

International Committee on Systematics of Prokaryotes

Subcommittee on the taxonomy of *Halobacteriaceae*

Minutes of the meetings, 24 September 2001, Seville, Spain

Session 1. Open meeting

Minute 1. Call to order. The open meeting was held on 24 September 2001, at the Hotel NH Plaza de Armas, Seville, Spain. The Chairman, Dr A. Ventosa, called the meeting to order at 18:30.

Minute 2. Record of attendance. The subcommittee members present were Drs A. Ventosa (Chairman), A. Oren (Secretary), W. D. Grant, L. I. Hochstein, C. D. Litchfield, F. Rodríguez-Valera, H. G. Trüper and R. H. Vreeland. Apologies were received from R. R. Colwell, M. Kamekura, A. Ramos-Cormenzana and B. J. Tindall. In addition the meeting was attended by H. Bolhuis, H.-J. Busse, E. B. M. Denner, M. L. Dyal-Smith, K. Ihara, K. Ingvorsen, B. E. Jones, T. J. McGenity, H. Patzelt, C. Radax, B. H. A. Rehm, H. Stan-Lotter and H. Wieland.

Minute 3. New taxa. An updated list of taxa within the family *Halobacteriaceae* was distributed.

A. Oren stressed that the nomenclatural type of the *Halobacteriales* is the genus *Halobacterium* Elazari-Volcani 1957, not the family *Halobacteriaceae* Gibbons 1974 (Approved Lists 1980) as cited in Validation List no. 31 [Grant, W. D. & Larsen, H. *Int J Syst Bacteriol* **39** (1989), 495–497] [Euzéby, J. P. & Tindall, B. J. *Int J Syst Evol Microbiol* **51** (2001), 725–727].

Reports on the following new taxa and reclassification of existing taxa were presented by members of the subcommittee and other attendees of the meeting:

Halorhabdus utahensis gen. nov., sp. nov. [Wainø, M., Tindall, B. J. & Ingvorsen, K. *Int J Syst Evol Microbiol* **50** (2000), 183–190], with type strain DSM 12940 (presented by K. Ingvorsen). Recommended three-letter abbreviation of the genus: *Hrd*.

Haloterrigena thermotolerans sp. nov. [Montalvo-Rodríguez, R., López-Garriga, J., Vreeland, R. H., Oren, A., Ventosa, A. & Kamekura, M. *Int J Syst Evol Microbiol* **50** (2000), 1065–1071], with type strain DSM 11552, ATCC 700275 (presented by R. H. Vreeland).

Natrinema versiforme sp. nov. [Xin, H., Itoh, T., Zhou, P., Suzuki, K., Kamekura, M. & Nakase, T. *Int J Syst Evol Microbiol* **50** (2000), 1297–1303], with type strain DSM 11552, ATCC 700275.

Emended description of *Natrialba asiatica* [Hezayen, F. F., Rehm, B. H. A., Tindall, B. J. & Steinbüchel, A. *Int J Syst Evol Microbiol* **51** (2001), 1133–1142] (presented by B. H. A. Rehm).

Natrialba aegyptiaca sp. nov. [Hezayen, F. F., Rehm, B. H. A., Tindall, B. J. & Steinbüchel, A. *Int J Syst Evol Microbiol* **51** (2001), 1133–1142], with type strain DSM 13077, JCM 11194 (presented by B. H. A. Rehm). The species appears in the Notification List [*Int J Syst Evol*

Microbiol **51** (2001), 1231–1233] as *Natrialba aegyptiaca* corrig. The subcommittee stated that this correction was not justified because the specific epithet *aegyptiaca* is correct as well. The use of the name *Natrialba aegyptiaca* was recommended. The secretary of the subcommittee should request the chairman of the ICSP to add the issue to the agenda of the upcoming ICSP meeting in Paris in 2002.

Natrialba taiwanensis sp. nov. [Hezayen, F. F., Rehm, B. H. A., Tindall, B. J. & Steinbüchel, A. *Int J Syst Evol Microbiol* **51** (2001), 1133–1142], with type strain DSM 12281, JCM 9577 (presented by B. H. A. Rehm).

Natrialba hulunbeirensis sp. nov. [Xin, Y., Wang, Z., Xue, Y., Zhou, P., Ma, Y., Ventosa, A. & Grant, W. D. *Int J Syst Evol Microbiol* **51** (2001), 1693–1698], with type strain JCM 10989 (presented by A. Ventosa).

Natrialba chahannaensis sp. nov. [Xin, Y., Wang, Z., Xue, Y., Zhou, P., Ma, Y., Ventosa, A. & Grant, W. D. *Int J Syst Evol Microbiol* **51** (2001), 1693–1698], with type strain JCM 10990 (presented by A. Ventosa).

Natronobacterium nitratireducens sp. nov. [Xin, H., Itoh, T., Zhou, P., Suzuki, K. & Nakase, T. *Int J Syst Evol Microbiol* **51** (2001), 1825–1829], with type strain JCM 10717.

It was further stated that a description of *Haloferax alexandrinus* sp. nov., with type strain JCM 10717, IFO 16590, is in press [Asker, D. & Ohta, Y. *Int J Syst Evol Microbiol*, in press], and that a description of *Halosimplex carlsbadense* gen. nov., sp. nov., is presently under review [Vreeland, R. H., Straight, S., Rosenzweig, W. D. & Kamekura, M. *Int J Syst Evol Microbiol*, submitted for publication]. The type strain is ATCC BAA-75, JCM 11222. Recommended three-letter abbreviation of the genus: *Hsp*.

Minute 4. Species *incertae sedis*. A number of species *incertae sedis* are awaiting taxonomic assessment and if necessary valid description as new species. These include ‘*Haloalcalophilum atacamensis*’, ‘*Haloarcula aidinensis*’, ‘*Haloarcula californiae*’, ‘*Haloarcula sinaiensis*’, ‘*Halobacterium dachaidanensis*’, ‘*Halococcus dachaidanensis*’, ‘*Halorubrum hochsteinium*’, ‘*Natronobacterium innermongoliae*’, ‘*Natronobacterium wudunaoensis*’ and ‘*Natronococcus xinjiangense*’. The subcommittee calls upon those colleagues who isolated these strains to publish full descriptions and to validate the names of the taxa. The former name ‘*Natrinema patibile*’ (AB023426) has been corrected to *Natrinema versiforme*. A. Ventosa noted that a formal description of *Haloferax lucentensis* (‘*Haloferax alicantei*’) is in preparation.

Minute 5. The taxonomic status of *Haloarcula mukohataei*. *Haloarcula mukohataei* [Ihara, K., Watanabe, S. & Tamura, T. *Int J Syst Bacteriol* **47** (1997), 73–77], with type strain JCM 9738 (DSM 12286, ATCC 700874, NCIMB 13541) has a polar lipid composition different from that of all other *Haloarcula* species. In addition, its phylogenetic distance

from other *Haloarcula* species is rather large. Therefore, at its meeting in Sydney in 1999, the subcommittee suggested that transfer to a new genus may be warranted. A description of *Halomicrobium mukohataei* gen. nov., comb. nov. has been prepared (Oren, A., Eleri, R., Watanabe, S., Tamura, T. & Ihara, K. *Int J Syst Evol Microbiol*, submitted for publication) and an emended description of the species has been written in accordance with the minimal standards for description of new taxa in the order *Halobacteriales*.

Minute 6. Taxonomic rearrangements within the genera *Haloterrigena* and *Natrinema*. The genera *Haloterrigena* and *Natrinema* overlap to a large extent. W. D. Grant presented 16S rRNA-based phylogenetic trees and DNA similarities of a number of isolates. Reclassification of a number of isolates presently belonging to the genus *Haloterrigena* as *Natrinema* species may be justified, while *Haloterrigena turkmenica* (type strain VKM B-1734) should remain the type species of the genus *Haloterrigena*. Phenotypic characterizations of most relevant strains is still incomplete, and therefore an in-depth study of the relevant strains was recommended. R. H. Vreeland will coordinate this study.

Minute 7. Mislabelled strains in culture collections. As recommended at the subcommittee meeting in Sydney in 1999, the secretary has contacted the curators of ATCC and NCIMB in an attempt to remove invalid names from their catalogues. As a result, ATCC has removed entries named '*Halococcus acetoinfaciens*', '*Halococcus agglomerans*' and '*Halococcus nondenitrificans*' (all three Bacteria, unrelated with the archaeal genus *Halococcus*) from its catalogue. The curator of NCIMB replied that 'Curators and not ICSB subcommittee members decide what information is contained in their respective catalogues', and added that an effort would be made to better clarify the taxonomic standing of the strains in its catalogue. This has not been implemented thus far, so that entries such as *Halobacterium simoncinii* and *Halobacterium volcanii* subsp. *lipolyticum* still appear in the online NCIMB catalogue. W. D. Grant will approach the curator of NCIMB with a renewed request to correct the relevant catalogue entries.

Minute 8. Collections of *Halobacteriaceae* in endangered culture collections. R. H. Vreeland reported that he has obtained all strains of extreme halophiles from the discontinued culture collection of the National Research Council of Canada, a collection that is of great historical importance for the study of the *Halobacteriaceae*, especially thanks to the large number of strains isolated by the late Norman Gibbons. Out of the 28 cultures received, 20 proved viable. Dr Vreeland is presently checking the cultures for purity and characterizing their lipid patterns. He will request additional cultures of those strains that did not grow. Finally, he will submit the strains for deposition in at least two culture collections.

Minute 9. The species concept for prokaryotes. A. Oren gave a short overview of the ideas presented in the review by R. Rosselló-Móra and R. Amann (*FEMS Microbiol Rev* **25**,

39–67), and their implications for the description of new taxa within the *Halobacteriaceae*.

Minute 10. Adjournment. The open meeting was adjourned at 19:50 on 24 September 2001.

Session 2. Closed meeting

Minute 11. Call to order. The closed meeting was held on 24 September 2001, at the Hotel NH Plaza de Armas, Seville, Spain. The chairman, Dr A. Ventosa, called the meeting to order at 19:55.

Minute 12. Record of attendance. The members present were Drs A. Ventosa (Chairman), A. Oren (Secretary), W. D. Grant, L. I. Hochstein, C. D. Litchfield, F. Rodríguez-Valera, H. G. Trüper and R. H. Vreeland. Apologies were received from R. R. Colwell, M. Kamekura, A. Ramos-Cormenzana and B. J. Tindall.

Minute 13. Approval of agenda. The agenda of the meeting was approved.

Minute 14. Minutes of previous meeting. The minutes of the meetings held in Sydney, Australia, 16 August 1999 [*Int J Syst Evol Microbiol* **50** (2000), 1405–1407], were approved.

Minute 15. Resignation of D. J. Kushner and I. S. Zvyagintseva as members of the subcommittee. The Secretary read letters received from Donn J. Kushner (Toronto, Canada)† and Irina S. Zvyagintseva (Moscow, Russia), who both have expressed the wish to retire from membership of the subcommittee. The subcommittee accepted Drs Kushner and Zvyagintseva's resignations with regret, and thanked them for their long service. Professor Y. Ma (Beijing, China) was named as a possible candidate member of the subcommittee. The Secretary will formally invite Professor Ma to join the subcommittee at its next meeting.

Minute 16. Current membership. The current membership of the subcommittee is as follows: A. Ventosa (Seville, Spain) (Chairman), A. Oren (Jerusalem, Israel) (Secretary), R. R. Colwell (Arlington, VA, USA), W. D. Grant (Leicester, UK), L. I. Hochstein (Las Vegas, NV, USA), M. Kamekura (Noda, Japan), C. D. Litchfield (Manassas, VA, USA), A. Ramos-Cormenzana (Granada, Spain), F. Rodríguez-Valera (Alicante, Spain), B. J. Tindall (Braunschweig, Germany), H. G. Trüper (Bonn, Germany) and R. H. Vreeland (West Chester, PA, USA).

Minute 17. Next meeting of the subcommittee. The next meeting of the subcommittee will be held in 2002 in association with the International Union of Microbiological Societies Congresses in Paris, France (27 July–1 August 2002).

Minute 18. Adjournment. The meeting was adjourned at 20:05 on 24 September 2001.

Note added in proof

†Deceased 15 September 2001.

A. Oren, Secretary
A. Ventosa, Chairman