fossil insect COLLABORATIVE

Talia Karim- University of Colorado
Museum of Natural History

Fossil Insect Collaborative

- Seven institutions:
  - Dena Smith-lead PI

University of Colorado Boulder

Yale Peabody Museum

American Museum of Natural History

Illinois Natural History Survey
Prairie Research Institute

- Two partner institutions:

Smithsonian
National Museum of Natural History

Museum of Comparative Zoology
Harvard University

Virginia Museum of Natural History

KU Biodiversity Institute
The University of Kansas

Fossil Insect Collaborative

The Plan:

- Over four years
  - Database ~500,000 specimens
  - ~77,000 digital images
  - Data sharing
  - iDigPaleo development

Start Date July 2013

Fossil Insect Collaborative

- Research Goals:
  - Examine insect response to environmental change in deep time
  - Examine evolutionary history of fossil insect groups and patterns of diversity in deep time

Fossil Insect Collaborative

- Paleo Digitization Workshop -Yale, Fall 2013

Fossil Insect Collaborative

& TCN Year 1 Meeting-Yale, Fall 2013

Fossil Insect Collaborative

The Plan:

- Over four years
  - Database ~500,000 specimens
  - ~77,000 digital images
  - Data sharing
  - iDigPaleo development

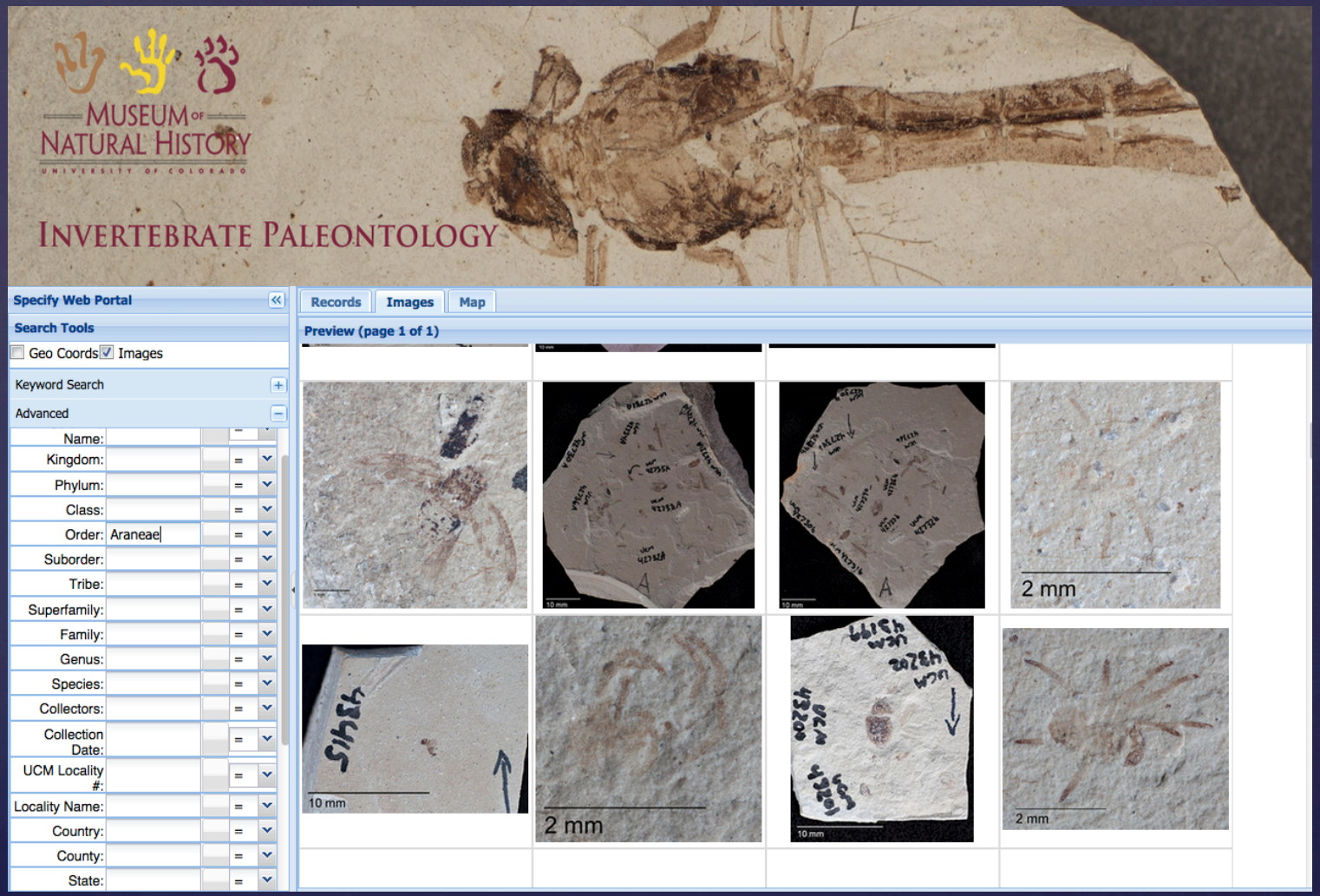
  - Georeferencing
  - Publishing locality data
  - Taxonomic authority files
  - Metadata standards

Fossil Insect Collaborative

Year 1:

- ~94,323 specimens records
- ~10,500 digital images
- Data sharing
  - Institutional websearches
  - GBIF
  - iDigPaleo-beta testing

Publishing- CU Websearch



invertpaleosearch.colorado.edu

Social Media

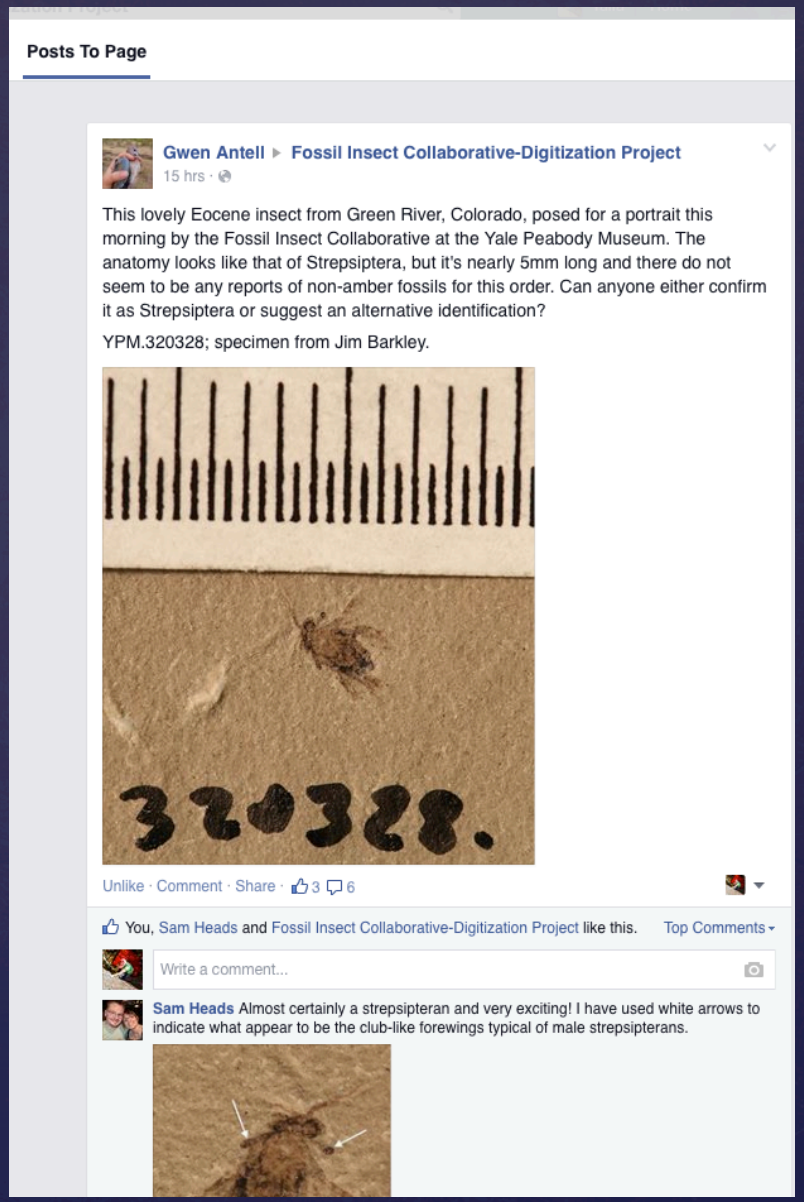
Year 1:

- #FossilFriday

Social Media

Year 1:

- Interactions within TCN
  - Specimen IDs



Project Website

Year 1:

fossil insect COLLABORATIVE

Collaborators Gallery | Research | Collections | Education | Image

ABOUT THE DIGITIZATION PROJECT

Fossil insects provide a unique deep-time record of ecological and evolutionary response to past environmental changes and therefore are invaluable for understanding the impacts of climate change on the current biodiversity crisis. Given current models of future climate change and the important role that insects play in human society (biodiversity, pests, pollination, vectors of disease) the ability to access these data and make predictions about future insect populations becomes even more urgent. The Fossil Insect Collaborative will make available all the major collections of fossil insect specimens in the United States by creating electronic specimen records consisting of digital images and associated collection data.

The digitized fossil insect collections will be made broadly accessible to the research community, K-16 education, government and industry, the general public, and the media through the project website and a central site integrating all the paleobiological Thematic Collections Networks called iDigPaleo. Mobile apps and activities that allow a wide variety of users to experience and interact directly with the collections data will be developed. This award is made as part of the National Resource for Digitization of Biological Collections through the Advancing Digitization of Biological Collections program and all data resulting from this award will be available through the national resource (iDigBio.org).

LATEST NEWS

Entomological Society of America 2014 Annual Meeting: Fossil Insect Symposium - Sep 04, 2014

Check out the symposium on Fossil Insects at the ESA meeting! Session starts at 8am on November 19th.

Digitization Session at GSA 2014 Vancouver - Sep 04, 2014

Make sure and check out the Geoscience Collections Digitization session at GSA this fall. There will be a full day of talks on Wednesday, October 22nd.

New Pygmy Grasshopper - Sep 04, 2014

LATEST BLOG

Green River Digitization at the UCM - October 31, 2014

If you've been following the Fossil Insect Collaborative through social media or as a participant in the digitization project, chances are you've seen examples of the specimens being imaged at the University of Colorado Museum of Natural History (UCM). ...

All Blog Posts >>

UPCOMING EVENTS

NOV 16 **Entomological Society of America Annual Meeting** Portland, OR, United States

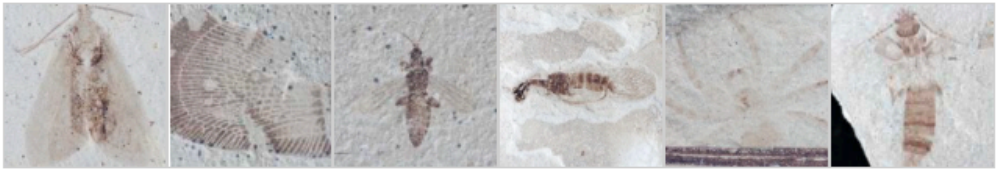
All Events >>

Project Website

Year 1:

Green River Digitization at the UCM

If you've been following the Fossil Insect Collaborative through social media or as a participant in the digitization project, chances are you've seen examples of the specimens being imaged at the University of Colorado Museum of Natural History (UCM). Since January, this has included a constant stream of compression fossils—largely flies, beetles, and wasps, among others. But how, exactly, did this seemingly endless source of fossil insects end up at the Museum? The answer lies in the ambition of one citizen scientist dedicated to the fossil insects of Colorado's Green River Formation.



UCM 56079a – Lepidoptera (Moth) | UCM 56746 – Hemiptera: Flatidae (Planthopper) | UCM 57108a – Thysanoptera (Thrip) | UCM 56552a – Raphidioptera (Snakefly) | UCM 47270a – Araneae (Spider) | UCM 56190 – Dermaptera (Earwig)

From 2004-2011, David Kohls of Battlement Mesa, CO single-handedly amassed thousands of fossil insects for the UCM. Specifically, he donated at least 150,000 individual specimens from 18 Green River localities, or 5,500 to 8,200 individual shale samples—trimmed and ready for accession—per field season during his active collecting years. Including previous donations to the Smithsonian Institution, David estimates he has contributed at least 225,000 individual specimens to these museums since he began collecting in 1991. In contrast to many historic collections, the collections he made were not produced by high-grading "prized" specimens, but by collecting every fossil found. As a result, these collections represent systematically acquired samples of fossil insect assemblages, making them suitable for paleoecological and taphonomic studies.

David Kohls at a Green River fossil locality. This fall, UCM Invertebrate Paleontology visited with him and shared news about progress made in imaging the fossils he collected.

To say these collections keep UCM's Invertebrate Paleontology staff "busy" is an understatement. Students, faculty, and staff interact with Green River specimens on a daily basis through curation, digitization, and research. In turn, these collections have provided valuable career training for graduate and undergraduate students in geology, biology, environmental studies, anthropology, communications, and museum studies. Even a decade after David's first donation to the Museum, boxes of Green River fossils are still being unpacked and added to the curation and digitization queues. At a time when funding for field programs is limited, contributions such as David's to developing research-quality collections are truly invaluable. In recognition of his commitment to Green River paleontology and responsible fossil collecting, David received The Paleontological Society's Harrell L. Strimple Award in 2009.

Paleo Imaging Workshop

Year 1:

- Paleo imaging workshop- Austin, April 2014

Specify for Paleo Workshop

Year 1:

- Specify for Paleo Collections- Lawrence, May 2014

Fossil Insect Collaborative

Unexpected Outcomes-Year 1:

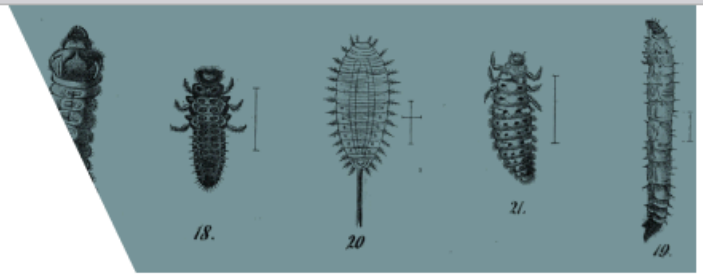
- Over 36,000 specimen records edited
  - Lots of data cleanup
- Equipment delays and lab moves
- iDigPaleo development moved up

fossil insect COLLABORATIVE

- Central portal for sharing Fossil Insect TCN data
- Aggregate and send data to iDigBio
- Education and outreach tools
- Research tools
- Potential to incorporate future Paleo TCNs

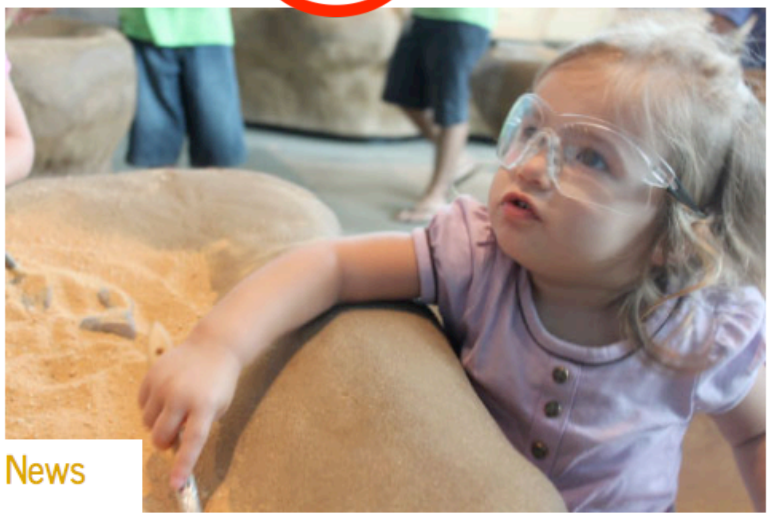
fossil insect COLLABORATIVE

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



ABOUT NEWS BROWSE JOIN EDUCATION

Search



News

News Heading

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nunc faucibus nunc nisi, eu sollicitudin nibh pellentesque non.

Featured Fossils

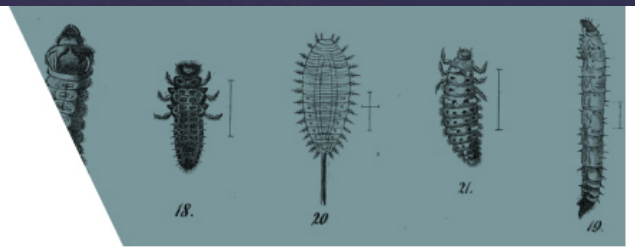
Cyrtinopsis sp. (YPM IP 002564)

YPM IP




fossil insect COLLABORATIVE

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



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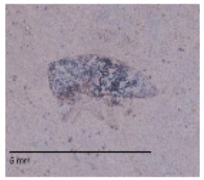
Search

169 SPECIMEN RESULTS

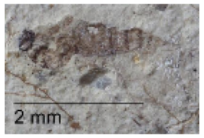
HAS MEDIA: HAS MEDIA

Filters

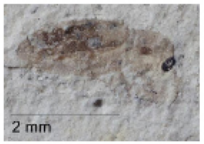


CUMNH UCM 37048
Curculionidae

CUMNH UCM 37078
Coleoptera

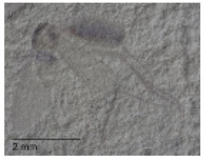


CUMNH UCM 37080
Insecta

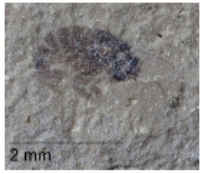


CUMNH UCM 37081
Curculionidae

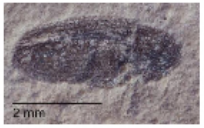
CUMNH UCM 37090
Curculionidae



CUMNH UCM 37091
Diptera



CUMNH UCM 37098
Coleoptera



CUMNH UCM 37119
Coleoptera

University of Colorado Museum of Paleontology

CONTINENT
North America

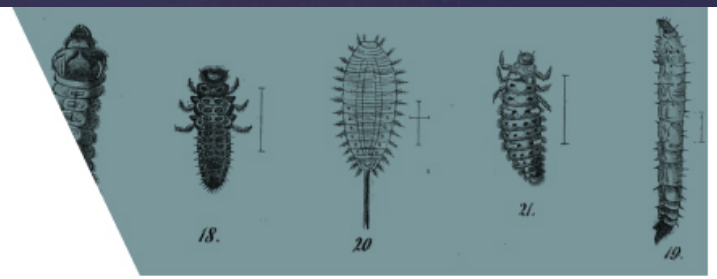
SYSTEM
Paleogene

SERIES
Eocene
Eocene M

PERSON
Clarke, Laura
Hollis, Kathy
Karim, Talia
Levy, Rick
Walker, Lindsay

fossil insect COLLABORATIVE

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



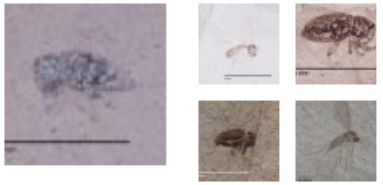
ABOUT NEWS BROWSE JOIN EDUCATION

Search

LIGHTBOXES

TEST COLLECTION 1

CLASSROOM COLLLECTION



activity stream

Chris Norris changed an item in Classroom Colllection
10/7/14 2:52PM

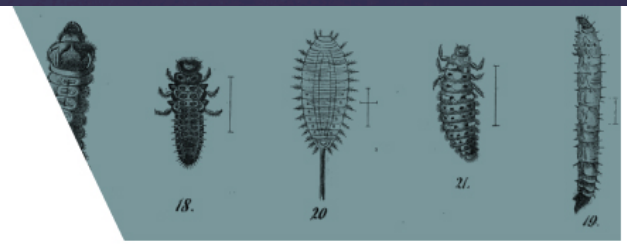
Chris Norris changed an item in Classroom Colllection
10/7/14 2:51PM

Chris Norris added an item to Classroom Colllection
10/7/14 2:51PM

Chris Norris changed an item in Classroom Colllection
10/7/14 2:51PM

fossil insect COLLABORATIVE

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



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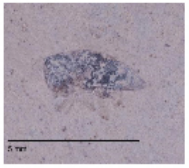
CLASSROOM COLLLECTION



???, Karim, Talia

???

???, Karim, Talia

???, Karim, Talia

add your comment

SAVE

???

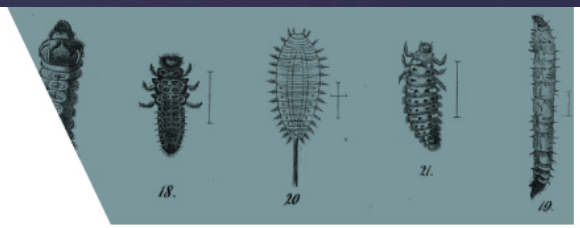
0 comments

This looks like a mosquito

SAVE

fossil insect COLLABORATIVE

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



PREV
BACK

COMMENTS (0)
SHARE

Insecta

CUMNH UCM 42979
University of Colorado Museum of Paleontology

TAXONOMY

Invertebrates > Arthropoda > Insecta

STRATIGRAPHY

Chronostratigraphy
Paleogene, Eocene M

Lithostratigraphy
Green River Formation, Parachute Creek?

LOCALITY

North America > USA > CO > Garfield > DON - Donnell Site

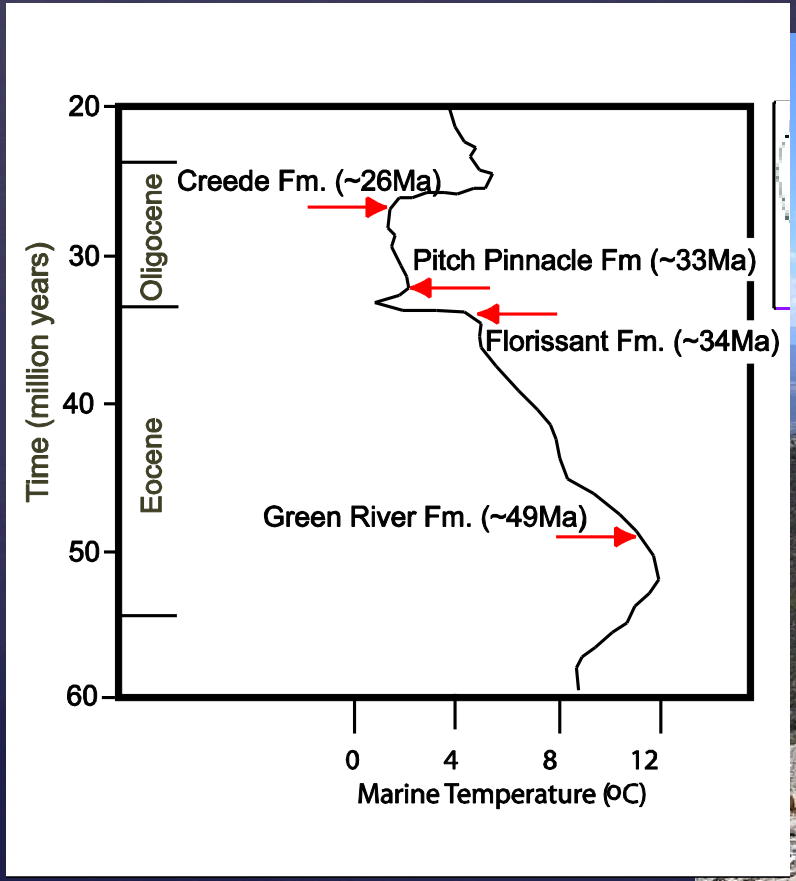
iDigPaleo Outreach

- Yale:
  - Evolutions
  - Teacher Training Workshop

Research

Ecological Patterns- Climate Change

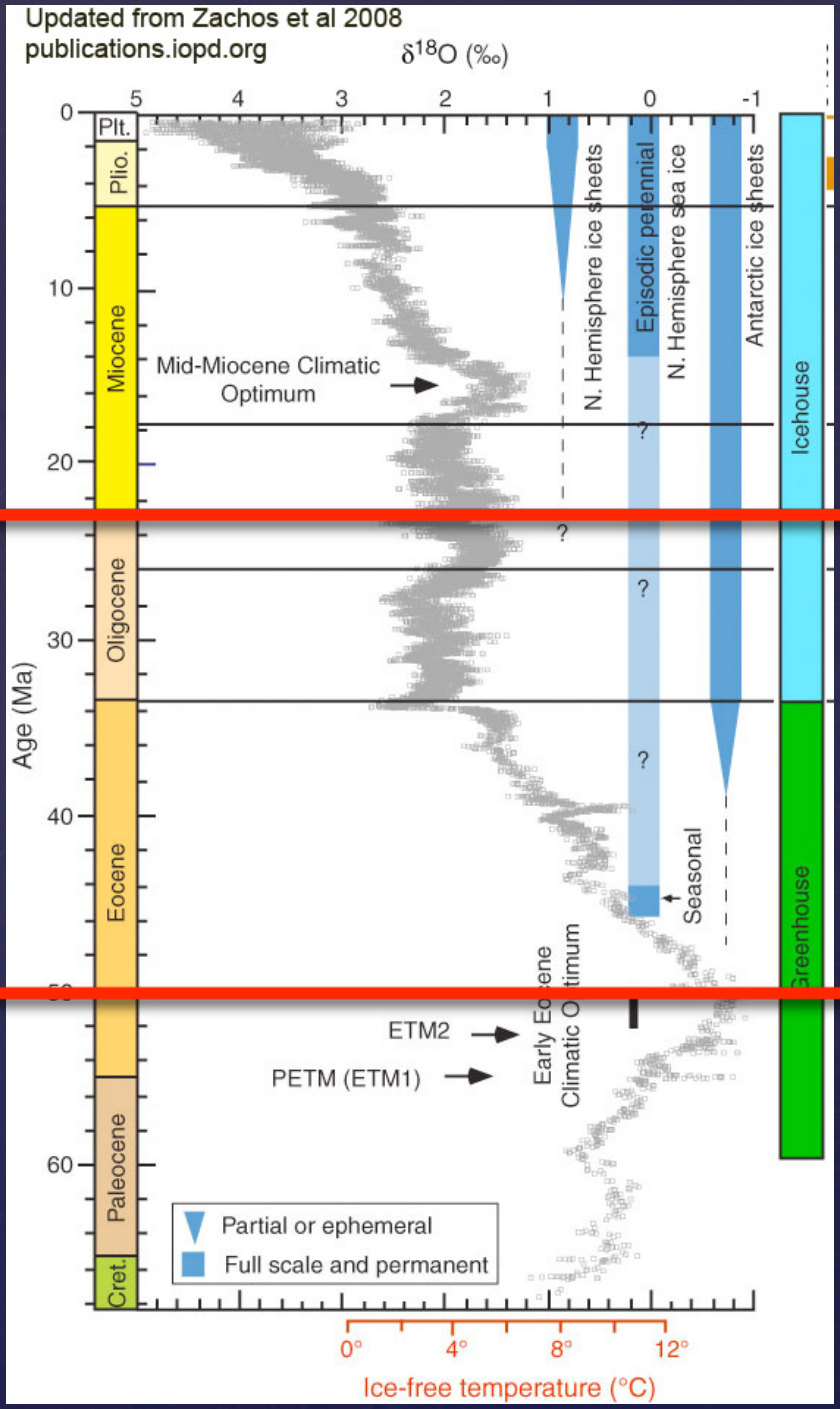
- Dena Smith- CU Boulder



49 Ma
Middle Eocene

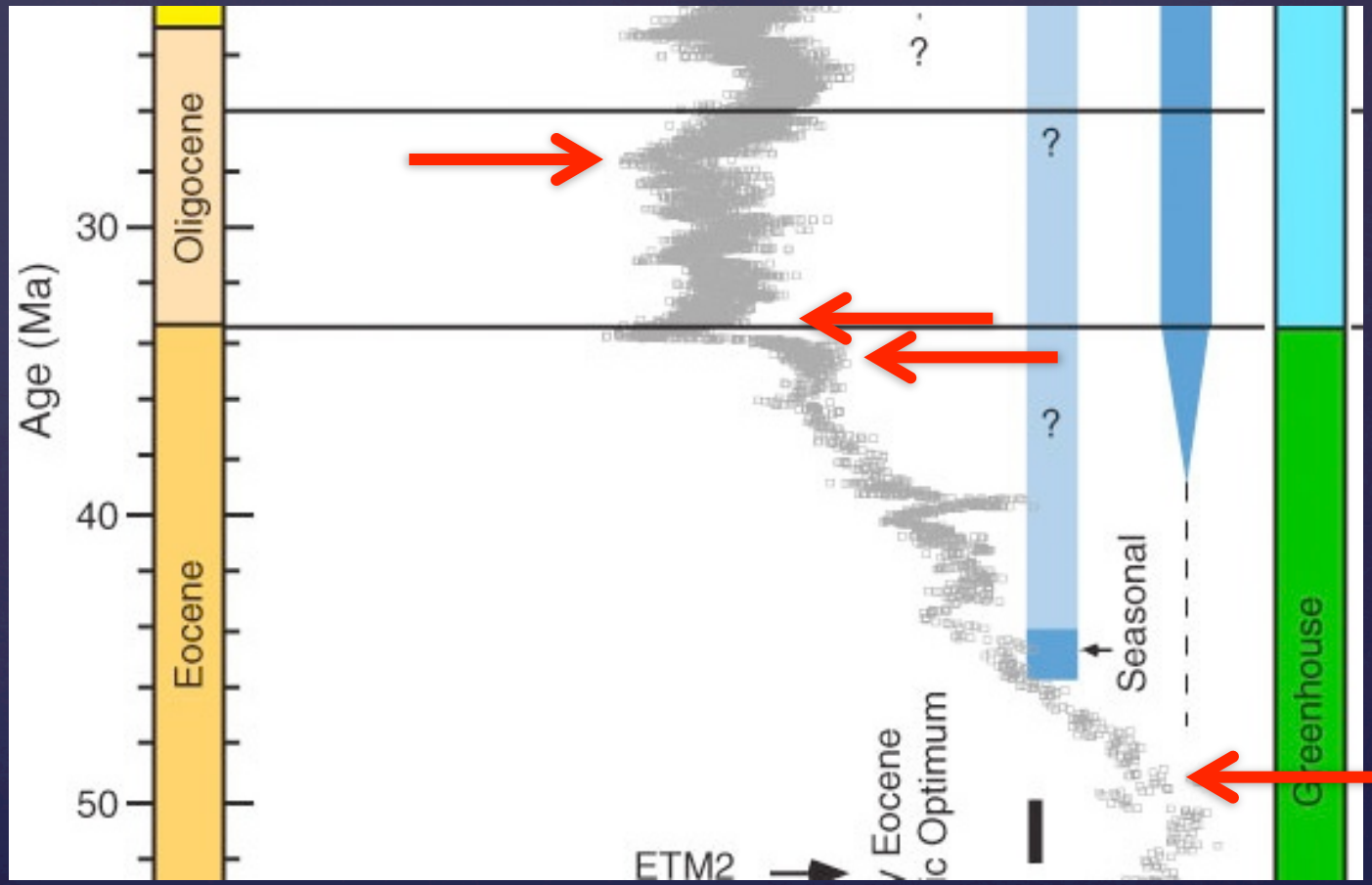
Research

Eocene-Oligocene Climate Change



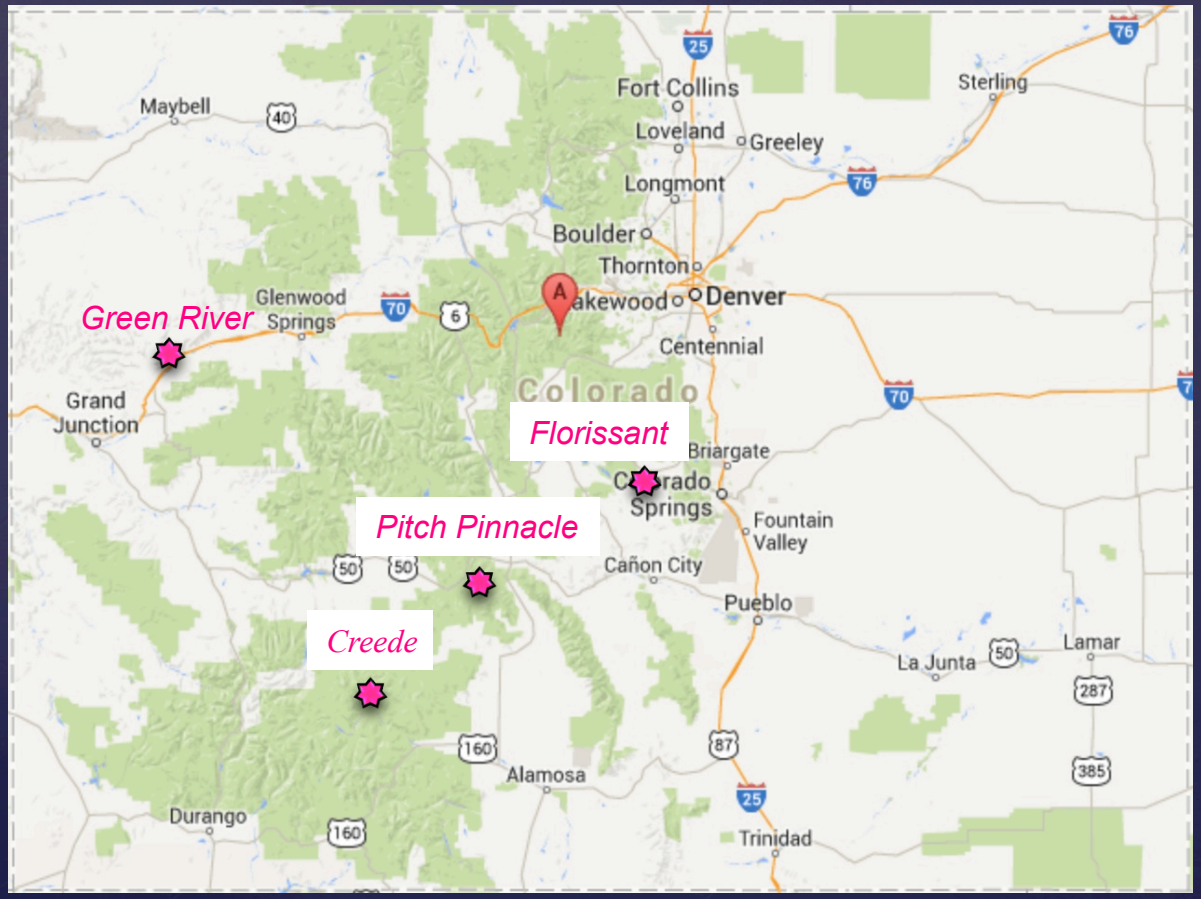
Research

Eocene-Oligocene Climate Change



Research

Eocene-Oligocene Climate Change



MAT (°C)

Creede	2.5
Pitch Pinnacle	12
Florissant	12.7
Green River	18

Research

Diversity of Eocene Beetles from the Green River Formation

- Lindsay Walker- CU Museum Studies MS student
- Assessing community turnover with consideration for ecological preference

Green River cliffs (~49 Ma) in western Colorado

Research

Diversity of Eocene Beetles from the Green River Formation

Pros:
- Facilitates comparisons
- Enables measurements

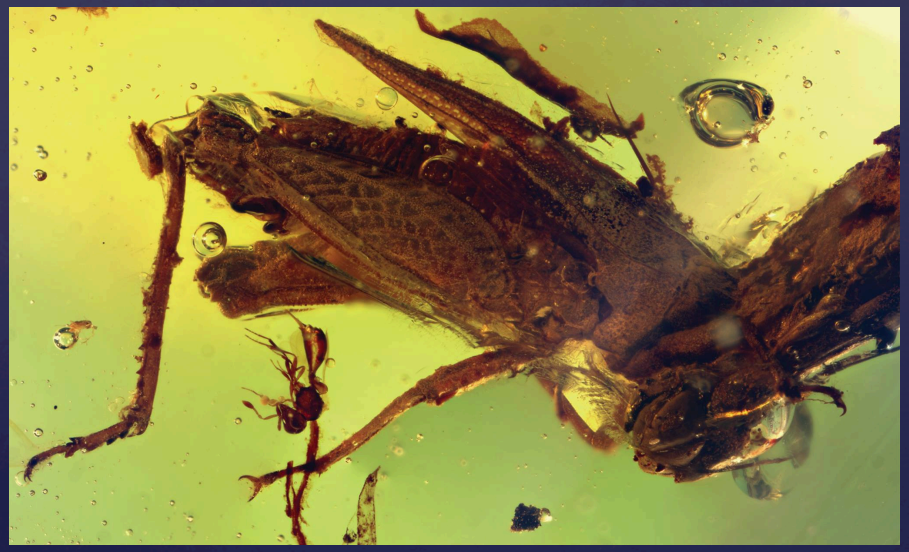
Complications:
- Time-consuming
- Image management/logistics
- Image quality

Future considerations:
- High-res image retrieval

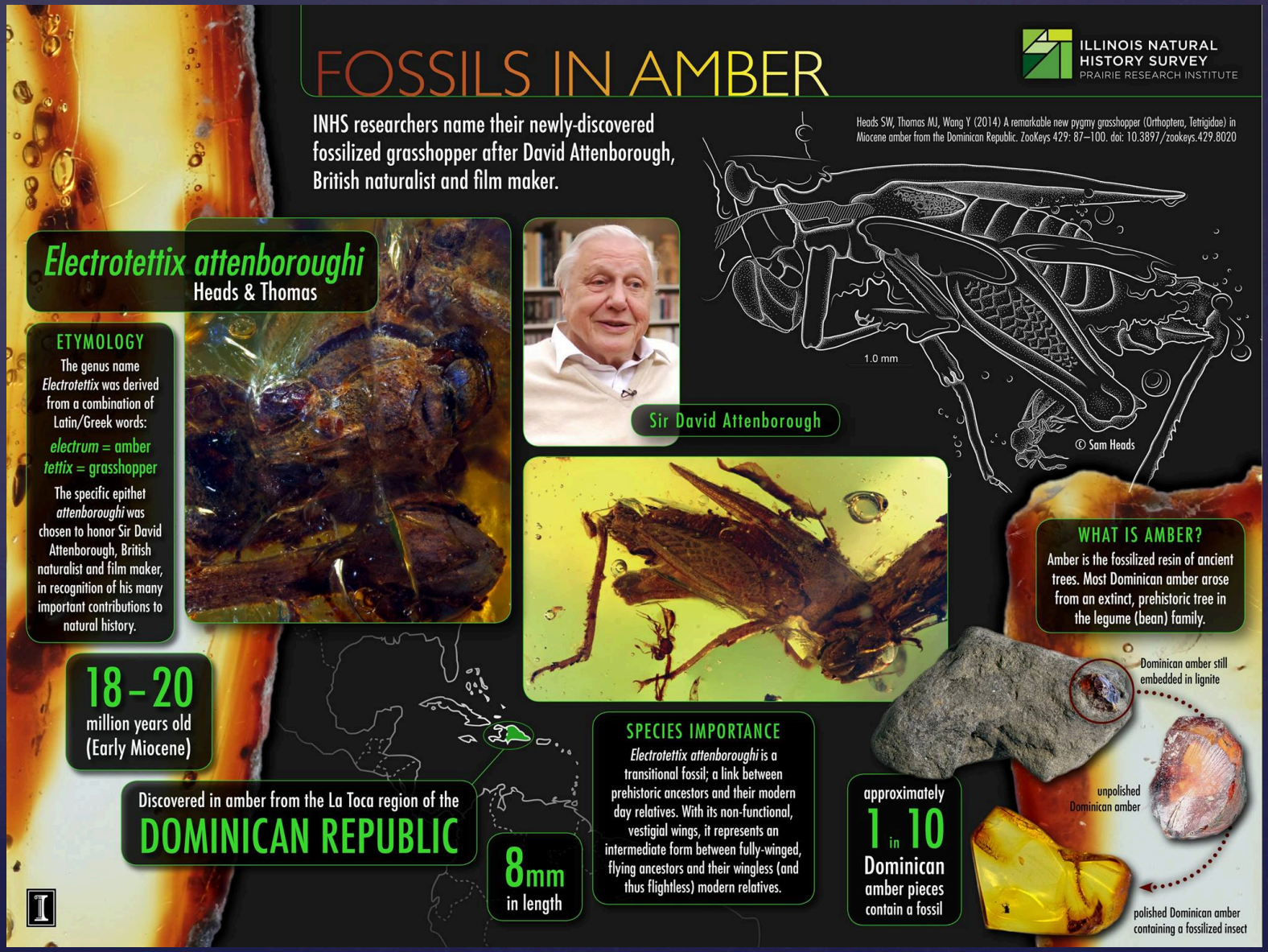
Research

Electrotettix attenboroughi Heads & Thomas

- Heads et al. (2014)-Zookeys
  - Pygmy grasshopper
  - Sanderson amber collection
  - ~150 pounds unprocessed

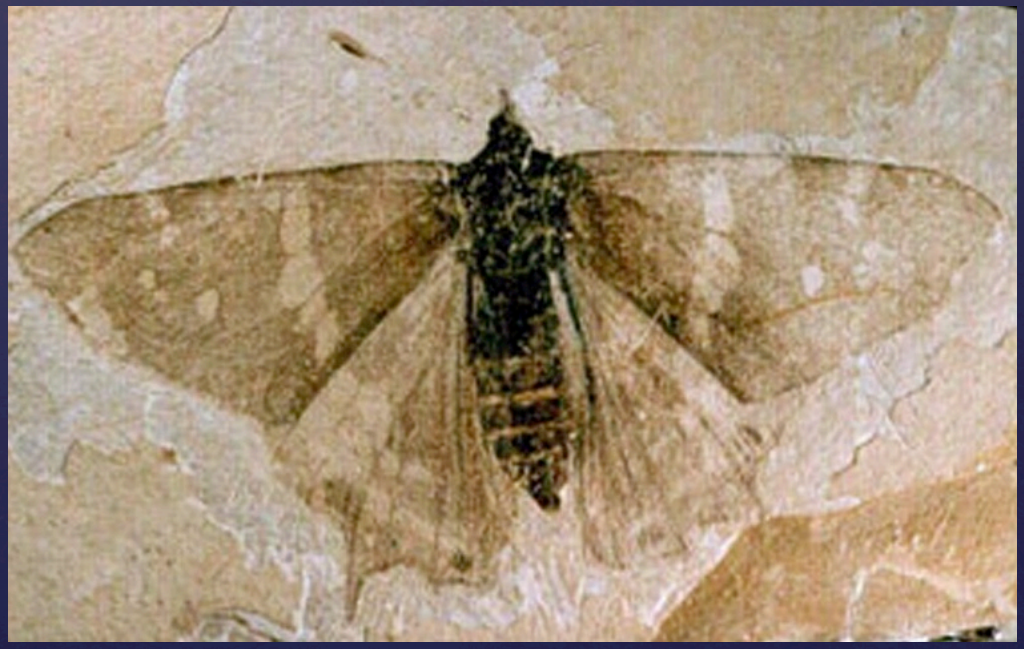


Research


FOSSILS IN AMBER
ILLINOIS NATURAL HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE
INHS researchers name their newly-discovered fossilized grasshopper after David Attenborough, British naturalist and film maker.
Heads SW, Thomas MJ, Wang Y (2014) A remarkable new pygmy grasshopper (Orthoptera, Tetrigidae) in Miocene amber from the Dominican Republic. ZooKeys 429: 87–100. doi: 10.3897/zookeys.429.8020
Electrotettix attenboroughi
Heads & Thomas
1.0 mm
© Sam Heads
Sir David Attenborough
ETYMOLOGY
The genus name Electrotettix was derived from a combination of Latin/Greek words:
electrum = amber
tettix = grasshopper
The specific epithet attenboroughi was chosen to honor Sir David Attenborough, British naturalist and film maker, in recognition of his many important contributions to natural history.
WHAT IS AMBER?
Amber is the fossilized resin of ancient trees. Most Dominican amber arose from an extinct, prehistoric tree in the legume (bean) family.
18–20 million years old (Early Miocene)
Discovered in amber from the La Toca region of the DOMINICAN REPUBLIC
8mm in length
SPECIES IMPORTANCE
Electrotettix attenboroughi is a transitional fossil; a link between prehistoric ancestors and their modern day relatives. With its non-functional, vestigial wings, it represents an intermediate form between fully-winged, flying ancestors and their wingless (and thus flightless) modern relatives.
approximately 1 in 10 Dominican amber pieces contain a fossil
Dominican amber still embedded in lignite
unpolished Dominican amber
polished Dominican amber containing a fossilized insect

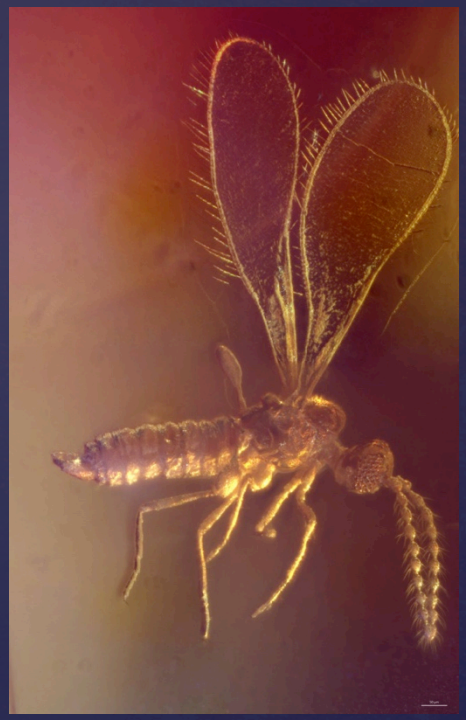
Fossil Insect Collaborative

- Fossil Insect Symposium
  - Wednesday 8am-noon
  - room B110-112



Fossil Insect Collaborative

- Future Plans:
  - Amber prep workshop
    - February 2015- AMNH
  - iDigPaleo:
    - Assimilate more data
    - Launch and test



Questions?