LETTER TO THE EDITOR

Rhodocista centenaria vs Rhodospirillum centenum: a reply to Gest and Favinger

In an accompanying letter, Gest & Favinger (2001) have documented an interesting case where two different names are applied to the same organism, namely Rhodospirillum centenum and Rhodocista centenaria. The authors also draw our attention to a number of problems which appear to be the source of confusion as to which of the two names should be used. The authors make the valid point that most microbiologists are not familiar with the Bacteriological Code (1990 Revision) (Lapage et al., 1992) and provide an illuminating commentary on the nature of the problems which have arisen. The purpose of the present article is to examine, in a little more depth the problems that Gest and Favinger highlight.

Having provided a brief overview of the interesting properties of the organism which they described as Rhodospirillum centenum (Favinger et al., 1989), the authors raise the point that Kawasaki et al. (1992) indicate in the title of their paper that they were describing Rhodocista centenaria sp. nov. They also draw attention to the fact that these authors were using a strain derived from ATCC 43720 (the type strain), which they deposited in the Institute of Applied Microbiology under a different number. Gest and Favinger ‘considered this to be a violation of acceptable practice’. It should be noted that Kawasaki et al. (1992) make it quite clear in their publication that one of the organisms they were studying was in fact ATCC 43720, and that it was isolated from Thermopolis Hot Springs, Wyoming, USA, by Favinger et al. (1989). The fact that this strain was also deposited in the Institute for Applied Microbiology as IAM 14193 would seem, in the eyes of Gest and Favinger, to highlight some form of ‘unacceptable practice’. In fact many of the major culture collections, worldwide, frequently indulge in the practice of exchanging strains (particularly type strains) to facilitate the distribution of this important biological material and also to secure the same essential biological material at different sites in order to guarantee its safe, secure and long-term availability. Far from being in violation of acceptable practice, culture collection actively co-operate in such transfers.

Gest & Favinger (2001) also bring our attention to the tricky problem of the way in which names enter into use in bacterial taxonomy and how one can determine which of two or more names is the proper one to use. The term ‘effective publication’ is used to denote publication of a name and a description of the taxon in conformity with the Bacteriological Code (1990 Revision) (Lapage et al., 1992), which excludes publication of a name in newspapers, laboratory notes or simply by labelling a culture. The most important date that is attributed to the name of a taxon is the date of valid publication, which, in this case took place via Validation List no. 48. The authors correctly indicate that both the names Rhodospirillum centenum and Rhodocista centenaria were assigned the same priority number, ‘2’, which one may infer means that the request for valid publication of both names was received on the same day. Thus, the proper citation of the names are Rhodocista centenaria Kawasaki et al. 1994 (Kawasaki et al., 1994) and Rhodospirillum centenum Favinger et al. 1994 (Favinger et al., 1994). However, closer examination of the Bacteriological Code (1990 Revision) (Lapage et al., 1992) indicates that names only compete for priority within the same taxon (i.e. with a given position). Thus, had Kawasaki et al. (1992) named their species Rhodospirillum gestii, then it would be difficult to determine which of the two names has priority. However, in the present case we are dealing with differences in taxonomic opinion. If ATCC 43720 (= IAM 14193) is considered to be a member of the genus Rhodospirillum, then it must be called Rhodospirillum centenum Favinger et al. 1994, but should it be placed in another genus, then it must be called Rhodocista centenaria Kawasaki et al. 1994.

One interesting problem arises, and that is the fact that both names are homotypic (objective) synonyms of one another, but neither is the earlier (senior) synonym. The Bacteriological Code governs nomenclature and not the way in which taxonomic disputes are settled (see Tindall, 1999). Despite the fact that Gest and Favinger consider this to be inconsistent with the aims of a fair, appropriate and useful system for nomenclature of bacteria, the Bacteriological Code makes a clear ruling on which name is to be used in which taxon. Since the choice of taxon (which genus) is a taxonomic matter the Code remains fair and impartial, allowing taxonomic battles to be fought without affecting the principles and rules of nomenclature.

In elucidating Principle 1 and Rule 55 of the Bacteriological Code (1990 Revision) (Lapage et al., 1992), the authors draw our attention to important aspects for avoiding the needless creation of names. In further supporting their case for not calling the genus Rhodocista, Gest and Favinger make a connection with the
cyst-forming ability of the organism. However, since
the name Rhodocista is derived from the Greek (rhodos
= red) and Latin (cista = basket), meaning the ‘red
basket’, there should be no confusion, because the
name does not mean the ‘red cyst’. Confusion with the
name ‘Rhodocystis’ can easily be avoided, since
Bergery’s Manual uses it in an historical context, the
name is validly published and has no standing in
nomenclature under the Bacteriological Code. While it
is a pity that this name was not revived instead of
creating a new genus, Rubrivivax for the species
Rubrivivax gelatinosa (‘Rhodocystis gelatinosa’
Molisch, 1907), this is something that we must accept.
Quite clearly the suggestion to change the name of the
genus Rhodomicrobium to Rhodexosporus would be in
violation of Principle 1(1).

In criticizing the title of the paper by Kawasaki et al.
(1992), Gest and Favinger draw a number of con-
clusions which are not correct. Firstly there is no
taxonomic committee which approved valid publica-
tion of the genus name Rhodocista, and secondly the
authors conform to the guidelines in the Bacterio-
logical Code. Although Favinger et al. (1989) described
their new species in 1989, they neglected to submit the
name for valid publication, and as the Bacteriological
Code states, and as pointed out by Kawasaki et al.
(1992), the name Rhodospirillum centenum had no
standing in nomenclature in 1992. Thus the authors
were left with a problem of creating a species name for
an organism for which no other name was recognized
by the Bacteriological Code. The Code clearly advises
authors to indicate new names or new combinations
appropriately. Thus, Kawasaki et al. (1992) were at
liberty to designate their genus Rhodocista as a new
genus (gen. nov.), and in the absence of any other
validly published name for the species they could only
create a new species name Rhodocista centenaria sp.
nov. It should be noted that this is a new species and
not a new combination as listed on Validation List no.
48. Gest & Favinger (2001) also recognize the fact that
the authors could not create a new combination,
because they neglected to validly publish the name
Rhodospirillum centenum. The concept of nomen novum
(nom. nov.), however, is reserved for cases such as the
unification of two species in the same genus, both with
the same specific epithet i.e. in transferring the species
Streptoverticillum album to the genus Streptomyces
the fact that the type species of the genus Streptomyces
is Streptomyces albus must be taken into consideration,
resulting in the creation of a new name Streptomyces
luteosporus (basonym Streptoverticillum album) (Witt

Despite interesting undertones in the article by Gest
and Favinger, Kawasaki et al. (1992) were simply using
terminology recommended by the Bacteriological
Code. It should be emphasized that in operating in a
fair fashion the valid publication of names is not
undertaken by screening the literature, but by allowing
scientists to submit suitable work as they see fit, either
as articles in the International Journal of Systematic
and Evolutionary Microbiology (IJSEM) (International
Journal of Systematic Bacteriology before 1 January
2000), or via the Validation Lists that are published in
the same journal. Neither priority nor precedence is
given to any one research group: those who do not
submit their own work have no-one to blame but
themselves.

While it is clear that a critical evaluation of the use of
16S rDNA sequence data in the light of more recent
findings based on the sequencing of total genomes
should be undertaken, one should also remember that
the first problems in interpretation of gene sequences
are materializing. Most significant are the difficulties
in assigning appropriate functions to the expressed
products of genes based on the similarity of gene or
protein sequences alone. Interpretation of data in the
form of dendrograms is also a problem, as indicated
by Gest & Favinger (2001). Despite the low confidence
levels from the bootstrap values, this is not significant
if one considers that Kawasaki et al. (1992) were
dealing with three species in three genera. Rhodocista
centenaria, Rhodospirillum rubrum and Magnetospir-
illum gryphiswaldense. The confidence levels are
also not significant if one reduces the three species to
members of one genus. Problems do, however, arise
if one tries to reduce the three species to two genera
which, based on 16S rDNA data alone, must meet the
criteria of being monophyletic. Thus none of the
pairs Rhodocista–Rhodospirillum, Rhodospirillum–
Magnetospirillum or Rhodocista–Magnetospirillum
can be recovered with confidence.

Despite the criticism of Gest & Favinger (2001),
Kawasaki et al. (1992) used not only the 16S rDNA
data, but also the data of Favinger et al. (1989) and
additional chemotaxonomic data to support the separ-
ation of Rhodospirillum centenum from Rhodo-
spirillum rubrum, creating the new genus Rhodocista.
While Gest and Favinger have presented a list of
objections to using the name Rhodocista centenaria
based on ‘inconsistencies’ in the Bacteriological Code,
closer examination of their points indicates that there
is obviously a need to communicate the workings of the
Bacteriological Code to a wider audience. In
essence the problem boils down to a simple matter of
taxonomic opinion, whether one considers Rhodocista
centenaria Kawasaki et al. 1994 to be the correct name
of the taxon, or whether the correct name of the taxon
is Rhodospirillum centenum Favinger et al. 1994, with
the associated debate whether one should define one
genus or two, and that is something which the
Bacteriological Code does not attempt to clarify. As
Murray (1998) accurately points out, the taxonomy
which lasts ‘is determined by general acceptance’, and
long may that principle continue.

References

centenum, sp. nov., a thermotolerant cyst-forming anoxygenic
Letter to the Editor


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