

Minutes

International Committee on Systematics of Prokaryotes

Subcommittee on the taxonomy of *Bifidobacterium*, *Lactobacillus* and related organisms

Minutes of the meetings, 30 August and 1 September 2006, Bologna, Italy

Günter Klein, *Secretary*

Session 1. Open meeting

Minute 1. Call to order. The open meeting was called to order as part of the Food Micro 2006 symposium, Bologna, Italy, at 16:30 on 30 August, 2006, by the Chairman, F. Dellaglio.

Minute 2. Record of attendance. The members present were: B. Biavati (Deputy Chairman), Johanna Björkroth, F. Dellaglio (Chairman), L. M. T. Dicks (Deputy Chairman), W.-H. Holzapfel, G. Klein (Secretary), M.-C. Montel and B. Pot. Apologies for absence were received from: C. Bonaparte, W. P. Hammes, A. Kagermeier-Callaway, E. Lauer, G. Reuter, B. Sgorbati and M. Vancanneyt. No apologies were received from M. D. Collins. Guests present included G. Felis and many participants of the Food Micro 2006 symposium.

Minute 3. Call for research reports. The following research reports on topics related to taxonomy of lactobacilli and bifidobacteria were presented:

Franco Dellaglio, Giovanna Felis: Omics in the taxonomy of food bacteria.

M. Ventura: First insights into the genome sequence analysis of the mouth-commensal *Bifidobacterium dentium* Bd1.

J. van Hylckama Vlieg: Genomic diversity and flexibility of *Lactococcus lactis*.

M. J. Callanan: IS elements as mediators of *Lactobacillus helveticus* strain diversity.

J. P. Bowman: Genetic responses of *Listeria monocytogenes* exposed to hydrostatic pressure processing.

A brief discussion followed each presentation.

Minute 4. Adjournment. The chairman thanked all the presenters for their contributions. The open meeting was adjourned at 18:10 on 30 August, 2006.

Session 2. Closed meeting

Minute 5. Call to order. The Chairman, F. Dellaglio, called the closed meeting to order at 17:00 on 1 September, 2006.

Minute 6. Record of attendance. The members present were: B. Biavati (Deputy Chairman), Johanna Björkroth, F. Dellaglio (Chairman), L. M. T. Dicks (Deputy Chairman), W.-H. Holzapfel, G. Klein (Secretary), M.-C. Montel, B. Pot and G. Reuter. Apologies for absence were received from: C. Bonaparte, W. P. Hammes, A. Kagermeier-Callaway, E. Lauer, B. Sgorbati and M. Vancanneyt. No apologies were received from M. D. Collins. G. Felis was present as a guest and K. Itoh (Tokyo, Japan) was present as an observer.

Minute 7. Approval of the agenda. The proposed agenda was approved.

Minute 8. Minutes of the previous meetings. The minutes of the meetings of the subcommittee in Stuttgart-Hohenheim, Germany, on 1 and 2 April 2005 were approved.

Minute 9. Membership. Notices of intentions to resign were received from the following members: A. Kagermeier-Callaway, E. Lauer and M.-C. Montel. The subcommittee accepted the resignations. The chairman and all present members of the subcommittee expressed their gratitude for the work and contributions of the retiring members. E. Ringø was considered as a candidate, provided that he would be present at the next meeting with a presentation at the open meeting. K. Itoh was asked to consider himself or another Japanese colleague as a potential candidate for the subcommittee. Other possible candidates were also discussed. The members also agreed to exclude inactive members if they do not attend meetings and/or do not contribute further to the work of the subcommittee. The secretary was asked to write a letter to such members indicating their exclusion from the subcommittee.

Minute 10. Scope of the Subcommittee. The status quo of genera within the purview of the subcommittee is as follows: *Bifidobacterium*, *Lactobacillus*, *Aerococcus*, *Carnobacterium*, *Leuconostoc*, *Pediococcus*, *Tetragenococcus*, *Weissella*, *Oenococcus*, *Vagococcus*, *Gardnerella*, *Paralactobacillus*, *Scardovia* and *Parascardovia*. The subcommittee proposed that the new genera *Isobaculum*, *Aeriscardovia*,

Lactosphaera and *Desemzia* should be included in the remit of the subcommittee. Generally, the scope of the subcommittee should be narrowed and the Secretary for Subcommittees should be contacted concerning this issue.

Minute 11. Call for old business. *Bifidobacterium infantis* and *Bifidobacterium suis* belong to the species *Bifidobacterium longum* and consequently three new subspecies of *B. longum* should be proposed. B. Biavati, C. Bonaparte and B. Pot agreed to elaborate a Request for an Opinion concerning this problem.

Regarding problems with the type strains within the *Bifidobacterium indicum*/*B. coryneforme*/*B. asteroides*-group, B. Biavati had collected the type strains from different culture collections and compared them by DNA fingerprinting. A manuscript is in preparation.

The origin of the type strain of *Bifidobacterium animalis* subsp. *lactis* (the former species *Bifidobacterium lactis*) remains unclear (isolation from yoghurt or re-isolation). The subcommittee will prepare a Taxonomic Note concerning the designation of a neotype strain.

The Judicial Commission has rejected a formal request introduced by B. Pot and supported by the subcommittee [Klein, *Int J Syst Evol Microbiol* **56** (2006), 2501–2503] regarding the *Lactobacillus casei*-group. The proposal to reject the species *Lactobacillus paracasei*, to designate strain ATCC 334 as the neotype of *L. casei* and to reclassify the current type strain of *L. casei* ATCC 393 was rejected.

The separate species status of *Lactobacillus animalis* and *Lactobacillus murinus* has been confirmed by M. Vancanneyt through DNA–DNA hybridization studies. *L. animalis* LMG 9843^T and *L. murinus* LMG 14189^T show a binding level of 56% (standard deviation of 2% between reciprocal values) according to data provided by M. Vancanneyt.

Minute 12. Minimal Standards. To facilitate the preparation of Minimal Standards for description of novel species, the subcommittee considered the preparation of a general standard applicable to all of the genera and species within the scope of the subcommittee. Special additional standards with specific requirements for genera could then be added. W. Holzapfel, together with W. Hammes, agreed to prepare a proposal for a general document including an overview table (B. Pot). B. Biavati will prepare an additional document for bifidobacteria. Within the standards, the subcommittee will include a recommendation to describe more than one strain when describing a novel species.

Minute 13. Call for new business. F. Dellaglio presented considerations concerning a new subdivision of the genus *Lactobacillus*. At the moment there is a great genetic diversity within this genus requiring the application of

different genetic and phenotypic techniques for defining new taxonomic units. F. Dellaglio will circulate a draft within the subcommittee with recommendations for the genus *Lactobacillus*.

Minute 14. Review of new species and subspecies.

The following novel species and subspecies were acknowledged by the subcommittee: *Lactobacillus apodemi* [Osawa *et al.*, *Int J Syst Evol Microbiol* **56** (2006) 1693–1696], *Lactobacillus concavus* [Tong & Dong, *Int J Syst Evol Microbiol* **55** (2005), 2199–2202], *Lactobacillus harbinensis* [Validation List No. 107, *Int J Syst Evol Microbiol* **56** (2006), 1–6; Miyamoto *et al.*, *Syst Appl Microbiol* **28** (2005), 688–694], *Lactobacillus nantensis* [Valcheva *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 587–591], *Lactobacillus oligofermentans* [Validation List No. 106, *Int J Syst Evol Microbiol* **55** (2005), 2235–2238; Koort *et al.*, *Appl Environ Microbiol* **71** (2005), 4400–4406], *Lactobacillus plantarum* subsp. *argentoratensis* [Bringel *et al.*, *Int J Syst Evol Microbiol* **55** (2005), 1629–1634], *Lactobacillus rennini* [Chenoll *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 449–452], *Lactobacillus siliginis* [Aslam *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 2209–2213], *Lactobacillus sobrius* [Konstantinov *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 29–32], *Lactobacillus vini* [Rodas *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 513–517], *Leuconostoc durionis* [Leisner *et al.*, *Int J Syst Evol Microbiol* **55** (2005), 1267–1270], *Leuconostoc pseudoficulneum* [Chambel *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 1375–1381], *Oenococcus kitaharae* [Endo & Okada, *Int J Syst Evol Microbiol* **56** (2006), 2345–2348], *Pediococcus cellicola* [Zhang *et al.*, *Int J Syst Evol Microbiol* **55** (2005), 2167–2170], *Pediococcus ethanolidurans* [Zhang *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 2405–2408], *Pediococcus stilesii* [Franz *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 329–333], *Tetragenococcus koreensis* [Lee *et al.*, *Int J Syst Evol Microbiol* **55** (2005), 1409–1413]. *Lactobacillus amylophilus* LMG 11400 and NRRL B-4435 have been reclassified as *Lactobacillus amylophilus* sp. nov. [Naser *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 2523–2527], *Lactobacillus arizonensis* has been reclassified as a later heterotypic synonym of *Lactobacillus plantarum* [Kostinek *et al.*, *Int J Syst Evol Microbiol* **55** (2005), 2485–2489], *Lactobacillus brevis* strains LMG 11494 and LMG 11984 have been reclassified as *Lactobacillus parabrevis* sp. nov. [Vancanneyt *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 1553–1557], *Lactobacillus cypricasei* Lawson *et al.* 2001 has been reclassified as a later heterotypic synonym of *Lactobacillus acidipiscis* Tanasupawat *et al.* 2000 [Naser *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 1681–1683], *Lactobacillus durianis* Leisner *et al.* 2002 has been reclassified as a later heterotypic synonym of *Lactobacillus vaccinofermentus* Kozaki and Okada 1983 [Dellaglio *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 1721–1724], *Lactobacillus ferintoshensis* has been reclassified as a later heterotypic synonym of *Lactobacillus parabuchneri* [Vancanneyt *et al.*, *Int J Syst Evol Microbiol* **55** (2005), 2195–2198], *Lactobacillus suntoryeus* Cachat and Priest 2005 has been reclassified as a later synonym of

Lactobacillus helveticus (Orla-Jensen 1919) Bergey *et al.* 1925 (Approved Lists 1980) [Naser *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 355–360], *Lactobacillus thermotolerans* Niamsup *et al.* 2003 has been reclassified as a later synonym of *Lactobacillus ingluviei* Baele *et al.* 2003 [Vancanneyt *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 793–795]. *Lactobacillus salivarius* subsp. *salivarius* and *Lactobacillus salivarius* subsp. *salicinius* have been considered to represent one species and an emended description of *Lactobacillus salivarius* has been given [Aslam *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 2397–2403].

Minute 15. Review of new genera. The new genus *Catelicoccus*, with the novel species *Catelicoccus marimammalium* [Lawson *et al.*, *Int J Syst Evol Microbiol* **56** (2006), 429–432], was acknowledged by the subcommittee.

Minute 16. Miscellaneous. G. Reuter will prepare a scientific history of the subcommittee and will forward the draft to the chairman.

Minute 17. Present membership. The following individuals are members of the Subcommittee on *Bifidobacterium*, *Lactobacillus* and related organisms: Bruno Biavati (Bologna, Italy) (Deputy Chairman), Johanna Björkroth (Helsinki, Finland), Christine Bonaparte (Hannover, Germany), Matthew D. Collins (Reading, UK), Franco Dellaglio (Verona, Italy) (Chairman), Leon M. T. Dicks (Stellenbosch, South Africa) (Deputy Chairman), Walter P. Hammes (Stuttgart, Germany), Wilhelm H. Holzapfel (Karlsruhe, Germany), Günter Klein (Hannover, Germany) (Secretary), Bruno Pot (Gent, Belgium), Gerhard Reuter (Berlin, Germany), Barbara Sgorbati (Bologna, Italy) and Marc Vancanneyt (Gent, Belgium).

Minute 18. Date and place of the next meeting. The next meeting of the subcommittee will be with the Food Micro meeting in 2008 in Aberdeen, UK, or with the IUMS meeting in 2008 in Istanbul, Turkey. Another option is the LAB9 meeting in The Netherlands.

Minute 19. Adjournment. The closed meeting was adjourned at 18:45 on 1 September, 2006.