International Committee on Systematic Bacteriology Subcommittee on the Taxonomy of *Vibrionaceae* (Vibrios)†

Minutes of the Meetings, 7 and 11 August 1982, Boston, Massachusetts

Session 1. Closed meeting

Minute 1. Call to order. The closed meeting was called to order at 9:00 on 7 August 1982 by the Chairman, R. Sakazaki.

Minute 2. Record of attendance. The members present were R. Sakazaki (Chairman), A. L. Furniss (Secretary), R. R. Colwell, J. J. Farmer III, Rudolph Hugh, and M. Véron.

Minute 3. Agenda. The written agenda previously sent to members was presented by the Secretary. Two items were added, and the agenda was approved. The minutes of the previous meeting, which was held on 4 September 1978 in Munich, Federal Republic of Germany, had been approved by mail and have been published (Int. J. Syst. Bacteriol. 29:170-171, 1979).

Minute 4. Changes in membership and officers. A. L. Furniss resigned from the office of Secretary and from the Subcommittee. R. Hugh and G. I. Barrow resigned from the Subcommittee. These resignations were accepted with regret, and letters of appreciation for service to the Subcommittee will be written. R. Hugh was voted an honorary member to recognize his service since the formation of the Subcommittee. J. J. Farmer III was elected Secretary, and R. Sakazaki was elected for a second term as Chairman. J. V. Lee, PHLS Centre for Applied Microbiology and Research, Salisbury, Wiltshire, United Kingdom, was elected a new member.

Minute 5. Current membership. The current voting membership of the Subcommittee is as follows: R. Sakazaki (Chairman), Tokyo, Japan; J. J. Farmer III (Secretary), Atlanta, Ga.; P. Baumann, Davis, Calif.; R. R. Colwell, College Park, Md.; J. V. Lee, Salisbury, Wiltshire, United Kingdom; S. C. Sanyal, Varanasi, India; R. W. H. Schubert, Frankfurt/Main, Federal Republic of Germany; and M. Véron, Paris, France.

Minute 6. Change in Subcommittee name. It was agreed that the organisms of interest to the Subcommittee are *Vibrio*, *Photobacterium*, *Aeromonas*, *Plesiomonas*, and other related (nonfastidious) oxidase-positive, gram-negative bacteria which ferment glucose (for example, see *Allomonas* and *Halomonas* under Minute 16). These organisms are usually classified in the family *Vibrionaceae*. Since organisms in all of these genera have been considered in the past by the Subcommittee, it was decided that the name Subcommittee on the Taxonomy of *Vibrionaceae* would be a more appropriate name. A motion to formally request this change passed unanimously.

Minute 7. Definitions of *Vibrio*, *Aeromonas*, and *Plesiomonas*. The difficulties in forming a precise definition for the genus *Vibrio* were discussed in relation to the oxidase-negative species *Vibrio metschnikovii* (J. V. Lee, T. J. Donovan, and A. L. Furniss, Int. J. Syst. Bacteriol. 28:99-111, 1978) and *Vibrio gazogenes* (C. S. Harwood, Curr. Microbi-

ol. 1:233-238, 1978) (*V. gazogenes* was listed as oxidase positive in the original description). The addition of the gas-producing species *V. gazogenes* and *Vibrio fluvialis* (J. V. Lee, P. Shread, A. L. Furniss, and T. N. Bryant, J. Appl. Bacteriol. 50:73-94, 1981) has also changed the definition of *Vibrio*, as has the addition of many species which were originally classified in the genus *Beneckeia* (P. Baumann, L. Baumann, S. S. Bang, and M. J. Woolkalis, Curr. Microbiol. 4:127-132, 1980). It was agreed that the next step in defining the genus *Vibrio* should be the circulation of previous descriptions, such as the one given in the minutes of the 1972 meeting in Munich. Descriptions of *Vibrio*, *Photobacterium*, *Aeromonas*, and *Plesiomonas* from the new edition of *Bergey's Manual* will also be circulated if possible. Formal definitions can be considered in this light.

Minute 8. Minimal characters for the description of new species of *Vibrionaceae*. There was a lengthy discussion of the responsibility under the *International Code of Nomenclature of Bacteria* of the Subcommittee to recommend minimal standards for descriptions of new taxa. A recommendation on minimal characters must be submitted eventually to the International Committee on Systematic Bacteriology through the Judicial Commission. It was agreed that certain tests should be done for description of a new species. These tests should be simple enough that they can be done by most microbiology laboratories; they would be considered minimal tests. However, many tests fall into the category of desirable, but not minimal. These include deoxyribonucleic acid-deoxyribonucleic acid and deoxyribonucleic acid-ribonucleic acid hybridization, the guanine-plus-cytosine content of the deoxyribonucleic acid, and the utilization of 50 to 100 different carbon sources. The question of minimal standards must be considered in detail so that a document can be published in the International Journal of Systematic Bacteriology.

The same problem exists for standard methods. The Subcommittee was pessimistic that a set of standard methods could be proposed because each laboratory has its own standard methods.

Minute 9. International system for serotyping *Vibrio cholerae*. The Chairman asked that a letter from R. Sutton, Diarrheal Diseases Control Program, World Health Organization, be read. This letter pointed out the confusion caused by having two different schemes for serotyping strains of *V. cholerae* which are not serogroup O1. The Subcommittee was requested to resolve this problem, which was then discussed at some length. The following motion was adopted: "(a) strains of *V. cholerae* which are not serogroup O1 (non-O1 *V. cholerae*) should be grouped on the basis of heat-stable somatic antigens; (b) serotyping of non-O1 *V. cholerae* can include a complete antigenic analysis, including, but not limited to, the heat-stable somatic and other heat-stable antigens, flagellar, fimbrial, capsular, and other heat-labile antigens; and (c) to this end an international working group for the standardization of *V. cholerae* serotyping should be formed under the Subcommittee on the Taxonomy of Vibrios." The possible composition of this working group

† The subcommittee name was officially amended by the Secretary for Subcommittees, ICSB, on 17 May 1984 (see Minute 6).

was discussed, along with the various approaches used in different laboratories.

Minute 10. International Vibrionaceae Working Group. A discussion was held on the International Vibrionaceae Working Group (R. R. Colwell and J. V. Lee, ASM News 48:1, 1982), which was recently formed by R. R. Colwell and J. V. Lee. This working group is not affiliated with any international body. R. Sakazaki requested that in order to avoid confusion, any recommendations on nomenclature, classification, and standardization of methods from the Vibrionaceae Working Group should be submitted to the Subcommittee since these specific charges are given to it by the Bacteriological Code. R. R. Colwell indicated that since she and J. V. Lee are members of both groups, this should not be a problem.

Minute 11. Status of the type strains of *Aeromonas hydrophila* and *Aeromonas salmonicida*. Minute 5 from the 1978 Subcommittee meeting in Munich (Int. J. Syst. Bacteriol. 29:170–171, 1979) indicated that there was some doubt about the status of the type strains of *Aeromonas hydrophila* and *Aeromonas salmonicida*. The Judicial Commission was informally asked in writing for an opinion [two strain numbers in Minute 5 were transposed, and the third sentence should have read, "The Subcommittee supported the recognition of ATCC 9071 as the neotype strain of *A. hydrophila* in place of ATCC 7966 (NCMB 86) and the recognition of ATCC 14174 (NCMB 833) as the neotype strain for *A. salmonicida* in place of NCMB 1102."].

A. L. Furniss read portions of letters which he had received from the Chairman of the Judicial Commission, which indicated that strain ATCC 7966 is the type strain of *A. hydrophila* and strain NCMB 1102 is the type strain of *A. salmonicida*. These strains could be challenged, but it would take a formal opinion of the Judicial Commission to alter their status as type strains, and such an opinion is unlikely. There was a discussion on the merits of the position of the Judicial Commission but there was no indication that a formal request for a change in either type strain would be forthcoming from a Subcommittee member.

Minute 12. Other scientific matters. The taxonomic position of the newly described species *Vibrio mimicus* (B. R. Davis, G. R. Fanning, J. M. Madden, A. G. Steigerwalt, H. B. Bradford, Jr., H. L. Smith, Jr., and D. J. Brenner, J. Clin. Microbiol. 14:631–639, 1981) was discussed. Several members expressed the opinion that it would be better to classify this organism as a subspecies of *V. cholerae* rather than as a separate species.

The meeting was adjourned at 11:45 on 7 August.

Session 2. Open meeting

Minute 13. Call to order. The meeting was called to order at 16:00 on 11 August 1982 by the Chairman, R. Sakazaki.

Minute 14. Record of attendance. The members present were R. Sakazaki (Chairman), J. J. Farmer III (Secretary),

R. R. Colwell, R. Hugh, R. H. W. Schubert, and M. Véron. In addition, there were 11 guests who participated in the discussion.

Minute 15. Summary of closed meeting. The Secretary read a summary of the closed meeting.

Minute 16. Informal discussion. A number of topics were discussed by the Subcommittee members and guests. Two new genera that have been classified in the family Vibrionaceae have been proposed. *Halomonas* was described in the International Journal of Systematic Bacteriology (R. H. Vreeland, C. D. Litchfield, E. L. Martin, and E. Elliot, Int. J. Syst. Bacteriol. 30:485–495, 1980), and cultures are available from the American Type Culture Collection (*Halomonas elongata* ATCC 33173 and ATCC 33174). *H. elongata* was isolated from salterns (solar salt facilities where the salt concentration was 13 to 26%). "*Allomonas*" is another new genus described in the Russian literature (G. P. Kalina, A. G. Somova, L. S. Podosinnikova, and T. I. Grafova, Z. Mikrobiol. Epidemiol. Immunobiol. 57:40–46, 1978), but this name has not been validated by publication in the International Journal of Systematic Bacteriology; thus, it has no standing in nomenclature. Apparently no authentic strains of "*Allomonas enterica*" are available in the west. However, strains similar to the published description of "*Allomonas*" have been identified (M. T. MacDonnell, F. L. Singleton, and M. A. Hood, Appl. Environ. Microbiol. 44:423–427, 1982). Further study of these new genera is needed. *V. mimicus* is very similar to *V. cholerae* based on phenotypic analysis, serological typing, and ecology. These arguments were made to support its classification as a subspecies of *V. cholerae*. Counterarguments based on deoxyribonucleic acid-deoxyribonucleic acid hybridization were made to support classification as a separate species. It was pointed out that strains were only 24 to 54% related to *V. cholerae* at 60°C and the level of relatedness dropped to 18 to 26% at 75°C. These data support the argument that this bacterium is a separate species. Thus, there was disagreement on the classification of *V. mimicus*. The species *Vibrio vulnificus* is easy to identify when it comes from human cases of septicemia or wound infection, but strains from the environment pose more of a problem in identification. This is apparently due to the presence of phenotypically similar *Vibrio* species in the environment. The species and subspecies concept in *Aeromonas* is being investigated by deoxyribonucleic acid-deoxyribonucleic acid hybridization, and it is expected that this study will result in some change from the numbers of species (three) and subspecies (eight) which were recognized in *Bergey's Manual of Determinative Bacteriology*, 8th ed. None of the present classifications of *Aeromonas* is universally accepted at this time.

The meeting was adjourned at 17:30 on 11 August.

J. J. FARMER III, Secretary