Plant Names and Classification

Chapt. 16
Scientific Names

• Common names - recognized by laypeople; less imposing, simple, easy to remember; may be descriptive; many different names for same organism or no common name; may be misleading; may be used for more than one taxon

• Scientific names - (ideally) a unique name for each organism used worldwide; Latin(ized)
Scientific Names

• provides a unique "identifier" for a taxon

• provides information about the relationships among taxa
Taxonomy

- the branch of biology that deals with the identification, naming and classification of organisms

- Taxonomists

- taxon - a general term that refers to any group of similar organisms
Scientific Names

• Binomial nomenclature - each species name consists of:

  Generic name - e.g. *Andropogon*

  Specific epithet - e.g. *gerardii*

  Big bluestem - *Andropogon gerardii*
Scientific Names (cont.)

Botanists also include an authority(s); indicates who named the taxon and/or revised the classification

e.g. *Andropogon gerardii* Vitman

Fulgenzio Vitman 1728-1806, Italian botanist and clergyman, founded botanical garden in Milan

*Schizachyrium scoparium* (Michx.)Nash

Michaux originally described little bluestem, but he put it in the genus *Andropogon*. Nash later provided evidence that it should be transferred to the genus *Schizachyrium*. 
Classification and Nomenclature

• Theophrastus - died 287 B.C.; classified plants based on leaf morphology

• Doctrine of Signatures - 15th-17th Century
  "God hath imprinted upon the plants, herb and flowers as were it in hieroglyphics the very signature of their virtues." Robert Turner, 1664

• Polynomials - grouped plants into genera; used Latin phrases to distinguish between species
Linnaeus

- 1707-1778
- 1753 - *Species Plantarum*, included polynomials, but also a 2 word "abbreviation" for each species - first consistent use of binomials

- Species - (a population of) similar individuals capable of freely interbreeding and producing fertile offspring; reproductively isolated from similar groups
Linnaeus

• Created a system of 24 artificial "classes" distinguished primarily by stamens and other flower characteristics

• Greatly facilitated identification, but "classes" did not accurately identify phylogenetic relationships
International Code of Botanical Nomenclature

- 1867
- agreed to use Species Planatarum as the starting point for scientific names
- agreed to use binomials for species names
- provides standardized rules for naming and classifying plants
International Code of Botanical Nomenclature

• Official recognition of a new plant requires:
  1) publishing a Latin description of the plant in a public publication or journal
  2) deposition of an annotated type specimen in a public herbarium
Taxonomic Groups

- Domain
- Kingdom
- Phylum (Division)
- Class
- Order
- Family
- Genus
- Species
Domains

- Archaea
- Bacteria
- Eukarya

Biochemical evidence suggests three different broad categories of living organisms
Kingdoms

- 6 Kingdom system recognizes
  - Archaea (may be elevated to Domain)
  - Bacteria (may be elevated to Domain)
  - Protista
  - Fungi
  - Plantae
  - Animalia combined under Domain Eukarya
Taxonomic Groups

- Domain: Eukarya
- Kingdom: Plantae
- Phylum: Magnoliophyta
- Class: Liliopsida
- Order: Cyperales
- Family: Poaceae
- Genus: Andropogon
- Species: Andropogon gerardii
Standardized endings for Taxonomic Groups

- Phylum - *ophyta* e.g. *Magnoliophyta*
- Class - *opsida* e.g. *Liliopsida*
- Order - *ales* e.g. *Cyperales*
- Family - *aceae* e.g. *Poaceae*
### Examples

<table>
<thead>
<tr>
<th>Big Bluestem</th>
<th>Little Bluestem</th>
<th>Annual Sunflower</th>
<th>Piñon Pine</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D</strong> Eukarya</td>
<td><strong>E</strong> Eukarya</td>
<td><strong>E</strong> Eukarya</td>
<td><strong>E</strong> Eukarya</td>
</tr>
<tr>
<td><strong>K</strong> Plantae</td>
<td><strong>P</strong> Plantae</td>
<td><strong>P</strong> Plantae</td>
<td><strong>P</strong> Plantae</td>
</tr>
<tr>
<td><strong>P</strong> Magnoliophyta</td>
<td><strong>M</strong> Magnoliophyta</td>
<td><strong>M</strong> Magnoliophyta</td>
<td><strong>P</strong> Pinophyta</td>
</tr>
<tr>
<td><strong>C</strong> Liliopsida</td>
<td><strong>L</strong> Liliopsida</td>
<td><strong>M</strong> Magnoliopsida</td>
<td><strong>P</strong> Pinopsida</td>
</tr>
<tr>
<td><strong>O</strong> Cyperales</td>
<td><strong>C</strong> Cyperales</td>
<td><strong>A</strong> Asterales</td>
<td><strong>P</strong> Pinales</td>
</tr>
<tr>
<td><strong>F</strong> Poaceae</td>
<td><strong>P</strong> Poaceae</td>
<td><strong>A</strong> Asteraceae</td>
<td><strong>P</strong> Pinaceae</td>
</tr>
<tr>
<td><strong>G</strong> Andropogon</td>
<td><strong>S</strong> Schizachyrium</td>
<td><strong>H</strong> Helianthus</td>
<td><strong>P</strong> Pinus</td>
</tr>
<tr>
<td><strong>S</strong> A. gerardii</td>
<td><strong>S</strong> scoparium</td>
<td><strong>H</strong> annuus</td>
<td><strong>P</strong> edulis</td>
</tr>
</tbody>
</table>

*bold font only used to highlight shared taxons*
Dichotomous Keys

• a tool designed to help identify an organism

• most keys are dichotomous - the reader is provided with two choices at each step in the key; selections continually eliminate dissimilar organisms until a single taxon is identified
References

• Flora or Manual - keys, descriptions, perhaps illustrations, distributions, life histories, economic importance, taxonomic problems

• Keys - only identification tools

• Guides - generally nontechnical