Taxonomic Note

Correspondence

Hans G. Trüper
trueper@uni-bonn.de

Against conservation of specific epithets formed wrongly as nominative nouns in apposition

Hans G. Trüper

Institut für Mikrobiologie & Biotechnologie, Rheinische Friedrich-Wilhelms-Universität,
Meckenheimer Allee 168, D-53115 Bonn, Germany

Together with 31 other incorrectly formed (i.e. as nominative nouns in apposition) specific epithets, the epithet of *Streptomyces scabies* was corrected to *Streptomyces scabiei* in Taxonomic Notes published in 1997 and 1998. A subsequent Request for an Opinion, published in 2001, to reinstate the incorrect epithets for ten of these species was denied by the Judicial Commission in 2002. In 2007, a further Request for an Opinion was submitted to the Judicial Commission which proposed the conservation of the incorrect epithet of *Streptomyces* 'scabies' over the corrected one, *scabiei*. After having stated once that the corrections made to the epithets were performed according to the correct application of the International Code of Nomenclature of Bacteria (now 'of Prokaryotes', ICNP), the Judicial Commission would lose authority and credibility if it were to follow a request to abandon even one of the now correct 32 epithets in favour of its incorrectly formed predecessor. Microbiologists who accept changes in names of genera should also accept the correction of grammatical or orthographical changes in specific epithets.

In 1997 and 1998, Trüper and de' Clari published, according to Rule 61 of the *International Code of Nomenclature of Bacteria* (Lapage *et al.*, 1992, ICNB), corrections for 32 specific epithets that had been incorrectly formed as nominatives in apposition (Trüper & de' Clari, 1997, 1998).

In a letter to the editors of *ASM News*, Kilian (1998) complained about these corrections, accusing the authors of a 'lack of respect for all those who use bacterial names in their professional life'. This letter was answered in a very honest and scholarly way by de' Clari (1999), who explained the correct formation of genitive nouns as specific epithets. In addition, he pointed out that changes in genus names (e.g. *Pseudomonas* to *Burkholderia* or *Neisseria* to *Branhamella* and further to *Moraxella*) seem to be more easily accepted by the microbiology community than simple grammatical corrections of incorrectly formed specific epithets.

At the IUMS Congress in Sydney in 1999, the Judicial Commission followed a proposal by Euzéby (1998) to (non-retroactively) modify Rule 61 so that from the year of publication of the minutes of the Sydney meeting, no grammatical or orthographical corrections would be accepted for names that have appeared in the Approved Lists of Bacterial Names, in the Validation Lists or in the Notification Lists. The minutes of this 1999 meeting were published in 2000 (De Vos & Trüper, 2000).

Subsequently, Kilian (2001) published a Request for an Opinion in which he proposed the conservation of at least

ten of the incorrectly formed epithets of the 32 that had appeared in the Approved Lists of Bacterial Names (Skerman *et al.*, 1980), namely *Streptococcus sanguis*, *Streptococcus rattus*, *Streptococcus cricetus*, *Erwinia ananas*, *Eubacterium tarantellus*, *Lactobacillus sake*, *Nitrosococcus oceanus*, *Pseudomonas betle*, *Rickettsia canada* and *Streptomyces rangoon*. He further based his request upon Principle 1 (stability of names) of the ICNB (Lapage *et al.*, 1992). At the meeting of the Judicial Commission of the ICSP (formerly ICSB) that was held during the IUMS Congress in Paris in 2002, Kilian's request was dealt with and denied. The Request for an Opinion was denied as, in this case, Rule 61 (orthographic and grammatical corrections) had been correctly applied by Trüper & de' Clari (1997, 1998) and it had been applied before Euzéby's proposal of 1998 became effective by the publication of the minutes of the 1999 meeting in 2000. The minutes of the 2002 Paris meeting contain a short remark on this matter (Saddler, 2005, see Minute no. 17iii). Thus, on one hand Kilian's request came too late for the Judicial Commission to revoke the corrections made by Trüper and de' Clari and, on the other, the argument for maintaining the 32 now correctly formed epithets weighed heavier for the Judicial Commission than the reinstallation of the incorrectly formed epithets.

Since then, this debate had remained quiet until the recent publication by Lambert *et al.* (2007) of another Request for an Opinion of the Judicial Commission of the ICSP. This Request for an Opinion recommended the conservation of the incorrectly formed epithet of *Streptococcus scabies*

against the correctly formed epithet of *Streptococcus scabiei*. Their argument was that when the Approved Lists of Bacterial Names (Skerman *et al.*, 1980) were published, this species was excluded because its designated type strain did not correspond to the original description. Validation of the name did not occur before Lambert and Loria redescribed it in 1989 (Lambert & Loria, 1989). Why should this be a reason to revive an incorrect name? During the manifold changes of the genus name from *Tubercinia scabies* (Berkeley, 1846) via *Sorosporium*, *Oomyces*, *Actinomyces* and finally to *Streptomyces scabies*, at least five opportunities were missed to correct the incorrectly formed epithet *scabies* to *scabiei*!

The authors further argue that the corrected epithet has not achieved widespread recognition or common use and try to support this statement with data from electronically accessible databases. Scanning the results obtained from the Google search engine (<http://www.google.com>) suggests, however, that journals such as *International Journal of Systematic and Evolutionary Microbiology* (IJSEM), *Journal of Applied Microbiology*, *Canadian Journal of Plant Science*, *Physiological and Molecular Plant Pathology*, *American Journal of Potato Research*, *Microbiology*, *Applied and Environmental Microbiology*, *Plant Pathology* and *Systematic and Applied Microbiology* are aware of the correct spelling of *scabiei*. Even the pages of the NCBI Taxonomy Browser website, the ISPP Taxonomy of Plant Pathogenic Bacteria website and those of the major bacterial culture collections contain the correct spelling. When a correction or change to a name is published in IJSEM (formerly IJSB), it usually takes about two years until the change is disseminated to the wider community of microbiologists; only a few will notice the change immediately. Thus citation data for 1997 and perhaps 1998 are of little value in this case. The Google search engine is badly suited for such a comparison because the years of the citations are not immediately visible. As we all know, Google also cites older papers with the (wrong) old epithet *scabies* in the reference lists of even very recent papers (which may use the corrected name in their texts) which would then be attributed to the date of the recent paper. Besides this issue, Google treats the key words 'Streptomyces scabies', 'Streptomyces' and 'scabies' differently. Google is well recognized as not being an 'authority' and one must critically evaluate the results. The question that Lambert *et al.* (2007) do not tackle is where to find the 'authority' associated with the correctly spelled epithet and the use of that spelling. Therefore, the use of such citation numbers by Lambert *et al.* (2007) is worthless as an argument for reinstallation of the old (incorrect) epithet. It certainly does not make the old epithet correct but may instead prove how little many microbiologists and agricultural scientists, not to mention all the other people and companies interested in this organism or the disease it causes, care about the correctness of names, with the exception of those few who have a deep interest in taxonomy and correct nomenclature.

The situation could easily be clarified if the end users were actually taught something about the nomenclature and taxonomy of prokaryotes and were aware of the fact that the current scheme is one of the best examples of a well maintained system. Official lists of names can be found at websites such as the Lists of Prokaryote Names with Standing in Nomenclature (<http://www.bacterio.cict.fr/>), the Taxonomic Outline of the Bacteria and Archaea (TOBA; <http://www.taxonomicoutline.org>) and Bacterial Nomenclature up-to-date (http://www.dsmz.de/microorganisms/main.php?contentleft_id=14), so one does not have to rely on a single publication in which the correct spelling of a name is given. Nomenclature only makes sense when it is correct in itself and when it is followed correctly! This is what many scientists nowadays tend to forget.

Do Lambert *et al.* (2007) and their possible supporters really expect the Judicial Commission of the ICSP, the highest authority on prokaryote nomenclature, to be so unreliable, irresolute, irresponsible and capricious as to throw overboard their correct decisions in favour of incorrect epithets?

Acknowledgements

I thank Brian J. Tindall for fruitful discussions about the matter.

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