

International Committee on Systematic Bacteriology

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

Minutes of the meetings, 22 and 23 September 1999, Veldhoven, The Netherlands

Session 1. Closed meeting

Minute 1. Call to order. Deputy Chairman F. Dellaglio called the closed meeting to order at 14:00 on 22 September 1999.

Minute 2. Record of attendance. The members present were B. Biavati, F. Dellaglio, L. M. T. Dicks, F. Gasser, W. P. Hammes, A. Kagermeier-Callaway, G. Klein, M. C. Montel, B. Pot and G. Reuter. Apologies for absence were received from: W. H. Holzapfel, E. Lauer, J. London, T. Mitsuoka and N. Weiss. The guests present were C. Bonaparte, M. Ehrmann, C. Hertel and G. Pérez-Martínez.

Minute 3. Approval of minutes. The minutes of the meetings of the subcommittee in Bingen, Germany, on 1 and 3 September 1993, and the statement concerning the safety of lactic acid bacteria of Chairman E. Lauer, were approved.

Minute 4. Organization of the subcommittee. B. Biavati proposed the establishment of subgroups for special problems, which should report to the subcommittee regularly. The proposals were welcomed by the members but no formal decision was made.

Minute 5. Scope of the subcommittee. Several new genera have been described which should be in the scope of the subcommittee according to their taxonomic position. The Secretary was therefore charged with contacting the Secretary for Subcommittees to request permission to include the new genera *Oenococcus* and *Vagococcus* as well as the previously described genus *Gardnerella* into the scope of the subcommittee.

Minute 6. Proposal of new candidates. Two scientists were proposed as candidates for membership: C. Bonaparte (Vienna, Austria) was nominated by G. Klein, and the nomination was seconded by E. Lauer (by correspondence). G. W. Tannock (Dunedin, New Zealand) was nominated by F. Dellaglio and the nomination was seconded by W. P. Hammes. The election was postponed to the next meeting and the candidates agreed to send to the Secretary a CV and publication list for circulation.

Minute 7. Election of new Chairman and Secretary. E. Lauer expressed his desire (by correspondence) to step down from his post after having served as Chairman for two terms. F. Dellaglio was proposed as Chairman by G. Reuter. L. M. T. Dicks agreed to assist him as Deputy Chairman and B. Biavati agreed to assist as Deputy Chairman for bifidobacteria. G. Klein was asked to remain Secretary. The election of all nominees was unanimous.

Minute 8. Call for old business. B. Biavati pointed out that the species *Bifidobacterium longum*/*Bifidobacterium infantis*/*Bifidobacterium suis* are closely related species and

the problem of differentiation is still unsolved. The members suggested to review the literature and to decide if *Bifidobacterium longum* and *Bifidobacterium infantis* are two separate species or subspecies of each other. *Bifidobacterium animalis* and *Bifidobacterium lactis* should be included in the process. The Secretary was charged to contact T. Mitsuoka concerning this problem. B. Biavati, E. Lauer and guest C. Bonaparte should report to the subcommittee at the next meeting. The members decided to investigate additional strains to solve the problems within the *Bifidobacterium indicum*/*Bifidobacterium coryneforme*/*Bifidobacterium asteroides* group. The relationship of the species *Bifidobacterium asteroides*, *Bifidobacterium indicum* and *Bifidobacterium coryneforme* to each other and on the genus level have to be reinvestigated. B. Biavati, E. Lauer and B. Pot agreed to report to the subcommittee. The Request for an Opinion by L. M. T. Dicks, E. M. du Plessis, F. Dellaglio & E. Lauer [*Int J Syst Bacteriol* **46** (1996), 337–340] to reject *Lactobacillus paracasei*, to designate strain ATCC 334 as neotype of *Lactobacillus casei* and to reclassify the current type strain of *Lactobacillus casei* ATCC 393 was strongly supported by the subcommittee. In the meantime several research reports gave more evidence for this reclassification [K. Mori, K. Yamazaki, T. Ishiyama, M. Katsamuta, K. Kobayashi, Y. Kawai, N. Inoue & H. Shinano, *Int J Syst Bacteriol* **47** (1997), 54–57; G. Klein, A. Pack, C. Bonaparte & G. Reuter, *Int J Food Microbiol* **41** (1998), 103–125]. F. Dellaglio, L. M. T. Dicks, W. P. Hammes, G. Klein and guest G. Pérez-Martínez agreed to report to the subcommittee. The Request for an Opinion to reject *Lactobacillus panis* [F. Dellaglio & G. Klein, *Int J Syst Bacteriol* **47** (1997), 910] was supported by the subcommittee and a decision was postponed after a decision of the Judicial Commission. The separate species status of *Lactobacillus animalis* and *Lactobacillus murinus* should be verified and the Secretary was charged to ask M. D. Collins and N. Weiss if there was new data concerning 16S rRNA and the DNA-homology. B. Pot agreed to perform SDS-PAGE studies. The members agreed that *Lactobacillus uli* does not belong to the genus *Lactobacillus*. The Secretary was charged to ask M. D. Collins and N. Weiss for new data and to ask them to prepare a Request for an Opinion. No decision was made concerning *Leuconostoc fallax* and *Leuconostoc argentinum* and the Secretary was charged to contact N. Weiss concerning these species. According to an information forwarded by N. Weiss by correspondence it was proposed to transfer *Lactosphaera pasteurii* to the genus and species of *Trichococcus flocculiformis* [E. Stackebrandt, P. Schumann, J. Swiderski & N. Weiss, *Int J Syst Bacteriol* **49** (1999), 185–188]. No decision was made and the Secretary was charged to contact N. Weiss concerning the status of these species. The members recognized a problem with the type strains of *Pediococcus acidilactici* Lindner 1887 and *Pediococcus pentosaceus*. F.

Dellaglio, W. P. Hammes and B. Pot agreed to report to the subcommittee and M. D. Collins should be contacted by the Secretary. A second draft of the Minimal Standard requirements for the description of new species of the genus *Bifidobacterium* was presented by E. Lauer (by correspondence). It was decided to distribute the draft to all members for approval or further suggestions, to be returned to E. Lauer within 4 months. B. Biavati agreed to contact E. Lauer for the final manuscript. W. P. Hammes agreed to contact W. Holzapfel concerning the preparation of a first draft of the Minimal Standard requirements for the description of new species of the genus *Lactobacillus*.

Minute 9. Call for new business. Correction of species names (e.g. *Lactobacillus sakei*, *Lactobacillus kefir*, *Lactobacillus parakefir*, *Lactobacillus sanfranciscensis*, etc.) was considered as necessary by the members to avoid incorrect latin names. The naming of new species descriptions should strictly follow the rules. A. Kagermeier-Callaway suggested that the method for the analysis of the electrophoretic mobility of LDHs and the definition of lactate isomers as taxonomic markers should be clearly described. The members agreed to include this proposal in the draft of the Minimal Standard requirements for the description of new species of the genus *Lactobacillus*. The members stated that *Bifidobacterium lactis* is not a valid species because there is significant evidence that the type strain of *Bifidobacterium lactis* has a high DNA–DNA homology with the *Bifidobacterium animalis* type strain (81–86% according to unpublished data from N. Weiss and F. Gavini). B. Biavati was asked to prepare a Request for an Opinion to reject *Bifidobacterium lactis*. The discussion concerning the taxonomic position of *Lactobacillus brevis* was postponed to the next meeting.

Minute 10. Acceptance of new species and subspecies. The following new species and subspecies were acknowledged as valid by the subcommittee: *Aerococcus christensii* [M. D. Collins, M. R. Jovita, R. A. Hutson, M. Ohlen & E. Falsen, *Int J Syst Bacteriol* **49** (1999), 1125–1128], *Lactobacillus amyolyticus* [I. Bohak, W. Back, L. Richter, M. Ehrmann, W. Ludwig & K. H. Schleifer, *Syst Appl Microbiol* **21** (1998), 360–364], *Lactobacillus iners* [E. Falsen, C. Pascual, B. Sjöden, M. Ohlén & M. D. Collins, *Int J Syst Bacteriol* **49** (1999), 217–221], *Lactobacillus lindneri* nom. rev. [W. Back, I. Bohak, M. Ehrmann, W. Ludwig & K. H. Schleifer, *Syst Appl Microbiol* **19** (1996), 322–325], *Lactobacillus kunkeei* [C. G. Edwards, K. M. Haag, M. D. Collins, R. A. Hutson & Y. C. Huang, *J Appl Microbiol* **84** (1998), 698–702], *Lactobacillus manihottivorans* [J. Morlon-Guyot, J. P. Guyot, B. Pot, I. Jacobe de Haut & M. Raimbault, *Int J Syst Bacteriol* **48** (1998), 1101–1109], *Lactobacillus sakei* subsp. *sakei*, *Lactobacillus sakei* subsp. *carneus*, *Lactobacillus curvatus* subsp. *curvatus*, *Lactobacillus curvatus* subsp. *melibiosus* [S. Torriani, C. A. van Reenen, G. Klein, G. Reuter, F. Dellaglio & L. M. T. Dicks, *Int J Syst Bacteriol* **46** (1996), 1158–1163, in combination with F. Berthier & S. D. Ehrlich, *Int J Syst Bacteriol* **49** (1999), 997–1007], *Lactobacillus zeae* [L. M. T. Dicks, E. M. du Plessis, F. Dellaglio & E. Lauer, *Int J Syst Bacteriol* **46** (1996), 337–340], *Tetragenococcus muraticus* [M. Satomi, B. Kimura, M. Mizoi, T. Sato & T. Fujii, *Int J Syst Bacteriol* **47** (1997), 832–836] and *Weissella hellenica* [M. D. Collins, J. Samelis, J. Metaxopoulos & S. Wallbanks, *J Appl Bacteriol* **75** (1993), 595–603].

Bifidobacterium lactis [L. Meile, W. Ludwig, U. Rueger, C. Gut, P. Kaufmann, G. Dasen, S. Wenger & M. Teuber, *Syst Appl Microbiol* **20** (1997), 57–64] was not acknowledged as a valid species by the subcommittee. The decision to acknowledge *Lactobacillus panis* [B. G. Wiese, W. Strohmair, F. A. Rainey & H. Diekmann, *Int J Syst Bacteriol* **46** (1996), 449–453] as a valid species was postponed after the decision of the Judicial Commission concerning the Request for an Opinion [F. Dellaglio & G. Klein, *Int J Syst Bacteriol* **47** (1997), 910] to reject *Lactobacillus panis*.

Minute 11. Acceptance of new genera. The new genera *Tetragenococcus* [M. D. Collins, A. M. Williams & S. Wallbanks, *FEMS Microbiol Lett* **70** (1990), 255–262] and *Weissella* [M. D. Collins, J. Samelis, J. Metaxopoulos & S. Wallbanks, *J Appl Bacteriol* **75** (1993), 595–603] were acknowledged as valid by the subcommittee.

Minute 12. Acceptance of new ordo and family. The new ordo *Bifidobacteriales* and the new family *Bifidobacteriaceae* [E. Stackebrandt, F. A. Rainey & N. L. Ward-Rainey, *Int J Syst Bacteriol* **47** (1997), 479–491] were each acknowledged as a valid by the subcommittee.

Minute 13. Present membership. The following individuals are members of the Subcommittee on *Bifidobacterium*, *Lactobacillus* and related organisms: Bruno Biavati (Deputy Chairman), Bologna, Italy; Matthew D. Collins, Reading, UK; Franco Dellaglio (Chairman), Verona, Italy; Leon M. T. Dicks (Deputy Chairman), Stellenbosch, South Africa; Francis Gasser, Paris, France; Walter P. Hammes, Stuttgart, Germany; Wilhelm H. Holzapfel, Karlsruhe, Germany; Angelika Kagermeier-Callaway, Mainz, Germany; Günter Klein (Secretary), Berlin, Germany; Eckhard Lauer, Berlin, Germany; Jack London, Bethesda, MD, USA; Tomotari Mitsuoka, Tokyo, Japan; Marie-Christine Montel, Saint-Genes-Champanelle, France; Bruno Pot, Gent, Belgium; Gerhard Reuter, Berlin, Germany; Barbara Sgorbati, Bologna, Italy; Norbert Weiss, Braunschweig, Germany.

Minute 14. Date and place of the next meeting. The next meeting of the subcommittee will be at the latest in conjunction with the ICSB meeting of the International Union of Microbiological Societies in July/August 2002 in Paris, France, or in conjunction with an appropriate meeting in 2001 or 2002.

Minute 15. Adjournment. The closed meeting was adjourned at 16:30 on 22 September 1999.

Session 2. Open meeting

Minute 16. Call to order. The open meeting was called to order at 14:00 on 23 September 1999, by Chairman F. Dellaglio.

Minute 17. Record of attendance. The members present were: F. Dellaglio, L. M. T. Dicks, F. Gasser, A. Kagermeier-Callaway, G. Klein, M. C. Montel and G. Reuter. Apologies for absence were received from: B. Biavati, W. P. Hammes, W. H. Holzapfel, E. Lauer, J. London, T. Mitsuoka, B. Pot and N. Weiss. The guests present were: C. Bonaparte, S. Torriani and other attendees at the 6th Lactic Acid Bacteria Symposium.

Minute 18. Call for research reports. The following research reports were presented. M. C. Montel 'Amino acid catabolism by lactic acid bacteria from meat.'; L. M. T. Dicks,

M. E. Silvester, P. A. Lawson & M. D. Collins 'Taxonomy of lactic acid bacteria isolated from the posterior fornix of the vagina of non-pregnant and pregnant patients. Description of a new species *Lactobacillus fornicis* sp. nov.' A brief discussion followed each presentation.

Minute 19. Adjournment. The Chairman thanked all presenters for their contributions. The open meeting was adjourned at 15:00 on 23 September 1999.

Günter Klein, *Secretary*