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DRAFT PROPOSAL FOR EMENDATION OF THE
INTERNATIONAL CODE OF NOMENCLATURE
OF THE BACTERIA AND VIRUSES

Preliminary Statement

Editorial Board*

The formulation of a suitable proposal for emendation of the International Code of Nomenclature of the Bacteria and Viruses which would include provision for additional (optional) infrageneric ranks of taxa in addition to subgenus has been asked. Some authors in revising the classification of certain genera of bacteria which include many species have recognized taxa intermediate between subgenus and species. In most cases they have used the names Section, Subsection, Series and Subseries for these categories as listed in the International Code of Botanical Nomenclature. Should specific provision be made for recognition in the Bacteriological Code of additional taxa between genus and species? The following statement reviews the status of infrageneric taxa in the three biological codes of nomenclature, and formulates a draft proposal for emendation of the bacteriological code. After consideration of comments and suggestions received, a proposal will be drafted for consideration by the Judicial Commission. If approved, it will then be submitted to the members of the International Committee on Bacteriological Nomenclature for action.

Nature of Proposal. It is proposed that the International Code of Nomenclature of the Bacteria and Viruses be amended by the recognition of four optional ranks of taxa between subgenus and species. A rewording of Principle 7, Rules 5, 9a, 9c and of Recommendation 13 to include 4 in-

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frasubgeneric ranks of taxa, section, subsection, series and subseries is suggested.

The number of described and named species in certain genera of bacteria is large. One hundred forty-nine named species of the genus Streptomyces are included in Bergey's Manual of Determinative Bacteriology (7th. ed.). The number of species named in the extensive literature is several times as large. Bergey's Manual also describes and names 149 species of Pseudomonas, 60 species of Xanthomonas, and 93 species of Clostridium. Some of the genera as treated in Krassilnikov's Manual are also large.

Infrageneric and Intrasubgeneric Taxa in Biological Nomenclature

The codes of nomenclature of all three of the biological disciplines, bacteriology, botany, and zoology, provide for the "subgenus" as the primary infrageneric taxon. The Botanical Code is the only one which provides for infrasubgeneric taxa.

Bacteriology. The Bacteriological Code recognizes the subgenus as the single infrageneric taxon. The subgenus and genus, as in zoology, are regarded as coordinate nomenclaturally. It is proposed that four infrasubgeneric ranks of taxa be recognized, but not coordinate nomenclaturally with genus and subgenus.

Zoology. The Bradley draft of the Zoological Code, like the Bacteriological Code, recognizes the rank subgenus as the designation of the single infrageneric taxon. However, provision is made for the recognition of names of those of subgenera even though not labeled as such. The statement (Art. 14, Sect. 3) reads:

A name that would qualify as an available generic name, were it so proposed, shall have the nomenclatural status of a subgeneric name when applied to a group of species within a given genus, even though the group to which it was applied was expressly designated by an expression such as 'section,' 'division,' 'group,' or the equivalent.

The accompanying Explanation states:

While divisions of genera are all to be treated nomenclaturally as though they were subgenera, that does not imply that they may not be differentiated taxonomically.

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In other words, they may be treated as different grades of subgenera.

It seems that the names of all "grades of subgenera" are to be regarded as nomenclaturally coordinate, and that the names of all genera and of subgenera of every grade are subject to the laws of homonymy.

Botany in its 1956 Code recognizes five infrageneric ranks of taxa named in descending sequence, subgenus, section, subsection, series, and subseries. Any one of the primary subdivisions, subgenus, section, or series, may be used in a genus independently, but use of subsection or subseries apparently implies the simultaneous recognition of section and series respectively. The name of each of these infrageneric taxa (Art. 21, p. 22) "is a combination of a generic name and a subdivisional epithet connected by a term (subgenus, section, series, etc.) denoting its rank." The following examples are given: Banisteria subg. Hemiramma; Ricinocarpus sect. Anomodiscus; Sapium subsect. Patentinervia; Euphorbia sect. Tithymalus subsect. Tenellae.

In botany the name of a subdivision of a genus must at least be a binary combination, the generic name followed by a single epithet, in some cases by two epithets; conceivably the name of a subseries in a genus must be written with five epithets following the generic name. In practice such multiverbal combinations apparently do not occur. The Botanical Code further states: "The same epithet may be used for subdivisions of different genera, but two subdivisions of the same genus, even if they are of different rank, cannot bear the same epithet unless they are based on the same type." In other words, all the names of the infrageneric taxa of a genus are nomenclaturally coordinate from the standpoint of homonymy, but do not compete with the subdivisional epithets within other genera, nor with the names of taxa of other ranks.

The subgeneric or sectional epithet in botany is usually a substantive resembling the name of a genus or repeating the name of the genus itself. "It is further recommended that for subsections, series, and subseries the epithet is preferably a plural adjective agreeing in gender with the generic name and written with a capital letter." At first sight the recommendation that an epithet be a plural adjective which agrees in gender but not in number with the generic name with which it constitutes a binary combination seems to be advocating grammatical inconsistency. One is

reminded that an adjective used as a specific epithet must agree in both gender and number with the name of the genus. Why this apparent discrepancy? This usage has long been recognized in botany. An apparent explanation of the apparent anomaly is to be found in the use of plural adjectives as nouns in the naming of taxa of many suprageneric ranks such as the family. For example, there exist other genera of plants related to the genus Rosa, they were grouped together as Plantae rosaceae, the family of rose-like plants. The plural adjectival epithet by ellipsis became the name of the family. Similarly with the genus it may be wise to recognize certain groups of species. Within the genus Rosa there may be several species that form a natural group having certain characters in common with Rosa setosa, there is a group of "setose" roses, in a series that might be called Rosae setosae. Here the plural epithet setosae may emerge as the series epithet Setosae. Generic names in botany were often used in the plural in this way. Perhaps a clearer statement for the Code would be to say that the epithet of a subsection, a series, or a subseries is preferably a plural adjective agreeing in gender and number with the plural form of the generic name.

In bacteriology there are authors who have recognized that the inclusion in botany of four more ranks of infragenetic taxa than are authorized specifically in the Bacteriological Code has some advantages when applied to the ordering of the taxonomy of certain bacterial genera. Such authors have used in consequence some of the provisions of the Botanical Code with a degree of satisfaction. The Bacteriological Code contains no prohibition, but instead inferential encouragement for such additional ranks of taxa when needed.

Summary.

1. The recognition of additional ranks of taxa between genus and species has been urged as advantageous in the systematic treatment of the species in certain genera of bacteria.
2. The Bacteriological Code, like the Zoological Code and unlike the Botanical Code, recognizes the name of a subgenus as a single word (a noun), coordinate from the standpoints of priority and homonymy with generic names. The Botanical Code defines the subgenus as

a binary combination, consisting of the generic name followed by a subgeneric epithet. The epithet is not the name of the subgenus. A subgeneric epithet has no status in priority or homonymy outside the genus it is included.

The rules governing the rank of subgenus in bacteriology have been generally accepted, a change to the botanical concept would require some nomenclatural changes and lead to some confusion. A change from the present concept and definition is probably undesirable.

3. Additional ranks of taxa below the genus in bacteriology, if made, would seem logically to be infrasubgeneric, to be placed between subgenus and species.
4. Nomenclaturally it may be desirable to include the ranks of section, subsection, series and subseries as infrasubgeneric taxa in the Bacteriological Code.
5. The Botanical Code requires that the name of an infrasubgeneric taxon be a binary, ternary or other combination of which the first term is the name of the genus and the last the sectional, subsectional, series or subseries epithet. Use of this concept of the name of a infrasubgeneric taxon it is believed would be confusing and cumbersome if applied in bacteriology.
6. It is proposed the bacteriological and zoological precedent recognizing a single word as the name of an infrasubgeneric taxon in bacteriology be continued. The method of forming epithets of infrasubgeneric taxa as given in the Botanical Code should prove acceptable for formation of the names of infrasubgeneric taxa in bacteriology.
7. As in the provisions of the Botanical Code, the rules governing priority and homonymy apply to the names of taxa of infrasubgeneric rank within a genus, they do not apply to use of the same names in different genera.

Draft Proposal of the Amendment

- A. (1). Emend Principle 7 (Page 13, 1958 ed. paragraph three, to read as follows:
- "In some genera the infrasubgeneric taxa section (sectio) and series (series) are recognized.

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In many species, subspecies or varieties are distinguished; in some cases subdivisions of a species such as strains, groups, serotypes, variants, phases, and others may be recognized."

- (2). In the fourth paragraph of Principle 7 delete "etc." at the end and add "subsection, a rank between section and series, and subseries, a rank between series and species."

- (3). The draft paragraph as amended will read:

"(c) If a greater number of intermediate categories (ranks) is required, the terms for these subdivisions are made by adding the prefix 'sub-' to the terms denoting the ranks. Thus subfamily denotes a rank between family and tribe, subtribe a rank between tribe and genus, subsection a rank between section and series, and subseries a rank between series and species."

- B. Emend Rule 5 (Chapter 3, Sect. 1, p. 26) as follows:

Prefix the following title to Rule 5 and revise as follows.

Rule 5. Names of genera and of infrageneric taxa.

Rule 5a. Names of genera and subgenera.

1. Paragraph present 5a with no change.
2. Paragraph present 5b with no change.
3. Paragraph present 5c with no change.

Rule 5b. Names of infrasubgeneric taxa; section, subsection, series and subseries.

1. The name of a section is a substantive or an adjective used as a substantive resembling the name of a genus or subgenus.
2. The name of a subsection, series or subseries is preferably a plural adjective used as a substantive or a substantive, spelled with an initial capital letter. A name having the form of a plural adjective agrees in gender and number with the plural of the name of the genus.

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3. The same names of section, subsections, series, and subseries may be used for infrasubgeneric subdivisions in different genera.
4. The same name for two infrasubgeneric subdivisions in the same genus may not be used, even if they are of different ranks, unless they are based upon the same type.
5. An infrasubgeneric name is not from a nomenclatural standpoint coordinate with names of genera and subgenera. It has no status in priority or homonymy outside the genus in which it is included.

C. Emend Rule 9a (Sect. 2, p. 53) as follows: In the second sentence, revise the phrase "that of a genus or a subgenus is a species" to read, "that of a genus, a subgenus, or an infrasubgeneric taxon (of the rank of section, subsection, series, or subseries) is a species." The revised sentence reads:

"The nomenclatural type of a class or subclass is an order, that of an order or suborder is a family, that of a family, subfamily, tribe, or subtribe is a genus, that of a genus, subgenus, or an infrasubgeneric taxon (of the rank of section, subsection, series, or subseries) is a species."

D. Emend Rule 9c (Sect. 2, p. 54) as follows: emend the first line to read as follows:

Rule 9c. Designation of the nomenclatural type of a genus or subgenus and of an infrasubgeneric taxon of the rank of section, subsection, series or subseries.

Add a paragraph (4) to Rule 9c to read:

- (4). The nomenclatural type of a section, subsection, series, or subseries shall be a species and its selection shall be governed by the rules governing the selection of type species for genera and subgenera as outlined in Rule 9c (1), (2), and (3).

E. Emend Rule 13 to read as follows (Sect. 3, p. 70):

Rule 13a. The name of a genus or of a subgenus is not validly published unless it is accompanied

- (1). by a description of the genus or subgenus, or by citation of a previously and effectively published description of the genus or subgenus, or by citation of a previously and effectively published description of the genus as a subgenus or of the subgenus as a genus, or in the case of a monotypic new genus based on a new species, by a combined generic and specific description.
- (2). and by a description of one or more species or by citation of a previously and effectively published description of one or more species included in the genus.

Rule 13b. The name of an infrasubgeneric taxon (section, subsection, series, subseries) is not validly published unless it is accompanied

- (1). by a description of the taxon or by a citation of a previously and effectively published description of the taxon, and
- (2). by the description of one or more included species or by citation of a previously and effectively published description of one or more species included in the taxon.

F. Emend Recommendation 6a by adding at the end, the following sentence:

"When it is desired to indicate the name of a section, subsection, series, or subseries in connection with the name of a species, the name of the rank of the infrasubgeneric name followed by the name of the taxon may be placed in parentheses between the two."