International Committee on Systematic Bacteriology Subcommittee on the Taxonomy of the Genus *Pseudomonas* and Related Organisms

Minutes of the Meetings, 4 July 1994, Postgraduate Medical & Pharmaceutical Institute, Prague, Czech Republic

Session 1. Open meeting.

Minute 1. Call to order. The meeting was called to order by the Chairman, T. Bergan (Oslo, Norway), at 1600 on 4 July 1994.

Minute 2. Record of attendance. The members present were T. Bergan (Oslo, Norway), E. Yabuuchi (Osaka, Japan), and P. De Vos (Ghent, Belgium). Also in attendance were J. F. Bernadet (Jouy-en Josas, France), M. Gillis (Ghent, Belgium), D. Janssens (Ghent, Belgium), J. Kostál (Prague, Czech Republic), E. Lipinska (Warsaw, Poland), P. Segers (Ghent, Belgium), J. M. Tiedje (East Lansing, Mich.), and M. Vancanney (Ghent, Belgium).

Minute 3. Report of recent developments in *Pseudomonas* taxonomy. Reports concerning the taxonomy of the genus *Pseudomonas* in view of recent publications were presented. E. Yabuuchi presented a report on the reconstruction of the genus *Pseudomonas* and the taxonomic status of non-*Pseudomonas* species previously considered members of the genus *Pseudomonas*. Most of the species listed in *Bergey's Manual of Determinative Bacteriology*, 8th ed., were included on the Approved Lists of Bacterial Names; the only exception was *Pseudomonas maltophilia*, which was omitted by mistake and was revived later by Palleroni and Holmes. After the 1990 meeting of the subcommittee, *Xanthomonas maltophilia* (formerly *Pseudomonas maltophilia*) was transferred to the new genus *Stenotrophomonas*, and the new genus *Burkholderia*, with type species *Burkholderia cepacia*, was proposed for rRNA homology group II. New combinations for six other species, *Burkholderia mallei*, *Burkholderia pseudomallei*, *Burkholderia pickettii*, *Burkholderia caryophylli*, *Burkholderia gladioli*, and *Burkholderia solanacearum*, were also proposed. These proposals were based on the results of cellular lipid and fatty acid analyses, DNA-DNA hybridization experiments, and sequence alignments performed with 1,174 nucleotides of 16S rRNA-coding DNAs (Yabuuchi et al., *Microbiol. Immunol.* **36**:1251–1275, 1992; Validation List no. 45 [*Int. J. Syst. Bacteriol.* **43**:398–399, 1993; Erratum, **43**:625]). Classification of the genus *Xanthomonas*, especially reconciliation of plant pathogenicity and classification data in comparison with the relationship between pathogenicity and classification in human pathogens, was also discussed. Additional developments in the work of L. Vauterin et al. (*Int. J. Syst. Bacteriol.* **40**:312–316, 1990), presented in a paper entitled "Towards an Improved Taxonomy of *Xanthomonas*," were expected. Furthermore, use of the terms α , β , γ , and δ for the subclasses of the *Proteobacteria* and use of superfamily as a taxon above the rank of family should be replaced by a formal nomenclature based on the ranks mentioned in the *International Code of Nomenclature of Bacteria*. P. De Vos presented a report describing a polyphasic approach to the study of the so-called "*Pseudomonas diminuta*-*Pseudomonas vesicularis*" group (rRNA group IV of the genus *Pseudomonas* as described in *Bergey's Manual of Systematic Bacteriology*, vol. 1) and reclassification of the organisms belonging to this group in the new genus *Brevundimonas* (*Int. J. Syst. Bacteriol.* **44**:499–510, 1994). It has been clear for a long time that the members of this rRNA group needed to be reclassified as members of a new genus on phylogenetic grounds (levels of rRNA similarity). A polyphasic approach based on sodium dodecyl sulfate-polyacrylamide gel electrophoresis of whole-

cell proteins, gas-liquid chromatography of fatty acids, polyamine patterns, a phenotypic analysis based on the API auxanographic technique, and DNA-DNA hybridization allowed De Vos et al. to delineate the new genus, as well as two species, *Brevundimonas diminuta* and *Brevundimonas vesicularis*. P. De Vos also presented an overview of the phylogenetic position of the different genera in which members of the genus *Pseudomonas* sensu *Bergey's Manual of Systematic Bacteriology*, vol. 1, have been classified. This new classification has been described in different publications during the last 4 years. Furthermore, the positions within the phylogenetic framework (rRNA similarity dendrogram) of the so-called *Pseudomonas* species of uncertain affiliation were determined. Some of these organisms can be assigned to what is now considered the genus *Pseudomonas* sensu stricto, which corresponds to *Pseudomonas* rRNA group I sensu *Bergey's Manual of Systematic Bacteriology*, vol. 1; others belong to the recently defined genera *Hydrogenophaga*, *Acidovorax*, *Comamonas*, *Stenotrophomonas*, *Burkholderia*, and *Brevundimonas*; and still others have been misclassified and are related to other genera of the *Proteobacteria* and therefore should be reclassified. It was stated that the new classification of the genus *Pseudomonas* should be described (e.g., in a minireview form) in journals to reach bacteriologists working in different fields (e.g., clinical microbiology, environmental microbiology, etc.).

Minute 4. Minimal standards. A draft manuscript describing the minimal standards for proposed new species of the genus *Pseudomonas* and proposed new genera related to the genus *Pseudomonas* and their species will be prepared before the end of August 1995.

Minute 5. Adjournment. The meeting was adjourned at 1800 on 4 July 1994.

Session 2. Closed meeting.

Minute 6. Call to order. The meeting was called to order by the Chairman, T. Bergan (Oslo, Norway), at 1800 on 4 July 1994.

Minute 7. Record of attendance. The members present were T. Bergan, E. Yabuuchi (Osaka, Japan), and P. De Vos (Ghent, Belgium).

Minute 8. Current members of the subcommittee. The current members of the subcommittee are T. Bergan (Chairman) (Oslo, Norway), E. Yabuuchi (Secretary) (Osaka, Japan), J. De Ley (Ghent, Belgium), P. Fahy (New South Wales, Australia), E. Falsen (Göteborg, Sweden), P. Grimont (Paris, France), D. Hildebrand (Berkeley, Calif.), H. Oyaizu (Tokyo, Japan), N. J. Palleroni (Caldwell, N.J.), C. L. Poh (Singapore), D. E. Stead (Harpenden, United Kingdom), and P. De Vos (Ghent, Belgium). It was agreed that each member should be asked to what extent he is still interested in being a full member of the subcommittee. T. Bergan proposed that E. Yabuuchi should succeed him as Chairman and that P. De Vos should succeed E. Yabuuchi as Secretary of the subcommittee; both accepted. Furthermore, T. Bergan agreed to compile the minutes of the Prague meetings. E. Yabuuchi and P. De Vos agreed to comment on the minutes before publication.

Minute 9. Adjournment. The meeting was adjourned at 1845 on 4 July 1994.

E. Yabuuchi, Secretary
P. De Vos