Status of strains that contravene Rules 27(3) and 30 of the Bacteriological Code. Request for an Opinion

J. P. Euzéby¹ and B. J. Tindall²

Correspondence

J. P. Euzéby
j.euzeby@envt.fr

¹Société de Bactériologie Systématique et Vétérinaire (SBSV) and École Nationale Vétérinaire de Toulouse (ENVT), 23 chemin des Capelles, 31076 Toulouse cedex 3, France

²DSMZ-Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH, Mascheroder Weg 1b, D-38124 Braunschweig, Germany

In the period from January 2001, at least 207 new names proposed in articles in the *International Journal of Systematic and Evolutionary Microbiology* or cited in Validation Lists are not in accordance with Rules 27(3) and 30 of the Bacteriological Code. The purpose of the present Request for an Opinion is to clarify the status of the names listed and to provide a solution whereby they may be considered to be validly published.

The Rules of the Bacteriological Code governing the deposit of type strains were modified on 14 August 1999 by the Judicial Commission during its meetings in Sydney, Australia (De Vos & Trüper, 2000). Thereafter, the International Committee on Systematic Bacteriology (ICSB) (now International Committee on Systematics of Prokaryotes, ICSP) also voted unanimously in favour of these changes at the Sydney meeting (Labeda, 2000).

The revised Rule 27 states:

‘The name of a new taxon, or a new combination for an existing taxon, is not validly published unless the following criteria are met.

(3) The type of the taxon must be designated. In the case of species or subspecies the culture collection numbers of at least two publicly accessible service collections in different countries where a subculture of the type strain has been deposited must be indicated.’

The revised Rule 30 states: ‘For the name of species to be validly published it must conform with the following conditions.

(1) It must be published in conformity with the Rules 27 and 28b.

(2) It must be published as a binary combination consisting of a genus name followed by a single species epithet (see Rule 12a).

(3a) Up to the publication of the acceptance of these Minutes by the IJSEM, before publication of the name of a

new species, a culture of the type strain (or, if the species is non-cultivable, type material, a photograph or an illustration) should be deposited in at least one of the permanently established culture collections from which it would be readily available. The designation allotted to the strain by the culture collections should be quoted in the published description.

(3b) As of the publication date of the acceptance of these Minutes by the IJSEM, the description must include the designation of a type strain, and a viable culture of that strain must be deposited in at least two publicly accessible service collections in different countries from which subcultures must be available. The designations allotted to the strain by the culture collections should be quoted in the published description.

(4) Patent strains may serve as type strains and must also be deposited as in (3a) or (3b). Patent strains must be clearly identified as such at the time of publication. If the patent is not yet awarded or not laid open, the publication of a name and the description has to be deferred until the patent is awarded or subcultures become available.’

Minutes of the meetings of the Judicial Commission and of the ICSP were published in the November 2000 issue of the IJSEM (De Vos & Trüper, 2000; Labeda, 2000). As the publication date of this issue was 14 December 2000, for all practical purposes the revised Rules 27(3) and 30 apply from 1 January 2001. However, it should be noted that members of the Judicial Commission or ICSP serving on the Editorial Board of IJSEM, who were at the Sydney meeting, should have been aware of these forthcoming changes, and that these requirements were published on the IJSEM web site under the section ‘Guidelines for Authors’ well in advance of the publication of the Minutes.

Table 1. New species, new subspecies or new combinations where type strains are not deposited in any recognized service collection or deposited in a single recognized culture collection or deposited in at least two different recognized culture collections in the same country

To the authors' knowledge (as of 9 October 2003), a deposit in another recognized culture collection in a different country is not documented.

Name of taxon and author(s)	Type strain(s) cited in effective publication
<i>Acetobacter cibinongensis</i> Lisdiyanti <i>et al.</i> 2002	4H-1 = IFO (now NBRC) 16605 = JCM 11196
<i>Acetobacter orientalis</i> Lisdiyanti <i>et al.</i> 2002	21F-2 = IFO (now NBRC) 16606 = JCM 11195
<i>Acetobacter syzygii</i> Lisdiyanti <i>et al.</i> 2002	9H-2 = IFO (now NBRC) 16604 = JCM 11197
<i>Acetobacterium tundrae</i> Simankova <i>et al.</i> 2001	Z-4493 = DSM 9173
<i>Actinoplanes capillaceus</i> Matsumoto <i>et al.</i> 2001	K95-5561 = JCM 10268 = IFO (now NBRC) 16408
<i>Actinoplanes friuliensis</i> Aretz <i>et al.</i> 2001	HAG 010964 = DSM 7358
<i>Aeromonas culicicola</i> Pidiyar <i>et al.</i> 2002	MTCC 3249 = NCIM 5147
<i>Alicyclobacillus acidocaldarius</i> subsp. <i>rittmannii</i> Nicolaus <i>et al.</i> 2002	MR1 = DSM 11297
<i>Alkalispirillum mobile</i> Rijkenberg <i>et al.</i> 2002	SL-1 = DSM 12769
<i>Anaeromyxobacter dehalogenans</i> Sanford <i>et al.</i> 2002	2CP-1 = ATCC BAA-258
<i>Asaia siamensis</i> Katsura <i>et al.</i> 2001	S60-1 = JCM 10715 = IFO (now NBRC) 16457 = NRIC 0323
<i>Azoarcus buckelii</i> Mechichi <i>et al.</i> 2002	U120 = DSM 14744
<i>Azospirillum doebereineriae</i> Eckert <i>et al.</i> 2001	GSF71 = DSM 13131
<i>Bacillus thermantarcticus</i> corrig. Nicolaus <i>et al.</i> 2002	M1 = DSM 9572
<i>Borrelia sinica</i> Masuzawa <i>et al.</i> 2001	CMN3 = JCM 10505
<i>Bradyrhizobium yuanmingense</i> Yao <i>et al.</i> 2002	CCBAU 10071 = CFNEB 101
<i>Chlorobaculum limnaeum</i> Imhoff 2003	DSM 1677
<i>Chlorobaculum parvum</i> Imhoff 2003	DSM 263
<i>Chlorobaculum thiosulfatiphilum</i> Imhoff 2003	DSM 249
<i>Chlorobium clathratiforme</i> (Szafer 1911) Imhoff 2003	BU1 = DSM 5477
<i>Chlorobium luteolum</i> (Schmidle 1901) Imhoff 2003	DSM 273
<i>Clostridium phytofermentans</i> Warnick <i>et al.</i> 2002	ISDg = ATCC 700394
<i>Comamonas koreensis</i> Chang <i>et al.</i> 2002	YH12 = KCTC 12005 = IMSNU 11158
<i>Dehalospirillum multivorans</i> Scholz-Muramatsu <i>et al.</i> 2002	DSM 12446
<i>Desulfobulbus mediterraneus</i> Sass <i>et al.</i> 2002	86FS1 = DSM 13871
<i>Desulfomicrobium orale</i> Langendijk <i>et al.</i> 2001	NY678 = DSM 12838
<i>Desulfomonile limimaris</i> Sun <i>et al.</i> 2001	DCB-M = ATCC 700979
<i>Desulfovibrio dechloracetivorans</i> Sun <i>et al.</i> 2001	SF3 = ATCC 700912
<i>Desulfovibrio mexicanus</i> Hernandez-Eugenio <i>et al.</i> 2001	Lup1 = DSM 13116
<i>Desulfovibrio vietnamensis</i> Dang <i>et al.</i> 2002	G3 100 = DSM 10520
<i>Dethiosulfovibrio acidaminovorans</i> Surkov <i>et al.</i> 2001	SR 15 = DSM 12590
<i>Dethiosulfovibrio marinus</i> Surkov <i>et al.</i> 2001	WS 100 = DSM 12537
<i>Dethiosulfovibrio russensis</i> Surkov <i>et al.</i> 2001	SR 12 = DSM 12538
<i>Ensifer kummerowiae</i> (Wei <i>et al.</i> 2002) Young 2003	AS 1.3046 = CCBAU 71714
<i>Enterobacter cowanii</i> Inoue <i>et al.</i> 2001	888-76 = JCM 10956
<i>Geoglobus ahangari</i> Kashefi <i>et al.</i> 2002	234 = ATCC BAA-425
<i>Hahella chejuensis</i> Lee <i>et al.</i> 2001	96CJ10356 = KCTC 2396 = IMSNU 11157
<i>Haloferax alexandrinus</i> Asker and Ohta 2002	TM = JCM 10717 = IFO (now NBRC) 16590
<i>Halorhodospira neutriphila</i> Hirschler-Réa <i>et al.</i> 2003	SG 3301 = DSM 15116
<i>Helicobacter typhlonius</i> Franklin <i>et al.</i> 2002	MIT 97-6810 = ATCC BAA-367
<i>Heliobacterium sulfidophilum</i> Bryantseva <i>et al.</i> 2001	BR4 = UNIQEM 113
<i>Heliorestis baculata</i> Bryantseva <i>et al.</i> 2001	OS-H1 = DSM 13446
<i>Herbaspirillum frisingense</i> Kirchhof <i>et al.</i> 2001	GSF30 = DSM 13128
<i>Hydrogenobacter subterraneus</i> Takai <i>et al.</i> 2001	HGP1 = IFO (now NBRC) 16485 = JCM 10560
<i>Hydrogenophaga intermedia</i> Contzen <i>et al.</i> 2001	S1 = DSM 5680
<i>Ketogulonicigenium vulgare</i> corrig. Urbance <i>et al.</i> 2001	DSM 4025
<i>Lactobacillus ferintoshensis</i> Simpson <i>et al.</i> 2002	R7-84 = CIP 106749
<i>Leptotrichia trevisanii</i> Tee <i>et al.</i> 2002	'Wee Tee' 1999 = ATCC 700907
<i>Leuconostoc gasicomitatum</i> Björkroth <i>et al.</i> 2001	TB 1-10 = LMG 18811
<i>Marinospirillum alkaliphilum</i> Zhang <i>et al.</i> 2002	Z4 = CGMCC AS 1.2746

Table 1. cont.

Name of taxon and author(s)	Type strain(s) cited in effective publication
<i>Methanocaldococcus fervens</i> (Jeanthon <i>et al.</i> 1999) Whitman 2002	AG86 = DSM 4213
<i>Methanocaldococcus infernus</i> (Jeanthon <i>et al.</i> 1998) Whitman 2002	ME = DSM 11812
<i>Methylobacterium buryatense</i> Kaluzhnaya <i>et al.</i> 2001	5B = VKM B-2245
<i>Methylovorus mays</i> Doronina <i>et al.</i> 2001	BV = VKM B-2221
<i>Microcystis aeruginosa</i> Otsuka <i>et al.</i> 2001 (illegitimate name)	NIES843 = IAM M-247
<i>Mycobacterium heckeshornense</i> Roth <i>et al.</i> 2001	S369 = DSM 44428
<i>Mycoplasma agassizii</i> Brown <i>et al.</i> 2001	PS6 = ATCC 700616*
<i>Mycoplasma alligatoris</i> Brown <i>et al.</i> 2001	A21JP2 = ATCC 700619
<i>Mycoplasma microti</i> Brown <i>et al.</i> 2001	IL371 = ATCC 700935
<i>Nautilia lithotrophica</i> Miroshnichenko <i>et al.</i> 2002	525 = DSM 13520
<i>Neochlamydia hartmannellae</i> Horn <i>et al.</i> 2001	A ₁ Hsp = ATCC 50802
<i>Neorickettsia risticii</i> (Holland <i>et al.</i> 1985) Dumler <i>et al.</i> 2001	Illinois = HRC-IL = ATCC VR-986 (deaccessioned)
<i>Neorickettsia sennetsu</i> (Misao and Kobayashi 1956) Dumler <i>et al.</i> 2001	Miyayama = ATCC VR-367
<i>Nitrobacter hamburgensis</i> Bock <i>et al.</i> 2001	X14 = DSM 10229
<i>Nitrobacter vulgaris</i> Bock <i>et al.</i> 2001	Z = DSM 10236
<i>Nitrosomonas aestuarii</i> Koops <i>et al.</i> 2001	Nm 36†
<i>Nitrosomonas communis</i> Koops <i>et al.</i> 2001	Nm 2†
<i>Nitrosomonas eutropha</i> Koops <i>et al.</i> 2001	Nm 57†
<i>Nitrosomonas halophila</i> Koops <i>et al.</i> 2001	Nm 1†
<i>Nitrosomonas marina</i> Koops <i>et al.</i> 2001	Nm 22†
<i>Nitrosomonas nitrosa</i> Koops <i>et al.</i> 2001	Nm 90†
<i>Nitrosomonas oligotropha</i> Koops <i>et al.</i> 2001	Nm 45†
<i>Nitrosomonas ureae</i> Koops <i>et al.</i> 2001	Nm 10†
<i>Nitrospira moscoviensis</i> Ehrich <i>et al.</i> 2001	NSP M-1 = DSM 10035
<i>Opitutus terrae</i> Chin <i>et al.</i> 2001	PB90-1 = DSM 11246
<i>Paenibacillus granivorans</i> Van der Maarel <i>et al.</i> 2001	A30 = CBS 229.89
<i>Planococcus alkanoclasticus</i> Engelhardt <i>et al.</i> 2001	MAE2 = NCIMB 13489
<i>Prochlorococcus marinus</i> Chisholm <i>et al.</i> 2001	CCMP-1375
<i>Prochlorococcus marinus</i> subsp. <i>marinus</i> Chisholm <i>et al.</i> 2001	CCMP-1375
<i>Propionispora vibrioides</i> Biebl <i>et al.</i> 2001	FKBS1 = DSM 13305
<i>Prosthecochloris vibrioformis</i> (Pelsh 1936) Imhoff 2003	DSM 260
<i>Pseudomonas cedrina</i> corrig. Dabboussi <i>et al.</i> 2002	CFML 96-198 = CIP 105541
<i>Pseudomonas cremoricolorata</i> Uchino <i>et al.</i> 2002	CC-8 = NRIC 0181 = IFO (now NBRC) 16634 = JCM 11246
<i>Pseudomonas orientalis</i> Dabboussi <i>et al.</i> 2002	CFML 96-170 = CIP 105540
<i>Pseudomonas parafulva</i> Uchino <i>et al.</i> 2002	CB-1 = AJ 2129 = IFO (now NBRC) 16636 = JCM 11244 = NRIC 0501
<i>Pseudomonas psychrophila</i> Yumoto <i>et al.</i> 2002	E-3 = JCM 10889
<i>Rhizobium indigoferae</i> Wei <i>et al.</i> 2002	AS 1.3045 = CCBAU 71042
<i>Rhodobaca bogoriensis</i> Milford <i>et al.</i> 2001	LBB1 = ATCC 700920
<i>Rhodferax antarcticus</i> Madigan <i>et al.</i> 2001	ANT.BR = ATCC 700587
<i>Rickettsia felis</i> Bouyer <i>et al.</i> 2001	Strain <i>Ctenocephalides felis</i> -LSU
<i>Rickettsia felis</i> Bouyer <i>et al.</i> 2001 emend. La Scola <i>et al.</i> 2002	CNCM I-2363‡
<i>Roseospirillum parvum</i> Glaeser and Overmann 2001	930I = DSM 12498
<i>Selenihalanaerobacter shriftii</i> Switzer Blum <i>et al.</i> 2001	DSSe-1 = ATCC BAA-73
<i>Sinorhizobium kummerowiae</i> Wei <i>et al.</i> 2002	AS 1.3046 = CCBAU 71714
<i>Sinorhizobium morelense</i> Wang <i>et al.</i> 2002	Lc04 = CFN E1007 = LMG 21331
<i>Sulfolobus tokodaii</i> Suzuki <i>et al.</i> 2002	7 = JCM 10545
<i>Sulfurospirillum multivorans</i> (Scholz-Muramatsu <i>et al.</i> 2002) Luijten <i>et al.</i> 2003	DSM 12446
<i>Syntrophus aciditrophicus</i> Jackson <i>et al.</i> 2001	SB = ATCC 700169
<i>Thauera aminoaromatica</i> Mechichi <i>et al.</i> 2002	S2 = DSM 14742
<i>Thauera chlorobenzoica</i> Song <i>et al.</i> 2001	3CB-1 = ATCC 700723
<i>Thauera phenylacetica</i> Mechichi <i>et al.</i> 2002	B4P = DSM 14743
<i>Thermococcus sibiricus</i> Miroshnichenko <i>et al.</i> 2001	MM 739 = DSM 12597

Table 1. cont.

Name of taxon and author(s)	Type strain(s) cited in effective publication
<i>Thermoproteus uzoniensis</i> Bonch-Osmolovskaya <i>et al.</i> 2001	Z-605 = DSM 5263
<i>Thioflavicoccus mobilis</i> Imhoff and Pfennig 2001	8321 = ATCC 700959
<i>Treponema parvum</i> Wyss <i>et al.</i> 2001	OMZ 833 = ATCC 700770
<i>Trichlorobacter thiogenes</i> De Wever <i>et al.</i> 2001	K1 = ATCC BAA-34
<i>Tropheryma whipplei</i> La Scola <i>et al.</i> 2001	CNCM I-2202§

*The type strain is also available from the Mollicutes Culture Collection (Curators Drs J. K. Davis and M. K. Davidson, University of Florida).
†Strains deposited at the culture collection of the Institut für allgemeine Botanik, Mikrobiologische Abteilung, Universität Hamburg, Germany.
‡The type strain is also available upon request from the authors.
§CNCM numbers appear to be issued solely for patent purposes. In the cases listed, the status of these strains as patent strains is not documented, nor does evidence appear to have been presented that the relevant patent has either been issued or laid open. The type strains have been also deposited in the Collection de l'Unité des Rickettsies (WHO Collaborative Center for Rickettsial Reference and Research, Marseilles, France).

Unfortunately, some new species, new subspecies and new combinations, published in the IJSEM subsequent to 1 January 2001, are not in accordance with the revised Rules 27(3) and 30. These names are listed in this paper in four different tables. It should be emphasized that the Judicial Commission and the ICSP introduced the changes in these two Rules in order to counter the undesirable trend whereby unreasonable restrictions were placed on the strains or where access was being denied. It should be noted that some exceptions may be made, particularly in cases where only a limited number of collections have access to certain technical facilities (e.g. extreme barophiles or organisms of Risk Group 3). The deposit of strains in at least two different collections also ensures a system whereby type material is stored in at least two different global locations, ensuring the safe storage of this material.

Table 1 lists new species, new subspecies names and new combinations where (a) the type strain is not deposited in any recognized service collection; (b) the type strain is only known to have been deposited in a single culture collection; (c) the type strain is deposited in at least two different culture collections in the same country; or (d) in some cases it is unclear whether additional acronyms refer to other, unidentified, internationally recognized service culture collections.

The names included in this table provide the greatest problems, although we suggest that this Request for an Opinion be used as a mechanism by which this problem is made known and the authors of these names, or curators of service culture collections are asked to supply information on the additional deposit of these strains in at least a second internationally recognized service collection in a second country. In the event of such deposits being made known to the Judicial Commission, these names should be regarded as validly published. We also suggest that this be co-ordinated via the current List Editor.

Table 2 lists new species or new combinations where the effective publication only documents deposit in a single

internationally recognized service culture collection, or in two culture collections in the same country. In view of the fact that we have been able to document the deposit of the type strain in other internationally recognized culture collections, we suggest that these names be treated as having being validly published at the time of their effective publication in the IJSEM.

Table 3 lists new subspecies or new combinations where the effective publication makes no reference to the deposit of the type strain in any internationally recognized service culture collection. In view of the fact that we have been able to document the deposit of the type strain in at least two internationally recognized service culture collections, in two different countries, we suggest that these names be treated as having being validly published at the time of their effective publication in the IJSEM.

Table 4 lists new species where the protologue in the effective publication makes reference to the deposit of the type strain in either only one internationally recognized service culture collection, or in two internationally recognized service culture collections in the same country. However, in view of the fact that the authors also document the deposit of the type strain in at least two internationally recognized service culture collections in two different collections (usually in the Abstract), we suggest that these names be treated as having being validly published at the time of their effective publication in the IJSEM.

We would also like to draw the international microbiological community to the importance of following the Rules on the deposit of type strains in internationally recognized collections. These organisms serve as irreplaceable viable documents of the microbial diversity on this planet and they are the 'cultural heritage' of modern prokaryotic systematics. The type strain system also gives us unique access to the genetic, biochemical and physiological properties of that material, which is impossible with the vast majority of type material available in botany and zoology.

Table 2. New species, new subspecies or new combinations where the effective publication only documents deposit in a single recognized culture collection or in two recognized culture collections in the same country, but deposit in at least one other recognized culture collection in a different country is documented

Name of taxon and author(s)	Accession number cited in effective publication	Other accession number(s) under which type strain is available
<i>Actinocorallia aurantiaca</i> (Lavrova and Preobrazhenskaya 1975) Zhang <i>et al.</i> 2001	JCM 8201	DSM 43924 = IFO (now NBRC) 15554 = IFO (now NBRC) 16147 = IMET 9577 = KCTC 9554
<i>Actinocorallia glomerata</i> (Itoh <i>et al.</i> 1996) Zhang <i>et al.</i> 2001	JCM 9376	DSM 44360 = IFO (now NBRC) 15960
<i>Actinocorallia libanotica</i> (Meyer 1981) Zhang <i>et al.</i> 2001	IFO (now NBRC) 14095	ATCC 35576 = DSM 43554 = JCM 3284 = JCM 10696 = NRRL B-16097 = VKM Ac-939
<i>Actinocorallia longicatena</i> (Itoh <i>et al.</i> 1996) Zhang <i>et al.</i> 2001	JCM 9377	CIP 105488 = DSM 44361 = IFO (now NBRC) 15961
<i>Actinomadura viridilutea</i> (Agre and Guzeva 1975) Zhang <i>et al.</i> 2001	JCM 3398	ATCC 33925 = CCRC 13638 = DSM 44433 = IFO (now NBRC) 14480 = JCM 7346
<i>Anaerobranca gottschalkii</i> Prowe and Antranikian 2001	DSM 13577	ATCC BAA-51
<i>Anaerococcus octavius</i> (Murdoch <i>et al.</i> 1997) Ezaki <i>et al.</i> 2001	NCTC 9810	DSM 11663
<i>Anaerococcus prevotii</i> (Foubert and Douglas 1948) Ezaki <i>et al.</i> 2001	ATCC 9321	CCUG 41932 = CIP 105881 = DSM 20548 = JCM 6508 = NCTC 11806
<i>Bacillus arseniciselenatis</i> corrig. Switzer Blum <i>et al.</i> 2001	E1H = ATCC 700614	DSM 15340
<i>Bacillus selenitireducens</i> Switzer Blum <i>et al.</i> 2001	ATCC 700615	DSM 15326
<i>Carboxydibrachium pacificum</i> corrig. Sokolova <i>et al.</i> 2001	DSM 12653	ATCC BAA-271
<i>Cellulosimicrobium cellulans</i> (Metcalf and Brown 1957) Schumann <i>et al.</i> 2001	DSM 43879	ATCC 12830 = CFBP 4267 = CIP 103404 = HAMBI 95 = IFO (now NBRC) 15516 = JCM 9965 = LMG 16221 = NRRL B-2768 = VKM Ac-1412
<i>Clostridium hungatei</i> Monserrate <i>et al.</i> 2001	ATCC 700212	DSM 14427
<i>Clostridium saccharoperbutylacetonicum</i> Keis <i>et al.</i> 2001	ATCC 27021 (derived from ATCC 13564)	DSM 14923 = NCIMB 12606
<i>Comamonas denitrificans</i> Gumaelius <i>et al.</i> 2001	ATCC 700936	CCUG 44425
<i>Cryptosporangium aurantiacum</i> (ex Ruan <i>et al.</i> 1976) Tamura and Hatano 2001	IFO (now NBRC) 13967 = JCM 3241	AS 4.1052 = DSM 46144 = KCC A-0241 = KCTC 9529 = NCIMB 12649 = NRRL B-16698
<i>Desulfotobacterium chlororespirans</i> Sanford <i>et al.</i> 2001	ATCC 700175	DSM 11544
<i>Desulfotobacterium metallireducens</i> Finneran <i>et al.</i> 2002	ATCC BAA-636	DSM 15288
<i>Desulfobacula phenolica</i> (Bak and Widdel 1988) Kuever <i>et al.</i> 2001*		ATCC 43956 = DSM 3384
<i>Desulfotignum balticum</i> Kuever <i>et al.</i> 2001	DSM 7044	ATCC BAA-19
<i>Desulfotomaculum thermobenzoicum</i> subsp. <i>thermosyntrophicum</i> Plugge <i>et al.</i> 2002	DSM 14055	ATCC BAA-281
<i>Dorea formicigenerans</i> (Holdeman and Moore 1974) Taras <i>et al.</i> 2002	ATCC 27755	DSM 3992
<i>Gallicola barnesae</i> (Schiefer-Ullrich and Andreesen 1986) Ezaki <i>et al.</i> 2001	DSM 3244	ATCC 49795
<i>Geobacillus kaustophilus</i> (Priest <i>et al.</i> 1989) Nazina <i>et al.</i> 2001	ATCC 8005	CCUG 28890 = CIP 106929 = DSM 7263 = LMG 9819 = NCCB 30003 = NRRL NRS-81

Table 2. cont.

Name of taxon and author(s)	Accession number cited in effective publication	Other accession number(s) under which type strain is available
<i>Geobacillus stearothermophilus</i> (Donk 1920) Nazina <i>et al.</i> 2001	DSM 22	ATCC 12980=CCM 2062=CCRC 11092=CCUG 26241=CIP 66.23=IAM 11062=IFO (now NBRC) 12550=JCM 2501=KCTC 1665=KCTC 1752=LMG 6939=NCCB 75019=NCFB 1768=NCIMB 8923=NCTC 10339=NRRL B-1172=VKM B-510
<i>Geobacillus thermodenitrificans</i> (Manachini <i>et al.</i> 2000) Nazina <i>et al.</i> 2001	DSM 465	ATCC 29492=LMG 17532
<i>Geobacillus thermoglucosidasius</i> (Suzuki <i>et al.</i> 1984) Nazina <i>et al.</i> 2001	DSM 2542	ATCC 43742=CCUG 28887=CIP 106930=LMG 7137=NRRL B-14516
<i>Geobacillus thermoleovorans</i> (Zarilla and Perry 1988) Nazina <i>et al.</i> 2001	DSM 5366	ATCC 43513=LMG 9823
<i>Grimontia hollisae</i> (Hickman <i>et al.</i> 1982) Thompson <i>et al.</i> 2003	LMG 17719	ATCC 33564=CCUG 13625=CDC 0075-80=CIP 101886=DSM 15132=JCM 1283=NCTC 11640
<i>Helicobacter aurati</i> Patterson <i>et al.</i> 2002	MIT 97-5075c=ATCC BAA-1	CCUG 47791
<i>Helicobacter canadensis</i> Fox <i>et al.</i> 2002	NLEP-16143=ATCC 700968=MIT 98-5491	CCUG 47163
<i>Heliobacterium undosum</i> Bryantseva <i>et al.</i> 2001	DSM 13378	UNIQEM 114
<i>Lamprocystis purpurea</i> (Eichler and Pfennig 1989) Imhoff 2001	DSM 4197	ATCC 49210
<i>Legionella drozanskii</i> Adeleke <i>et al.</i> 2001	ATCC 700990	CCUG 43885
<i>Legionella fallonii</i> Adeleke <i>et al.</i> 2001	ATCC 700992	CCUG 43887
<i>Legionella rowbothamii</i> Adeleke <i>et al.</i> 2001	ATCC 700991	CCUG 43886
<i>Lentzea violacea</i> (Lee <i>et al.</i> 2000) Labeda <i>et al.</i> 2001	IMSNU 50388	JCM 10975
<i>Marinibacillus marinus</i> (Rüger and Richter 1979) Yoon <i>et al.</i> 2001	DSM 1297	ATCC 29841=CCUG 28884=CIP 103308=LMG 6930=NRRL B-14321
<i>Marinobacterium jannaschii</i> (Bowditch <i>et al.</i> 1984) Satomi <i>et al.</i> 2002	ATCC 27135	CIP 103444=DSM 6295=IFO (now NBRC) 15466=LMG 6239
<i>Marinobacterium stanieri</i> (Baumann <i>et al.</i> 1983) Satomi <i>et al.</i> 2002	ATCC 27130	CCUG 16021=CIP 106697=DSM 7027=LMG 6847
<i>Methanocaldococcus jannaschii</i> (Jones <i>et al.</i> 1984) Whitman 2002	DSM 2661	ATCC 43067=CIP 104961=JCM 10045=OCM 168
<i>Methanocaldococcus vulcanius</i> (Jeanthon <i>et al.</i> 1999) Whitman 2002	DSM 12094	ATCC 700851
<i>Methanothermococcus thermolithotrophicus</i> (Huber <i>et al.</i> 1984) Whitman 2002	DSM 2095	ATCC 35097=JCM 10549=OCM 138
<i>Methanotorris igneus</i> (Burggraf <i>et al.</i> 1990) Whitman 2002	DSM 5666	JCM 11834
<i>Methylophilus leisingeri</i> corrig. Doronina and Trotsenko 2001	VKM B-2013	DSM 6813
<i>Mycobacterium bovis</i> subsp. <i>caprae</i> (Aranaz <i>et al.</i> 1999) Niemann <i>et al.</i> 2002	spc-1=gM-1=CIP 105776	ATCC BAA-824
<i>Nocardia cyriacigeorgica</i> corrig. Yassin <i>et al.</i> 2001	IMMIB D-1627=DSM 44484	JCM 11763
<i>Nocardia vinacea</i> Kinoshita <i>et al.</i> 2002	JCM 10988=IFO (now NBRC) 16497	DSM 44638

Table 2. cont.

Name of taxon and author(s)	Accession number cited in effective publication	Other accession number(s) under which type strain is available
<i>Nonomuraea roseoviolacea</i> subsp. <i>roseoviolacea</i> (Nonomura and Ohara 1971) Zhang <i>et al.</i> 1998	IFO (now NBRC) 14098	AS 4.1072 = ATCC 27297 = CBS 260.72 = CCM 3491 = CCRC 13406 = CIP 106924 = DSM 43144 = JCM 3145 = KCTC 9283 = NCIMB 11117 = NRRL B-16127 = VKM Ac-909
<i>Oceanobacter kriegii</i> (Bowditch <i>et al.</i> 1984) Satomi <i>et al.</i> 2002	ATCC 27133	CIP 103443 = DSM 6294 = IFO (now NBRC) 15467 = LMG 6238
<i>Olsenella profusa</i> Dewhirst <i>et al.</i> 2001	DSM 13989	CCUG 45371 = CIP 106885
<i>Olsenella uli</i> (Olsen <i>et al.</i> 1991) Dewhirst <i>et al.</i> 2001	VPI D76D-27C = ATCC 49627	CCUG 31166 = DSM 7084 = LMG 11480
<i>Paracoccus kondratievae</i> Doronina and Trotsenko 2001	VKM B-2222	NCIMB 13773
<i>Peptoniphilus asaccharolyticus</i> (Distaso 1912) Ezaki <i>et al.</i> 2001	ATCC 14963	CCUG 9988 = CIP 74.17 = DSM 20463 = NCTC 11461
<i>Peptoniphilus harei</i> (Murdoch <i>et al.</i> 1997) Ezaki <i>et al.</i> 2001	DSM 10020	CIP 105323 = NCTC 13076
<i>Peptoniphilus indolicus</i> (Christiansen 1934) Ezaki <i>et al.</i> 2001	ATCC 29427	CCUG 17639 = DSM 20464 = NCTC 11088
<i>Peptoniphilus ivorii</i> (Murdoch <i>et al.</i> 1997) Ezaki <i>et al.</i> 2001	DSM 10022	CIP 105325 = NCTC 13078
<i>Pseudomonas brenneri</i> Baïda <i>et al.</i> 2002	CFML 97-391 = CIP 106646	DSM 15294
<i>Pseudospirillum japonicum</i> (Watanabe 1959) Satomi <i>et al.</i> 2002	ATCC 19191	CIP 103373 = DSM 7165 = IFO (now NBRC) 15446 = LMG 10146
<i>Sphingomonas aquatilis</i> Lee <i>et al.</i> 2001	KCCM 41067 = KCTC 2881	IFO (now NBRC) 16722 = JCM 11455
<i>Sphingomonas cloacae</i> Fujii <i>et al.</i> 2001	IAM 14885 = JCM 10874	CIP 107076 = DSM 14926
<i>Sphingomonas koreensis</i> Lee <i>et al.</i> 2001	KCCM 41069 = KCTC 2882	IFO (now NBRC) 16723 = JCM 11456
<i>Sphingomonas taejonensis</i> Lee <i>et al.</i> 2001	KCCM 41068 = KCTC 2884	IFO (now NBRC) 16724 = JCM 11457
<i>Streptococcus gallolyticus</i> subsp. <i>pasteurianus</i> (Poyart <i>et al.</i> 2002) Schlegel <i>et al.</i> 2003	NEM 1202 = CIP 107122	DSM 15351
<i>Streptococcus lutetiensis</i> Poyart <i>et al.</i> 2002	NEM 782 = CIP 106849	DSM 15350
<i>Streptococcus pasteurianus</i> Poyart <i>et al.</i> 2002	NEM 1202 = CIP 107122	DSM 15351
<i>Tenacibaculum maritimum</i> (Wakabayashi <i>et al.</i> 1986) Suzuki <i>et al.</i> 2001	NCIMB 2154	ATCC 43398 = CIP 103528 = CCUG 35198 = IFO (now NBRC) 15946 = LMG 11612
<i>Tenacibaculum ovolyticum</i> (Hansen <i>et al.</i> 1992) Suzuki <i>et al.</i> 2001	NCIMB 13127	ATCC 51887 = CCUG 35199 = CIP 106403 = LMG 13026
<i>Terasakiella pusilla</i> (Terasaki 1973) Satomi <i>et al.</i> 2002	IFO (now NBRC) 13613	ATCC 33338 = CIP 103382 = DSM 6293 = LMG 7372
<i>Thermococcus acidaminovorans</i> Dirmeier <i>et al.</i> 2001	DSM 11906	JCM 12186
<i>Thermococcus waiotapuensis</i> González <i>et al.</i> 2001	DSM 12768	JCM 10985
<i>Virgisporangium aurantiacum</i> corrig. Tamura <i>et al.</i> 2001	IFO (now NBRC) 16421 = JCM 11002	CIP 107212
<i>Virgisporangium ochraceum</i> corrig. Tamura <i>et al.</i> 2001	IFO (now NBRC) 16418 = JCM 11001	CIP 107213

**Desulfobacula phenolica* (Bak and Widdel 1988) Kuever *et al.* 2001 may be considered as 'incidental mention'.

Table 3. New subspecies or new combinations where the effective publication makes no reference to the deposit of the type strain in any publicly accessible service collection, but deposits in at least two recognized cultures collections in different countries are documented

Name of taxon and author(s)	Accession number(s) under which type strain is available
<i>Achromobacter denitrificans</i> (Rüger and Tan 1983) Coenye <i>et al.</i> 2003	ATCC 15173 = CCUG 407 = CIP 77.15 = DSM 30026 = IFO (now NBRC) 15125 = JCM 5490 = LMG 1231 = NCTC 8582
<i>Clostridium stercorarium</i> subsp. <i>leptospartum</i> (Toda <i>et al.</i> 1989) Fardeau <i>et al.</i> 2001	ATCC 51338 = DSM 9219 = IAM 13499
<i>Clostridium stercorarium</i> subsp. <i>stercorarium</i> Madden 1983	ATCC 35414 = DSM 8532 = NCIB 11754
<i>Clostridium stercorarium</i> subsp. <i>thermolacticum</i> (Le Ruyet <i>et al.</i> 1988) Fardeau <i>et al.</i> 2001	ATCC 43739 = DSM 2910
<i>Novosphingobium aromaticivorans</i> corrig. (Balkwill <i>et al.</i> 1997) Takeuchi <i>et al.</i> 2001	ATCC 700278 = CIP 105152 = DSM 12444 = HAMBI 2257 = IFO (now NBRC) 16084 = SMCC F199
<i>Novosphingobium capsulatum</i> (Leifson 1962) Takeuchi <i>et al.</i> 2001	ATCC 14666 = CCUG 17697 = CCUG 31202 = CIP 82.103 = DSM 30196 = GIFU 11526 = HAMBI 103 = IFO (now NBRC) 12533 = JCM 7508 = JCM 7452 = LMG 2830 = VKM B-1564
<i>Novosphingobium rosa</i> corrig. (Takeuchi <i>et al.</i> 1995) Takeuchi <i>et al.</i> 2001	ATCC 51837 = DSM 7285 = HAMBI 2068 = IFO (now NBRC) 15208 = LMG 17328 = NCPPB 2661
<i>Novosphingobium stygium</i> corrig. (Balkwill <i>et al.</i> 1997) Takeuchi <i>et al.</i> 2001	ATCC 700280 = CIP 105154 = DSM 12445 = IFO (now NBRC) 16085 = SMCC B0712
<i>Novosphingobium subarcticum</i> (Nohynek <i>et al.</i> 1996) Takeuchi <i>et al.</i> 2001	CIP 105288 = DSM 10700 = HAMBI 2110 = IFO (now NBRC) 16058 = JCM 10398
<i>Novosphingobium subterraneum</i> corrig. (Balkwill <i>et al.</i> 1997) Takeuchi <i>et al.</i> 2001	ATCC 700279 = CIP 105153 = DSM 12447 = IFO (now NBRC) 16086 = SMCC B0478
<i>Planomicrobium mcmeekinii</i> (Junge <i>et al.</i> 1998) Yoon <i>et al.</i> 2001	ATCC 700539 = CIP 105673
<i>Planomicrobium okeanoikoites</i> (ZoBell and Upham 1944) Yoon <i>et al.</i> 2001	ATCC 33414 = CCM 320 = CIP 105082 = IFO (now NBRC) 12536 = LMG 4030 = NCIMB 561 = VKM B-1175
<i>Propionivibrio pelophilus</i> (Meijer <i>et al.</i> 1999) Brune <i>et al.</i> 2002	CIP 106101 = DSM 12018
<i>Sphingobium chlorophenolicum</i> (Nohynek <i>et al.</i> 1996) Takeuchi <i>et al.</i> 2001	ATCC 33790 = CIP 104885 = DSM 7098 = IFO (now NBRC) 16172 = JCM 10275 = LMG 17771
<i>Sphingobium herbicidovorans</i> (Zipper <i>et al.</i> 1997) Takeuchi <i>et al.</i> 2001	CIP 106705 = ATCC 700291 = DSM 11019 = IFO (now NBRC) 16415 = LMG 18315
<i>Sphingobium yanoikuyae</i> (Yabuuchi <i>et al.</i> 1990) Takeuchi <i>et al.</i> 2001	ATCC 51230 = CCUG 28380 = CCUG 31205 = CIP 106726 = DSM 7462 = GIFU 9882 = HAMBI 1842 = IFO (now NBRC) 15102 = JCM 7371 = LMG 11252
<i>Sphingopyxis macroglotabida</i> (Takeuchi <i>et al.</i> 1993) Takeuchi <i>et al.</i> 2001	ATCC 51380 = CIP 104196 = DSM 8826 = HAMBI 1841 = IFO (now NBRC) 15033 = LMG 17324
<i>Sphingopyxis terrae</i> (Takeuchi <i>et al.</i> 1993) Takeuchi <i>et al.</i> 2001	ATCC 51381 = CIP 104198 = DSM 8831 = HAMBI 1834 = IFO (now NBRC) 15098 = JCM 10195 = LMG 17326
<i>Sporosarcina globispora</i> (Larkin and Stokes 1967) Yoon <i>et al.</i> 2001	ATCC 23301 = CCUG 7419 = CIP 103266 = DSM 4 = HAMBI 471 = IFO (now NBRC) 16082 = JCM 10046 = LMG 6928 = NRRL NRS-1533 = NRRL B-3396 = VKM B-1435
<i>Sporosarcina pasteurii</i> (Miquel 1889) Yoon <i>et al.</i> 2001	ATCC 11859 = CCUG 7425 = CIP 66.21 = DSM 33 = LMG 7130 = NCCB 48021 = NCTC 4822 = NRRL NRS-673 = VKM B-513
<i>Sporosarcina psychrophila</i> (Nakamura 1984) Yoon <i>et al.</i> 2001	ATCC 23304 = CCM 2117 = CCRC 11738 = CCUG 28886 = CIP 103267 = DSM 3 = IAM 12468 = IFO (now NBRC) 15381 = JCM 9075 = LMG 6929 = NRRL B-3397 = NRRL NRS-1530
<i>Zobellia uliginosa</i> (ZoBell and Upham 1944) Barbeyron <i>et al.</i> 2001	ACAM 538 = ATCC 14397 = CCUG 33448 = CECT 4277 = CIP 104808 = DSM 2061 = IFO (now NBRC) 14962 = LMG 3809 = NCIMB 1863

Table 4. New species where the protologue in the effective publication makes reference to the deposit of the type strain in either a single recognized culture collection or in two recognized culture collections in the same country, but another recognized culture collection in a different country is cited in the Abstract

Name of taxon and author(s)	Accession number(s) cited in the protologue	Accession number(s) cited in the Abstract
<i>Arcanobacterium pluranimalium</i> Lawson <i>et al.</i> 2001	CCUG 42575	CCUG 42575 = CIP 106442
<i>Corynebacterium aurimucosum</i> Yassin <i>et al.</i> 2002	DSM 44532 = IMMIB D-1488	DSM 44532 = IMMIB D-1488 = NRRL B-24143
<i>Corynebacterium casei</i> Brennan <i>et al.</i> 2001	LMG S-19264 = DPC 5298	LMG S-19264 = NCIMB 30130
<i>Corynebacterium mooreparkense</i> Brennan <i>et al.</i> 2001	LMG S-19265 = DPC 5310	LMG S-19265 = NCIMB 30131
<i>Enterococcus villorum</i> Vancanneyt <i>et al.</i> 2001	LMG 12287	LMG 12287 = CCM 4887

This Request for an Opinion also documents problems which have arisen because insufficient attention has been paid to the workings and purpose of the Bacteriological Code (Lapage *et al.*, 1992). While this may appear trivial, few microbiologists realize that, due to the efforts of a small group of dedicated systematists over the past 50 years, prokaryotic systematics has unique and comprehensive access to the information on names, the literature associated with them, type strains and the location of these strains, something which is the envy of those who wish to implement similar systems in botany and zoology. In paying attention to the workings and purpose of the Bacteriological Code (Lapage *et al.*, 1992), it is hoped that this situation will be maintained, despite dwindling resources for systematics worldwide. Obviously, some of the problems listed here are due to suboptimal communication between the Judicial Commission, the ICSP, the Editors of the IJSEM, as well as the authors of papers submitted for valid publication of new names and new combinations. We hope that highlighting this problem will positively attract the attention of those involved and contribute to improving the current situation. As a result, prokaryotic systematics may maintain its role in leading the way in presenting accurate and comprehensive information to its end users.

Lists of abbreviations of collections and institutions cited in the tables are provided in several files available on the Internet. For example: 'LBSN – Culture collections of

prokaryotes' (<http://www.bacterio.cict.fr/collections.html>); 'DSMZ – Abbreviations of Collections and Institutions' (<http://www.dsmz.de/species/abbrev.htm>); or 'WDCM – Home Pages of Culture Collections in the World' (<http://wdcm.nig.ac.jp/hpcc.html>).

References of original publications may be found in 'Bacterial Nomenclature Up To Date' (<http://www.dsmz.de/bactnom/bactname.htm>) or in the 'List of Bacterial Names with Standing in Nomenclature' (<http://www.bacterio.cict.fr>).

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