

Current text	Proposed new text	Comments	References
<i>Type of a Species or Subspecies</i>	<i>Type of a Species or Subspecies</i>		
<p>Rule 18a Whenever possible, the type of a species or subspecies is a designated strain. The type strain is made up of living cultures of an organism, which are descended from a strain designated as the nomenclatural type. The strain should have been maintained in pure culture and should agree closely to its characters with those in the original description (see Chapter 4C). The type strain may be designated in various ways (see Rules 18b, 18c, and 18d). (1) Until 31 December 2000, for a species (or subspecies) which has not so far been maintained in laboratory cultures or for which a type does not exist, a description, preserved specimen, or illustration (see also Rule 18f) may serve as the type.</p> <p>Example: Non-cultivated, <i>Oscillospira guilliermondii</i> Chatton and Perard 1913. (2) As from 1 January 2001, a description, preserved (non-viable) specimen, or illustration may not serve as the type</p>	<p>Rule 18a Whenever possible, the type of a species or subspecies is a designated strain. The type strain is made up of living cultures of an organism, which are descended from a strain designated as the nomenclatural type. The strain should have been maintained in pure culture and should agree closely to its characters with those in the original description (see Chapter 4C). The type strain may be designated in various ways (see Rules 18b, 18c, and 18d). (1) Until 31 December 2000, where a type strain has not so far been maintained in laboratory cultures or for which a type strain does not exist, a description, preserved specimen, or illustration (see also Rule 18f) may be designated as the type.</p> <p>Example: Non-cultivated, <i>Oscillospira guilliermondii</i> Chatton and Perard 1913. (2) As from 1 January 2001, no further descriptions, preserved (non-viable) specimens, or illustrations may be designated as the type. This does not</p>	<p>Text clarifications prepared by the Editorial Board</p> <p>The Editorial Board exchanged correspondence about the terms ‘Whenever possible’ and ‘agree closely’. ‘Whenever possible’ could be replaced by “As of 1 January 2001,” (as in Rule 30.3).</p>	<p>Tindall BJ. What does Rule 18c of the International Code of Nomenclature of Bacteria really say? <i>Int J Syst Evol Microbiol</i> 2016;66:3622–3624.</p> <p>Tindall BJ. Clarifying the definition and role of effective publication in the International Code of Nomenclature of Prokaryotes with proposals to make changes. <i>Int J Syst Evol Microbiol.</i> 2019;69:2602-2605.</p>

	<p>affect nomenclatural types designated under Rule 18a (1) until 31 December 2000.</p> <p>3. For species (or subspecies) of <i>Cyanobacteria</i> described under the provisions of the International Code of Nomenclature for algae, fungi, and plants, the type designated under that Code is also recognized as the type under the International Code of Nomenclature of Prokaryotes. In cases of homonymy, wherein the name of a cyanobacterial taxon was published under both codes, the oldest name has priority.</p> <p>Example: <i>Prochlorococcus</i> Chisholm et al. 1992 and not <i>Prochlorococcus</i> Chisholm et al. 2001.</p>		
<p>Rule 18b Designation by original author</p> <p>If the author in the effective publication of the name of a species or subspecies definitely designated a type strain, then this strain shall be accepted as the type strain and may be referred to as the holotype.</p>	<p>Rule 18b Designation by original author(s)</p> <p>If the author(s) of the name of a species or subspecies unambiguously designated a type strain in the effective publication, then this strain shall be accepted as the type strain and may be referred to as the holotype.</p>		<p>Tindall BJ. Clarifying the definition and role of effective publication in the International Code of Nomenclature of Prokaryotes with proposals to make changes. <i>Int J Syst Evol Microbiol.</i> 2019;69:2602-2605.</p>
<p>Rule 18c Designation as neotype</p>	<p>Rule 18c Designation as neotype</p>		

<p>If a strain on which the original description was based cannot be found, a neotype strain may be proposed. A neotype strain must be proposed (proposed neotype) in the IJSEM, together with citation of the author(s) of the name, a description or reference to an effectively published description, and a record of the permanently established culture collection(s) where the strain is deposited (see also Note 1 to Rule 24a). The author should show that a careful search for the strains used in the original description has been made and that none of them can be found. The author should also demonstrate that the proposed neotype agrees closely with the description given by the original author</p> <p>The neotype becomes established (established neotype) two years after the date of its publication in the IJSEM, provided that there are no objections, which must be referred within the first year of the publication of the neotype to the Judicial Commission for consideration.</p> <p><i>Note.</i> The term “strain” refers to the culture or subcultures of it, described in the original description. This is not</p>	<p>If a strain on which the original description was based cannot be found, a neotype strain may be proposed. A neotype strain must be proposed (proposed neotype) in the IJSEM, together with citation of the author(s) of the name, a description or reference to a description or listing of the properties of the taxon that has appeared in an effectively published description, and a record of the permanently established culture collection(s) where the strain is deposited (see also Note 1 to Rule 24a). The author(s) should show that a careful search for the strains used in the original description has been made and that none can be found. The author(s) should also demonstrate that the proposed neotype agrees closely with the description given by the original author(s).</p> <p>The neotype becomes established (established neotype) two years after the date of its publication in the IJSEM, provided that there are no objections, which must be referred within the first year of the publication of the neotype to the Judicial Commission for consideration.</p> <p><i>Note.</i> The term “strain” refers to the culture or subcultures of it, described in</p>		<p>Tindall BJ. Clarifying the definition and role of effective publication in the International Code of Nomenclature of Prokaryotes with proposals to make changes. <i>Int J Syst Evol Microbiol.</i> 2019;69:2602-2605.</p>
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<p>restricted to the strain bearing the culture collection number mentioned in the valid publication, but refers to any culture knowingly derived from the original strain.</p> <p>Example: Roop et al. [6] proposed a neotype strain (strain VPI S-17=ATCC 35980) for <i>Campylobacter sputorum</i> (Prévot 1940) Véron and Chatelain 1973 (Approved Lists 1980) because the type strain Forsyth ER33 was no longer extant. Any objection has been referred and the neotype strain of <i>Campylobacter sputorum</i> is the strain VPI S-17=ATCC 35980.</p>	<p>the original description. This is not restricted to the strain(s) bearing the culture collection number mentioned in the valid publication, but refers to any culture derived from the original strain(s).</p> <p>Example: Roop <i>et al.</i> [6] proposed a neotype strain (strain VPI S-17 =ATCC 35980) for <i>Campylobacter sputorum</i> (Prévot 1940) Véron and Chatelain 1973 (Approved Lists 1980) because the type strain Forsyth ER33 was no longer extant. Any objection has been referred and the neotype strain of <i>Campylobacter sputorum</i> is the strain VPI S-17=ATCC 35980.</p>	<p>Instead of numbered references, Roop <i>et al.</i> (<i>Int J Syst Bacteriol</i> 1986;36:348) is possible.</p>	
<p>Rule 18d A strain suggested as a neotype but not formally proposed in accordance with the requirements of Rule 18c (suggested neotype) has no standing in nomenclature until formally proposed and established.</p>	<p>Rule 18d A strain suggested as a neotype but not formally proposed in accordance with the requirements of Rule 18c (suggested neotype) may not serve as a neotype until formally proposed and established.</p>		<p>Tindall BJ. An analysis of the term 'standing in nomenclature', as used in the International Code of Nomenclature of Prokaryotes. <i>Int J Syst Evol Microbiol.</i> 69:2166-2168.</p>
<p>Rule 18e If an original strain that should constitute the type of a species is discovered subsequent to the formal proposal or establishment of a neotype for that species, the matter shall be referred immediately to the Judicial Commission.</p>	<p>Rule 18e If an original strain that should constitute the type of a species is discovered subsequent to the formal proposal or establishment of a neotype for that species, the matter shall be referred to the Judicial Commission.</p>		

<p>Rule 18f If a description or illustration constitutes, or a dead preserved specimen has been designated the type of a species (Rule 18a(1)) and later a strain of this species is cultivated, then the type strain may be designated by the person who isolated the strain or by a subsequent author. This type strain shall then replace the description, illustration or preserved specimen as the nomenclatural type. The designation of a type strain in this manner must be published in the IJSEM, the authorship and date of priority of publication being determined by the effective and valid publication of the name by the original authors (Rule 24b).</p>	<p>Rule 18f If a description or illustration constitutes, or a dead preserved specimen has been designated the type of a species (Rule 18a(1)) and later a strain of this species is cultivated, then the type strain may be designated by the person who isolated the strain or by a subsequent author. This type strain shall then replace the description, illustration or preserved specimen as the nomenclatural type. The designation of a type strain in this manner must be published in the IJSEM, the authorship and date of priority of publication being determined by the valid publication of the name by the original author(s) (Rule 24b).</p>		<p>Tindall BJ. Clarifying the definition and role of effective publication in the International Code of Nomenclature of Prokaryotes with proposals to make changes. <i>Int J Syst Evol Microbiol.</i> 2019;69:2602-2605.</p>
<p>Rule 18g Change in characters of type and neotype strains If a type or neotype strain has become unsuitable owing to changes in its characters or for other reasons, then the matter should be referred to the Judicial Commission, which may decide to take action leading to replacement of the strain.</p>	<p>Rule 18g Change in characters of type and neotype strains If a type or neotype strain has become unsuitable, owing to changes in its characters or for other reasons, then the matter should be referred to the Judicial Commission, which may decide to take action leading to replacement of the strain.</p>		
<p>Rule 19 Reference strains A reference strain is a strain that is neither a type nor a neotype strain but a strain used in comparative studies, e.g. taxonomic or serological, or for chemical assay.</p>	<p>Rule 19 Reference strains A reference strain is a strain that is neither a type nor a neotype strain but a strain used in comparative studies, e.g., taxonomic or serological, or for chemical assay.</p>		<p>Tindall BJ. An analysis of the term 'standing in nomenclature', as used in the International Code of Nomenclature of Prokaryotes. <i>Int J Syst Evol</i></p>

<p>A reference strain has no standing in nomenclature, but it may, by subsequent action, be made a neotype.</p>	<p>A reference strain may, by subsequent action, be made a neotype, but otherwise has no formal status under this Code.</p>		<p><i>Microbiol.</i> 2019; 69:2166-2168.</p>
<p>Type of a Genus</p>	<p>Type of a Genus</p>		
<p>Rule 20a The nomenclatural type (see Rule 15) of a genus or subgenus is the type species, that is, the single species or one of the species included when the name was originally validly published. Only species whose names are legitimate may serve as types.</p>	<p>Rule 20a The nomenclatural type (see Rule 15) of a genus is the type species, that is, the single species or one of the species included when the name was originally validly published. Only species whose names are validly published may serve as types.</p>		
<p>Rule 20b Designation by original author If the author of the effective or valid publication of a generic or subgeneric name designated a type species, that species shall be accepted as the type species.</p>	<p>Rule 20b Designation by original author If the author(s) of the effectively or validly published generic name designated a type species, that species shall be accepted as the type species.</p>		<p>Tindall BJ. Clarifying the definition and role of effective publication in the International Code of Nomenclature of Prokaryotes with proposals to make changes. <i>Int J Syst Evol Microbiol.</i> 2019;69:2602-2605.</p>
<p>Rule 20c Genus with only one species If the genus when originally published included only one species, then that species is the type species.</p>	<p>Rule 20c Genus with only one species If the genus, when its name is validly published, included only one species, then that species is the type species irrespective of whether it is designated as the type.</p>	<p>Or: If a genus includes only one species when validly published, that species is the type species.</p>	<p>Tindall BJ. Are Rules 20d and 20e of the International Code of Nomenclature of Prokaryotes superfluous? <i>Int J Syst Evol Microbiol.</i> 2016;66:4907–4909.</p>

			Tindall BJ. Clarifying the definition and role of effective publication in the International Code of Nomenclature of Prokaryotes with proposals to make changes. <i>Int J Syst Evol Microbiol.</i> 2019;69:2602-2605.
Rule 20d Designation by a subsequent author The type species shall be selected from one of the species included when the genus was originally published.		Tindall (2016) argued that Rules 20d and 20e are superfluous, and the Editorial Board agrees.	Tindall BJ. Are Rules 20d and 20e of the International Code of Nomenclature of Prokaryotes superfluous? <i>Int J Syst Evol Microbiol.</i> 2016;66:4907–4909.
Recommendation 20d Authors are recommended to exclude the following species from consideration in selecting the type: (1) Doubtfully identified or inadequately characterized species. Example: <i>Lactobacillus caucasicus</i> Beijerinck 1901 (Opinion 38; Judicial Commission [7]). (2) Species doubtfully referred to the genus. Example: No example yet found.		Tindall (2016) argued that Rules 20d and 20e are superfluous, and the Editorial Board agrees.	Tindall BJ. Are Rules 20d and 20e of the International Code of Nomenclature of Prokaryotes superfluous? <i>Int J Syst Evol Microbiol.</i> 2016;66:4907–4909.

<p>(3) Species which definitely disagree with the generic description. Example: <i>Halococcus litoralis</i> (Poulsen) Schoop 1935.</p> <p>(4) Species mentioned as in any way exceptional, including species which possess characters stated in the generic description as rare or unusual. Example: <i>Pseudomonas mallei</i> (Zopf) Redfearn et al. 1966 (Approved Lists 1980).</p>			
<p>Rule 20e Designation by international agreement</p> <p>(1) If none of the species named by an author in the effective or valid publication of a generic name can be recognized, i.e. if no identifiable type species can be selected in accordance with the Rules, the Judicial Commission may issue an Opinion declaring such generic name to be a rejected name (<i>nomen rejiciendum</i>) and without standing in nomenclature (see Rule 23a, Note 4). Example: Rejection of the generic name <i>Gaffkya</i> Trevisan 1885 (Opinion 39; Judicial Commission [8]).</p> <p>(2) However, a generic name for which no identifiable type species can be selected in accordance with the Rules might have come into use for identifiable species which were subsequently named.</p>		<p>Tindall (2016) argued that Rules 20d and 20e are superfluous, and the Editorial Board agrees.</p>	<p>Tindall BJ. Clarifying the definition and role of effective publication in the International Code of Nomenclature of Prokaryotes with proposals to make changes. <i>Int J Syst Evol Microbiol.</i> 2019;69:2602-2605.</p>

<p>In this case, one of these later species may be selected as the type species and established as such by an Opinion of the Judicial Commission. The generic name is then ascribed to the author of the name of the species selected as the type species.</p> <p>Example: <i>Vibrio</i> Pacini 1854 and its type species <i>Vibrio cholerae</i> Pacini 1854 (Approved Lists 1980) (Opinion 31; Judicial Commission [9]).</p>			
<p>Rule 20f Retention of type species on publication of a new generic name</p> <p>The valid publication of a new generic name as a deliberate substitute for an earlier one does not change the type species of the genus.</p> <p>Example: The deliberate creation of <i>Xanthomonas</i> as a substitute for the name <i>Phytomonas</i> (not available, as it was already in use as the name of a protozoan genus) does not change the type species, which was <i>Phytomonas campestris</i> and which became <i>Xanthomonas campestris</i>.</p>	<p>Rule 20d Retention of type species upon publication of a new generic name</p> <p>The valid publication of a new generic name as a deliberate substitute for an earlier one does not change the type species of the genus.</p> <p>Example: The deliberate creation of <i>Xanthomonas</i> as a substitute for the name <i>Phytomonas</i> (not available, as it was already in use as the name of a protozoan genus) does not change the type species, which was <i>Phytomonas campestris</i> and which became <i>Xanthomonas campestris</i>.</p>		
<p>Type of a Subgenus</p>	<p>Type of a Subgenus</p>	<p>The Editorial Board discussed whether the rank of subgenus could be abolished, in spite of the fact that there are validly published names of subgenera.</p>	
<p>Rule 20g</p>	<p>Rule 20e</p>		

<p>A genus and its type subgenus share the same type species. Example: <i>Moraxella lacunata</i> is the type species of the genus <i>Moraxella</i> and of its type subgenus, <i>Moraxella</i>.</p>	<p>A genus and its type subgenus share the same type species. Example: <i>Moraxella lacunata</i> is the type species of the genus <i>Moraxella</i> and of its type subgenus, <i>Moraxella</i>.</p>		
<p>Type of a Taxon from Genus to Order (Subtribe, Tribe, Subfamily, Family, Suborder, and Order)</p>	<p>Type of a Taxon from Genus to Order (Tribe, Family, Suborder, and Order)</p>	<p>The intention was from [but not including] genus. Genus is covered in Rule 20a. Any suggestions on how to formulate this better?</p>	<p>Oren A. Proposal to modify the Rules of the <i>International Code of Nomenclature of Prokaryotes</i> to abolish the taxonomic categories Subfamily, Subtribe and Kingdom. <i>Int J Syst Evol Microbiol</i> 2019;69:1524–1525.</p>
<p>Rule 21a The nomenclatural type (see Rule 15) of a taxon above genus, up to and including order, is the legitimate name of the included genus on whose name the name of the relevant taxon is based. One taxon of each category must include the type genus. The names of the taxa which include the type genus must be formed by the addition of the appropriate suffix to the stem of the name of the type genus (see Rule 9). Example: Order, <i>Pseudomonadales</i>; suborder, <i>Pseudomonadineae</i>; family, <i>Pseudomonadaceae</i>; tribe, <i>Pseudomonadeae</i>; type genus, <i>Pseudomonas</i>.</p>	<p>Rule 21a The nomenclatural type (see Rule 15) of a taxon above genus, and including order, is the validly published legitimate name of the included genus on which the name of the relevant taxon is based. One taxon of each category must include the type genus. The names of the taxa which include the type genus must be formed by the addition of the appropriate suffix to the stem of the name of the type genus (see Rule 9). Example: Order, <i>Pseudomonadales</i>; suborder, <i>Pseudomonadineae</i>; family, <i>Pseudomonadaceae</i>; tribe, <i>Pseudomonadeae</i>; type genus, <i>Pseudomonas</i>.</p>	<p>“up to and including order” was deleted from the Tindall 2019 proposal, but is presumably needed, as the nomenclatural type of a class remains “one of the contained orders”. However it could be deleted if this is covered by the section title .</p>	

<p>Rule 21b</p> <p>If the name of a family was not made in conformity with Rule 21a but its name has been conserved, then the type genus may be fixed by an Opinion of the Judicial Commission. Example: The genus <i>Escherichia</i> is the type genus of the family <i>Enterobacteriaceae</i> (Opinion 15; Judicial Commission [10]).</p>	<p>Rule 21b</p> <p>The nomenclatural type (see Rule 15) of a taxon covered by this Code (Rule 5b) above genus is the validly published, legitimate name at the rank of genus on whose name the name of the relevant taxon is based. One taxon of each category must include the type genus. The names of the taxa which include the name of the type genus must be formed by the addition of the appropriate suffix to the stem of the name of the type genus (see Rule 9).</p> <p><i>Note:</i> it follows that genus names that either are not validly published or are validly published but are illegitimate may not serve as nomenclatural types.</p> <p>If the name of a family was not made in conformity with Rule 21a but its name has been conserved, then the type genus may be fixed by an Opinion of the Judicial Commission. Example: The genus <i>Escherichia</i> is the type genus of the family <i>Enterobacteriaceae</i> (Opinion 15; Judicial Commission, 1958).</p>	<p>The ambiguously worded proposal by Tindall (2019) for the unification of “Rules 21 and 22” was probably intended as ‘Rules 21a and 21b’. Here is Tindall’s proposed text. It looks problematic as many names of classes are not based on a type genus. Unification of Rules 21a and 21b may be unnecessary.</p> <p>It is unclear from the typesetting in IJSEM if “Note: it follows that genus names that either are not validly published or are validly published but are illegitimate may not serve as nomenclatural types” is proposed as new text for the ICNP or is the start of his explanation (as there are then 3 paragraphs more before the apparent text to rule 21b.</p>	<p>Tindall BJ. Names above the rank of genus; the radical approach. <i>Int J Syst Evol Microbiol</i> 2018;69:1833–1834.</p>
<p>Type of a Taxon Higher than Order</p>	<p>Type of a Taxon Higher than Order</p>		
<p>Rule 22</p>	<p>Rule 22</p> <p>The type of a phylum is one of the contained genera. If there is only one</p>		<p>Oren A, Arahal DR, Rosselló-Móra R, Sutcliffe IC, Moore ERB.</p>

<p>The type (see Rule 15) of a taxon higher than order is one of the contained orders, and if there is only one order this becomes the type. If there are two or more orders the type shall be designated by the author at the time of the proposal of the name.</p> <p>Example: The order <i>Bacillales</i> of the class <i>Firmibacteria</i>, or the order <i>Verrucomicrobiales</i> of the class <i>Verrucomicrobiae</i>.</p> <p>If not designated, the type of a taxon higher than order may be later designated by an Opinion of the Judicial Commission.</p> <p>Example: None of the Opinions so far issued (A–C, 1–96) has dealt with this subject.</p>	<p>genus, this becomes the type. If there are two or more genera, the type shall be designated by the author at the time of the proposal of the phylum name, although authors are encouraged to respect priority by considering which genus was described first. The type of a class or subclass is one of the contained orders.</p> <p>The type of a class or subclass is one of the contained orders. If only one order is validly published, this becomes the type. If two or more orders are validly published, the type shall be designated by the author(s) at the time of the proposal of the name.</p> <p>Example: The order <i>Bacillales</i> of the class <i>Bacilli</i> or the order <i>Verrucomicrobiales</i> of the class <i>Verrucomicrobiae</i>.</p> <p>If not designated, the type of a taxon higher than order may be later designated by an Opinion of the Judicial Commission.</p> <p>Example: None of the Opinions so far issued (A–C, 1–102) has dealt with this subject.</p>		<p>Emendation of Rules 5b, 8, 15, and 22 of the International Code of Nomenclature of Prokaryotes to include the rank of phylum. <i>Int J Syst Evol Microbiol</i> 2021;71:004851</p>
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