

Current text	Proposed new text	Comments
APPENDIX 10. INFRASUBSPECIFIC SUBDIVISIONS	APPENDIX 10. INFRASUBSPECIFIC SUBDIVISIONS	
The designations of these taxa are not covered by the Rules of this Code, but this Appendix is included to encourage conformity and to clarify the application of these designations (see Rule 14a, b).	The designations of these taxa are not covered by the Rules of this Code, but this Appendix is included to encourage conformity and to clarify the application of these designations (see Rule 14a, b).	
A. Definitions	A. Definitions	
<p>The term infrasubspecific subdivision (or division) has been used in two ways to denote both terms and taxa. It is preferable to distinguish them as given below.</p> <p>Infrasubspecific “subdivision” has been used rather than “division” to avoid any confusion with the taxonomic category “division” (<i>divisio</i>).</p> <p><i>Note.</i> Infrasubspecific subdivisions are not arranged in any order of rank, and may overlap one another.</p> <p>(1) <i>Infrasubspecific taxa.</i> An infrasubspecific taxon is one strain or a set of strains showing the same or similar properties, and treated as a taxonomic group.</p> <p>Example: <i>Staphylococcus aureus</i> phagovar 81.</p> <p>The sets of properties used may be of a similar kind but are not necessarily the same.</p>	<p>The term infrasubspecific subdivision (or division) has been used in two ways to denote both terms and taxa. It is preferable to distinguish them as given below.</p> <p>Infrasubspecific “subdivision” has been used rather than “division” to avoid any confusion with the taxonomic category “division” (<i>divisio</i>) used in the botanical and the zoological nomenclature.</p> <p><i>Note.</i> Infrasubspecific subdivisions are not arranged in any order of rank, and may overlap one another.</p> <p>(1) <i>Infrasubspecific taxa.</i> An infrasubspecific taxon is one strain or a set of strains showing the same or similar properties, and treated as a taxonomic group.</p> <p>Example: <i>Staphylococcus aureus</i> phagovar 81.</p> <p>The sets of properties used may be of a similar kind but are not necessarily the same.</p>	

<p>Example: The susceptibility to a different phage may be used to define another phagovar of <i>Staphylococcus aureus</i>, e.g., phagovar 42D.</p> <p>Infrasubspecific taxa based on different sets of properties may overlap; e.g., one serovar may contain strains belonging to different phagovars.</p> <p>Example: <i>Salmonella typhi</i> serovars, phagovars, and biovars.</p> <p>(2) <i>Infrasubspecific terms</i>. An infrasubspecific term is used to refer to the kinds of taxa below subspecies.</p> <p>Examples: serovar, chemovar, <i>forma specialis</i>.</p> <p>If a species has not been divided into subspecies, the infrasubspecific terms may be applied to other subdivisions within that species. The subdivisions so named would still be infrasubspecific subdivisions for nomenclatural purposes until such time as they may be raised to subspecific or specific rank.</p> <p>Example: Serovars of <i>Erysipelothrix rhusiopathiae</i>.</p> <p>(3) <i>Use of other terms</i>. Infrasubspecific form has been used to refer to a bacterial strain, but this use should be avoided.</p> <p>A culture of bacteria is a population of bacterial cells in a given place at a given time, e.g., in this test tube or on that</p>	<p>Example: The susceptibility to a different phage may be used to define another phagovar of <i>Staphylococcus aureus</i>, e.g., phagovar 42D.</p> <p>Infrasubspecific taxa based on different sets of properties may overlap; e.g., one serovar may contain strains belonging to different phagovars.</p> <p>Example: <i>Salmonella typhi</i> serovars, phagovars, and biovars.</p> <p>(2) <i>Infrasubspecific terms</i>. An infrasubspecific term is used to refer to the kinds of taxa below subspecies.</p> <p>Examples: serovar, chemovar, <i>forma specialis</i>.</p> <p>If a species has not been divided into subspecies, the infrasubspecific terms may be applied to other subdivisions within that species. The subdivisions so named would still be infrasubspecific subdivisions for nomenclatural purposes until they may be raised to subspecific or specific rank.</p> <p>Example: Serovars of <i>Erysipelothrix rhusiopathiae</i>.</p> <p>(3) <i>Use of other terms</i>. Infrasubspecific form has been used to refer to a bacterial strain, although this use should be avoided.</p> <p>A culture of prokaryotes is a population of bacterial cells in a given place at a given time, e.g., in this test tube or on</p>	
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<p>agar plate. It may have a longer duration, e.g., desiccated cultures.</p> <p>A clone is a population of bacterial cells derived from a single parent cell.</p> <p>A strain is made up of the descendants of a single isolation in pure culture. A strain is usually made up of a succession of cultures and is often derived from a single colony. The number of bacteria which gave rise to the original colony is often unknown. Most bacterial strains are not known to be clones.</p> <p>Individual is a term with little meaning in bacteriology and has been applied to a single bacterial cell or to a bacterial strain; therefore, it is best to avoid the use of this term.</p>	<p>that agar plate. It may have a long duration, e.g., desiccated cultures.</p> <p>A clone is a population of prokaryotic cells derived from a single parent cell.</p> <p>A strain is made up of the descendants of a single isolation in pure culture. A strain is usually made up of a succession of cultures and is often derived from a single colony. The number of prokaryotes which gave rise to the original colony is often unknown. Most prokaryotic strains are not known to be clones.</p> <p>Individual is a term with little meaning in bacteriology although it has been applied to a single prokaryotic cell or to a bacterial strain; it is best to avoid the use of this term.</p>	
<p>B. Intrasubspecific Terms</p>	<p>B. Intrasubspecific Terms</p>	
<p>Table 1 contains some of the terms which are commonly used, and the preferred name appears in the first column. The introduction of the suffix “-var” or “-form” to replace “-type” is recommended to avoid confusion with the strict use of the term “type” to mean nomenclatural type (see Rule 15).</p> <p>The term “type” in bacteriology should be used strictly for a nomenclatural type (Principle 5 and Chapter 3, Section 4). It should not be used to designate a division of a species nor to designate taxa based on antigenic characters.</p> <p>The term “group” is informal and has no nomenclatural standing. It may prove useful to designate informally a set</p>	<p>Table 1 contains some of the terms which are commonly used, and the preferred name appears in the first column. The introduction of the suffix “-var” or “-form” to replace “-type” is recommended to avoid confusion with the strict use of the term “type” to mean nomenclatural type (see Rule 15).</p> <p>The term “type” in prokaryotic biology (e.g., phenotype, genotype, serotype, etc.) should not be confused with the strictly nomenclatural use of the term, type (Principle 5 and Chapter 3, Section 4).</p> <p>The term “group” is informal and has no nomenclatural standing. It may prove useful to designate informally a set</p>	<p>About the term “type”. One of the members of the Editorial Board commented: This recommendation has implications for traditional use of sub-specific delineations, e.g., phenotype, genotype, serotype, PFGE-type, etc., and for particular</p>

<p>of organisms having certain characteristics in common, provided that it is used with care and exact definition to avoid ambiguity. It should not be used to avoid the use of the correct name of a taxon such as genus or species. However, it may be useful when the bacteriologist does not wish to give a formal name to a set of bacteria until further studies have been made but wishes to publish his results and seek the opinion of others.</p> <p>Example: "IID group," later named <i>Cardiobacterium hominis</i>.</p>	<p>of organisms having certain characteristics in common, provided that it is used with care and exact definition to avoid ambiguity. It should not be used to avoid the use of the correct name of a taxon such as genus or species. However, it may be useful when the bacteriologist does not wish to give a formal name to a set of prokaryotes until further studies have been made but wishes to publish his results and seek the opinion of others.</p> <p>Example: "IID group," later named <i>Cardiobacterium hominis</i>.</p>	<p>methods which are in common use, e.g., phenotyping, genotyping, serotyping, PFGE-typing, etc. These terms are so commonly used, particularly in clinical microbiology, that this recommendation becomes impractical and will be ignored. This recommendation was included in the 1976 and 1990 revisions (I did not check all earlier versions). In the 1948 version – Intl Bacteriological Code of Nomenclature, Buchanan et al., refer to, "... in some cases, subdivisions of a species such as ... serotypes ..., and others may be recognized." In (2), pg. 293, Buchanan et al., refer to the use of 'type' as a term frequently used to designate a subdivision of a species, etc. They recommend that the terms 'serotype', etc., may (should?) be substituted for 'type' or, e.g., in serology, "... subdivisions within the group should be designated as types and distinguished by Arabic numerals (e.g., ... Group A, Type I ...)", when used as a designation of a subdivision of a species. They do not recommend that the term, 'type' be reserved only for the</p>
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		<p>nomenclatural use – that must have come later. I wonder if this was added at a time when analyses of sub-specific delineations were not as common as they are today. In the past, there has never been confusion between, e.g., serotypes and nomenclatural types. I propose that this paragraph be reworded to point out that the term ‘type in bacteriology should not be confused with the term, as it is used in nomenclature.</p>
TABLE 1	TABLE 1	<p>The Table is given below. The Editorial Board added genomovar / genoovar, a term in use since 1990. https://www.microbiologyresearch.org/content/journal/ijsem/10.1099/00207713-45-3-604</p>
C. Nomenclature of Intraspecific Taxa	C. Nomenclature of Intraspecific Taxa	
<p>An intraspecific taxon is designated or cited by the name of the species followed by the intraspecific term used to designate this intraspecific subdivision followed by the intraspecific designation.</p> <p>Example: <i>Staphylococcus aureus</i> phagovar 81.</p>	<p>An intraspecific taxon is designated or cited by the name of the species followed by the intraspecific term used to designate this intraspecific subdivision followed by the intraspecific designation.</p> <p>Example: <i>Staphylococcus aureus</i> phagovar 81.</p>	

Reference strains of infrasubspecific taxa may be designated. There are many ways that infrasubspecific taxa may be designated; among these are the following: latinized words, e.g., <i>cerealis</i> in <i>Xanthomonas translucens</i> f.sp. <i>cerealis</i> ; vernacular names or words, e.g., rough phase; numbers, letters, or formulae, e.g., phagovar 42D in <i>Staphylococcus aureus</i> phagovar 42D	Reference strains of infrasubspecific taxa may be designated. There are many ways that infrasubspecific taxa may be designated; among these are the following: latinized words, e.g., <i>cerealis</i> in <i>Xanthomonas translucens</i> f.sp. <i>cerealis</i> ; vernacular names or words, e.g., rough phase; numbers, letters, or formulae, e.g., phagovar 42D in <i>Staphylococcus aureus</i> phagovar 42D	
D. Nomenclature of Strains	D. Nomenclature of Strains	
A strain may be designated in any manner, e.g., by the name of an individual, by a locality, or by a number.	A strain may be designated in any manner, e.g., by the name of an individual, by a locality, or by a number. Strain designations (e.g., strain collection accession numbers) should be preserved to ensure the 'chain of custody' of prokaryotes presumed to be the same but that may demonstrate different features.	.

Table 1. Infrasubspecific terms

Preferred name	Synonym(s)	Notes
Biovar	Biotype, physiological type	Biochemical or physiological properties.
Chemoform	Chemotype	Chemical constitution.
Chemovar		Production or amount of production of a particular chemical.
Cultivar		A cultivated strain with particular properties.
<i>forma specialis</i> (abbreviation, f.sp.)	Special form	A parasitic, symbiotic, or commensal microorganism distinguished primarily by adaptation to a particular host or habitat. Named preferably by the scientific name of the host, in the genitive.

Genomovar	Genovar, genomic group	Used to designate distinct intraspecific groups based on genomic comparisons, that cannot be phenotypically distinguished.
Morphovar	Morphotype	Morphological characteristics.
Pathovar	Pathotype	Disease responses in one or more hosts. For recommendations on designating pathovars and use of designations when reviving names, see Dye <i>et al.</i> (1980) in Appendix 3.
Phagovar	Phagotype, lysotype	Reactions to bacteriophage.
Phase		Restricted to well-defined stages of naturally occurring alternating variations.
Serovar	Serotype	Antigenic characteristics.
State		Colonial variants, e.g., rough, smooth, mucoid (may be defined antigenically).