Slide 1

Plant Taxonomy and Scientific Names

Lecture 8

Slide 2

Learning Outcomes

- The need for plant classification
- Hierarchy of ranks of classification
- Rarity
- Endemism
- Speciation
- California Native Plant Society

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The Need for Plant Classification

- Some plants are edible
- Some plants are inedible
- Some plants are deadly
- Neolithic cultures (pre-agriculture) dependent upon identifying wild plants
- To communicate with others they needed names

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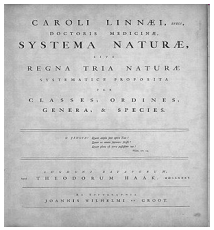
Plant Taxonomy

- Linnaeus
  - Systema Naturae 1735
- Grouped plants (and animals) based upon similar structures
- Ordered groups in to a hierarchy
- Used Latin
- Universal language of science



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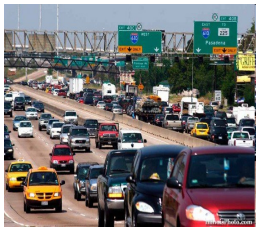
Kids and Cars

- Kids = Kingdom
- Dodging = Division
- Cars = Class
- On = Order
- Freeways = Family
- Get = Genus
- Splatted = Species



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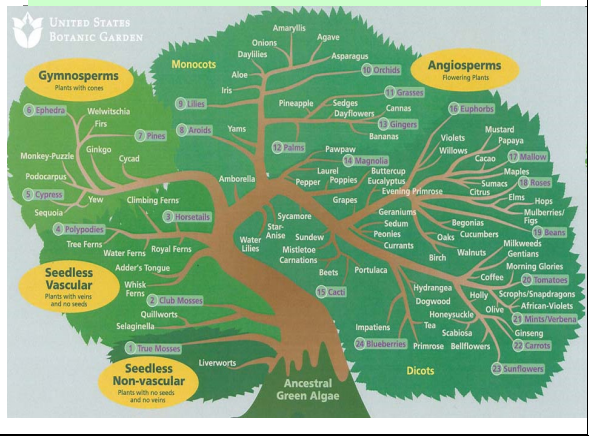

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Order

- Level above Family
- Several families grouped in same order
- Suffix – ALES
- Rosales
  - Moraceae – Fig Family
  - Rosaceae – Rose family
  - Rhamnaceae – Buckthorn family
- Cucurbitales - Squashes

Slide 8

A Family Affair

- All members of a family share common ancestry
- Recognized by similar structures
- Flowers, fruit leaves
- Family ending **aceae**
- **E.g. Ericaceae**
- All have bell shaped flowers

Enkianthus campanulatus

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All in the Family

- Reproductive structures
- Flower anatomy
- Basis for classification
- Rosaceae
  - Silverweed
  - Cotoneaster
  - Blackberry

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Genus

- Always capitalized
- Contains one to many different species
- Generally descriptive
- Eucalyptus = true capsule describing woody fruit
- 700 different species

Specific Name

- Always lower case
  - specific
- Descriptive or honorary or fanciful
- Each species has a unique Latin binomial
- *Eucalyptus sideroxylon*
- *E. globulus*
- *Genus name can be shortened once the Genus name has been given in FULL*

Using Latin binomials

- Typing
  - Italicize
- Writing
  - Underline
- Abbreviating the Genus
  - Risk of confusion
  - Several genera start with same letter

TABLE 2. Examples of Descriptive Generic and Specific Names

Common Name	Genus	Species
Coast Redwood	*Sequoia*	*sempervirens*
Ponderosa pine	*Pinus*	*ponderosa*
Ocotillo	*Fouquieria*	*splendens*
Joshua tree	*Yucca*	*brevifolia*
Basin sagebrush	*Artemesia*	*tridentata*
California-poppy	*Eschscholzia*	*californica*

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Using Common Names

- Only reliable if context is understood by all parties
- Examples
  - Buckeye
- Many plant species may have same common name
- Several different common names for one plant species
- Regional names
  - California Bay a.k.a. Oregon Myrtle
- Different common name for each language

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Hierarchical Nature of Classification

- Each level of classification fits into the next larger unit of classification

TABLE 3. The Hierarchical Nature of the Taxonomic System

Taxonomic Unit	Characteristics Members	Taxonomic
Sugar pine *(Pinus lambertiana)*	Leaves Fi Cone Le	
Pines (*Pinus* spp.)	L Cones Cone s	
Pine family (Pinaceae)	Cor Cone	
Coniferales	Cone One to Leaves	

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Naming New Plant Species

- New never before seen plants still found in CA
- Tiburon Mariposa Lily 1973
- *Calochortus tiburonensis*
- Shasta Snow Wreath *Neviusia cliftonii*
- 1992

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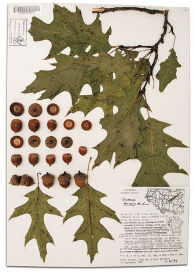
Herbaria

- Names must follow protocol
  - International Code of Botanical Nomenclature
- Formal description in Latin
- Type specimen first specimen collected
  - held in Herbarium Collection
  - Reference available to researchers
- California Academy of Sciences
- Jepson Herbarium UC Berkeley



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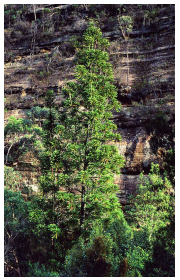
Classification Active Area of Research

- Classifying new species
- Understanding evolutionary relationships among plant groups
- New techniques
  - DNA analysis
- Reclassification
- Families merged or split
- Scrophulariaceae chopped up



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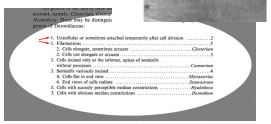
Identifying Plants

- Field Guides
  - Regional
  - By group e.g. Ferns
- Flora
- Every species in state/country

- Dichotomous Keys
- Series of questions with "Yes" or "No" answers



Convergent Forms

- Classification based upon anatomy
- However, different groups plants share simil adaptations to similar environments