Notes on the ecology and distribution of five members of *Carex*, section Phaestoglochin in Maryland and the District of Columbia

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Sedge Basics

Ecologically diverse and globally distributed

- Flowering plants with tiny, reduced inflorescences reduced to scales and a sac-like structure or envelope surrounding the seed (achene).
- ~ 2000 species in the genus globally
- 179 taxa representing 162 species in Maryland/DC
- 18 species in Sec. Phaestoglochin
Why Sect. Phaestoglochin?

- At a time of global change species in this section are “in motion”
- Among the most obscure and rarely collected species in the genus.
- Tell good stories.
Warnings

• Sedges are not very photogenic.
• They all look alike.
• They pose significant identification problems, especially when immature or with incomplete specimens.
• They all have a complex collection history.
• The species considered here are near the northern or eastern extents of their geographic ranges.
Carex aggregata Mackenzie

- At one time thought to be extirpated in Maryland with few historical records.
- Thought to be associated with calcareous glades and woodlands perhaps resembling prairies?
Found it in some really nice places

• Mesic bottomland forests over limestone.

• Early collections from “Serpentine Barrens of Maryland”, Cecil County, June 30, 1913, *Bayard Long 8672 (PH)*.

• That fits.

• But . . .
What’s going on?

• Collections started pouring in from 1996-2000.

• From some surprising places.

FLORA OF MARYLAND
Tawes Herbarium, Department of Natural Resources
Annapolis, Maryland

Carex aggregata Mackenzie

Date. 16, May 1997
Loc. Coastal Plain, Caroline County, Town of Denton,
201 South Fifth Avenue, flower-garden and edge of curbing.

Habitat. Concrete curbing and flower garden.

Coll. Christopher T. Frye 970516-SN
Extremely adaptable, easily dispersed or just overlooked?

- Earliest collection 1875 from “State Department Grounds, Georgetown”
- Hmm, where else?
- 1915, E. S. Steele’s “backyard”
- 1928, “North side of mall, Washington DC”
- “Rocky bank along P.R.R. by Susquehanna River”, Bayard Long and E. B. Bartram 1239 June 1, 1913, (PH).
**Carex australina** (Small) Mackenzie

- Not known from Maryland prior to 1998.

- First appeared in native, warm-season grass plantings used to enhance wildlife values of meadows.
Predictability so far = 75%
Expect to find more

- Rather obviously associated with human-transport.

- An additional 2 Maryland Counties added to the distribution in 2011: Saint Mary’s and Talbot.
Carex gravida Bailey

- Not known from the Maryland Flora prior to 1999.
- First collected in a meadow in Calvert County.
Dispersal mode?
Expect to find more
Carex leavenworthii Dewey

- Thought to be extirpated in Maryland prior to 1997.
- Associated with rich, dry woodlands and rocky, riverside prairies.
Conservation ranks for *C. leavenworthii*

Collection history is, well interesting

- Early collections:
- 1901 “Massachusetts Avenue extension, Washington, DC” E. S. Steele (US)
- 1906 “introduced into new lawns, Washington, DC” C. F. Wheeler (US)
- 1914 “12th Street, Mall, City” E. S. Steele (US)
Adventive or native and just extremely adaptable?

- Maryland distribution continues to expand and occurrences have been highly predictable.

- Added two more counties to the Maryland distribution from 2010-2011; Dorchester and Queen Anne's.
Sedge collecting by bicycle
Mode of Dispersal?

<table>
<thead>
<tr>
<th>Pure Seed</th>
<th>Germination</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.50% “Midnight”</td>
<td>95%</td>
</tr>
<tr>
<td>Kentucky Bluegrass</td>
<td></td>
</tr>
<tr>
<td>29.25% “Serene”</td>
<td>95%</td>
</tr>
<tr>
<td>Kentucky Bluegrass</td>
<td></td>
</tr>
<tr>
<td>29.25% “Manhattan”</td>
<td>90%</td>
</tr>
<tr>
<td>Perennial Ryegrass</td>
<td></td>
</tr>
<tr>
<td>19.50% Creeping Red Fescue</td>
<td>80%</td>
</tr>
</tbody>
</table>

Other Ingredients:
- 0.50% Other Crop Seed
- 1.80% Inert Matter
- 0.20% Weed Seed

Net Wt. 50lbs. (22.68 kg)

Tested: January 2000
Lot No. WW112-003
Carex mesochorea Mackenzie

- Once considered an Endangered Species.
- Associated with dry woodlands and glades.
Conservation ranks for C. mesochorea

Adventive or native and just extremely adaptable?

- Early collections are few and often vague.
- 1900 “College Park”
- 1940 “Catoctin Recreation Area above falls”
- 1950 “lawn, back of Smithsonian”

![Carex mesochorea Collection History](chart.png)

<table>
<thead>
<tr>
<th>Time Period of Collections</th>
<th>Number of Collections</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2011</td>
<td>5</td>
</tr>
<tr>
<td>1981-2000</td>
<td>12</td>
</tr>
<tr>
<td>1960-1980</td>
<td>1</td>
</tr>
<tr>
<td>1930-1959</td>
<td>4</td>
</tr>
<tr>
<td>1900-1929</td>
<td>1</td>
</tr>
<tr>
<td>pre-1900</td>
<td>1</td>
</tr>
</tbody>
</table>

N = 25
Predictability ~ 40%
Building a conceptual model for evaluating conservation ranks.

Phylogenetic Context
Historical Context

- Fairly substantial data demands, a few specimens do not tell a story.

- The peripheries of ranges require some explanation as to how the species arrived.
Current Context
Developing the Model

- Make some model predictions—these need not be complex.
- Field-truth your model.
- Good questions to ask:
  1. What are the habitats in the core range?
  2. What are the habitats stated on historical collections?
  3. How much of the habitat do you have?
Teach
Special thanks to: Anton Reznicek, Robert Naczi, Chris Lea, Rod Simmons, and my wife Jennifer who waits patiently on our walks while I look at sedges.