

Topic 01 Introduction to Plant Systematics



I. What is Systematics?

A. Definition & Objectives

1. Study of biodiversity and its many facets
 - diversity & distribution of its species and other taxa
 - evolutionary history
 - taxonomic classification
 - uses (ethnobotany / economic botany)



I. What is Systematics?

B. Important products

1. Taxa (species, genera, families, etc.)
2. Phylogenies & phylogenetic methods
3. Taxonomic monographs & floras (manuals, field guides)



Primary use of phylogenies in systematics: doing taxonomy

Boscia
 Trichema
 Garuga
 Boswellia
 Rosellea
 Canarium
 Bursera
 Commiphora
 Semecarpus (Indian marking nut)
 Anacardium (cashew)
 Sanea (blum mango)
 Mangifera (mango)
 Toxicodendron (poison ivy, oak)
 Rhus (sumac)
 Colinus (sandelwood)
 Pistacia (guttachis)
 Sapindus
 Koeberlinia
 Acer
 Anacardus
 Zanthoxylum
 Phellodendron
 Citrus
 Ruta

How to classify these 24 genera ?

A bad taxonomy because it misrepresents the phylogeny

Boscia
 Trichema
 Garuga
 Boswellia
 Rosellea
 Canarium
 Bursera
 Commiphora
 Semecarpus (Indian marking nut)
 Anacardium (cashew)
 Sanea (blum mango)
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 Sapindus
 Koeberlinia
 Acer
 Anacardus
 Zanthoxylum
 Phellodendron
 Citrus
 Ruta

Frankincense & Myrrh Family
 Cashew Family
 Citrus Family
 Sapindales (order)

Phylogenies eliminate some possibilities and help identify plausible alternatives.

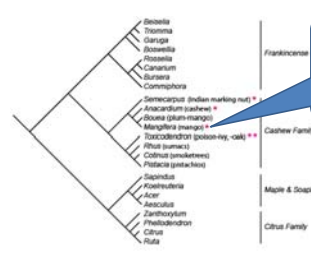
Good taxonomy

Boscia
 Trichema
 Garuga
 Boswellia
 Rosellea
 Canarium
 Bursera
 Commiphora
 Semecarpus (Indian marking nut)
 Anacardium (cashew)
 Sanea (blum mango)
 Mangifera (mango)
 Toxicodendron (poison ivy, oak)
 Rhus (sumac)
 Colinus (sandelwood)
 Pistacia (guttachis)
 Sapindus
 Koeberlinia
 Acer
 Anacardus
 Zanthoxylum
 Phellodendron
 Citrus
 Ruta

Frankincense & Myrrh Family
 Cashew Family
 Maple & Sapberry Family
 Citrus Family
 Sapindales (order)

Phylogenies eliminate some possibilities and help identify plausible alternatives.

Broader impacts of phylogenies:



From understanding the basis for unusual allergies...

Frankeniaceae

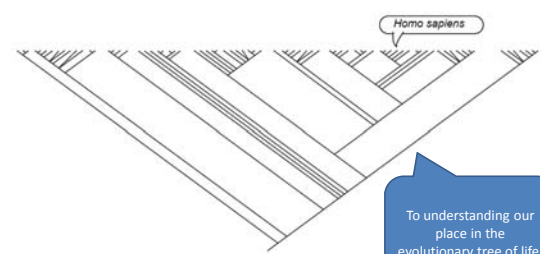
Celastraceae Family

Malvaceae & Sapotaceae Family

Citrus Family

Species listed: Beilschmiedia, Trichostema, Garrya, Borealis, Rosales, Canarium, Bursaria, Compositae, Serracarpus (Indian marking nut), Anacardium (cashew), Borea (plant mango), Mangifera (mango), Toxicodendron (poison-ivy, oak), Alnus (hickory), Cofus (sawdust), Pistacia (gum arabic), Sapindus, Proteaceae, Acer, Anacardium, Zanthoxylum, Prinos, Citrus, Ruta.

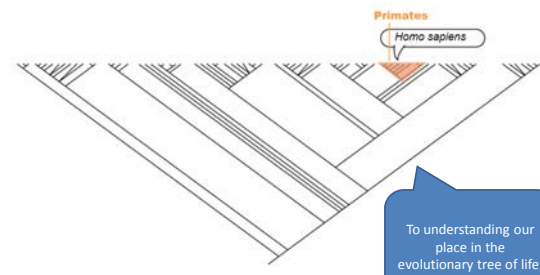
Broader impacts of phylogenies:



Homo sapiens

To understanding our place in the evolutionary tree of life.

Broader impacts of phylogenies:



Primates

Homo sapiens

To understanding our place in the evolutionary tree of life.

