



# **The Nature of Naming**

**Lady Bird Johnson Wildflower Center**

**Flo Oxley**

# What's in a Name?

- "A rose is a rose," it has been said
- And most of us know a rose when we see one
- As we know the African marigolds
- Maples, elms, cedars, and pines that shade our backyards and line our streets



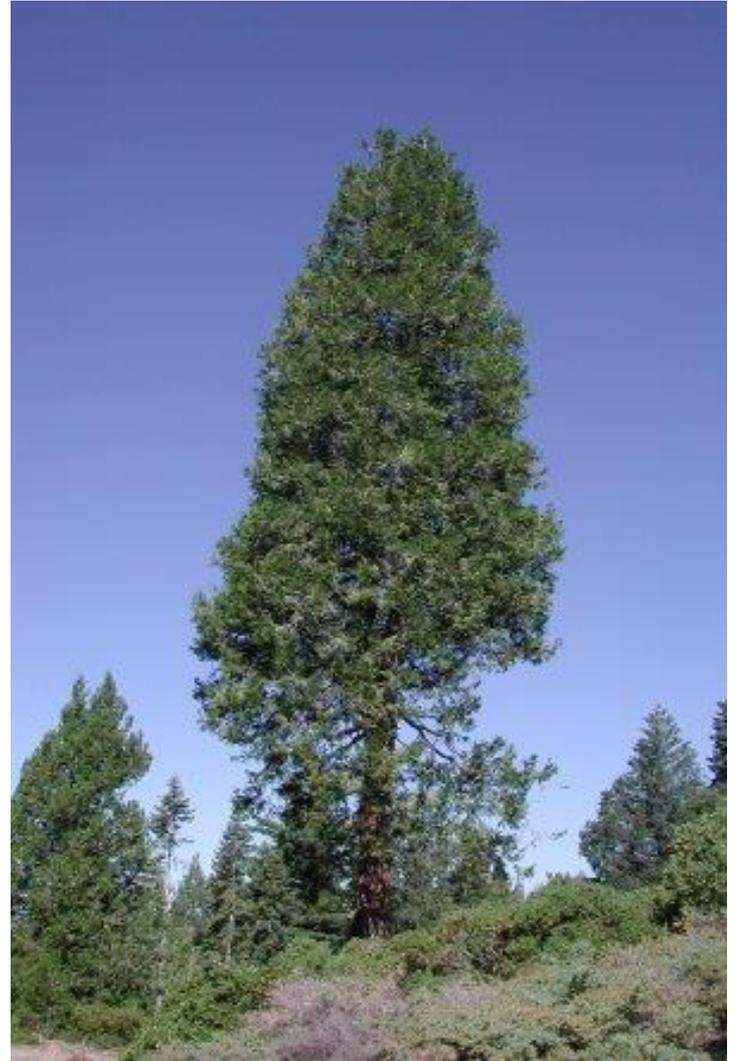
# What's in a Name?

- We usually call these plants by their common names
- But if we wanted to know more about the cedar tree in our front yard, we would find that "cedar" may refer to:
  - Eastern red cedar



# What's in a Name?

- Incense cedar



# What's in a Name?

- Western red cedar



# What's in a Name?

- Atlantic white cedar



# What's in a Name?

- Spanish cedar



# What's in a Name?

- Biblical Lebanon cedar



# What's in a Name?

- In fact, we would find that cedars are found in three separate plant families



# What's in a Name?

- Later, after discovering that our "African" marigolds are in fact from Mexico and our "Spanish" cedar originated in the West Indies, we would realize how misleading the common names of plants can be.



# What's in a Name?

- The same plant can have many different common names
  - European white lily has at least 245
  - Marsh marigold has at least 280



# What's in a Name?

- Clearly, if we use only the common name of a plant, we cannot be sure of understanding very much about that plant



# Classification

- It is for this reason that the scientific community prefers to use a more precise way of naming, or classification
- Scientific classification, however, is more than just naming: it is a key to understanding
- Botanists name a plant to give it a unique place in the biological world, as well as to clarify its relationships within that world

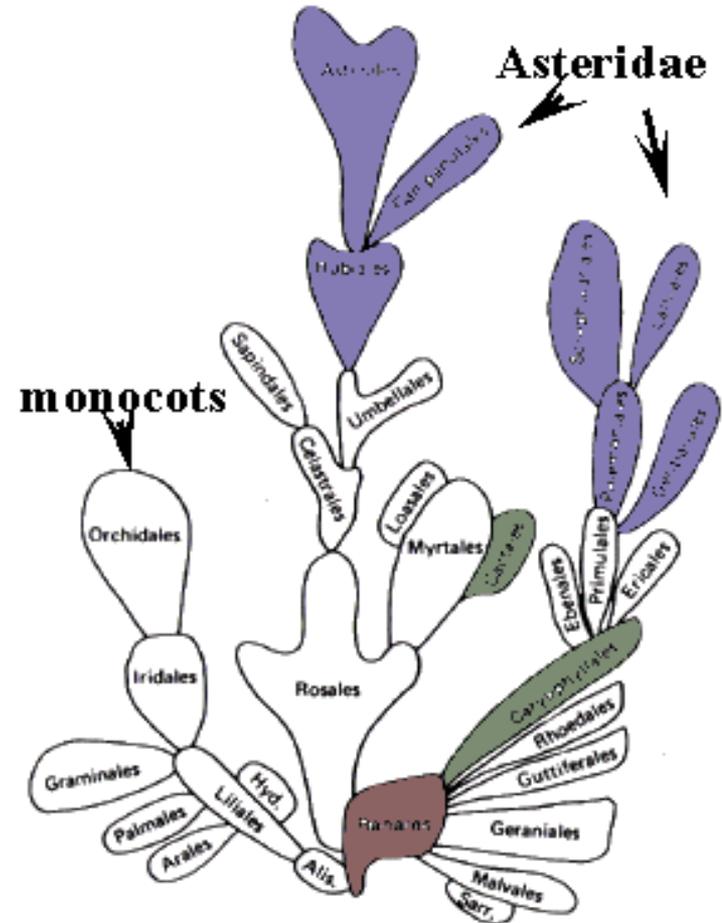
Table 4. Statistics of the species in families with more than 30 species and their distribution types according to genera in which they belong, as percentage of the species of the total for each family.

Item Number	1	2	3	4	5	6	7	T (2-7)	8	9	10	11	12	13	14	T (8-14)	J5	Total	Number of S. in China	Number S. of HR./S. of China (%)	
Papilionaceae	17	123		13	6	7	20	169	6	41	5	11	1		2	66	1	253	1097	23.06	
Compositae	25	38	5	16		23	5	87	52	3	29	4	1	24	113	4	229	2321	3.87		
Robiaceae	9	59		26	14	7	41	147	8	1				14	23	1	180	493	36.51		
Poaceae	16	62		11	5	20	32	110	23		2	2			12	29	1	165	1301	12.68	
Orobanchaceae	15	19		12	26	4	59	121	15	2	2				8	27	1	163	1039	15.69	
Euphorbiaceae	73			32	5	11	32	154							3	3	1	158	418	37.80	
Rosaceae	48	8				2	10	49	18	8					16	91	1	150	1026	14.62	
Labiatae	36	4	1	13	1	3	25	47	10	4	25	1			12	52	2	137	899	43.88	
Urticaceae		62		40		6	19	127	3							1	4	1	243	53.91	
Lauraceae	12	18		1	16	74	121		1							1		122	423	28.84	
Liliaceae		28		8	1	10	47	13	9	10					35	67	1	115	476	23.74	
Cyperaceae	70	26						26								0		96	676	14.21	
Gesneriaceae				2	3	50	55								27	27	14	96	413	23.24	
Moraceae	75			1	5	8	14	6			1					7		96	171	56.14	
Fagaceae								0	40	48						88		88	250	35.20	
Apocynaceae	21	26	16	6	16		85							1	1	2	88	190	46.32		
Celastraceae	60	7				4	71							3	3	74		74	183	40.44	
Verbenaceae	52	1	1	1	11		66							3	3		69	176	39.20		
Mrysiaceae	43	22	3				68									0		68	130	52.31	
Theaceae	6	32				6	20	64		2						2	1	67	375	17.87	
Scrophulariaceae	1	16		5	10	1	7	39	15	2	1				7	25	2	67	666	10.06	
Rhamnaceae	25	10		7	5	3	1	26		10	2				2	14		65	138	47.10	
Asclpiadaceae				6	10	16	1	22	55							10		65	233	27.66	
Vitaceae	14			6	20			40	13	7						20		60	112	53.57	
Araliaceae	13			1	1	19	34		15							8	23	1	58	174	33.33
Ranunculaceae	42						1	1	11						3	14		57	820	6.93	
Ericaceae		2						2	4	8					4	52		56	725	7.72	
Caprifoliaceae								0	51	1					1	53	1	54	200	27.00	
Magnoliaceae							34	34		17						17		51	173	29.45	
Anacardiaceae	5		4	1	13	26	49									0		49	178	27.53	
Rubiaceae	16		15	9	1	4	45								4	4		49	150	32.67	
Polygonaceae	43							0		2	3					5		48	500	9.60	
Umbelliferae	8	5						5	16	15		2			2	35		48	200	24.00	
Melastomataceae				13			26	41								2	2	2	45	160	28.13
Oleaceae	23							23	5	5	11					21		44	200	22.00	
Aquifoliaceae	40							40								0		40	140	28.57	
Solanaceae	23	8	5					13	1							2	3	39	105	37.14	
Menispermaceae	4		19		1	13	37									1	1	38	70	54.29	
Primulaceae	30							0	7							1	8	38	500	28.57	
Symplocaceae	35							35								0		35	79	44.30	
Saxifragaceae							4	4	5	19						5	29	33	300	11.00	
Malvaceae	23	1	5		1	1	31	2								2		33	83	39.76	
Actinidiaceae	6							1	7							25	25	32	96	33.33	
Sabiaceae	19						13	32								0		32	70	45.71	
Total	483	908	112	305	144	142	373	2184	891	225	113	18	4	1	228	980	34	3681	18718	19.67	

\* 1=Cosmopolitan; 2=Pan-tropic; 3=tropical Asia and Tropical America; 4=Old world tropical; 5= Tropical Asia and tropical Australasia; 6=Tropical Asia and tropical Africa; 7= Tropical southeast Asia; 8=North Temperate; 9=Eastern Asia and North America; 10=Old World Temperate; 11=Temperate Asia; 12=Mediterranean; 13=Central Asia; 14=Eastern Asia; 15=Chinese endemics; T(2-7)=Total from 2 to 7 item; T(8-14)=Total from 8 to 14 item.

# How Are Plants Classified?

- Science classifies living things in an orderly system through which they can be easily identified
  - Categories of increasing size, based upon relationships within those categories



# How Are Plants Classified?

- For example, all plants can be put in order from the more primitive to the more advanced.
- Such a ranking would look like this:

# How Are Plants Classified?

- **Plant Kingdom**

- Bryophytes: Small with leaflike, stemlike, and rootlike structures.

- Disseminated by spores: mosses, liverworts, hornworts.

- **Vascular Plants: Larger with true leaves, stems, and roots.**

- Seedless: Ferns, horsetails, club mosses.

- Seed Plants:

- Gymnosperms: Usually have cones, no flowers, seeds not enclosed in fruit: pines, spruces, firs, hemlocks, cycads, ginkgo.

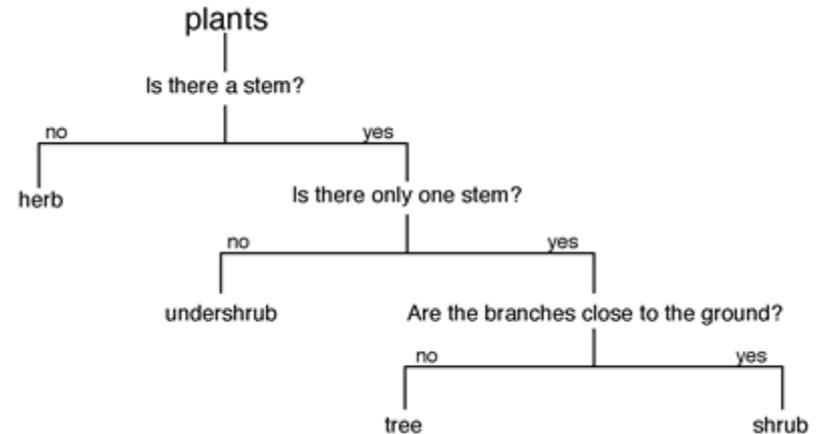
- Angiosperms: Have flowers, seeds enclosed in fruit

- Monocotyledons: Leaves have parallel veins, one seed leaf: grasses, orchids, lilies, palms.

- Dicotyledons: Leaves have netted veins, two seed leaves: cherry trees, maples, coffee, daisies, etc.

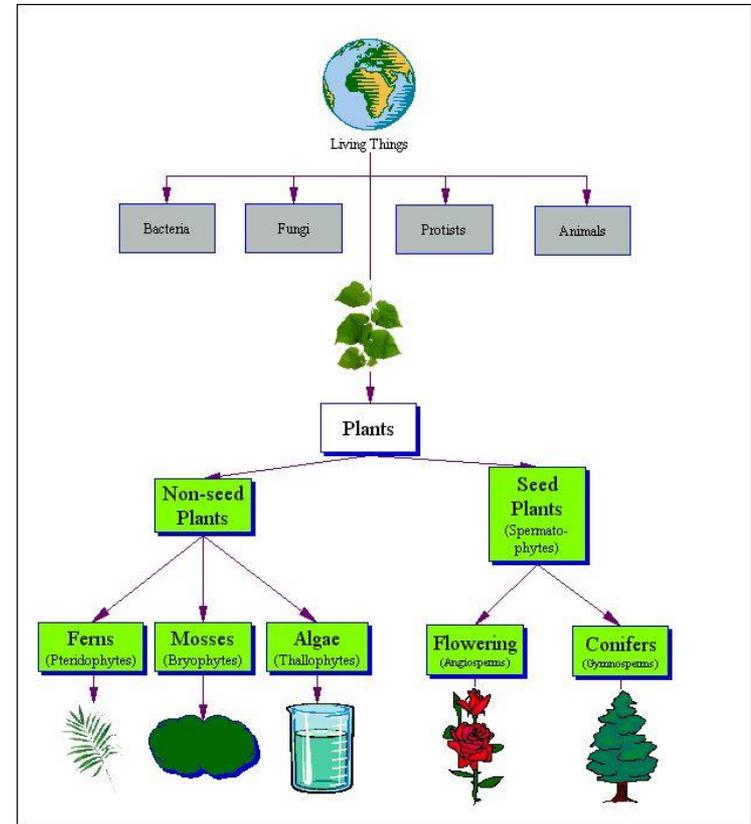
# How Are Plants Classified?

- This informal way of describing plant classification gives an overview of how plants are classified
- Botanists use a more complex system



# How Are Plants Classified?

- A botanist divides the plant kingdom into Divisions
  - Similar to the Phyla used to divide the animal kingdom.
- There are twelve divisions.
  - Three are Bryophytes
  - Four are seedless plants
  - Four are Gymnosperms
  - One is Angiosperms



Classification of Plants

# How Are Plants Classified?

- Divisions are divided into
  - **Classes**
  - Classes are divided into **Orders**
  - Orders are divided into **Families**
  - Families are divided into **Genera** (singular, Genus)
  - Genera are divided into **Species**
- Anthophyta
  - Dicotyledoneae
    - Fabales
      - Fabaceae
        - » *Lupinus*
        - » *Lupinus texensis*
- More than 200 species of *Lupinus* in the world

# How Are Plants Classified?

- Species is the "basic unit" of classification
- Individuals in a species are able to breed with each other
  - While in broader categories individuals do not interbreed.

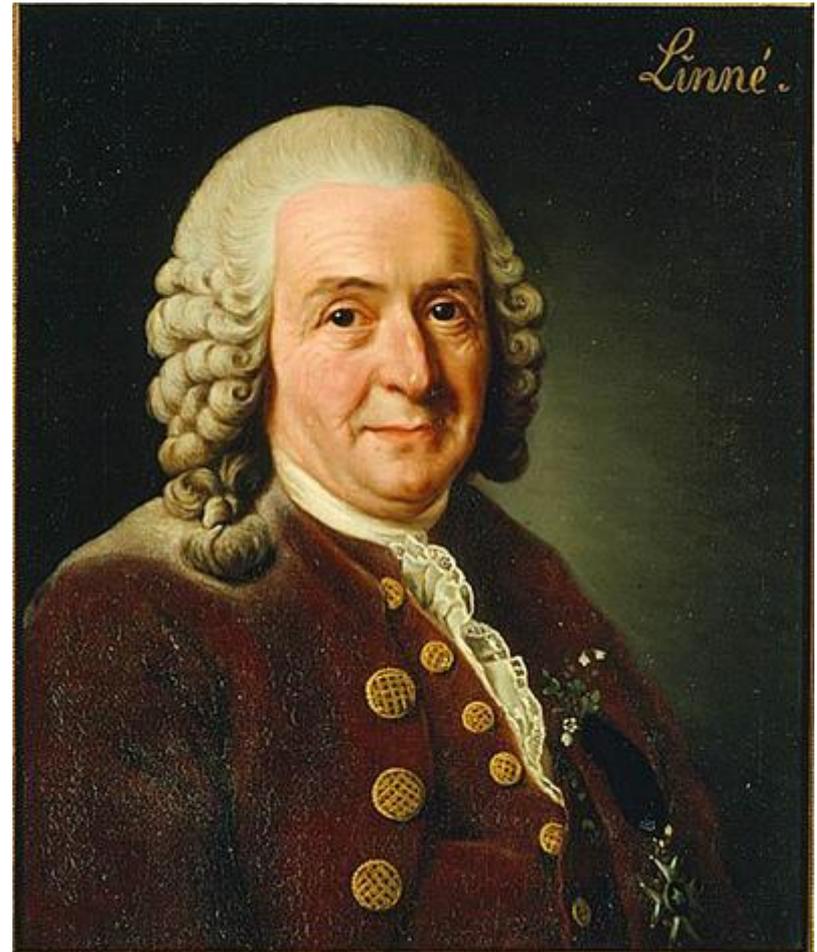
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'We're in luck— we've discovered A new species!'

# Binomial System of Classification

- The scientific or botanical name of a plant is the means by which we give it its unique place in the scientific and biological world
  - Begun by Carolus Linneaus, a Swedish botanist, in the eighteenth century
  - This name is binomial (has two parts) consisting of
    - Genus
    - Species
- Expressed in Latin



# Binomial System of Classification

- The genus or generic name is a noun which usually names some aspect of a plant
  - *Coffea*, the Latinized form of the Arabic word for beverage, kahwah
- The species or specific name is usually an adjective that describes the genus
  - In the case of coffee, the species is *arabica*, indicating that the plant was thought to originate in Arabia

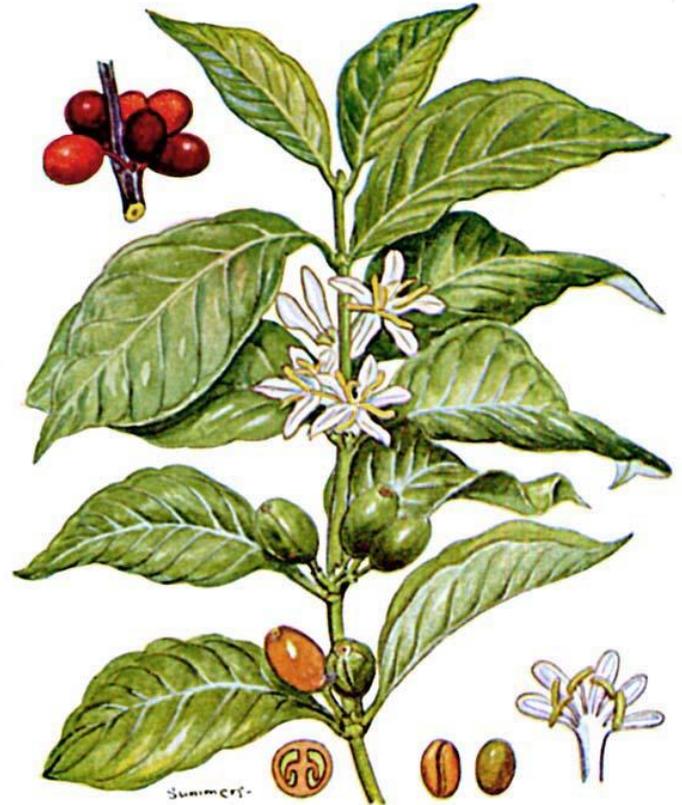


PLATE XI.—*Coffea arabica* (Coffee). (From Jackson: *Experimental Pharmacology and Materia Medica*.)

# Binomial System of Classification

- The coffee plant botanical name, *Coffea arabica*, refers to only one plant and cannot be confused with any other
- Its botanical name is unique to that particular plant the world over



# Binomial System of Classification

- The botanical name is often followed by a letter or letters which stand for the botanist who named that plant
- The coffee plant's complete botanical name is *Coffea arabica* L.
  - L. standing for Linneaus.
- If the original botanical name of a plant is later changed, the original classifier is still noted in parentheses



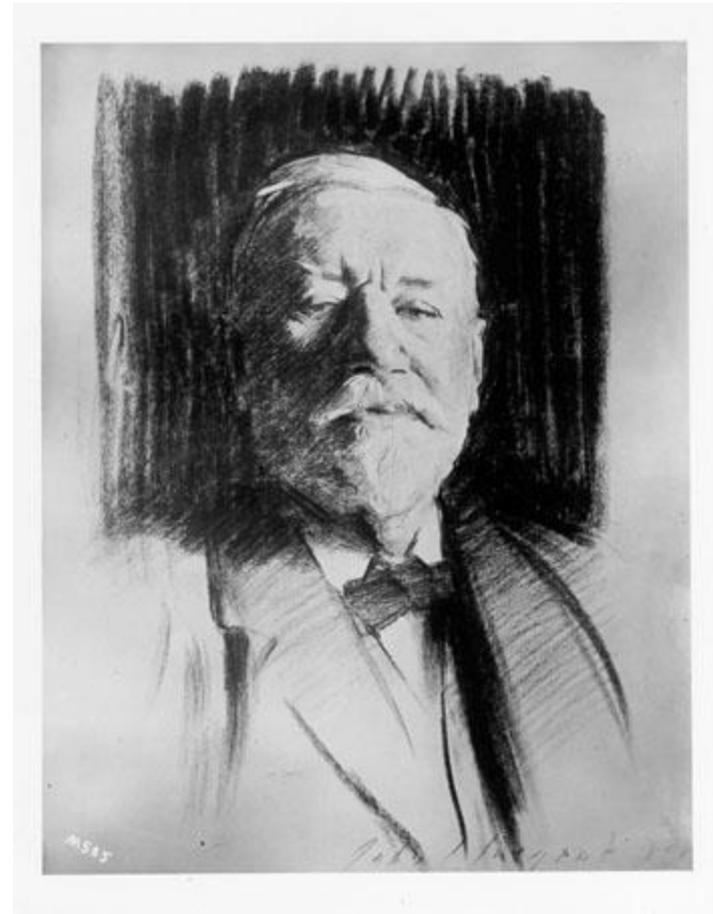
# *Cirsium horridulum* Michx.

- *Cirsium* = from Greek *cirsos* meaning swollen vein
- *horridulum* = prickly
- Prickly plant that cures swollen veins
- Prickly, horribly armed
- Michx. = Andre Michaux (1746-1802)
  - French botanist and explorer
  - Author of *Flora Boreali-Americana* (1803)



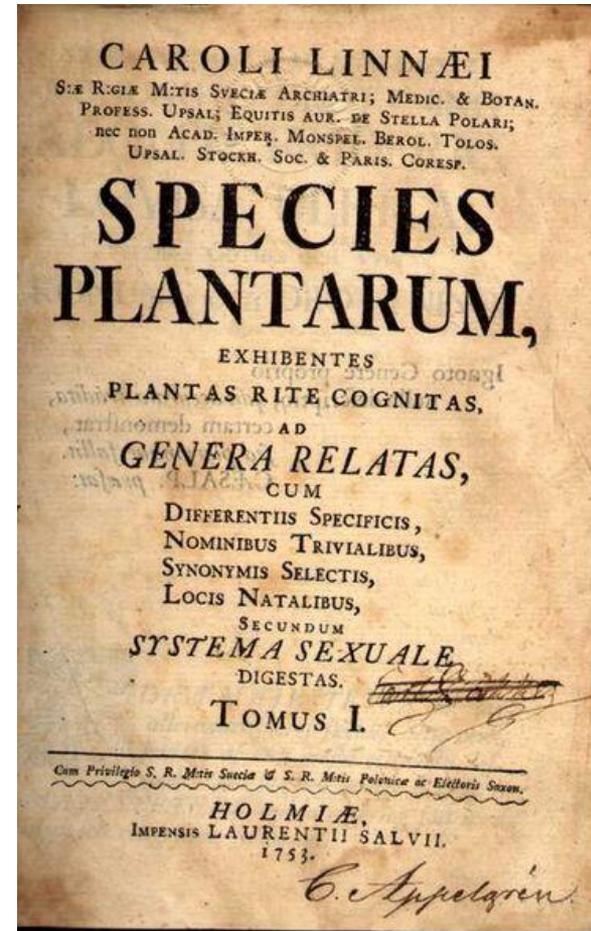
# Binomial System of Classification

- Other often used abbreviations are Sarg. for Charles Sprague Sargent, founder of Harvard University's Arnold Arboretum
- Lam. for Jean Baptiste Lamarck, French evolutionist and botanist
- Audub. for John James Audubon, ornithologist, naturalist, and painter
- Interestingly, this convention of naming the discoverer is not found in the naming of animals



# Binomial System of Classification

- Linneaus's book *Species Plantarum* (The Species of Plants), published in 1753, continues to influence the naming of plants today
- It is the starting point for checking whether a name has been used previously to insure that each plant is given a unique name
- The earliest name for a plant is usually the official name should a dispute arise



# What the Name Means

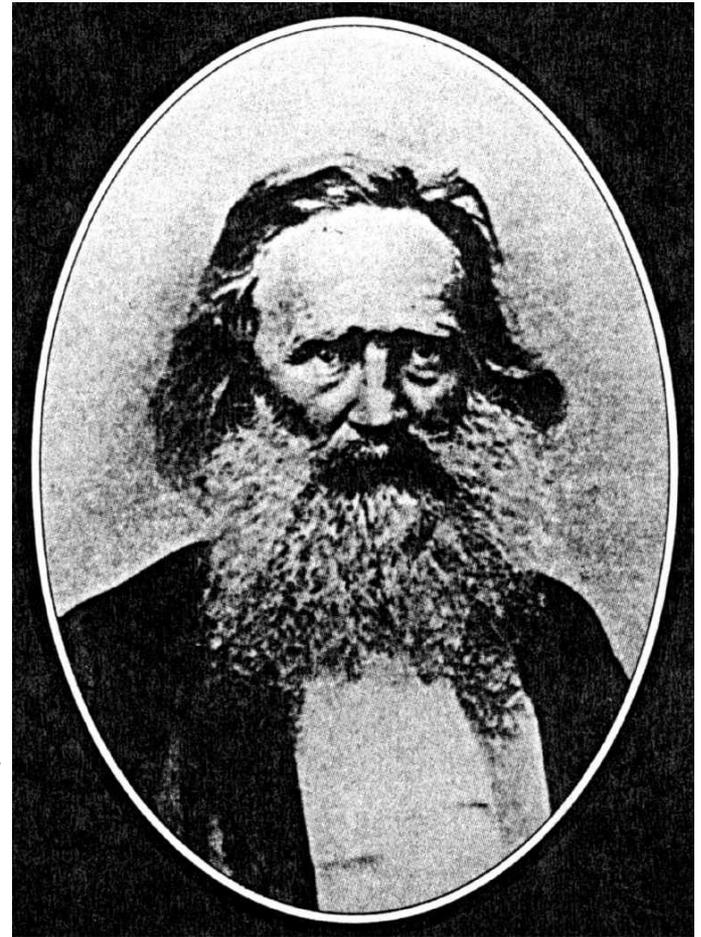
- The genus and species names often tell something about the plant
  - Can describe the appearance of the plant
  - Reflect the common name of the plant
  - Indicate a chemical present in the plant
  - Tell how the plant tastes or smells
  - Describe how the plant grows



*Cucurbita foetidissima* Kunth.

# What the Name Means

- The genus or species name can honor someone
  - A botanist
    - Lindheimeri
  - A person in power
    - maximilliani
  - Someone historically prominent
    - drummondianus
  - The name can reflect the country or origin of a plant
    - texana



# What the Name Means

- The jaborandi tree, *Pilocarpus jaborandi*, has a genus name which indicates that the alkaloid pilocarpine can be extracted from the plant
- The species name *jaborandi* means "one who makes saliva or one who spits," referring to the use of the plant as an expectorant



# What the Name Means

- Plant classification can be painstakingly difficult
- Plant species can resemble one another quite closely
  - Plants can sometimes interbreed within species or across species
  - Produce hybrids and varieties that complicate classification



# What the Name Means

- A case in point is the cinchona tree
  - Instrumental in world history as a result of its alkaloid derivative, quinine
    - Helped to reduce the incidence of the terrible disease malaria
- The cinchona tree, with its many species and hybrids and varieties within species, has resisted absolute classification



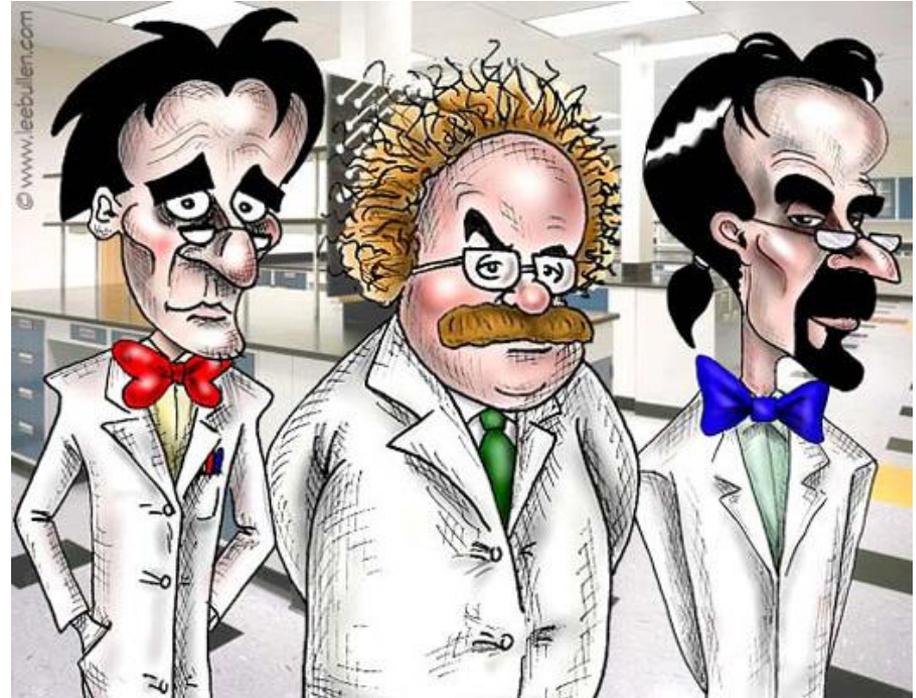
# Plant Classification in Our Modern World

- Many plants yet to be discovered, classified, and utilized
- Unknown plants are treasures waiting to be found.
- Today's ethnobotanists are combing regions of the world, looking for tomorrow's medicines and food crops.



# Plant Classification in Our Modern World

- Need to understand ecological systems which preserve biodiversity
- Today's scientists are exploring how genetic diversity and ecological sensitivity are necessary in solving such problems as feeding the population and fighting disease
- Plant classification is vital to these endeavors



# Some Familiar Texans



# *Lupinus texensis* Hook.

- *Lupinus* = Latin, *lupus*, meaning wolf
- *texensis* = state it was first collected from
  - Of Texas
- Hook.
  - Sir William Jackson Hooker (1785-1865)
  - Director of RBG, Kew (1841-1865)
  - Founder and editor of the Journal of Botany



# *Gaillardia pulchella* Foug.

- *Gaillardia* = M. Gaillard de Charentoneau
  - 18<sup>th</sup> century French magistrate
  - Patron of botany
- *pulchella* = handsome
- Handsome Gaillard
- Foug. = Auguste Denis Fougeroux de Bondaroy (1732-1789)
  - French
  - Illustrated manuscript on turtles



# *Oenothera speciosa* Nutt.

- *Oenothera* = Greek *oinotheras* wine scenting; roots used to make wine
- *speciosa* = showy, good-looking
- Showy, wine-scented flower
- Nutt. = Thomas Nuttall (1786-1859)
  - English-American botanist, naturalist, and ornithologist
  - Collected throughout western North America



# *Lindheimera texana* Engelm. & A. Gray

- *Lindheimera* = Ferdinand Lindheimer (1801-1879)
  - New Braunfels
  - Collected throughout Central Texas
- *texana* = of Texas
- Lindheimer of Texas



# *Engelmannia peristenia* (Raf.) Goodman & C.A. Lawson

- *Engelmannia* = Dr. George Engelmann (1809-1884)
  - German-born botanist and physician
  - St. Louis
- *peristenia* = from Greek *perisso*, meaning odd in number and *tenia*, meaning band or ribbon
- Raf. = Constantin Samuel Rafinesque (1783-1840)



# *Asclepias tuberosa* L.

- *Asclepias* = Greek god of medicine, Asklepios
  - Refers to the medicinal properties
- *tuberosa* = tuberous, referring to its root system
- L. = Linnaeus



# *Callicarpa americana* L.

- *Callicarpa* = from the Greek *callos*, meaning beauty and *carpos*, meaning fruit
- *americana* = of America
- Beautiful fruit of America
- L. = Linnaeus



# *Coreopsis lanceolata* L.

- *Coreopsis* = from the Greek *coris*, meaning bug and *opsis*, meaning appearance
  - Achenes look like little bugs
- *lanceolata* = lance-shaped
  - Lance-shaped leaves
- L = Linnaeus



# *Dracopsis amplexicaulis* (Vahl) Cass.

- *Dracopsis* = from the Greek, *drakon*, meaning dragon and referring to the appendages on the style
- *amplexicaulis* = stem clasping; refers to the attachment of the leaves on the stems



*dracopsis amplexicaulis*  
© 2005 pictured by antonie va  
for aycronto.com



# *Glandularia bipinnatifida* (Nutt.) Nutt.

- *Glandularia* = Latin, *glandula*, meaning glandular and referring to glandular mass on the stigma
- *bipinnatifida* = twice pinnately cut
- Refers to the leaves



# So, What's in a Name?

- As is plain to see, a name is not just a name

