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Title	Release of an accessible database of MALDI-TOF spectra of strains investigated
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Abstract	<p>Considering the increasing impact of MALDI-TOF MS on the identification and typing of microorganisms this technique appears to be of great promise for quality control and research purposes in resource centres and laboratories handling high numbers of bacterial strains. In order to support the introduction of this fast and reliable identification method in European culture collections, deliverable D.15.33 of Subtask JRA2.1.3 was dedicated to the creation of a MALDI-TOF MS database of bacterial protein patterns for public use.</p> <p>After internal quality control, a total of 1150 profiles have been made publicly available for download. The spectra represent strains of the suborder <i>Micrococccineae</i> (172) and the following genera and families: <i>Acetobacter</i> (22), <i>Aeromonas</i> (71), <i>Carnobacterium</i> (26), <i>Lactobacillus</i> (491), <i>Lactococcus</i> (9), <i>Leuconostocaceae</i> (108), <i>Pediococcus</i> (18), <i>Propionibacterium</i> (14), <i>Pseudomonas</i> (142) and <i>Vibrionaceae</i> (77).</p>
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Abbreviation key

MALDI-TOF Matrix Assisted Laser Desorption Ionization Time-of-Flight

MS Mass Spectrometry

1 Background and Objectives

Bacterial taxonomy is still a challenging domain (Godfray, H.C.J., 2002. Challenges for taxonomy; *Nature*, 417(6884), 17-19. Cohan, F., 2002. What are bacterial species? *Annual Review of Microbiology*, 56, 457-487). During the last decade MALDI-TOF MS has found increasing application in clinical diagnosis and systematics and appears to be of great promise for quality assurance and research purposes in resource centres. The first attempt to use mass spectrometry to identify bacteria was proposed in 1975 (Anhalt & Fenselau, 1975). At the beginning, the targeted molecules were very small (<300D) or between 600 and 1000D for bacterial polar lipids, and the analysis was most often applied to lysed bacteria. **The idea to target the bacterial proteins and to use whole cells by applying a MALDI source started only in years 1995-1995 with in particular the paper of Holland *et al.* 1996.** Since that time, many attempts were made to identify gram negative or gram positive bacteria, highlighting the importance of sample preparation, and of reproducibility of spectra. **An exhaustive bibliography of this subject since that date is presented in a specific section below.** All papers underlined the great potential of MALDI-TOF in terms of bacterial identification, even sometimes on sub species and strain differentiation.

In order to support the introduction of this fast and reliable identification method in European culture collections, deliverable D15.33 of sub-task JRA2.1.3 was dedicated to the creation of a public MALDI-TOF MS database of bacterial protein patterns for reference and identification purposes.

2 Methods

2.1 Strains

After internal quality control, a total of 1150 profiles have been made publicly available for download. The spectra represent strains of the suborder *Micrococccineae* (172) and the following genera and families: *Acetobacter* (22), *Aeromonas* (71), *Carnobacterium* (26), *Lactobacillus* (491), *Lactococcus* (9), *Leuconostocaceae* (108), *Pediococcus* (18), *Propionibacterium* (14), *Pseudomonas* (142) and *Vibrionaceae* (77).

These species were chosen because either for their technological interest or for the daily challenge to identify them correctly.

See annex 1 of this document for the detailed list of strains.

Strains were recovered and cultivated using the medium and incubation conditions recommended in the respective on-line catalogues (www.cect.org, www.dsmz.de, www.crbip.pasteur.fr, www.belspo.be). The biomass was collected from agar plates.

2.2 Sample preparation

Sample preparation for MALDI-TOF MS was carried out according to the ethanol/formic acid extraction protocol recommended by Bruker Daltonics (<http://www.bdal.de>): ca. 10 mg biomass (5-10 mg for CIP) from agar cultures was first suspended in 300 µl water by careful mixing. Then the suspension was mixed with 900 µl ethanol. The biomass was collected by centrifugation and the pellet was re-suspended in 50 µl 70% formic acid. The suspension was mixed carefully with 50 µl acetonitrile (ACN). Immediately after centrifugation the supernatant was removed and aliquots of 1-1.5 µl were placed on each spot of a stainless-steel target plate. After air-drying 1-2 µl matrix solution (saturated solution of α -cyano-4-hydroxycinnamic acid in 50% aqueous ACN containing 2.5% trifluoroacetic acid) is added.

2.3 Instrumentation

The spectra were recorded with different models of mass spectrometers: Reflex IV (Bruker Daltonics), Autoflex speed (Bruker Daltonics) and Microflex L20 (Bruker Daltonics) respectively for CECT, CIP and DSMZ. Spectra of LMG strains were recorded at DSMZ by using cell extracts obtained from LMG.

The instruments are equipped with a N₂ laser. All spectra were recorded in linear, positive mode. The acceleration voltage was 20 kV. Spectra were collected as a sum of 250 (240 for CECT) shots across a spot. A mass range of 2,000-20,000 *m/z* was used for analysis.

The following ribosomal proteins of *E. coli* DSM 498 (=ATCC 23716 = IMG 1711; K-12 wildtype) were used for calibration: RL36 4364.33 Da; RS32 5095.82 Da; RS34 5380.39 Da; RS33m 6254.39 Da, RL32 6315.19 Da; RL30 6410.60 Da; RL35 7157.74 Da; RL29 7273.45 Da; RS21 8368.76 Da; RS15 10137.57 Da; RS19 10299.09 Da.

2.4 Spectra

The vast majority of profiles were represented by 12 to 16 spectra (repetitions).

The Flexanalysis software (Bruker Daltonics) was used for baseline subtraction, smoothing of spectra and mass labelling of peaks. Spectra with maximal peak intensities of 2000 or less were deleted.

3 Access to the database of MALDI-TOF mass spectra of bacteria

3.1 Terms of usage

Users of the database are requested to acknowledge the project that enabled the built of the public database: The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7, 2007-2013), Research Infrastructures action, under the grant agreement No. FP7-228310 (EMbaRC project).

3.2 Download of mass spectra

The database of MALDI-TOF mass spectra of bacterial strains is hosted by the FTP-server of UVEG-CECT. The database can be downloaded in full or in part (per taxonomic groups) after requesting a username and password by writing to the email address maldi_embarc@cect.org.

The user obtains an attached list displaying the database content and the necessary login and download information by the following email message:

"Dear user,

Thank you for your interest in the EMbaRC MALDI-TOF mass spectra database.

The database is organized into folders per taxonomic groups: one suborder (*Micrococcineae*), two families (*Leuconostocaceae* and *Vibrionaceae*), and eight genera (*Acetobacter*, *Aeromonas*, *Carnobacterium*, *Lactobacillus*, *Lactococcus*, *Pediococcus*, *Propionibacterium* and *Pseudomonas*). The number of spectra and the coverage they represent within each group is variable (you may check it at the excel file attached).

In order to reduce the time for downloading, all folders are compressed to rar-files.

To access the ftp server follow the link <ftp://cect.uv.es/>

Alternatively you may copy and paste it into your web browser or your file browser.

Username: XxXxX

Password: XxXxX

(Note that both are case sensitive)

Once saved in your computer you can mix spectra from different folders at your convenience or delete the ones you do not need.

As far as we are aware, the spectra are only compatible with the analysis software Biotyper (Bruker Daltonics).

Yours sincerely,

...."

After download of the spectra to the computer the user needs the appropriate software (Biotyper, Bruker) for handling and analysing the profiles.

4 Conclusion

The database of MALDI-TOF mass spectra of bacteria was created in two periods of Subtask JRA 2.1.3.: The first period was dedicated to the strain authentication and identification of accurate and misclassified / mislabeled strains in consortium holdings of the participating culture collections (see Deliverable D15.15). In the course of this study, spectra of 451 equivalent strains were recorded which were included into the database. The inclusion of synonymous strains deposited in parallel in the participating collections gives an insight into the range of spectra variability of a particular strain. In the second period, the participants accumulated 699 additional spectra of strains of their individual research interests. This strategy resulted in a database of spectra that represent strains of practical relevance for reference and identification purposes and is valuable for the research activities of the participating institutions. Its portfolio makes the database of MALDI-TOF mass spectra of bacteria generated in the course of Subtask JRA2.1.3. attractive also for external users.

5 Literature about bacterial identification by mass spectrometry

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6 Significance of this deliverable

MALDI-TOF MS is of great promise for the identification and typing of microbial strains and the most recent literature was provided here.

This collaborative work described in this workpackage provides a set of quality control profiles (1150 profiles from 11 genus) that is publicly available and can be download by scientists for the implementation of this new identification approach.

7 Annex 1: Species and strains represented in the database by MALDI-TOF mass spectra

7.1 Genus *Acetobacter*

Name

<i>Acetobacter aceti</i>	CECT 298 ^T
<i>Acetobacter aceti</i>	DSM 2002
<i>Acetobacter cerevisiae</i>	DSM 14362 ^T
<i>Acetobacter cibirongensis</i>	DSM 15549 ^T
<i>Acetobacter estunensis</i>	DSM 04493 ^T
<i>Acetobacter indonesiensis</i>	DSM 15552 ^T
<i>Acetobacter lovaniensis</i>	DSM 04491 ^T
<i>Acetobacter malorum</i>	DSM 14337 ^T
<i>Acetobacter oeni</i>	CECT 5830 ^T
<i>Acetobacter oeni</i>	DSM 23926 ^T
<i>Acetobacter orientalis</i>	DSM 15550 ^T
<i>Acetobacter orleanensis</i>	DSM 04492 ^T
<i>Acetobacter pasteurianus</i>	DSM 2006
<i>Acetobacter pasteurianus</i>	DSM 2324
<i>Acetobacter pasteurianus</i>	DSM 2347
<i>Acetobacter pasteurianus</i>	DSM 46617
<i>Acetobacter pasteurianus</i>	DSM 46618
<i>Acetobacter pasteurianus</i>	DSM 46619
<i>Acetobacter pomorum</i>	DSM 11825 ^T
<i>Acetobacter senegalensis</i>	DSM 18889 ^T
<i>Acetobacter syzygii</i>	DSM 15548 ^T
<i>Acetobacter tropicalis</i>	DSM 15551 ^T

Origin and number of strains

CECT	2
DSM	20
TOTAL	22

7.2 Genus *Aeromonas*

Name

<i>Aeromonas allosaccharophila</i>	CECT 4220
<i>Aeromonas allosaccharophila</i>	CECT 4911
<i>Aeromonas aquariorum</i>	CECT 7289 ^T
<i>Aeromonas bestiarum</i>	CECT 4227 ^T
<i>Aeromonas bestiarum</i>	CECT 5219
<i>Aeromonas bestiarum</i>	CECT 7451
<i>Aeromonas bivalvium</i>	CECT 7112
<i>Aeromonas bivalvium</i>	CECT 7113 ^T
<i>Aeromonas caviae</i>	CECT 4226
<i>Aeromonas caviae</i>	CECT 838 ^T
<i>Aeromonas diversa</i>	CECT 4254 ^T
<i>Aeromonas encheleia</i>	CECT 4342 ^T
<i>Aeromonas encheleia</i>	CECT 4985
<i>Aeromonas encheleia</i>	CECT 5027
<i>Aeromonas enteropelogenes</i>	CECT 4255
<i>Aeromonas enteropelogenes</i>	CECT 4487 ^T
<i>Aeromonas enteropelogenes</i>	CECT 4935
<i>Aeromonas enteropelogenes</i>	CECT 4937
<i>Aeromonas eucrenophila</i>	CECT 4224 ^T
<i>Aeromonas eucrenophila</i>	CECT 4827
<i>Aeromonas eucrenophila</i>	CECT 4855
<i>Aeromonas fluvialis</i>	CECT 7401 ^T
<i>Aeromonas hydrophila</i> subsp. <i>anaerogenes</i>	CECT 4221 ^T
<i>Aeromonas hydrophila</i> subsp. <i>anaerogenes</i>	CECT 4588
<i>Aeromonas hydrophila</i> subsp. <i>dhakensis</i>	CECT 5743
<i>Aeromonas hydrophila</i> subsp. <i>dhakensis</i>	CECT 5744 ^T
<i>Aeromonas hydrophila</i> subsp. <i>dhakensis</i>	CECT 5745
<i>Aeromonas hydrophila</i> subsp. <i>hydrophila</i>	CECT 398
<i>Aeromonas hydrophila</i> subsp. <i>hydrophila</i>	CECT 4330
<i>Aeromonas hydrophila</i> subsp. <i>hydrophila</i>	CECT 839 ^T
<i>Aeromonas ichthiosmia</i>	CECT 4486 ^T
<i>Aeromonas jandaei</i>	CECT 4228 ^T

<i>Aeromonas jandaei</i>	CECT 4229
<i>Aeromonas jandaei</i>	CECT 4231
<i>Aeromonas jandaei</i>	CECT 4335
<i>Aeromonas media</i>	CECT 4232 ^T
<i>Aeromonas molluscorum</i>	CECT 5864 ^T
<i>Aeromonas molluscorum</i>	CECT 5865
<i>Aeromonas molluscorum</i>	CECT 5868
<i>Aeromonas piscicola</i>	CECT 7443 ^T
<i>Aeromonas popoffii</i>	CECT 4995
<i>Aeromonas popoffii</i>	CECT 5176 ^T
<i>Aeromonas popoffii</i>	CECT 5250
<i>Aeromonas salmonicida</i> subsp. <i>achromogenes</i>	CECT 4238
<i>Aeromonas salmonicida</i> subsp. <i>achromogenes</i>	CECT 4239
<i>Aeromonas salmonicida</i> subsp. <i>achromogenes</i>	CECT 895 ^T
<i>Aeromonas salmonicida</i> subsp. <i>masoucida</i>	CECT 896 ^T
<i>Aeromonas salmonicida</i> subsp. <i>pectinolytica</i>	CECT 5752 ^T
<i>Aeromonas salmonicida</i> subsp. <i>salmonicida</i>	CECT 5209
<i>Aeromonas salmonicida</i> subsp. <i>salmonicida</i>	CECT 894 ^T
<i>Aeromonas salmonicida</i> subsp. <i>smithia</i>	CECT 5179 ^T
<i>Aeromonas salmonicida</i> subsp. <i>pectinolytica</i>	CECT 5753
<i>Aeromonas schubertii</i>	CECT 4240 ^T
<i>Aeromonas schubertii</i>	CECT 4241
<i>Aeromonas schubertii</i>	CECT 4934
<i>Aeromonas sobria</i>	CECT 4245 ^T
<i>Aeromonas sobria</i>	CECT 837
<i>Aeromonas sobria</i>	CECT 4835
<i>Aeromonas</i> sp.	CECT 7080
<i>Aeromonas</i> sp.	CECT 7081
<i>Aeromonas</i> sp.	CECT 7083
<i>Aeromonas</i> sp.	CECT 7084
<i>Aeromonas</i> sp.	CECT 7444
<i>Aeromonas</i> sp.	CECT 8029
<i>Aeromonas tecta</i>	CECT7082 ^T
<i>Aeromonas veronii</i>	CECT 4199
<i>Aeromonas veronii</i>	CECT 4257 ^T
<i>Aeromonas veronii</i>	CECT 4819
<i>Aeromonas veronii</i>	CECT 4910
<i>Aeromonas veronii</i>	CECT 5761 ^T

Origin and number of strains

CECT

71

7.3 Genus *Carnobacterium*

Name

<i>Carnobacterium alterfunditum</i>	CECT 5892 ^T
<i>Carnobacterium alterfunditum</i>	DSM 5972 ^T
<i>Carnobacterium alterfunditum</i>	DSM 5973
<i>Carnobacterium divergens</i>	CECT 4016 ^T
<i>Carnobacterium divergens</i>	DSM 20589
<i>Carnobacterium divergens</i>	DSM 20623 ^T
<i>Carnobacterium divergens</i>	DSM 20625
<i>Carnobacterium funditum</i>	CECT 5893 ^T
<i>Carnobacterium funditum</i>	DSM 5970
<i>Carnobacterium funditum</i>	DSM 5971
<i>Carnobacterium gallinarum</i>	CECT 5958 ^T
<i>Carnobacterium gallinarum</i>	DSM 4847
<i>Carnobacterium inhibens</i>	CECT 5963 ^T
<i>Carnobacterium inhibens</i>	DSM 13024
<i>Carnobacterium maltaromaticum</i>	DSM 20342
<i>Carnobacterium maltaromaticum</i>	DSM 20344
<i>Carnobacterium maltaromaticum</i>	DSM 20590
<i>Carnobacterium maltaromaticum</i>	DSM 20624
<i>Carnobacterium maltaromaticum</i>	DSM 20722
<i>Carnobacterium maltaromaticum</i>	DSM 20730
<i>Carnobacterium mobile</i>	CECT 5959 ^T
<i>Carnobacterium mobile</i>	DSM 4848 ^T
<i>Carnobacterium mobile</i>	DSM 4849
<i>Carnobacterium pleistocenium</i>	DSM 17715 ^T
<i>Carnobacterium viridans</i>	CECT 5758 ^T
<i>Carnobacterium viridans</i>	DSM 14451 ^T

Origin and number of strains:

CECT

7

DSM	19
TOTAL	26

7.4 Genus *Lactobacillus*

Name

<i>Lactobacillus acetotolerans</i>	CECT 4019 ^T
<i>Lactobacillus acetotolerans</i>	CIP 103180 ^T
<i>Lactobacillus acetotolerans</i>	DSM 20749 ^T
<i>Lactobacillus acetotolerans</i>	LMG 10751 ^T
<i>Lactobacillus acidifarinae</i>	CIP 108702 ^T
<i>Lactobacillus acidifarinae</i>	DSM 19394 ^T
<i>Lactobacillus acidifarinae</i>	LMG 22200 ^T
<i>Lactobacillus acidipiscis</i>	DSM 15353
<i>Lactobacillus acidipiscis</i>	DSM 15836 ^T
<i>Lactobacillus acidipiscis</i>	LMG 19820 ^T
<i>Lactobacillus acidophilus</i>	CECT 362
<i>Lactobacillus acidophilus</i>	CECT 4179
<i>Lactobacillus acidophilus</i>	CECT 903 ^T
<i>Lactobacillus acidophilus</i>	CIP 103595
<i>Lactobacillus acidophilus</i>	CIP 103597
<i>Lactobacillus acidophilus</i>	CIP 76.13 ^T
<i>Lactobacillus acidophilus</i>	DSM 20079 ^T
<i>Lactobacillus acidophilus</i>	DSM 20242
<i>Lactobacillus acidophilus</i>	DSM 9126
<i>Lactobacillus acidophilus</i>	LMG 9433 ^T
<i>Lactobacillus agilis</i>	CECT 4131 ^T
<i>Lactobacillus agilis</i>	CIP 101264 ^T
<i>Lactobacillus agilis</i>	DSM 20509 ^T
<i>Lactobacillus agilis</i>	LMG 9186 ^T
<i>Lactobacillus algidus</i>	DSM 15638 ^T
<i>Lactobacillus algidus</i>	LMG 19872 ^T
<i>Lactobacillus alimentarius</i>	CECT 570 ^T
<i>Lactobacillus alimentarius</i>	DSM 20181
<i>Lactobacillus alimentarius</i>	DSM 20249 ^T
<i>Lactobacillus alimentarius</i>	LMG 9187 ^T

<i>Lactobacillus alimentarius</i>	CIP 102986 ^T
<i>Lactobacillus alimentarius</i>	CIP 105163
<i>Lactobacillus amylolyticus</i>	DSM 11664 ^T
<i>Lactobacillus amylolyticus</i>	LMG 18796 ^T
<i>Lactobacillus amylophilus</i>	CIP 102988 ^T
<i>Lactobacillus amylophilus</i>	DSM 20533 ^T
<i>Lactobacillus amylophilus</i>	CECT 4133 ^T
<i>Lactobacillus amylophilus</i>	LMG 6900 ^T
<i>Lactobacillus amylotrophicus</i>	DSM 20534
<i>Lactobacillus amylotrophicus</i>	LMG 11400 ^T
<i>Lactobacillus amylovorus</i>	CECT 4132 ^T
<i>Lactobacillus amylovorus</i>	CIP 109151
<i>Lactobacillus amylovorus</i>	DSM 16698
<i>Lactobacillus amylovorus</i>	DSM 20531 ^T
<i>Lactobacillus amylovorus</i>	LMG 9496 ^T
<i>Lactobacillus animalis</i>	CECT 4060 ^T
<i>Lactobacillus animalis</i>	CIP 103152 ^T
<i>Lactobacillus animalis</i>	DSM 20602 ^T
<i>Lactobacillus animalis</i>	LMG 9843 ^T
<i>Lactobacillus apodemi</i>	CIP 108913 ^T
<i>Lactobacillus apodemi</i>	DSM 16634 ^T
<i>Lactobacillus aquaticus</i>	CECT 7355 ^T
<i>Lactobacillus aquaticus</i>	DSM 21051 ^T
<i>Lactobacillus aviarius</i> subsp. <i>araffinosus</i>	CIP 103145 ^T
<i>Lactobacillus aviarius</i> subsp. <i>araffinosus</i>	DSM 20653 ^T
<i>Lactobacillus aviarius</i> subsp. <i>araffinosus</i>	LMG 23560 ^T
<i>Lactobacillus aviarius</i> subsp. <i>aviarius</i>	CIP 103144 ^T
<i>Lactobacillus aviarius</i> subsp. <i>aviarius</i>	DSM 20655 ^T
<i>Lactobacillus aviarius</i> subsp. <i>aviarius</i>	LMG 10753 ^T
<i>Lactobacillus bif fermentans</i>	DSM 20003 ^T
<i>Lactobacillus bif fermentans</i>	LMG 9845 ^T
<i>Lactobacillus bobalius</i>	CECT 7310 ^T
<i>Lactobacillus bobalius</i>	CIP 109926 ^T
<i>Lactobacillus bobalius</i>	DSM 19674 ^T
<i>Lactobacillus brevis</i>	CECT 216
<i>Lactobacillus brevis</i>	CECT 4121 ^T
<i>Lactobacillus brevis</i>	CECT 4669
<i>Lactobacillus brevis</i>	CECT 5172

<i>Lactobacillus brevis</i>	CECT 5354
<i>Lactobacillus brevis</i>	CECT 5918
<i>Lactobacillus brevis</i>	CIP 102806 ^T
<i>Lactobacillus brevis</i>	CIP 103474
<i>Lactobacillus brevis</i>	CIP 105137
<i>Lactobacillus brevis</i>	DSM 1267
<i>Lactobacillus brevis</i>	DSM 1268
<i>Lactobacillus brevis</i>	DSM 20054 ^T
<i>Lactobacillus brevis</i>	DSM 6235
<i>Lactobacillus brevis</i>	LMG 6906 ^T
<i>Lactobacillus buchneri</i>	CECT 4111 ^T
<i>Lactobacillus buchneri</i>	CIP 103023 ^T
<i>Lactobacillus buchneri</i>	DSM 20057 ^T
<i>Lactobacillus buchneri</i>	DSM 5987
<i>Lactobacillus buchneri</i>	LMG 6892 ^T
<i>Lactobacillus cacaonum</i>	DSM 21116 ^T
<i>Lactobacillus cacaonum</i>	LMG 24285 ^T
<i>Lactobacillus camelliae</i>	CIP 109883 ^T
<i>Lactobacillus camelliae</i>	DSM 22697 ^T
<i>Lactobacillus capillatus</i>	DSM 19910
<i>Lactobacillus casei</i>	CECT 4044
<i>Lactobacillus casei</i>	CECT 4045
<i>Lactobacillus casei</i>	CECT 475 ^T
<i>Lactobacillus casei</i>	CECT 5276
<i>Lactobacillus casei</i>	CIP 103137 ^T
<i>Lactobacillus casei</i>	DSM 20011 ^T
<i>Lactobacillus casei</i>	LMG 6904 ^T
<i>Lactobacillus catenaformis</i>	CECT 4140 ^T
<i>Lactobacillus catenaformis</i>	CIP 104817 ^T
<i>Lactobacillus catenaformis</i>	DSM 20559 ^T
<i>Lactobacillus catenaformis</i>	LMG 23559 ^T
<i>Lactobacillus ceti</i>	CECT 7185 ^T
<i>Lactobacillus ceti</i>	CIP 109847 ^T
<i>Lactobacillus ceti</i>	DSM 22408 ^T
<i>Lactobacillus coleohominis</i>	CIP 106820 ^T
<i>Lactobacillus coleohominis</i>	DSM 22408 ^T
<i>Lactobacillus coleohominis</i>	LMG 21591 ^T
<i>Lactobacillus collinoides</i>	CECT 922 ^T

<i>Lactobacillus collinoides</i>	CIP 103008 ^T
<i>Lactobacillus collinoides</i>	DSM 20515 ^T
<i>Lactobacillus collinoides</i>	LMG 9194 ^T
<i>Lactobacillus concavus</i>	DSM 17758 ^T
<i>Lactobacillus concavus</i>	LMG 22739 ^T
<i>Lactobacillus coryniformis</i> subsp. <i>coryniformis</i>	CECT 982 ^T
<i>Lactobacillus coryniformis</i> subsp. <i>coryniformis</i>	CIP 103133 ^T
<i>Lactobacillus coryniformis</i> subsp. <i>coryniformis</i>	DSM 20001 ^T
<i>Lactobacillus coryniformis</i> subsp. <i>coryniformis</i>	LMG 9196 ^T
<i>Lactobacillus coryniformis</i> subsp. <i>torquens</i>	CECT 4129 ^T
<i>Lactobacillus coryniformis</i> subsp. <i>torquens</i>	CIP 103134 ^T
<i>Lactobacillus coryniformis</i> subsp. <i>torquens</i>	DSM 20004 ^T
<i>Lactobacillus coryniformis</i> subsp. <i>torquens</i>	LMG 9197 ^T
<i>Lactobacillus crispatus</i>	CECT 4840 ^T
<i>Lactobacillus crispatus</i>	CIP 102990 ^T
<i>Lactobacillus crispatus</i>	DSM 20584 ^T
<i>Lactobacillus crispatus</i>	LMG 9479 ^T
<i>Lactobacillus curvatus</i> subsp. <i>curvatus</i>	CECT 904 ^T
<i>Lactobacillus curvatus</i> subsp. <i>curvatus</i>	CIP 102992 ^T
<i>Lactobacillus curvatus</i> subsp. <i>curvatus</i>	DSM 20019 ^T
<i>Lactobacillus curvatus</i> subsp. <i>curvatus</i>	LMG 9198 ^T
<i>Lactobacillus delbrueckii</i> subsp. <i>bulgaricus</i>	CECT 4005 ^T
<i>Lactobacillus delbrueckii</i> subsp. <i>bulgaricus</i>	CIP 101027 ^T
<i>Lactobacillus delbrueckii</i> subsp. <i>bulgaricus</i>	DSM 20080
<i>Lactobacillus delbrueckii</i> subsp. <i>bulgaricus</i>	DSM 20081 ^T
<i>Lactobacillus delbrueckii</i> subsp. <i>bulgaricus</i>	LMG 6901 ^T
<i>Lactobacillus delbrueckii</i> subsp. <i>delbrueckii</i>	CECT 286 ^T
<i>Lactobacillus delbrueckii</i> subsp. <i>delbrueckii</i>	CECT 4685
<i>Lactobacillus delbrueckii</i> subsp. <i>delbrueckii</i>	CIP 57.8 ^T
<i>Lactobacillus delbrueckii</i> subsp. <i>delbrueckii</i>	DSM 20074 ^T
<i>Lactobacillus delbrueckii</i> subsp. <i>delbrueckii</i>	LMG 6412 ^T
<i>Lactobacillus delbrueckii</i> subsp. <i>lactis</i>	CECT 282
<i>Lactobacillus delbrueckii</i> subsp. <i>lactis</i>	CECT 287
<i>Lactobacillus delbrueckii</i> subsp. <i>lactis</i>	CIP 101028 ^T
<i>Lactobacillus delbrueckii</i> subsp. <i>lactis</i>	CIP 53.61
<i>Lactobacillus delbrueckii</i> subsp. <i>lactis</i>	CIP 54.4
<i>Lactobacillus delbrueckii</i> subsp. <i>lactis</i>	DSM 20072 ^T
<i>Lactobacillus delbrueckii</i> subsp. <i>lactis</i>	DSM 20355

<i>Lactobacillus delbrueckii</i> subsp. <i>lactis</i>	LMG 7942 ^T
<i>Lactobacillus dextrinicus</i>	CECT 4791 ^T
<i>Lactobacillus dextrinicus</i>	CIP 103407 ^T
<i>Lactobacillus dextrinicus</i>	DSM 20335 ^T
<i>Lactobacillus dextrinicus</i>	LMG 11485 ^T
<i>Lactobacillus diolivorans</i>	CIP 107499 ^T
<i>Lactobacillus diolivorans</i>	DSM 14421 ^T
<i>Lactobacillus diolivorans</i>	LMG 19667 ^T
<i>Lactobacillus equi</i>	DSM 15833 ^T
<i>Lactobacillus equi</i>	LMG 21748 ^T
<i>Lactobacillus equicursoris</i>	DSM 19284 ^T
<i>Lactobacillus equigenerosi</i>	CIP 109834 ^T
<i>Lactobacillus equigenerosi</i>	DSM 18793 ^T
<i>Lactobacillus fabifermentans</i>	DSM 21115 ^T
<i>Lactobacillus fabifermentans</i>	LMG 24284 ^T
<i>Lactobacillus farciminis</i>	CECT 571 ^T
<i>Lactobacillus farciminis</i>	DSM 20184 ^T
<i>Lactobacillus farciminis</i>	LMG 9200 ^T
<i>Lactobacillus farciminis</i>	CIP 103136 ^T
<i>Lactobacillus farraginis</i>	CIP 109567 ^T
<i>Lactobacillus farraginis</i>	DSM 18382 ^T
<i>Lactobacillus farraginis</i>	LMG 24140 ^T
<i>Lactobacillus fermentum</i>	CECT 285
<i>Lactobacillus fermentum</i>	CECT 4007 ^T
<i>Lactobacillus fermentum</i>	CECT 562
<i>Lactobacillus fermentum</i>	CIP 102980 ^T
<i>Lactobacillus fermentum</i>	CIP 53.163
<i>Lactobacillus fermentum</i>	DSM 20052
<i>Lactobacillus fermentum</i>	DSM 20055
<i>Lactobacillus fermentum</i>	DSM 20391
<i>Lactobacillus fermentum</i>	LMG 6902 ^T
<i>Lactobacillus fermentum</i>	CIP 102981
<i>Lactobacillus fructivorans</i>	CECT 4785 ^T
<i>Lactobacillus fructivorans</i>	CIP 103042 ^T
<i>Lactobacillus fructivorans</i>	DSM 20203 ^T
<i>Lactobacillus fructivorans</i>	LMG 9201 ^T
<i>Lactobacillus frumenti</i>	CIP 106922 ^T
<i>Lactobacillus frumenti</i>	DSM 13145 ^T

<i>Lactobacillus frumenti</i>	LMG 19473 ^T
<i>Lactobacillus fucheunsis</i>	DSM 14340 ^T
<i>Lactobacillus fucheunsis</i>	DSM 14341
<i>Lactobacillus fucheunsis</i>	DSM 14342
<i>Lactobacillus fucheunsis</i>	LMG 21669 ^T
<i>Lactobacillus gallinarum</i>	CIP 103611 ^T
<i>Lactobacillus gallinarum</i>	DSM 10532 ^T
<i>Lactobacillus gallinarum</i>	LMG 9435 ^T
<i>Lactobacillus gasseri</i>	CECT 4479 ^T
<i>Lactobacillus gasseri</i>	CIP 102991 ^T
<i>Lactobacillus gasseri</i>	CIP 103699
<i>Lactobacillus gasseri</i>	DSM 20077
<i>Lactobacillus gasseri</i>	DSM 20243 ^T
<i>Lactobacillus gasseri</i>	DSM 20243 ^T
<i>Lactobacillus gasseri</i>	LMG 9203 ^T
<i>Lactobacillus ghanensis</i>	CIP 109616 ^T
<i>Lactobacillus ghanensis</i>	DSM 18630 ^T
<i>Lactobacillus graminis</i>	CECT 4017 ^T
<i>Lactobacillus graminis</i>	CIP 105164 ^T
<i>Lactobacillus graminis</i>	DSM 20719 ^T
<i>Lactobacillus graminis</i>	DSM 20720
<i>Lactobacillus graminis</i>	DSM 20721
<i>Lactobacillus graminis</i>	LMG 9825 ^T
<i>Lactobacillus hammesii</i>	DSM 16381 ^T
<i>Lactobacillus hammesii</i>	DSM 16382
<i>Lactobacillus hammesii</i>	LMG 23074 ^T
<i>Lactobacillus hamsteri</i>	DSM 05661 ^T
<i>Lactobacillus hamsteri</i>	LMG 10754 ^T
<i>Lactobacillus harbinensis</i>	DSM 16991
<i>Lactobacillus harbinensis</i>	LMG 24040 ^T
<i>Lactobacillus hayakitensis</i>	CIP 109885 ^T
<i>Lactobacillus hayakitensis</i>	DSM 18933 ^T
<i>Lactobacillus hayakitensis</i>	LMG 24490 ^T
<i>Lactobacillus helveticus</i>	CECT 403
<i>Lactobacillus helveticus</i>	CECT 4305 ^T
<i>Lactobacillus helveticus</i>	CECT 541
<i>Lactobacillus helveticus</i>	CECT 800
<i>Lactobacillus helveticus</i>	CIP 103146 ^T

<i>Lactobacillus helveticus</i>	CIP 104343
<i>Lactobacillus helveticus</i>	DSM 20075 ^T
<i>Lactobacillus helveticus</i>	LMG 6413 ^T
<i>Lactobacillus helveticus</i>	CIP 76.19
<i>Lactobacillus hilgardii</i>	CECT 4786 ^T
<i>Lactobacillus hilgardii</i>	CIP 103007 ^T
<i>Lactobacillus hilgardii</i>	DSM 20176 ^T
<i>Lactobacillus hilgardii</i>	LMG 6895 ^T
<i>Lactobacillus homohiochii</i>	CECT 4136 ^T
<i>Lactobacillus homohiochii</i>	CECT 983
<i>Lactobacillus homohiochii</i>	CIP 103141 ^T
<i>Lactobacillus homohiochii</i>	DSM 20351
<i>Lactobacillus homohiochii</i>	DSM 20571 ^T
<i>Lactobacillus hordei</i>	CIP 109892 ^T
<i>Lactobacillus hordei</i>	DSM 19519 ^T
<i>Lactobacillus hordei</i>	LMG 24241 ^T
<i>Lactobacillus iatae</i>	DSM 21414
<i>Lactobacillus iners</i>	CIP 105923 ^T
<i>Lactobacillus iners</i>	DSM 13335 ^T
<i>Lactobacillus iners</i>	LMG 18914 ^T
<i>Lactobacillus ingluviei</i>	DSM 15946 ^T
<i>Lactobacillus ingluviei</i>	LMG 20380 ^T
<i>Lactobacillus intestinalis</i>	CIP 104793
<i>Lactobacillus intestinalis</i>	DSM 6629
<i>Lactobacillus intestinalis</i>	LMG 14196
<i>Lactobacillus jensenii</i>	CECT 4306 ^T
<i>Lactobacillus jensenii</i>	CIP 69.17 ^T
<i>Lactobacillus jensenii</i>	DSM 20557 ^T
<i>Lactobacillus jensenii</i>	LMG 6414 ^T
<i>Lactobacillus johnsonii</i>	CECT 289
<i>Lactobacillus johnsonii</i>	CIP 103620 ^T
<i>Lactobacillus johnsonii</i>	DSM 10533 ^T
<i>Lactobacillus johnsonii</i>	LMG 9436 ^T
<i>Lactobacillus johnsonii</i>	CIP 103653
<i>Lactobacillus kalixensis</i>	CIP 109909 ^T
<i>Lactobacillus kalixensis</i>	DSM 16043 ^T
<i>Lactobacillus kalixensis</i>	LMG 22115 ^T
<i>Lactobacillus kefiranofaciens</i> subsp.	CECT 5954 ^T

<i>kefiranofaciens</i>	
<i>Lactobacillus kefiranofaciens</i> subsp.	
<i>kefiranofaciens</i>	CIP 103307 ^T
<i>Lactobacillus kefiranofaciens</i> subsp.	
<i>kefiranofaciens</i>	DSM 05016 ^T
<i>Lactobacillus kefiranofaciens</i> subsp.	
<i>kefiranofaciens</i>	LMG 19149 ^T
<i>Lactobacillus kefiranofaciens</i> subsp. <i>kefirgranum</i>	CECT 5919 ^T
<i>Lactobacillus kefiranofaciens</i> subsp. <i>kefirgranum</i>	CIP 104241 ^T
<i>Lactobacillus kefiranofaciens</i> subsp. <i>kefirgranum</i>	LMG 15132 ^T
<i>Lactobacillus kefiri</i>	DSM 20485
<i>Lactobacillus kefiri</i>	DSM 20587 ^T
<i>Lactobacillus kefiri</i>	DSM 20588
<i>Lactobacillus kefiri</i>	LMG 9480 ^T
<i>Lactobacillus kimchii</i>	CIP 107019 ^T
<i>Lactobacillus kimchii</i>	DSM 13961
<i>Lactobacillus kimchii</i>	LMG 19822 ^T
<i>Lactobacillus kisonensis</i>	DSM 19906
<i>Lactobacillus kitasatonis</i>	DSM 16761 ^T
<i>Lactobacillus kitasatonis</i>	LMG 23133 ^T
<i>Lactobacillus kunkeei</i>	DSM 12361 ^T
<i>Lactobacillus kunkeei</i>	LMG 18925 ^T
<i>Lactobacillus lindneri</i>	CECT 5957 ^T
<i>Lactobacillus lindneri</i>	CIP 102983 ^T
<i>Lactobacillus lindneri</i>	DSM 20690 ^T
<i>Lactobacillus lindneri</i>	LMG 14528 ^T
<i>Lactobacillus malefermentans</i>	CECT 5928 ^T
<i>Lactobacillus malefermentans</i>	CECT 7875
<i>Lactobacillus malefermentans</i>	CIP 103367 ^T
<i>Lactobacillus malefermentans</i>	DSM 05705 ^T
<i>Lactobacillus malefermentans</i>	DSM 20177
<i>Lactobacillus malefermentans</i>	LMG 11455 ^T
<i>Lactobacillus mali</i>	CECT 4149 ^T
<i>Lactobacillus mali</i>	DSM 20483 ^T
<i>Lactobacillus mali</i>	CIP 103143 ^T
<i>Lactobacillus manihotivorans</i>	CIP 105851 ^T
<i>Lactobacillus manihotivorans</i>	DSM 13343 ^T
<i>Lactobacillus manihotivorans</i>	LMG 18010 ^T

<i>Lactobacillus mindensis</i>	DSM 14500 ^T
<i>Lactobacillus mindensis</i>	LMG 21932 ^T
<i>Lactobacillus mucosae</i>	CIP 106485 ^T
<i>Lactobacillus mucosae</i>	DSM 13345 ^T
<i>Lactobacillus mucosae</i>	DSM 13346
<i>Lactobacillus mucosae</i>	LMG 19534 ^T
<i>Lactobacillus murinus</i>	CECT 4135 ^T
<i>Lactobacillus murinus</i>	CIP 104818 ^T
<i>Lactobacillus murinus</i>	DSM 20452 ^T
<i>Lactobacillus murinus</i>	LMG 14189 ^T
<i>Lactobacillus nagelii</i>	CECT 5983 ^T
<i>Lactobacillus nagelii</i>	CIP 107647 ^T
<i>Lactobacillus nagelii</i>	DSM 13675 ^T
<i>Lactobacillus nagelii</i>	LMG 21593 ^T
<i>Lactobacillus namurensis</i>	CIP 109498 ^T
<i>Lactobacillus namurensis</i>	DSM 19117 ^T
<i>Lactobacillus namurensis</i>	LMG 23583 ^T
<i>Lactobacillus nantensis</i>	DSM 19908 ^T
<i>Lactobacillus nodensis</i>	DSM 19682
<i>Lactobacillus oeni</i>	CECT 7334 ^T
<i>Lactobacillus oeni</i>	CIP 110039 ^T
<i>Lactobacillus oeni</i>	DSM 19972 ^T
<i>Lactobacillus oligofermentans</i>	CIP 10991 ^T
<i>Lactobacillus oligofermentans</i>	DSM 15707 ^T
<i>Lactobacillus oligofermentans</i>	LMG 22743 ^T
<i>Lactobacillus oris</i>	CECT 4021 ^T
<i>Lactobacillus oris</i>	CIP 105162 ^T
<i>Lactobacillus oris</i>	DSM 4864 ^T
<i>Lactobacillus oris</i>	LMG 9848 ^T
<i>Lactobacillus parabuchneri</i>	CECT 5740 ^T
<i>Lactobacillus parabuchneri</i>	CIP 103368 ^T
<i>Lactobacillus parabuchneri</i>	DSM 05707 ^T
<i>Lactobacillus parabuchneri</i>	LMG 11457 ^T
<i>Lactobacillus paracasei</i>	CECT 277
<i>Lactobacillus paracasei</i>	DSM 20008
<i>Lactobacillus paracasei</i>	LMG 9192 ^T
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	CECT 4022 ^T
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	CECT 981

<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	CIP 103918 ^T
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	CIP 107868
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	DSM 20006
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	DSM 20020
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	DSM 20312
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	DSM 46331
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	DSM 4905
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	DSM 5622 ^T
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	LMG 13087 ^T
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	LMG 9438
<i>Lactobacillus paracasei</i> subsp. <i>paracasei</i>	CECT 4583
<i>Lactobacillus paracasei</i> subsp. <i>tolerans</i>	CECT 4175 ^T
<i>Lactobacillus paracasei</i> subsp. <i>tolerans</i>	CIP 102994 ^T =103024 ^T
<i>Lactobacillus paracasei</i> subsp. <i>tolerans</i>	DSM 20258 ^T
<i>Lactobacillus paracasei</i> subsp. <i>tolerans</i>	LMG 9191 ^T
<i>Lactobacillus paracollinoides</i>	CECT 5926
<i>Lactobacillus paracollinoides</i>	CIP 108394 ^T
<i>Lactobacillus paracollinoides</i>	DSM 15502 ^T
<i>Lactobacillus paracollinoides</i>	DSM 20197
<i>Lactobacillus paracollinoides</i>	LMG 22473 ^T
<i>Lactobacillus parafarraginis</i>	CIP 109568 ^T
<i>Lactobacillus parafarraginis</i>	DSM 18930 ^T
<i>Lactobacillus parafarraginis</i>	LMG 24141 ^T
<i>Lactobacillus parakefiri</i>	CIP 104242 ^T
<i>Lactobacillus parakefiri</i>	DSM 10551
<i>Lactobacillus parakefiri</i>	LMG 15133 ^T
<i>Lactobacillus paraplanatarum</i>	CECT 5783
<i>Lactobacillus paraplanatarum</i>	CECT 5787
<i>Lactobacillus pentosus</i>	CECT 4023 ^T
<i>Lactobacillus pentosus</i>	CIP 103156 ^T
<i>Lactobacillus pentosus</i>	DSM 20314 ^T
<i>Lactobacillus pentosus</i>	LMG 10755 ^T
<i>Lactobacillus perolens</i>	CECT 5955 ^T
<i>Lactobacillus perolens</i>	DSM 12744 ^T
<i>Lactobacillus perolens</i>	LMG 18936 ^T
<i>Lactobacillus plantarum</i>	CECT 220
<i>Lactobacillus plantarum</i>	CECT 4180
<i>Lactobacillus plantarum</i>	CECT 4528

<i>Lactobacillus plantarum</i>	CECT 5956
<i>Lactobacillus plantarum</i>	CECT 749
<i>Lactobacillus plantarum</i>	CIP 103151 ^T
<i>Lactobacillus plantarum</i>	DSM 20205
<i>Lactobacillus plantarum</i>	CIP 71.39
<i>Lactobacillus plantarum</i>	CIP A159
<i>Lactobacillus plantarum</i> subsp. <i>argentoratensis</i>	DSM 16365 ^T
<i>Lactobacillus plantarum</i> subsp. <i>argentoratensis</i>	LMG 9205 ^T
<i>Lactobacillus plantarum</i> subsp. <i>plantarum</i>	CECT 748 ^T
<i>Lactobacillus plantarum</i> subsp. <i>plantarum</i>	DSM 20174 ^T
<i>Lactobacillus plantarum</i> subsp. <i>plantarum</i>	LMG 6907 ^T
<i>Lactobacillus pontis</i>	DSM 08475 ^T
<i>Lactobacillus pontis</i>	LMG 14187 ^T
<i>Lactobacillus psittaci</i>	DSM 15354
<i>Lactobacillus rapi</i>	DSM 19907 ^T
<i>Lactobacillus rennini</i>	CECT 5922 ^T
<i>Lactobacillus rennini</i>	CECT 5923
<i>Lactobacillus rennini</i>	CIP 109172 ^T
<i>Lactobacillus rennini</i>	DSM 20253 ^T
<i>Lactobacillus rennini</i>	DSM 20254
<i>Lactobacillus reuteri</i>	CECT 925 ^T
<i>Lactobacillus reuteri</i>	CIP 101887 ^T
<i>Lactobacillus reuteri</i>	DSM 20016 ^T
<i>Lactobacillus reuteri</i>	LMG 13557 ^T
<i>Lactobacillus rhamnosus</i>	CECT 278 ^T
<i>Lactobacillus rhamnosus</i>	CECT 288
<i>Lactobacillus rhamnosus</i>	CIP 57.6
<i>Lactobacillus rhamnosus</i>	CIP A157 ^T
<i>Lactobacillus rhamnosus</i>	DSM 20021
<i>Lactobacillus rhamnosus</i>	DSM 20245
<i>Lactobacillus rhamnosus</i>	DSM 20247
<i>Lactobacillus rhamnosus</i>	LMG 6400 ^T
<i>Lactobacillus rimaе</i>	DSM 15814 ^T
<i>Lactobacillus rimaе</i>	LMG 22972 ^T
<i>Lactobacillus ruminis</i>	CECT 7785 ^T
<i>Lactobacillus ruminis</i>	CIP 103153 ^T
<i>Lactobacillus ruminis</i>	DSM 20403 ^T
<i>Lactobacillus ruminis</i>	LMG 10756 ^T

<i>Lactobacillus saerimneri</i>	DSM 16027
<i>Lactobacillus saerimneri</i>	DSM 16049 ^T
<i>Lactobacillus saerimneri</i>	LMG 22087 ^T
<i>Lactobacillus sakei</i>	CIP 104494
<i>Lactobacillus sakei</i>	DSM 20494
<i>Lactobacillus sakei</i> subsp. <i>carneus</i>	CECT 5766 ^T
<i>Lactobacillus sakei</i> subsp. <i>carneus</i>	CIP 105422 ^T
<i>Lactobacillus sakei</i> subsp. <i>carneus</i>	CIP 109872
<i>Lactobacillus sakei</i> subsp. <i>carneus</i>	DSM 15740
<i>Lactobacillus sakei</i> subsp. <i>carneus</i>	DSM 15831 ^T
<i>Lactobacillus sakei</i> subsp. <i>carneus</i>	LMG 17302 ^T
<i>Lactobacillus sakei</i> subsp. <i>carneus</i>	LMG 18295
<i>Lactobacillus sakei</i> subsp. <i>sakei</i>	CECT 4591
<i>Lactobacillus sakei</i> subsp. <i>sakei</i>	CECT 906 ^T
<i>Lactobacillus sakei</i> subsp. <i>sakei</i>	CIP 103139 ^T
<i>Lactobacillus sakei</i> subsp. <i>sakei</i>	DSM 20017 ^T
<i>Lactobacillus sakei</i> subsp. <i>sakei</i>	LMG 9468
<i>Lactobacillus salivarius</i>	CECT 4062
<i>Lactobacillus salivarius</i>	CECT 4063 ^T
<i>Lactobacillus salivarius</i>	CIP 103140 ^T
<i>Lactobacillus salivarius</i>	DSM 20554 ^T
<i>Lactobacillus salivarius</i>	LMG 9476
<i>Lactobacillus salivarius</i>	LMG 9477 ^T
<i>Lactobacillus salivarius</i> subsp. <i>salicinus</i>	CIP 103155 ^T
<i>Lactobacillus sanfranciscensis</i>	CIP 102982
<i>Lactobacillus sanfranciscensis</i>	CIP 103252 ^T
<i>Lactobacillus sanfranciscensis</i>	DSM 20451 ^T
<i>Lactobacillus sanfranciscensis</i>	DSM 20663
<i>Lactobacillus sanfranciscensis</i>	LMG 16002 ^T
<i>Lactobacillus secaliphilus</i>	DSM 17896 ^T
<i>Lactobacillus secaliphilus</i>	LMG 24164 ^T
<i>Lactobacillus senmaizukei</i>	CIP 109886 ^T
<i>Lactobacillus senmaizukei</i>	DSM 21775 ^T
<i>Lactobacillus sharpeae</i>	DSM 20504
<i>Lactobacillus sharpeae</i>	DSM 20505 ^T
<i>Lactobacillus sharpeae</i>	DSM 20506
<i>Lactobacillus sharpeae</i>	LMG 9214 ^T
<i>Lactobacillus siliginis</i>	DSM 22696 ^T

<i>Lactobacillus</i> sp.	CECT 5927
<i>Lactobacillus</i> sp.	CECT 8013
<i>Lactobacillus</i> sp.	CIP 102987
<i>Lactobacillus</i> sp.	DSM 20182
<i>Lactobacillus</i> sp.	DSM 6265
<i>Lactobacillus</i> sp.	LMG 14527
<i>Lactobacillus spicheri</i>	DSM 15429 ^T
<i>Lactobacillus spicheri</i>	LMG 21871 ^T
<i>Lactobacillus suebicus</i>	CECT 5917 ^T
<i>Lactobacillus suebicus</i>	CIP 103411 ^T
<i>Lactobacillus suebicus</i>	DSM 05007 ^T
<i>Lactobacillus suebicus</i>	LMG 11408 ^T
<i>Lactobacillus taiwanensis</i>	DSM 21401 ^T
<i>Lactobacillus thailandensis</i>	DSM 22698 ^T
<i>Lactobacillus thermotolerans</i>	DSM 14792 ^T
<i>Lactobacillus thermotolerans</i>	LMG 22056 ^T
<i>Lactobacillus tucseti</i>	CECT 5920 ^T
<i>Lactobacillus tucseti</i>	DSM 20183 ^T
<i>Lactobacillus tucseti</i>	CIP 110049 ^T
<i>Lactobacillus ultunensis</i>	DSM 16047
<i>Lactobacillus ultunensis</i>	LMG 22117 ^T
<i>Lactobacillus uvarum</i>	CECT 7335 ^T
<i>Lactobacillus uvarum</i>	CIP 109959 ^T
<i>Lactobacillus uvarum</i>	DSM 19971 ^T
<i>Lactobacillus vaccinostercus</i>	CECT 5925 ^T
<i>Lactobacillus vaccinostercus</i>	CIP 102807 ^T
<i>Lactobacillus vaccinostercus</i>	DSM 20634 ^T
<i>Lactobacillus vaccinostercus</i>	LMG 9215 ^T
<i>Lactobacillus vaginalis</i>	CECT 4089 ^T
<i>Lactobacillus vaginalis</i>	CIP 105932 ^T
<i>Lactobacillus vaginalis</i>	DSM 05837 ^T
<i>Lactobacillus vaginalis</i>	LMG 12891 ^T
<i>Lactobacillus versmoldensis</i>	CECT 5773 ^T
<i>Lactobacillus versmoldensis</i>	CIP 107931 ^T
<i>Lactobacillus versmoldensis</i>	DSM 14857 ^T
<i>Lactobacillus versmoldensis</i>	LMG 21929 ^T
<i>Lactobacillus vini</i>	CECT 5924 ^T
<i>Lactobacillus vini</i>	CIP 109261 ^T

<i>Lactobacillus vini</i>	DSM 20605 ^T
<i>Lactobacillus vini</i>	LMG 23202 ^T
<i>Lactobacillus vini</i>	LMG 23202 ^T
<i>Lactobacillus vitulinus</i>	DSM 20405 ^T
<i>Lactobacillus zeae</i>	DSM 20178 ^T
<i>Lactobacillus zeae</i>	LMG 17315 ^T
<i>Lactobacillus zymae</i>	CIP 108703 ^T
<i>Lactobacillus zymae</i>	DSM 19395 ^T
<i>Lactobacillus zymae</i>	LMG 22198 ^T

Origin and number of strains:

CECT	98
CIP	110
LMG	110
DSM	173
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TOTAL	491

7.5 Genus *Lactococcus*

Name

<i>Lactococcus garvieae</i>	CECT 4531 ^T
<i>Lactococcus garvieae</i>	DSM 20064
<i>Lactococcus garvieae</i>	DSM 20684 ^T
<i>Lactococcus garvieae</i>	DSM 20685
<i>Lactococcus lactis</i> subsp. <i>cremoris</i>	CECT 7100 ^T
<i>Lactococcus lactis</i> subsp. <i>lactis</i>	CECT 185 ^T
<i>Lactococcus lactis</i> subsp. <i>lactis</i>	DSM 20250
<i>Lactococcus piscium</i>	CECT 4493 ^T
<i>Lactococcus raffinolactis</i>	CECT 988 ^T

Origin and number of strains:

CECT	5
DSM	4
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TOTAL	9

7.6 Family Leuconostocaceae

Name

<i>Fructobacillus durionis</i>	CECT 7089 ^T
<i>Fructobacillus durionis</i>	CIP 108761 ^T
<i>Fructobacillus durionis</i>	DSM 19113 ^T
<i>Fructobacillus ficulneus</i>	CECT 5747 ^T
<i>Fructobacillus ficulneus</i>	CIP 107593 ^T
<i>Fructobacillus ficulneus</i>	DSM 13613 ^T
<i>Fructobacillus fructosus</i>	CECT 7088 ^T
<i>Fructobacillus fructosus</i>	DSM 20349 ^T
<i>Fructobacillus pseudoficulneus</i>	CECT 5759 ^T
<i>Fructobacillus pseudoficulneus</i>	CIP 109309 ^T
<i>Fructobacillus pseudoficulneus</i>	DSM 15468 ^T
<i>Leuconostoc carnosum</i>	CECT 4024 ^T
<i>Leuconostoc carnosum</i>	CIP 103319 ^T
<i>Leuconostoc carnosum</i>	DSM 5576 ^T
<i>Leuconostoc citreum</i>	CECT 4025 ^T
<i>Leuconostoc citreum</i>	CIP 103405
<i>Leuconostoc citreum</i>	CIP 103405
<i>Leuconostoc citreum</i>	DSM 20188
<i>Leuconostoc citreum</i>	DSM 5577 ^T
<i>Leuconostoc fallax</i>	CECT 7087 ^T
<i>Leuconostoc fallax</i>	CIP 104855 ^T
<i>Leuconostoc fallax</i>	DSM 10614
<i>Leuconostoc fallax</i>	DSM 10615
<i>Leuconostoc fallax</i>	DSM 20189 ^T
<i>Leuconostoc fructosus</i>	CIP 102985
<i>Leuconostoc gasicomitatum</i>	CECT 5767 ^T
<i>Leuconostoc gasicomitatum</i>	DSM 15947 ^T
<i>Leuconostoc gelidum</i>	CECT 4026 ^T
<i>Leuconostoc gelidum</i>	CIP 103318 ^T
<i>Leuconostoc gelidum</i>	DSM 5578 ^T
<i>Leuconostoc holzapfelii</i>	DSM 21478 ^T
<i>Leuconostoc inhae</i>	CECT 7026 ^T
<i>Leuconostoc inhae</i>	CIP 108081 ^T
<i>Leuconostoc inhae</i>	DSM 15101 ^T

<i>Leuconostoc lactis</i>	CECT 4173 ^T
<i>Leuconostoc lactis</i>	CIP 102422 ^T
<i>Leuconostoc lactis</i>	CIP 103889
<i>Leuconostoc lactis</i>	DSM 20192
<i>Leuconostoc lactis</i>	DSM 20202 ^T
<i>Leuconostoc lactis</i>	DSM 8581
<i>Leuconostoc lactis</i>	DSM 8582
<i>Leuconostoc lactis</i>	DSM 8583
<i>Leuconostoc mesenteroides</i> subsp. <i>cremoris</i>	CECT 872 ^T
<i>Leuconostoc mesenteroides</i> subsp. <i>cremoris</i>	CIP 103009 ^T
<i>Leuconostoc mesenteroides</i> subsp. <i>cremoris</i>	DSM 20200
<i>Leuconostoc mesenteroides</i> subsp. <i>cremoris</i>	DSM 20346 ^T
<i>Leuconostoc mesenteroides</i> subsp. <i>dextranicum</i>	CECT 912 ^T
<i>Leuconostoc mesenteroides</i> subsp. <i>dextranicum</i>	CIP 102423 ^T
<i>Leuconostoc mesenteroides</i> subsp. <i>dextranicum</i>	DSM 20187
<i>Leuconostoc mesenteroides</i> subsp. <i>dextranicum</i>	DSM 20484 ^T
<i>Leuconostoc mesenteroides</i> subsp. <i>dextranicum</i>	DSM 46216
<i>Leuconostoc mesenteroides</i> subsp. <i>mesenteroides</i>	CECT 891 ^T
<i>Leuconostoc mesenteroides</i> subsp. <i>mesenteroides</i>	CIP 102305 ^T
<i>Leuconostoc mesenteroides</i> subsp. <i>mesenteroides</i>	CIP 78.59
<i>Leuconostoc mesenteroides</i> subsp. <i>mesenteroides</i>	DSM 20240
<i>Leuconostoc mesenteroides</i> subsp. <i>mesenteroides</i>	DSM 20241
<i>Leuconostoc mesenteroides</i> subsp. <i>mesenteroides</i>	DSM 20343 ^T
<i>Leuconostoc palmae</i>	DSM 21144 ^T
<i>Leuconostoc pseudomesenteroides</i>	CECT 4027 ^T
<i>Leuconostoc pseudomesenteroides</i>	CIP 103316 ^T
<i>Leuconostoc pseudomesenteroides</i>	CIP 103325
<i>Leuconostoc pseudomesenteroides</i>	CIP 110051
<i>Leuconostoc pseudomesenteroides</i>	DSM 20193 ^T
<i>Leuconostoc pseudomesenteroides</i>	DSM 5624
<i>Leuconostoc pseudomesenteroides</i>	DSM 5625
<i>Oenococcus kitaharae</i>	CIP 109430 ^T
<i>Oenococcus kitaharae</i>	DSM 17330 ^T
<i>Oenococcus oeni</i>	CECT 217 ^T
<i>Oenococcus oeni</i>	CIP 106144 ^T
<i>Oenococcus oeni</i>	DSM 10519
<i>Oenococcus oeni</i>	DSM 20252 ^T
<i>Oenococcus oeni</i>	DSM 20255

<i>Oenococcus oeni</i>	DSM 20257
<i>Weissella cibaria</i>	CECT 7032 ^T
<i>Weissella cibaria</i>	CIP 107376 ^T
<i>Weissella cibaria</i>	CIP 108011
<i>Weissella cibaria</i>	DSM 14295
<i>Weissella cibaria</i>	DSM 15878 ^T
<i>Weissella confusa</i>	CECT 4707 ^T
<i>Weissella confusa</i>	CIP 103172 ^T
<i>Weissella confusa</i>	DSM 20196 ^T
<i>Weissella ghanensis</i>	DSM 19935 ^T
<i>Weissella halotolerans</i>	CECT 573 ^T
<i>Weissella halotolerans</i>	CIP 103005 ^T
<i>Weissella halotolerans</i>	DSM 20190 ^T
<i>Weissella hellenica</i>	CECT 7033 ^T
<i>Weissella hellenica</i>	DSM 7378 ^T
<i>Weissella kandleri</i>	CECT 4307 ^T
<i>Weissella kandleri</i>	CIP 102809 ^T
<i>Weissella kandleri</i>	DSM 20593 ^T
<i>Weissella koreensis</i>	DSM 15830 ^T
<i>Weissella minor</i>	CECT 572 ^T
<i>Weissella minor</i>	CIP 102978 ^T
<i>Weissella minor</i>	DSM 20014 ^T
<i>Weissella paramesenteroides</i>	CECT 4268 ^T
<i>Weissella paramesenteroides</i>	DSM 20288 ^T
<i>Weissella paramesenteroides</i>	DSM 5623
<i>Weissella paramesenteroides</i>	CIP 102421 ^T
<i>Weissella soli</i>	CECT 7031 ^T
<i>Weissella soli</i>	DSM 14420 ^T
<i>Weissella thailandensis</i>	CECT 7052 ^T
<i>Weissella thailandensis</i>	DSM 15832 ^T
<i>Weissella thailandensis</i>	CIP 106751 ^T
<i>Weissella viridescens</i>	CECT 283 ^T
<i>Weissella viridescens</i>	CIP 102810 ^T
<i>Weissella viridescens</i>	DSM 20248
<i>Weissella viridescens</i>	DSM 20410 ^T

Origin and number of strains:

CECT	26
CIP	31
DSM	51
<hr/> TOTAL	<hr/> 108

7.7 Suborder Micrococcineae

Name

<i>Acaricomes phytoseiuli</i>	CIP 109141 ^T
<i>Acaricomes phytoseiuli</i>	DSM 14247 ^T
<i>Actinotalea fermentans</i>	CIP 103003 ^T
<i>Actinotalea fermentans</i>	DSM 3133 ^T
<i>Agromyces albus</i>	DSM 15934 ^T
<i>Agromyces bracchium</i>	DSM 14596 ^T
<i>Agromyces cerinus</i> subsp. <i>cerinus</i>	DSM 8595 ^T
<i>Agromyces cerinus</i> subsp. <i>nitratu</i> s	DSM 8596 ^T
<i>Agromyces fucosus</i> subsp. <i>fucosus</i>	DSM 8597 ^T
<i>Agromyces fucosus</i> subsp. <i>hippuratus</i>	DSM 8598 ^T
<i>Agromyces humatus</i>	DSM 16389 ^T
<i>Agromyces italicus</i>	DSM 16388 ^T
<i>Agromyces lapidis</i>	DSM 16390 ^T
<i>Agromyces luteolus</i>	DSM 14595 ^T
<i>Agromyces neolithicus</i>	DSM 16197 ^T
<i>Agromyces rhizosphaerae</i>	DSM 14597 ^T
<i>Agromyces salentinus</i>	DSM 16198 ^T
<i>Agromyces subbeticus</i>	DSM 16689 ^T
<i>Agromyces ulmi</i>	DSM 15747 ^T
<i>Arsenicococcus bolidensis</i>	CIP 108315 ^T
<i>Arsenicococcus bolidensis</i>	DSM 15745 ^T
<i>Arthrobacter albus</i>	DSM 13068 ^T
<i>Arthrobacter ardleyensis</i>	DSM 17432 ^T
<i>Arthrobacter arilaitensis</i>	DSM 16368 ^T
<i>Arthrobacter atrocyaneus</i>	DSM 20127 ^T
<i>Arthrobacter aurescens</i>	DSM 20116 ^T
<i>Arthrobacter bergerei</i>	DSM 16367 ^T
<i>Arthrobacter castelli</i>	DSM 16402 ^T

<i>Arthrobacter chlorophenolicus</i>	DSM 12829 ^T
<i>Arthrobacter citreus</i>	DSM 20133 ^T
<i>Arthrobacter creatinolyticus</i>	DSM 15881 ^T
<i>Arthrobacter crystallopoietes</i>	DSM 20117 ^T
<i>Arthrobacter defluvii</i>	DSM 18782 ^T
<i>Arthrobacter flavus</i>	DSM 15322 ^T
<i>Arthrobacter gandavensis</i>	DSM 15046 ^T
<i>Arthrobacter gangotriensis</i>	DSM 15796 ^T
<i>Arthrobacter histidinolorans</i>	DSM 20115 ^T
<i>Arthrobacter ilicis</i>	DSM 20138 ^T
<i>Arthrobacter kerguelensis</i>	DSM 15797 ^T
<i>Arthrobacter koreensis</i>	DSM 16760 ^T
<i>Arthrobacter luteolus</i>	DSM 13067 ^T
<i>Arthrobacter methylotrophus</i>	DSM 14008 ^T
<i>Arthrobacter monumenti</i>	DSM 16405 ^T
<i>Arthrobacter mysorens</i>	DSM 12798 ^T
<i>Arthrobacter nasiphocae</i>	DSM 13988 ^T
<i>Arthrobacter nicotianae</i>	DSM 20123 ^T
<i>Arthrobacter nitroguajacolicus</i>	DSM 15232 ^T
<i>Arthrobacter parietis</i>	DSM 16404 ^T
<i>Arthrobacter pascens</i>	DSM 20545 ^T
<i>Arthrobacter phenanthrenivorans</i>	DSM 18606 ^T
<i>Arthrobacter pigmenti</i>	DSM 16403 ^T
<i>Arthrobacter polychromogenes</i>	DSM 20136 ^T
<i>Arthrobacter protophormiae</i>	DSM 20168 ^T
<i>Arthrobacter psychrolactophilus</i>	DSM 15612 ^T
<i>Arthrobacter psychrophenolicus</i>	DSM 15454
<i>Arthrobacter ramosus</i>	DSM 20546
<i>Arthrobacter roseus</i>	DSM 14508 ^T
<i>Arthrobacter russicus</i>	DSM 14555 ^T
<i>Arthrobacter scleromae</i>	DSM 17756 ^T
<i>Arthrobacter stackebrandtii</i>	DSM 16005 ^T
<i>Arthrobacter subterraneus</i>	DSM 17585 ^T
<i>Arthrobacter sulfonivorans</i>	DSM 14002 ^T
<i>Arthrobacter sulfureus</i>	DSM 20167 ^T
<i>Arthrobacter tecti</i>	DSM 16407 ^T
<i>Arthrobacter tumbae</i>	DSM 16406 ^T
<i>Beutenbergia cavernae</i>	CIP 106362 ^T

<i>Beutenbergia cavernae</i>	DSM 12333 ^T
<i>Bogoriella caseilytica</i>	CIP 105404 ^T
<i>Bogoriella caseilytica</i>	DSM 11294 ^T
<i>Cellulomonas biazotea</i>	DSM 20111 ^T
<i>Cellulomonas bogoriensis</i>	DSM 16987 ^T
<i>Cellulomonas chitinilytica</i>	DSM 17922 ^T
<i>Cellulomonas denverensis</i>	DSM 15764 ^T
<i>Cellulomonas flavigena</i>	CIP 82.10 ^T
<i>Cellulomonas flavigena</i>	DSM 20109 ^T
<i>Cellulomonas gelida</i>	DSM 20111 ^T
<i>Cellulomonas hominis</i>	DSM 9581 ^T
<i>Cellulomonas iranensis</i>	DSM 14785 ^T
<i>Cellulomonas persica</i>	DSM 14784 ^T
<i>Cellulomonas terrae</i>	DSM 17791 ^T
<i>Cellulomonas xylanilytica</i>	DSM 16933 ^T
<i>Cellulosimicrobium cellulans</i>	CIP 103404 ^T
<i>Cellulosimicrobium cellulans</i>	DSM 43879 ^T
<i>Demequina aestuarii</i>	DSM 19086 ^T
<i>Demetria terragena</i>	CIP 105501 ^T
<i>Demetria terragena</i>	DSM 11295 ^T
<i>Dermacoccus abyssi</i>	DSM 17573 ^T
<i>Dermacoccus barathri</i>	DSM 17574 ^T
<i>Dermacoccus profundus</i>	DSM 17575 ^T
<i>Frondicola australicus</i>	CIP 109654 ^T
<i>Frondicola australicus</i>	DSM 17894 ^T
<i>Georgenia muralis</i>	DSM 14418 ^T
<i>Georgenia ruanii</i>	DSM 17458 ^T
<i>Humibacillus xanthopallidus</i>	DSM 21776 ^T
<i>Humihabitans oryzae</i>	CIP 109705 ^T
<i>Intrasporangium calvum</i>	DSM 43043 ^T
<i>Janibacter anophelis</i>	DSM 18333 ^T
<i>Janibacter limosus</i>	CIP 105278 ^T
<i>Janibacter limosus</i>	DSM 11140 ^T
<i>Janibacter melonis</i>	DSM 16063 ^T
<i>Janibacter sanguinis</i>	DSM 15959
<i>Janibacter terrae</i>	DSM 13876 ^T
<i>Kineosphaera limosa</i>	DSM 14548 ^T
<i>Knoellia sinensis</i>	CIP 106775 ^T

<i>Knoellia sinensis</i>	DSM 12331 ^T
<i>Kocuria halotolerans</i>	DSM 18442 ^T
<i>Lapillicoccus jejuensis</i>	DSM 18607 ^T
<i>Luteimicrobium subarcticum</i>	DSM 22413 ^T
<i>Marihabitans asiaticum</i>	DSM 18935 ^T
<i>Myceligenerans crystallogenes</i>	DSM 17134 ^T
<i>Myceligeneras xiligouense</i>	DSM 15700 ^T
<i>Nesterenkonia aethiopica</i>	DSM 17733 ^T
<i>Nesterenkonia alba</i>	DSM 19423 ^T
<i>Nesterenkonia flava</i>	DSM 19422 ^T
<i>Nesterenkonia halobia</i>	CIP 81.68 ^T
<i>Nesterenkonia halobia</i>	DSM 20541 ^T
<i>Nesterenkonia halophila</i>	DSM 16378 ^T
<i>Nesterenkonia halotolerans</i>	DSM 15474 ^T
<i>Nesterenkonia lacusekhoensis</i>	DSM 12544 ^T
<i>Nesterenkonia lutea</i>	DSM 15666 ^T
<i>Nesterenkonia sandarakina</i>	DSM 15664 ^T
<i>Nesterenkonia xinjiangensis</i>	DSM 15475 ^T
<i>Oerskovia enterophila</i>	DSM 43852 ^T
<i>Oerskovia paurometabola</i>	DSM 14281 ^T
<i>Oerskovia turbata</i>	CIP 100331 ^T
<i>Oerskovia turbata</i>	DSM 20577 ^T
<i>Ornithinimicrobium humiphilum</i>	CIP 106634 ^T
<i>Ornithinimicrobium humiphilum</i>	DSM 12362 ^T
<i>Oryzihumus leptocrescens</i>	DSM 18082 ^T
<i>Rarobacter faecitabidus</i>	CIP 103380
<i>Rarobacter faecitabidus</i>	DSM 4813 ^T
<i>Rarobacter incanus</i>	DSM 10596 ^T
<i>Ruania albidiflava</i>	CIP 109565 ^T
<i>Ruania albidiflava</i>	DSM 18029 ^T
<i>Salana multivorans</i>	DSM 13521 ^T
<i>Sanguibacter antarcticus</i>	DSM 18966 ^T
<i>Sanguibacter keddiei</i>	CIP 106323 ^T
<i>Sanguibacter keddiei</i>	DSM 10542 ^T
<i>Sanguibacter suarezii</i>	DSM 10543 ^T
<i>Serinicoccus marinus</i>	CIP 108477 ^T
<i>Serinicoccus marinus</i>	DSM 15273 ^T
<i>Terrabacter aeriphilus</i>	DSM 18563 ^T

<i>Terrabacter aerolatus</i>	DSM 18562 ^T
<i>Terrabacter lapilli</i>	DSM 18583 ^T
<i>Terrabacter tumescens</i>	DSM 20308 ^T
<i>Terrabacter tumescens</i>	CIP 102515 ^T
<i>Terracoccus luteus</i>	CIP 105511 ^T
<i>Terracoccus luteus</i>	DSM 44267 ^T
<i>Tetrasphaera australiensis</i>	DSM 12890 ^T
<i>Tetrasphaera duodecadis</i>	DSM 12806 ^T
<i>Tetrasphaera elongata</i>	DSM 14184 ^T
<i>Tetrasphaera japonica</i>	DSM 13192 ^T
<i>Xylanibacterium ulmi</i>	DSM 16932 ^T
<i>Xylanimicrobium pachnodae</i>	DSM 12657 ^T
<i>Xylanimonas cellulosilytica</i>	DSM 15894 ^T
<i>Yaniella halotolerans</i>	DSM 15476 ^T
<i>Zhihengliuella halotolerans</i>	DSM 17364 ^T

Origin and number of strains:

DSM	135
CIP	37
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TOTAL	172

7.8 Genus *Pediococcus*

Name

<i>Pediococcus acidilactici</i>	CECT 5765 ^T
<i>Pediococcus claussenii</i>	CECT 7027 ^T
<i>Pediococcus claussenii</i>	DSM 14800 ^T
<i>Pediococcus damnosus</i>	CECT 793 ^T
<i>Pediococcus damnosus</i>	DSM 20291
<i>Pediococcus inopinatus</i>	DSM 20285
<i>Pediococcus inopinatus</i>	DSM 20287
<i>Pediococcus pentosaceus</i>	CECT 4695 ^T
<i>Pediococcus pentosaceus</i>	DSM 20280
<i>Pediococcus pentosaceus</i>	DSM 20281
<i>Pediococcus pentosaceus</i>	DSM 20283
<i>Pediococcus pentosaceus</i>	DSM 20333
<i>Pediococcus pentosaceus</i>	DSM 46292

<i>Pediococcus soyae</i>	DSM 20337
<i>Pediococcus soyae</i>	DSM 20338
<i>Pediococcus</i> sp.	DSM 1056
<i>Pediococcus stilesii</i>	DSM 18001 ^T

Origin and number of strains:

CECT	4	
DSM		13
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TOTAL		18

7.9 Genus *Propionibacterium*

Name

<i>Propionibacterium acidifaciens</i>	DSM 21887 ^T
<i>Propionibacterium acnes</i>	CECT 5684 ^T
<i>Propionibacterium acnes</i>	DSM 01897 ^T
<i>Propionibacterium avidum</i>	DSM 04901 ^T
<i>Propionibacterium avidum</i>	DSM 04901 ^T
<i>Propionibacterium cyclohexanicum</i>	DSM 16859 ^T
<i>Propionibacterium freudenreichii</i> subsp. <i>shermanii</i>	CECT 875 ^T
<i>Propionibacterium freudenreichii</i> subsp. <i>shermanii</i>	DSM 20270
<i>Propionibacterium jensenii</i>	DSM 20274
<i>Propionibacterium jensenii</i>	DSM 20278
<i>Propionibacterium jensenii</i>	DSM 20279
<i>Propionibacterium jensenii</i>	DSM 20535
<i>Propionibacterium microaerophilum</i>	DSM 13435 ^T
<i>Propionibacterium thoenii</i>	DSM 20277

Origin and number of strains:

CECT	2	
DSM		12
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TOTAL		14

7.10 Genus *Pseudomonas*

Name

<i>Pseudomonas aeruginosa</i>	CECT 110 ^T
<i>Pseudomonas corrugata</i>	CECT 124 ^T
<i>Pseudomonas marginalis</i>	CECT 229 ^T
<i>Pseudomonas pseudoalcaligenes</i>	CECT 318 ^T
<i>Pseudomonas mendocina</i>	CECT 320 ^T
<i>Pseudomonas putida</i>	CECT 324 ^T
<i>Pseudomonas fluorescens</i>	CECT 378 ^T
<i>Pseudomonas oleovorans</i>	CECT 4079 ^T
<i>Pseudomonas aeruginosa</i>	CECT 4407
<i>Pseudomonas syringae</i>	CECT 4429 ^T
<i>Pseudomonas agarici</i>	CECT 4467 ^T
<i>Pseudomonas asplenii</i>	CECT 4468 ^T
<i>Pseudomonas fragi</i>	CECT 446 ^T
<i>Pseudomonas chlororaphis</i>	CECT 4470 ^T
<i>Pseudomonas cichorii</i>	CECT 4471 ^T
<i>Pseudomonas tolaasii</i>	CECT 4472 ^T
<i>Pseudomonas viridiflava</i>	CECT 458 ^T
<i>Pseudomonas rhizosphaerae</i>	CECT 5726 ^T
<i>Pseudomonas lutea</i>	CECT 5822 ^T
<i>Pseudomonas argentinensis</i>	CECT 7010 ^T
<i>Pseudomonas simiae</i>	CECT 7078 ^T
<i>Pseudomonas guineae</i>	CECT 7231 ^T
<i>Pseudomonas litoralis</i>	CECT 7669
<i>Pseudomonas litoralis</i>	CECT 7670 ^T
<i>Pseudomonas sabulinigri</i>	CECT 7679 ^T
<i>Pseudomonas pelagia</i>	CECT 7689 ^T
<i>Pseudomonas baetica</i>	CECT 7721 ^T
<i>Pseudomonas pertucinogena</i>	CECT 7776 ^T
<i>Pseudomonas caeni</i>	CECT 7778 ^T
<i>Pseudomonas alcaligenes</i>	CECT 7784 ^T
<i>Pseudomonas anguilliseptica</i>	CECT 899 ^T
<i>Pseudomonas stutzeri</i>	CECT 930 ^T
<i>Pseudomonas aeruginosa</i>	CIP 100720 ^T
<i>Pseudomonas aeruginosa</i>	CIP 103282
<i>Pseudomonas aeruginosa</i>	CIP 103467

<i>Pseudomonas aeruginosa</i>	CIP 103837
<i>Pseudomonas aeruginosa</i>	CIP 104116
<i>Pseudomonas aeruginosa</i>	CIP 104467
<i>Pseudomonas aeruginosa</i>	CIP 105094
<i>Pseudomonas aeruginosa</i>	CIP 105925
<i>Pseudomonas aeruginosa</i>	CIP 59.33
<i>Pseudomonas aeruginosa</i>	CIP 59.34
<i>Pseudomonas aeruginosa</i>	CIP 59.35
<i>Pseudomonas aeruginosa</i>	CIP 59.36
<i>Pseudomonas aeruginosa</i>	CIP 59.37
<i>Pseudomonas aeruginosa</i>	CIP 59.38
<i>Pseudomonas aeruginosa</i>	CIP 59.39
<i>Pseudomonas aeruginosa</i>	CIP 59.40
<i>Pseudomonas aeruginosa</i>	CIP 59.41
<i>Pseudomonas aeruginosa</i>	CIP 59.43
<i>Pseudomonas aeruginosa</i>	CIP 59.44
<i>Pseudomonas aeruginosa</i>	CIP 60.93
<i>Pseudomonas aeruginosa</i>	CIP A22
<i>Pseudomonas oleovorans</i>	DSM 1045 ^T
<i>Pseudomonas syringae</i>	DSM 10604 ^T
<i>Pseudomonas viridiflava</i>	DSM 11124 ^T
<i>Pseudomonas aeruginosa</i>	DSM 1117
<i>Pseudomonas aeruginosa</i>	DSM 1128
<i>Pseudomonas graminis</i>	DSM 11363 ^T
<i>Pseudomonas avellanae</i>	DSM 11809 ^T
<i>Pseudomonas agarici</i>	DSM 11810 ^T
<i>Pseudomonas anguilliseptica</i>	DSM 12111 ^T
<i>Pseudomonas aeruginosa</i>	DSM 1253
<i>Pseudomonas moorei</i>	DSM 12647 ^T
<i>Pseudomonas putida</i>	DSM 12735
<i>Pseudomonas aeruginosa</i>	DSM 1299
<i>Pseudomonas marginalis</i>	DSM 13124 ^T
<i>Pseudomonas brassicacearum</i> subsp. <i>brassicacearum</i>	DSM 13227 ^T
<i>Pseudomonas stutzeri</i>	DSM 13592
<i>Pseudomonas stutzeri</i>	DSM 13627
<i>Pseudomonas thermotolerans</i>	DSM 14292 ^T
<i>Pseudomonas congelans</i>	DSM 14939 ^T
<i>Pseudomonas psychrotolerans</i>	DSM 15758 ^T

<i>Pseudomonas vranovensis</i>	DSM 16006 ^T
<i>Pseudomonas moraviensis</i>	DSM 16007 ^T
<i>Pseudomonas rhizosphaerae</i>	DSM 16299 ^T
<i>Pseudomonas</i> sp.	DSM 1650
<i>Pseudomonas putida</i>	DSM 1693
<i>Pseudomonas cremoricolorata</i>	DSM 17059 ^T
<i>Pseudomonas aeruginosa</i>	DSM 1707
<i>Pseudomonas asplenii</i>	DSM 17133 ^T
<i>Pseudomonas lutea</i>	DSM 17257 ^T
<i>Pseudomonas argentinensis</i>	DSM 17259 ^T
<i>Pseudomonas psychrophila</i>	DSM 17535 ^T
<i>Pseudomonas nitroreducens</i>	DSM 17553
<i>Pseudomonas abietaniphila</i>	DSM 17554 ^T
<i>Pseudomonas pachastrellae</i>	DSM 17577 ^T
<i>Pseudomonas fulva</i>	DSM 17717 ^T
<i>Pseudomonas peli</i>	DSM 17833 ^T
<i>Pseudomonas borbori</i>	DSM 17834 ^T
<i>Pseudomonas extremaustralis</i>	DSM 17835 ^T
<i>Pseudomonas pertucinogena</i>	DSM 18268 ^T
<i>Pseudomonas mohnii</i>	DSM 18327 ^T
<i>Pseudomonas reinekei</i>	DSM 18361
<i>Pseudomonas simiae</i>	DSM 18861 ^T
<i>Pseudomonas tolaasii</i>	DSM 19342 ^T
<i>Pseudomonas boreopolis</i>	DSM 19620 ^T
<i>Pseudomonas panipatensis</i>	DSM 21819 ^T
<i>Pseudomonas xiamenensis</i>	DSM 22326 ^T
<i>Pseudomonas xinjiangensis</i>	DSM 23391 ^T
<i>Pseudomonas putida</i>	DSM 291 ^T
<i>Pseudomonas putida</i>	DSM 295
<i>Pseudomonas halophila</i>	DSM 3050T
<i>Pseudomonas aeruginosa</i>	DSM 3227
<i>Pseudomonas putida</i>	DSM 3263
<i>Pseudomonas fragi</i>	DSM 3456 ^T
<i>Pseudomonas putida</i>	DSM 3601
<i>Pseudomonas aeruginosa</i>	DSM 46358
<i>Pseudomonas putida</i>	DSM 46608
<i>Pseudomonas mendocina</i>	DSM 50017 ^T
<i>Pseudomonas putida</i>	DSM 50026

<i>Pseudomonas aeruginosa</i>	DSM 50069
<i>Pseudomonas aeruginosa</i>	DSM 50071 ^T
<i>Pseudomonas aeruginosa</i>	DSM 50073
<i>Pseudomonas chlororaphis</i> subsp. <i>chlororaphis</i>	DSM 50083 ^T
<i>Pseudomonas fluorescens</i>	DSM 50090 ^T
<i>Pseudomonas fluorescens</i>	DSM 50091
<i>Pseudomonas fluorescens</i>	DSM 50108
<i>Pseudomonas pseudoalcaligenes</i> subsp. <i>pseudoalcaligenes</i>	DSM 50188 ^T
<i>Pseudomonas stutzeri</i>	DSM 50227
<i>Pseudomonas asplenii</i>	DSM 50254
<i>Pseudomonas cichorii</i>	DSM 50259 ^T
<i>Pseudomonas marginalis</i>	DSM 50276
<i>Pseudomonas syringae</i>	DSM 50312
<i>Pseudomonas syringae</i>	DSM 50315
<i>Pseudomonas alcaligenes</i>	DSM 50342 ^T
<i>Pseudomonas fluorescens</i>	DSM 50415
<i>Pseudomonas</i> sp	DSM 50906 ^T
<i>Pseudomonas stutzeri</i>	DSM 5190 ^T
<i>Pseudomonas stutzeri</i>	DSM 6082
<i>Pseudomonas lundensis</i>	DSM 6252 ^T
<i>Pseudomonas chlororaphis</i> subsp. <i>aureofaciens</i>	DSM 6698 ^T
<i>Pseudomonas meliae</i>	DSM 6759 ^T
<i>Pseudomonas atlantica</i>	DSM 6840
<i>Pseudomonas ficuserectae</i>	DSM 6929 ^T
<i>Pseudomonas stutzeri</i>	DSM 7136
<i>Pseudomonas corrugata</i>	DSM 7228 ^T
<i>Pseudomonas fuscovaginae</i>	DSM 7231 ^T
<i>Pseudomonas putida</i>	DSM 7314
<i>Pseudomonas putida</i>	DSM 84
<i>Pseudomonas nitroreducens</i>	DSM 9128
<i>Pseudomonas aeruginosa</i>	DSM 939

Origin and number of strains:

CECT	32
CIP	21
DSM	89
<hr/> TOTAL	<hr/> 142

7.11 Family Vibrionaceae

Name

<i>Aliivibrio finisterrensis</i>	CECT 7228 ^T
<i>Aliivibrio fischeri</i>	CECT 524 ^T
<i>Aliivibrio logei</i>	CECT 5009 ^T
<i>Enterovibrio calviensis</i>	CECT 7414 ^T
<i>Enterovibrio coralii</i>	CECT 7249 ^T
<i>Enterovibrio nigricans</i>	CECT 7320 ^T
<i>Enterovibrio norvegicus</i>	CECT 7288 ^T
<i>Grimontia hollisae</i>	CECT 5069 ^T
<i>Photobacterium angustum</i>	CECT 5690 ^T
<i>Photobacterium aphoticum</i>	CECT 7614 ^T
<i>Photobacterium damsela</i> subsp. <i>damsela</i>	CECT 626 ^T
<i>Photobacterium damsela</i> subsp. <i>piscicida</i>	CECT 5896
<i>Photobacterium ganghwense</i>	CECT 7641 ^T
<i>Photobacterium halotolerans</i>	CECT 5860 ^T
<i>Photobacterium leiognathi</i>	CECT 4191 ^T
<i>Photobacterium lutimaris</i>	CECT 7642 ^T
<i>Photobacterium phosphoreum</i>	CECT 4192 ^T
<i>Photobacterium rosenbergii</i>	CECT 7644 ^T
<i>Photobacterium swingsii</i>	CECT 7576 ^T
<i>Photobacterium</i> sp.	CECT 7580
<i>Salinivibrio costicola</i> subsp. <i>costicola</i>	CECT 4059 ^T
<i>Vibrio aerogenes</i>	CECT 7868 ^T
<i>Vibrio agarivorans</i>	CECT 5085 ^T
<i>Vibrio alginolyticus</i>	CECT 521 ^T
<i>Vibrio anguillarum</i>	CECT 522 ^T
<i>Vibrio artabrorum</i>	CECT 7226 ^T
<i>Vibrio atlanticus</i>	CECT 7223 ^T
<i>Vibrio breoganii</i>	CECT 7222 ^T
<i>Vibrio campbellii</i>	CECT 523 ^T
<i>Vibrio celticus</i>	CECT 7224 ^T
<i>Vibrio cholerae</i>	CECT 514 ^T
<i>Vibrio cincinnatiensis</i>	CECT 4216 ^T

<i>Vibrio diazotrophicus</i>	CECT 627 ^T
<i>Vibrio fluvialis</i>	CECT 4217 ^T
<i>Vibrio furnissii</i>	CECT 4203 ^T
<i>Vibrio gallaecicus</i>	CECT 7244 ^T
<i>Vibrio gazogenes</i>	CECT 5068 ^T
<i>Vibrio harveyi</i>	CECT 525 ^T
<i>Vibrio ichthyoenteri</i>	CECT 5675 ^T
<i>Vibrio ichthyoenteri</i>	CECT 7096
<i>Vibrio inhibens</i>	CECT 7692 ^T
<i>Vibrio lentus</i>	CECT 5110 ^T
<i>Vibrio mangrovi</i>	CECT 7927 ^T
<i>Vibrio marisflavi</i>	CECT 7928 ^T
<i>Vibrio mediterranei</i>	CECT 621 ^T
<i>Vibrio mediterranei</i>	CECT 623
<i>Vibrio mediterranei</i>	CECT 7870
<i>Vibrio mimicus</i>	CECT 4218 ^T
<i>Vibrio mytili</i>	CECT 632 ^T
<i>Vibrio natriegens</i>	CECT 526 ^T
<i>Vibrio nereis</i>	CECT 595 ^T
<i>Vibrio nigripulchritudo</i>	CECT 628 ^T
<i>Vibrio ordalii</i>	CECT 582 ^T
<i>Vibrio orientalis</i>	CECT 629 ^T
<i>Vibrio ostreicida</i>	CECT 7398 ^T
<i>Vibrio ostreicida</i>	CECT 7399
<i>Vibrio parahaemolyticus</i>	CECT 511 ^T
<i>Vibrio pelagius</i>	CECT 4202 ^T
<i>Vibrio ponticus</i>	CECT 5869 ^T
<i>Vibrio rhizosphaerae</i>	CECT 7877 ^T
<i>Vibrio ruber</i>	CECT 7878 ^T
<i>Vibrio scophthalmi</i>	CECT 4638 ^T
<i>Vibrio scophthalmi</i>	CECT 5965
<i>Vibrio scophthalmi</i>	CECT 5966
<i>Vibrio scophthalmi</i>	CECT 5967
<i>Vibrio scophthalmi</i>	CECT 5968
<i>Vibrio scophthalmi</i>	CECT 5969
<i>Vibrio sinaloensis</i>	CECT 7298 ^T
<i>Vibrio</i> sp.	CECT 7558
<i>Vibrio</i> sp.	CECT 7559

<i>Vibrio</i> sp.	CECT 7734
<i>Vibrio splendidus</i>	CECT 528 ^T
<i>Vibrio stylophorae</i>	CECT 7929 ^T
<i>Vibrio tapetis</i>	CECT 4600 ^T
<i>Vibrio tubiashii</i>	CECT 4196 ^T
<i>Vibrio vulnificus</i>	CECT 529 ^T
<i>Vibrio vulnificus</i>	CECT 5763

Origin and number of strains:

CECT

77