

Plants, Herbivores, and Parasitoids: A Model System for the Study of Tri-trophic Associations



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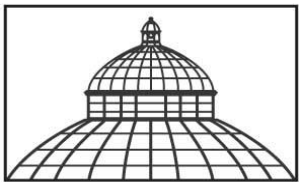


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iDigBio Summit III
19 November 2013

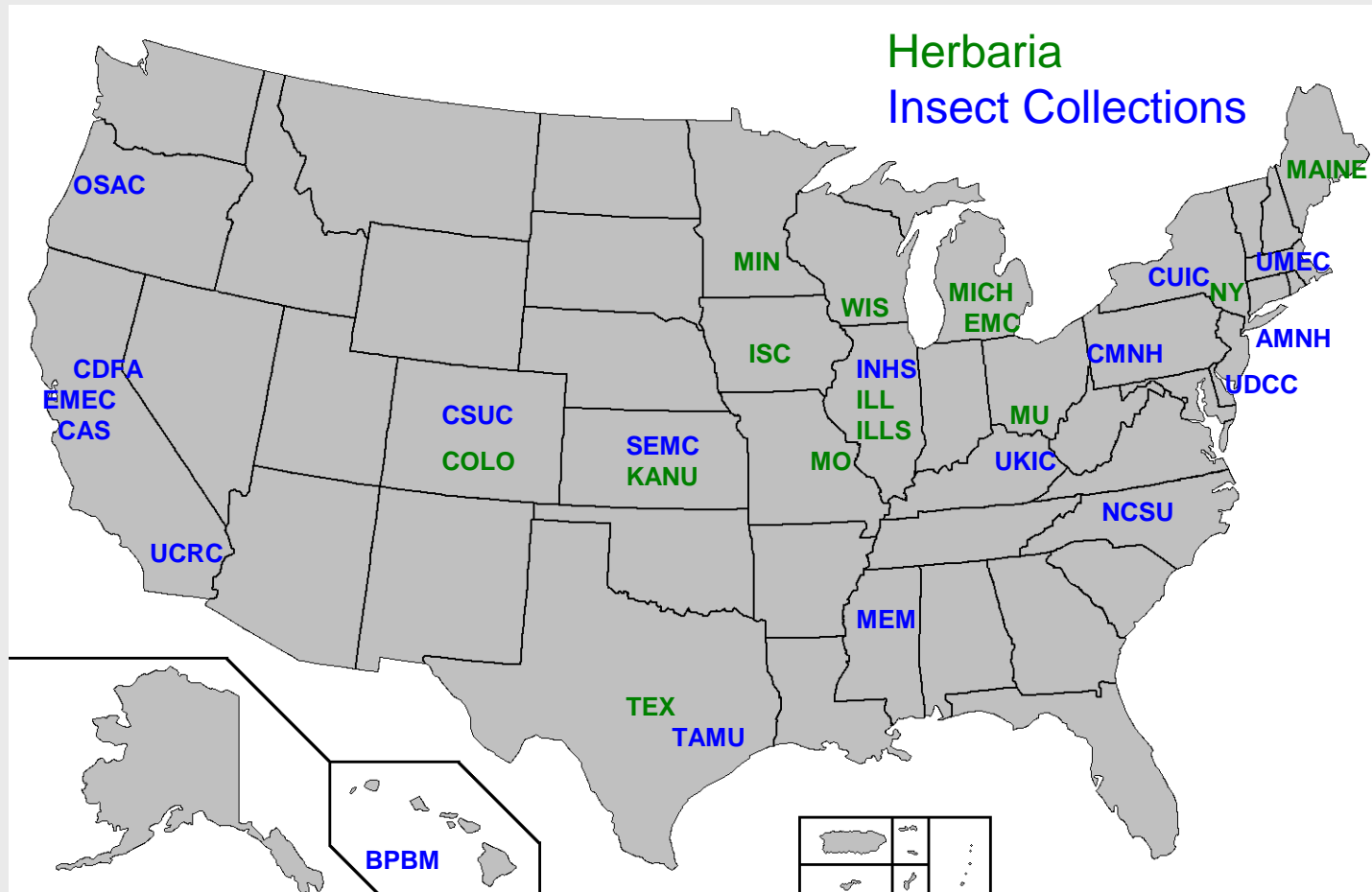


Tri-trophic TCN

PI: Randall “Toby” Schuh (AMNH)

32 institutions: 18 insect collections, 14 herbaria

NYBG is lead on botanical digitization, AMNH on entomological



Goals

Plants

- Image and database 1.26M specimens from 20 families of vascular plants
- **Unify** these with 3.5M specimens from 3 data providers
- Mobilize total of **6.06M** specimens

Bugs

- Database 1.16M specimens from 92 families of Hemiptera
- **Unify** these with .38M specimens from 3 data providers
- Image selected specimens

Parasitoids

- Database 45K specimens from 5 families of Hymenoptera

Integrate trophic levels (7.65M records) in **Discover Life**

Progress on Goals – start of year 3

- Botany: (currently at NY)
 - 377K skeletal records and images (75% of expected)
 - 1.18M existing, complete records (88% of expected)
- Insects + Parasitoids:
 - 646K records completed (53.3% of expected; 15-182% from contributors)

Major Accomplishments

- Entomological database software (Arthropod Easy Capture) now an iDigBio-supported virtual appliance:
https://www.idigbio.org/wiki/index.php/IDigBio_Virtual_Appliances
- Botanical imaging protocols finalized and disseminated:
https://www.idigbio.org/wiki/index.php/Digitization_Resources
- Symbiota and Discover Life portals opened to enable all botanical partners to access images and populate skeletal records
- Education & Outreach: numerous activities

Specimen Informatics Course

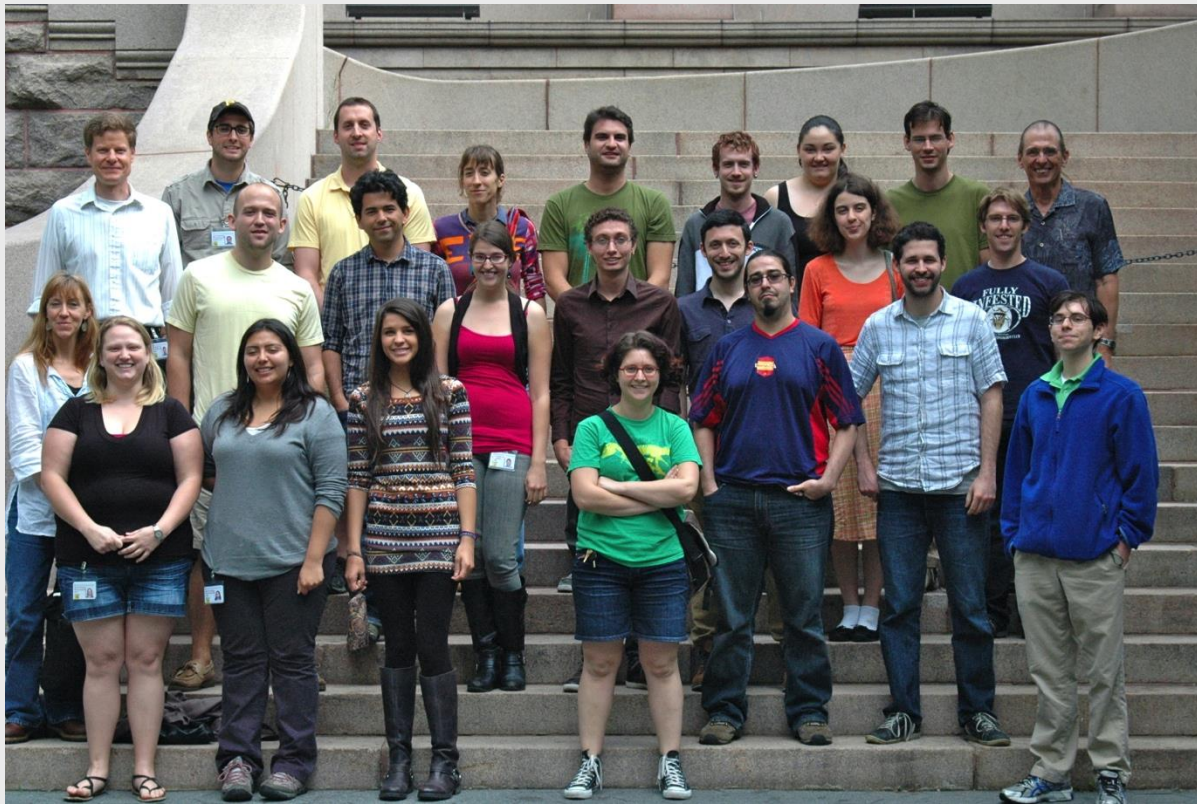
May 13–24, 2013 at AMNH and NYBG

Offered by 8 faculty through AMNH's Richard Gilder Graduate School
Lectures, tours, demonstrations, workshops, exercises, assignments

73 applicants; 23 students from campuses throughout U.S.A.

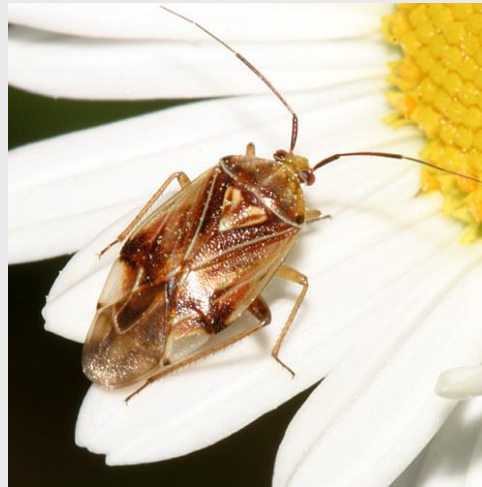
<http://tcn.amnh.org/home/specimen-course> (course curriculum and materials)

<http://tinyurl.com/pwgpuhj> (iDigBio report)



Remaining Challenges

1. Completion of databasing and imaging
2. Population of botanical records from images
3. Integration of data sets---across institutions and across trophic levels



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Upcoming Activities

Specimen Digitization Symposium

- UC-Riverside, 2014 (late June?)
- data-mining and species distribution modeling
- use Tri-trophic Database as platform
- targeted to systematists and ecologists

Data discovery and integration through Discover Life

- images and data
- integrate trophic levels

Integration of trophic datasets in Discover Life

- Generate species pages with specimen data, maps, and images
- Create a linkage between host/herbivore/parasitoid data
- Data updated every ± 24 hours
- *Come to our demo describing DL capabilities.*

Plagiognathus concoloris Schuh, 2001
[Life](#) [Insecta](#) [Hemiptera](#) [Miridae](#) [Plagiognathus](#)

[Plagiognathus concoloris](#), AMNH PBI00370104
© American Museum of Natural History
Plagiognathus concoloris, AMNH PBI00370104
Set display option above. Click on image to enlarge.



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Plagiognathus concoloris, AMNH PBI00370104



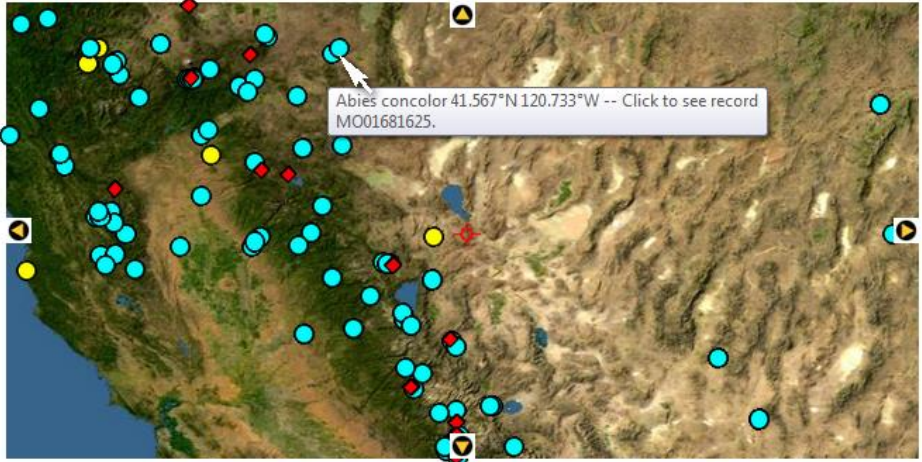
Click on map for details about points.

IDnature guide

- [Miridae](#)

Map of Plagiognathus cor x

[www.discoverlife.org/mp/20m?r=.0125&la=39.75&lo=-119.5&kind=PI](#)



Abies concolor 41.567°N 120.733°W -- Click to see record MO01681625.

Zoom level: [Globe](#) [sat](#) [s](#) [s](#) [s](#) [s](#) [s](#) [m](#) [topo](#) [topo](#) [photo](#) [p](#)

Map center: NAD83 Lat-long 39.75°N 119.5°W UTM 11 285812E 4402999N Resolution 0.0125 degrees/pixel

[Discover Life](#) | [Global Mapper](#)
[Help](#) | [About](#) | [Find place](#) | [Menu](#) | [Demo](#)

[Customize this map](#) (add species, change resolution, filter points, etc. -- [See all options](#)).

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◆ [Plagiognathus concoloris](#) @ Plant Bug (22)

Hosts:

- [Abies amabilis](#) @ Global Biodiversity Information Facility (4) [[CAS Botany \(BOT\)](#)] (3); [NMNH Botany Collections](#) (1); [RBGE Living Collections](#) (1) accessed through the [GBIF Data Portal](#). Each record tells when. See dataset links for citations & terms of use.]
- [Abies concolor](#) @ American Museum of Natural History Entomology (68); Plant Bug (30); California Department of Food and Agriculture, Thematic Collection Network (7); Global Biodiversity Information Facility (79) [[CAS Botany \(BOT\)](#)] (29); California State University, Chico (17); UCJEPS TAPIR Provider (15); USU-UTC Specimen Database (9); [RBGE Living Collections](#) (6); [Phaneroqamic Botanical Collections](#) (9) (2); [iNaturalist research-grade observations](#) (2); [RBGE Herbarium \(E\)](#) (2); [NMNH Botany Collections](#) (1) accessed through the [GBIF Data Portal](#). Each record tells when. See dataset links for citations & terms of use.]; Steve Baskauf, Vanderbilt University (1); Missouri Botanical Garden (5); Oregon State University Collection (6); Plants Database, United States Department of Agriculture (1); Utah State [www.discoverlife.org/mp/20?id=MO01681625](#) University (1)

Acknowledgments



NSF-ADBC; *for funding this project*

iDigBio; *for building community*

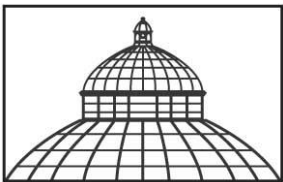
All TCN partners, particularly Toby Schuh, Charles Bartlett, John Heraty, Christine Johnson, Bob Magill, Benjamin Normark, Melissa Tulig, Kim Watson, Christiane Weirauch; *for steering our TCN*

Barbara Thiers (Director, NYBG Herbarium); *for help with many aspects of this project*

John Pickering (Director, Discover Life); *for programming DL tools*

Our digitizers; *for their careful work and dedication to our mission*

Tom Murray; *for sharing his photographs*



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