International Committee on Nomenclature of Bacteria

Subcommittee on the Taxonomy of *Mycoplasmatales*

Minutes of the Meeting, 10 August 1970

Mexico City, Mexico

Minute 1. Call to order The meeting was called to order by the Chairman, D. G. ff. Edward, on August 10, 1970.

Minute 2. Record of attendance. Members present were: D. G. ff. Edward (Chairman), E. A. Freundt (Secretary), R. M. Chanock, S. Razin, and Ruth G. Wittler. H. Erno was present as an alternate for L. Hayflick. A letter was received from J. Fabricant commenting in some detail on the agenda.

Minute 3. Report of the Subcommittee to the ICNB. The draft report that had been circulated to all members prior to the meeting received unanimous approval.

Minute 4. The status of the specific names *Mycoplasma hyopneumoniae* and *M. suis pneumoniae*. The names *Mycoplasma hyopneumoniae* and *M. suis pneumoniae* were independently proposed for an organism causing enzootic pneumonia of pigs. *M. hyopneumoniae* Mare and Switzer 1965 has priority as to date of publication; it was validly published, and a type strain (VPP-11) has been deposited with the American Type Culture Collection (ATCC). The name *M. suis pneumoniae* Goodwin et al. 1965 was proposed later. Subsequently it was shown by the latter authors that the type strain (strain J) of their species was serologically identical with a culture obtained from Switzer. The point was then made that, since this latter culture was an uncloned broth culture, it was open to doubt whether it was the same as the original culture described by Mare and Switzer or whether it was the same as the culture deposited with the ATCC. These considerations raised the possibility that *M. hyopneumoniae* might be regarded as a *nomen dubium*. The problem was further complicated by the fact that difficulties were encountered in growing the strain VPP-11 deposited with the ATCC.

The Subcommittee learned from Ruth Wittler that she had now succeeded in growing this strain and was prepared to compare it with strain J. If the two strains, VPP-11 and J, prove to be the same, the Subcommittee considered

that a request should be made to the Judicial Commission for an Opinion as to the correct name of the species.

Minute 5. Status of the names *Mycoplasma pharyngis* and *M. orale*. A request for an Opinion that the name *Mycoplasma pharyngis* be rejected and that *Mycoplasma orale* be conserved had been submitted by the Subcommittee to the Judicial Commission. It was argued in this request that the name *M. pharyngis* was not validly published because the publication, presented in abstract form, was not accompanied by a description.

The Judicial Commission, considering this to be such a clear case, decided not to adjudicate on it. The Subcommittee, therefore, agreed to recommend that *M. orale* Taylor-Robinson et al. 1964 be accepted as the first validly published name for the species concerned and that the specific epithet *pharyngis* in the name *Mycoplasma pharyngis* be placed on the list of rejected epithets.

Minute 6. Taxonomic status of the three proposed types of *Mycoplasma orale* and their relationship to *M. salivarium*. Presently, three "types" of *Mycoplasma orale* are recognized (Taylor-Robinson et al. 1964, Taylor-Robinson et al. 1965, Fox et al. 1969). In addition to minor differences with respect to cultural and biochemical properties, the three types are serologically distinct by the growth inhibition (GI) and metabolic inhibition (MI) tests. Also, nucleic acid homology data indicate that types 1 and 2 are quite distinct from each other and from *M. salivarium*. With the CF test a marked cross-reaction is demonstrable between types 1 and 2, and a one-way cross-reaction between types 1 and 3. The gel-electrophoretic pattern of the cell proteins shows some degree of relationship between types 1 and 2, but here again distinct differences are demonstrable.

The authors who described the three "types" of *M. orale* did, in fact, regard them as three distinct species rather than as subtypes of one species. The nomenclature proposed by them was guided, however, by the view that a

numerical system of nomenclature is preferable to a binomial nomenclature.

The Subcommittee agreed to recommend that *M. orale* 1 and 2 be recognized as two separate species, and—in consequence—that a binomial name be proposed for *M. orale* 2.

It was also agreed that a recommendation on the taxonomic status of *M. orale* 3 should await the results of further comparative studies based on nucleic acid homology and gel-electrophoresis techniques. Thus far, such studies have been hampered by the difficulties encountered in growing this organism in sufficient quantities.

Minute 7. Taxonomic status of the "Donetta-like" strains classified as *Mycoplasma agalactiae* subspecies *bovis*. The "Donetta" strain is the type strain of *M. agalactiae* subsp. *bovis* Hale et al. 1962. When proposing this name, no satisfactory evidence was provided by Hale et al. in support of the view that "Donetta" and like strains represented a subspecies of *M. agalactiae*, the nomenclature merely being based on pathogenic properties. Neither were any data subsequently provided by Jain et al. 1967, in proposing the alternative name *M. bovimastitidis* to show that the proposed new taxon had the properties of a separate species.

The Subcommittee discussed presently available more informative data. The cultural and biochemical properties of *M. agalactiae* and *M. agalactiae* subspecies *bovis* are nearly identical. Serologically they are clearly distinct by the GI test, while cross reactions to very low titers can be obtained with the MI test. More extensive crossings, though partly in the form of one-way reactions, are demonstrable by DF and IHA test (Erno 1970). In addition, close similarities have been shown in the electrophoretic patterns of the cell proteins of the type strains of each group of organisms (Razin, 1968). Though the Subcommittee wish to encourage the performance of further comparative work, including nucleic acid homology studies, it considered that the above observations justify the tentative recognition of the group of "Donetta-like" strains as a subspecies of *M. agalactiae*. If other workers feel that the group deserves recognition as a separate species, named *M. bovimastitidis*, it will be for them to provide sufficient evidence in support of that claim.

The Subcommittee took advantage of this case to discuss the feasibility of providing guidelines for what constitutes a species. It was felt that one should not be too dogmatic on this point, and that it would be inadvisable to

set up too rigid a system until more is known about the biological range of the *Mollicutes*. It was emphasized, on the other hand, that the separation of a group of organisms into two or more species should be based on a variety of distinctive properties and that the results of growth-inhibition, gel-electrophoresis, and nucleic acid hybridization studies should be considered in particular.

Minute 8. Taxonomic status of the *T-mycoplasmas*. The Subcommittee took note of information provided by Razin that, according to recent studies carried out by Rottem, Pfendt, and Hayflick (J. Bacteriol, *in press*), the *T-mycoplasmas* require cholesterol for growth. This implies that this group of mycoplasmas belongs to the genus *Mycoplasma* of the two genera as yet recognized within the order *Mycoplasmatales*.

A total of at least seven serotypes have been established for the *T-mycoplasmas* of human provenance. Evidence for the existence of a more complex and closer relationship between all of these serotypes has been obtained by recent work. Particularly impressive studies by gel-electrophoresis indicating a close relationship between 12 strains examined were briefly reported to the Subcommittee by Razin.

The Subcommittee recommended that so far one named species should be recognized for the *T-mycoplasmas*, with T-960 as the type strain. Recommendations on the taxonomic status of the remaining *T-mycoplasmas*, and their relationship to that species, were left open for further discussion.

Minute 9. Proposal for establishing a new genus (*Acholeplasma*) and family (*Acholeplasmataceae*) of the order *Mycoplasmatales*. The proposal by Edward and Freundt (1970) to establish a new genus, *Acholeplasma*, and a new family, *Acholeplasmataceae*, in the order *Mycoplasmatales* received the unanimous approval of the Subcommittee.

Minute 10. Recommendations for minimum standards for descriptions of new taxa of the order *Mycoplasmatales*. At the request of the ICNB, and with the purpose of encouraging investigators to provide a sufficiently detailed description before proposing the establishment of a newly named taxon, draft recommendations had been prepared by the Subcommittee. According to these recommendations, it should first be demonstrated that the candidate in question possesses the general characteristics of the order *Mycoplasmatales*. Secondly, it should be shown by a variety of biochemical, serological, and other tests that it is a new taxon. In the recommendations, emphasis is made on

such tests which can be performed by an investigator with only ordinary laboratory facilities.

The Subcommittee further considered these recommendations and felt that where facilities and expertise were available it was highly desirable to supplement the more simple tests with, for example, electron-microscopy (to demonstrate the absence of a cell wall), gel-precipitation, gel-electrophoresis, determination of GC ratios and nucleic-acid homologies. It further considered that these recommendations, subject to further amendment, should be published, even if minimum standards for descriptions of new taxa were not incorporated into the forthcoming revision of the *International Code of Nomenclature of Bacteria*.

Minute 11. *Reelection and election of new members to the Subcommittee.* The present members were reelected, pending their willingness to keep membership. In addition, J. G. Tully was elected a new member.

Minute 12. *Officers of the Subcommittee.* The Chairman and the Secretary will hold office for another term.

Minute 13. *Membership of the Subcommittee.* The present membership of the Subcommittee is as follows: D. G. ff. Edward (Chairman), London, England; E. A. Freundt (Secretary), Aarhus, Denmark; R. Chanock, Bethesda, Maryland, USA; J. Fabricant, Ithaca, New York, USA; L. Hayflick, Stanford, California, USA; Ruth Lemcke, London, England; S. Razin, Jerusalem, Israel; N. L. Somerson, Columbus, Ohio, USA; J. G. Tully, Bethesda, Maryland, USA; Ruth G. Wittler, Washington, D.C., USA.

Minute 14. *Adjournment:* The meeting was adjourned.

E. A. Freundt, Secretary
D. G. ff. Edward, Chairman