Biological bases of classification of the plant world

Plan

- Classification, taxonomy, and systematics.
- Taxonomy
- Classification
- Systematics
- Levels of taxonomic hierarchy
- Modern system of living nature

Classification, Taxonomy, and Systematics . Etymologically, the terms systematics and taxonomy have virtually the same meaning, and in Greek taxonomy means "to put in order" and systematics means "to arrange together". The term taxonomy (as systematic botany, meaning "arrangement of organisms in an elementary classification") was coined by Carl Linnaeus (1751).

The term Systematics was introduced by the Swiss botanist de Candolle (1813) and denoted the theory of plant classification. Later the term became more widely used for methods and principles of classification of any groups of organisms. For example, Ch. Darwin (1859) considered the terms taxonomy and systematics as synonyms. And nowadays some botanists consider taxonomy and systematics as synonyms, by some they differ.

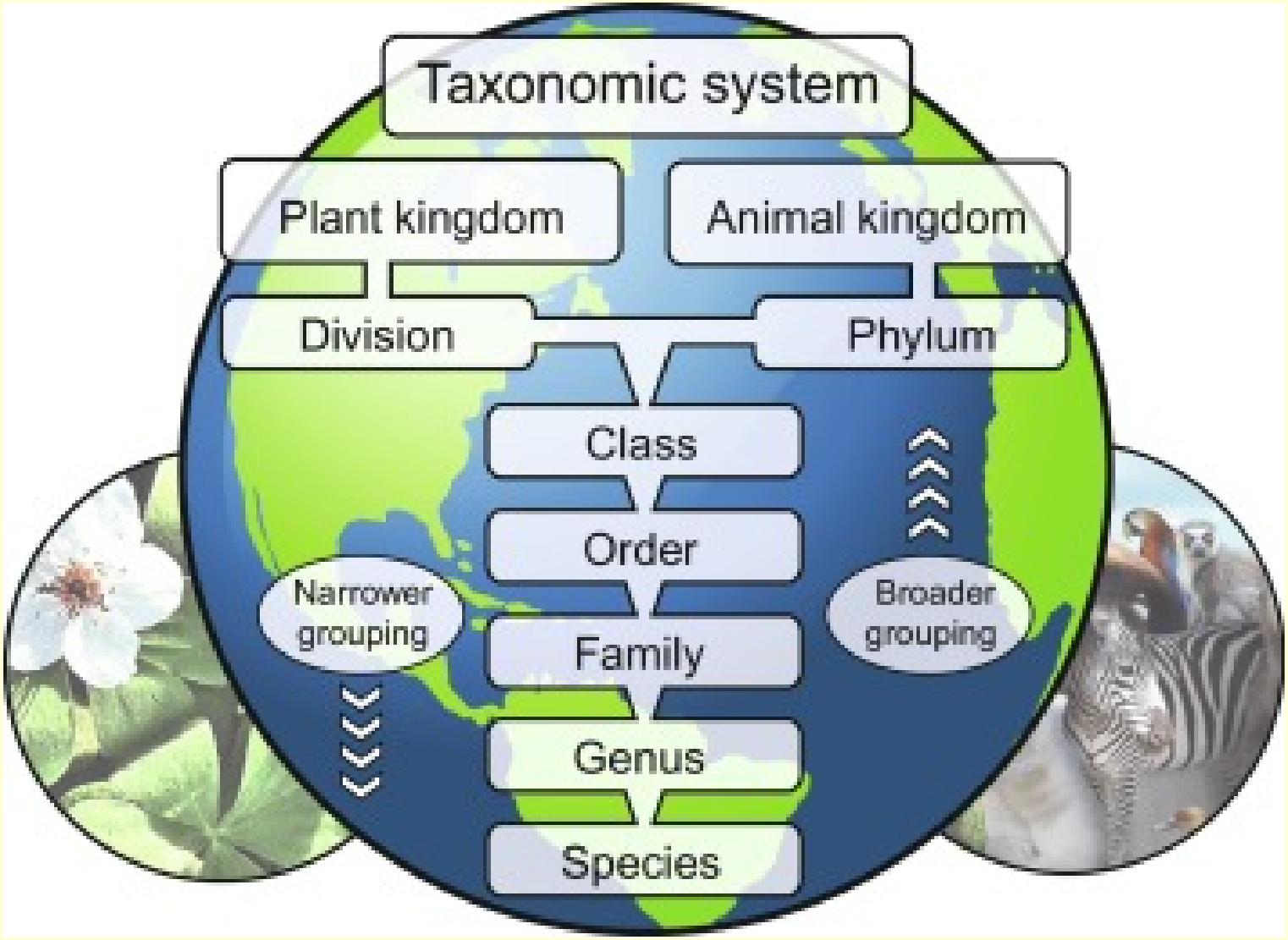
Classification is the arrangement of objects (organisms, species, etc.) on the basis of common properties, the grouping of organisms in a hierarchical system. Taxonomy - theoretical basis of classification, rules based on which taxa are arranged in the system. Taxonomic keys and - a method of analysis based on the features obtained during classification, but it should be remembered that keys themselves are not classification systems.

Description - a listing of features (usually morphological) of organisms or groups of organisms. Diagnosis - a short comparative description emphasizing those features that separate a taxon from its close relatives of the same rank, is given, as a rule, when describing new species (genera, etc.). The diagnosis, in accordance with the rules, indicates affinity and relationships - some degree of presumed genetic or evolutionary proximity, usually expressed in morphological similarity.

Levels of Hierarchy

The main taxonomic levels are highlighted in yellow.

Regnum
Subregnum
Divisio (Phyllum)
Subdivisio
Classis
Subclassis
Superordo
Ordo
Subordo
Familia (Fam.)
Sublamilia .(Subiam.)
Tribus (Trib.)
Genus (Gen.)
Subgenus (subgen.)
Sectio (sect.)
Species (sp.)
Subspecies (subsp.)


Taxonomic system
Plant kingdom
Animal kingdom
Division
Phylum
Class
Order
Family
Genus
Species
Narrower grouping
Broader grouping

Taxon	Suffixes
Kingdom	No definite suffix
↑	
Division	phyta/spermae
↑	
Class	nae/opsida
↑	
Order	ales
↑	
Family	aceae
↑	
Genus	No definite suffix
↑	
Species	No definite suffix

Regnum	-	Plantae
Divisio	**-phyta**	Magnoliophyta
Subdivisio	**-icae**	Pinicae
Classis	**-opsida**	Magnoliopsida
Subclassis	**-idae**	Magnoliidae
Ordo	**-ales**	Geraniales
Subordo	**-ineae**	Geranineae
Familia	**-aceae**	Ranunculaceae
Subfamilia	**-oideae**	Rosoideae
Tribus	**-eae**	Roseae
Subtribus	**-inae**	Rutinae
Genus		Malva
Subgenus		Ranunculus subg. Batrachium
Section		Rosa sect. Canina subsect. Villosae
Species		Silene dioica
Subspecies		ssp. zeylanica

Kingdom	Plantae
Subkingdom	Tracheobionta (Vascular plants)
Superdivision	Spermatophyta (Seed plants)
Division	Magnoliophyta (Flowering plants)
Class	Magnoliopsida (Dicotyledons)
Subclass	Magnoliidae
Order	Magnoliales
Family	Annonaceae (Custard apple family)
Genus	Annona
Species	squamosa (Sugar apple)

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopside
Order	Rosales
Family	Rosaceae
Subfamily	Amygdaloideae
Tribe	Maleae
Sub-tribe	Malinae
Genus	*Pyrus* L.
Species	*Communis* Linn.

Kingdom	**Plantae - Plants**
Subkingdom	Tracheobionta - Vascular plants
Division	Mangoliophyta – Flowering plants
Class	Magnoliopsida- Dicotyledons
Sub class	Rosidae
Order	Fabales
Family	Fabacae (caesalpiniaceae) – Pea family
Genus	Cassia L. - Cassia
Species	*C. Fistula* Linn. – Golden shower

1. Superkingdom Procariotes (Procaryota). Organisms without a formalized cell nucleus.

1. Kingdom Archaebacteria. Methane-forming anaerobic chemosynthetic bacteria.

2. The Bacteria kingdom. Various groups of anaerobic and aerobic heterotrophic prokaryotes, less frequently autotrophic chemosynthetic bacteria and bacteria capable of anoxygenic (without oxygen liberation) photosynthesis.

3. The Oxyphotobacteria kingdom. Autotrophic aerobic prokaryotes capable of oxygenated photosynthesis. These include cyanobacteria and chlorooxybacteria.

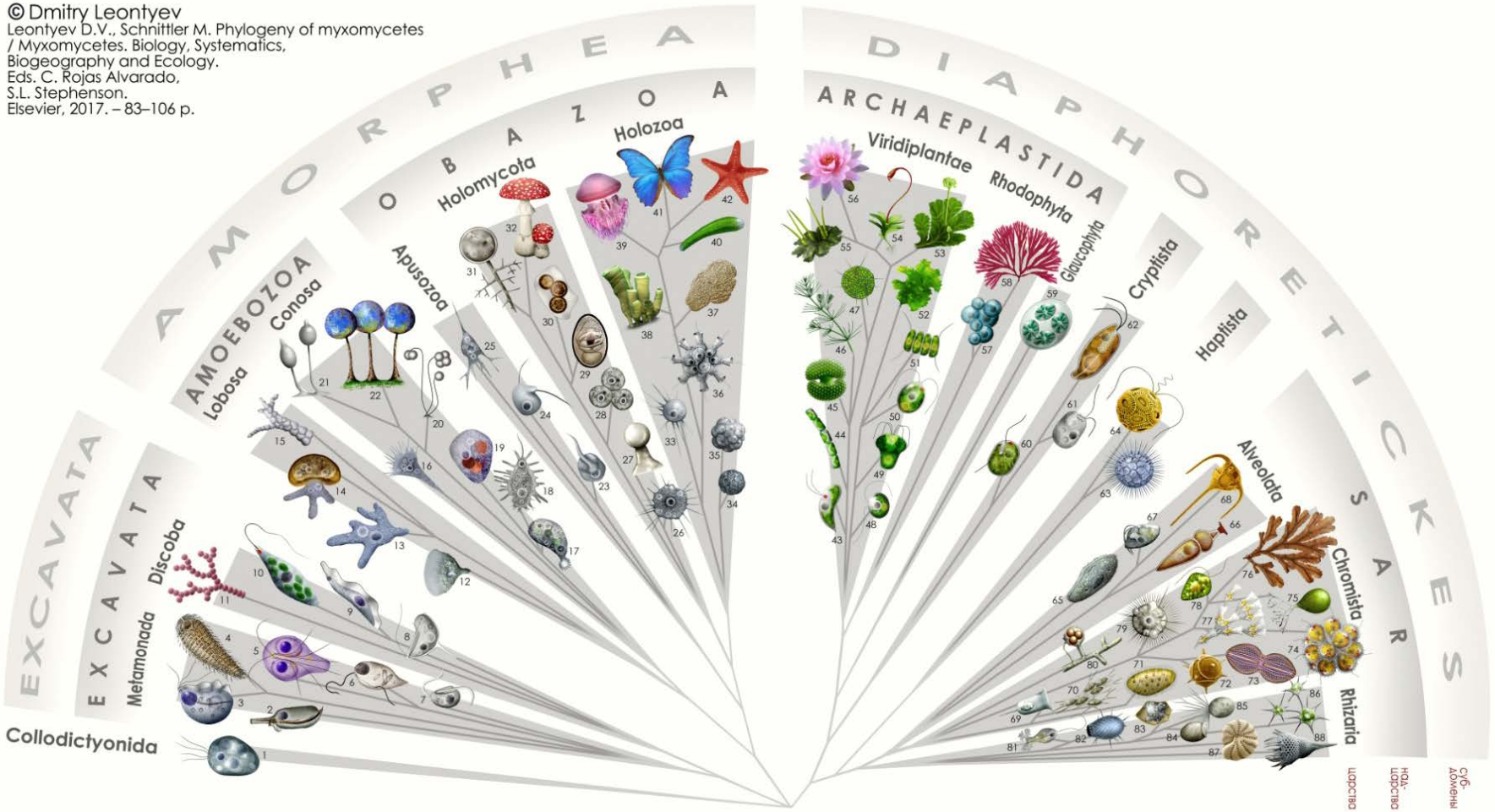
2. Superkingdom Eucaryotes (Eucaryota) Organisms that have a formalized cell nucleus.

1. Animal kingdom. Heterotrophs, feeding chiefly by ingestion of solid food, more rarely by adsorption (absorption of liquid food). Dense cell membrane is absent. Typically diploid organisms.

2. Fungi. Heterotrophs, absorb food by absorption. Usually has hard cell membrane. Haploide or dikaryontic (bicore organisms).

3. Plant kingdom. Autotrophs, feeding by synthesis of organic and inorganic materials from sunlight. Photosynthesis is oxygenic (with liberation of oxygen). There is a dense cell membrane. Alternation of diploid and haploid generations is characteristic; diploid organisms predominate more often.

Phylogenetic system of eukarytes



1. Collodictyonida; 2. Oxymonadida; 3. Trichomonadida; 4. Hypermastigida; 5. Diplomonadida; 6. Retortamonadida; 7. Malawimonadida; 8. Jakobida; 9. Kinetoplastida; 10. Euglenida; 11. Heterolobosea; 12. Flabellinea; 13. Euamoebida; 14. Arcellida; 15. Copromyxida; 16. Variosea; 17. Pelobiontida; 18. Mastigamoebida; 19. Entamoebidae; 20. Protosporangiida; 21. Dictyosteliomycetes; 22. Myxomycetes; 23. Apusomonadida; 24. Ancyromonadida; 25. Breviatida; 26. Nucleariida; 27. Fonticulida; 28. Aphelidea; 29. Microsporidia; 30. Cryptomycota; 31. Chytridiomycota; 32. Amastigomycota; 33. Filasterea; 34. Corallochytrida; 35. Mezomycetozoea; 36. Choanoflagellata; 37. Placozoa; 38. Parazoa; 39. Radiata; 40. Xenacoelomorpha; 41. Protostomia; 42. Deuterostomia; 43. Mesostigmatophyceae; 44. Klebsormidiophyceae; 45. Zygnematophyceae; 46. Charophyceae; 47. Coleochaetophyceae; 48. Nephroselmidophyceae; 49. Pyramimonadophyceae; 50. Chlorodendrophyceae; 51. Chlorophyceae; 52. Ulvophyceae; 53. Marchantiophyta; 54. Bryophyta; 55. Anthocerotophyta; 56. Tracheophyta; 57. Cyanidiophytina; 58. Rhodophytina; 59. Glaucophyta; 60. Katablepharida; 61. Goniomonas; 62. Cryptophyceae; 63. Centrohelida; 64. Haptophyta; 65. Ciliophora; 66. Apicomplexa; 67. Protaveolata; 68. Dinoflagellata; 69. Bicosoecida; 70. Labyrinthulomycetes; 71. Opalinida; 72. Bolidophyceae; 73. Bacillariophyceae; 74. Synurophyceae; 75. Xanthophyceae; 76. Phaeophyceae; 77. Chrysophyceae; 78. Raphidophyceae; 79. Actinophryida; 80. Oomycota; 81. Cercomonadida; 82. Euglyphida; 83. Plasmodiophoromycetes; 84. Haplosporidia; 85. Gromiida; 86. Chlorarachniophyceae; 87. Foraminifera; 88. Radiolaria.