

# Systematic Botany. Lecture 18

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# Outline

Questions and answers

Monera

Bacteria

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Monera

Bacteria

## Previous final question: the answer

Which rank is between phylum and order?

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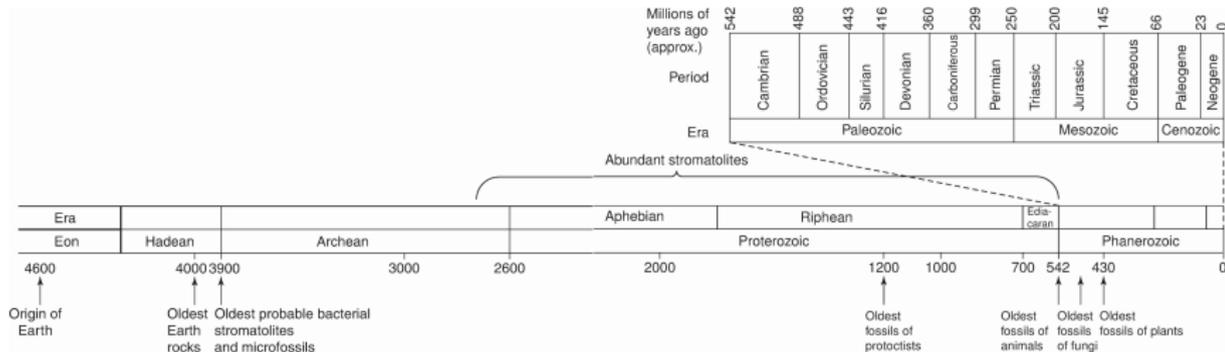
Which rank is between phylum and order?

- ▶ Class

## Announcement: Lab 1 paper

- ▶ Due October 21
- ▶ 1000-1200 words
- ▶ Topics: (1) Basic principles of plant construction; (2) Prairie plant communities

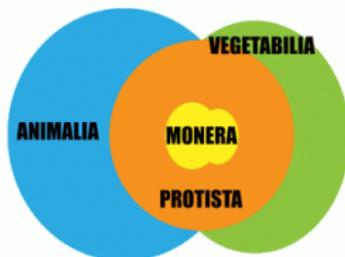
# Timeline of evolution



# Classification Web site

© Shipunov A.B. Systema Naturae [Electronic resource]. 1995—onwards.  
Mode of access: <http://herba.msu.ru/shipunov/os/os-en.htm>

## Systema Naturae



Current  $\beta$  version:

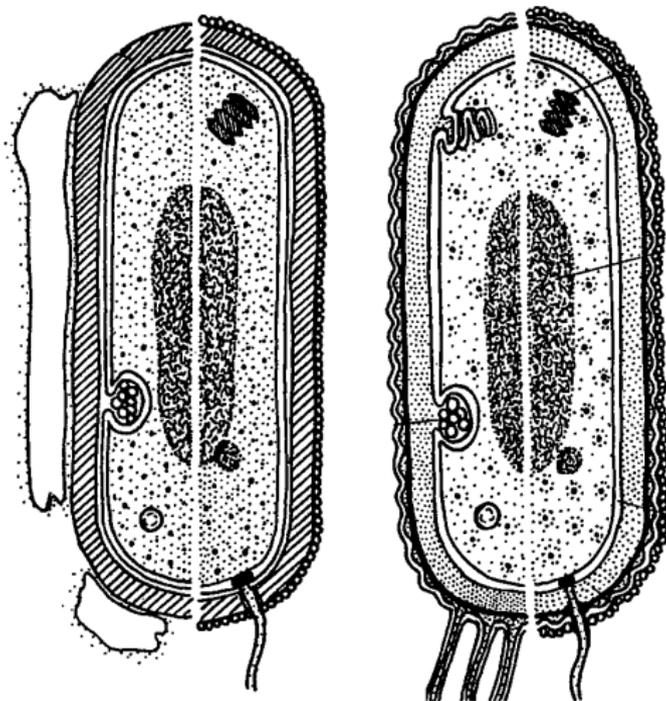
- [Classification itself](#), in PDF (version information inside)
- [What's new](#) since 5.4, plain text
- [Treemap of classification](#), in SVG
- [Pyramid of kingdoms](#), in SVG
- [References](#), in BibTeX

**Stable version 5.802** (April 2009):

*Shipunov A.B.* Systema Naturae or the outline of living world classification // Protistology. 2009. 6 (1): 3-13,  
[Open access](#), or [Local PDF](#).

<http://ashipunov.info/shipunov/os/os-en.htm>

## Gram-positive *versus* Gram-negative bacteria



## Basal lineages (B-13 & B-14)

**Regnum Monera** [<sup>7</sup>*Bacillus*]

**Subregnum *Bacteria*** [<sup>6,8</sup>*Bacillus*]\* <sup>1</sup>

Superphylum *Terrabacteria* [<sup>6,2</sup>*Bacillus*] s.a.

Phylum 1. THERMOBACTERIA<sup>†</sup> [<sup>6</sup>*Deinococcus*] s.a.

Classis 1(1). *Deinococci* [<sup>5</sup>*Deinococcus*]<sup>2</sup>

2(2). *Thermodesulfobacteria* [<sup>5</sup>*Thermodesulfobacterium*] i.s.

3(3). *Aquificae* [<sup>5</sup>*Aquifex*] sed.m.<sup>3</sup>

4(4). *Thermotogae* [<sup>5</sup>*Thermotoga*] sed.m.

Phylum 2. OBSCUROBACTERES<sup>†</sup> <sup>4</sup>

## Firmicutes (B-9, B-10, B-12)

Phylum 3. ACTINOBACTERES<sup>†</sup> [<sup>6</sup>*Actinomyces*]

Classis 1(5). *Actinobacteria* [<sup>5</sup>*Actinomyces*]

Phylum 4. FIRMICUTES [<sup>6</sup>*Bacillus*] s.a., sed.m.<sup>5</sup>

Classis 1(6). *Fusobacteria* [<sup>5</sup>*Fusobacterium*] sed.m.

2(7). *Dictyoglomia* [<sup>5</sup>*Dictyoglomus*] sed.m.

3(8). *Mollicutes* [<sup>5</sup>*Mycoplasma*]<sup>6</sup>

4(9). *Clostridia* [<sup>5</sup>*Clostridium*] s.a.<sup>7</sup>

5(10). *Negativicutes* [<sup>5</sup>*Negativicoccus*]

6(11). *Bacilli* [<sup>5</sup>*Bacillus*] s.a.<sup>8</sup>

## Photosynthetic lineages (B-6 & B-7)

### Phylum 5. CYANOBACTERIA [<sup>6</sup>*Nostoc*]

- Classis 1(12). *Gloeobacteria* [<sup>5</sup>*Gloeobacter*]  
2(13). *Oscillatorineae*\* [<sup>5</sup>*Oscillatoria*] s.a.<sup>9</sup>  
3(14). *Nostocineae* [<sup>5</sup>*Nostoc*]

### Phylum 6. CHLOROFLEXES [<sup>6</sup>*Chloroflexus*]<sup>10</sup>

- Classis 1(15). *Armatimonadetes* [<sup>5</sup>*Armatimonas*] stat.m.<sup>11</sup>  
2(16). *Dehalococcoidetes* [<sup>5</sup>*Dehalococcoides*]  
3(17). *Chloroflexi* [<sup>5</sup>*Chloroflexus*]  
4(18). *Thermomicrobia* [<sup>5</sup>*Thermomicrobium*]<sup>12</sup>  
5(19). *Anaerolineae* [<sup>5</sup>*Anaerolinea*]<sup>13</sup>  
6(20). *Ktedonobacteria* [<sup>5</sup>*Ktedonobacter*]

## Final question (1 point)

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Name one photosynthetic phylum of Bacteria

## For Further Reading



Margulis and Chapman. 2009.

*Kingdoms and domains: an illustrated guide to the phyla of life on Earth*. 4th edition.

Chapter 1 (pp. 37–57; 65–107).