On names of genera of prokaryotes that are later homonyms of generic names with standing in the zoological or the botanical nomenclature. Proposal of Neomegalonema gen. nov. and Neomegalonema perideroedes comb. nov. as replacements for the prokaryotic generic name Meganema and the species name Meganema perideroedes

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Abstract

I here present a survey of generic names with standing in the prokaryotic nomenclature that have homonyms with standing under the International Code of Zoological Nomenclature and/or the International Code of Nomenclature for algae, fungi, and plants. I especially discuss such names added after Principle 2 of the Bacteriological Code/Prokaryotic Code was changed in 1999 to make the prokaryote nomenclature not independent of botanical and zoological nomenclature. Cases include the genera Micromonas, Quadrococcus, Yania, Sinococcus, and Meganema. The generic name Meganema was not previously recognized as a homonym of two genera with standing in the zoological nomenclature. Therefore, I here propose renaming Meganema and Meganema perideroedes as Neomegalonema gen. nov. and Neomegalonema perideroedes comb. nov., respectively.

There are a number of generic names of prokaryotes with standing in the nomenclature that have homonyms with standing under the International Code of Zoological Nomenclature and/or the International Code of Nomenclature for algae, fungi, and plants. A not necessarily exhaustive list includes the genera Arachnia, Bacillus, Frankia, Halococcus, Proteus, Johnsonella (also present in zoological nomenclature), Hirschia (also in botanical nomenclature), and Edwardsiella, Jonesia, Kingella, Lawsonia, Micrococcus, and Stella (homonyms both in zoological and botanical nomenclature). All these generic names of prokaryotes predate the year 2000, when the International Code of Nomenclature of Bacteria (the Bacteriological Code) was still largely independent of the Zoological Code and of the Botanical Code. A more recent addition to the list of homonyms is Yangia (Alphaproteobacteria), a name validly published in March 2006 [1], 1 month before the same generic name was used for a Cretaceous angiosperm [2]. But prior to 2000, a bacterial (prokaryotic) name was illegitimate if it is a later (junior) homonym of a name of a taxon of … fungi, algae, protozoa or viruses based on Rule 51b(4) as found in the 1990 revision of the Code [3], a Rule retained in the 2008 revision of the Code [4].

In 1999, Tindall [5] proposed to change Principle 2 of the Bacteriological Code (now the International Code of Nomenclature of Prokaryotes; the Prokaryotic Code [4]) so that the Code should no longer operate independently of the zoological and the botanical Codes to prevent the creation of further homonyms between prokaryote taxa, botanical taxa and zoological taxa. This proposal was adopted by the International Committee on Systematic Bacteriology – ICSB, now the International Committee on Systematics of Prokaryotes – ICSP, at its meetings in Sydney in 1999 [6, 7]. Principle 2 of the Prokaryotic Code therefore currently reads: ‘The nomenclature of prokaryotes is not independent of botanical and zoological nomenclature. When naming new taxa in the rank of genus or higher, due consideration is to be given to avoiding names which are regulated by the International Code of Zoological Nomenclature and the International Code of Nomenclature for algae, fungi and plants’. For all practical purposes, the new Principle 2 applies from January 2001. The 1990 revision of the Bacteriological Code [3] already discouraged the formation of homonyms under the botanical and the zoological codes in Recommendation 10a(3): ‘Avoid introducing into bacteriology as generic names such names as are in use in botany or zoology, in particular well-known names’. This recommendation was included unchanged in the 2008 revision of the Prokaryotic Code [4]. Another relevant statement in the Code, present both in the 1990 and in the

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2008 revisions to discourage the formation of homonyms under the botanical and the zoological codes, is found in Recommendation 10a(3): ‘Avoid introducing into bacteriology as generic names such names as are in use in botany or zoology, in particular well-known names’.

Two papers have been published after 2001 to replace prokaryotic generic names that had homonyms earlier published under the botanical Code. The first was the replacement of *Micromonas* Murdoch and Shah 2000 (*Clostridia*) [8, 9] and *Quadrilococcus* Maszenan et al. 2002 (*Betaproteobacteria*) [10] with *Parvimonas* and *Quatrichoniococcus*, respectively [11]. As *Micromonas* and *Quadrilococcus* are genera of algae, these names were illegitimate under the Bacteriological Code based on Rule 51b(4).

The second was a proposal to change the generic names *Yania* Li et al. 2004 (*Actinobacteria*) [12] and *Sinococcus* Li et al. 2006 (*Bacilli*) [13] to *Yanniella* and to *Sinobaca*, respectively [14], as *Yania* was already a genus of Lepidoptera [15] and of *Arachnida* [16], and *Sinococcus* a genus of Homoptera [17]. The renaming of these prokaryote genera in 2008 was a welcome contribution to the reduction of the number of homonyms under the Prokaryotic Code and the Zoological Code. However, I disagree with the statement by Li et al. [14] that the change had to be made because the names were at the time illegitimate. This is based on the following argumentation [18]:

(1) The modified Principle 2 of the Prokaryotic Code (‘The nomenclature of prokaryotes is not independent of botanical and zoological nomenclature. When naming new taxa in the rank of genus or higher, due consideration is to be given to avoiding names which are regulated by the International Code of Zoological Nomenclature and the International Code of Nomenclature for algae, fungi and plants’) is a Principle, not a Rule, and the words ‘due consideration is to be given’ can be interpreted in different ways.

(2) According to General Consideration 6 (1) and 6 (2), ‘The Principles form the basis of the Code, and the Rules and Recommendations are derived from them. The Rules are designed to make effective the Principles…’. But in the current version of the ICNP there is not any Rule which implements the new version of Principle 2 and without a relevant Rule, this Principle would remain ineffective.

(3) Recommendation 10a(3) (‘Avoid introducing into bacteriology as generic names such names as are in use in botany or zoology, in particular well-known names’) was retained in the 2008 revision of the Prokaryotic Code, and according to General Consideration 6 (3), ‘the Recommendations are intended to be guides to desirable practice in the future, but names contrary to a Recommendation cannot be rejected for this reason’. This implies that based on Recommendation 10a(3), newly created prokaryotic genus names with homonymy with botanical and zoological genus names can still be legitimate under the Prokaryotic Code.

(4) The case does not fall under one of the categories given in the (non-exhaustive) list of reasons for which a name may be illegitimate as given in Rule 51b, a list that does include the case of later homonyms of names of taxa of prokaryotes, fungi, algae, protozoa, or viruses.

A proposal is currently pending to solve the current problematic situation by deleting Recommendation 10a(3) and by adding the following sentence to Rule 10a, to be retroactive: ‘As from January 2001, newly proposed generic names must not be later homonyms of names in use in botany or zoology (see Principle 2)’ [18]. In this way Principle 2 can be effectively implemented.

A case, not recognized before, that resembles the case of *Yania* et al. *Sinococcus* is that of the genus *Meganema* (*Alphaproteobacteria*). This genus name, with type species (and thus far single species) *Meganema perideroedes*, was published in the IJSEM in 2006 [19]. The generic name is a homonym of two genera used in the zoological nomenclature, one for a mollusc described in 1868 [20] and one for a coelenterate described in 1939 [21]. Even if according to the current Rules of the Prokaryotic Code the name *Meganema* may not be illegitimate for the reasons outlined above, I here propose a replacement name to reduce the current number of homonyms between prokaryote taxa, botanical taxa and zoological taxa. If in the future the proposal to emend Rule 10a and delete Recommendation 10a [3, 18] will be accepted, a replacement name will be necessary in any case. Based on the updated orthography rules published in 2009 as Appendix 9 of the Prokaryotic Code, section A (1)(a) and A(1)(b) [22], a more correct name would be *Meganema*. But that name is already in use in zoology for a genus of catfish described in 1912 [23]. Therefore, I here propose the names *Neomegalonema* gen. nov. and *Neomegalonema perideroedes* comb. nov. as replacements for the prokaryotic generic name *Meganema* and the species name *Meganema perideroedes* Thomsen, Blackall, Aquino de Muro, Nielsen and Nielsen 2006, respectively.

**DESCRIPTION OF NEOMEGALONEMA GEN. NOV.**

*Neomegalonema* (Ne.o.me.ga.lo.ne.ma’ma. Gr. pref. neo- (from Gr. adj. neos) new; Gr. adj. megas big; Gr. neut. n. nema thread; N.L. neut. n. *Neomegalonema* a new large thread-like micro-organism).

The description of the genus is as given for *Meganema* Thomsen, Blackall, Aquino de Muro, Nielsen and Nielsen 2006 [19].

The type species is *Neomegalonema perideroedes*. 

DESCRIPTION OF NEOMEGALONEMA PERIDEROEDES (THOMSEN, BLACKALL, AQUINO DE MURO, NIELSEN AND NIELSEN 2006) OREN COMB. NOV.

Neomegalonomema perideroeides (peri.de.ro’e.des. N.L. neut. adj. perideroeides necklace-like).

Basonym: Meganema perideroeides (Thomsen, Blackall, Aquino de Muro, Nielsen and Nielsen 2006).

The description of the species is as given for Meganema perideroeides [19]. The type strain is Gr1T (=ATCC BAA-740T=DSM 15528T).

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Conflicts of interest
The author declares that there is no conflicts of interest.

Ethical statement
No experiments with humans or animals were carried out.

References
15. Huang H. Yania gen. nov. and Yania sinica sp. nov. from Sichuan, China (Lepidoptera: Hesperiidae). J Res Lepid 1997;34:147–153.