iDigPaleo & ePANDDA

Digital infrastructure and tools for collection discovery and use

Susan Butts[1], Talia Karim[2], Chris Norris[1] & Dena Smith[2,3]

(1) Yale University, (2) University of Colorado, (3) Geological Society of America

THE PHYLOGENY OF THE OREODONTS

PART 1: MERYCOIDODONTINAE, EPOREODONTINAE, AND LEPTAUCHENIINAE, THREE SUBFAMILIES OF OREODONTS, WITH AN APPENDIX TO THE REVISION OF THE MERYCOIDODONTIDAE

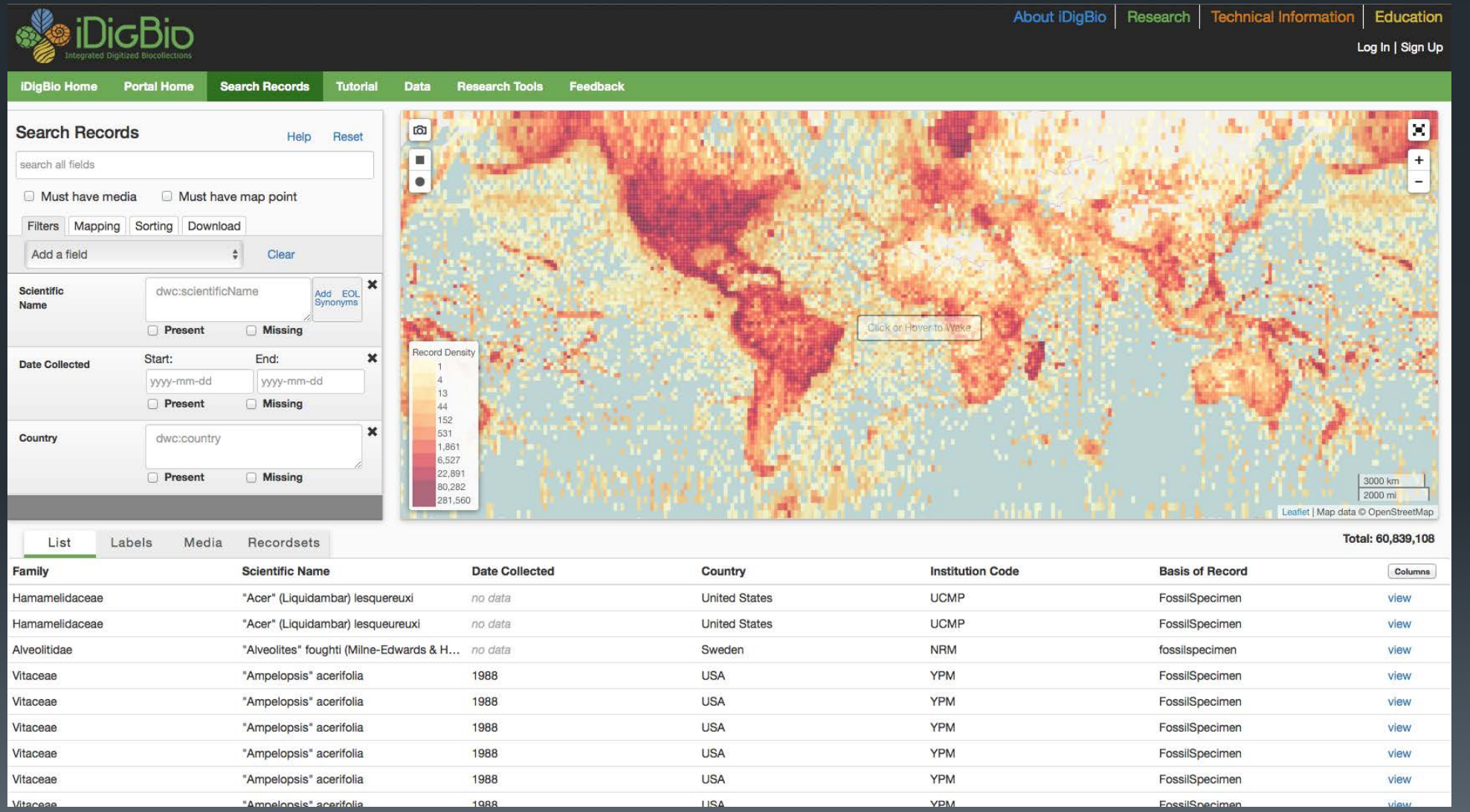
PART 2: SUMMARY AND CONCLUSIONS CONCERNING THE MERYCOIDODONTIDAE

C. BERTRAND SCHULTZ
Director of the University of Nebraska State Museum
Regents Professor of Geology, the University of Nebraska

CHARLES H. FALKENBACH
Late Assistant Curator, Frick Laboratory
The American Museum of Natural History
Research Associate, University of
Nebraska State Museum

EIGHTH CONTRIBUTION TO THE REVISION OF THE OREODONTS (MERYCOIDODONTIDAE), SUBFAMILIES 9, 10, AND 11
PUBLICATION OF THE FRICK LABORATORY IN COOPERATION WITH THE UNIVERSITY OF NEBRASKA STATE MUSEUM

BULLETIN
OF THE
AMERICAN MUSEUM OF NATURAL HISTORY
VOLUME 139 NEW YORK : 1968



Family	Scientific Name	Date Collected	Country	Institution Code	Basis of Record	
Hamamelidaceae	"Acer" (Liquidambar) lesquereuxi	*no data*	United States	UCMP	FossilSpecimen	view
Hamamelidaceae	"Acer" (Liquidambar) lesqueureuxi	*no data*	United States	UCMP	FossilSpecimen	view
Alveolitidae	"Alveolites" foughti (Milne-Edwards & H…	*no data*	Sweden	NRM	fossilspecimen	view
Vitaceae	"Ampelopsis" acerifolia	1988	USA	YPM	FossilSpecimen	view
Vitaceae	"Ampelopsis" acerifolia	1988	USA	YPM	FossilSpecimen	view
Vitaceae	"Ampelopsis" acerifolia	1988	USA	YPM	FossilSpecimen	view
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Vitaceae	"Ampelopsis" acerifolia	1988	USA	YPM	FossilSpecimen	view
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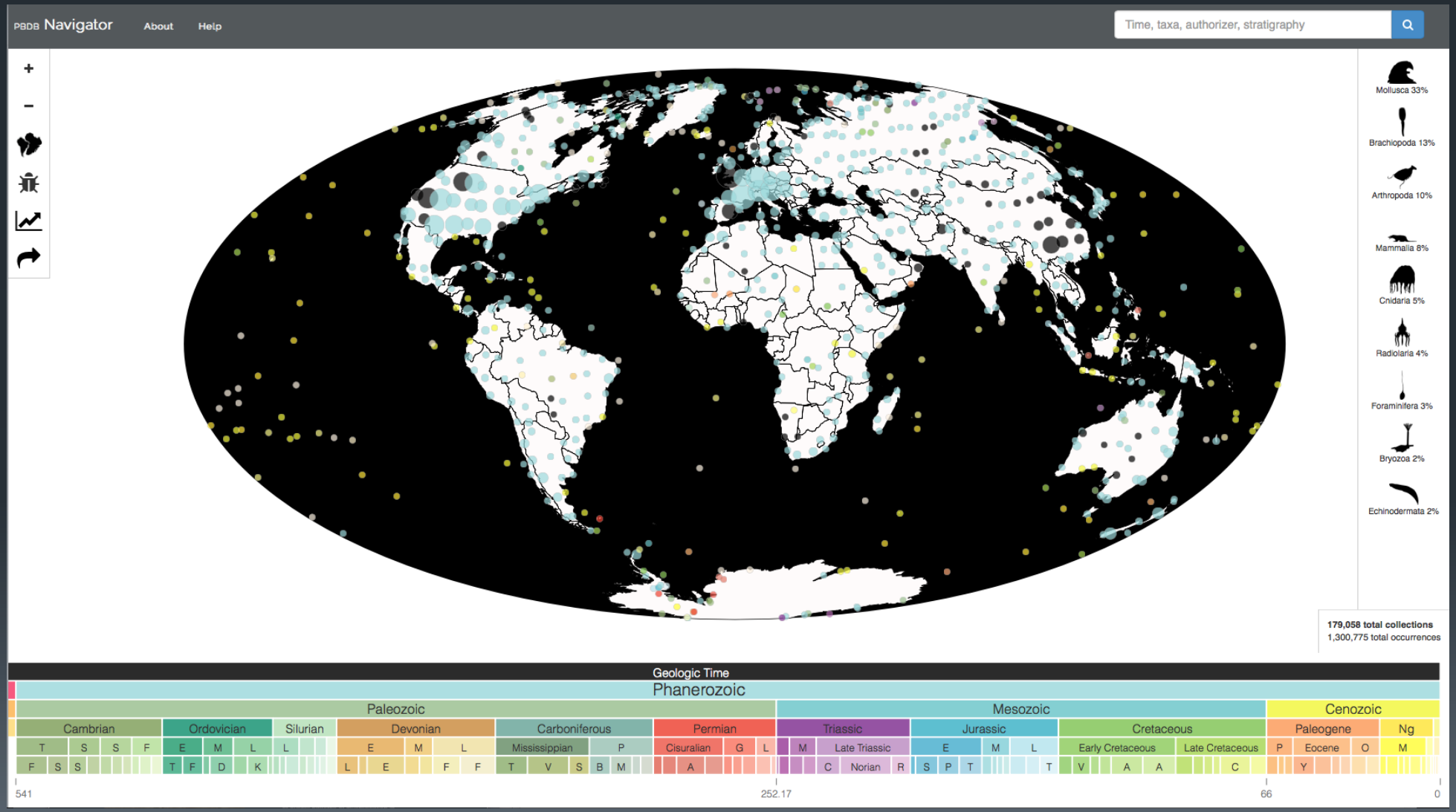
DigPaleo


PBDB Navigator
About
Help
Time, taxa, authorizer, stratigraphy
Mollusca 33%
Brachiopoda 13%
Arthropoda 10%
Mammalia 8%
Cnidaria 5%
Radiolaria 4%
Foraminifera 3%
Bryozoa 2%
Echinodermata 2%
179,058 total collections
1,300,775 total occurrences
Geologic Time
Phanerozoic
Paleozoic
Mesozoic
Cenozoic
Cambrian
Ordovician
Silurian
Devonian
Carboniferous
Permian
Triassic
Jurassic
Cretaceous
Paleogene
Ng
Mississippian
Cisuralian
Late Triassic
Norian
Early Cretaceous
Late Cretaceous
Eocene
541
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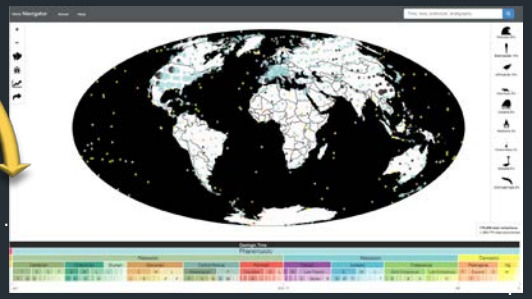
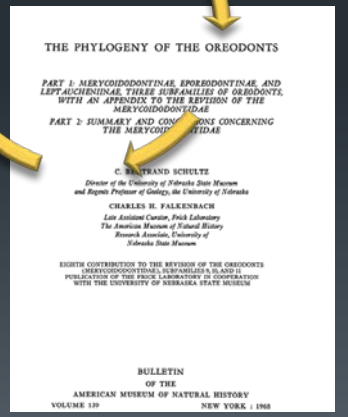
DigPaleo





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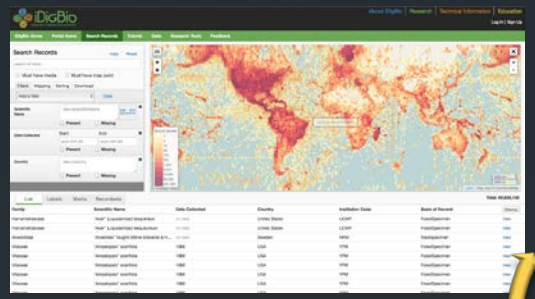
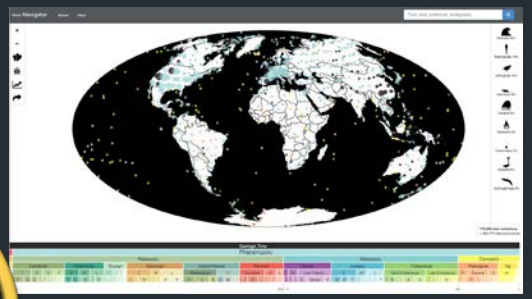




ePANDDA: seamless linkage of paleontological data from multiple sources

iDigPaleo: tools for discovering, saving, and sharing paleontological data

fossil insect COLLABORATIVE

DigPaleo

TCN: Fossil Insect Collaborative: A Deep-Time Approach to Studying Diversification and Response to Environmental Change

- Lead PIs: University of Colorado Museum of Natural History – Dena Smith (also now STEPPE GSA) and Talia Karim
- YPM PIs: Susan Butts and Chris Norris

NSF

fossil insect COLLABORATIVE

DigPaleo

YPM-IP.1002 *Dunbaria fasciipennis* Holotype

Digitize and make available all the major collections of fossil insect specimens in the United States

Research Goals

- understand responses to environmental change and patterns of biodiversity through time
- phylogenetic reconstruction, evolution of morphological characteristics, and studies of overall patterns of diversification in deep time

Virginia Museum of Natural History
In association with the Smithsonian Institution

American Museum of Natural History

PEN

The Field Museum

DigPaleo

Harvard University
Museum of Comparative Zoology

KU Biodiversity Institute & Natural History Museum
The University of Kansas

PEN

University of California Museum of Paleontology

Smithsonian
National Museum of Natural History

National Park Service

Yale Peabody Museum

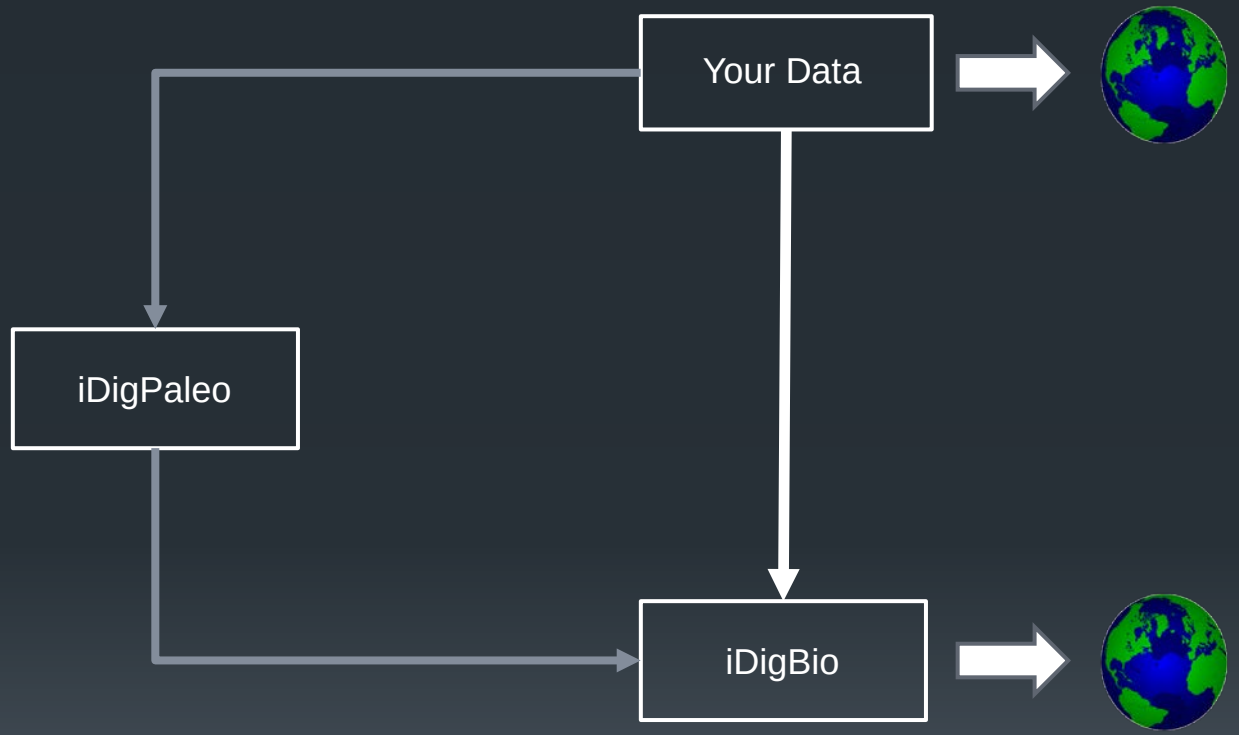
Boulder

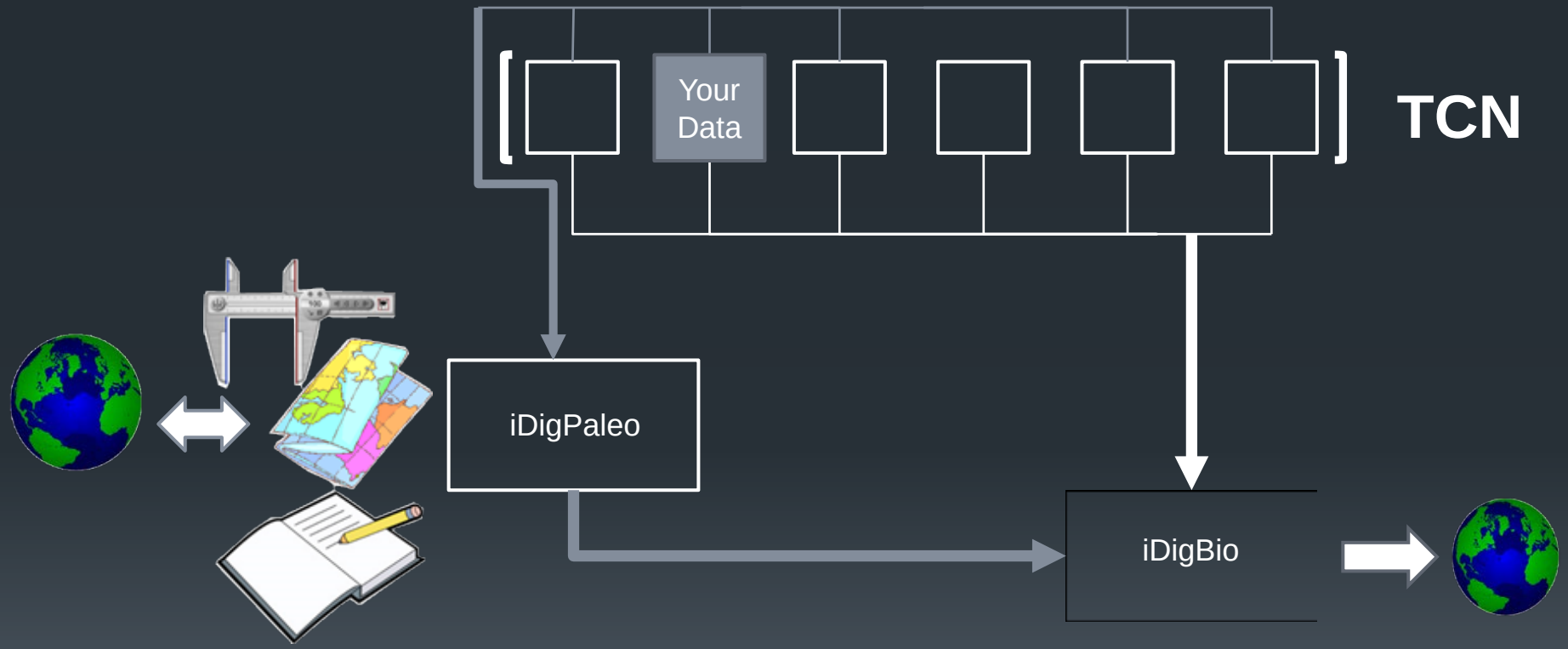
Illinois Natural History Survey
Prairie Research Institute

DigPaleo

DigPaleo

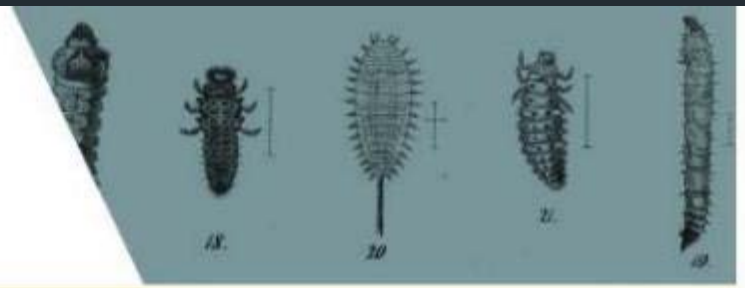
- Aggregate data from fossil insect project
- Provide tools for educational access to these data


Your Data
iDigPaleo
iDigBio


Your
Data
TCN
iDigPaleo
iDigBio

fossil insect COLLABORATIVE

Making data and images of millions of insect specimens available on the web



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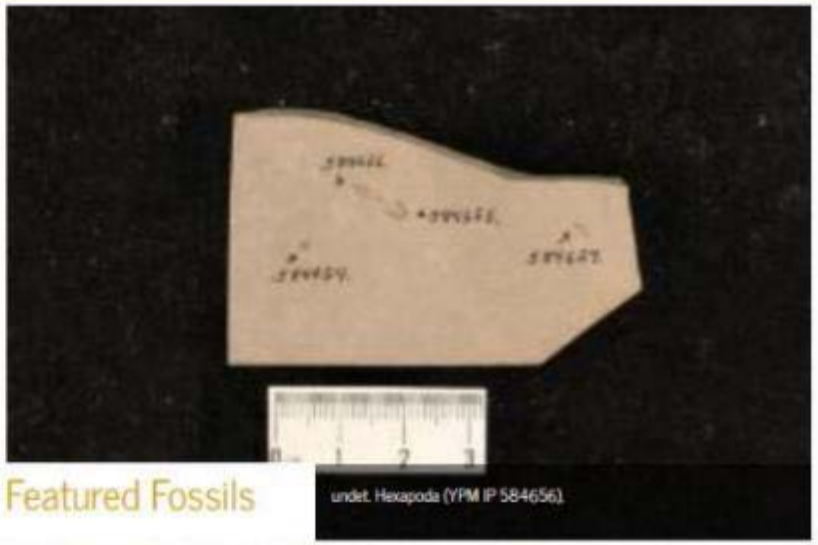


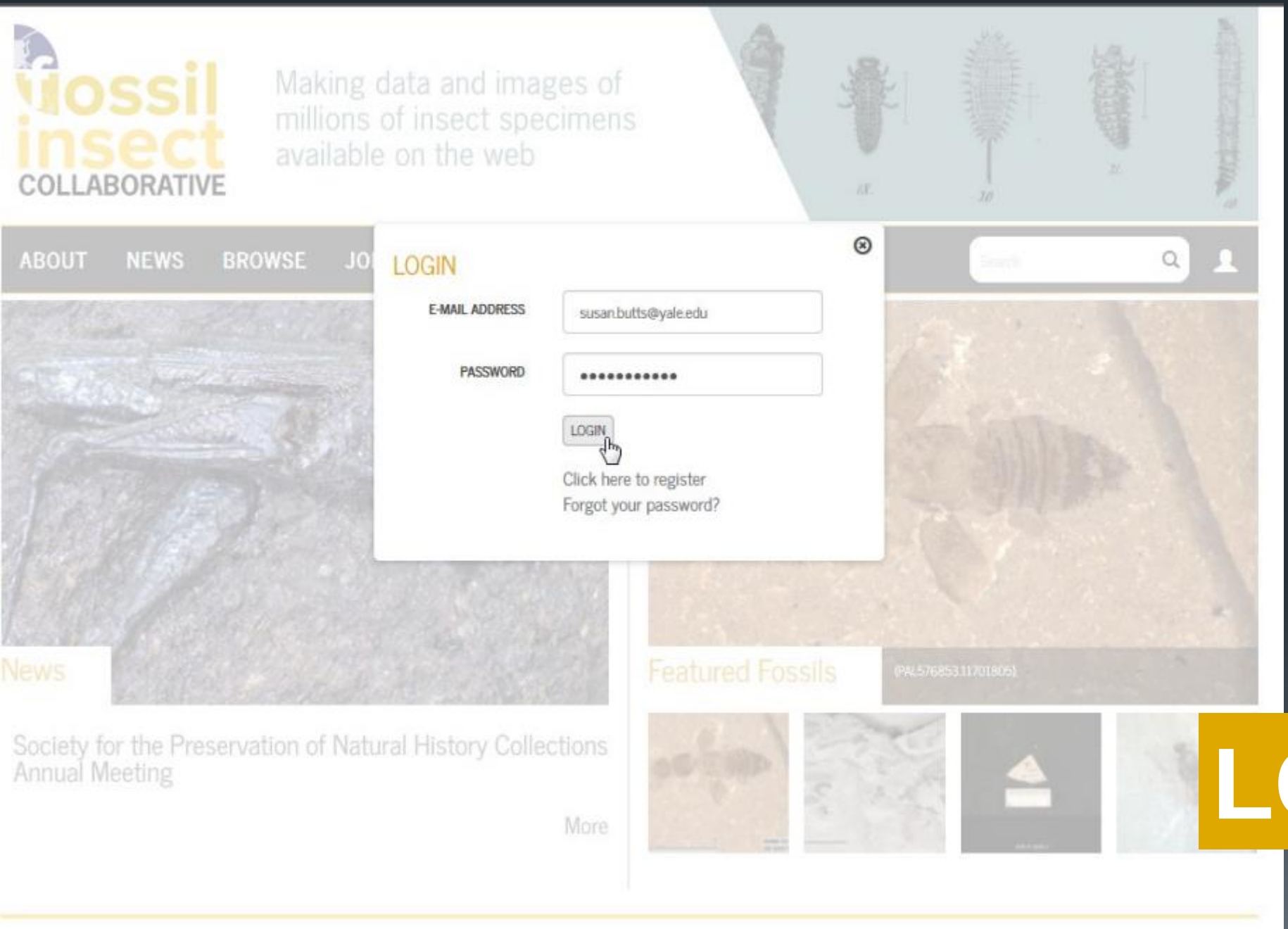
undet. Hexapoda (YPM IP 584656)

Featured Fossils

YPM IP 585232

Latest Comments

Featured Institution



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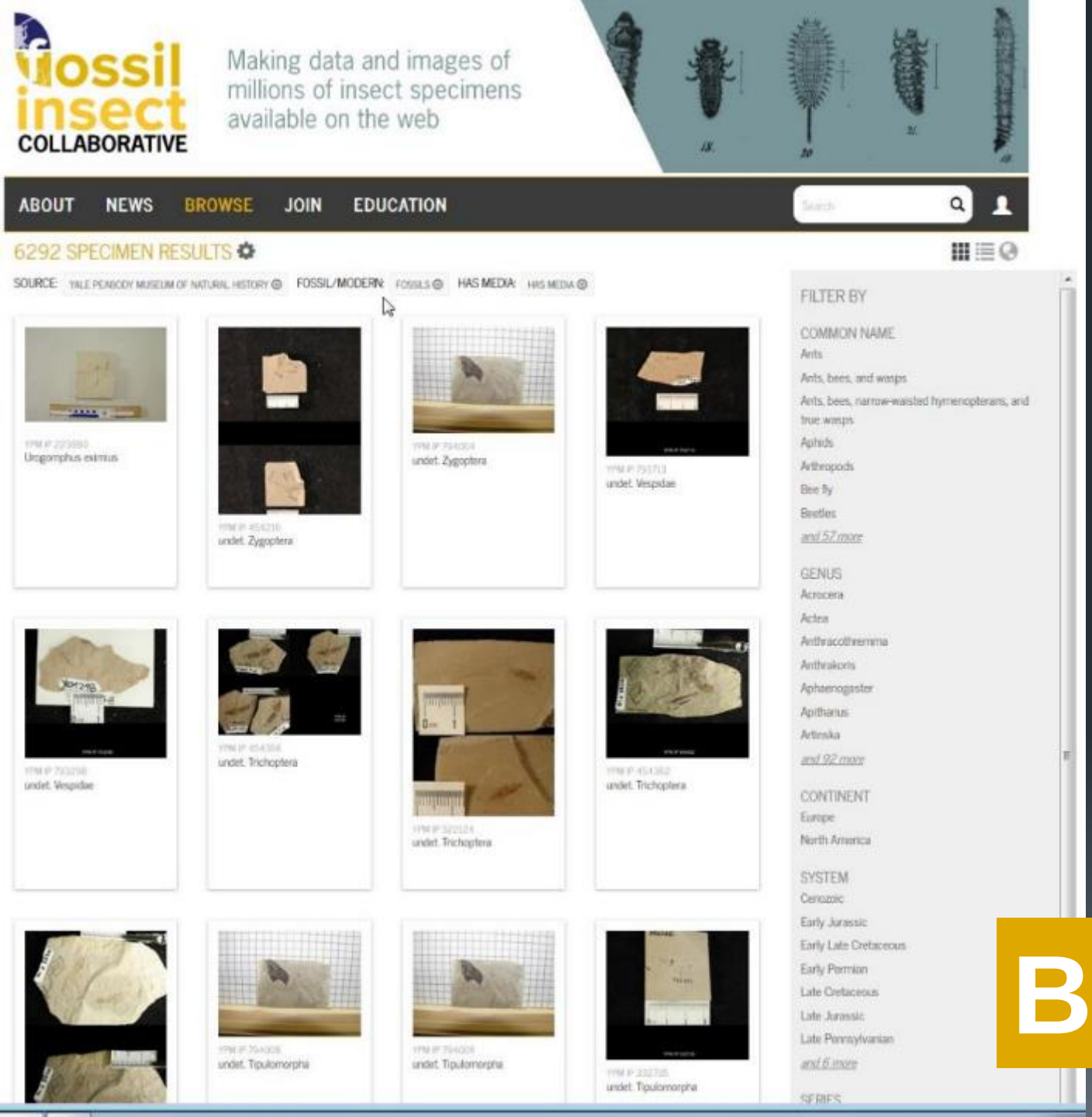
LOGIN



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BROWSE

fossil insect COLLABORATIVE

Making data and images of millions of insect specimens available on the web

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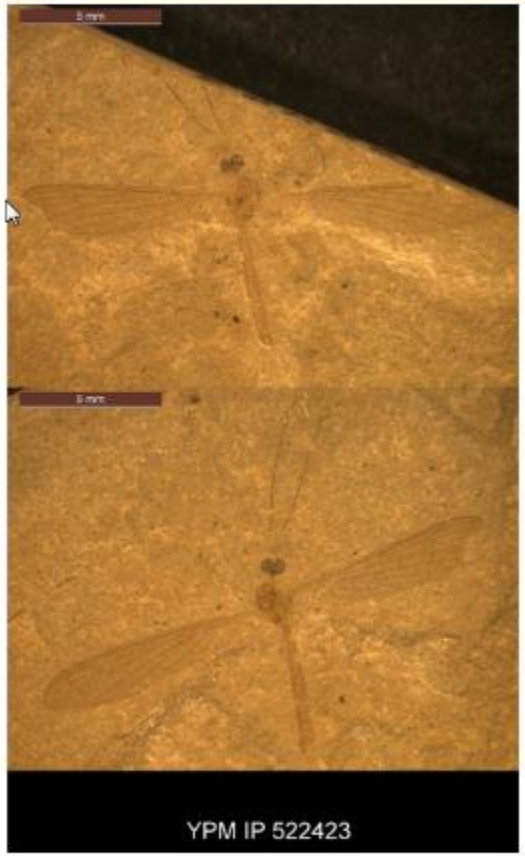

undet. Tipulidae; feather on slab with

True flies, Mosquitoes and Gnats

YPM IP 522423

Yale Peabody Museum of Natural History

TAXONOMY

Animalia > Arthropoda > Insecta > Diptera > Tipulidae > Family

LOCALITY

North America > USA > Colorado > Garfield County > N end of Radar Dome

ADD TO ASSIGNMENT

COMMENTS (0)

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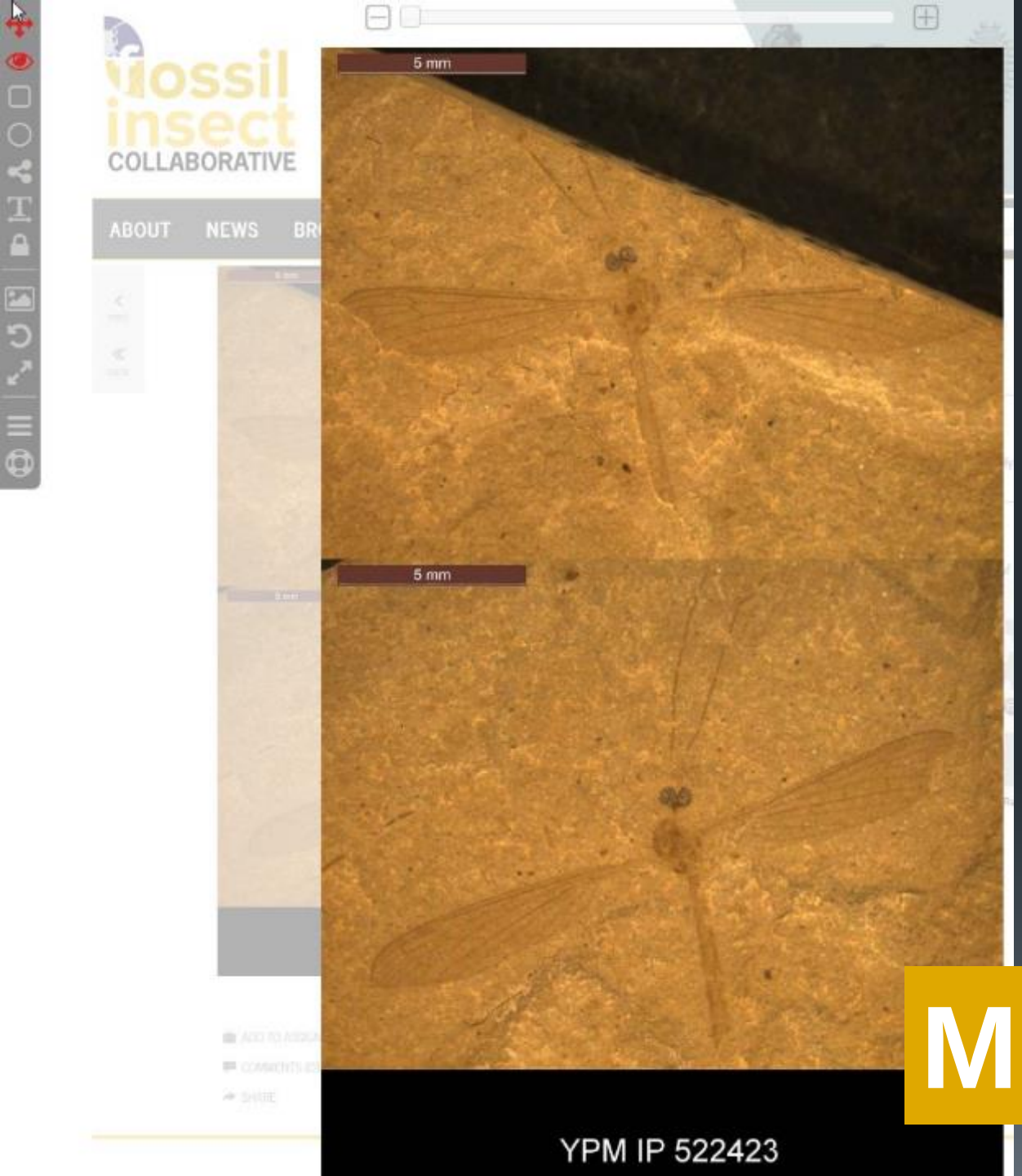
MAP



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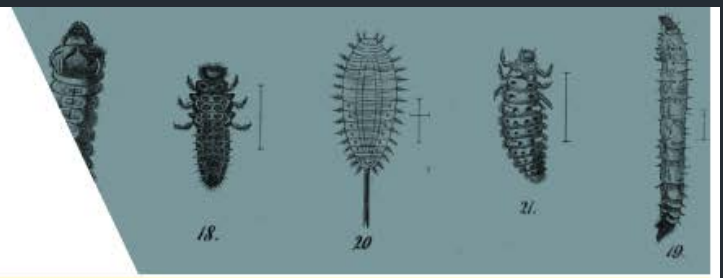
MEASURE

NOTE

fossil insect COLLABORATIVE

Making data and images of millions of insect specimens available on the web



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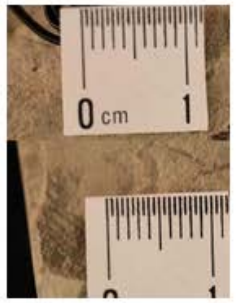
5 SPECIMEN RESULTS

SOURCE: YALE PEABODY MUSEUM OF NATURAL HISTORY HAS MEDIA: HAS MEDIA FOSSIL/MODERN: FOSSILS SERIES: EOCENE
COMMON NAME: ROBBER FLIES

YPM IP 454405
undet. Asilidae



YPM IP 584576
undet. Asilidae

YPM IP 584521
undet. Asilidae

YPM IP 454423
Asilidae?

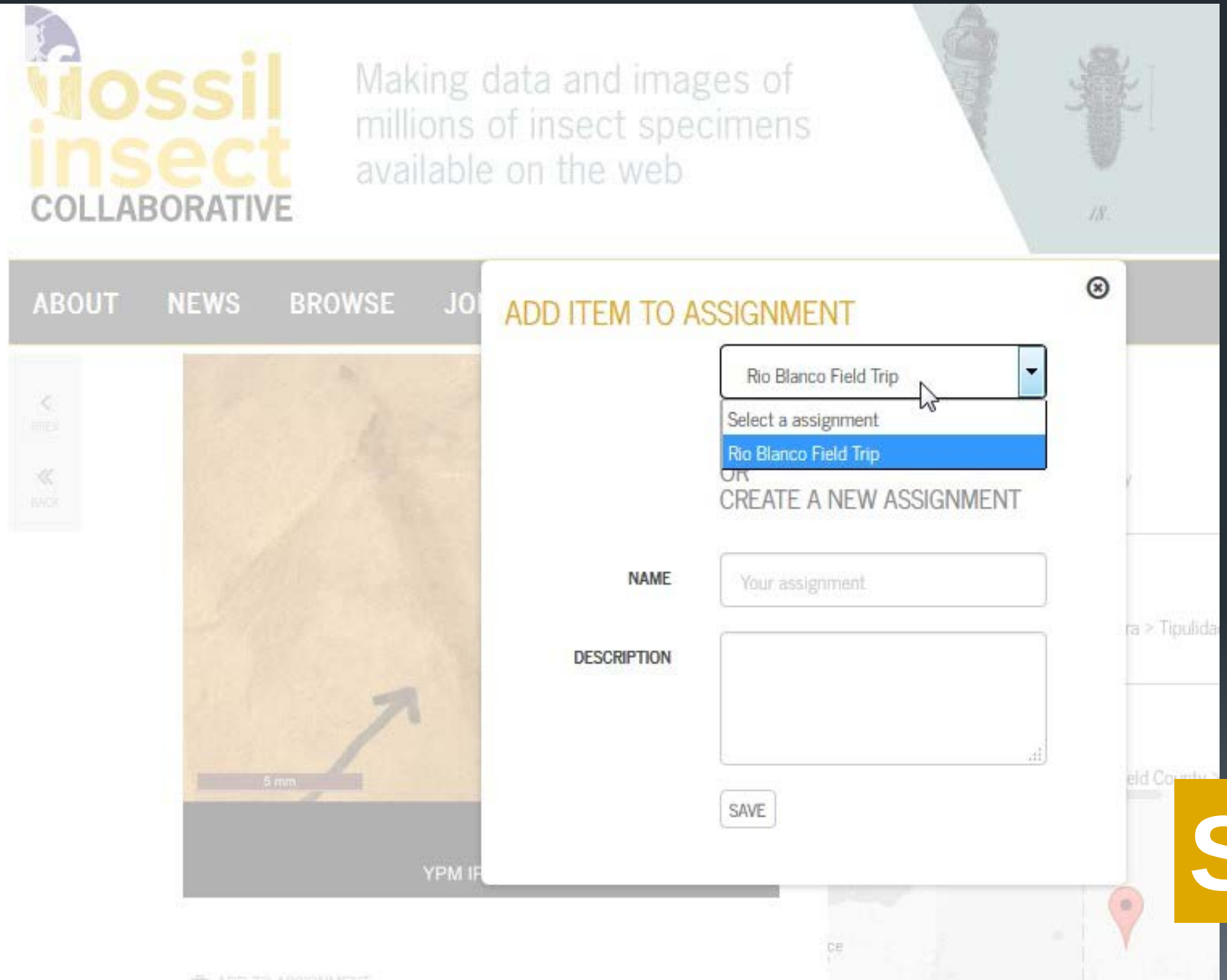
YPM IP 454441
Asilidae?

FILTER BY

CONTINENT
North America

DigPaleo

GROUP



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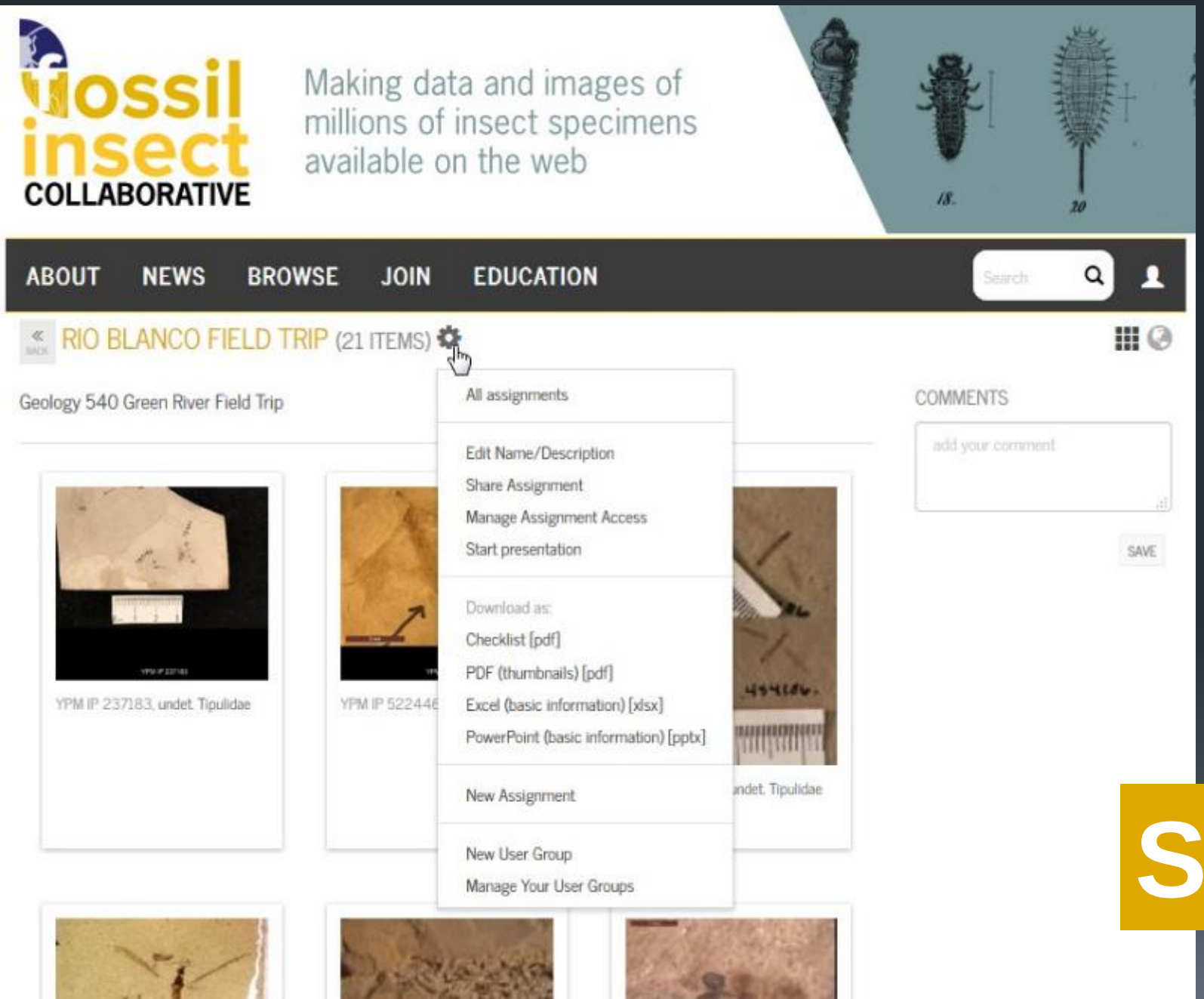
SAVE



DigPaleo

SHARE

iDigPaleo Teacher Workshop, Yale Peabody Museum July 20-21, 2015

- Pilot version of iDigPaleo is being developed for K-12 classroom usage
- Could just as easily be used for undergraduate or postgraduate education
- Could also be a tool for research

iDigPaleo

iDigPaleo

fossil insect COLLABORATIVE

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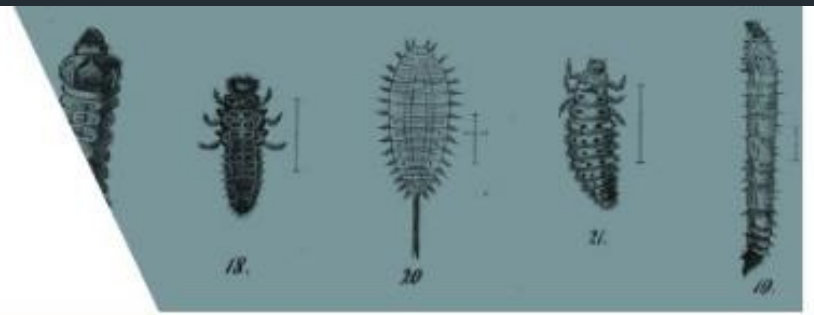

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Featured Fossils

(PAL5742191169935O)

PBDB

fossilworks Gateway to the

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Arco Hills type section, packstone (Carboniferous of the United States)

Where: Butte County, Idaho (43.6° N, 113.3° W: paleocoordinates 3.9° N, 41.1° W)

- coordinate based on nearby landmark
- outcrop-level geographic resolution

When: Adetognathus unicornis conodont zone, Arco Hills Formation, Serpukhovian (326.4 - 318.1 M

- Late Chesterian, Mamet Foraminiferal Zone 19
- group of beds-level stratigraphic resolution

Environment/lithology: deep subtidal; lithified packstone

- transported brachiopod assemblages in packstones

Size class: macrofossils

Primary reference: S. H. Butts. 2007. Silicified Carboniferous (Chesterian) Brachiopoda of the Arco H Idaho. *Journal of Paleontology* **81(1)**:48-63 [W. Kiessling/U. Merkel] more details

Purpose of describing collection: taxonomic analysis

PaleoDB collection 93283: authorized by Wolfgang Kiessling, entered by Uta Merkel on 13.01.2010

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Taxonomic list

Show authors, comments, and common names

Rhynchonellata

Athyridida - Athyrididae	*Composita subquadrata*, *Composita idahoensis* n. sp., *Composita sigma*, *C sublamellosa*
Spiriferinida - Punctospiriferidae	*Punctospirifer transversus*
Spiriferida - Spiriferidae	*Anthracospirifer arcoensis* n. sp., *Anthracospirifer occiduus*, *Anthracospirif Anthracospirifer curvilateralis*, *Anthracospirifer shawi*
Spiriferida - Elythidae	*? Torynifer sp.*

Apps

56,578 references

387 scientists

iDigBio
Integrated Digitized Biocollections

iDigBio

ePANDDA

Taxonomy

External authority files:
taxonomy, stratigraphy,
locality, bibliography

ePANDDA:

enhancing PAleontological and Neontological Data Discovery API

iDigPaleo

Susan Butts, Yale
Talia Karim, Colorado
Chris Norris, Yale
Dena Smith, GSA

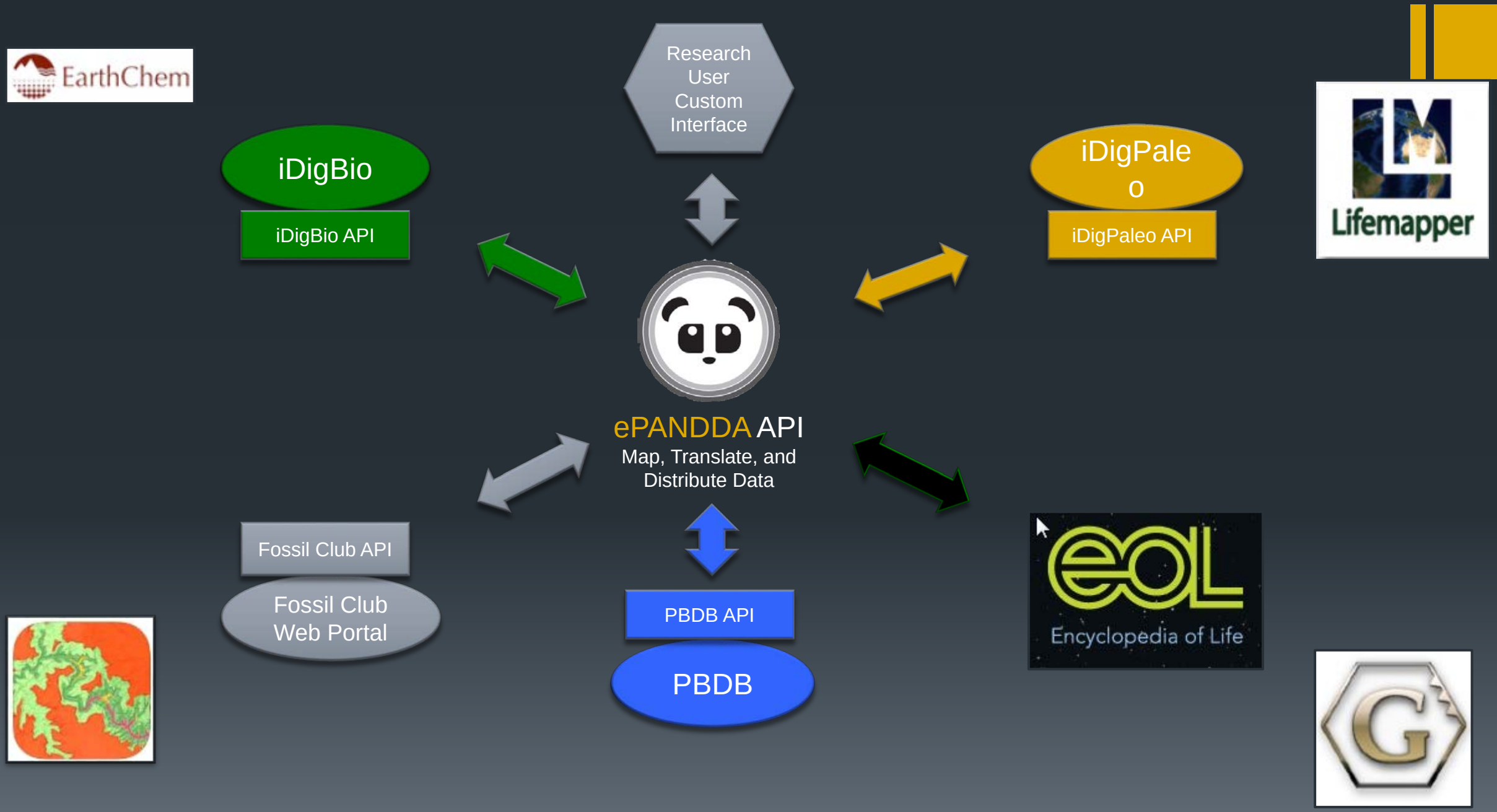
PaleoDB

Jocelyn Sessa, AMNH
Mark Uhen, George Mason

iDigBio

Shelley James, Florida
Gil Nelson, Florida State

Not our final logo


EarthChem
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Custom
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iDigPaleo API
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Map, Translate, and
Distribute Data
Fossil Club API
Fossil Club
Web Portal
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PBDB
eol
Encyclopedia of Life

ePANDDA

- Matching services
  - Occurrence – specimen
  - Publication – specimen
  - Taxon – specimen
  - Locality – specimen
  - Stratigraphic – specimen
- Utility services
  - Lookup and validation – taxon, DOI, stratigraphy
- Inexact text matching algorithms & machine learning
  - Establish potential links between data entities
- User customizable
  - Control methods employed
  - Set how aggressive (or not) matching will be

Possible Pathways to implementation

- Interactive API based on replicated dataset
  - PROS: requires only minimal dataset to perform matching; more customizable; much faster
  - CONS: requires more infrastructure – storage, bandwidth, processing
- Non-interactive API, working on a per-request basis
  - PROS: less infrastructure management
  - CONS: less functionality – fewer matching options, fewer services: slower; less scalable as usage grows

Thank you

iDigPaleo: Christina Byrd, Michael Engel, Brian Farrell, David Grimaldi, Alex Hastings, Sam Heads, Kathy Hollis, Holly Little, Ricardo Perez-de la Fuente

ePANDDA: Larry Gall, Shelley James, John Lauters, Gil Nelson, Jocelyn Sessa, Danielle Serratos, Harry Shyket, Mark Uhen

Programming for iDigPaleo and ePANDDA is coordinated by Seth Kaufman, Whirl-i-Gig

Development of iDigPaleo is supported through NSF EF 1305027: Digitization TCN: Collaborative Research: Fossil Insect Collaborative: A deep-time approach to studying diversification and response to environmental change

ePANDDA is supported through NSF ICER 1540984: EarthCube IA. Collaborative Proposal: ePANDDA: Enhancing Paleontological and Neontological Data Discovery API