Collections

Participate

Discovery

Connecting Biodiversity Research and Collections with Education and Outreach through ***CITIZEN SCIENCE***

Special Thanks to Our Partners:

ZOONIVERSE

eol Encyclopedia of Life

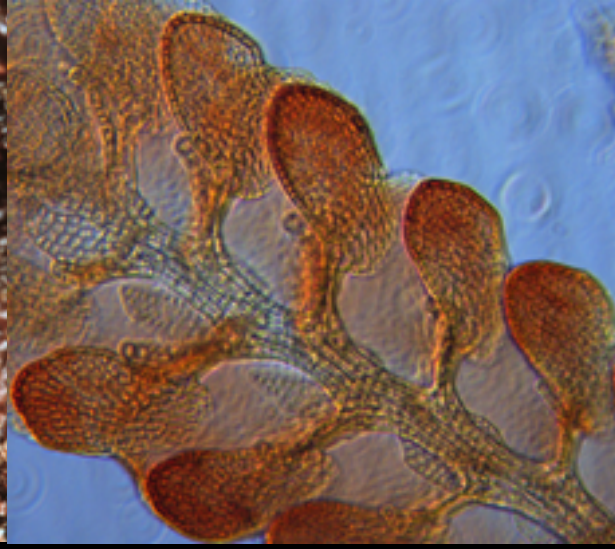
NSF

BIOSYNC biodiversity synthesis center



Crowd-sourced science: digitized natural history collections extends its branches to education and outreach

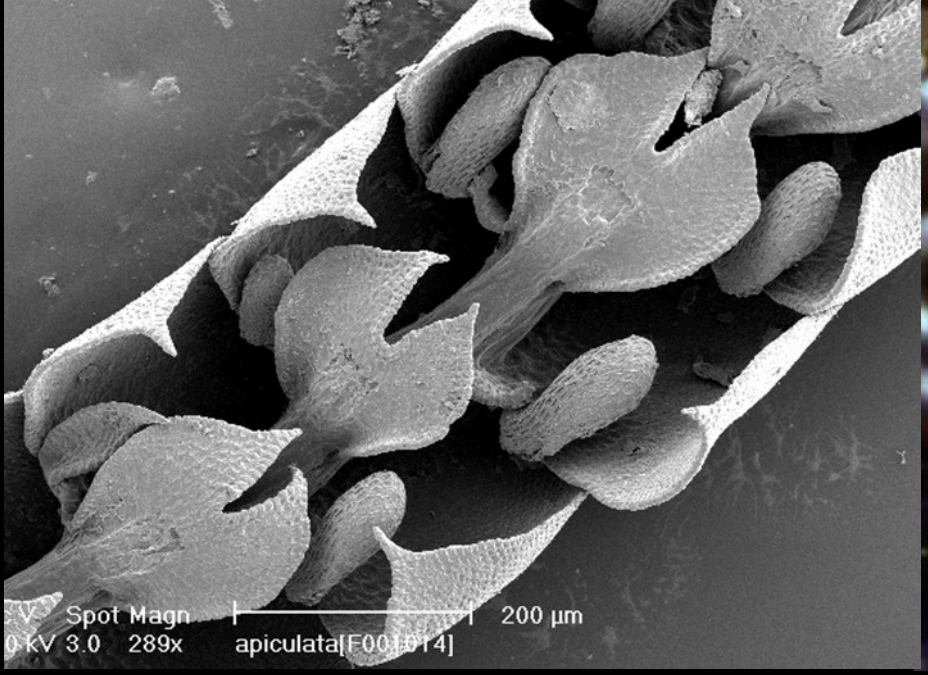
MicroPlants
COLLECTION
CONNECTION



Collection Connection:

MicroPlants

http://microplants.zooniverse.org



Tom Campbell
NEIU

Arfon Smith, Brian Carstensen, Laura Whyte
Zooniverse, Adler Planetarium

Juan Larraín
Field Museum

Oana Vadineanu, Zak Zillon, Jon Scheffel, Charlie DLavoy
NEIU

Matthew Grief
Wilbur Wright College

Eve Gauss, Beth Crownover
Education Dept., Field Museum

Lauren Hasan
Field Museum

Michael Bryson
Roosevelt University

John Kasmer, Kara Nuss
NEIU

Kristina Lugo
Roosevelt University

Blanka Shaw, Ben Carter, Jon Shaw
Duke University

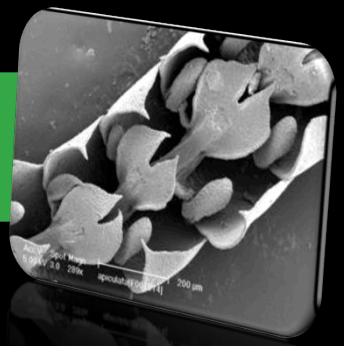
Lisa Murata
NEIU

Beth Sanzenbacher, Audrey Aronowsky
BioSynC, Field Museum

Matt von Konrat
Field Museum

Leilah Lyons
UIC

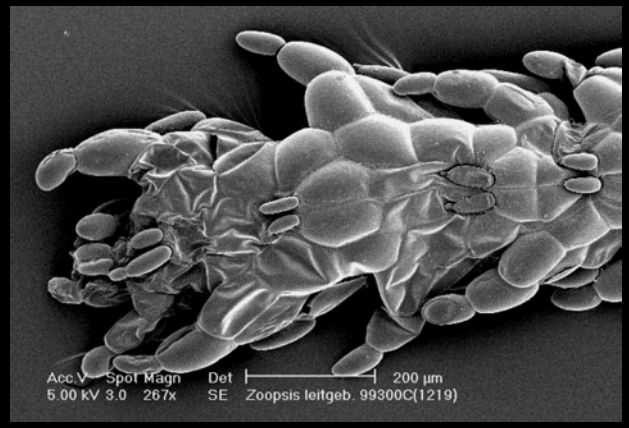
Overview

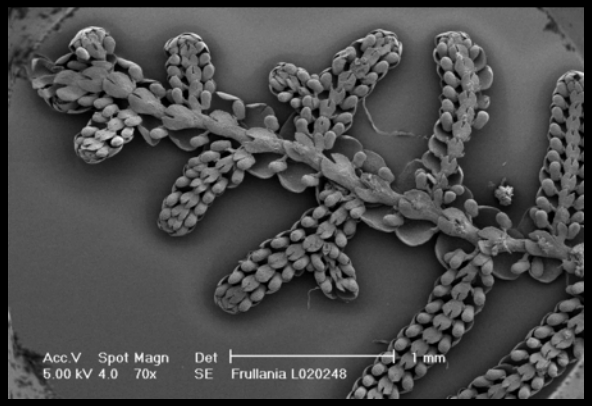


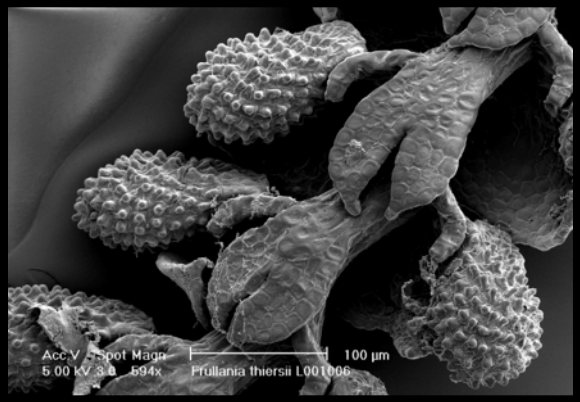
Connecting Collections to Education & Outreach

- Phase I) 12 month pilot study involving almost 750 under-graduate students (2012-13)
- Phase II) A model engagement including general public, high school and under-graduate students (2013-14)
- Demonstration of web-based online tool (MicroPlants 2.0)

A matter of scale







Importance of Liverworts in the Environment

- Form microhabitats for other organisms.
- Contribute to food chains & the Web of Life.
- Absorb excess water like a sponge, preventing erosion and floods.
- Protection from land slides

Early Land Plants: Environmental Indicators

- Potential indicators of global warming & climate change.
- Used to assess the "health" of forests.
- Indicators of pollution and heavy metals in the atmosphere.

Intersection of ADBC and ARTS

North American Lichens and Bryophytes: Sensitive Indicators of Environmental Quality and Change

PI's Corinna Gries, Thomas H. Nash III

- NSF ADBC funding 2011
  - ~ 2.3 million specimens
  - 65 non-governmental US herbaria
  - 16 digitization centers (collaborators)

The Taxonomic Impediment

Advancing Revisionary Taxonomy and Systematics (ARTS)

"ARTS encourages collaborations that would broaden the human resource base available to tackle the taxonomic impediment, such as partnerships with undergraduate institutions, community colleges, and other institutions……"

The taxonomic impediment …..

Diversity is disappearing worldwide at unprecedented rates

Worldwide shortage of taxonomists

- to identify species,
- describe species that are new to science,
- determine their taxonomic relationships,
- to make predictions about their properties

Advancing Revisionary Taxonomy and Systematics (ARTS)
"ARTS encourages collaborations that would broaden the human resource base available to tackle the taxonomic impediment, such as partnerships with undergraduate institutions, community colleges, and other institutions……."

FRULLANIA

collaborative research network

ELPT

EARLY LAND PLANTS TODAY

Welcome to *Frullania*.org - a Collaborative Research Network

This portal has been created to facilitate the sharing of data, synthesizing existing web resources and databases into a single streamlined resource for experts working on the liverwort genus *Frullania*. A major goal is to provide a dynamic forum to accelerate taxonomic research as well as education. Liverworts (Marchantiophyta) are pivotal in our understanding of early land plant evolution and are ecologically significant, existing as important and conspicuous components of the vegetation in many regions of the world.

News and Events

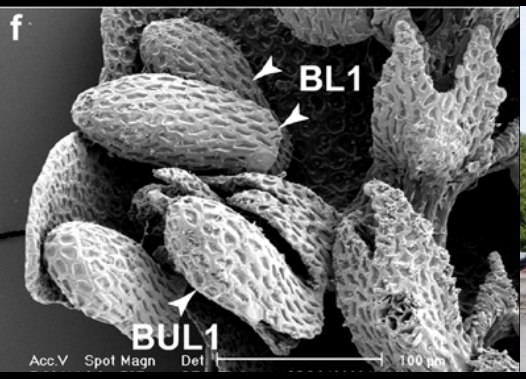
- News/event item one
- News/event item two

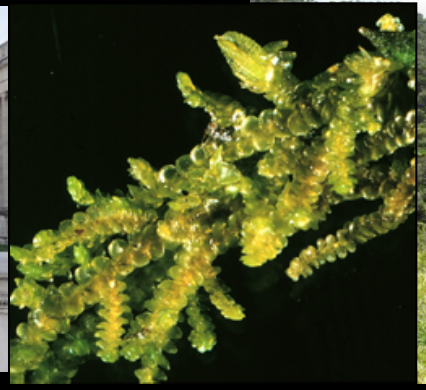
Modern monographic treatments of liverworts are rare, and comprehensive treatments for species-rich genera currently are lacking. *Frullania* represents an exceptionally hyper-diverse, taxonomically complex genus with a worldwide distribution. There are over 2000 published names, of which almost 800 are currently accepted. Yet, conservative estimates that no more than 350–375 species may exist. Many *Frullania* species have interesting biological properties. For example, chemical compounds from some species show cytotoxicity against certain cancer cell lines.

The portal advocates a community approach to help yield high quality data and to expedite taxonomic research. The network is in direct synergy with the ?Early Land Plants Today? (see http://www.elpt.fieldmuseum.org) seeking to synthesize the vast amount of information on the taxonomy, nomenclature and distribution. The *Frullania*.org - Collaborative Research Network – is supported by the Symbiota Virtual Biota project (http://symbiota.org) promoting collaboration on biodiversity projects.

The portal is under development and currently contains modules for physical specimens and their associated data, taxonomy, interactive keys and checklists. The project is looking towards creating linked modules including sequences, and microsatellite profiles, morphological and biochemical data modules and the ability to automatically generate descriptions to be used as the basis for the monographs.

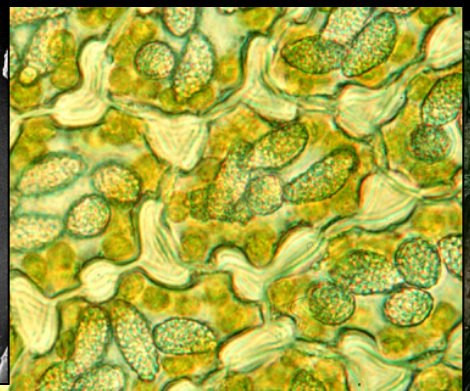
Please contact either Matt von Konrat (mvonkonrat@fieldmuseum.org), Blanka Shaw (blanka@duke.edu), Juan Larraín (jlarrain@fieldmuseum.org).

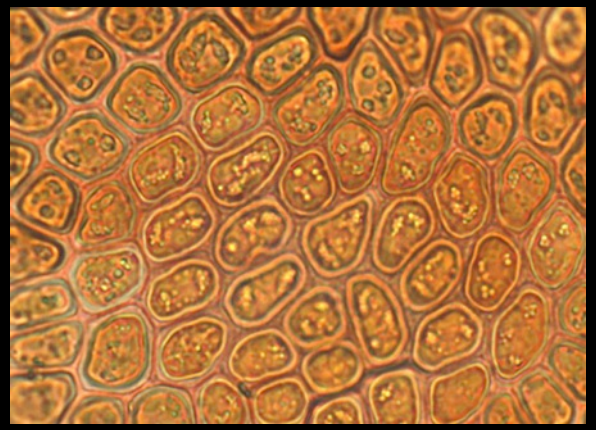



ARTS: Collaborative Research: A model systematic treatment of a hyper-diverse lineage descended from early land plants (*Frullania*, Frullaniaceae, Marchantiophyta).

Principal investigators Matt von Konrat, Juan Larraín, Matt Greif, Blanka Shaw, Ben Carter & Jon Shaw

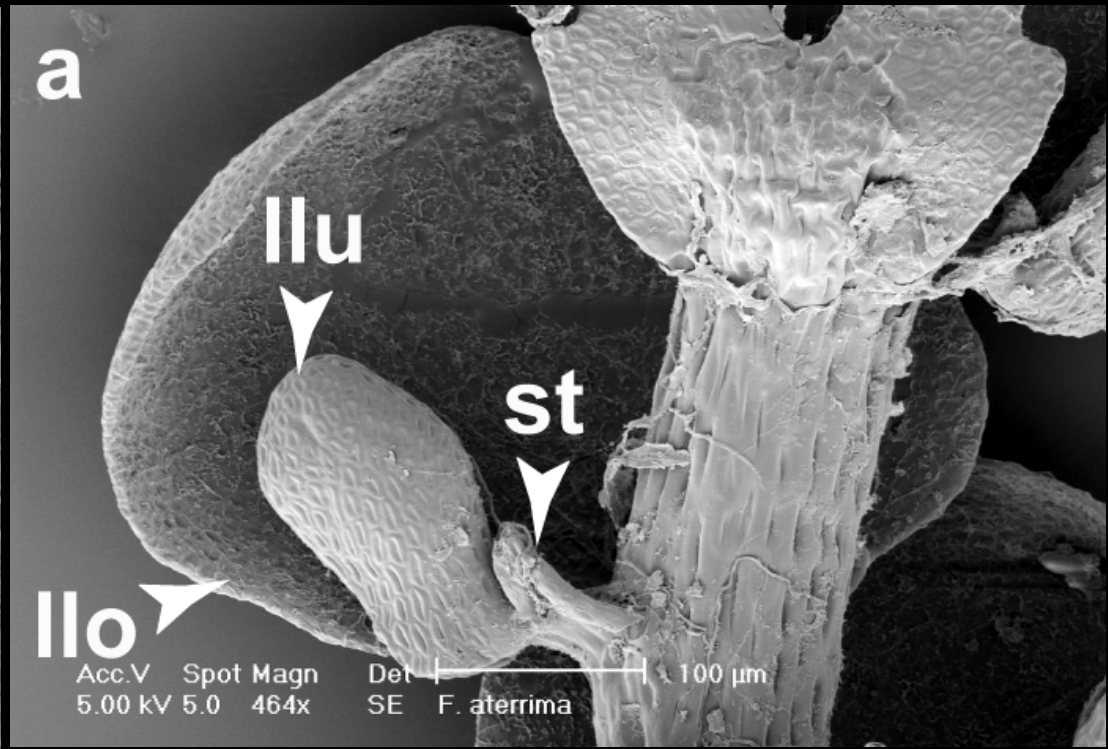



Microfrullania

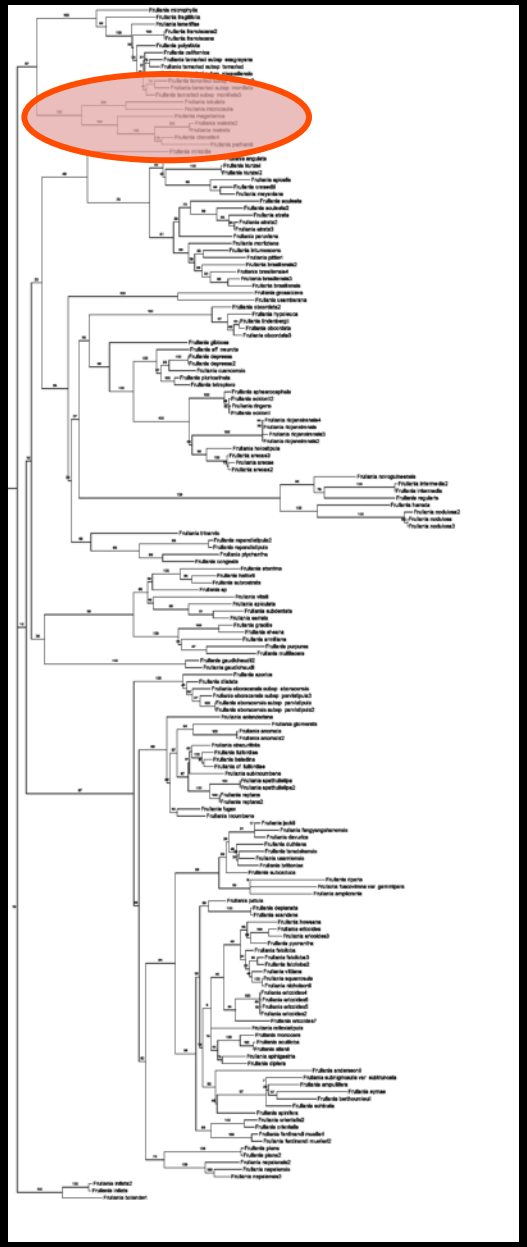
27 taxa (17/10)

Frullania Raddi

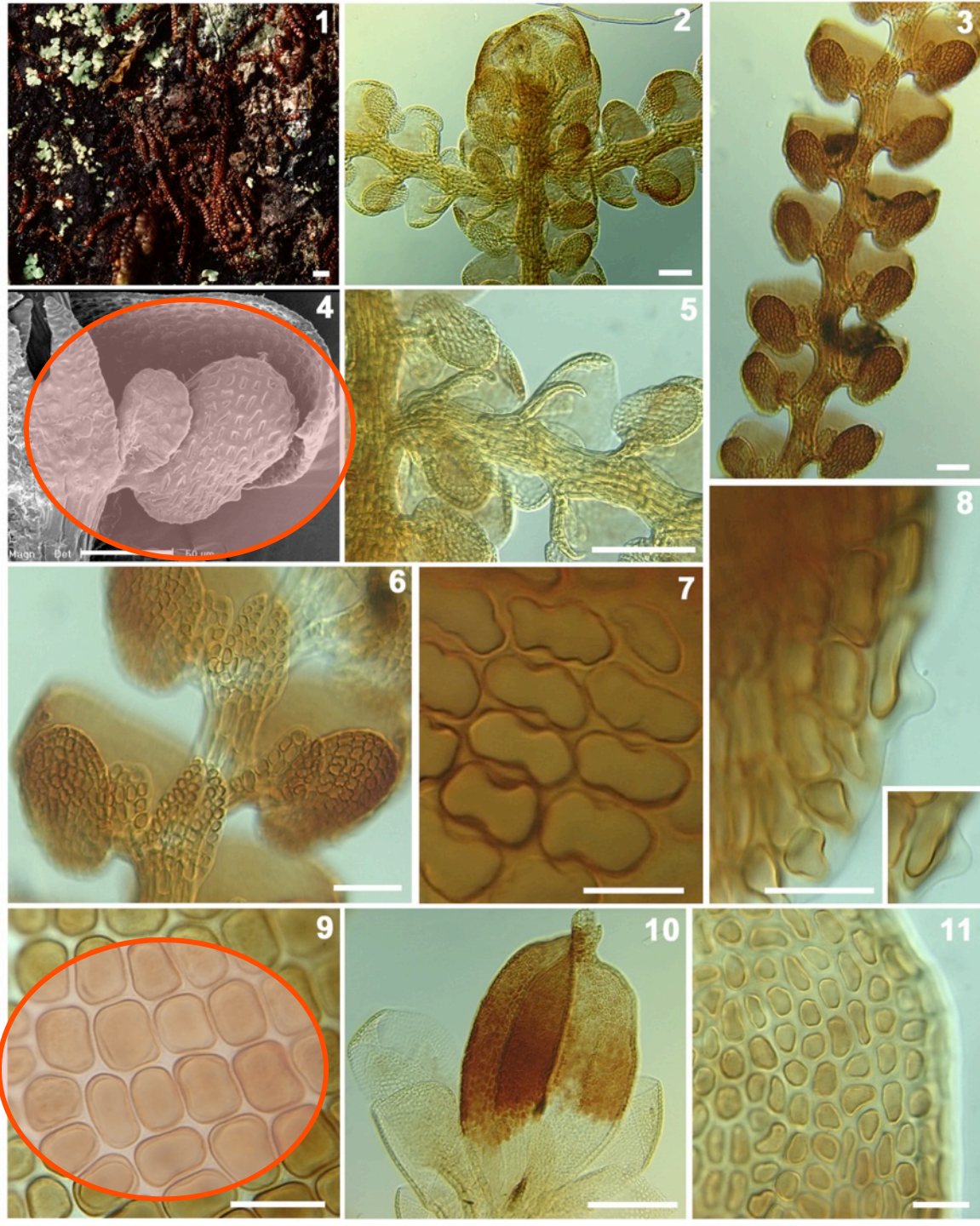
- More than 2000 published names (300-375 valid species?)
- Worldwide distribution, with centers of diversity in the humi
  and warm temperate regions
- Common as epiphyte

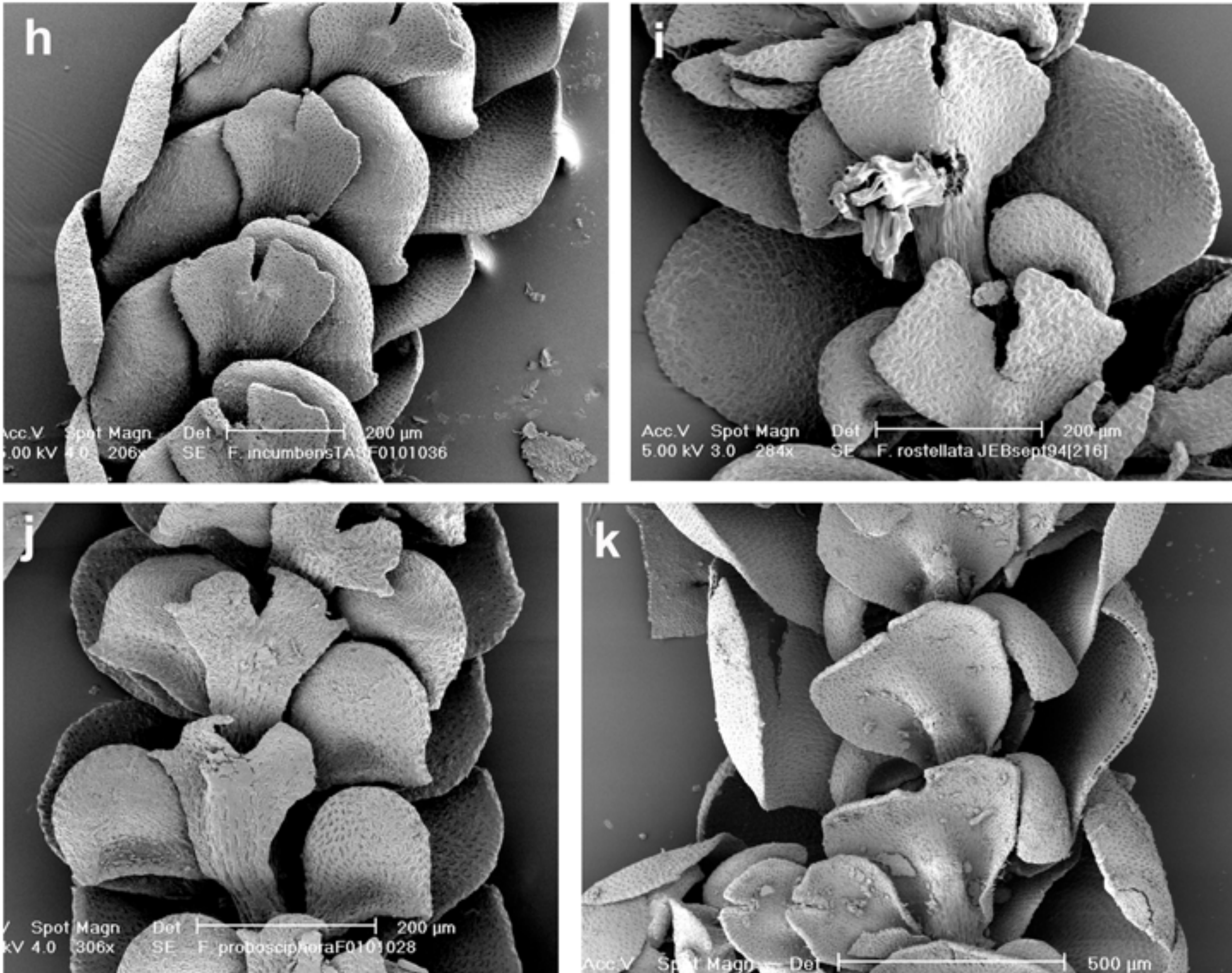


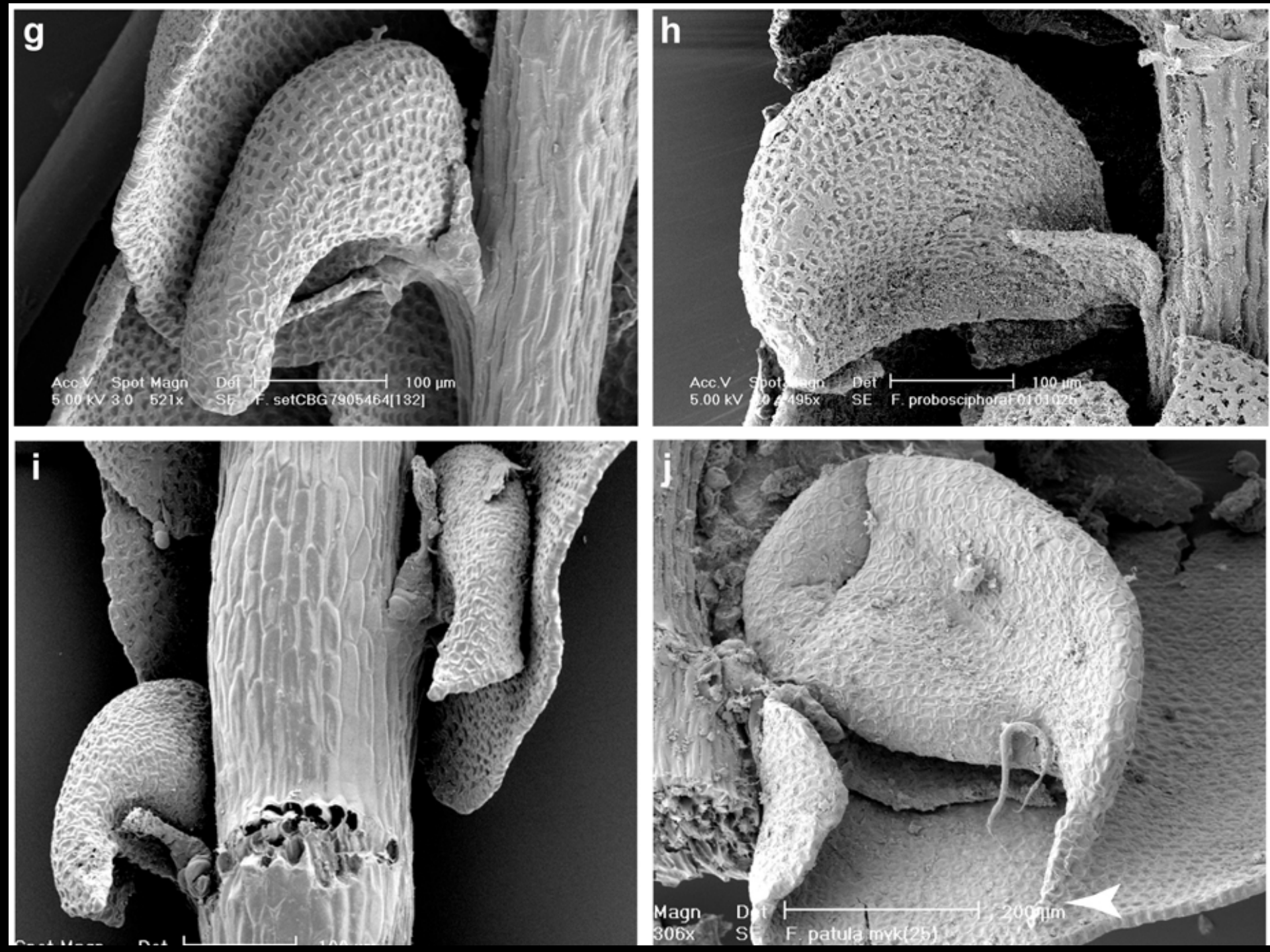
Subg. *Microfrullania*



Hentschel et al.




h
Acc.V Spot Magn Det 200 µm
.00 kV 4.0 206x SE F. incumbensTASF0101036
i
Acc.V Spot Magn Det 200 µm
5.00 kV 3.0 284x SE F. rostellata JEBsept94[216]
j
Spot Magn Det 200 µm
kV 4.0 306x SE F. probosciphoraF0101028
k
Acc.V Spot Magn Det 500 µm


g
Acc.V Spot Magn Det
5.00 kV 3.0 521x SE F. setCBG7905464[132]
100 µm
h
Acc.V Spot Magn Det
5.00 kV 495x SE F. proboscipho
100 µm
i
j
Magn Det
306x SE F. patula myk(25)
200 µm

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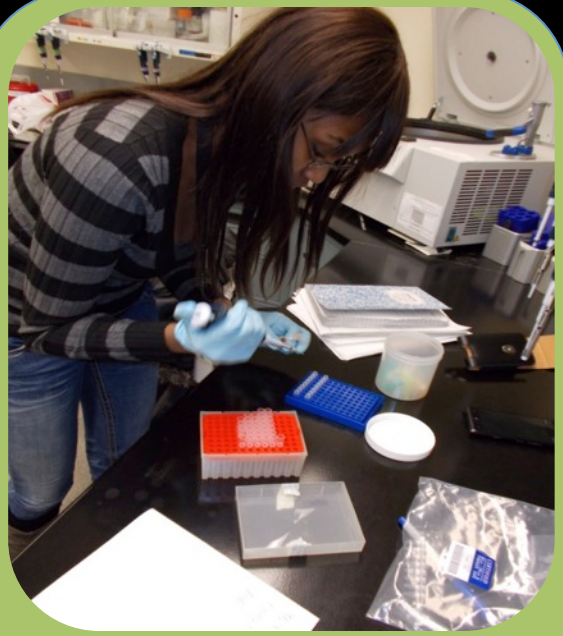
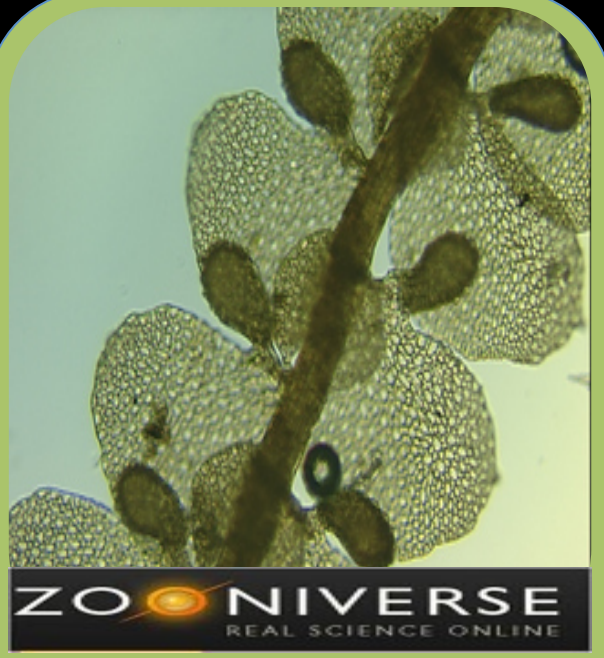


Research Team

Herbarium Collections & Digitized Labels



Production of Digital Microscopic Images & Web Tool

The Connection Collection: MicroPlants Network

CITY COLLEGES of CHICAGO
Wilbur Wright
Education that Works

NORTHEASTERN ILLINOIS UNIVERSITY
ESTABLISHED 1867

Undergraduate students (ca. 1,500 students)

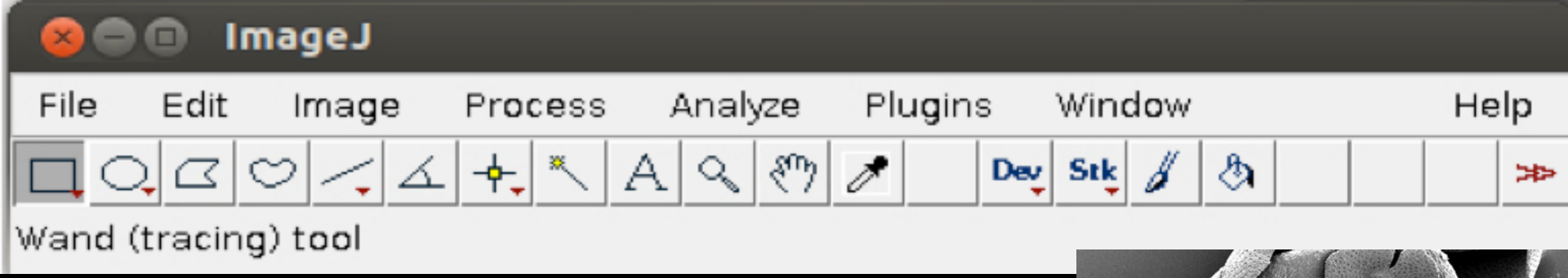
Families, general public (ca. 4,000 participants)

Data Analysis

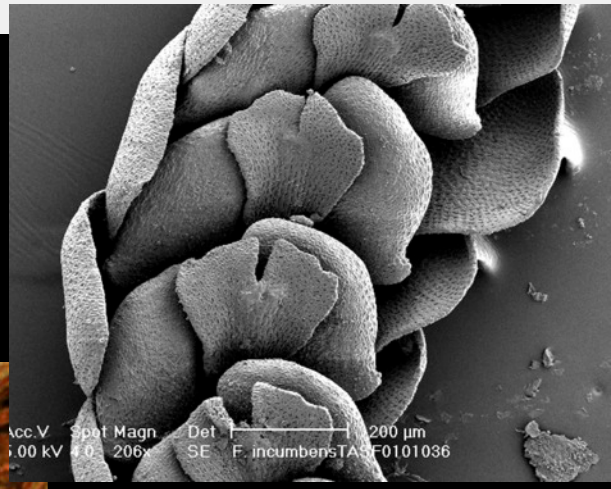
(54,000+ measurements)

Review by independent evaluation

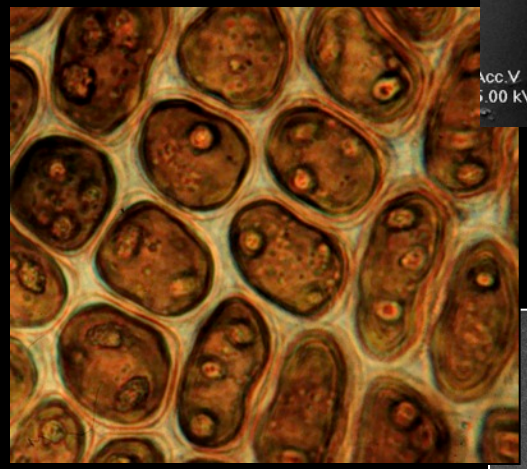
The Leaf Project Network (Post K-12)



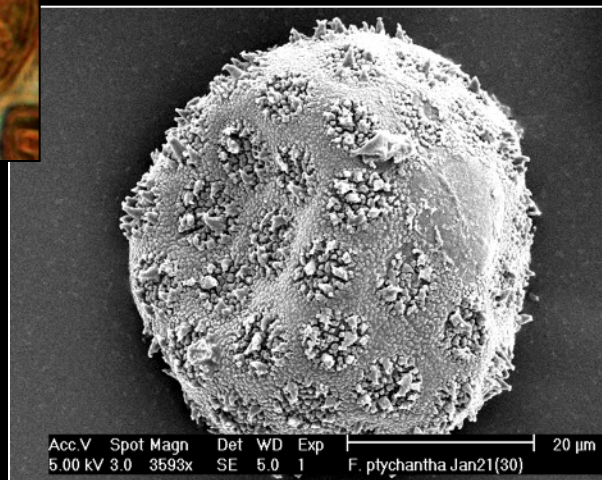
1. Leaf lobule (inflated sac)



2. Cell anatomy
   - Cell size
   - Oilbodies



3. Spores
   - Size
   - Number of “rosettes”



Northeastern Illinois University, BIOLOGY DEPT.

- BIO150 *Essential Skills for Biologists*

Course Catalog description

"A practical approach to providing students with the basic skills they will be expected to have in upper-division biology courses, including lab safety; methods and units of scientific measurement; scientific record-keeping, communication and library research skills; and summarizing and presenting data. This course has both lecture and lab, with a significant web-based component."

Student Data Sheet

Researcher Name: First Name Last Name

Exercise 1

Distance in pixels	
Known distance	
Unit of Length	
Scale	(pixles / unit of length)

Exercise 2

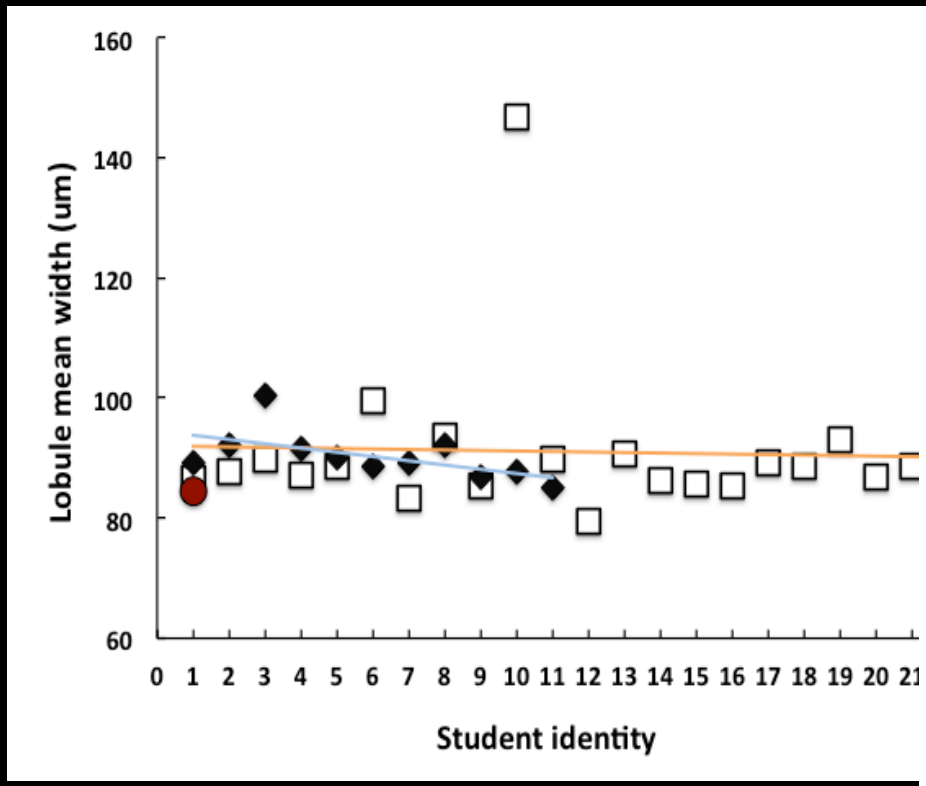
	Lobule Measurements					
	Species A		**Species B**		**Species C**	
No.	Length	Width	Length	Width	Length	Width
1	1					
2	2					
3	2					
4	2					
5	2					
Margin						
Mean						
s^2						
s						

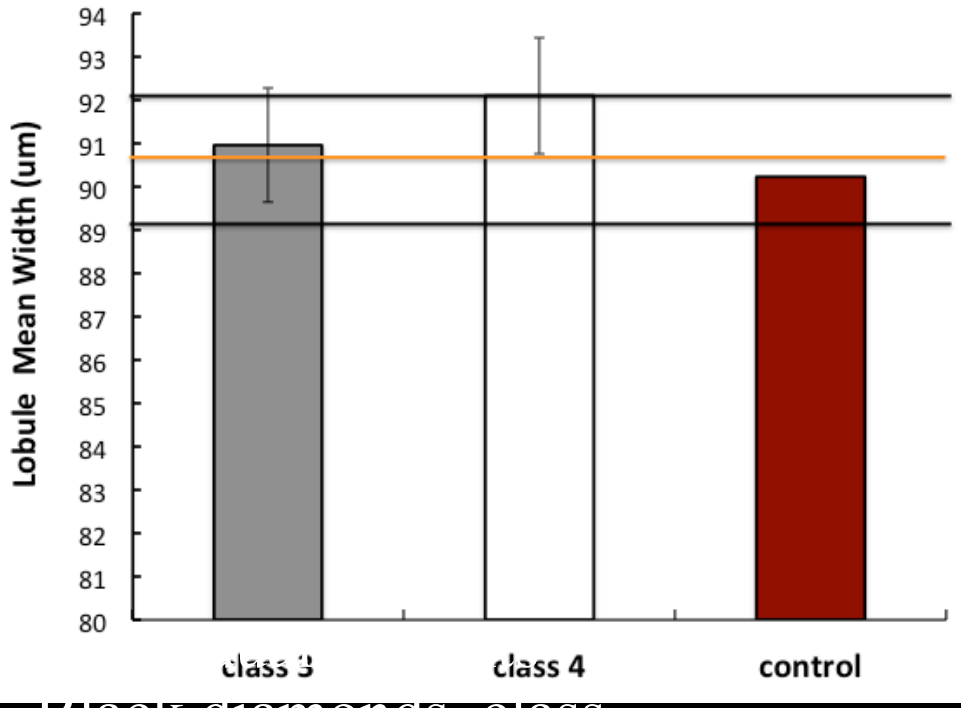
"As you can see, we run a completely paperless office."

Wilbur Wright College

Northeastern Illinois University

Results: How well did it work?



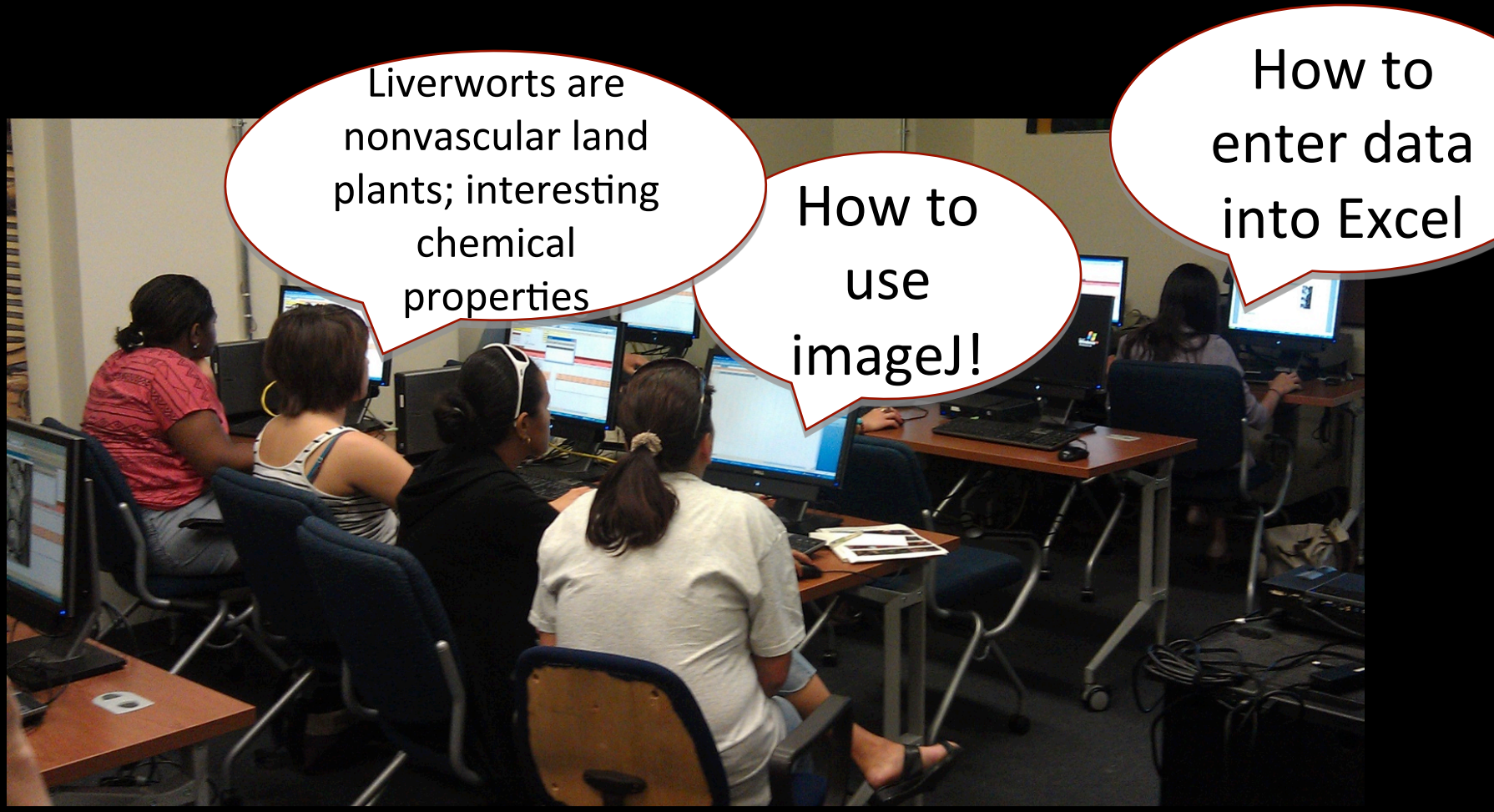


Mean lobule width measurements from NEIU from 2 different classes. Black diamonds, class 3; white squares, class 4; red circle, control; orange line, best fit of class 4; blue line, best fit of class 3.

Mean lobule width measurements +/- SE for classes 3 & 4. Orange bar represents mean measure of classes 3 & 4, black bars represents +/-1 standard deviation.

But did the students like it?

What did you learn from this exercise?



Phase II: pilot of online tool

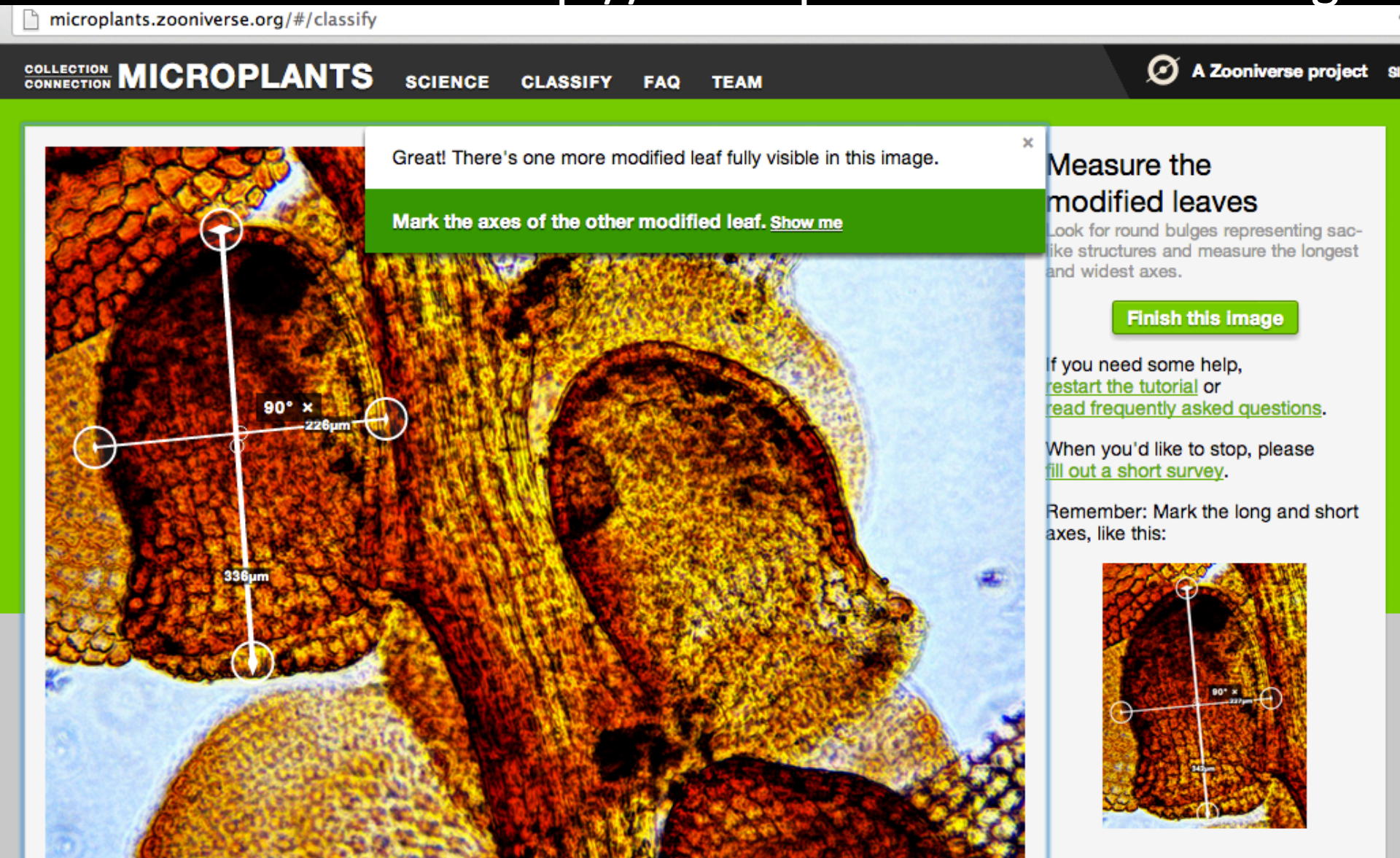
Help discover biodiversity!

Scientists from the Field Museum, Duke University and international researchers need your help.

Measure a critical morphological feature, a modified leaf (lobule), from early land plants to help scientists document and describe new

Connection Collection: Microplants – **Classify**

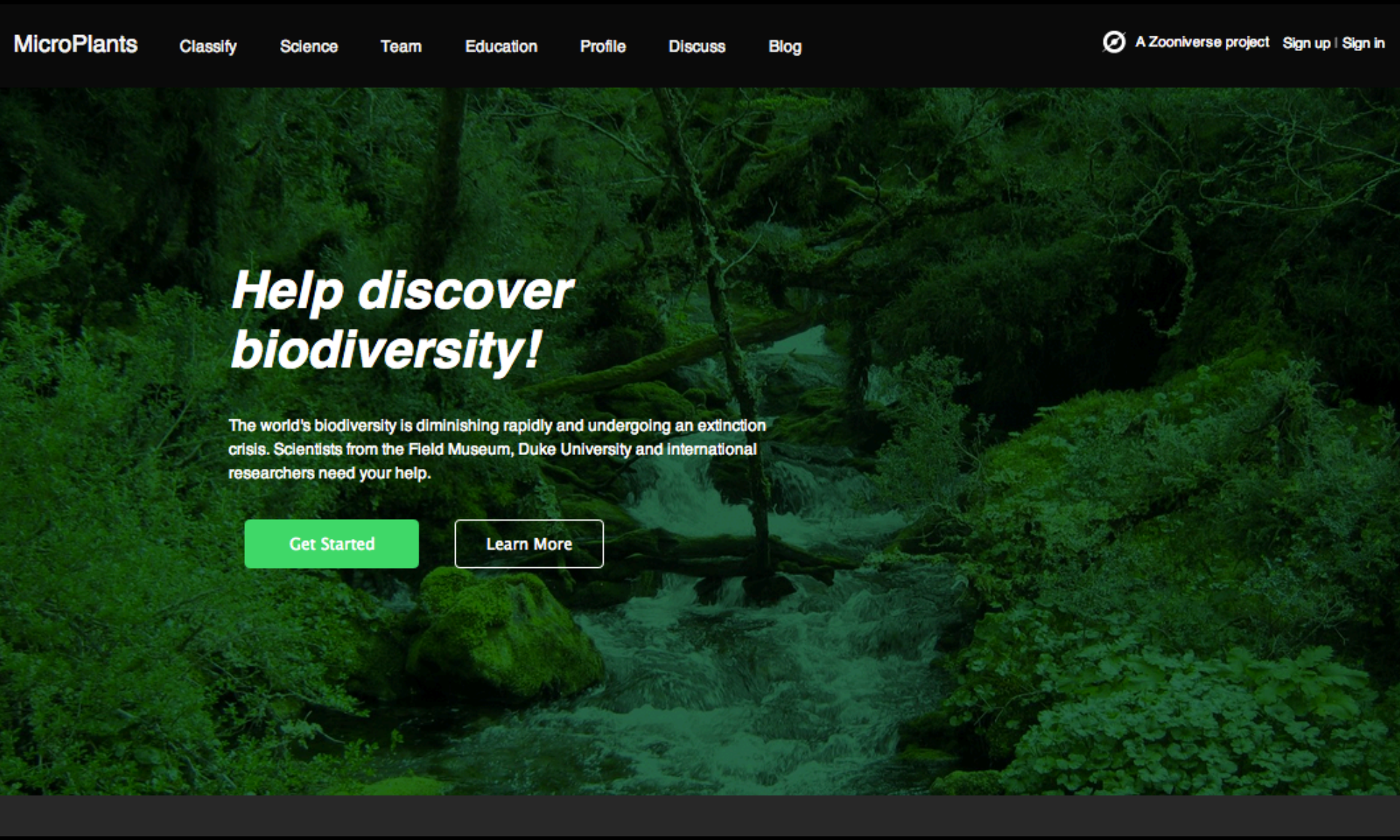
http://microplants.zooniverse.org




I'm a Citizen Scientist!
MicroPlants
COLLECTION
CONNECTION
ZOONIVERSE
The Field Museum
microplants.zooniverse.org

Connection Collection: Microplants – **2.0**

http://microplants.zooniverse.org



Connection Collection: Microplants – **Science**

http://microplants.zooniverse.org

Overview | About Bryophytes | Importance of Bryophytes | Images Origin



Life on Earth is undergoing a mass extinction crisis. The world's biodiversity is diminishing rapidly and undergoing an extinction crisis. Biological collections of museums and academic institutions, documenting the fossilized and living members of the world's ecosystems and their changes over time, are uniquely poised to inform the stewardship of life on Earth.

Taxonomy – the branch of science classifying biodiversity. Researchers at The Field Museum and partnering institutions are conducting a taxonomic treatment of a hyper-diverse group of early land plants in the liverwort genus Frullania. This includes documenting, describing and discovering new species to science. Liverworts (Marchantiophyta) are pivotal in our understanding of early land plant evolution and exist as important components of the vegetation in many regions of the world. Taxonomic conclusions will be drawn from a multi-faceted data set, including morphology, fieldwork,

Microplants – **About Bryophytes**

http://microplants.zooniverse.org



About Bryophytes

What is a bryophyte?

Bryophytes are a diverse group of early land plants that includes liverworts (Marchantiophyta), hornworts (Anthocerotophyta), and mosses (Bryophyta). They are considered to be the living descendents of the first terrestrial plants that evolved here on Earth. While much remains to be discovered about their biodiversity, biology, and geographic distribution, they are widespread throughout the globe and have important evolutionary, ecological, and medicinal characteristics that make them critically important to document, identify, and study. Some bryophytes might be confused

Microplants – **Importance of Bryophytes**

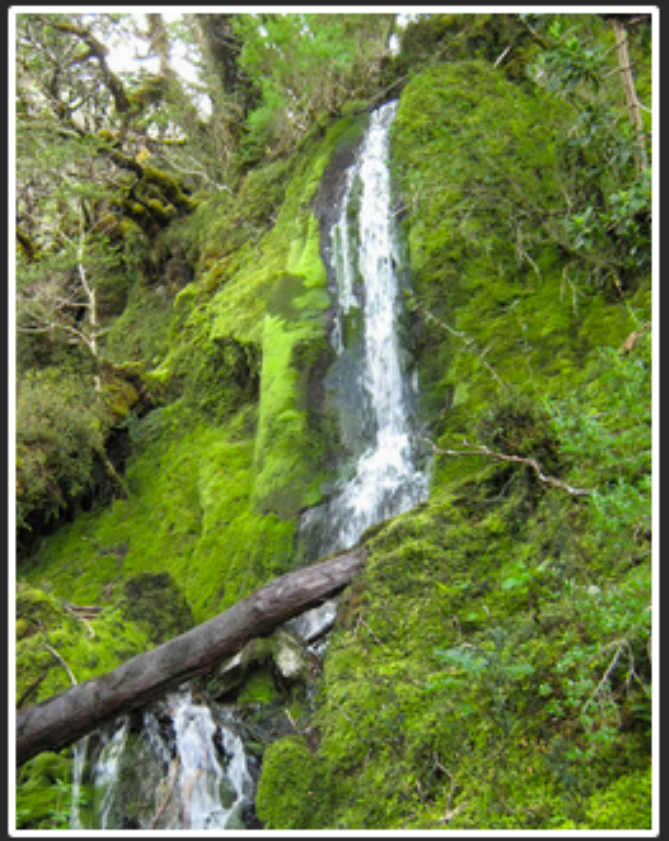
http://microplants.zooniverse.org

About Bryophytes | **Importance of Bryophytes** | Images Origin

Why Study Bryophytes

Why are bryophytes important?

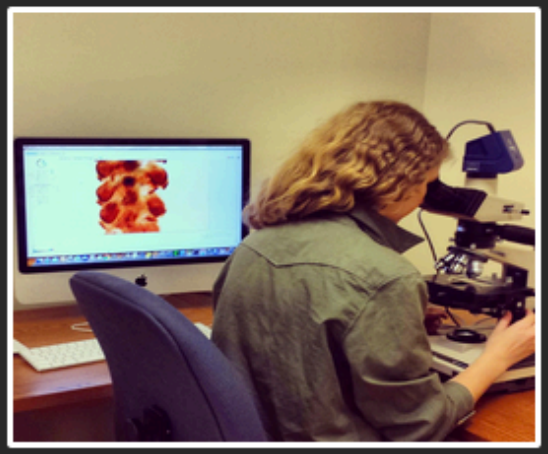
Together, bryophytes are the second largest group of land plants after flowering plants, and are pivotal in our understanding of early land plant evolution. Bryophytes are an important component of the vegetation in many regions of the world, constituting a major part of the biodiversity in moist forest, wetlands, mountain, and tundra ecosystems. Liverworts and mosses offer microhabitats that are critical to the survival of a tremendous diversity of organisms such as single-celled eukaryotes, protozoa, and numerous groups of invertebrates. Their structural contribution to levels of diversity might be as significant as that of vascular plants, albeit at a smaller scale.

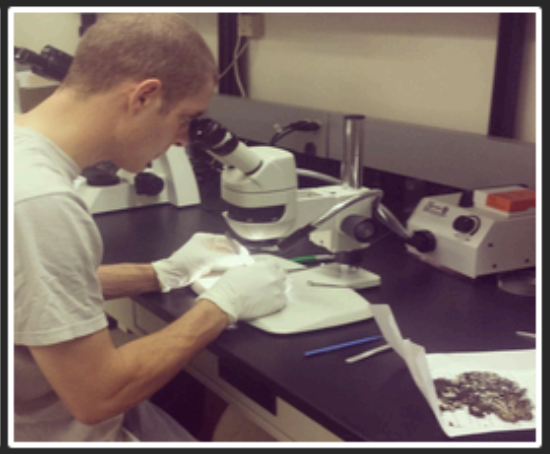


Microplants – **Origin of images**

http://microplants.zooniverse.org

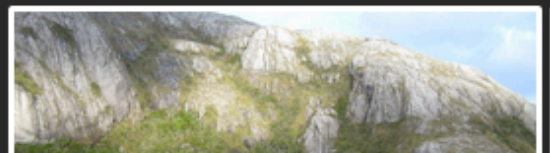
Overview | About Bryophytes | Importance of Bryophytes | Images Origin

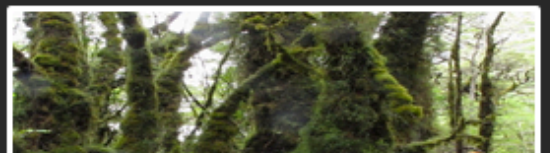




Where are these images from?

Liverworts grow all over the world, but these Frullania images have typically been collected from the southern hemisphere in areas like Fiji, New Caledonia, and Chile. Specimens were collected in the field, brought back to the museum, and painstakingly mounted onto slides. From there, they imaged with a microscope by our many interns. Images were taken by interns at the Field Museum from Northeastern Illinois University, DePaul University, Harold Washington Chicago City College, and The Ohio State University. You might be the first person ever to study and analyze a particular image!





Microplants – **Education**

http://microplants.zooniverse.org

Classify Science Team **Education** Profile Discuss Blog A Zooniverse pro

developed. These have been deve to non biology majors as well as ent level biology. Some of the activities coul for advanced placement biology students in high school.

Undergraduate students express their experience!

"All together" Past Field Museum undergraduate interns, explain their experiences using MicroPlants as well as the ImageJ software used in some of our activities!

Microplants – **Education**

http://microplants.zooniverse.org

Overview | **Activities**

Biological Illustrations.pdf

Learn how to make scientific illustrations and record your observations, a great tool to help you to remember all the features of an observed specimen.

Early Land Plants Today.pdf

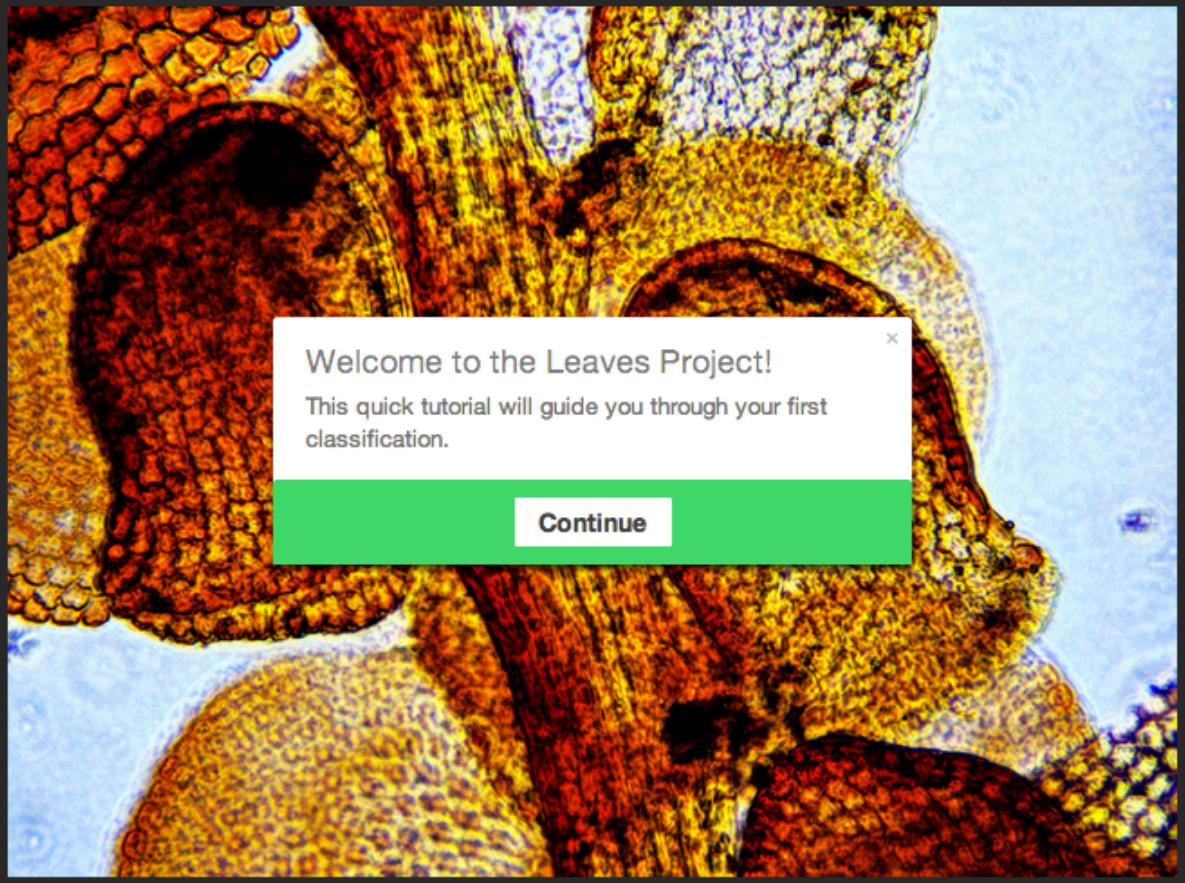
This activity focuses on morphology, the study of form and structure of organisms and specific structural features. Students can investigate morphological characteristics of early land plants.

ImageJ Instructions.pdf

ImageJ is a free program developed by the National Institute of Health (NIH) that has given the scientific community a way of generating data from images.

MicroPlants | Classify | Science | Team | Education | Profile | Discuss | Blog | A Zooniverse project | Sign up | Sign in

IMAGE CLASSIFICATION



Info | Guide | Measure the lobules! | Finished

Connection Collection: Microplants – **FAQ**

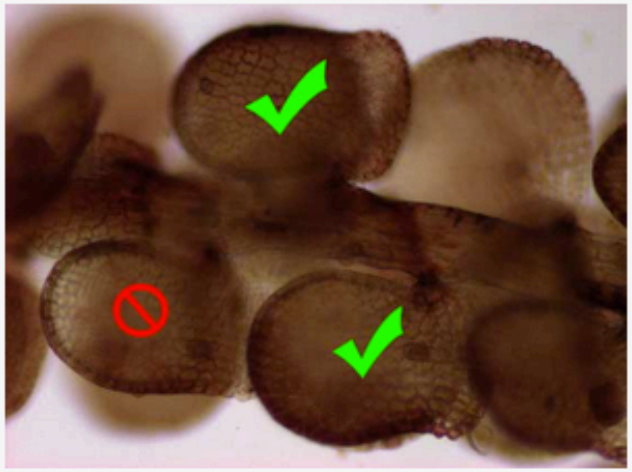
http://microplants.zooniverse.org

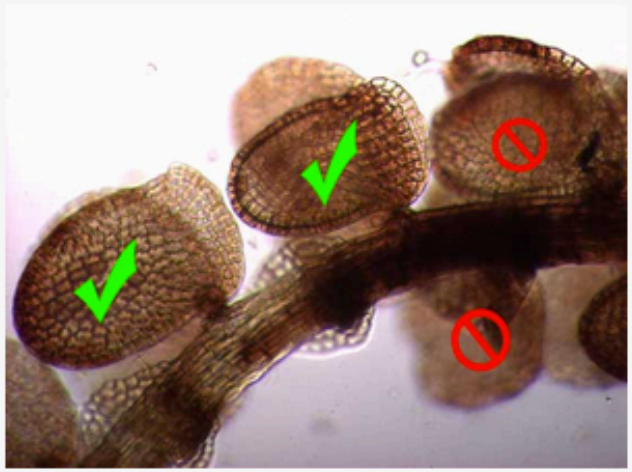
Oops! I made a mistake. How do I undo a mistake?

First off, don't panic! Simply, select the "X" that appears in the grey box after each measurement to delete that set of measures. In any event, if you make a mistake, we will be able to sort that out when all the data is collected.

How do I differentiate a lobule from the rest of the image?

Usually the structures in clear focus within the image will be the lobules; it will generally be toward the center of the image. We will measure only lobules (modified leaves) that are clearly focused and fall entirely within the image. Here are some pictures to help guide you.





How many lobules are on each image?

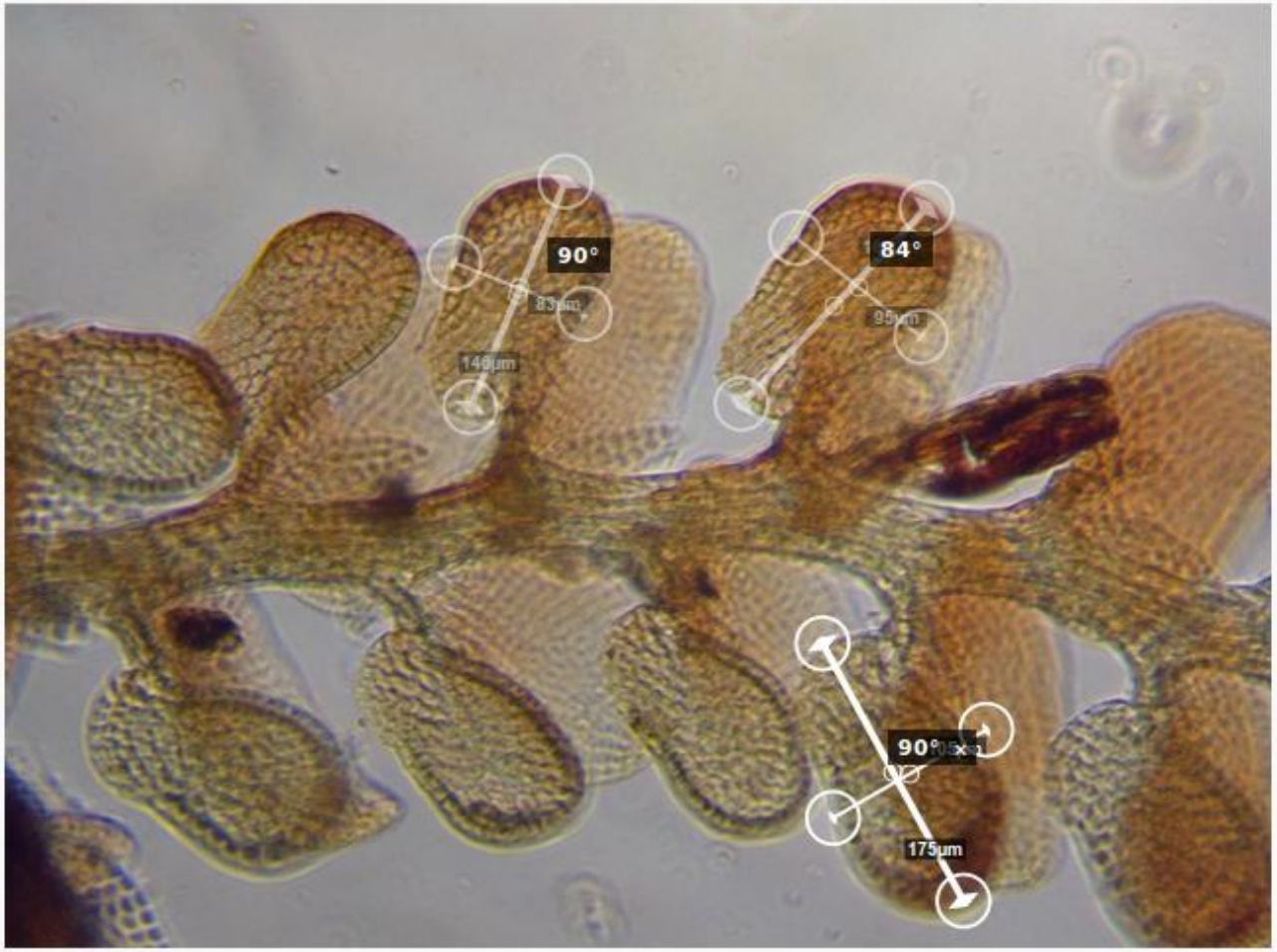
Each image will have at least one lobule; however, some images will have several.

The app is not loading, what should I do?

The website may be affected by your connection speed. If you're able to connect to the internet, check to see if you're using the latest

http://microplants.zooniverse.org

COLLECTION CONNECTION **MICROPLANTS** SCIENCE CLASSIFY FAQ TEAM



Measure the modified leaves

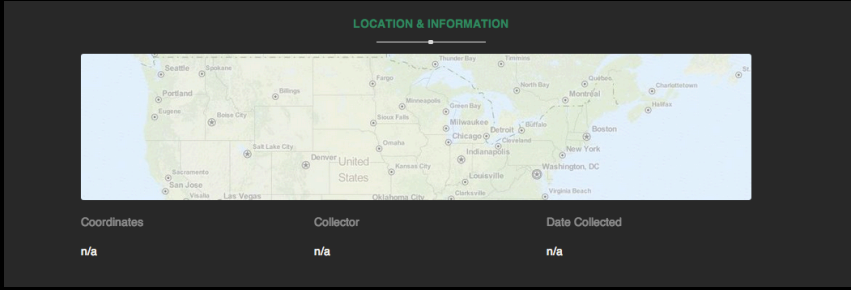
Look for round bulges representing sac-like structures and measure the longest and widest axes.

Finish this image

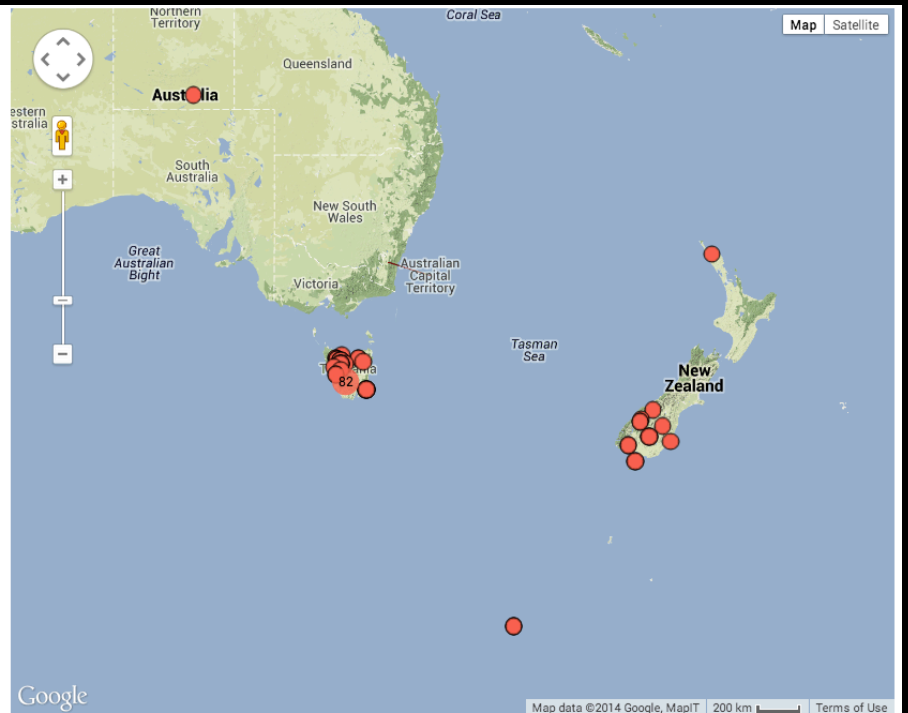
If you need some help, restart the tutorial or read frequently asked questions.

When you'd like to stop, please fill out a short survey.

Location and information



Collector, Date collected, Habitat, Links to Symbiota



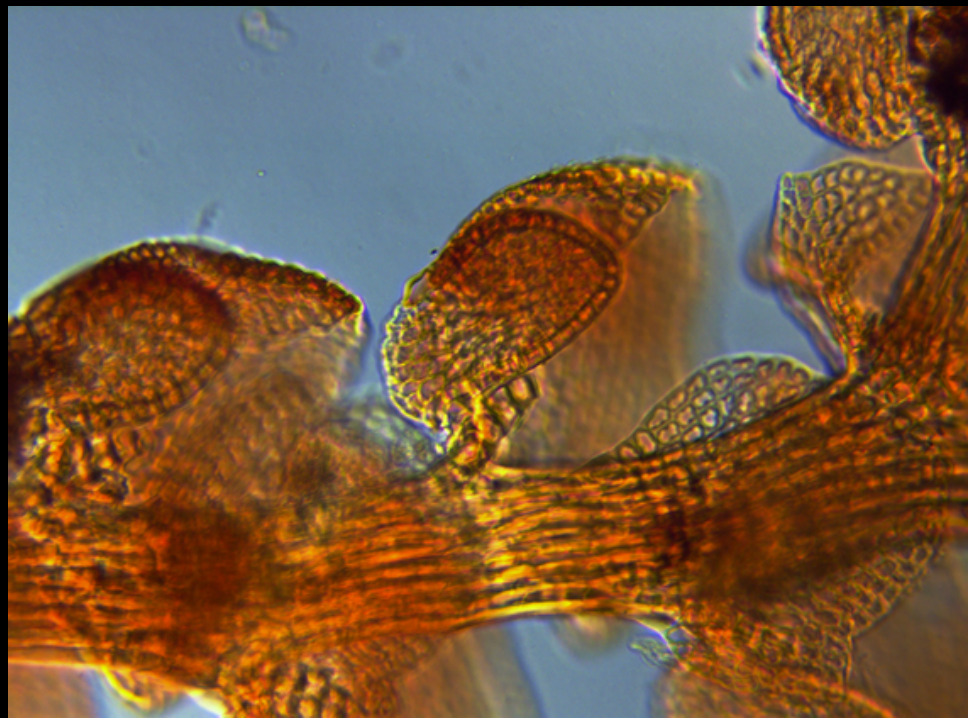
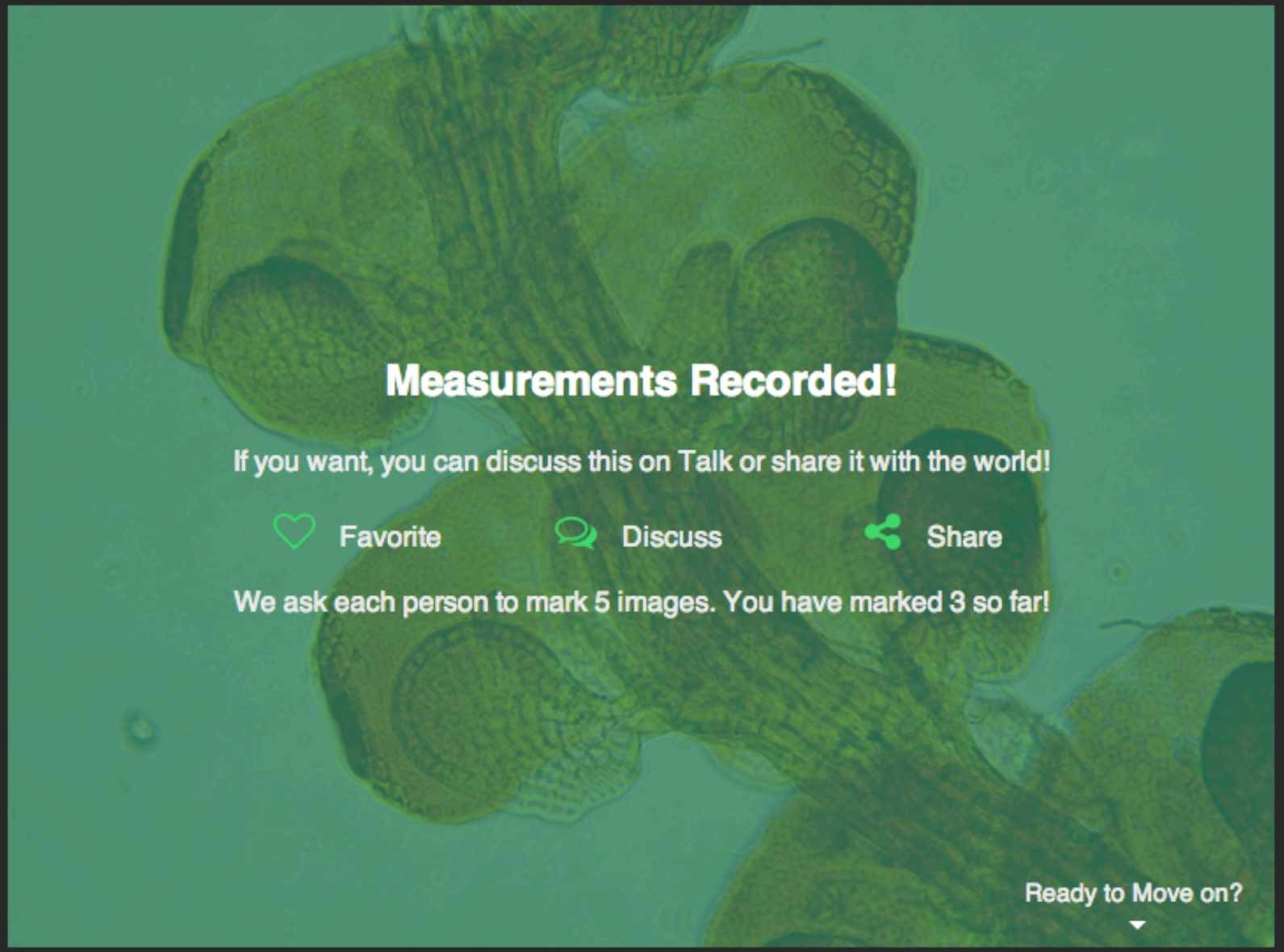


IMAGE CLASSIFICATION



Info Guide Next Image

Weekly data dumps
Sunday July 27, 54,209 measurements!

classification	created_at	image_name	image_url	user_name	user_group_	step	label	p0_x	p0_y	p1_x	p1_y	p2_x	p2_y	p3_x	p3_y	major_axis	minor_axis
51db130df6	2013-07-08 1	tutorial-subj	http://micro	brian-c		lobules	85å¡	172.222222	96.2518657	172.222222	403.815299	43.3333333	259.990672	281.111111	236.757463	307.563433	238.910137
51db130df6	2013-07-08 1	tutorial-subj	http://micro	brian-c		lobules	86å¡	458.888889	163.738806	633.333333	487.897388	447.777778	369.518657	646.666667	276.585821	368.116355	219.529729
51db12e239	2013-07-08 1	PDL_11544_	http://micro	brian-c		lobules	90å¡	524	180.324627	285	403.488806	331	211.208955	487	375.593284	326.991209	226.623493
51db27c3f6	2013-07-08 2	PDL_595_br	http://micro	not-logged-in-960530252		lobules	82å¡	383	69.738806	496	181.320896	398	196.264925	485	78.7052239	158.806684	146.250755
51db27a6f6	2013-07-08 2	tutorial-subj	http://micro	not-logged-in-96053025228d86323043ab3aca262a2a													
51db285c39	2013-07-08 2	PDL_11627_	http://micro	not-logged-in-960530252		lobules	89å¡	179	385.432836	417	215.802239	250	219.817164	370	379.410448	292.264503	199.674776
51db28c8f6	2013-07-08 2	tutorial-subj	http://micro	not-logged-in-960530252		lobules	89å¡	150	88.5074627	191.111111	437.005597	55.5555556	271.054105	285.555556	245.608209	350.914624	231.403314
51db2cacf6	2013-07-08 2	Kiener_4525	http://micro	not-logged-in-79b813c4bc		lobules	85å¡	347	258.033582	499	459.279851	307	474.223881	539	263.014925	313.740694	252.198455
51db2c2f39	2013-07-08 2	PDL_11596B	http://micro	not-logged-in-79b813c4bc		lobules	74å¡	370	135.492537	377	327.772388	313	250.063433	446	206.227612	192.407227	140.037778
51db2c1439	2013-07-08 2	tutorial-subj	http://micro	not-logged-in-79b813c4bc		lobules	86å¡	140	71.9123134	178.888889	422.623134	48.8888889	269.947761	286.666667	225.69403	352.860349	241.860837
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51db843039	2013-07-09 0	JL_35925_br	http://micro	not-logged-in-11c36f40e0		lobules	83å¡	1.5	348.294776	164.5	316.175373	71.5	298.108209	96.5	372.384328	166.134452	78.3705424
51db843039	2013-07-09 0	JL_35925_br	http://micro	not-logged-in-11c36f40e0		lobules	87å¡	104.5	396.473881	280.5	360.339552	184.5	345.283582	204.5	418.55597	179.67106	75.9528989
51db843039	2013-07-09 0	JL_35925_br	http://micro	not-logged-in-11c36f40e0		lobules	83å¡	183.5	459.708955	348.5	438.630597	237.5	413.537313	259.5	498.854478	166.340907	88.1079934
51db843039	2013-07-09 0	JL_35925_br	http://micro	not-logged-in-11c36f40e0		lobules	85å¡	540.5	274.018657	628.5	396.473881	547.5	340.264925	611.5	284.05597	150.795497	85.1789096
51db843039	2013-07-09 0	JL_35925_br	http://micro	not-logged-in-11c36f40e0		lobules	78å¡	444.5	199.742537	515.5	352.309702	443.5	277.029851	509.5	225.839552	168.278756	83.5251259
51db843039	2013-07-09 0	JL_35925_br	http://micro	not-logged-in-11c36f40e0		lobules	88å¡	337.5	164.61194	422.5	141.526119	360.5	107.399254	410.5	269	169.1591	88.0792548
51db843039	2013-07-09 0	JL_35925_br	http://micro	not-logged-in-11c36f40e0		lobules	88å¡	227.5	44.1641791	287.5	203.757463	222.5	126.470149	300.5	92.3432836	170.499314	85.1389627
51db84f8f6a	2013-07-09 0	JL_36204_br	http://micro	not-logged-in-11c36f40e0		lobules	80å¡	27.5	92.6529851	114.5	228.145522	23.5	177.335821	95.5	110.585821	161.019339	98.1812737
51db84f8f6a	2013-07-09 0	JL_36204_br	http://micro	not-logged-in-11c36f40e0		lobules	89å¡	125.5	104.608209	261.5	245.08209	141.5	190.287313	210.5	120.548508	195.52215	98.1045415
51db84f8f6a	2013-07-09 0	JL_36204_br	http://micro	not-logged-in-11c36f40e0		lobules	89å¡	268.5	113.574627	393.5	242.093284	286.5	196.264925	352.5	128.518657	179.282027	94.5809543
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51db84f8f6a	2013-07-09 0	JL_36204_br	http://micro	not-logged-in-11c36f40e0		lobules	82å¡	521.5	130.511194	640.5	256.041045	535.5	222.16791	598.5	142.466418	172.970354	101.593936
51db84f8f6a	2013-07-09 0	JL_36204_br	http://micro	not-logged-in-11c36f40e0		lobules	87å¡	55.5	464.261194	163.5	390.537313	84.5	379.578358	139.5	467.25	130.76395	103.495492
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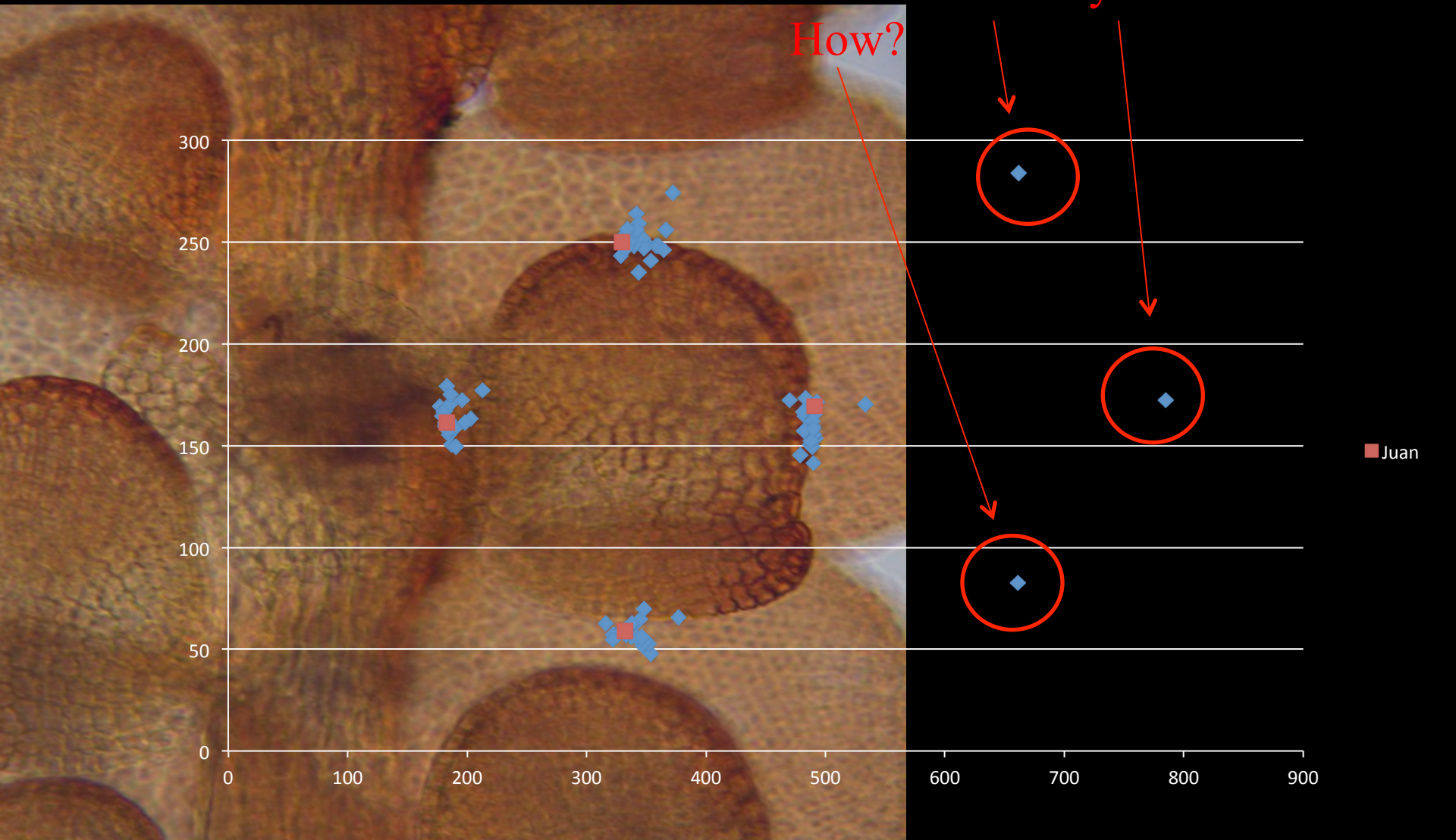
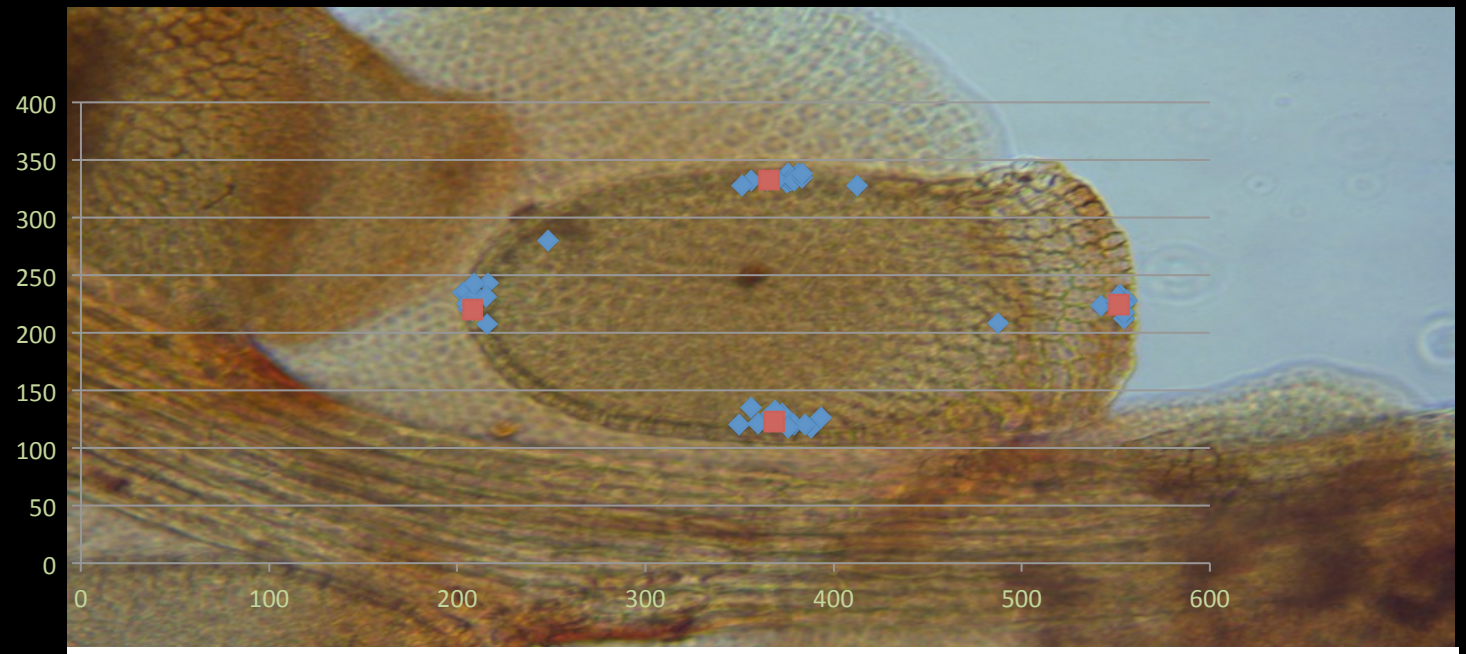
51db8daa39	2013-07-09 0	PDL_11386_	http://micro	not-logged-in-e39dcd92dt		lobules	80å¡	276	240.100746	404	307.847015	361	222.16791	328	324.783582	144.822501	107.791354
51db8daa39	2013-07-09 0	PDL_11386_	http://micro	not-logged-in-e39dcd92dt		lobules	82å¡	3	272.977612	176	313.824627	97	217.186567	86	350.686567	177.756796	133.952417

The data returns as (x,y) coordinates for the points where people mark the lines as beginning and ending.

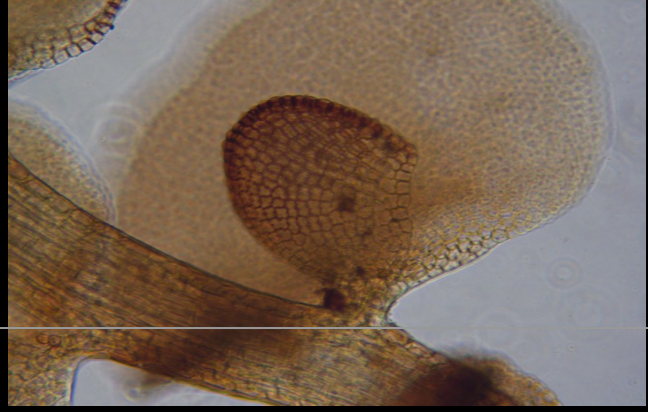


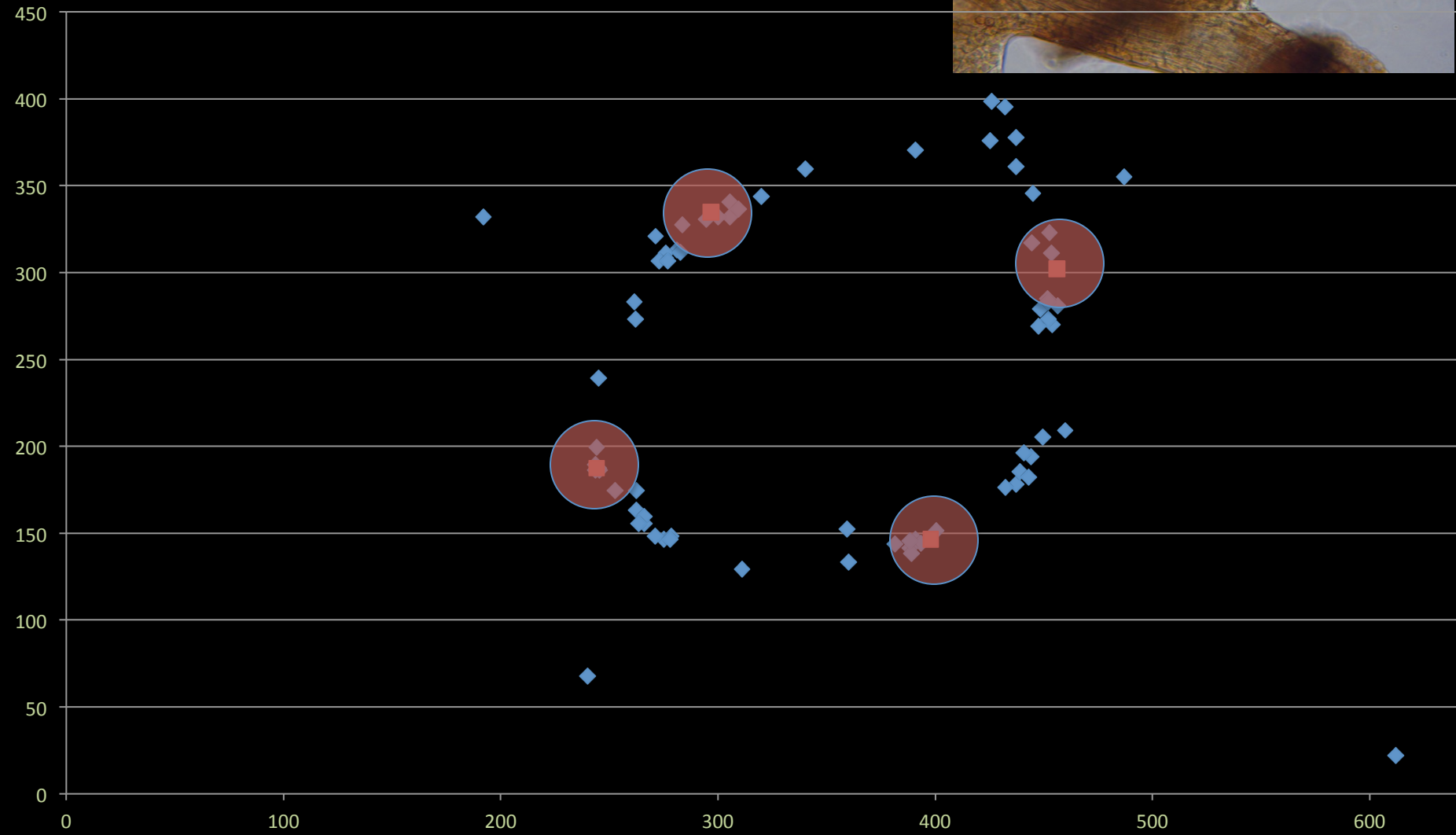
Juan's length data falls both within range and within a 95% CI of the mean length



					Juan
Average Major		335			**344**
Average Minor		209			**210**
Range Major		249	350	IN RANGE	
Range Minor		200	220	IN RANGE	
95 % CI around mean of major		16			
95% CI around mean of minor		4			
95 % CI RANGE Major		319	**344**		YES
95 % CI RANGE Minor		205	**210**		YES

The bad and the ugly





Connection Collection: Microplants – Survey

http://microplants.zooniverse.org

Welcome

Thank you for participating in this brief evaluation of your experience with Collection Connection: MicroPlants. This survey should take approximately 8 minutes.

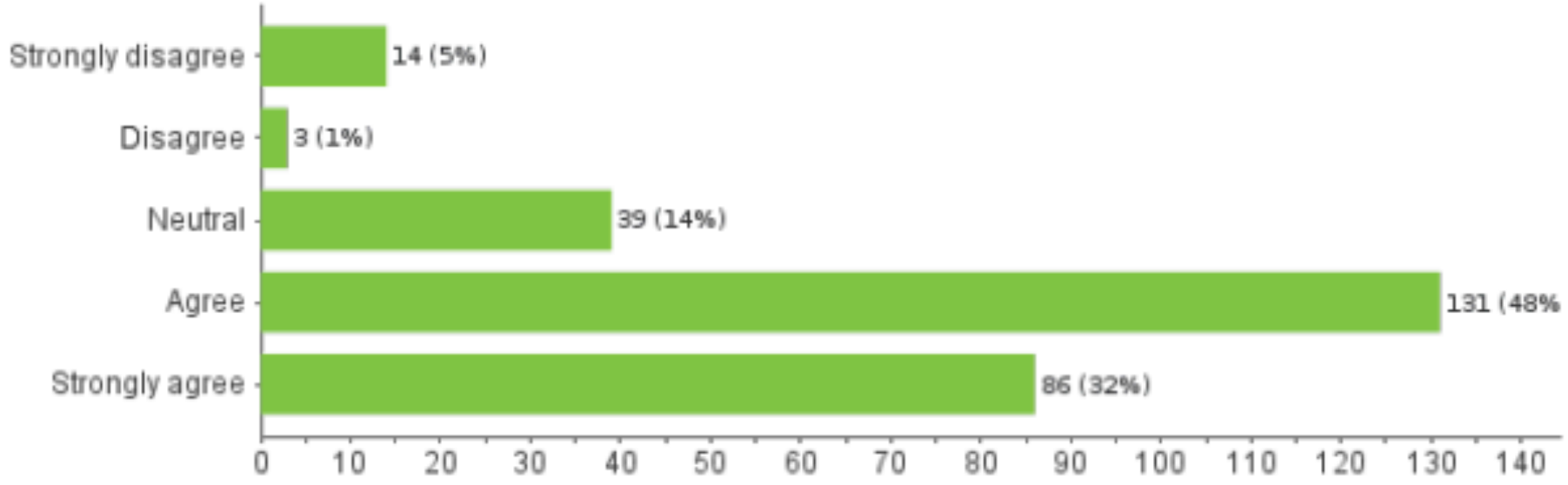
Tell us about yourself

Please enter your year of birth (YYYY):

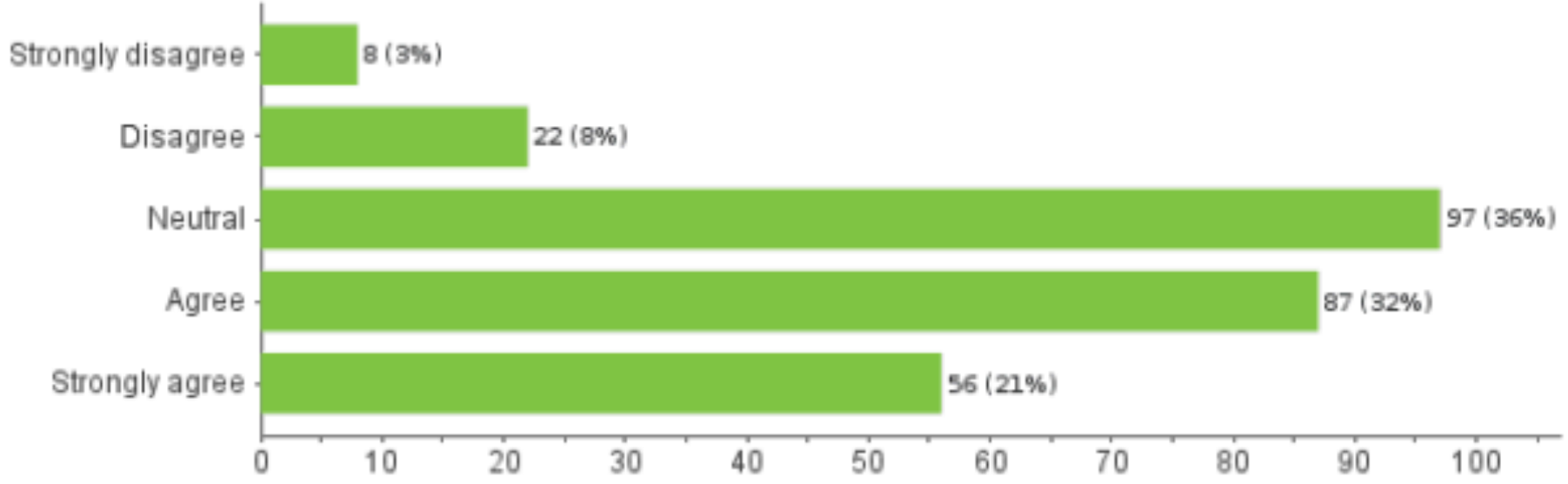
Before today, when did you last visit a museum?

- ○ Less than 3 months ago
- ○ 3-6 months ago
- ○ 6-12 months ago
- ○ More than a year ago

After completing this activity, I have a better understanding of the processes scientists use in research.

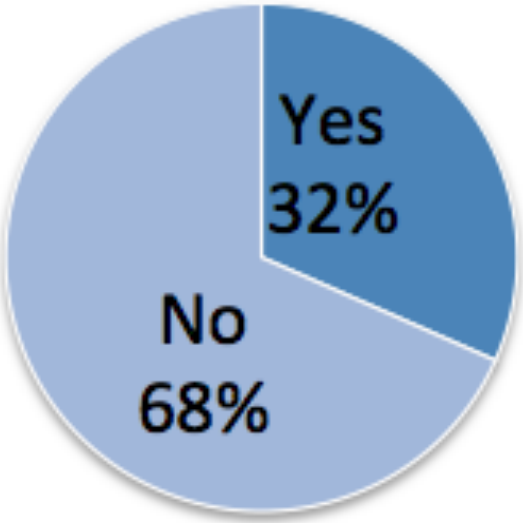


After participating in the project, I am likely to read more about science.

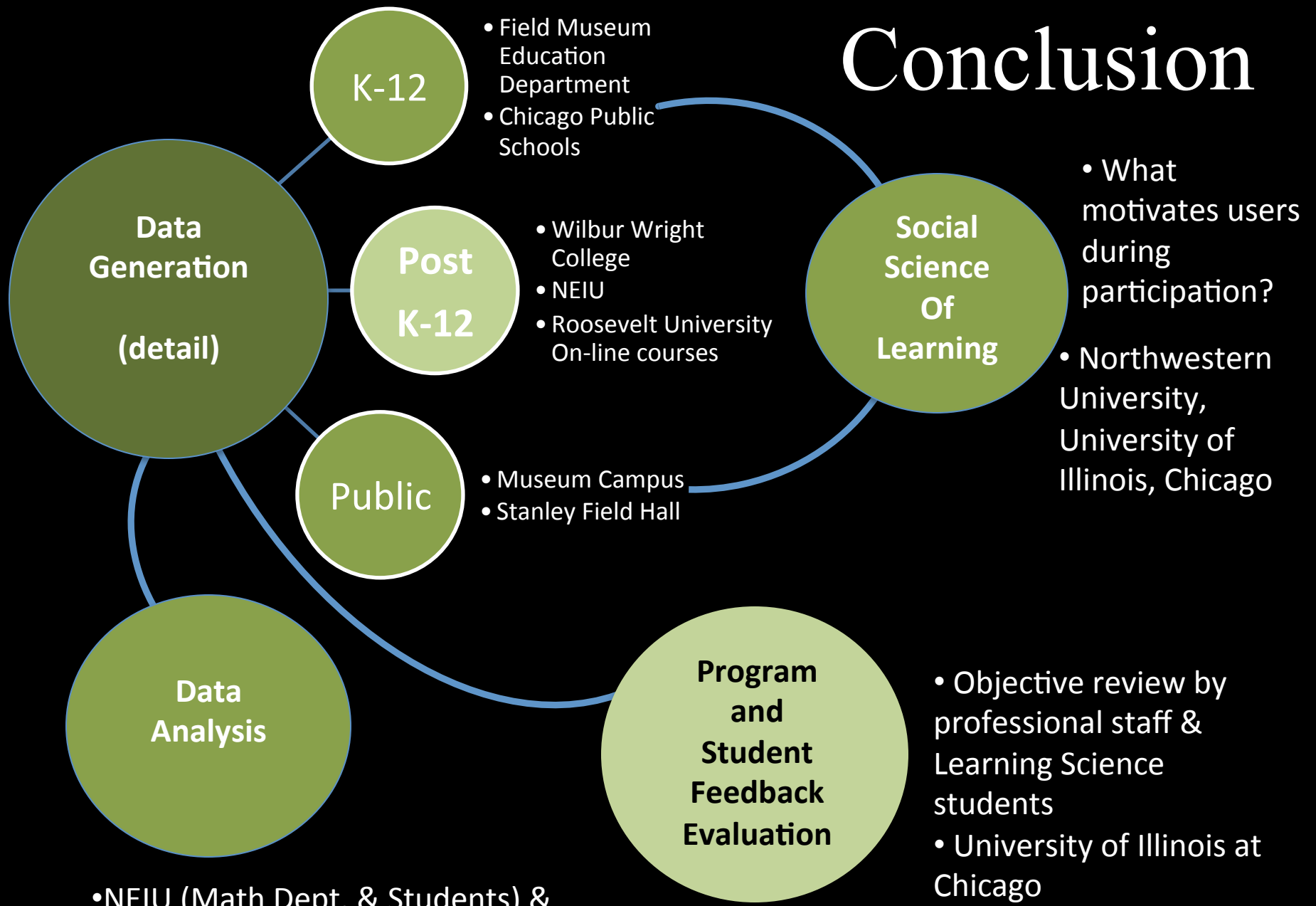


Familiarity with the Field's Research

Prior to this activity were you aware that the Field Museum has 25 million specimens and objects that are helping scientists at the museum and worldwide to help document biodiversity on earth?

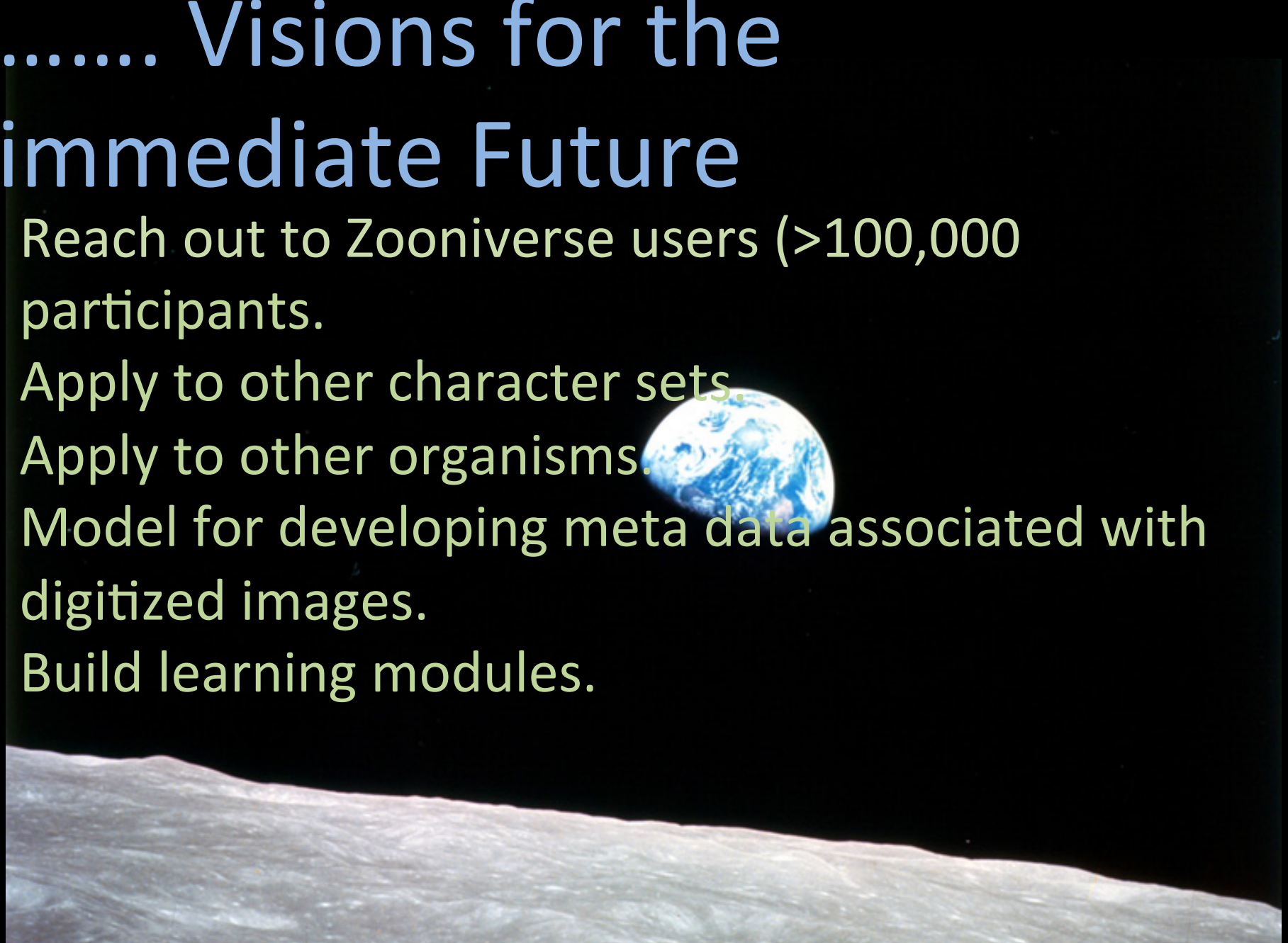


Conclusion


K-12
• Field Museum Education Department
• Chicago Public Schools
Data Generation
(detail)
Post K-12
• Wilbur Wright College
• NEIU
• Roosevelt University On-line courses
Public
• Museum Campus
• Stanley Field Hall
Social Science Of Learning
• What motivates users during participation?
• Northwestern University, University of Illinois, Chicago
Data Analysis
•NEIU (Math Dept. & Students) & Roosevelt University (Bioinformatics, graduate students
Program and Student Feedback Evaluation
• Objective review by professional staff & Learning Science students
• University of Illinois at Chicago

……. Visions for the immediate Future

- Reach out to Zooniverse users (>100,000 participants.
- Apply to other character sets.
- Apply to other organisms.
- Model for developing meta data associated with digitized images.
- Build learning modules.

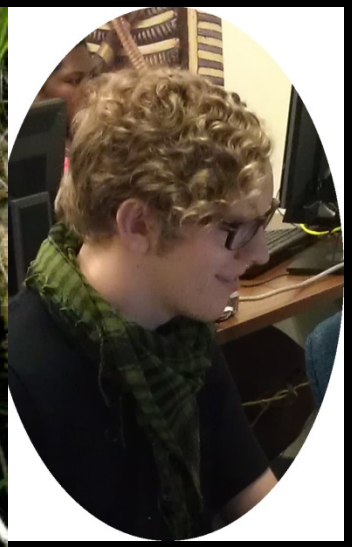


The Field Museum

Northeastern Illinois University

CITY COLLEGES of CHICAGO
Education that Works

NSF



Duke UNIVERSITY

UIC

ADLER PLANETARIUM

The Field Museum
Eve Gaus, Co-Principal Investigator (Digital Learning Manager, Education Department)
Juan Larrain (Post Doctoral Research Scholar, Science & Education)
Beth Crownover (Director, Education Department)
Jessica Hankey (School Partnerships and Programs Manager, Education Department)
Kristina Lugo (Annual Fund Coordinator, Institutional Advancement)
Juan Larrain (Post Doctoral Research Scholar, Science & Education)
Beth Sanzenbacher (Outreach Coordinator, BioSynC)
Audrey Aronowsky (Outreach Coordinator, BioSynC)
The Adler Planetarium
Arfon Smith, Co-Principal Investigator (Director of Citizen Science)
Michael Parrish
Brian Carstensen
David Miller
Kelly Borden
Northeastern Illinois University
Tom Campbell (Biology Instructor, Department of Biology)
John Kasmer (Associate Professor and Chair, Department of Biology)
Oana Vadineanu (Intern, Field Museum)

Wilbur Wright College
Matt Greif (Biology Instructor)
University of Illinois, Chicago
Leilah Lyons (Assistant Professor Computer and Learning Sciences)
Tia Shelley (Research Assistant, Computer and Learning Sciences)
Roosevelt University
Mike Bryson (Associate Professor of Humanities and Sustainability Studies)
Duke University
Blanka Shaw (Database Manager)
Smithsonian Institute, Jose Gudino (Collaborator, photos, keys)
Interns
Dara Arabsheibani (Northeastern Illinois University)
Charlie D'Lavoy (Northeastern Illinois University)
Alex Vizzone (Northeastern Illinois University)
Xenia Alava (Northeastern Illinois University)
Ariel Wagner (DePaul University)
Veronica Lopez (Northeastern Illinois University)
Jonathan Scheffel (Harold Washington, Chicago City College)
Pedro Rebollar (DePaul University)
Kavita Elliott (Ohio State University)
Ramsey Millison (DePaul University)
Zak Zillon (Northeastern Illinois University)