Minutes

Barry Holmes, *Chairman*
J. J. Farmer III, *Secretary*

International Committee on Systematics of Prokaryotes

Subcommittee on the taxonomy of *Enterobacteriaceae*

Minutes of the meetings, 7 August 2008, Istanbul, Turkey

Session 1. Closed meeting

Minute 1. Call to order. The Chairman, B. Holmes, called the closed meeting to order at 12:15 on 7 August 2008 in room Sultan 3 of the Istanbul Convention and Exhibition Center, Harbiye 80230, Istanbul, Turkey.

Minute 2. Record of attendance. The members present were B. Holmes (Chairman) and K. A. Bettelheim. Apologies for absence were received from J. J. Farmer, J. M. Janda and Y. Kosako. In the absence of the Secretary, the Chairman recorded the minutes.

Minute 3. Chairman's introductory remarks. The Chairman recorded that, although the *Enterobacteriaceae* Subcommittee was one of seven established officially as of 1 January 1950, the history can be traced back still further, to the *Salmonella* Subcommittee established in 1933 under the chairmanship of H. Schuetze. The year 1958 had been considered the 25th anniversary of the *Enterobacteriaceae* Subcommittee so, on this basis, the present meeting of the subcommittee marked its 75th anniversary. It was thus regrettable that more members were unable to be present to mark the occasion.

Minute 4. Approval of agenda. The proposed agenda was approved.

Minute 5. Minutes of the previous meeting. The minutes of the previous meeting, held in San Francisco in 2005, had been prepared, but not yet submitted for publication. Copies were available to be read and for any matters arising to be considered.

It had been recorded that a *Serratia* species can form spores [Int J Syst Evol Microbiol 53 (2003), 253–258] and it was suggested that a subcommittee member might address this issue to confirm or deny the observation. B. Holmes reported that Y. Kosako had kindly undertaken to examine *Serratia marcescens* subsp. *sakuensis* JCM 11315^T but that so far he has failed to demonstrate the presence of spores.

Minute 6. Changes in membership. There had been no resignations since the last meeting, but it was noted that Patrick Grimont had retired so would no longer remain a subcommittee member. Gratitude was expressed for his

contributions to the work of the subcommittee and, in particular, for his substantial contributions to the taxonomy of the *Enterobacteriaceae* over the years. A number of new members had been proposed: Diane Lightfoot (Melbourne, Australia), Dennis Hansen (Denmark) and Carol Iversen (Ireland). All subsequently accepted an invitation to become members and were subsequently approved by the Secretary for Subcommittees.

The Chairman announced that he was due to retire by the next meeting, so nominations would be sought and a ballot held with a view to a new Chairman being in place at the next meeting.

Minute 7. Current membership. The present membership of the Subcommittee is as follows: B. Holmes, Chairman (UK), J. J. Farmer, Secretary (USA), K. A. Bettelheim (UK), R. Colwell (USA), D. Hansen (Denmark), C. Iversen (Ireland), J. M. Janda (USA), Y. Kosako (Japan) and D. Lightfoot (Australia).

Minute 8. Any other business. The Chairman was tasked to investigate the current status of the International Federation for Enteric Phage Typing. Given application of this technique to several *Salmonella* serotypes, a closer working relationship might be beneficially established. Subsequently, the Chairman contacted the current Secretary, L. Ward, who advised that the Federation reported from time to time the number of strains isolated by phage type and country, where the country still performs phage-typing. The organisms concerned are principally *Salmonella typhi* and *Salmonella paratyphi*, but data are also presented on other salmonellas, most notably *Salmonella enteritidis* and *Salmonella typhimurium*. Antimicrobial resistance trends for *S. typhi* and *S. paratyphi* are also presented. It was hoped that the Federation and subcommittee would confer over plans for forthcoming meetings, where members of both might be in attendance.

Minute 9. Date and venue of next meeting. The next meeting of the subcommittee would be held at the next IUMS Congress in Sapporo, Japan, September 5–9, 2011.

Minute 10. Adjournment. The meeting was adjourned at 12:55 on 7 August 2008.

Session 2. Open Meeting

Minute 11. Call to order and welcome. The Chairman, B. Holmes, called the open meeting to order at 13:00 on 7 August 2008 in room Sultan 3 of the Istanbul Convention and Exhibition Center, Harbiye 80230, Istanbul, Turkey.

Minute 12. Record of attendance. The members present were B. Holmes (Chairman) and K. A. Bettelheim. Apologies for absence were received from J. J. Farmer, J. M. Janda and Y. Kosako. Henrik Christensen attended briefly to present some information relating to the reviewing of manuscripts.

Minute 13. Chairman's report. Since the last meeting, which re-established the Subcommittee, the Chairman had had pages created on the ICSP website for the Subcommittee (<http://www.the-icsp.org/subcoms/Enterobacteriaceae.htm>). The membership had been added and, following the Chairman's research of the subcommittee history, that had also been listed, including minutes of all previous meetings, reports, special publications and past officers. All that was needed for completeness was a list of taxa covered and K. A. Bettelheim undertook to prepare this.

Minute 14. Reports and discussions. K. A. Bettelheim presented, for information, a report on discussions on the taxonomy and nomenclature of Shigatoxigenic or Verocytotoxigenic *Escherichia coli*, which were held at the VTEC 2006 Conference in Melbourne, Australia on 1 November 2006. A round table discussion was held on the nomenclature of these bacteria and their toxins. The meeting was chaired by M. Levine and participants included F. Scheutz, M. Bitzan, P. Feng, M. Doyle, P. Tarr, M. Karmali, A. O'Brien, T. Whitton, V. Prado, C. Zhu, T. Cheasty, R. Johnston and M. Beale. M. Levine stressed that it is the clinical conditions of Haemolytic Uraemic Syndrome (HUS) and Haemorrhagic Colitis (HC), which give Verocytotoxigenic *E. coli* (VTEC), also known as Shigatoxigenic *E. coli* (STEC), their prominence. This is especially so as the vector(s) for the transmission of these pathogens are frequently popular food items. There is a need for uniform nomenclature to be adopted in order to be able to communicate clearly with the public. M. Levine considered that the term enterohaemorrhagic *E. coli* (EHEC) should be restricted to that subset of VTEC (or STEC) that carry the locus of enterocyte effacement (LEE) and produce enterohaemolysin. During the debate that followed differing opinions were expressed, that the term EHEC should be used under any or all of the following conditions: if they were part of an HUS outbreak, if they were part of an outbreak in which there were no cases of HUS, if they were isolated from cases of diarrhoea or if they were isolated solely from animals. These discussions centred on the problems of defining EHEC and a number of speakers considered these definitions as not scientific, although conceding their clinical usefulness.

While no vote was taken, there was probably a majority in favour of retaining the term EHEC, although no clear definition was given. In summary, it appeared that, if the term 'EHEC' was to be retained, then the definition must be revised. The question was going to be circulated to persons with a variety of interests and hopefully an adequate definition will be established. K. A. Bettelheim, however, considered the term EHEC to be misleading. Due to the great variety of serotypes of VTEC, which have differing host specificities and whose clinical role is often not fully established, the use of the term for one isolate in a clinical setting, when the full ecology has not been established, might only lead to confusion.

B. Holmes presented, for discussion, recent proposed developments relating to *Hafnia* and *Obesumbacterium*. Despite close phenotypic similarities, there are at least two distinct DNA–DNA hybridization groups (HG) in *Hafnia*. The type strain of the type species (ATCC 13337^T=NCTC 8105^T) falls in Group 1 (along with reference strain ATCC 29926) leaving Group 2 (containing strain ATCC 29927) unnamed. Similarly, there are two groups within *Obesumbacterium proteus*; these are separable by biochemical characters and DNA–DNA hybridization. However, despite having distinct phenotypic differences, *O. proteus* group 1 (type strain ATCC 12841^T) is 75 % related to DNA group 1 of *Hafnia alvei* (though only 52 % related to DNA group 2 of *H. alvei*); these two organisms thus represent a single species, *H. alvei*. This leaves two separate unnamed groups (*H. alvei* HG2 and *O. proteus* HG2) that are not closely related. J. M. Janda informed the rest of the subcommittee that a formal proposal to name *H. alvei* HG2, from the clinical environment, was underway. F. Priest and co-workers, however, had completed 16S rRNA gene trees of *O. proteus* biogroups 1 and 2 from breweries and had also sequenced four protein coding genes. A concatenated gene tree had also been produced. Both trees confirmed that *O. proteus* biogroups 1 and 2 belong in different genera. F. Priest had approached the subcommittee via the Secretary, J. J. Farmer, for advice on the best way to proceed. The various alternatives and questions raised by F. Priest were considered. These included possibly renaming *O. proteus* biogroup 1 as *Hafnia alvei* subsp. *proteus*, or as *Hafnia proteus* (*sic*) then seeking to designate biogroup 2 as *O. proteus* with a new type strain. *Escherichia blattae* would then be transferred to the genus as *O. blattae*. However, as *Hafnia proteus* is really not a distinct species from *H. alvei*, it would not be possible to write a definition for the former as a species. It seemed more appropriate to unite these organisms in *H. alvei*, below the level of species or subspecies to maintain flexibility of definition and circumscription, *H. alvei* 'brewery biogroups' seemed the best option. With regard to designating biogroup 2 as *O. proteus* with a new type strain, such an approach is much more complicated and would probably require a Request for an Opinion of the Judicial Commission to resolve the prime nomenclatural problem. It was agreed that the least confusing proposal would be a new genus name based on

one that captured the convoluted history of *Obesumbacterium/Hafnia* or one that would honour the discoverer of this brewery organism. The advantage of a new genus name was that it eliminated the confusion of *Obesumbacterium*, which referred to two different organisms. Within the new genus, *proteus* as the specific epithet might cause a problem because of its former name as *O. proteus*, but with a different type strain; a novel species name was therefore preferable, e.g. *paraproteus*. To summarize, the best way forward was to propose both a new genus and novel species for *O. proteus* biogroup 2 and probably to transfer *Escherichia blattae* also to that new genus.

The proposal by Iversen *et al.* [*Int J Syst Evol Microbiol* **58** (2008), 1442–1447] to reclassify *Enterobacter sakazakii* in a new genus *Cronobacter* was briefly discussed. Although this was a sound study based on molecular methods, concerns

were expressed over the reliance on a commercial test system for practical identification and the small numbers of strains used in the characterization studies.

It was noted that changes in shipping regulations from 1 January 2005 should facilitate easier transfer of cultures between researchers.

The development of minimal standards for the description of new members of the Family were still needed, but no-one had yet volunteered to undertake this task.

Minute 15. Any other business. There was no other business.

Minute 16. Adjournment. The meeting was adjourned at 13:55 on 7 August 2008.