

## Proposal to include the rank of phylum in the International Code of Nomenclature of Prokaryotes

To be open for discussion in the period November 1, 2020 – January 31, 2021 and ICSP ballot – February 1-28, 2021.

### Background information:

1. The word 'phylum' is not found in the ICNP (2008 revision, Parker et al. 2019) or in earlier versions of the ICNB. The highest taxon covered by the code is the class (except for the word 'kingdom' mentioned once in Rule 8).
2. The Approved Lists of 1980 include two 'divisions': the Firmacutes (sic) and the Gracilicutes; both names were derived from Gibbons and Murray (1978) Proposals concerning the higher taxa of *Bacteria*. *Int. J. Syst. Bacteriol.* 28: 1-6. Note that in the International Code of Nomenclature for algae, fungi, and plants, the term 'division' is equivalent to 'phylum'.
3. The word 'phylum' first occurs in the prokaryotic systematics literature in a paper by Woese et al. (1985) A phylogenetic definition of the major eubacterial taxa, *Syst. Appl. Microbiol.* 6: 143-151. Ten groupings were proposed that 'are appropriately termed eubacterial Phyla or Divisions'.
4. Since then the term 'phylum' has become extensively used and more phylum-level taxa have been proposed. Currently, LPSN lists 39 phylum-level taxa with cultivated representatives (<https://www.bacterio.net/domain>). However, phylum names cannot be validly published as long as the rank of phylum is not included in the rules of the ICNP.
5. The Judicial Commission of the ICSB at its meetings in Sydney in 1999 discussed the issue of taxa of higher rank and felt that discussion on this subject must be postponed until an ad hoc committee on this matter made its report. The establishment of an ad hoc committee to discuss naming of higher taxa (above class) was proposed at the meeting of the ICSP in Paris in 2002. Formation of an ad hoc committee on higher taxa was discussed again in San Francisco in 2005, but the proposed committee has never been convened.
6. Proposals to include the rank of phylum in the ICNP were published in the IJSEM in 2015 and 2018 but were not yet discussed by the ICNP:

Oren, da Costa, Garrity, Rainey, Rosselló-Móra, Schink, Sutcliffe, Trujillo and Whitman (2015) Proposal to include the rank of phylum in the International

Code of Nomenclature of Prokaryotes. *Int. J. Syst. Evol. Microbiol.* 65: 4284-4287.

Whitman, Oren, Chuvochina, da Costa, Garrity, Rainey, Rossello-Mora, Schink, Sutcliffe, Trujillo, Ventura (2018) Proposal of the suffix *-ota* to denote phyla. Addendum to 'Proposal to include the rank of phylum in the International Code of Nomenclature of Prokaryotes. *Int. J. Syst. Evol. Microbiol.* 68: 967-969.

The 2018 paper is an addendum to the 2015 proposal. The earlier proposal suggested the ending *-aeota* for phylum-level taxa, whilst the 2018 proposal changed this to the simpler and easier to pronounce *-ota*, an ending that is already widely used for both older and recently proposed phyla names.

7. The updated proposal, open for discussion until the end of January 2021 and voting by the ICSP in February 2021, is the emendation of Rules 5b, 8, 15, and 22 of the ICNP as follows (new additions are highlighted yellow):

**Rule 5b:**

'The taxonomic categories above and including species which are covered by these Rules are given below in ascending taxonomic rank. ... The Latin equivalents are given in parentheses.'

Species (Species)

...

Genus (Genus)

...

Family (Familia)

...

Order (Ordo)

...

Class (Classis)

**Phylum (Phylum)**

**Rule 8:**

The name of each taxon (covered by the Code) above the rank of order is a Latin or latinized word. The name of a class is in the neuter gender, the plural number

and written with an initial capital letter. The name is formed by the addition of the suffix *-ia* to the stem of the name of the type genus of the type order of the class. ... The name of a phylum is in the neuter gender, the plural number and written with an initial capital letter. The name is formed by the addition of the suffix *-ota* to the stem of the name of one of the contained classes.

**Table 2 – Taxonomic categories (belonging to Rule15):**

Taxonomic category	Type
....	
Class	One of the contained orders
Phylum	One of the contained classes

**Rule 22:**

The type of a phylum is one of the contained classes. If there is only one class, this becomes the type. If there are two or more classes the type shall be designated by the author at the time of the proposal of the name, although authors are encouraged to respect priority by considering which class was described first. The type of a class or subclass is one of the contained orders ...

8. The proposal by Whitman et al. 2018 gives a list of names of phyla to be considered for validation after approval of the proposal to include the rank of phylum in the ICNP. A few classes must be renamed as well. See further:

Oren, Parte, Garrity (2016) Implementation of Rule 8 of the International Code of Nomenclature of Prokaryotes for the renaming of classes. Request for an Opinion. *Int. J. Syst. Evol. Microbiol.* 66: 4296-4298.

Abstract:

The new version of Rule 8 of the International Code of Nomenclature of Prokaryotes as approved in Istanbul in 2008 has the clear advantage of establishing a uniform way to name classes of prokaryotes, similar to the way other higher taxa are named. However, retroactive implementation of the modified Rule is problematic as it destabilizes the nomenclature and requires the replacement of a large number of names of classes that have been validly published, which would be in violation of Principle 1 of the Code. Therefore, we call upon the International Committee on Systematics of Prokaryotes and its Judicial Commission to reconsider the retroactivity of Rule 8.

Tindall (2016) The undesirable retroactive changes to Rule 8 of the International Code of Nomenclature of Prokaryotes. *Int. J. Syst. Evol. Microbiol.* 66: 4895-4896.

Abstract:

Changes have been made to Rule 8 of the International Code of Nomenclature of Prokaryotes that caters for the names and nomenclatural types of classes and subclasses. The changes are retroactive because they are not specifically restricted in time. Consequently, that influences names of classes and subclasses and their

These proposals to rename classes have no direct impact on the proposal to include the rank of phylum in the ICNP. They can be discussed later, when in the future a proposed comprehensive revision of the code will be submitted by the ICNP editorial team for open discussion, followed by a vote by the ICSP.

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