

Topic 01


Introduction to Plant Systematics

Lecture readings:

1. Introduction (pp 1-7) of Rhoads & Block, 2007.
2. Prather A, et al. 2004. Implications of the decline in plant collecting for systematic and foristic research. *Systematic Botany* 29 (1): 216-220.
3. Dirig R. 2009. The art of botanical specimen preparation. Bulletin provided by the author.

Lab readings:


1. Plate 2. Leaf Terminology (pp 980-981) in Rhoads & Block 2007.



I. What is Systematics?

B. Relation to other fields?

As an umbrella science...



The Big Umbrella, twice the radius of the biggest men's umbrellas on the market, was designed to shield up to 18 people from the sun. It was a cheerful and simple design solution, but did 18 people want to stand together to avoid getting wet? Does bad weather affect people differently in different parts of the world? To find out, I took my big umbrella on the road between 2003-2004, visiting Paris, London, Dresden, Garmisch, New York and Manhattan.

I. What is Systematics?

B. Relation to other fields?

As a foundational science...

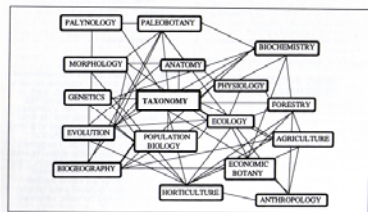


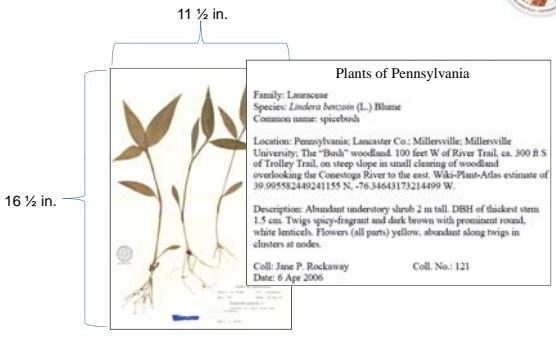

Figure 1-1. Areas of science and their relationship to plant taxonomy.

II. Herbaria



II. Herbaria

A. Herbarium specimens & important herbaria



11 1/2 in.

16 1/2 in.

Plants of Pennsylvania

Family: Lauraceae
Species: *Lindera benzoin* (L.) Bthme
Common name: spicebush

Location: Pennsylvania, Lancaster Co.: Millersville, Millersville University; The "Bush" woodland, 100 feet W of River Trail, ca. 300 ft S of Trolley Trail, on steep slope in small clearing of woodland overlooking the Conestoga River to the east. Wiki-Plant-Atlas estimate of 39.995582449241155 N, -76.34643173214499 W.

Description: Abundant understory shrub 2 m tall. DBH of thickest stem 1.5 cm. Twigs spicy-fragrant and dark brown with prominent round, white lenticels. Flowers (all parts) yellow, abundant along twigs in clusters at nodes.

Coll: Jane P. Rockaway Date: 6 Apr 2006 Coll. No.: 121

II. Herbaria



II. Herbaria



Important herbaria (after Index Herbariorum)

- MVSC (ca. 15 thousand)
- P (8 million)
- NY (7.3 million)
- K (7 million)
- MO (5.9 million)
- US (4.3 million)

II. Herbaria



Zoological analogs of herbaria



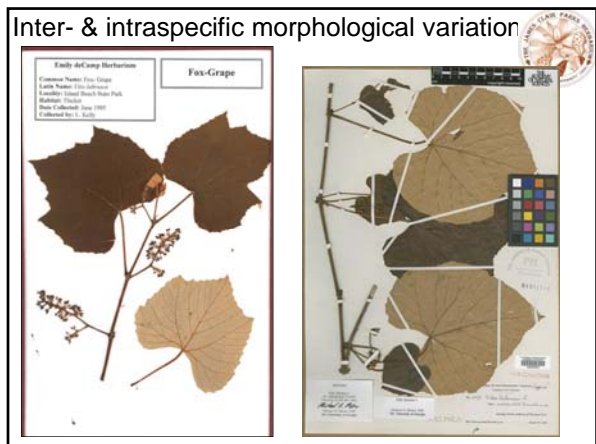
II. Herbaria

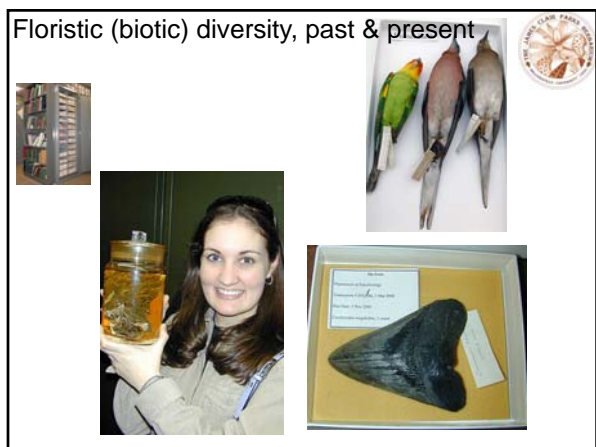


B. Use of specimens



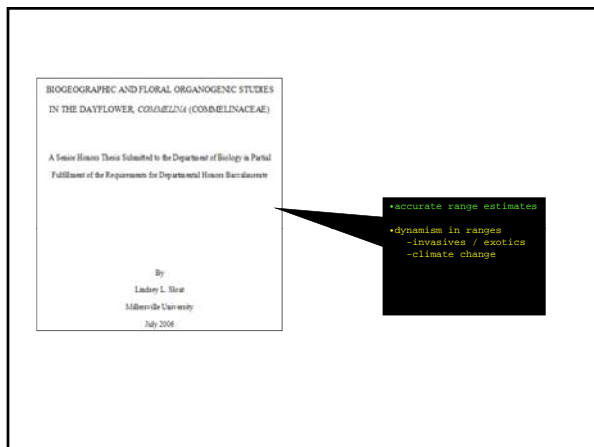
1. document patterns of morphological and geographical variation in plant diversity: past, present, and future

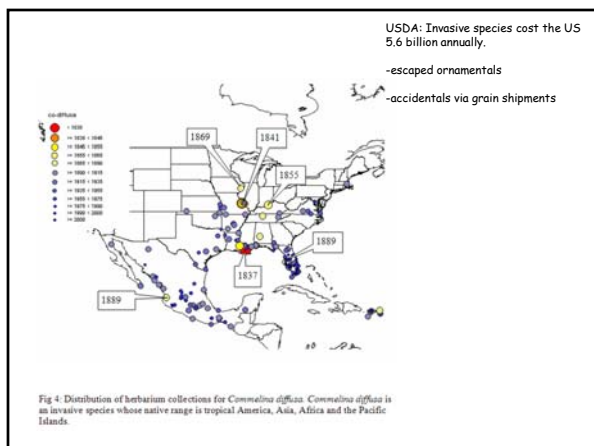


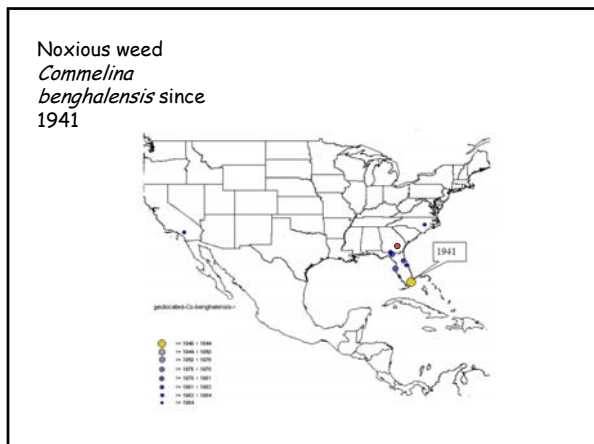


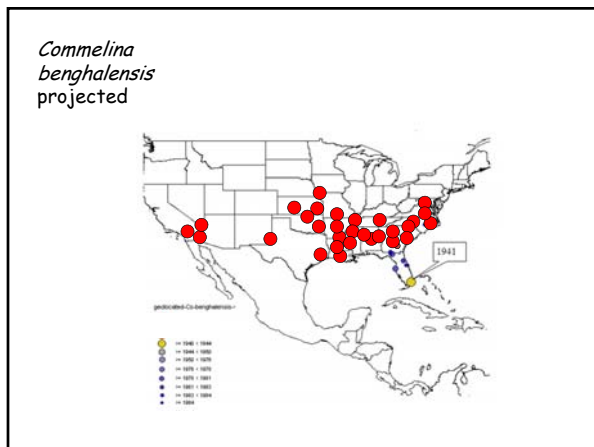













II. Herbaria

B. Use of specimens



2. the basis for new species descriptions and other taxonomic studies,


Journal of Herpetology, 2004, 38(2), pp. 306-313
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***Plowmanianthus*, a New Genus of Commelinaceae with Five New Species from Tropical America**

ACKNOWLEDGEMENTS. We would like to thank the faculty and staff at the following herbaria for providing loans or facilitating herbarium visits or fieldwork required for this study: AAU, AMAZ, B, BH, BM, CAS, COL, CR, CUZ, DUKE, E, FTG, GH, HBG, HUA, K, M, MICH, MQ, NY, PMA, QCA, QCNE, S, SEL, STRI, TEX, U, UC, US, and USM. Tana Acton provided the illustrations (excluding the seeds) for *Plowmanianthus perforans*. Alice Tangerini provided the illustration of the flower for *P. grandifolius*. Douglas Daly kindly provided the photograph used for Figure 12C. Urs Jauch assisted with the scanning electron microscopy of stigmas. Deborah Bell, David Brenner, Robert Dressler and the late

¹L.H. Zoliker
²U.S. National Herbarium
³Author for Correspondence

ABSTRACT. A new genus and five new species of Commelinaceae are described from tropical America. The new genus, *Plowmanianthus*, is named in honor of the late Plowmanianthus Zoliker.



II. Herbaria

B. Use of specimens



3. teaching aids,



II. Herbaria

B. Use of specimens


4. reference specimens for applications requiring accurate species identification (e.g., forensics or taxonomic and floristic surveys)



II. Herbaria

B. Use of specimens

4. reference specimens for applications requiring accurate species identification (e.g., forensics or taxonomic and floristic surveys)



II. Herbaria



C. How to make a specimen

1. Collecting
2. Pressing & Drying
3. Mounting

Collecting



1. Clippers, trowel
2. Diagnostic parts
 - Flowers or fruits, plus the following:
 - Herbs: roots, stem, leaves.
 - Woody: stem, leaves.
3. Wikiplantatlas.org map or GPS
4. Field notebook
 - Your collection number
 - Location description
 - Plant description (leaf, flower, fruit color) & measurements (e.g., height for herbs, shrubs; DBH for trees)
 - Abundance info
5. Plant press

Collecting



Information to record in notebook based on what must go on final label when mounted:

Plants of the Bush @ Millersville University	Plants of Pennsylvania
<p>Family: Lamiaceae Species: <i>Lindera benzoin</i> (L.) Blume Common name: spicebush</p> <p>Location: Pennsylvania; Lancaster Co.; Millersville; Millersville University; The "Bush" woodland, 100 feet W of River Trail, ca. 300 ft S of Trolley Trail, on steep slope in small clearing of woodland overlooking the Conestoga River to the east. WikiPlants-Atlas estimate of 39.99598249241155 N, -76.34643171214489 W.</p> <p>Description: Abundant understory shrub 2 m tall. DBH of thickest stem 1.5 cm. Twigs spicy-fragrant and dark brown with prominent round, white lenticels. Flowers (all parts) yellow, abundant along twigs in clusters at nodes.</p> <p>Coll: Jose P. Rockaway Coll. No.: 121 Date: 6 Apr 2006</p>	<p>Species: <i>Polystichum acrostichoides</i> (Michx.) Schott Vernacular: Christmas fern Family: Polypodiaceae</p> <p>Location: Pennsylvania; Lancaster; Millersville Borough; Conestoga River watershed; The Bush of Millersville University; N-aspect slope aside stream in humus-rich soil covered by leaf-litter.; Lat 39.99640677121804, Lng -76.3464792072773 (Precise within 2-10 m).</p> <p>Wild Status: Wild; Phenology: Flowers/Sporos/Pollen, No Fruits; Abundance: Greater than 100 plants; Other Comments: Christmas fern. Leaves dark green, plants evergreen. Fertile leaflets in distal third of leaf and smaller than vegetative leaflets; sori brown.</p> <p>Coll: Christopher R. Hardy 1111 Date (dd/mm/yyyy): 28/11/2011</p>

Pressing

- 1. Plant press
 - Two 12.5x18.5 wood panels
 - Two straps
 - Newsprint
 - Blotters or foam (12 x 18)
 - Corrugates (12 x 18)



© Univ. Fl. Herbarium



Pressing

- 2. Each plant is pressed between:
 - One fold of newsprint
 - Two blotters (or foam)
 - Two corrugates



Pressing

The specimen can fit the final sheet in a variety of ways.



© Univ. Reading



Pressing

The specimen can fit the final sheet in a variety of ways.



Pressing

3. Drying



Mounting

More on this in Dirig (2009)