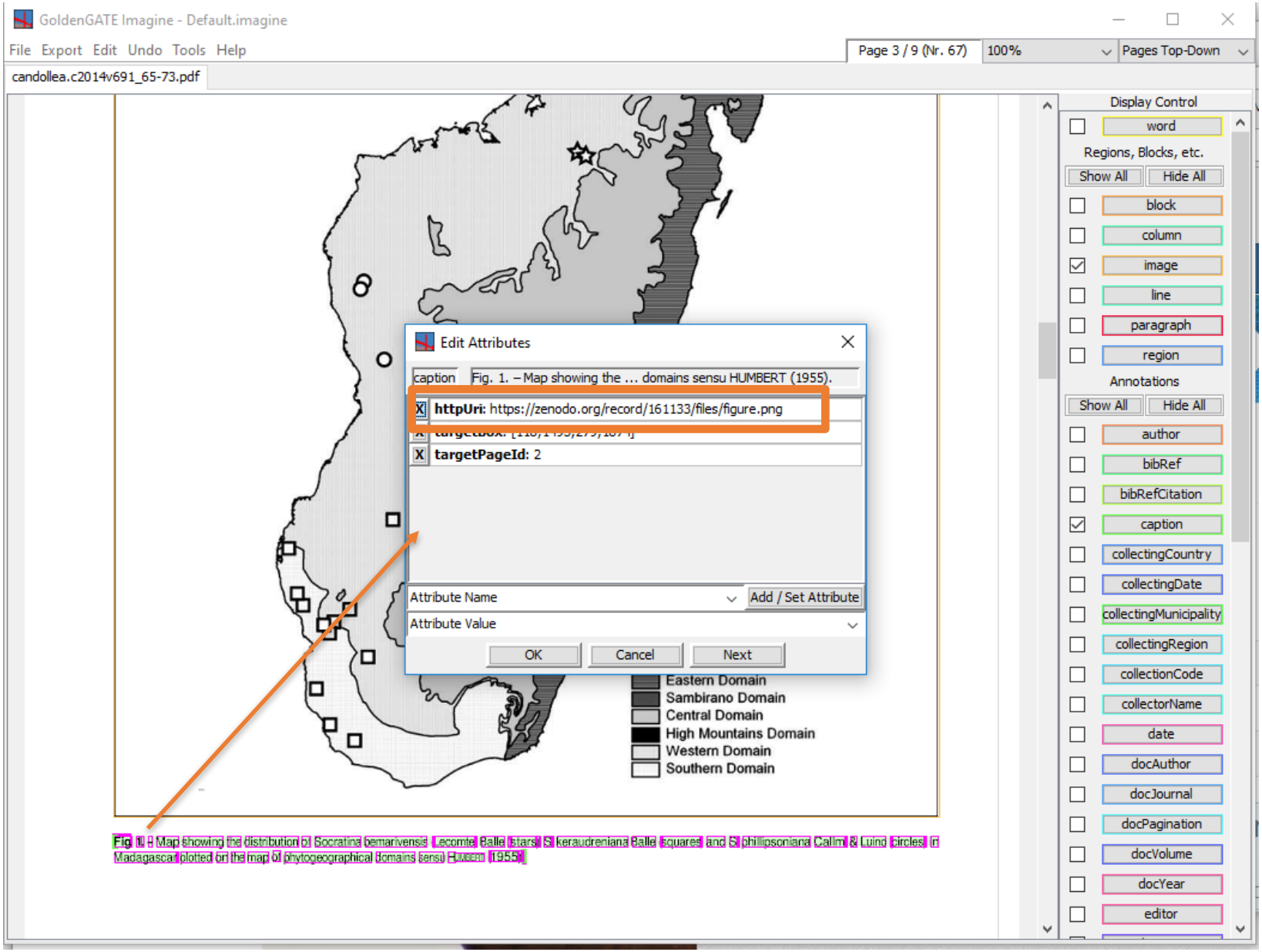

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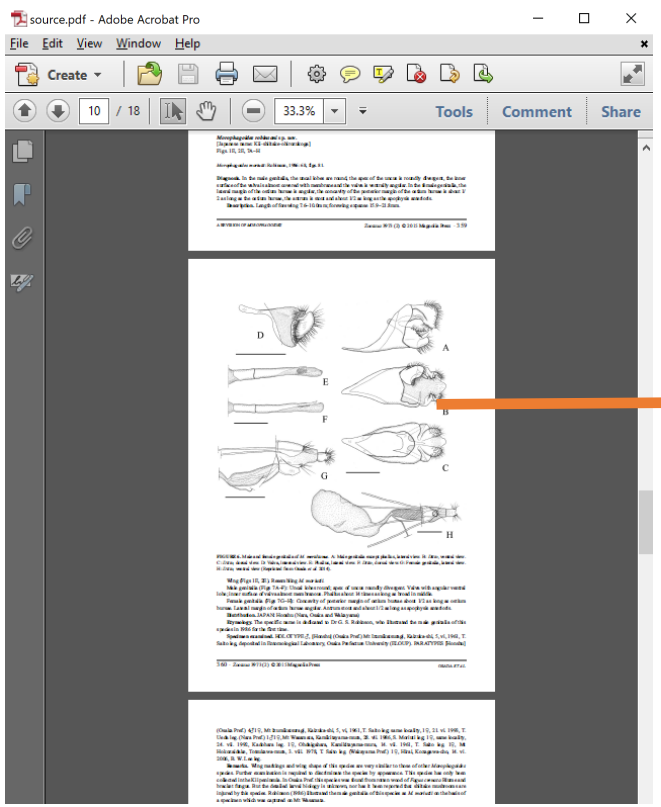

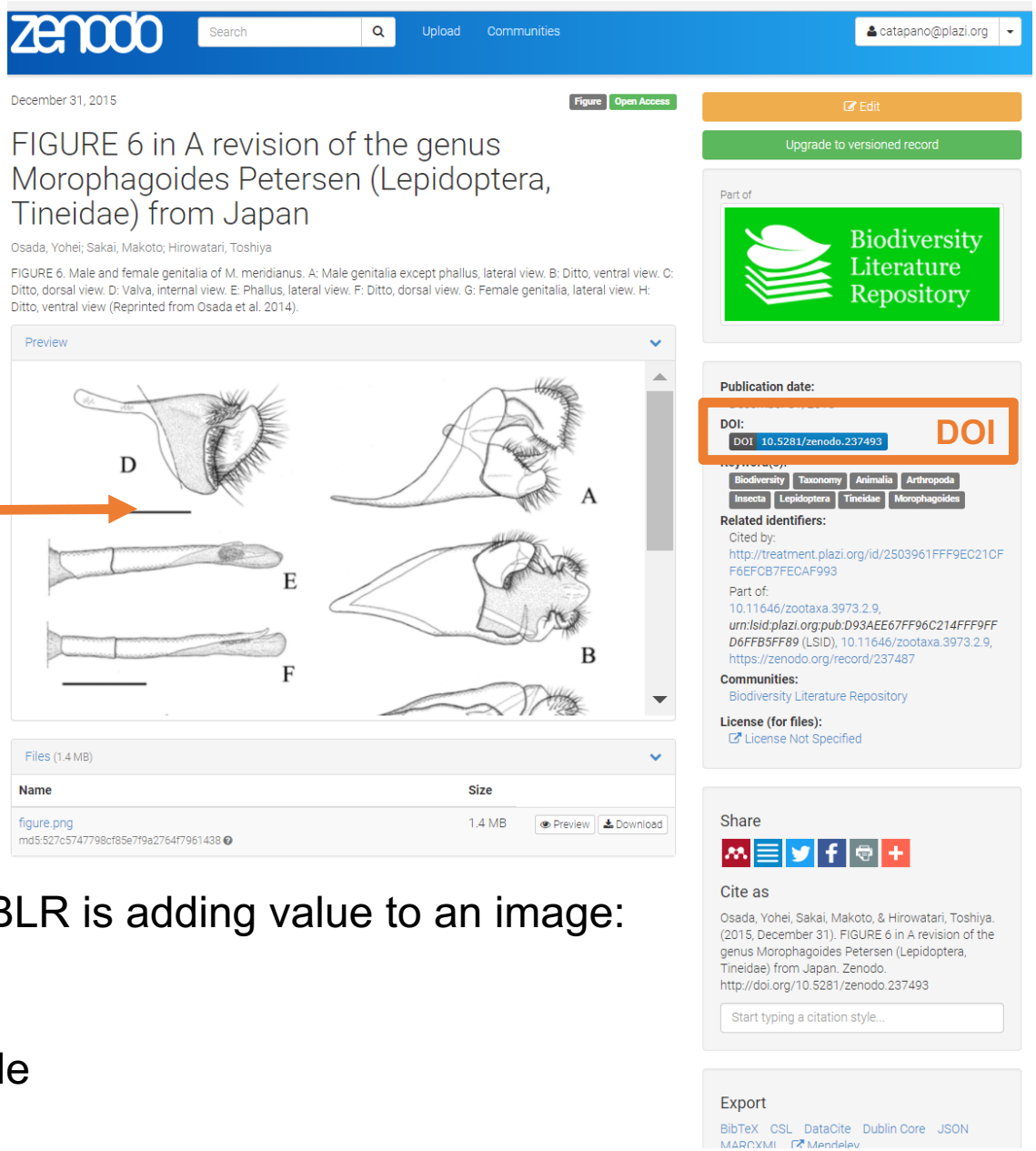

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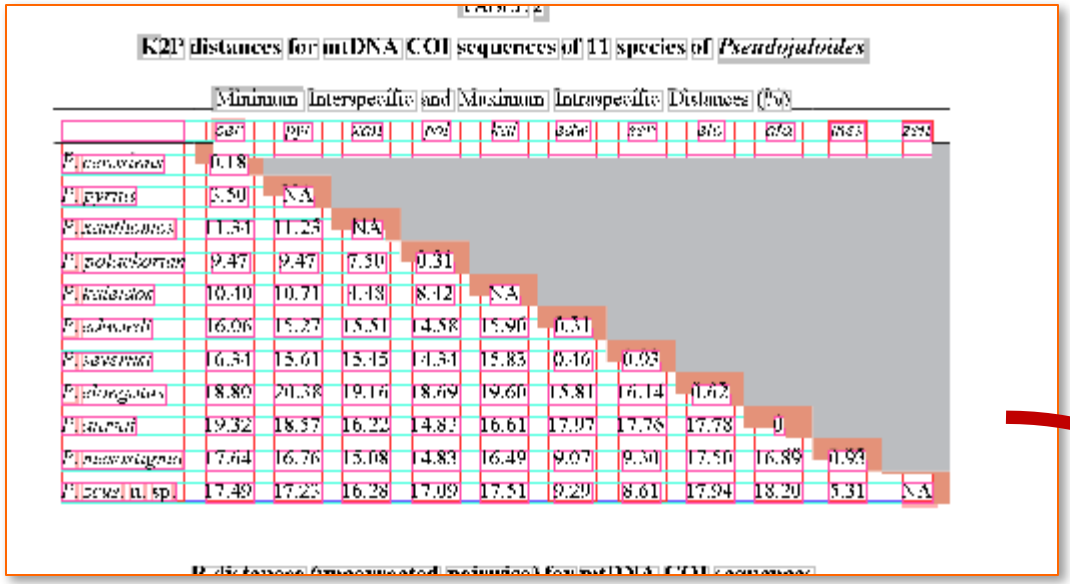

K2P distances for mtDNA COI sequences of 11 species of *Pseudojuloides*

Minimum Interspecific and Maximum Intraspecific Distances (%)

	cer	pyr	xan	pol	kal	edw	sev	elo	ata	mes	zeu
P. cerasinus	0.18										
P. pyrius	3.50	NA									
P. xanthomos	11.34	11.23	NA								
P. polackorum	9.47	9.47	7.50	0.31							
P. kaleidos	10.40	10.71	4.48	8.42	NA						
P. edwardi	16.06	15.27	15.51	14.58	15.90	0.31					
P. severnsi	16.34	15.61	15.45	14.34	15.83	0.46	0.93				
P. elongatus	18.80	20.38	19.16	18.69	19.60	15.81	16.14	0.62			
P. atavai	19.32	18.57	16.22	14.83	16.61	17.97	17.76	17.78	0		
P. mesostigma	17.64	16.76	15.08	14.83	16.49	9.07	9.30	17.50	16.89	0.93	
P. zeus, n. sp.	17.49	17.23	16.28	17.09	17.51	9.29	8.61	17.94	18.29	5.31	NA

Mark, copy and paste
(csv, text, excel)

	cer	pyr	xan	pol	kal	edw	sev	elo	ata	mes	zeu
P. cerasinus	0.18										
P. pyrius	3.50	NA									
P. xanthomos	11.34	11.23	NA								
P. polackorum	9.47	9.47	7.50	0.31							
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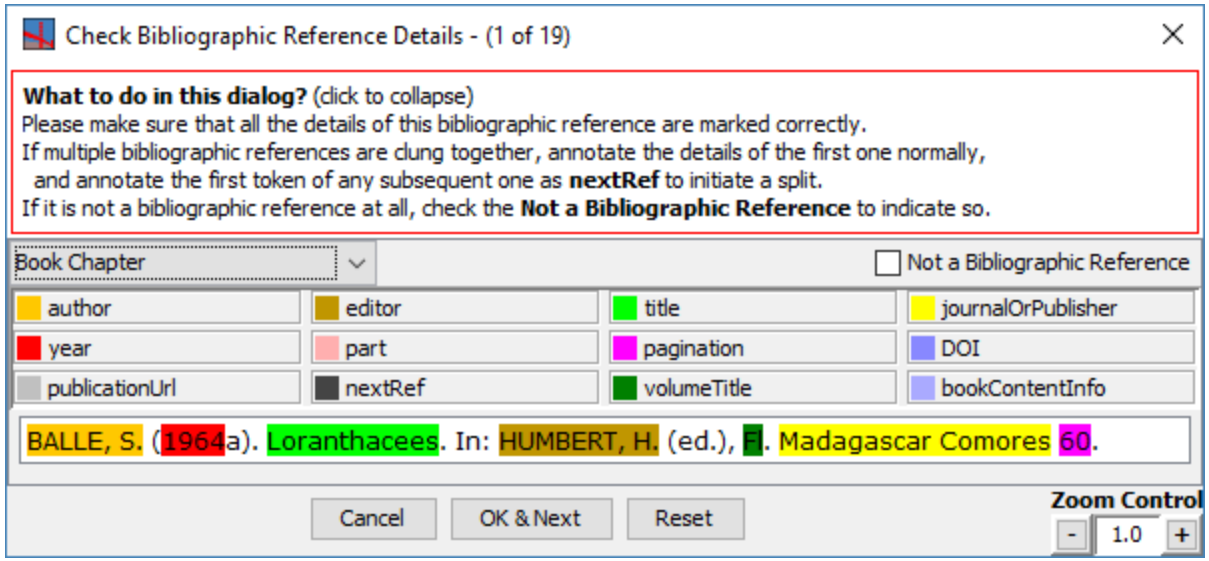
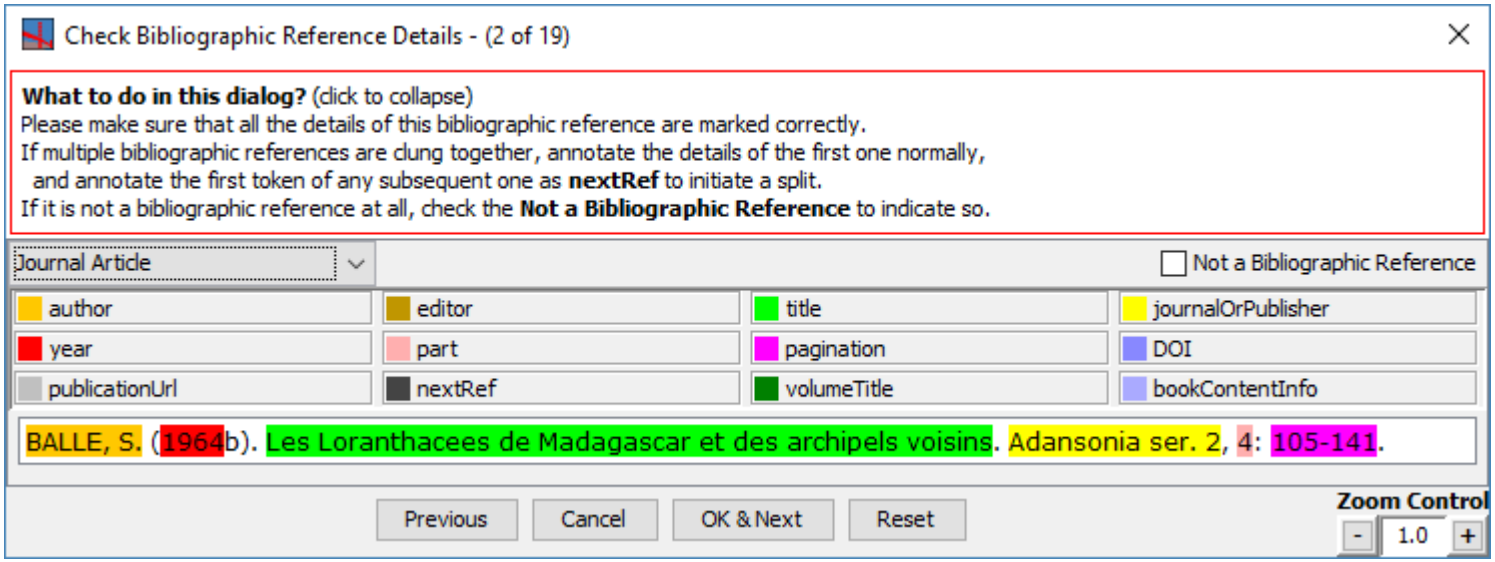
P. elongatus	18.80	20.38	19.16	18.69	19.60	15.81	16.14	0.62			
P. atavai	19.32	18.57	16.22	14.83	16.61	17.97	17.76	17.78	0		
P. mesostigma	17.64	16.76	15.08	14.83	16.49	9.07	9.30	17.50	16.89	0.93	
P. zeus, n. sp.	17.49	17.23	16.28	17.09	17.51	9.29	8.61	17.94	18.20	5.31	NA

Plazi: conversion





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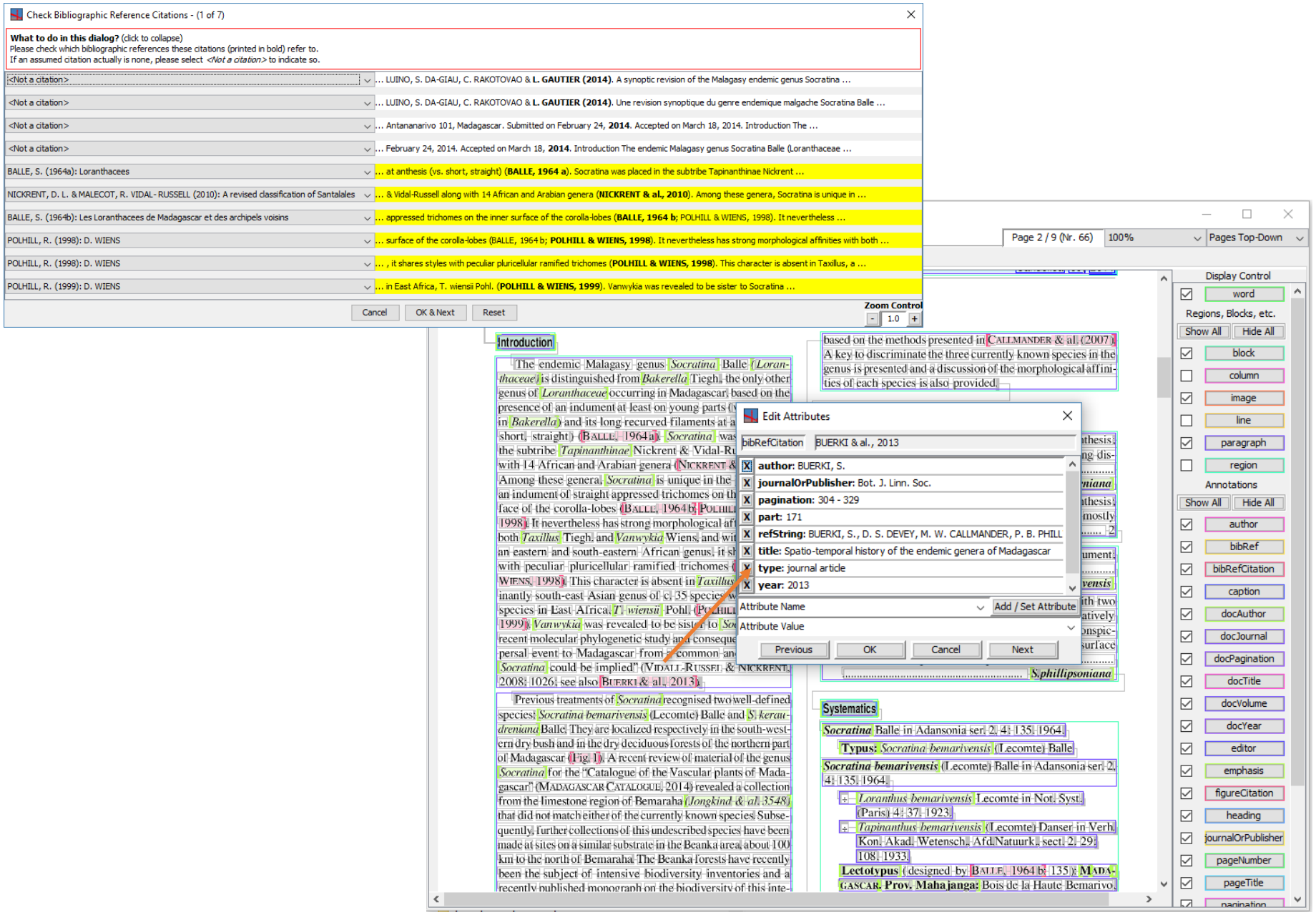

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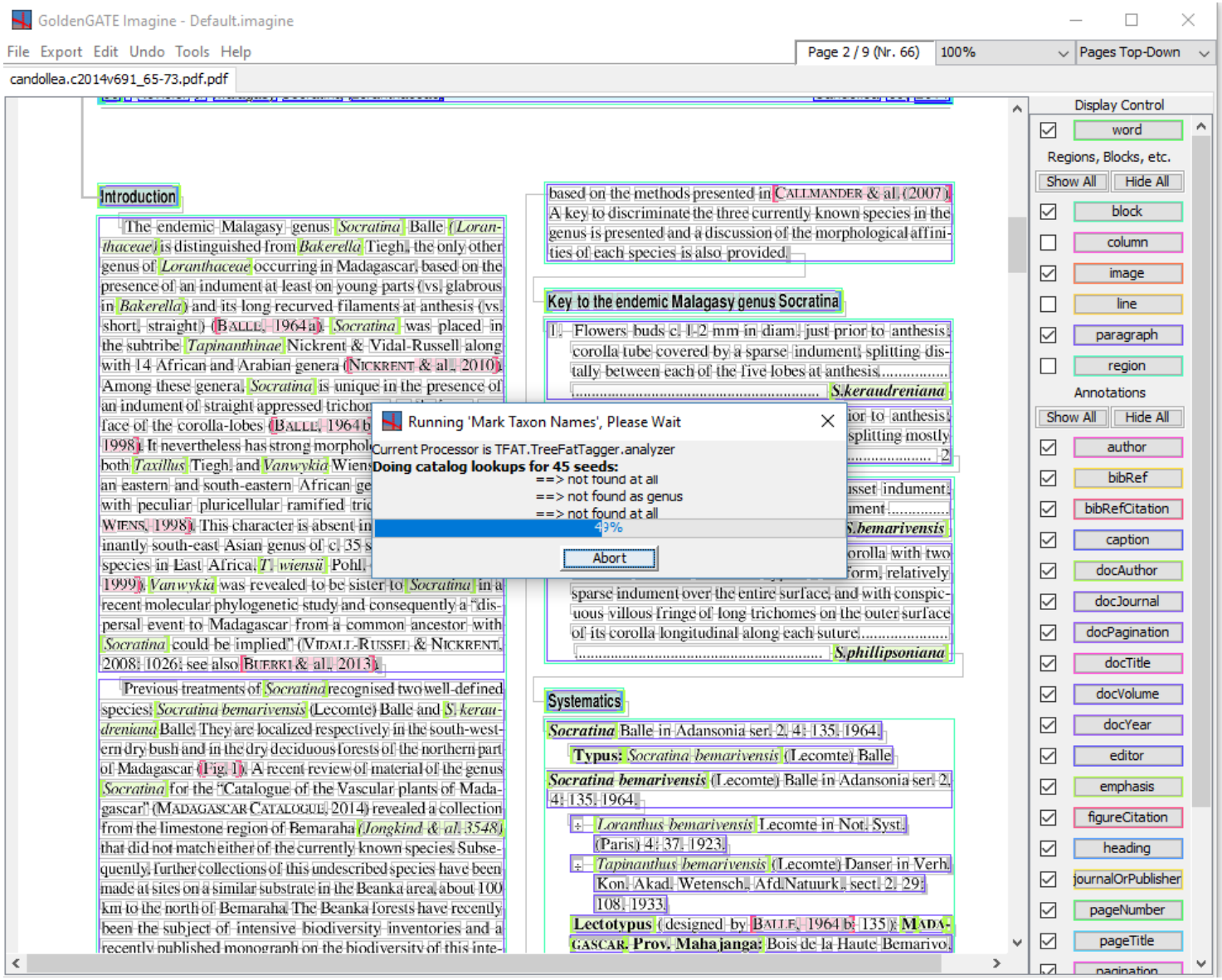
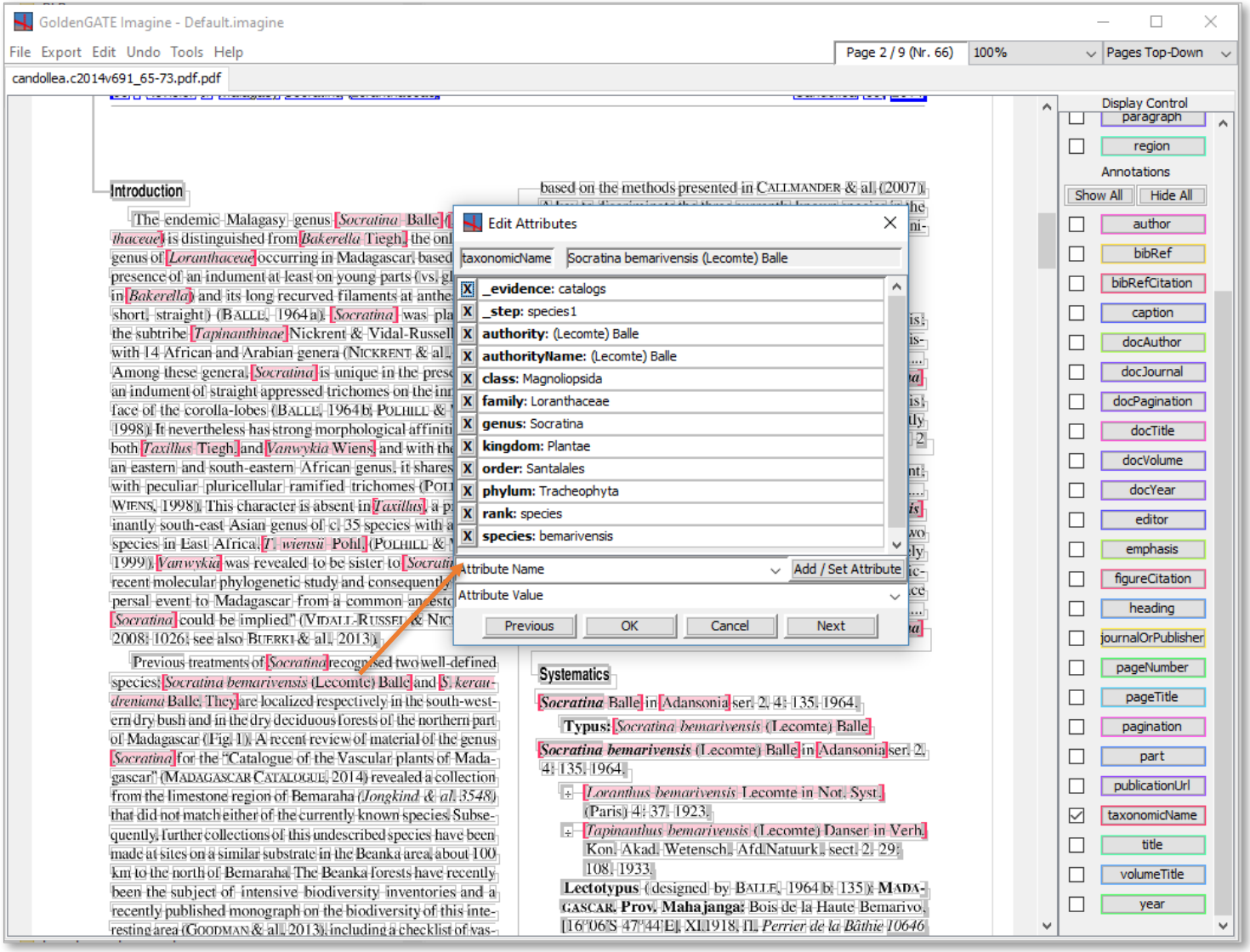


Plazi: conversion

Retrieving higher ranks from *GBIF* and *Catalogue of Life* (external resources)



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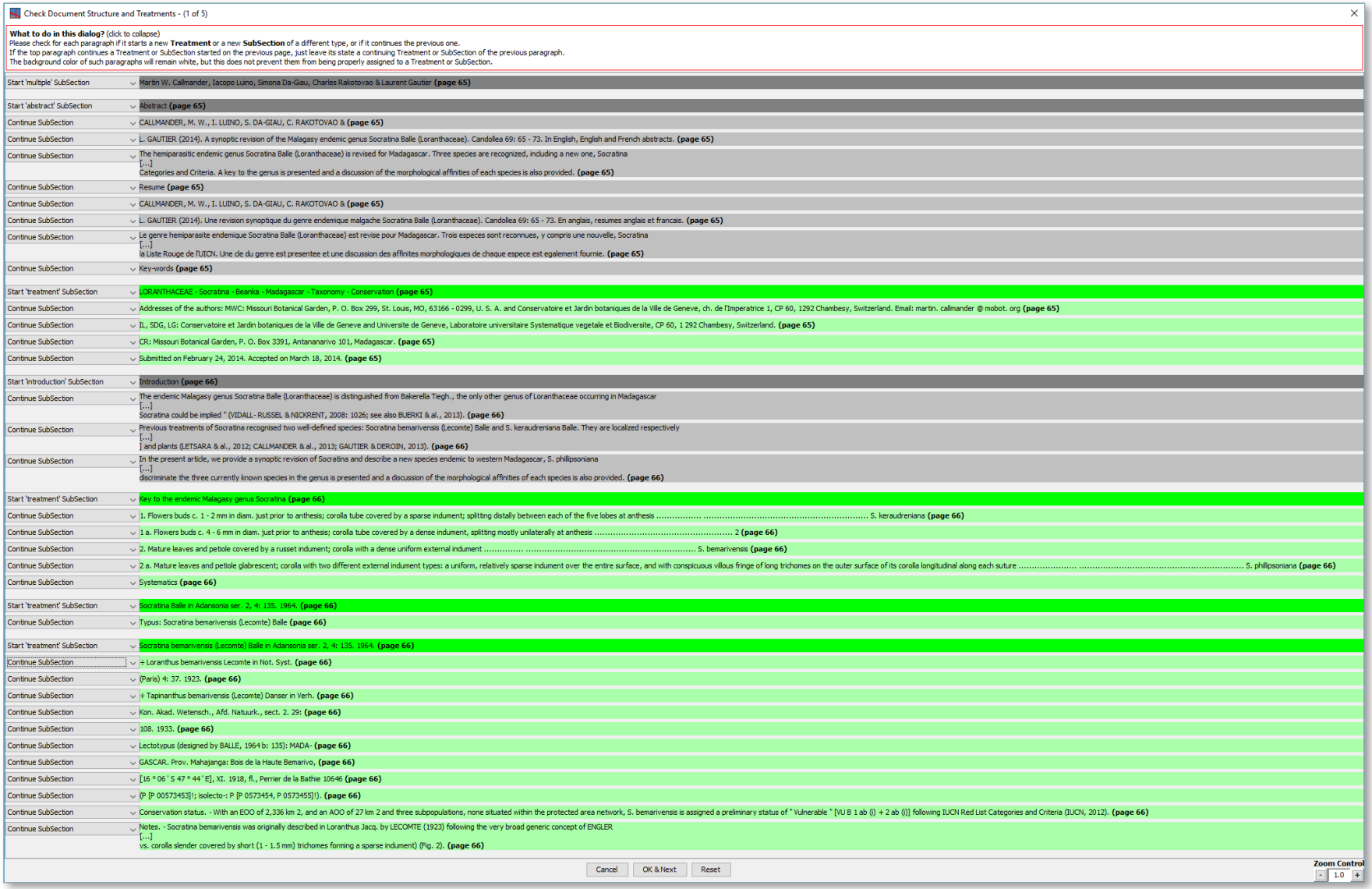

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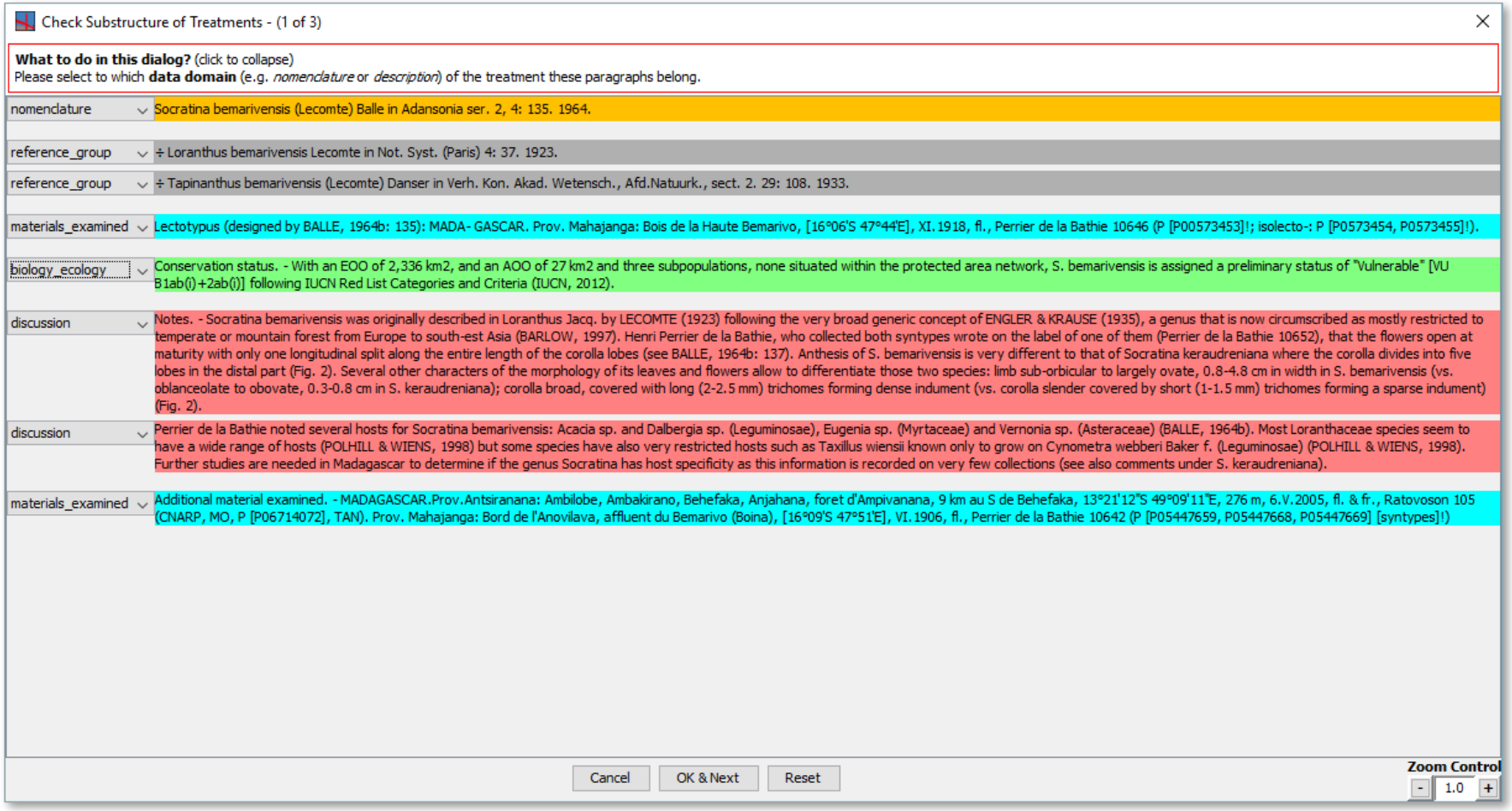

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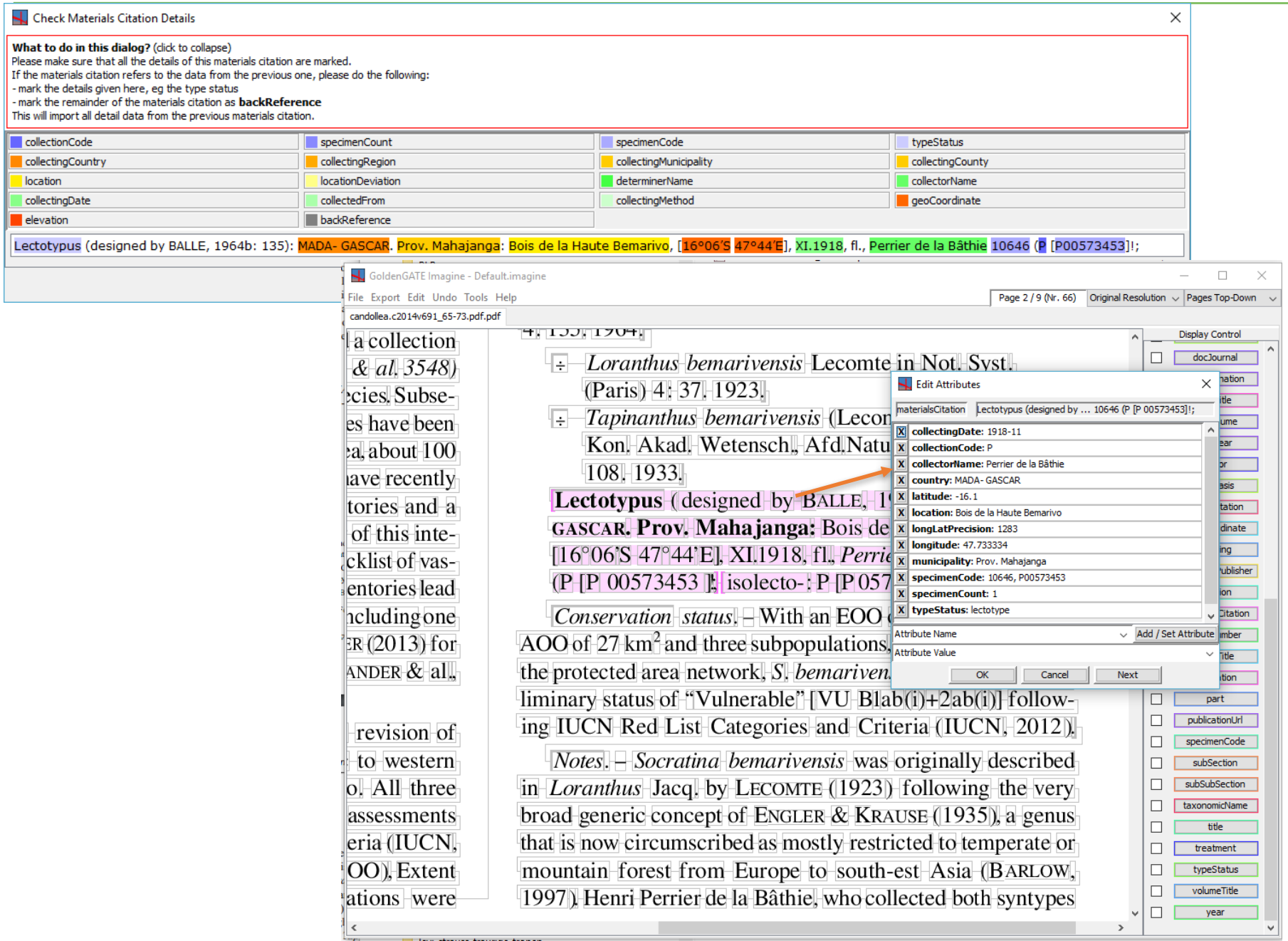

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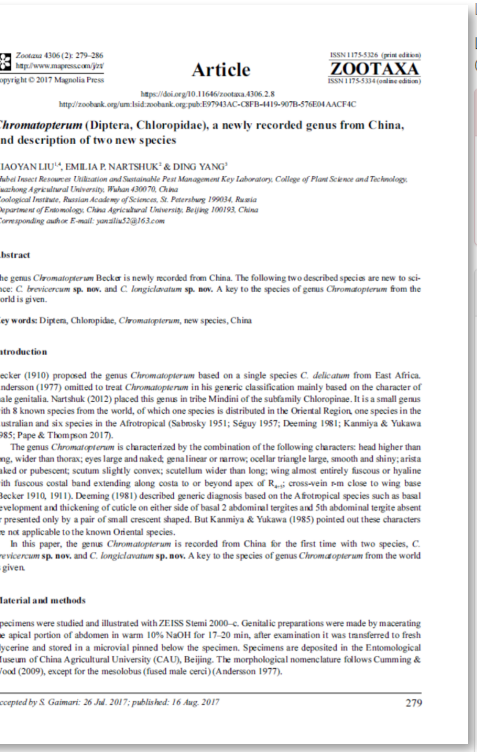

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Chromatopterum (Diptera, Chloropidae), a newly recorded genus from China, and description of two new species

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[2]Zoological Institute, Russian Academy of Sciences, St. Petersburg 199034, Russia
[3]Department of Entomology, China Agricultural University, Beijing 100193, China
[4]Corresponding author. E-mail: yanzilu52@163.com

Abstract

The genus *Chromatopterum* Becker is newly recorded from China. The following two described species are new to science: *C. brevicercum* **sp. nov.** and *C. longiclavatum* **sp. nov.** A key to the species of genus *Chromatopterum* from the world is given.

Key words: Diptera, Chloropidae, *Chromatopterum*, new species, China

Introduction

Becker (1910) proposed the genus *Chromatopterum* based on a single species *C. delicatum* from East Africa. Enderson (1977) omitted to treat *Chromatopterum* in his generic classification mainly based on the character of male genitalia. Nartshuk (2012) placed this genus in tribe Mindini of the subfamily Chloropinae. It is a small genus with 8 known species from the world, of which one species is distributed in the Oriental Region, one species in the Australian and six species in the Afrotropical (Sabrosky 1951; Séguy 1957; Deeming 1981; Kanmiya & Yukawa 1985; Pape & Thompson 2017).

The genus *Chromatopterum* is characterized by the combination of the following characters: head higher than long, wider than thorax; eyes large and naked; gena linear or narrow; ocellar triangle large, smooth and shiny; arista naked or pubescent; scutum slightly convex; scutellum wider than long; wing almost entirely fuscous or hyaline with fuscous costal band extending along costa to or beyond apex of R_{4+5}; cross-vein r-m close to wing base (Becker 1910, 1911). Deeming (1981) described generic diagnosis based on the Afrotropical species such as basal development and thickening of cuticle on either side of basal 2 abdominal tergites and 5th abdominal tergite absent or presented only by a pair of small crescent shaped. But Kanmiya & Yukawa (1985) pointed out these characters are not applicable to the known Oriental species.

In this paper, the genus *Chromatopterum* is recorded from China for the first time with two species, *C. brevicercum* **sp. nov.** and *C. longiclavatum* **sp. nov.** A key to the species of genus *Chromatopterum* from the world is given.

Material and methods

Specimens were studied and illustrated with ZEISS Stemi 2000–c. Genitalic preparations were made by macerating the apical portion of abdomen in warm 10% NaOH for 17–20 min, after examination it was transferred to fresh glycerine and stored in a microvial pinned below the specimen. Specimens are deposited in the Entomological Museum of China Agricultural University (CAU), Beijing. The morphological nomenclature follows Cumming & Wood (2009), except for the mesolobus (fused male cerci) (Andersson 1977).

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December 31, 2017

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Chromatopterum (Diptera, Chloropidae), a newly recorded genus from China, and description of two new species

Liu, Xiaoyan; Nartshuk, Emilia P.; Yang, Ding

Liu, Xiaoyan, Nartshuk, Emilia P., Yang, Ding (2017): Chromatopterum (Diptera, Chloropidae), a newly recorded genus from China, and description of two new species. Zootaxa 4306 (2): 279-286, DOI: https://doi.org/10.11646/zootaxa.4306.2.8

Files

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Files are not publicly accessible.

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Keyword(s):
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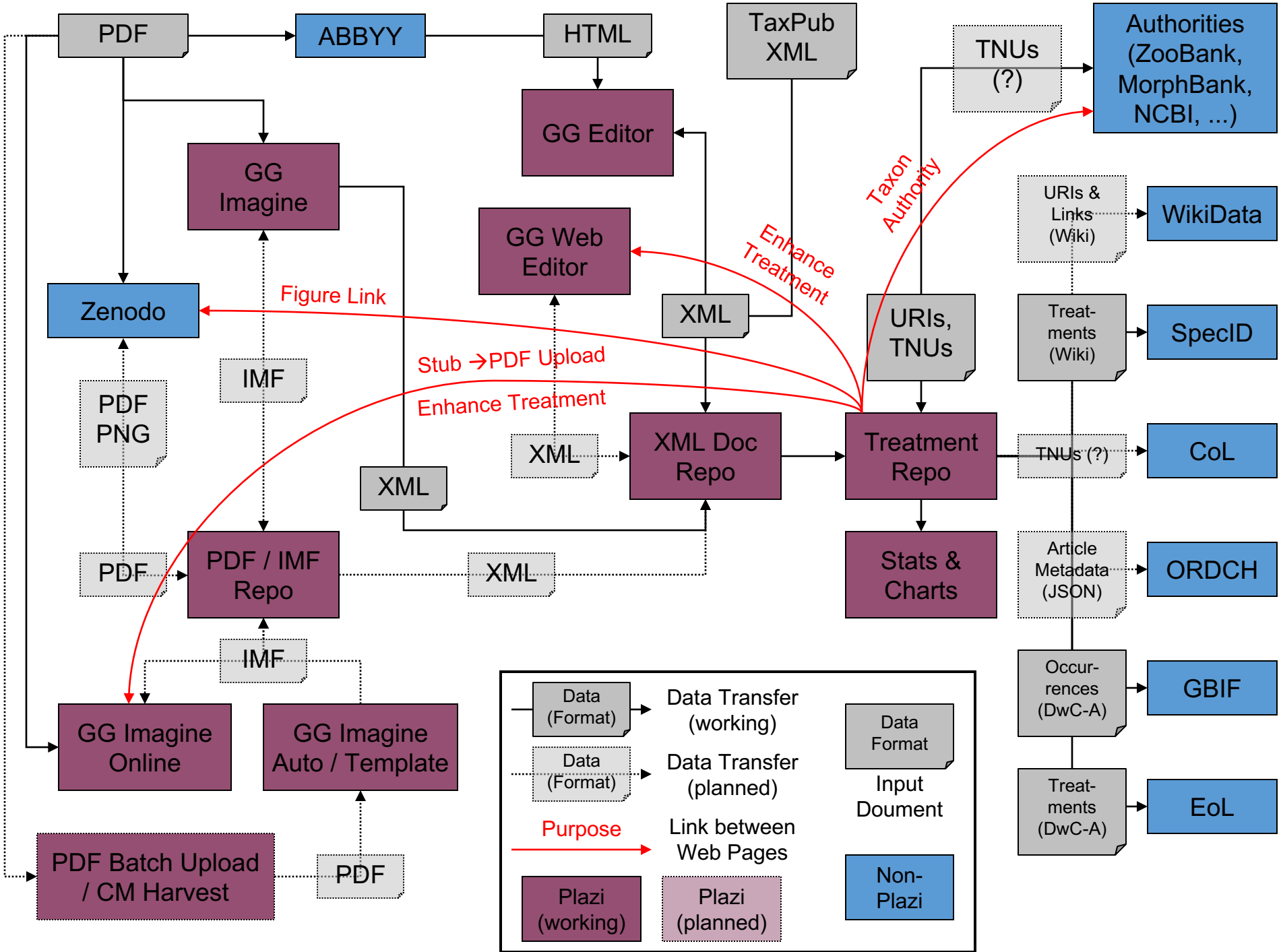
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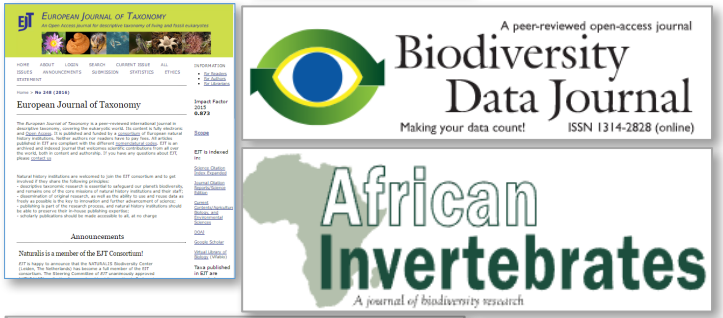

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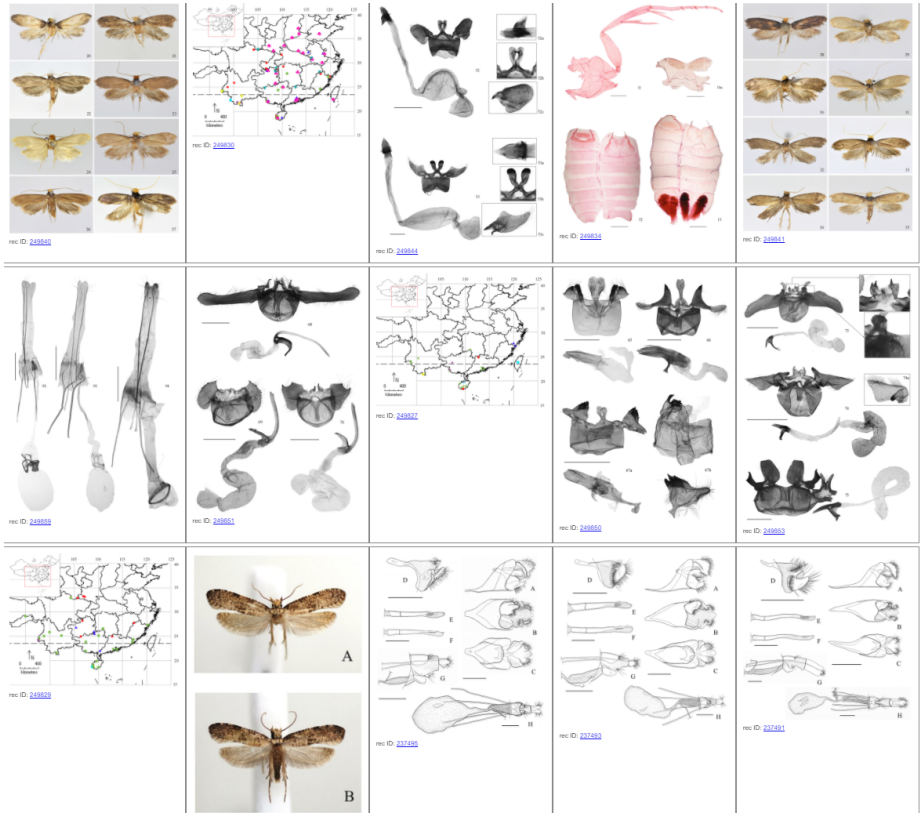
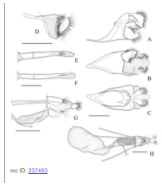
the value of a figure





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Conversion and publishing services: costs

Is it worthwhile – can we afford - to semantically enhance unstructured publications?

Copyright might be one reason

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- Copying of excerpts for internal use is a permitted act
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→ Standortvorteil for Swiss science

(Agosti&Egloff, 2009).

Improved science communication

TDM comes at a high cost, that ought to be omitted to discover data objects in text.

This can be done using semantically enhanced publishing.

An example is Pensoft's use of the Journal Archival Tag Suit (JATS) extension Taxpub which includs all the semantic elements describing the data in taxonomy.

Pensoft publications are automatically imported, without a TDM step, into TreatmentBank.

JATS based publications can automatically be imported in PubMed Central

Removing the PDF prison

Highly **structured** research data

publishing

Semantically **unstructured** text

data mining

Semantically enhanced, **structured** data

Highly **structured** research data

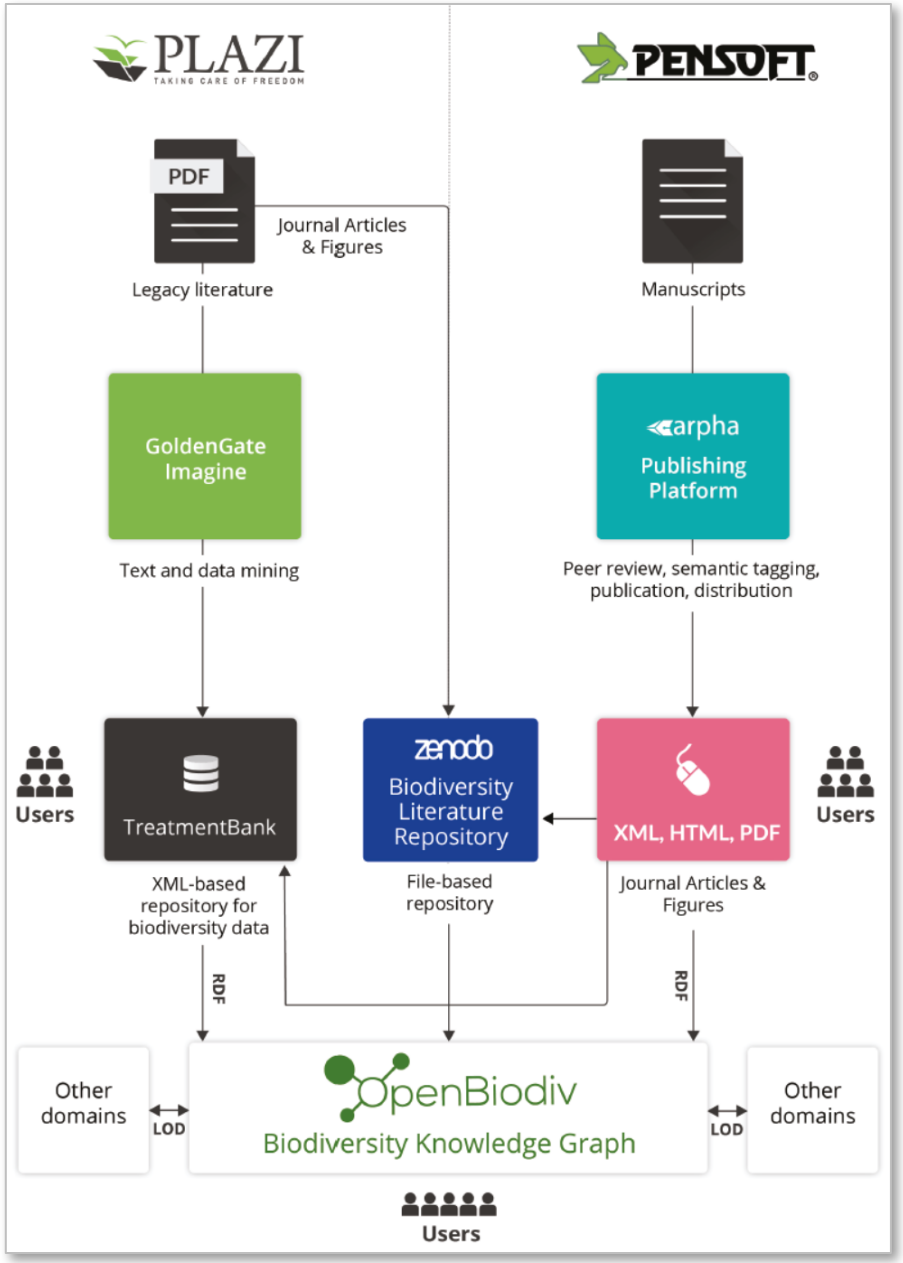
publishing

Semantically enhanced data

conversion

Semantically enhanced, **structured** data

The future will be open, semantically enhanced publishing



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Thank you!

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