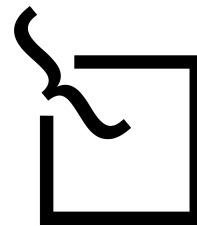


Cross-domain infrastructure for creating and maintaining WADM annotations against IIIF resources

Daniel Granville
Myriadne Wang

[10.5281/zenodo.15423975](https://doi.org/10.5281/zenodo.15423975)



Introductions

Daniel Granville

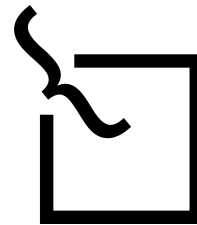
Technical Lead @ Data Futures GmbH

dan@data-futures.org

Myriadne Wang

PhD candidate @ SOAS, University of London

mw90@soas.ac.uk



Overview

Invenio RDM / Zenodo

annostor: repository annotation service

or - A cross-domain infrastructure for creating and maintaining WADM annotations against IIF resources

Example workflows

Use in PhD research

InvenioRDM



- ✓ Free
- ✓ Open source repository software platform
- ✓ FAIR
- ✓ IIIF-enabled

Powers large numbers of research data repositories internationally, including Zenodo.
Managed by CERN, with North Western, Caltech and (many) more, including Data Futures.

<https://inveniosoftware.org/>

<https://zenodo.org/>

RDM + IIIF



Supports IIIF out-of-the-box

- IIIF Preview of images

- All images available as IIIF resources

- Generates presentation manifest for any record containing images

- Native IIIF image service or integrates with existing services

Advantages

- Easy drag / drop upload

- Persistent, versioned IIIF resources

- Rich structured metadata

- Deposit multiple file types - images, annotations + non-image

Manage record

Published October 2, 2024 | Version v1

Image

Open

Manga Map

manga_map.tiff



Files (157.2 MB)

manga_map.tiff

md5:3ad20f53efba52e201c61b90cbb26f

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Inspector	Console	Debugger	Network	Style Editor					
Filter URLs			+ x 🔍	<input checked="" type="checkbox"/> Disable Cache	No Throttling				
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Holding Institution: Cama Athornan Institute

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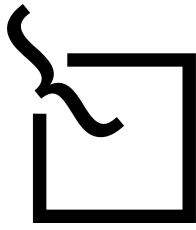

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7 (previous siglum: 091-286 [thus in both volumes]) Pahlavi Vendidad. Digitised. 2 Vols. Bound in lavish blue covers, with golden printed script on the bindings, saying "Vendidad. Vol. I/II" Av. + Phl. + Guj.; Guj. only irregularly. Modern. The scribe regularly left ample space between the individual lines of the Av. text and after the individua...

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annostor



Repository annotation service: provides external workspace for annotation-in-progress

Can annotate any IIIF source

Integrated with Zenodo, InvenioRDM-compatible

Can use multiple annotation instruments and repositories

FAIR principles

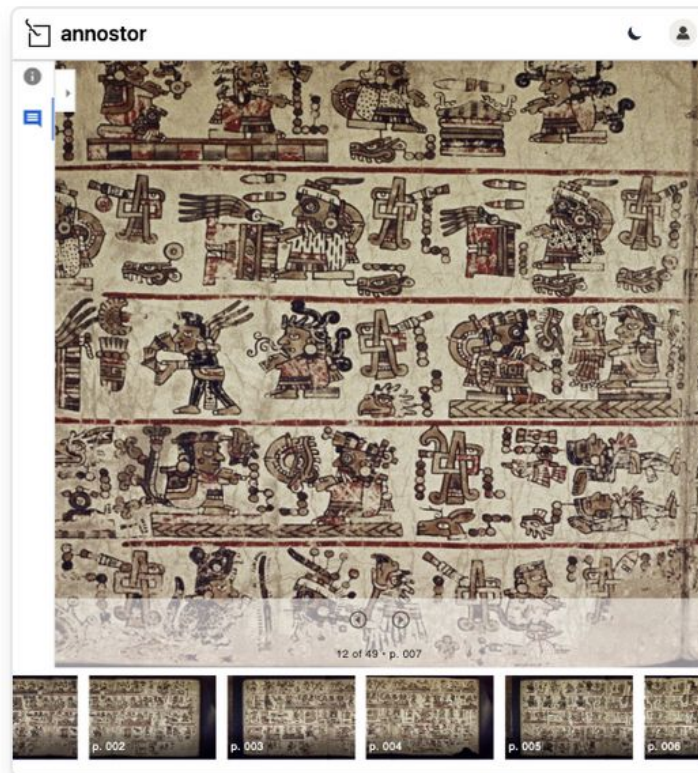
Annotate, share and preserve using standards-based technologies

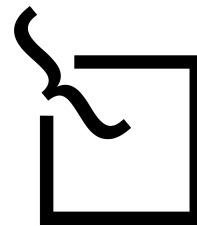
annostor empowers you to seamlessly annotate documents, videos, and images with well-known and trusted standards and technologies



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***annostor*: repository annotation service**

Import

Annotate any IIIF manifest

Import existing annotations

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Using Mirador or other instruments

Curate

Curator review and requests

Publish

Preserve in repository

Download WADM

Annotations

Showing 7 annotations

ITEM: [0007-0_DSC06803.JPG]

para.

Benedictory preface

pad nām i dādār ohrmazd

In the name of the creator Ohrmazd

pt ŠM Y d'11 whrmzd

qaa pahlavi black body

nérang regarding how to cook hadma-filter (wars), exclusive to ms.HJ (fascimile in Sanjana 1894) and manuscripts copied from it, including ms.M.Cod.Zend.53 (Haug 8), but not present in ms.TD

nérang wars poxtan nazdist dēg 1 pad pādyaib kardan ud zōhr 1 abar-kardan ud 3 sreik warš ālaxd wahrām ud andar abgandan ud wāz be-guftan wāz ohrmazd grftan xwarrah ud wars pad pādyaib be-kardan 3 ašəm vōhū ud andar dēg nihādan ud tā yōš awarēd dīyōn bē yōš abar ast ēakar 1 bār abar ud az ālaxd abar kardan brahm dīyōn az dēg abar dīdan ud dīdigar ham dīyōn ud az pēš bawēd

nīyng wls PPWN-tñ'nzdsf dyg 1 pt p'lyp BYDWN-tñ'W zwhl 1 MDM 'BYDWN-tñ'W 3 slšyk wlg bš wihl'm W BYN 'pğntñ'w'c BR 'gwptñ'w'c whrmzd 'HDWN-tñ'GDH W wls pt p'lyp BR 'kr-tñ' 3 ašəm vōhūMN bwn HLLWN-tñ'pt' hōwk ašəm vōhū MN bwn L Y L'YSH HLLWN-tñ'W MDM 'HL-k'kr-tñ'W BYN dyg HNHTWN-tñ'W D yws MDM YHYTYWN-yt' cygen BR yws MDM YT' škr 1 b1 MDM šmwltñ'W MN bš MDM 'BYDWN-tñ' bilm cygen MN dyg MDM HZYTWN-tñ'W dīyng hm cygen MN pylš YHWWN-yt'

qaa pahlavi black body

Prayer

ašəm vōhū

ave avestan black body

Prayer

ašəm vōhū

ave avestan black body

catchword

MDM

abar

qaa pahlavi black marginalia

page number

Edit annotation

TARGET

STYLE

LANGUAGE

Zoroastrian Middle Persian

SCRIPT

Pahlavi

PHONEMIC TRANSCRIPTION

B I U

pad nām i dādār ohrmazd

TRANSLITERATION

B I U

pt ŠM Y d'11 whrmzd

TRANSLATION

B I U

In the name of the creator Ohrmazd

COMMENT

B I U

para.

Benedictory preface

CRITICAL APPARATUS

B I U

PARAGRAPH

B I U

COLOR

Black

TYPE

Body

CANCEL SAVE

ID: 5E8A74E0-D48E-41E7-89B6-AAD23C785854

Published 1879–1900 | Version v1

JamaspAsa manuscript J104

Ancient India and Iran Trust, Cambridge (Research group) Data Futures GmbH (Producer)

Contributors

Project leader: Hintze, Almut
Project manager: Cornwell, Peter
Researcher: Wang, Myriane

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Ohrmazd

pt' ŠM Y d'ti' whrmzd

pad nām i dādār ohrmazd

lang: Zoroastrian Middle Persian

scr: Pahlavi type: body

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nérang regarding how to cook
haōma-filter (wars), exclusive
to ms.HJ (fascimile in Sanjana
1894) and manuscripts copied
from it, including
ms.M.Cod.Zend.53 (Haug 8),
but not present in ms.TD

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'HDWN-tñ' GōH W wls pt'

2 of 10 • 0007-0_DSC06803.JPG

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Keywords and subjects

Annotated

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DOI

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Resource type

Publication

Publisher

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Oxford Digital Scholarship MSc

Annotation in research skills training





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Publication

Open

Bodleian Library MS. Rawl. D. 252

Rawlinson, Richard

Contributors

Data manager: Data Futures GmbH

Hosting institution: University of Oxford

Researcher: Trowsdale, Elena

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Annotations on Digital Bodleian manifest.

Abbreviated from the Quarto Catalogue (W. D. Macray, Catalogi codicum manuscriptorum Bibliothecae Bodleianae...viri munificentissimi Ricardi Rawlinson, J.C.D., codicum...complectens, Quarto Catalogus V, 5 fascicles, 1862–1900).

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0001.jpg

Annotations

11111 scripte a sommewell: unique ampersand, meaning 'et'. Evidence for this in: Albert Derolez, The Palaeography of Gothic Manuscript Books: From the Twelfth to the Early Sixteenth Century (Cambridge: Cambridge University Press, 2003).

Description Latin Text

Ego guiro te sibilam per patre et film

Latin Holy Trinity Text

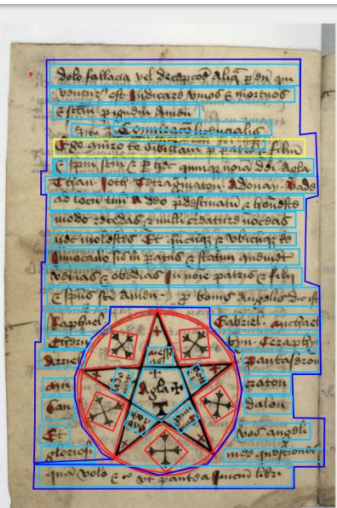
Transcription

dolo fallacia vel [de corpore] aliquis per en que

Latin Text Transcription

Reference

... by trickery or deceit, or by someone from the body through which he will come by fire to tell the empty, the dead and the spirit, amen. Literature of conjuration (?) 1 command



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Resource type

Publication

Publisher

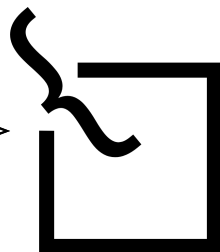
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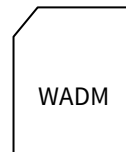
Bodleian Libraries
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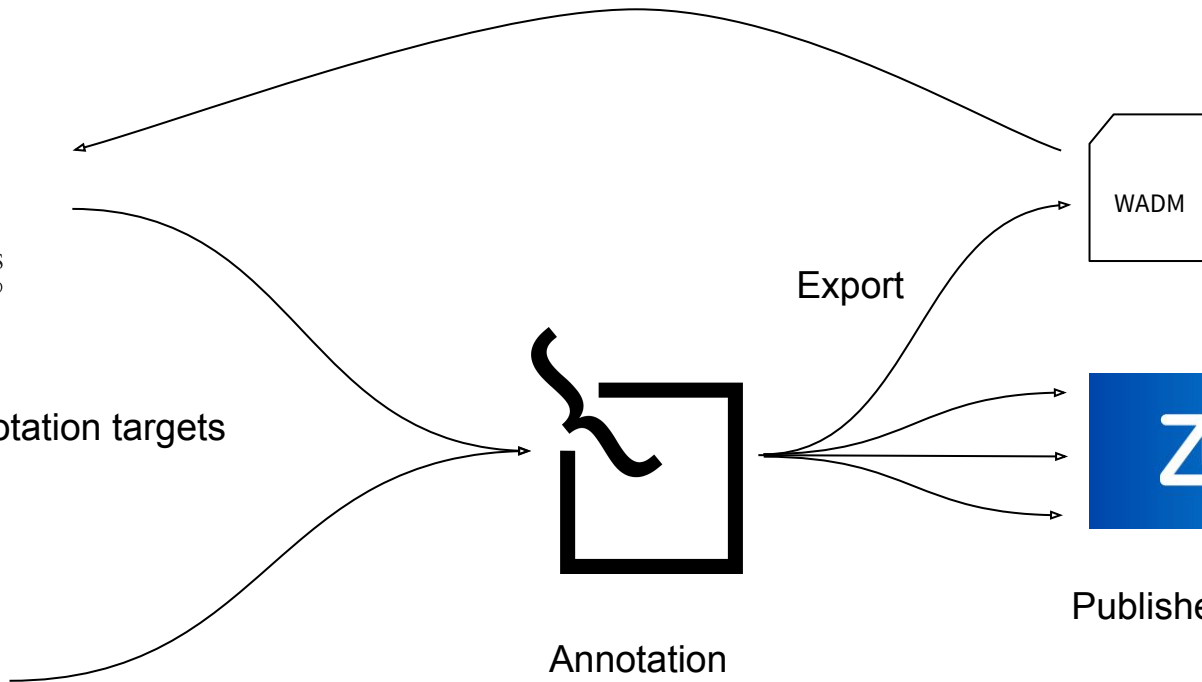


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Published WADM collections



Plazi Treatment Bank

Enhancing metadata for biodiversity data liberation





Liberated Data

Published 2022 | Version v1

Journal article

A new species of silverside of the genus *Odontesthes* (Atheriniformes: Atherinopsidae) with hypertrophic lips from a high-altitude basin in Southern Brazil

Wingert, Juliana M. ; Ferrer, Juliano ; Neves, Mayara P. ; Baumgartner, Dirceu ; Malabarba, Luiz R.

Contributors

Data collector: Plazi

Rights holder: 2022 by the American Society of Ichthyologists and Herpetologists

Abstract

Odontesthes crossognathos, espécie nova, é descrita da bacia do rio Pelotas, alto rio Uruguai, sul do Brasil. A nova espécie é facilmente diagnosticável por possuir lábios hipertrofiados com numerosas papilas dérmicas, caráter ausente em outras espécies do gênero. A nova espécie também se distingue das congêneres, exceto de *O. humensis*, por ter a mandíbula superior distintamente mais longa do que a inferior e a boca subterminal. Essas adaptações na morfologia da boca provavelmente estão relacionadas ao comportamento de forrageamento da nova espécie, que habita rios de corredeiras e fundos rochosos em uma bacia de altitude elevada.

Files

Wingert et al., 2022, *Odontesthes crossognathos.pdf*

A New Species of Silverside of the Genus *Odontesthes* (Atheriniformes: Atherinopsidae) with Hypertrophic Lips from a High-Altitude Basin in Southern Brazil

Juliana M. Wingert¹, Juliano Ferrer¹, Mayara P. Neves^{1,2}, Dirceu Baumgartner¹ and Luiz R. Malabarba¹

Odontesthes crossognathos, new species, is described from the Pelotas River basin, upper Uruguay River, southern Brazil. The new species is easily diagnosed by the possession of hypertrophied lips bearing numerous dermal papillae, character absent in other species of the genus. The new species is also distinguished from congeners, except *O. humensis*, by having the upper jaw distinctly longer than the lower jaw and a subterminal mouth. These mouth morphological adaptations are probably related to the foraging behavior of the new species, which inhabits rivers with rapids at rocky bottoms in a high-altitude basin.

Odontesthes crossognathos, espécie nova, é descrita da bacia do rio Pelotas, alto rio Uruguai, sul do Brasil. A nova espécie é facilmente diagnosticável por possuir lábios hipertrofiados com numerosas papilas dérmicas, caráter ausente em outras espécies do gênero. A nova espécie também se distingue das congêneres, exceto de *O. humensis*, por ter a mandíbula superior distintamente mais longa do que a inferior e a boca subterminal. Essas adaptações na morfologia da boca provavelmente estão relacionadas ao comportamento de forrageamento da nova espécie, que habita rios de corredeira e fundos rochosos em uma bacia de altitude elevada.

SILVERSIDES of the genus *Odontesthes*, (Atheriniformes: Atherinopsidae) with hypertrophic lips, character absent in other species of the genus, are widespread throughout freshwater drainages and coastal marine waters of southern South America. *O. humensis*, and *O. retropinnis* are widespread in the lower Paraná and lower Uruguay River basins. *O. humensis* occurs in the Fatos and Mirim lagoons; *O. retropinnis* occurs in the Fatos and Mirim lagoons; *O. humensis* and *O. retropinnis* are widespread in the lower Paraná and lower Uruguay River basins.

1. of 10 - page-01.png

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Additional details

Identifiers DOI
10.1643/2021136

External resources

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ITEM: [PAGE-03.PNG]

treatment1

treatment1

nomenclature3

- in treatment1

multiple1

- in treatment1

multiple1

- in treatment1

Odontesthes crossognathos

taxonomicName2

- in nomenclature3

682

Ichthyology & Herpetology: 110, No. 4, 2022

A

B




Fig. 1. *Odontesthes crossognathos*, in lateral view. (A) Holotype, UFRGS 27180, 183.7 mm SL, Invernadinha Stream, tributary to the Pelotas River in the locality of Luizinho, upper Uruguay River basin, municipality of São Joaquim, Santa Catarina State, Brazil; (B) paratype, UFRGS 28745, 103.2 mm SL, collected with the holotype.

5.5.6, and the alignment was performed using Clustal W (Thompson et al., 1994) under default parameters implemented in BioEdit 7.1.3.0 (Hall, 1999). Forward and reverse sequences were inspected by eye and any obvious mistakes corrected. Sequences, including those obtained from the holotype and one paratype, were uploaded to GenBank and accession numbers are listed in Table 1. A sequence of *Odontesthes argentinensis* was obtained from GenBank (Table 1).

The haplotype distribution, including the number of haplotypes and haplotype diversity, was calculated in the software DNASP v. 6 (Rozas et al., 2017). The median-joining network method was used for haplotype network construction (Bandelt et al., 1999) implemented in the PopART 4.8.4 software (<http://popart.otago.ac.nz>). The haplotype network graphics are composed of circles that represent the haplotypes, with circle size proportional to the number of individuals. The number of mutational steps between haplotypes is represented by crossed markers in the branches that connect the haplotypes. Median vectors are also showed being sequences of hypothetical haplotypes. Posteriorly, the network graphic was edited in the Adobe Illustrator CC version 21.0.1. Neighbor joining (NJ) and maximum likelihood (ML) analyses were conducted with 500 bootstraps, and Kimura 2 substitution model using MEGA X (Tamura et al., 2021).

Odontesthes crossognathos new species

urn:lsid:zoobank.org:act:8DAF49E8-AB63-4217-A884-ABBD5C3815AD

Figures 1–3, Table 2

Odontesthes sp.—Dehariva et al., 2019: pg. 8 (check list from Pelotas River); pg. 10, fig. SN (photograph in lateral view); pg. 11 (comparison with congeners from Uruguay River basin).

Holotype.—UFRGS 27180, 183.7 mm SL, Invernadinha Stream, tributary to the Pelotas River in the locality of Luizinho, upper Uruguay River basin, municipality of São Joaquim, Santa Catarina State, Brazil, 28°26'27.9"S, 49°53'17.8"W, J. Chuctaya, L. R. Malabarba, L. Sanches, M. Souza, and P. M. Ito, 28 March 2019. Tissue code in the UFRGS collection: TEC: 9265A. GenBank accession number for COI: OI.629033.

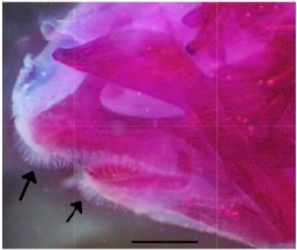


Fig. 2. Snout of *Odontesthes crossognathos*, in lateral view, anterior to left, paratype, UFRGS 28830, CS, 134.6 mm SL. Arrows indicate the dermal papillae. Scale bar = 2 mm.

Edit annotation

TARGET

STYLE

ANNOTATION TYPE

taxonomicName

RANK:

Genus

NOTES

B I

Odontesthes crossognathos

CANCEL SAVE

METADATA

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3 of 10 • page-03.png



A new species of silverside of the genus *Odontesthes* (Atheriniformes: Atherinopsidae) with hypertrophic lips from a high-altitude basin in Southern Brazil

Wingert, Juliana M. ; Ferrer, Juliano ; Neves, Mayara P. ; Baumgartner, Dirceu ; Malabarba, Luiz R.

Contributors

Annotator: Simoes, Felipe Lorenz

Data collector: Plazi

Rights holder: 2022 by the American Society of Ichthyologists and Herpetologists

Work package leader: Data Futures GmbH

Abstract

Odontesthes crossognathos, espécie nova, é descrita da bacia do rio Pelotas, alto rio Uruguai, sul do Brasil. A nova espécie é facilmente diagnosticável por possuir lábios hipertrofiados com numerosas papilas dérmicas, caráter ausente em outras espécies do gênero. A nova espécie também se distingue das congêneres, exceto de *O. humensis*, por ter a mandíbula superior distintamente mais longa do que a inferior e a boca subterminal. Essas adaptações na morfologia da boca provavelmente estão relacionadas ao comportamento de forrageamento da nova espécie, que habita rios de corredeiras e fundos rochosos em uma bacia de altitude elevada.

Annotator
attribution

Files

Wingert et al., 2022_Odontesthes crossognathos.pdf

In-band
annotation viewing

Annotations

Showing 6 annotations

ITEM: [PAGE-03.PNG]

Odontesthes crossognathos

taxonomicName2 species

treatment

treatment1

treatment

treatment1

subSubSection

crossed markers in the branches that Median vectors are also showed bein ical haplotypes. Posteriorly, the netw the Adobe Illustrator CC version 24.0 and maximum likelihood (ML) analy 500 bootstraps, and Kimura 2 substit X (Tamura et al., 2021).

Odontesthes crossognathos, new sp. urn:lsid:zoobank.org:act:8DAF49EB-A ABB05C3815AD Figures 1–3, Table 2

Odontesthes sp.—Delariva et al., 201 Pelotas River); pg. 10, fig. 5N (pho p. 1 (co)paris(4) with conger basin).

3 of 10 · page-03.png

Files (1.7 MB)

Additional details

Identifiers

DOI

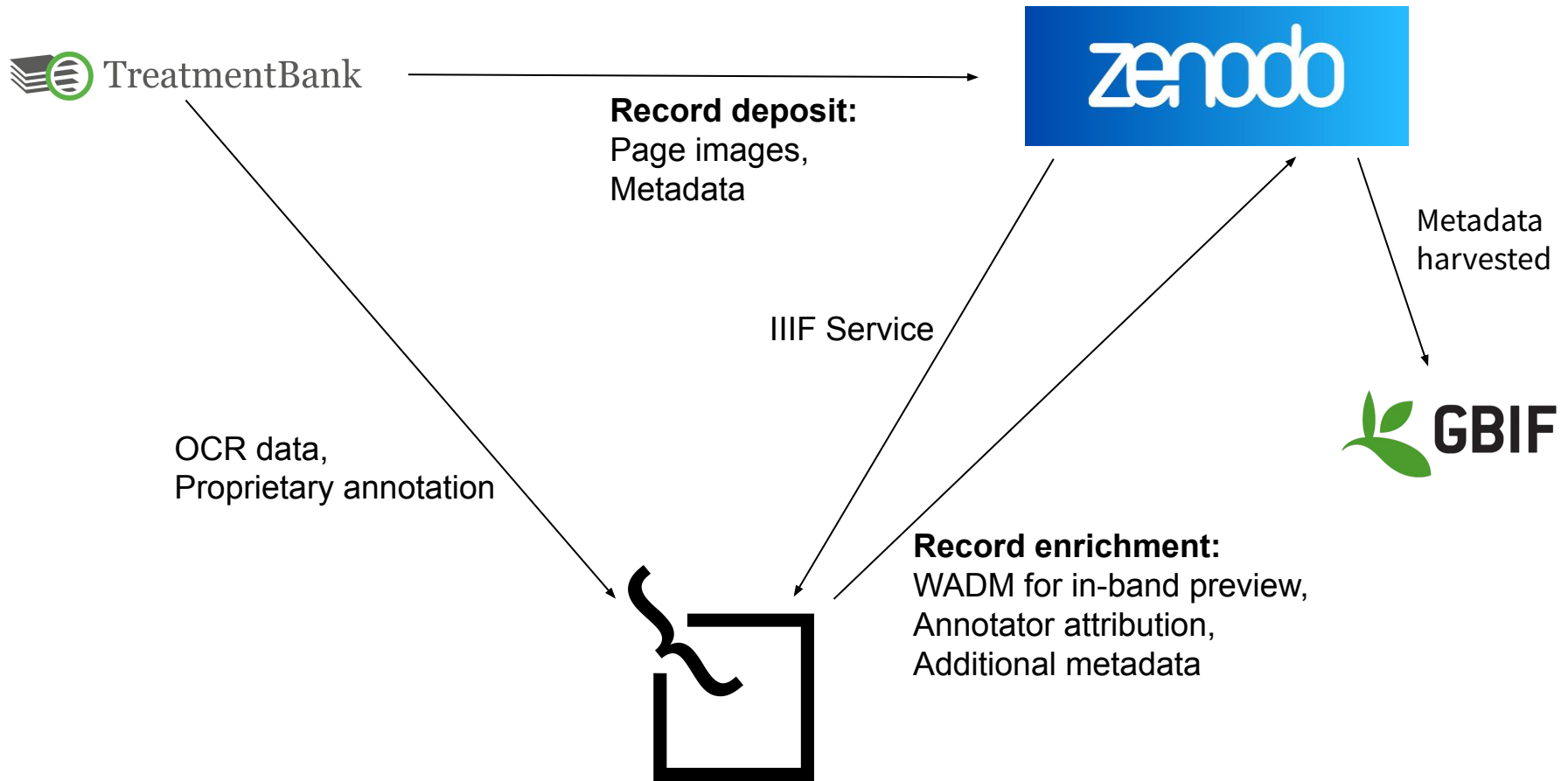
10.1643/2021136

Biodiversity

Species

Odontesthes crossognathos

Taxonomic names
from annotation -
harvested by GBIF



Tasks: OCR correction, classification of taxonomic terms, author identification



Structured Data from Historic Sources

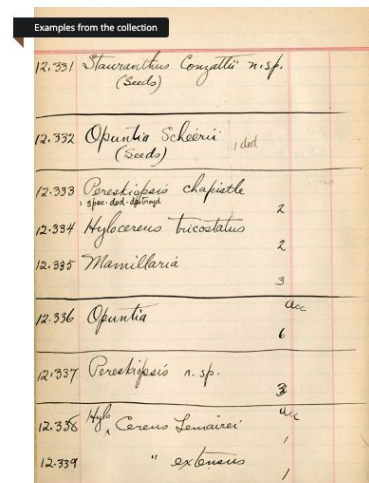
This repository supports a pilot project investigating extraction of structured taxonomic data products from a wide range of historic document types, as well as recent typeset and born-digital publications. Based initially on a corpus of Smithsonian field notebooks comprising primarily hand-written material and pasted-in photographs, the project builds on an existing project using AI to extract text and provide workflows for human checking and correction of text recognition.

Using Free and Open Source Software these individual outputs are delivered in a single repository interface using the International Image Interoperability Framework (IIIF) and W3C's Web Annotation Data Model (WADM). The InvenioRDM repository platform—which also supports the European Commission's Zenodo international repository for research data—provides standards-based APIs enabling external infrastructures and users to search and access data at scale, and creates the foundation for new AI-based analyses and services.


BHL Data: Workflow Assessment and Long-Term Enrichment


During the next six months additional corpora from the Biodiversity Heritage Library Partner Organizations will contribute a wide range of source material types, including early print publications, enabling assessment of workflows for managing long-term enrichment—including citizen science—and preservation of connections between data products and source material locations using persistent identifiers.

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ITEM:

[SMITHSONIANAFRI1MEAR_0057.J
P2]

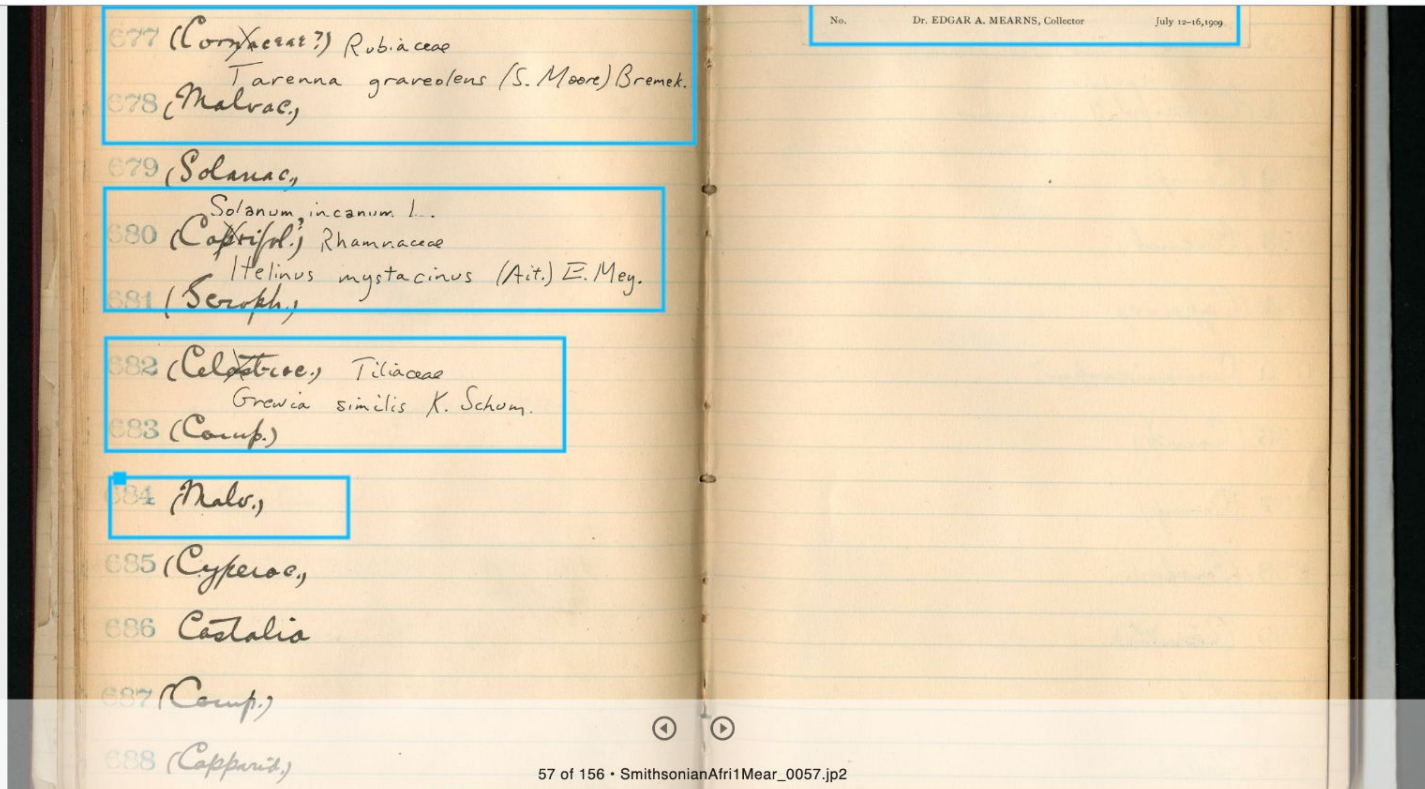
Malo.,
transcription

South side of Lake Naivasha,
British East Africa; altitude
1870 meters. July 12-16, 1909
collectionLocation 184706

Tiliaceae Grewia similis
K.Schum.
taxonomicName Grewia similis
K.Schum

taxonomicName Rhamnaceae
Itelinus mystacinus E.Mey

taxonomicName Tarenna
graveoleus S.Moore



57 of 156 • SmithsonianAfri1Mear_0057.jp2



Zoroastrian Manuscript Research



Yasna sādah Arundel Or 54

SOAS University of London ; British Library ; Data Futures GmbH 

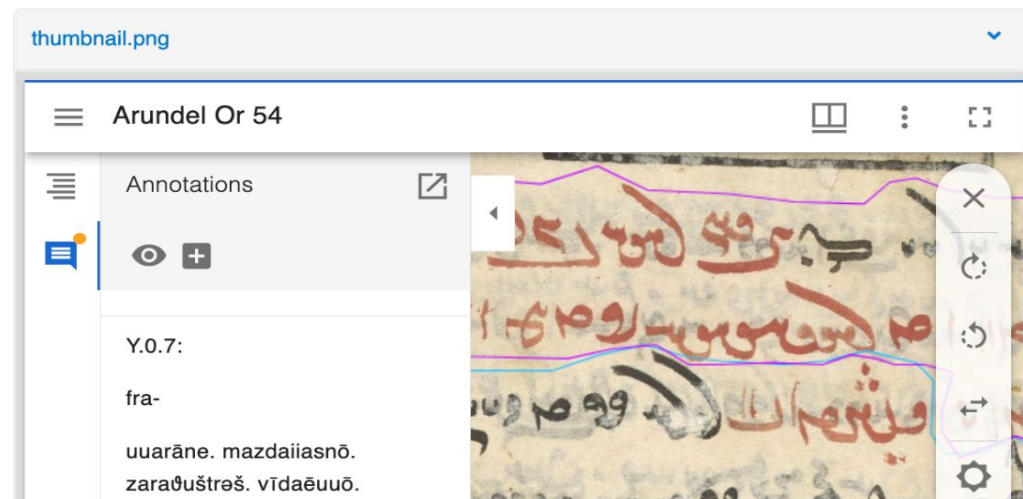
Project leader: Hintze, Almut¹  **Data manager:** Granville, Daniel² 

Researchers: Iskandar, Ding¹ ; Wang, Myriadne¹  **Project manager:**

Cornwell, Peter^{2, 3, 4}  **Data collector:** Sims-Williams, Ursula⁵ 

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Preview



Details

PIDs

DOI [10.5281/zenodo.8359113](https://doi.org/10.5281/zenodo.8359113)

HDL [20.500.14202/hasdai.4yygp-w0396](https://hdl.handle.net/20.500.14202/hasdai.4yygp-w0396)

Resource type

Annotation collection

Publisher

SOAS University of London

Languages

Avestan, Pahlavi, English

Rights



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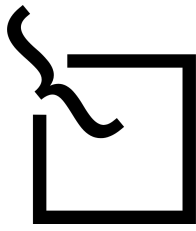
IIIF manifest

Export

Annotations
(WADM)

Export

Avestan: canonical language of Zoroastrianism



Development of repositories for key collections of manuscripts, which are the only surviving sources for the oral tradition of Avestan texts dating from 1500 BCE

- Cama Athornan Institute, Mumbai
- JamaspAsa Collection, Ancient India and Iran Trust, Cambridge
- Royal Asiatic Society, London

InvenioRDM corpus repositories, providing tailored annotation workflows and digital preservation of endangered physical sources

- WADM transcription via annotations: discoverable and citable
- supports collation for text-critical analysis of multiple witnesses
- creation of digital editions and analysis of scribes' impact on transmission

Issues arising in scholarly techniques exemplified by transmission of the Hērbedestān text

Wang, Myriadne ; Data Futures GmbH (Data curator) ; Ancient India and Iran Trust, Cambridge (Hosting institution) ;
Royal Asiatic Society (Hosting institution) ; Bayerische Staatsbibliothek, München (Hosting institution) 

The process of copying manuscripts, as exemplified by the transmission of the Hērbedestān (H) text through ms. J104, ms. M53 and West's modern transcription of ms. M53 in his Notebook 9, highlights the meticulous yet variable transmission techniques of scribes and scholars across centuries.

Looking closely at manuscripts ms. J104 and M53, both derived from the same ms. HJ, we uncover the intricate scribal practices employed by medieval Iranian Zoroastrian scholars to ensure textual accuracy and coherence. One recurring feature is the meticulous correction of errors within the text. In ms. M53, for example, the heterogram 'PPWN-tñ' in the nērang text is corrected from the erroneous verbal complement -yt to -tñ', transcribed to Pahlavi poxtan (see annotation ID 7E79DE69, 91E23EC8). Additionally, the physical constraints of the manuscript medium influenced scribal techniques, as illustrated in the first folio of ms. M53. Here, due to insufficient space at the end of the second line, the final two characters /xš/ of the word 'txš' are cramped above the line (annotation ID 7B89BC4F). Notably, West's modern transcription in Notebook 9 omits marking the above-the-line placement of /xš/ and copies only the standardised second-hand writing (annotation ID C2579CC5).

The comparison between manuscripts J104 and M53 both derived from HJ further illuminates the mechanisms of textual transmission. One notable feature is the consistent blank space found before the Avestan passage H 1.1 (hē...) in HJ and its derivatives, including J104 and M53 (annotation ID E2D0582B, 25BA3EAB). This space, spanning 2–5 characters, likely reflects an omission of some characters in the HJ tradition, with the original text potentially reconstructed as nmānahe or kō hē, based on the comparison with TD's reading knmō nmānahe. A more plausible reconstruction reads nmānahe aḍaurunem paraiiāt 'one should go forth from the house to religious study'. Notably, this omission spans both the Avestan term for "house" (nmāna-) and its Pahlavi equivalent (mēhan) in the HJ manuscript tradition, which further corroborates the hypothesis that these words were lost in transmission. This gap underscores the differences between the HJ and TD manuscript traditions and their respective fidelity to the Urtext.

West's transcription of ms. M53 in Notebook 9 demonstrates the modern scholar's role in meticulously collating variations between manuscripts (see annotation ID 079B5DA0 and 8D7CDAE0). For example, in the Pahlavi passage following the Avestan H 1.1, West copies the heterogram MN (az 'from') from ms. M53 (annotation ID 23D85820). When collating with ms. TD, he notes the addition of a vertical stroke, transforming MN (az 'from') to MNW (kē 'who'). West records this change by adding the stroke in red ink, highlighting its absence in M53. Additionally, TD's text includes 'L m'hñ' (ō mēhan 'to the house'), absent in M53, which West marks with a red circled insertion (see annotation ID 6AAE5191).

Similar attention to detail characterises his handling of the second heterograms MN in Pahlavi translation of H 1.1 (see annotation ID 0748C883, 69B35B72), where TD adds m'hñ' (mēhan), noted by West with a circled red insertion (annotation ID E32D0E22).

This comparative study of J104, M53, and West's transcription illustrates the layered process of textual transmission, where both historical scribes and modern transcribers preserved and refined their sources.

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≡ Edward West Notebook 9

Annotations

As in the case of the text written as MN found in the beginning of the line, here in M53 and other HJ derived mss, we find MN with a blank space, compared with the reading in TD: MN m'hn' /az mēhan/ 'from the house'. In copying the reading M53, West collates it with TD, indicating the word m'hn' /mēhan/ that is only found in TD with a circled insertion in red ink.

MN [...]

MN m'hn' TD

MN

az

qaa pahlavi black

body

≡ JamaspAsa manuscript J104

Annotations

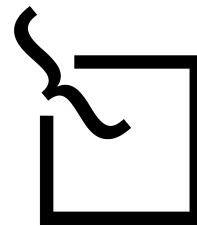
Compare the corresponding part in M53 and see the comment, it is clearly shown that there is a space after the word MN.

It is common to all manuscripts belonging to HJ tradition. The text should be

Wie man die Hōm-Filter (vars) auskochen soll, in Pahlavi. ...

Annotations

Similar to the beginning of the Pahlavi translation of H 1.1, here in the Pahlavi commentary of H 1.1, after the word MN, a blank space to an extent of 5 or so letters is found, in manuscripts belong to HJ tradition. By contrast, TD reads MN m'hn' I propose to



Conclusion

Thank you for listening

Please catch us this week if you'd like to find out more, or -

dan@data-futures.org mw90@soas.ac.uk

<https://zenodo.org/records/13328527>

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Thank you to the IIF community for creating and championing the standards that enable these workflows

Special thanks to Project Mirador and the Invenio RDM partners