Advancing Plant Specimen Digitization in the Texas-Oklahoma Region: Creating a Framework Across Institutions and a Portal for Shared Data

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Digitization of herbarium specimens involves three processes:
1) databasing of label information
2) imaging of specimens
3) geo-referencing localities on labels

PLANTS OF MISSOURI, U.S.A.

EUPHORBIACEAE
Euphorbia ouachitana Mayfield

BARRY COUNTY: Roaring River State Park, ca. 4 air miles S of Cassville via State Highway 112. Near S end of River Trail. Scattered intermittently along ca. 1/4 mile of trail, usually not in deep shade or on bluff ledges, but mostly in light gaps in loose gravelly soil. With Juniperus, Acer, Quercus, Ulmus, and (in some places) Lonicera japonica. 36° 34' 53" N Lat., 093° 50' 01" W Long. 1050 ft.

7 May 2014
G. Yatskievych 14-15
with Nels J. Holmberg

MISSOURI BOTANICAL GARDEN HERBARIUM (MO)

http://www.museum.tulane.edu/geolocate/web/WebGeoref.aspx

Rich Rabeler (MICH) and Kim Watson (NYBG) in front of an imaging station. (iDigBio)
The earliest digitization projects involved mainly the databasing aspect and were institution-specific.
The establishment of regional consortia of herbaria such as TORCH has been one logical extension of this concept.
Historically the TEX-LL herbaria began databasing in the 1990s using several off-the-shelf programs, especially Microsoft Access and Filemaker Pro.
We established a website that allowed us to serve separate Texas and Mexican portions of the overall data from our collections and shipped off our type data and images to be hosted externally on the JSTOR Global Plants website.
We also began development of an application to aggregate specimen data and images across multiple collections, which currently is called the Lundell Portal.
Searches on one of more of a variety of criteria yield lists of specimens matching the parameters entered.
High-resolution scanned images are linked to specimen records, which can be viewed full-screen.

Specimen records convey label data and indicate if images are linked to the records.
Symbiota, the platform developed under the auspices of the Symbiota Working Group by Ed Gilbert and his colleagues at what is now called Arizona State University’s School of Life Sciences Biodiversity Informatics Group. The first product of this work was SEINet.
Symbiota currently exists as several more or less independent working groups called Chapters.
Queries can be performed across multiple member institutions and also across multiple chapters.
Results are presented in a concatenated list with each institution's contribution listed separately.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Accession No.</th>
<th>Collector</th>
<th>Date</th>
<th>Location</th>
<th>Full Record Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asclepias nummularia</td>
<td>HPC00008665</td>
<td>Daniel, Britt</td>
<td>27 April 1979</td>
<td>United States, Texas, Jeff Davis</td>
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<td>HPC00008704</td>
<td>Mashburn, Judy L.</td>
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<td>Ryman, Susie</td>
<td>27 April 1979</td>
<td>United States, Texas, Jeff Davis</td>
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</tr>
</tbody>
</table>

Herbarium
Biology Department
Howard Payne University
Brownwood, Texas 76801
Asclepias nummularia Torr.

*Family:* Asclepiadaceae
*Habitat:* Alkaline soils

**VYAP Treatment**

**Plants:** perennial herbs, diminutive, densely to sparsely in the wild, the plant above ground level 1-2 cm tall; stems are from the base, few or several of level, opposite, the petals 1.7 mm long, the blades circular to broadly elliptic, 1.5-5 cm long, 1.5-5 cm broad, obtuse, rounded or subacute at the base, obtuse to rounded or truncate at the apex, petals **INFLORESCENCE:** UMBELLATE lateral but not hanging the leaves and appearing terminal, 3-10 cm long, the pedicels 2-6 mm long; **FLOWERS:** small, salvioid like 2-3 mm long; corolla purple-pink, the lobes 4-6 mm long; **FRUITS:** capsules, elliptical, 1-3 cm long, 5-7 mm wide, containing numerous seeds; **HABITAT:** shrubs, open and dry, rocky areas, 


SEINet results of taxon search on *Asclepias nummularia.*
Symbiota also allows the creation of Projects that capture data from the database on the fly to produce checklists, such as this one for Chiricahua National Monument in Arizona.
The SERNEC Portal includes Texas in the list of states for which one can generate a checklist and search for data.
After deciding that Symbiota by itself lacked features important to us for managing our herbarium, we followed the lead of a number of other regional consortium members and chose Specify as our main institutional database, for several reasons, including:

1) It is free and open source, thus can be customized by a programmer;
2) It has been tested by numerous museums in this country and abroad;
3) It is a general platform that can support multiple collections of different types of organisms, so that museums can integrate data from various animal, fungal, plant, fossil, and other collections;
4) It has built-in protocols to communicate information to Symbiota and also can easily transfer information to the national portal, iDigBio.
Default specimen data entry screen for the Botany Module in Specify. This needs customization to make data entry easier.
TORCH VIII & iDigBio Workshop
Tue, 04/05/2011 - 14:28 — admin

TORCH VIII meeting was held at Sul Ross State University in Alpine, TX, May 23-24. The meeting included a field trip to Liveness Ranch (thanks to Will Glovin for organizing this and to our host John Barnett), the TORCH business meeting/curators’ meeting, a presentation from Cullen Hancock and Jason Singhurst from Texas Parks & Wildlife, and an all-day digitization workshop led by Joanne McCaffrey and Dan Paul from iDigBio, with lightning-round presentations from participants. Please see the Meetings page for more information.

About TORCH

MISSION
The Texas Oklahoma Regional Consortium of Herbaria was developed to advocate for and to organize herbaria in Texas and Oklahoma. TORCH has four primary objectives:

- Provide a mechanism for communication and collaboration among regional herbaria of all types and areas
- Promote regional data sharing and plant taxonomic and collections-based research, outreach, and education
- Function as a regional consortium in the plant research collection network

Read more
Symbiota
"TORCH" Portal

1. Set-up communication with Symbiota to share data
1 + Transfer to some other database within TORCH system

Already have database you are satisfied with

Have database, but want to switch platforms

Do not want to support a separate database but can enter data

Collection not active

Use Specify 7 to enter data over the web onto the UT system

TORCH member visits or borrows collection and digitizes
Specimens at collections that TORCH members visit can be imaged and then databased from the images.

Potential complications:
Barcode use
Georeferencing
Establishing the framework for aggregating data from member collections through a regional portal is an important step in the overall goals of the TORCH network. It will also help to give TORCH more visibility and provides a common goal for all of the member herbaria to work toward. To mix metaphors, it will help to light a fire under the TORCH.