

# TAXONOMY

Taxonomy is the practice of identifying different organisms, classifying them into categories, and naming them. All organisms, both living and extinct, are classified into distinct groups with other similar organisms and given a scientific name.

The classification of organisms has various hierarchical categories. Categories gradually shift from being very broad and including many different organisms to very specific and identifying single species.

# Carl Linnaeus (1707–1778)

**Kingdom**

**Phylum**

**Class**

**Order**

**Family**

**Genus**

**Species**



Kingdom  
Phylum  
Class  
Order  
Family  
Genus  
Species

### Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mammalia
Order:	Carnivora
Family:	Canidae
Subfamily:	Caninae
Tribe:	Canini
Subtribe:	Canina
Genus:	<i>Canis</i>
Species:	<b><i>C. familiaris</i></b>

Kingdom  
 Phylum  
 Class  
 Order  
 Family  
 Genus  
 Species

### Scientific classification

Kingdom: **Plantae**  
 Clade: **Tracheophytes**  
 Clade: **Angiosperms**  
 Clade: **Eudicots**  
 Clade: **Rosids**  
 Order: **Rosales**  
 Family: **Rosaceae**  
 Subfamily: **Rosoideae**  
 Tribe: **Roseae**  
 Genus: ***Rosa***

### Scientific classification

Kingdom: **Animalia**  
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 Class: **Mammalia**  
 Order: **Carnivora**  
 Family: **Canidae**  
 Subfamily: **Caninae**  
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 Species: ***C. familiaris***

Kingdom  
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 Tribe: Canini  
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 Genus: *Canis*  
 Species: **C. familiaris**

### Scientific classification

Kingdom: Fungi  
 Division: Basidiomycota  
 Class: Agaricomycetes  
 Order: Agaricales  
 Family: Amanitaceae  
 Genus: *Amanita*  
 Species: **A. muscaria**

Kingdom  
 Phylum  
 Class  
 Order  
 Family  
 Genus  
 Species

### Scientific classification

Domain: Archaea  
 Kingdom: Crenarchaeota  
 Phylum: Crenarchaeota  
 Class: Thermoprotei  
 Order: Sulfolobales  
 Family: Sulfolobaceae  
 Genus: **Sulfolobus**

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### Scientific classification

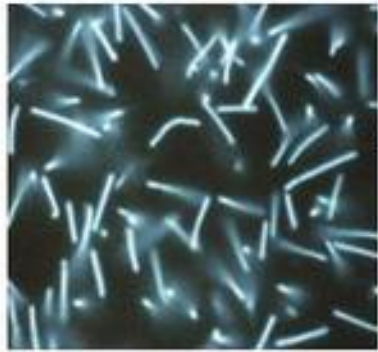
Domain: Bacteria  
 Phylum: Firmicutes  
 Class: Bacilli  
 Order: Lactobacillales  
 Family: Lactobacillaceae  
 Genus: **Lactobacillus**

### Scientific classification

Kingdom: Fungi  
 Division: Basidiomycota  
 Class: Agaricomycetes  
 Order: Agaricales  
 Family: Amanitaceae  
 Genus: *Amanita*  
 Species: **A. muscaria**

# 3 Domains

# 8 Kingdoms



Archaea



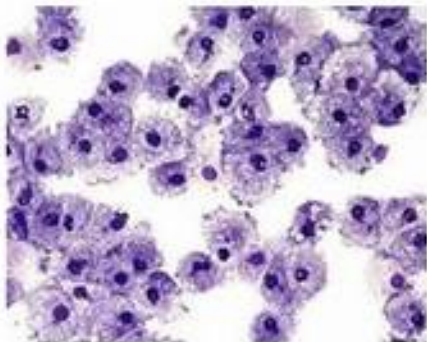
Archaeobacteria



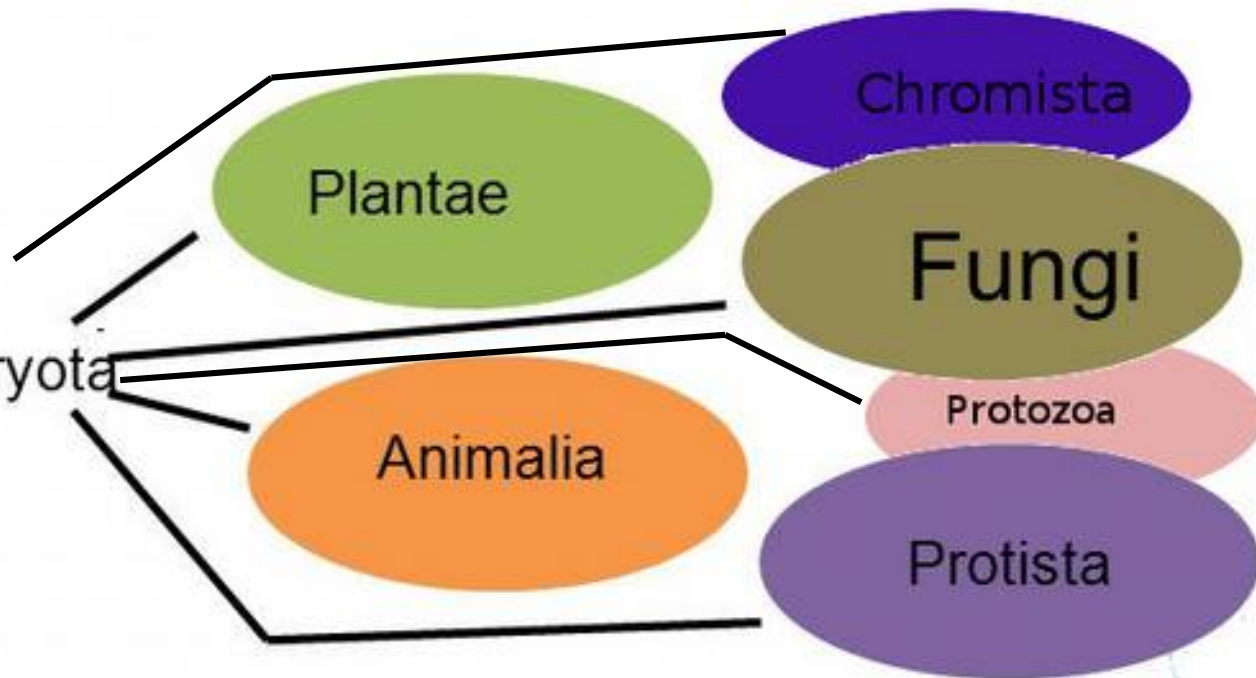
Bacteria



Eubacteria



Eukaryota



Plantae

Chromista

Fungi

Protozoa

Protista

Animalia



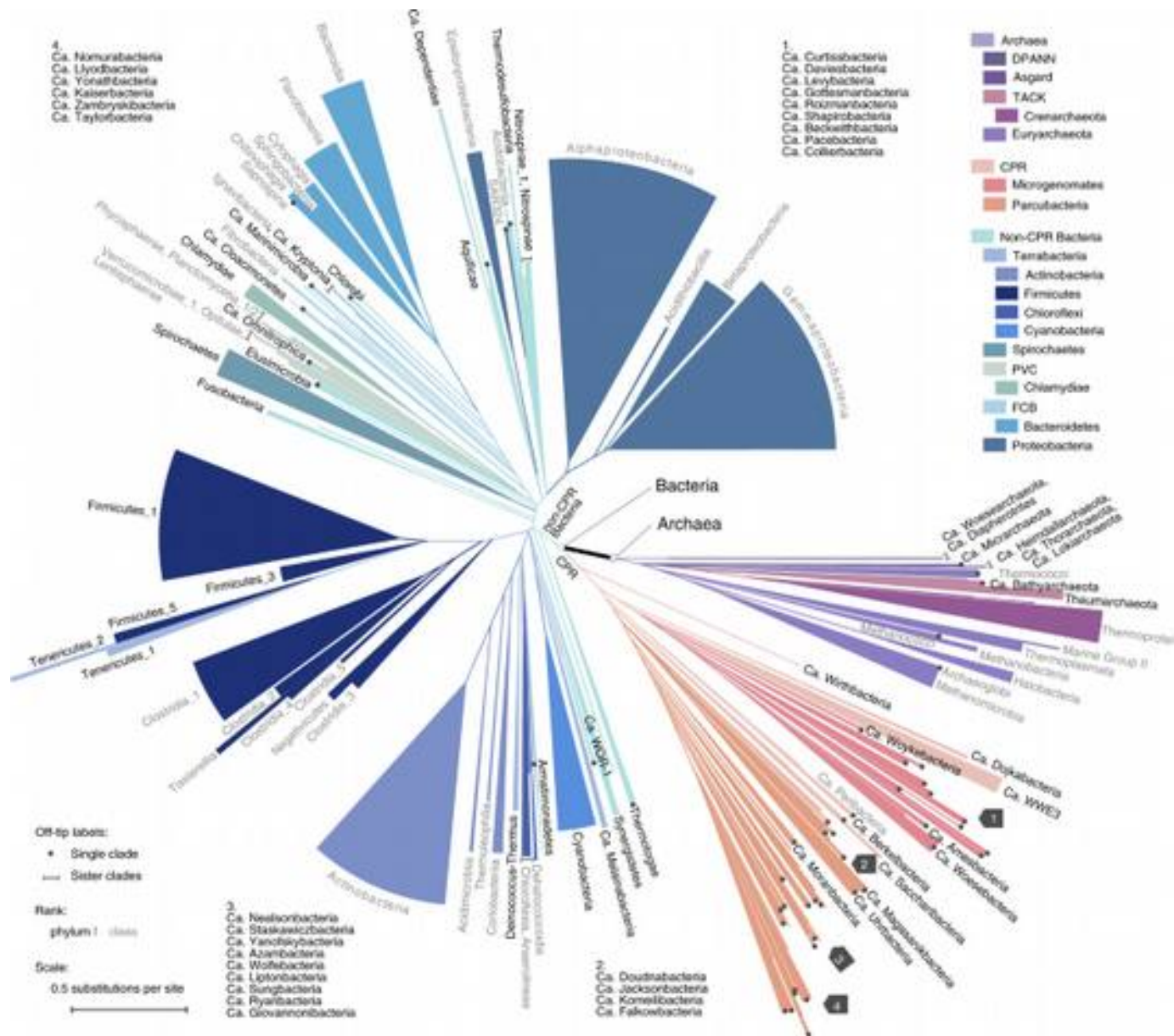
1735 <sup>[58]</sup>	1866 <sup>[59]</sup>	1925 <sup>[60]</sup>	1938 <sup>[61]</sup>	1969 <sup>[62]</sup>	1990 <sup>[63]</sup>	1998 <sup>[56]</sup>	2015 <sup>[64]</sup>
2 kingdoms	3 kingdoms	2 empires	4 kingdoms	5 kingdoms	3 domains	2 empires, 6 kingdoms	2 empires, 7 kingdoms
	Protista	Prokaryota	Monera	Monera	Bacteria	Bacteria	Bacteria
<i>(not treated)</i>					Archaea		Archaea
			Protoctista	Protista		Protozoa	Protozoa
						Chromista	Chromista
Vegetabilia	Plantae	Eukaryota	Plantae	Plantae	Eucarya	Plantae	Plantae
						Fungi	Fungi
Animalia	Animalia		Animalia	Animalia		Animalia	Animalia

*Main article: Kingdom (biology) § Summary*

1735 <sup>[58]</sup>	1866 <sup>[59]</sup>	1925 <sup>[60]</sup>	1938 <sup>[61]</sup>	1969 <sup>[62]</sup>	1990 <sup>[63]</sup>	1998 <sup>[56]</sup>	2015 <sup>[64]</sup>
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(not treated)	Protista	Prokaryota	Monera	Monera	Bacteria Archaea	Bacteria	Bacteria Archaea
			Protoctista	Protista		Protozoa Chromista	Protozoa Chromista
Vegetabilia	Plantae	Eukaryota	Plantae	Plantae Fungi	Eucarya	Plantae Fungi	Plantae Fungi
Animalia	Animalia		Animalia	Animalia		Animalia	Animalia

Main article: *Kingdom (biology) § Summary*

**Lineage** (full): [cellular organisms](#); [Bacteria](#); [Proteobacteria](#); [Gammaproteobacteria](#); [Enterobacterales](#)



# TAXONOMIC IMPEDIMENT

by Barcode Bulletin | Jul 27, 2020

Refers to the set of difficulties associated with assigning a name to any organism of interest. They include the (i) incomplete knowledge of biodiversity and a large number of unknown species, (ii) the insufficient number of taxonomic experts and their uneven distribution on the planet, and (iii) a lack of taxonomic infrastructures.



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## **Delimitation of taxa**

Go to:

Descriptions of taxa may be based on different sets of characters, for example sexual or asexual reproductive structures, physiological parameters or DNA bases. It may therefore be difficult to tell whether a taxon, described based on one type of character, is the same as a taxon described from another character type or set of characters. This is the basis behind both the former dual system of naming for “*Eumycota*” vis-à-vis “*Deuteromycota*” and the situation which is now faced with dark taxa. In the case of dark taxa, it is not immediately clear how to correlate a species delimited from environmental sequence data to, say, a range of physiological parameters quantified in the lab or a handful of morphological traits gleaned from microscopy studies of soil samples. Obtaining such additional data and mapping them to

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[MycoKeys](#), 2018; (30): 31–39.

PMCID: PMC5904500

Published online 2018 Feb 23. doi: [10.3897/mycokeys.30.24376](https://doi.org/10.3897/mycokeys.30.24376)

PMID: [29681731](https://pubmed.ncbi.nlm.nih.gov/29681731/)

## New light on names and naming of dark taxa

[Martin Ryberg](#)<sup>1</sup> and [R. Henrik Nilsson](#)<sup>2,3</sup>

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<sup>1</sup> Department of Organismal Biology, Evolutionary Biology Centre, Uppsala University, Norbyvägen 18D, 752 36 Uppsala, Sweden,

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taxon described from another character type or set of characters. This is the basis behind both the former dual system of naming for “*Eumycota*” vis-à-vis “*Deuteromycota*” and the situation which is now faced with dark taxa. In the case of dark taxa, it is not immediately clear how to correlate a species delimited from environmental sequence data to, say, a range of physiological parameters quantified in the lab or a handful of morphological traits gleaned from microscopy studies of soil samples. Obtaining such additional data and mapping them to

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## Unclassified microorganisms [ edit ]

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Published: 29 June 2017

# Taxonomy: retain scientific autonomy

Markus Lambertz 

*Nature* 546, 600 (2017) | [Cite this article](#)

7856 Accesses | 8 Citations | 20 Altmetric | [Metrics](#)

First, taxonomy is an independent biological discipline, not a service provider for conservation biologists or policymakers. Second, as with any scientific discipline, hypotheses are its cornerstone. Forcing taxonomists to adhere to a particular species concept might be interpreted as a form of academic censorship.

Even though the species as a taxon is thought to represent a real entity in nature, a species description is no different conceptually from any other scientific hypothesis (H. Wägele *et al.* *Front. Zool.* **8**, 25; 2011). Aside from unjustified and detrimental taxonomic vandalism (as discussed by H. Kaiser *et al.* *Herpetol. Rev.* **44**, 8–23; 2013), every taxonomist should retain the right to formulate their own hypotheses, provided that their rationale is clear and bolstered by unambiguous data.





## The integrative future of taxonomy

[José M Padial](#)<sup>1†</sup>, [Aurélien Miralles](#)<sup>2</sup>, [Ignacio De la Riva](#)<sup>3</sup> and [Miguel Vences](#)<sup>3‡</sup>

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### Results

Integrative taxonomy has been proposed as a framework to bring together these conceptual and methodological developments. Here we review perspectives for an integrative taxonomy that directly bear on what species are, how they can be discovered, and how much diversity is on Earth.

### Conclusions

We conclude that taxonomy needs to be pluralistic to improve species discovery and description, and to develop novel protocols to produce the much-needed inventory of life in a reasonable time. To cope with the large number of candidate species revealed by molecular studies of eukaryotes, we propose a classification scheme for those units that will facilitate the subsequent assembly of data sets for the formal description of new species under the Linnaean system, and will ultimately integrate the activities of taxonomists and molecular biologists.

# Example of forced taxonomy

Taxonomía	
Dominio:	Eukarya
Reino:	Protista
Filo:	Euglenozoa
Clase:	Euglenoidea
Orden:	Euglenales
Familia:	Euglenaceae
Género:	<b><i>Euglena</i></b> EHRENBERG, 1830
Especies	

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Taxonomía	
Reino:	Plantae
Subreino:	Tracheobionta
División:	Magnoliophyta
Clase:	Liliopsida
Subclase:	Liliidae
Orden:	Asparagales
Familia:	Orchidaceae
Subfamilia:	Epidendroideae
Tribu:	Gastrodieae
Subtribu:	Gastrodiinae
Género:	<i>Gastrodia</i>





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Taxonomía	
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Subreino:	Tracheobionta
División:	Magnoliophyta
Clase:	Liliopsida
Subclase:	Liliidae
	Asparagales
	Orchidaceae
	Epidendroideae
	Gastrodieae
	Gastrodiinae
	<i>Gastrodia</i>

Taxonomía	
Orden:	Euc
Familia:	Euc
Género:	<b>Eu</b>
	EHE
	<b>Es</b>
	Reino: Animalia
	Filo: Mollusca
	Clase: Gastropoda
	Subclase: Heterobranchia
	Infraclase: Opisthobranchia
	Orden: Sacoglossa
	Suborden: <b>Plakobanchacea</b>
	Superfamilia: <b>Placobranchoidea</b>
	Familia: <b>Plakobanchidae</b>
	Género: <b>Elysia</b>

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Taxonomía	
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Taxonomía	
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Taxonomía	
Superreino:	Eukaryota
Reino:	Plantae
División:	Magnoliophyta
Clase:	Liliopsida
Subclase:	Commelinidae
Orden:	Arecales
Familia:	Arecaceae
Subfamilia:	Arecoideae
Tribu:	Iriarteae
Subtribu:	Iriarteinae
Género:	<b>Socratea</b> H.KARST.



# Example of forced taxonomy



Superfamilia: **Placobranchoidea**  
Familia: **Plakobbranchidae**  
Género: ***Elysia***

## Taxonomía

Plantae  
Tracheobionta  
Magnoliophyta

Lili

## Taxonomía

Superreino: Eukaryota  
Reino: Plantae  
División: Magnoliophyta  
Clase: Liliopsida  
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H.KARST.

*Nada es mas queer que la naturaleza*

*Brigitte Baptiste*

Nothing is more queer than nature

Brigitte Baptist