An Index to Deoxyribonucleic Acid Base Compositions of Bacterial Species

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SUMMARY

This paper consists of a reference list of bacterial species for which deoxyribonucleic acid base compositions are known. Culture-collection strain numbers have been included wherever possible. The compilation may also provide a basis for the inclusion of these data into species descriptions.

INTRODUCTION

Deoxyribonucleic acid (DNA) base compositions are becoming widely used in taxonomy and it is already evident that there is a need to include such data into future species descriptions. The more recent reviews (e.g. Sueoka, 1961; Marmur, Falkow & Mandel, 1963; De Ley, 1964) omitted references to specific strains, whilst many reports of bacterial DNA base compositions have appeared since the last detailed review (Belozersky & Spirin, 1960). A survey of the literature to the end of 1965 shows that DNA base compositions have already been reported for about 400 differently named species. Moreover, about half the entries in the present compilation of data from the literature refer to strains deposited in various culture collections.

The index is arranged as follows. In the first column the genera are arranged alphabetically and the species alphabetically within their genera. Generic and specific epithets used in the original papers are retained and synonyms quoted by the authors are given in parenthesis. The only exceptions are: '*Diplococcus*' is included in *Streptococcus*; '*Coxiella*' in *Rickettsia*; and '*Staphylococcus roseus*' and '*Staphylococcus afermentans*' are transferred to *Micrococcus*. In the second column Culture Collection numbers or other strain identification symbols are given wherever possible. Reference to the technique used for the determination of the base composition is given in the third column. The base compositions, expressed as moles % of guanine + cytosine (% GC, hereafter) of the moles of total bases, are listed in column 4. Finally, the fifth column contains numerical references to the original papers. The references are arranged alphabetically and are numbered, these numbers being used in the index.

A graphical representation of the data is given in Figs. 1 and 2 which include only those genera for which at least two species or strains have been investigated for DNA base compositions. In the figures, the genera are arranged following the classification in *Bergey's Manual* (1957). Those genera which are not listed in the Manual are placed after the genus they most closely resemble.

The author would greatly appreciate receiving notices of any errors or omissions that may have escaped him.

Abbreviations used in the index

Column 2. Strain number

ATCC American Type Culture Collection, Washington.
 CCEB Culture Collection of Entomogenous Bacteria, Prague.
 CCM Czechoslovak Collection of Micro-organisms, Brno.
 IP Institut Pasteur, Paris.

Fig. 1

Fig. 2

Figs. 1 and 2. Graphical representation of the data given in the table. Only genera for which at least two species or strains have been investigated for DNA base composition are included. The horizontal lines represent the range of % GC values reported for each genus.

IMRU Institute of Microbiology, Rutgers University, New Brunswick.
 NCDO National Collection of Dairy Organisms, Shinfield, Reading, Berkshire.
 NCIB National Collection of Industrial Bacteria, Aberdeen.
 NCMB National Collection of Marine Bacteria, Aberdeen.
 NCTC National Collection of Type Cultures, London.
 NRRL Northern Utilization Research and Development Division, U.S. Department of Agriculture, Peoria.

Column 3. Method

The various techniques used to determine DNA base composition have been categorized as follows:

- a Methods of hydrolysis and chromatography, reviewed by Bendich (1957).
- b 'Melting temperature' (T_m) determinations from the sharp increase in absorbance at 250 $m\mu$ upon heating dilute aqueous solutions of the DNA (Marmur & Doty, 1962).
- c Determinations of the buoyant density of DNA in caesium chloride equilibrium ultra-centrifugation (Schildkraut, Marmur & Doty, 1962).
- d Determinations of the ratio of absorbancies of DNA at 260 and 280 $m\mu$ at pH 3 (Fredericq, Oth & Fontaine, 1961).
- e Spectroscopic determinations of the relative percentage of adenine by its reactivity towards bromine reagents (Wang & Hashagen, 1964).

Column 4. % GC

To the nearest 0.5 %, the moles % guanine + cytosine / moles total bases.

Table 1. *Index to DNA base compositions of bacterial species:*
moles % guanine + cytosine (% GC) of total bases

Species	Strain	Method	% GC	Ref.
<i>Acetobacter</i>				
<i>aceti</i>	Ch. 31	ab	59.5	18
<i>aceti (liquefaciens)</i>	NCIB 9505	ab	64-65.5	14, 18
<i>aceti (liquefaciens)</i>	p 12 α	b	64.5	14
<i>aceti</i> var. <i>muciparus</i>	5	b	59.5	18
<i>ascendens</i>	ATCC 9323	b	55	37
<i>cerinus</i> var. <i>rosiensis</i>	22	ab	55.5-56.5	18
<i>estunensis</i>	E	b	62	18
<i>gluconicum</i>	2 G	bc	54-55	37, 48
<i>mesoxydans</i> var. <i>saccharovorans</i>	—	ab	60.5-61	18
<i>mobilis</i>	NCIB 6428	ab	59	18
<i>paradoxus</i>	P 1	b	55.5	18
<i>paradoxus</i>	P 2	b	55.5	18
<i>pasteurianum</i>	11	b	60	18
<i>peroxydans</i>	NCIB 8618	ab	61-62.5	18
<i>peroxydans</i>	3	b	63.5	18
<i>peroxydans</i>	4	b	63.5	18
<i>rancens</i>	23 kl	b	55.5	18
<i>vini acetati</i>	NCIB 4939	b	57.5	18
<i>xylinoides</i>	NCIB 4940	b	62.5	18
<i>xylinum</i>	NCIB 8747	ab	61	18
<i>xylinum</i>	25	b	63	18
<i>Achromobacter fischeri</i>	—	—	40-42	38
<i>Actinobacterium abscessum</i>	1852 B	a	61.5	49
<i>Actinomyces propionici</i>	—	a	66.5	49
<i>Actinoplanes philippinensis</i>	—	b	73	28
<i>Aerobacter</i>				
<i>aerogenes</i>	(4 strains)	a	57-59	1
<i>aerogenes</i>	ATCC 14308	bc	54	9
<i>aerogenes</i>	ATCC 13048	bc	54.5	9, 35
<i>aerogenes</i>	MEG	bc	54.5	9
<i>aerogenes</i>	ATCC 211	bc	55.5	9
<i>aerogenes</i>	Indiana	bc	55.5	9
<i>aerogenes</i>	Balamuth	bc	56.5	9

Table 1 (*cont.*)

Species	Strain	Method	% GC	Ref.
<i>Aerobacter</i> cont.				
<i>aerogenes</i>	1088 (Harvard)	bc	57-57.5	37, 48
<i>cloacae</i>	—	—	52-54	38
<i>lipolyticus</i>	—	—	50-52	37
sp.	1041	b	51.5	37
<i>Aeromonas</i>				
<i>formicans</i>	ATCC 13137	b	59	9
<i>hydrophila</i>	ATCC 9071	b	55.5	35
<i>hydrophila</i>	IP R 126	a	59	50
<i>hydrophila</i>	IP R 307	a	59.5	50
<i>hydrophila</i>	NCTC 7810	a	61.5	50
<i>hydrophila</i>	NCTC 7812	a	62.5	50
<i>jamaicensis</i>	Caseltz x 3	a	62.5	50
<i>liquefaciens</i>	NRRL B-966	b	59	9
<i>liquefaciens</i>	ATCC 14715	b	59	9
<i>punctata</i>	ATCC 11163	bc	56.5	9
<i>punctata</i>	CCEB 386	a	61	50
<i>salmonicida</i>	ATCC 14174	b	56.5	9
<i>salmonicida</i>	CCEB 382	a	57	50
<i>salmonicida</i>	NCMB 833	a	58.5	50
<i>shigelloides</i>	ATCC 14029	b	52	35
(<i>Fergusonia</i>) <i>shigelloides</i>	IP 633	a	51	50
(<i>Fergusonia</i>) <i>shigelloides</i>	NCIB 9242	a	52.5	50
<i>Agrobacterium</i>				
<i>radiobacter</i>	(c. 30 strains)	—	59-60	15
<i>rhizogenes</i>		—	—	—
<i>tumefaciens</i>		—	—	—
<i>tumefaciens</i>		B 6	61.5	14
<i>tumefaciens</i>		S 1	62	14
<i>tumefaciens</i>	M 39	b	65.5	14
<i>tumefaciens</i>	—	a	58-59	1
<i>Alcaligenes</i>				
<i>faecalis</i>	ATCC 8750	bc	55	9
<i>faecalis</i>	—	a	67-70	1
<i>Arthrobacter</i>				
<i>globiformis</i>	—	—	62-64	38
<i>globiformis</i>	ATCC 8010	b	60	28
<i>Azotobacter</i>				
<i>agilis</i>	(2 strains)	a	55	1
<i>chromococcum</i>	(4 strains)	a	57.5	1
<i>vinelandii</i>	(2 strains)	b	56	1
<i>vinelandii</i>	ATCC 9104	b	60	37
<i>Bacillus</i>				
<i>alvei</i>	ATCC 6344	b	33	37
<i>anthracis</i>	(2 strains)	b	32-34	40
<i>brevis</i>	ATCC 9999	bc	43-45	37, 48
<i>carotarum</i>	—	c	42	48
<i>cereus</i>	ATCC 12137	a	36	1
<i>cereus</i>	(9 strains)	a	33-37	1
<i>cereus</i>	MB-19	bc	33-37	37, 48
<i>cereus</i>	ATCC 7064	b	32	40
<i>cereus</i>	ATCC 11950	b	32	40
<i>cereus</i>	ATCC 9139	b	32.5	40
<i>cereus</i>	NRRL B-569	b	40	40
<i>cereus</i>	(2 strains)	b	31.5-33	40
<i>cereus</i> var. <i>mycoides</i>	75a	c	39	48
<i>circulans</i>	ATCC 4513	b	35	37

Table 1 (cont.)

Species	Strain	Method	% GC	Ref.
<i>Bacillus</i> cont.				
<i>firmus</i>	—	b	41	37
<i>laterosporus</i>	ATCC 64	b	40	37
<i>lentus</i>	ATCC 10840	b	37	37
<i>licheniformis</i>	ATCC 9789	abc	46-51	21, 37, 48
<i>licheniformis</i>	ATCC 9945 a	b	44	40
<i>licheniformis</i>	(2 strains)	b	43	40
<i>macerans</i>	ATCC 7069	bc	50-54	37, 48
<i>megaterium</i>	—	abc	37-38	1, 37, 48
<i>megaterium-cereus</i>	—	b	34	37
<i>natto</i>	MB 275	bc	43-44	37, 48
<i>niger</i>	ATCC 6454	bc	43	37, 48
<i>polymyxa</i>	ATCC 842	b	44	37
<i>polymyxa</i>	NRRL B-367	c	47-48	20
<i>pumilus</i>	ATCC 6631	bc	39-41	20, 37
<i>sphaericus</i>	ATCC 4525	b	37	37
<i>stearothermophilus</i>	194	bc	44-46	37, 48
<i>subtilis</i>	168	abcde	39-45	25, 28, 37 48, 56, 57
<i>subtilis</i>	168 Mut MK 9	abd	63-64	25
<i>subtilis</i>	168 Mut MK 12	abd	62-63	25
<i>subtilis</i>	168 Mut SC-22	abd	64-65	25, 57
<i>subtilis</i>	—	a	43.5	31
<i>subtilis</i>	—	a	42.5	1
<i>subtilis</i>	ATCC 6633	c	43	20
<i>subtilis</i>	ATCC 6051	—	43	39
<i>subtilis</i>	(6 strains)	b	45.5-46.5	40
<i>subtilis</i> var. <i>aterrimus</i>	ATCC 6460	b	43	37
<i>subtilis</i> var. <i>niger</i>	ATCC 6455	b	43	37
<i>subtilis</i> var. <i>niger</i>	(Spores)	b	42.5	34
<i>thuringiensis</i>	ATCC 10792	abc	34-36	1, 37, 48
<i>Bacteroides</i>				
<i>insolitus</i>	IS 9	a	43	1
<i>insolitus</i>	NL 12	a	41	1
<i>Bifidobacterium bifidum</i>				
<i>longum</i>	(6 strains)	a	57-61.5	49
<i>parvulorum</i>	(2 strains)	a	58-59.5	49
<i>adolescentis</i>	(5 strains)	a	58.5-62	49
<i>breve</i>	(2 strains)	a	58.5-62.5	49
<i>liberorum</i>	(2 strains)	a	59.5-60.5	49
<i>bifidum</i>	(3 strains)	a	61.5-62	49
<i>infantis</i>	(1 strain)	a	61	49
<i>lactensis</i>	(5 strains)	a	58.5-64	49
<i>liberorum-lactensis</i>	(3 strains)	a	59.5-63.5	49
<i>Brucella</i>				
<i>abortus</i>	19 M	bc	55-56	37, 48
<i>abortus</i>	—	a	58	1
<i>Catenabacterium</i>				
<i>catenaforme</i>	1141	a	30	49
<i>catenaforme</i>	1871	a	33	49
<i>catenaforme</i>	194	a	44	49
<i>catenaforme</i>	180	a	47	49
<i>Caulobacter</i>				
<i>bacteroides</i>	CB 6	c	66	45
<i>crescentus</i>	KA 3	c	62	45
<i>fusiformis</i>	CB 37	c	67	45

Table 1 (*cont.*)

Species	Strain	Method	% GC	Ref.
<i>Caulobacter</i> <i>cont.</i>				
<i>henrici</i>	CB 4	c	62	45
<i>henrici</i>	KA 1	c	65	45
<i>intermedius</i>	CB-G	c	65	45
<i>leidy</i> (<i>Asticcacaulis excentricus</i>)	KA 4	c	55	45
<i>subvibrioides</i>	CB 79	c	67	45
<i>vibrioides limonus</i>	CB 21	c	64	45
<i>Cellulomonas biazotea</i>	ATCC 486	b	75	28
<i>Chlorobium</i>				
<i>thiosulfatophilum</i>	—	—	56–58	38
spp.	(6 strains)	bc	51–52·5	32
spp.	(3 strains)	bc	53·5–55	32
spp.	(8 strains)	bc	56·5–58	32
<i>Chondromyces apiculatus</i>	—	c	70	33
<i>Chromatium</i> sp.	K	—	64–66	38
<i>Chromobacterium</i>				
<i>lividum</i>	NCTC 9796	b	65·5	16
<i>lividum</i>	NCTC 7150	b	65·5	16
<i>lividum</i>	NCIB 9230	b	65·6–66	14
<i>lividum</i>	GA	b	71·5	16
<i>lividum</i>	(7 strains)	b	66	14
<i>violaceum</i>	NCTC 9373	b	63·5	16
<i>violaceum</i>	NCTC 9371	b	66	16
<i>violaceum</i>	NCTC 8684	b	67	16
<i>violaceum</i>	NCTC 8685	b	67	16
<i>violaceum</i>	NCTC 9757	b	67	16
<i>violaceum</i>	NCTC 9694	b	67·5	16
<i>Clostridium</i>				
<i>acidiurici</i>	—	abce	25–32	55
<i>bifementans</i>	—	a	32·5	1
<i>butylicum</i>	ATCC 862	c	38	48
<i>butylicum</i>	—	ab	31·5–37·5	55
<i>chauvoei</i>	—	bc	26·5–32	37, 48
<i>cylindrosporum</i>	—	abe	32–32·5	55
<i>kluyveri</i>	—	c	35	48
<i>madisoni</i>	16	bc	26·5–34	37, 48
<i>nigrificans</i>	NCIB 8395	c	48	48
<i>nigrificans</i>	(2 strains)	c	44·5	47
<i>nigrificans</i>	(2 strains)	c	45·5	47
<i>pasteurianum</i>	—	abce	30·5–31·5	55
<i>perfringens</i>	87 b	bc	26·5–32	37, 48
<i>perfringens</i>	(2 strains)	a	27–31	1
<i>saprogenes</i>	—	a	30·5	1
<i>tetani</i>	1	bc	26·5–34	37, 48
<i>tetanomorphum</i>	—	a	39·5	55
<i>valerianicum</i>	—	a	32	1
<i>Corynebacterium</i>				
<i>acnes</i>	(2 strains)	a	48	1, 5
<i>anaerobium</i>	—	a	51·5	5
<i>anaerobium</i>	3103	a	58	49
<i>annamensis</i>	—	a	58	5
<i>avidum</i>	—	a	52	5
<i>bovis</i>	—	a	58	5
<i>cutis commune</i>	—	a	54	5
<i>diphtheriae</i>	(3 strains)	a	52–54·5	1, 5
<i>diphtheroides</i>	—	a	53	5

Table 1 (cont.)

Species	Strain	Method	% GC	Ref.
<i>Corynebacterium</i> cont.				
<i>enzymicum</i>	—	a	51·5	5
<i>equi</i>	—	a	58·5	5
<i>fascians</i>	—	a	54·5	5
<i>granulomatis</i>	—	a	51·5	5
<i>granulosum</i>	—	a	52	5
<i>hepatodystrophicans</i>	—	a	52·5	5
<i>hoagii</i>	—	a	51·5	5
<i>hofmannii</i>	—	a	57	5
<i>humiferum</i>	—	a	54·5	5
<i>kutscheri</i>	—	a	58·5	5
<i>liquefasciens</i>	—	a	51·5	5
<i>lymphophilum</i>	—	a	54	5
<i>michiganense</i>	—	a	53·5	5
<i>minutissimum</i>	—	a	54·5	5
<i>parvum</i>	—	a	58	1, 5
<i>parvum</i>	936 B	a	54·5	49
<i>phocae</i>	—	a	52	5
<i>pseudotuberculosis</i>	—	a	52·5	5
<i>pyogenes</i>	—	a	48·5	5
<i>rathayi</i>	—	a	54	5
<i>renale</i>	—	a	53	5
<i>renale cuniculi</i>	—	a	58	5
<i>vadosum</i>	—	a	57·5	1
<i>xerosis</i>	—	a	55	5
<i>xerosis</i>	ATCC 9016	bc	57·5–59	37, 48
sp.	c 85	a	53	5
sp.	CB 2	a	53	5
sp.	CT 2	a	55·5	5
<i>Cytophaga</i>				
<i>aurantiaca</i>	ATCC 12208	c	42	33
<i>fermentans</i>	ATCC 12470	bc	39–41	33
<i>hutchinsonii</i>	—	c	39	33
<i>johnsonii</i>	MYX 1.1.1	c	33	33
<i>johnsonii</i>	Cook 405	bc	34·5–35	33
sp.	NCMB 11	b	34	16
sp.	NCMB 292	b	33·5	16
sp.	NCMB 275	b	36	16
sp.	NCMB 244	b	63	16
sp.	NCMB 259	b	63·5	16
<i>Desulfovibrio</i>				
<i>aestuarii</i>	NCIB 8380	c	55	48
<i>desulfuricans</i>	NCIB 8303	abc	60–65	47, 48, 51
<i>desulfuricans</i>	NCIB 8319	c	62	47
<i>desulfuricans</i>	NCIB 9442	c	62	47
<i>desulfuricans</i>	NCIB 8311	c	61	47
<i>desulfuricans</i>	NCIB 8386	c	61	47
<i>desulfuricans</i>	NCIB 8305	c	61	47
<i>desulfuricans</i>	NCIB 8302	c	60	47
<i>desulfuricans</i>	NCIB 8446	c	60	47
<i>desulfuricans</i>	NCIB 8387	c	60	47
<i>desulfuricans</i>	NCIB 8401	c	60	47
<i>desulfuricans</i>	NCIB 9335	c	56·5	47
<i>desulfuricans</i>	'V. cholinicus'			
	ATCC 13541	ac	56·5	47, 51
<i>desulfuricans</i>	NCIB 8310	c	55·5	47
<i>desulfuricans</i>	NCIB 8312	c	55·5	47
<i>desulfuricans</i>	NCIB 8391	c	55·5	47

Table 1 (*cont.*)

Species	Strain	Method	% GC	Ref.
<i>Desulfovibrio</i> cont.				
<i>desulfuricans</i>	NCIB 8363	c	55.5	47
<i>desulfuricans</i>	NCIB 8388	c	55.5	47
<i>desulfuricans</i>	NCIB 8393	ac	55.5–57.5	47, 51
<i>desulfuricans</i>	ATCC 7757	c	55.5	47
<i>desulfuricans</i>	NCIB 8380	abc	52.5–56	47, 51
<i>desulfuricans</i>	NCIB 8387	c	54.5	47
<i>desulfuricans</i>	NCIB 8307	c	54.5	47
<i>desulfuricans</i>	NCIB 8322	c	54.5	47
<i>desulfuricans</i>	NCIB 8398	c	46.5	47
<i>desulfuricans</i>	NCIB 8403	bc	44–45.5	47
<i>desulfuricans</i>	NCIB 8365	c	45.5	47
<i>desulfuricans</i>	NCIB 8364	c	45.5	47
<i>desulfuricans</i>	NCIB 8308	c	45.5	47
<i>orientis</i>	NCIB 8382	ac	41.5–42	47, 51
<i>orientis</i>	NCIB 8445	c	41.5	47
sp.	Gigas	a	64.5	51
sp.	NCIB 8395	a	45.5	51
<i>Erwinia</i>				
<i>ananas</i>	—	—	52–54	38
<i>aroideae</i>	—	—	50–52	38
<i>carotovora</i>	17	a	55	22
<i>carotovora</i>	64	a	53.5	22
<i>carotovora</i>	51	a	55	22
<i>carotovora</i>	58	a	54	22
<i>carotovora</i>	3a	a	53.5	22
<i>carotovora</i>	ATCC 8061	bc	50–51.5	37, 48
<i>carotovora</i>	—	a	54	1
<i>chrysanthemi</i>	—	—	52–54	38
<i>cypripedi</i>	—	—	52–54	38
<i>maydis</i>	—	—	50–52	38
<i>milletiae</i>	—	—	52–54	38
<i>nigrificans</i>	—	—	54–56	38
<i>nimipressurabilis</i>	—	—	52–54	38
<i>rhapontica</i>	—	—	50–52	38
<i>Escherichia</i>				
<i>aurescens</i>	—	—	50–52	38
<i>coli</i>	Many strains	{ ATCC 9723 d	—	1, 9, 35, 55
	including	{ ATCC 4157	—	
(<i>Citrobacter</i>) <i>freundii</i>	5610–52	bc	50–53	37, 48
<i>intermedium</i>	—	—	50–52	38
<i>Flavobacterium</i>				
<i>acidificum</i>	—	—	48–50	38
<i>aquatile</i>	ATCC 11947	bc	32.5	9
<i>arborescens</i>	—	—	66–68	38
<i>esteroaromaticum</i>	—	—	68–70	38
<i>flavescens</i>	—	—	66–68	38
<i>odoratum</i>	—	—	34–38	38
<i>suaveoleus</i>	—	—	66–68	38
<i>suaveoleus</i>	ATCC 958	b	64.5	9
<i>uitarumens</i>	—	—	64–66	38
<i>uitarumens</i>	ATCC 10234	b	63.5	9
sp.	NCMB 251	b	35.5	16
sp.	NCMB 289	b	36	16
sp.	NCMB 264	b	36.5	16
sp.	NCMB 249	b	40.5	16

Table 1 (*cont.*)

Species	Strain	Method	% GC	Ref.
<i>Fusobacterium</i>				
<i>fusiforme</i>	—	a	31·5	1
<i>polymorphum</i>	—	a	60	1
<i>Gluconobacter</i>				
<i>capsulatus</i>	NCIB 4943	ab	61·5–62	18
<i>gluconicum</i>	NCIB 4793	b	61·5	18
<i>melanogenus</i>	NCIB 8086	ab	60·5–61	18
<i>melanogenus</i>	116	b	60·5	18
<i>melanogenus</i>	49	b	61	18
<i>suboxydans</i>	NCIB 3734	b	61·5	18
<i>suboxydans</i>	SU	ab	57–58	18
<i>suboxydans</i>	26	ab	61–62	18
<i>viscosus</i>	NCIB 8131	ab	62–63·5	18
<i>Haemophilus</i>				
<i>aegypti</i>	—	bc	39–40	37, 48
<i>gallinarum</i>	ATCC 14385	b	42	46
<i>influenzae</i>	—	ad	38	1, 23
<i>influenzae</i>	—	e	41	56
<i>influenzae</i>	—	bc	39	37, 48
<i>parainfluenzae</i>	—	bc	39	37, 48
<i>suis</i>	3090	b	39	37
<i>Halobacterium</i>				
<i>cutirubrum</i>	(2 bands)	c	58–59, 68	29
<i>salinarum</i>	(2 bands)	c	58, 67	29
<i>salinarum</i>	CCM 2090	bd	65	4
sp.	IE 1	c	55	29
spp.	IV A 2, IV A 3	c	58	29
sp.	II G 2	c	64	29
<i>Klebsiella</i>				
<i>aerogenes</i>	—	—	52–54	38
<i>atlantae</i>	—	—	52–54	38
<i>edwardsii</i>	—	—	52–54	38
<i>pneumoniae</i>	—	bc	55–56	37, 48
<i>pneumoniae</i>	8821/6	—	55	39
<i>rhinoscleromatis</i>	—	—	54–56	38
<i>Lactobacillus</i>				
<i>acidophilus</i>	—	bc	39–42	37, 48
<i>bifidus</i>	—	a	57·5	1
<i>brevis</i>	NCDO 473	b	45·5	6
<i>buchneri</i>	NCDO 110	b	44	6
<i>casei</i> var. <i>alactosus</i>	NCDO 680	b	47·5	6
<i>casei</i> var. <i>casei</i>	NCDO 151	b	46	6
<i>casei</i> var. <i>rhamnosus</i>	NCDO 243	b	47	6
<i>cellobiosus</i>	NCDO 927	b	45·5	6
<i>fermenti</i>	NCDO 215	b	51·5	6
<i>plantarum</i>	NCDO 343	b	43	6
<i>Leptospira</i>				
<i>biflexa</i>	—	—	40–42	38
<i>pomona</i>	—	—	34–38	38
<i>Leuconostoc mesenteroides</i>	ATCC 12291	bc	39–42	37, 48
<i>Listeria monocytogenes</i>	—	bc	38	37, 48
<i>Methanobacterium omelianski</i>	—	a	44	55

Table 1 (*cont.*)

Species	Strain	Method	% GC	Ref.
<i>Micrococcus</i>				
(<i>S.</i>) <i>afermentans</i>	NCTC 7563	b	73	52
(<i>S.</i>) <i>afermentans</i>	NCTC 7503	ab	72-74.5	25
(<i>S.</i>) <i>afermentans</i> Mut. 44	NCTC 7503	ab	72-73	25
(<i>S.</i>) <i>afermentans</i> Mut. 22	NCTC 7503	abd	68-70	25
(<i>S.</i>) <i>afermentans</i>	NCTC 2665	b	73	52
<i>aquivivus</i>	CCM 316	bd	47.5-51	4
<i>asaccharolyticus</i>	—	—	34	1
<i>conglomeratus</i>	CCM 740	bd	53.5-58.5	4
<i>conglomeratus</i>	CCM 2087	bd	64-68.5	4
<i>conglomeratus</i>	CCM 825	b	69.5	4
<i>cryophilus</i>	—	—	38-40	38
(<i>Pediacoccus</i>) <i>cryophilus</i>	CCM 900	bd	41.5-44.5	4
<i>denitrificans</i>	CCM 982	bd	64	4
<i>denitrificans</i>	CCM 1896	bd	66.5-67	4
<i>eucinetus</i>	CCM 2388	bd	47.5-48	4
<i>eucinetus</i>	CCM 2389	bd	49-50.5	4
<i>halodenitrificans</i>	CCM 286	bd	65-66	4
<i>halodenitrificans</i>	—	—	64-66	38
<i>hitoralis</i>	CCM 2226	bd	63.5-65	4
<i>luteus</i>	CCM 132	bd	67-71	4
<i>luteus</i>	CCM 840	bd	71-72	4
<i>luteus</i>	CCM 1674	bd	71-71.5	4
<i>luteus</i>	CCM 337	bd	70-72.5	4
<i>luteus</i>	CCM 169	b	73.5	4
<i>luteus</i>	CCM 410	bd	70-73.5	4
<i>luteus</i>	CCM 149	bd	73-74.5	4
<i>luteus</i>	CCM 409	bd	72-75.5	4
<i>lysodeikticus</i>	—	a	72	1
<i>lysodeikticus</i>	—	e	72	56
<i>lysodeikticus</i>	NRRL B287	bc	72	37, 48
<i>radiodurans</i>	CCM 1700	bd	66-69	4
<i>radiodurans</i>	CCM 1701	bd	65.5	4
<i>radiodurans</i>	—	a	67	42
(<i>S.</i>) <i>roseus</i>	NCTC 7511	b	75	52
(<i>S.</i>) <i>roseus</i>	NCTC 7512	b	73	52
(<i>S.</i>) <i>roseus</i>	CCM 679	bd	68-69	4
(<i>S.</i>) <i>roseus</i>	CCM 837	bd	70	4
(<i>S.</i>) <i>roseus</i>	CCM 385	bd	68-71	4
(<i>S.</i>) <i>roseus</i>	CCM 560	bd	70-71	4
(<i>S.</i>) <i>roseus</i>	CCM 633	bd	69-73	4
sp.	CCM 168	bd	45-49.5	4
sp.	CCM 1405	bd	49.5-50.5	4
<i>Microcycylus</i> sp.	—	—	64-66	38
<i>Micromonospora coerulea</i>	—	a	72	1
<i>Moraxella</i>				
<i>bovis</i>	—	b	41	37
<i>liquefaciens</i>	—	—	40-42	38
<i>koeffii</i>	IP 55112	a	39.5	50
sp. (<i>Vibrio</i> sp. 01)	NCIB 8250	a	39	50
<i>Mycobacterium</i>				
<i>phlei</i>	(2 strains)	a	66.5-68.5	1
<i>phlei</i>	—	bc	66-73	37, 48
<i>smegmatis</i>	—	—	70	38
<i>tuberculosis</i>	(6 strains)	a	62-70	1

Table 1 (*cont.*)

Species	Strain	Method	% GC	Ref.
<i>Mycoplasma</i>				
<i>gallinarum</i>	ATCC 15319	b	28	46
<i>gallisepticum</i>	PPLO A5969	bc	34-35	37, 48
<i>gallisepticum</i>	PPLO A5969	ac	33-33.5	41
<i>gallisepticum</i>	ATCC 15302	b	32.5	46
<i>hominis</i>	0 7	a	46.5	30
<i>laidlawii</i>	Sewage A	bc	31-35.5	43
<i>mycoides</i> var. <i>capri</i>	PG 3	a	24-26	26, 27
<i>pneumoniae</i>	—	bc	39-41	43
sp.	Calf	bc	23.5-26.5	43
sp.	Goat-kid	bc	24-25.5	43
<i>Myxococcus</i>				
<i>fulvus</i>	(2 strains)	bc	69-71	33
<i>virescens</i>	(4 strains)	bc	68-71	33
<i>xanthus</i>	(2 strains)	bc	68-71	33
<i>xanthus</i>	—	b	68.5	28
spp.	(2 strains)	c	69	33
<i>Neisseria</i>				
<i>catarrhalis</i>	Ne 11	a	40.5	7
<i>catarrhalis</i>	Ne 13	abc	40-42	7, 37, 48
<i>flava</i>	JJ IIA	a	49.5	7
<i>flavescens</i>	ATCC 13120	abc	47-49.5	7, 37, 48
<i>gonorrhoeae</i>	—	a	49.5	1
<i>meningitidis</i>	Ne 15	abc	50-51.5	7, 37, 48
<i>meningitidis</i>	—	a	50.5	1
<i>perflava</i>	Ne 16	abc	48-50.5	7, 37, 48
<i>perflava</i>	Ne 20	a	50	7
<i>sicca</i>	Ne 12	abc	49-51.5	7, 37, 48
<i>subflava</i>	ATCC 11076	a	50.5	7
<i>Nitrosomonas</i> sp.	—	—	54-56	38
<i>Nocardia</i>				
<i>asteroides</i>	92	b	66	28
<i>asteroides</i>	96	b	64	28
<i>asteroides</i>	IMRU 727	c	69.5	24
<i>brasiliensis</i>	301	b	65	28
<i>citreus</i>	—	a	72	1
<i>farcinica</i>	2089	b	68.5	28
<i>Orskov's motile nocardia</i>	ATCC 12288	b	74	28
<i>Paracolobactrum</i>				
<i>aerogenoides</i>	McK	bc	54-55	37, 48
(<i>B. paracoli</i>)	—	ab	54-58	25
(<i>B. paracoli</i>)	Mut. 52-1	ab	75.5	25
(<i>B. paracoli</i>)	Mut. CU-15	b	54.5	25
(<i>B. paracoli</i>)	Mut. BU-12	b	54	25
<i>Pasteurella</i>				
<i>aviseptica</i>	—	a	36.5	1
<i>bovis septica</i>	—	a	37.5	1
<i>pestis</i>	EV 79	c	47	48
<i>pestis</i>	AVO2	b	46	37
<i>pestis</i>	EV6	b	46	37
<i>tularensis</i>	—	abc	33-36	1, 37, 48
<i>Pediococcus cerevisiae</i>	CCM 833	bd	44.5	4
<i>Polyangium cellulosum</i>	—	—	68-70	38

Table 1 (*cont.*)

Species	Strain	Method	% GC	Ref.
<i>Propionibacterium arabinosum</i>	NCIB 5958	a	70.5	49
<i>freudenreichii</i>	NCIB 5959	a	67	49
<i>pentosaceum</i>	NCIB 8070	a	68	49
<i>shermanii</i>	NCIB 8099	a	67	49
<i>technicum</i>	NCIB 5965	a	66.5	49
<i>thoenii</i>	NCIB 8072	a	67.5	49
<i>zeae</i>	NCIB 8100	a	67.5	49
<i>Proteus</i>				
<i>mirabilis</i>	35	bc	38-41	37, 48
<i>mirabilis</i>	ATCC 14273	b	39.5	46
<i>mirabilis</i> L form	ATCC 14166	b	39.5	46
<i>morganii</i>	—	a	53	1
<i>morganii</i>	ATCC 8019	bc	51-51.5	37, 48
<i>rettgeri</i>	3478	bc	39.5-42	37, 48
<i>vulgaris</i>	(2 strains)	a	36.5-40.5	1
<i>vulgaris</i>	ATCC 9484	bc	37-39	37, 48
<i>Providencia</i> group	—	—	40-42	38
<i>Pseudomonas</i>				
<i>acidovorans</i>	ATCC 15666	bc	60.5-62	8
<i>acidovorans</i>	ATCC 15667	bc	61.5	8
<i>acidovorans</i>	ATCC 15668	bc	64-64.5	8
<i>aeruginosa</i>	NRRL B23	bc	66-68	37, 48
<i>aeruginosa</i>	ATCC 8707	bc	64	9
<i>aeruginosa</i>	ATCC 8689	b	64.5	9
<i>aeruginosa</i>	(4 strains)	a	64-67	1
<i>atlantica</i>	—	c	55	10
<i>chlororaphis</i>	NRRL B 560	bc	64	9
<i>chlororaphis</i>	NRRL B977	bc	61	9
<i>cruciviae</i>	—	—	40-42	38
<i>cruciviae</i>	ATCC 13262	bc	36-37.5	8
<i>denitrificans</i>	ATCC 12133	bc	56.5-57.5	8
<i>desmolytica</i>	ATCC 15005	bc	64.5-66	8
<i>diminuta</i>	—	—	66-68	38
<i>diminuta</i>	ATCC 11568	c	64.5	8
<i>fluorescens</i>	ATCC 949	bc	60-62	37, 48
<i>fluorescens</i>	ATCC 12121	b	64	9
<i>fluorescens</i>	ATCC 10796	b	64.5	9
<i>fluorescens</i>	ATCC 12633	bc	61	9
<i>fluorescens</i>	ATCC 13034T	bc	63.5-64.5	8
<i>fluorescens</i>	CCEB 448	b	62.5	16
<i>fluorescens</i>	B/s 1000	a	63-64	1
<i>fragi</i>	ATCC 4973	bc	57.5-62	8
<i>geniculata</i>	CCEB 338	b	67.5	16
<i>iodinum</i>	ATCC 15729	bc	61-62.5	8
<i>iodinum</i>	ATCC 15728	bc	61.5-62.5	8
<i>iodinum</i>	ATCC 9897	bc	63.5	8
<i>indoloxidans</i>	ATCC 9355	bc	64.5-66.5	8
<i>maltophilia</i>	ATCC 13843	c	64.5	8
<i>maltophilia</i>	ATCC 13636	c	64.5	8
<i>maltophilia</i>	ATCC 13637	c	64.5	8
<i>maltophilia</i>	—	—	66-68	38
<i>marginalis</i>	ATCC 10858	bc	57.5-58.5	8
<i>oleovorans</i>	—	—	60-62	38
<i>ovalis</i>	ATCC 950	bc	64.5	8
<i>piscicida</i>	(1 strain)	c	43.5	36
<i>piscicida</i>	(5 strains)	c	44	36
<i>piscicida</i>	(7 strains)	c	44.5	36

Table 1 (cont.)

Species	Strain	Method	% GC	Ref.
<i>Pseudomonas</i> cont.				
<i>piscicida</i>	ATCC 15251	c	44.5	36
<i>piscicida</i>	(4 strains)	c	45	36
<i>piscicida</i>	(2 strains)	c	45.5	36
<i>putida</i>	CCEB 520	b	64	16
<i>putida</i>	101	b	63.5	16
<i>putida</i>	ATCC 4359	bc	58.5–59.5	8
<i>putrefaciens</i>	ATCC 8071	bc	43.5–45.5	8
<i>reptilovora</i>	ATCC 11252	bc	61.5–64	8
<i>saccharophila</i>	—	—	68–70	38
<i>stutzeri</i>	—	bc	64.5	8
<i>syncyanea</i>	ATCC 9979	bc	61.5–62.5	8
<i>tabaci</i>	—	a	67.5	1
<i>testosteroni</i>	RH 1104	bc	59.5–60.5	8
sp.	E 89 a	bc	59.5–61	8
<i>Ramibacterium ramosum</i>	—	a	30	1
<i>Rhizobium</i>				
<i>japonicum</i>	555	bc	61–63	37, 48
spp. Peritrichous flagellation	(20 strains)	b	59–63	17
spp. Subpolar flagellation	(15 strains)	b	61.5–65.5	17
<i>Rhodospirillum rubrum</i>	ATCC 11170	bc	60–67	37, 48
<i>Rickettsia</i>				
<i>burneti</i>	—	a	44.5	53
<i>burneti</i>	Paretsky	abc	42–45	37, 48, 58
<i>prowazekii</i>	—	a	32.5	58
<i>Ristella (Bacteroides) clostridiiformis</i>	—	a	31	1
<i>Salmonella</i>				
<i>abony</i>	—	—	50–52	38
<i>arizona</i>	PC 145	bc	50–53	37, 48
<i>ballerup</i>	—	b	51.5	37
<i>enteritidis</i>	(2 strains)	a	50	1
<i>gallinarum</i>	—	a	50	1
<i>paratyphi A</i>	—	a	50	1
<i>typhi</i>	643, ETS 9	bc	50–52	37, 48
<i>typhi</i>	—	a	53	1
<i>Saprospira grandis</i>	—	a	44–46	38
<i>Sarcina</i>				
<i>aurantiaca</i>	CCM 836	bd	64–68.5	4
<i>flava</i>	ATCC 540	a	70	31
<i>flava</i>	—	a	68.5	1
<i>lutea</i>	26 c	bc	68–72	37, 48
<i>lutea</i>	(2 strains)	a	72–74	1
<i>lutea</i>	—	a	64	1
(<i>Sporosarcina</i>) <i>ureae</i>	c1	ab	40–41.5	31
(<i>Sporosarcina</i>) <i>ureae</i>	752	b	40	31
(<i>Planosarcina</i>) <i>ureae</i>	—	—	38–40	38
<i>Serratia</i>				
<i>indica</i>	ATCC 4003	b	58	11
<i>kiliensis</i>	ATCC 992	b	53.5	11
<i>marinoruber</i>	—	b	56.5	11
<i>marcescens</i>	—	b	54	11
<i>marcescens</i>	ATCC 4261	b	55	11
<i>marcescens</i>	—	b	55.5	11
<i>marcescens</i>	(3 strains)	b	56.5	11
<i>marcescens</i>	ATCC 4013	b	57	11

Table 1 (*cont.*)

Species	Strain	Method	% GC	Ref.
<i>Serratia</i> cont.				
<i>marcescens</i>	(5 strains)	b	57	11
<i>marcescens</i>	ATCC 13880	b	57·5	11
<i>marcescens</i>	—	bc	57·5–59	37, 48
<i>marcescens</i>	(6 strains)	b	58	11
<i>marcescens</i>	ATCC 274	b	58	11
<i>marcescens</i>	—	a	58	1
<i>marcescens</i>	ATCC 990	b	58·5	11
<i>marcescens</i>	ATCC 990			
	variant	b	58·5	11
<i>marcescens</i>	(5 strains)	b	58·5	11
<i>marcescens</i>	—	a	59	1
<i>marcescens</i> subsp. <i>kiliensis</i>	ATCC 8101	b	58·5	11
<i>marcescens</i> var. <i>kiliensis</i>	ATCC 11111	b	59	11
<i>plymouthica</i> (<i>plymouthicum</i>)	ATCC 183	b	57·5	11
<i>Shigella</i>				
<i>dispar</i>	—	—	50–52	38
<i>dysenteriae</i>	—	a	53·5	1
<i>dysenteriae</i>	15	bc	50–51	37, 48
<i>paradysenteriae</i>	Flexner Y 6 R 0	a	49·5	1
<i>paradysenteriae</i>	Flexner Y 6 R 4	a	49	1
<i>sonnei</i>	—	a	50–52	38
<i>Sorangium</i>				
<i>cellulosum</i>	PY	c	69	33
<i>cellulosum</i>	PX	c	69	33
<i>Sphaerophorus</i>				
<i>necrophorus</i>	—	c	31	19
sp.	—	c	38	19
<i>Spirillum</i>				
<i>anulus</i>	—	—	54–56	38
<i>atlanticum</i>	NCMB 55	a	50·5	50
<i>itersonii</i>	—	—	54–56	38
<i>itersonii</i> var. <i>vulgatum</i>	NCIB 9071	a	57	50
<i>linum</i>	—	—	28–30	38
<i>polymorphum</i>	NCIB 9072	a	61·5	50
<i>serpens</i> var. <i>azotum</i>	NCIB 9011	a	54	50
<i>serpens</i> var. <i>serpens</i>	NCIB 8658	a	49	50
<i>sinuosum</i>	NCIB 9010	a	61·5	50
sp. Veron	63 D	a	61	50
<i>Sporocytophaga myxococcoides</i>	(2 strains)	bc	36	33
<i>Staphylococcus</i>				
<i>aureus</i>	ATCC 6538P	a	37·5	1
<i>aureus</i>	ATCC 14778	a	31	1
<i>aureus</i>	NCTC 8345	a	31·5	1
<i>aureus</i>	NCTC 4163	b	31	52
<i>aureus</i>	NCTC 8532	b	31	52
<i>aureus</i>	NCTC 6571	b	32	52
<i>aureus</i>	NCTC 4136	b	33	52
<i>aureus</i>	(5 strains)	a	30·5–40	1
<i>aureus</i>	NRRL B 313	bc	34	37, 48
<i>aureus</i> (coagulase —)	CCM 313	bd	30–32·5	4
<i>aureus</i> (coagulase —)	CCM 641	bd	33·5–35	4
<i>aureus</i> (coagulase —)	CCM 127	bd	30–34	4
<i>aureus</i> (coagulase —)	CCM 529	bd	34	4
<i>lactis</i>	NCTC 189	b	32	52
<i>lactis</i>	NCTC 7944	b	36·5	52
<i>lactis</i>	NCTC 7564	b	69	52

Table 1 (cont.)

Species	Strain	Method	% GC	Ref.
<i>Staphylococcus</i> cont.				
<i>saprophyticus</i> (<i>epidermidis</i>)	—	a	35	1
<i>saprophyticus</i>	NCTC 7292	b	31·5	52
<i>saprophyticus</i>	NCTC 7612	b	31	52
<i>saprophyticus</i>	CCM 901	bd	35·5–39	4
<i>Streptococcus</i>				
<i>bovis</i>	—	—	38–40	38
<i>cremoris</i>	—	—	38–40	38
<i>faecalis</i>	D 10	c	38	48
<i>faecalis</i>	—	a	34·5–38·5	1
<i>faecium</i>	—	—	34–38	38
<i>foetidus</i>	—	a	33·5	1
<i>liquefaciens</i>	—	—	34–38	38
<i>pneumoniae</i>	—	a	38·5	1
<i>pneumoniae</i>	ATCC 11733	bc	39–42	37, 48
<i>pyogenes</i>	—	a	33·5	1
<i>pyogenes</i>	—	—	38–40	38
<i>salivarius</i>	—	bc	39–42	37, 48
<i>sanguis</i>	—	—	38–40	38
<i>viridans</i>	—	—	38–40	38
<i>zymogenes</i>	—	a	33·5	1
sp. Group G	D-166 B	c	41	48
sp. Group A	—	a	34·5	44
sp. Group A, L form	—	a	33·5	44
<i>Streptomyces</i>				
<i>albus</i>	ATCC 618	c	71·5	24
<i>albus</i>	1685	b	73	28
<i>albus</i>	G	bc	71–74	37, 48
<i>bobilliae</i>	ATCC 3310	c	70·5	24
<i>diastaticus</i>	NRRL B-1270	c	70·5	24
<i>flaveolus</i>	ATCC 3319	c	70·5	24
<i>fradiae</i>	ATCC 10745	c	72·5–73·5	24
<i>fradiae</i>	3556	b	72	28
<i>globisporus</i>	—	a	73·5	1
<i>griseolus</i>	ATCC 3325	c	70·5	24
<i>griseus</i>	ATCC 10173	c	71·5	24
<i>griseus</i>	—	a	73	1
<i>griseus</i>	104	b	69·5	28
<i>intermedius</i>	ATCC 3329	c	69·5	24
<i>kentuckensis</i>	ATCC 12691	c	69·5	24
<i>niveus</i>	345	b	67	28
<i>parvulus</i>	ATCC 12434	c	71·5	24
<i>parvus</i>	ATCC 12429	c	70·5	24
<i>streptomycini</i>	—	a	73	1
<i>venezuelae</i>	13	b	69	28
<i>violaceoruber</i>	199	b	71	28
<i>viridochromogenes</i>	—	ab	73–74	1, 28
<i>viridochromogenes</i>	93	bc	70–74	37, 48
<i>Streptosporangium</i>				
<i>roseum</i>	27b	b	68·5	28
sp. (thermophilic)	11	bc	49–53·5	13
<i>Streptoverticillium cinnamomeus</i>	—	b	67	28
<i>Thermoactinopolyspora</i>				
sp.	6	b	77·5	13
sp.	10	b	74	13
<i>Thermomonospora</i>				
sp.	5	b	74	13
sp.	7	bc	44	13

Table 1 (*cont.*)

Species	Strain	Method	% GC	Ref.
<i>Thiobacillus</i>				
<i>novellus</i>	CCM 1077	bd	58-59	4
<i>thioparus</i>	—	—	68-70	38
<i>Treponema pallidum</i>	—	—	34-38	38
<i>Veillonella parvula</i>	—	a	36.5	1
<i>Vibrio</i>				
<i>alcaligenes</i>	NCTC 9239	a	65	50
<i>anguillarum</i>	NCMB 6	a	44.5	50
(<i>Campylobacter</i>) <i>bubulus</i>	IP 53103	a	29.5	50
(<i>Campylobacter</i>) <i>bubulus</i>	IP 5421	a	29.5	50
(<i>Campylobacter</i>) <i>bubulus</i>	IP 5422	a	30.5	50
(<i>Campylobacter</i>) <i>bubulus</i>	IP 5420	a	31	50
<i>cholonicus</i>	—	—	56-58	38
<i>comma (cholerae)</i>	—	a	43.5	1
<i>comma (cholerae)</i>	ATCC 9459	bc	47-49	10, 37, 48
<i>comma (cholerae)</i> and El Tor	(30 strains)	bc	46-47	12
<i>costicolus</i>	NCMB 1001	a	50	50
<i>cuneatus</i>	ATCC 6972	b	61	9
<i>cuneatus</i>	NCIB 8194	a	62.5	50
<i>cyclocistes</i>	NCIB 2581	a	64	50
(<i>Campylobacter</i>) <i>fetus</i>	IP 5396	a	33	50
(<i>Campylobacter</i>) <i>fetus</i>	IP 5443	a	34.5	50
(<i>Campylobacter</i>) <i>fetus</i>	IP 5395	a	35.5	50
<i>ichthyoderms</i>	NCMB 407	a	61	50
<i>marinus</i>	ATCC 15381	c	40	10
<i>marinus</i>	ATCC 15382	c	42	10
<i>metschnikovii</i>	ATCC 7708	bc	43-43.5	9, 10
<i>metschnikovii</i>	IP A267	a	46	50
<i>neocistes</i>	NCIB 2582	a	63.5	50
<i>neocistes</i>	RH 1810	bc	63.5-64.5	8
<i>percolans</i>	ATCC 8461	b	65	9
<i>percolans</i>	NCTC 1937	a	64.5	50
<i>percolans (Comamonas</i>				
<i>terrigena)</i>	RH 260	bc	61.5-62.5	8
<i>succinogenes</i>	—	a	49	50
<i>tyrogenes</i>	ATCC 7085	b	61.5	9
sp. (comma-like)	IP 5638	a	45.5	50
sp. (comma-like)	NCTC 4711	a	47	50
sp. (comma-like)	NCTC 4715	a	47.5	50
sp. (comma-like)	NCTC 8042	a	47.5	50
sp.	329	c	39	10
sp.	822	c	43	10
sp.	859	c	48	10
<i>Xanthomonas</i>				
<i>begoniae</i>	B 3	b	67	16
<i>campestris</i>	C 129	b	68	16
<i>carotae</i>	C 104	b	67	16
<i>carotae</i>	D 230	b	67.5	16
<i>hederae</i>	XH 5	b	62	9
<i>hederae</i>	H 1	b	67	16
<i>juglandis</i>	J 107	b	66	16
<i>pelargonii</i>	J.Koths	b	62.5	9
<i>pelargonii</i>	P 121	b	66.5	16
<i>phaseoli</i>	XP 163	b	63	9
<i>phaseoli</i>	XP 8	b	63	9
<i>phaseoli</i>	P 162	b	66	16
<i>pisi</i>	XP 171	b	64	9
<i>tamarindi</i>	T 20	b	67.5	16
<i>vesicatoria</i>	V 136	b	66.5	16

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