



BioCode: Third time lucky?

CHRISTINA FLANN

Netherlands Centre for Biodiversity Naturalis (section NHN), Biosystematics Group, Herbarium Vadense, Wageningen University, Generaal Foulkesweg 37, 6703 BL Wageningen, the Netherlands. Email: christinaflann@gmail.com

Fifteen year ago a draft BioCode was presented to the taxonomic community (Greuter *et al.* 1996). There is now a new version, published in *Taxon* (Greuter *et al.* 2011) and available online on the International Committee on Biological Nomenclature website as well as that of the International Commission for Zoological Nomenclature. Has the BioCode matured since it was last put forward? Was it ahead of its time in the 1990s, particularly in relation to the possibilities of electronic registration? Is it the future yet? As a taxonomist with an active interest in (botanical) nomenclature, I was still a student when this arose the last time and have referred to the literature to see what happened then. Interestingly it turns out that it wasn't the first time a biocode equivalent was suggested. Minelli (2008) discusses the suggestions drafted by a commission appointed on request of the zoologist Carlo Luciano Bonaparte in regard to the so-called Strickland Code (Strickland *et al.* 1842), these ideas, like the 1996 BioCode, were not accepted by the taxonomic community. Perhaps third time lucky?

The main reasons for the need for a code of bionomenclature across all organisms relate to issues of homonymy between kingdoms and continuing disruption and confusion caused by 'legacy' names, combined with the complicated nature of the current codes that have evolved over time. As noted in the introduction to the 1996 BioCode "The desirability of seeking some harmonization of all biological codes has been appreciated for some time" (McNeill 1996). It is impossible to argue with the statement in the Preamble of the 2011 Draft BioCode that "biology requires a precise, coherent and simple system for the naming of organisms used internationally" (Greuter *et al.* 2011).

This sort of undertaking has wide reaching effects and needs to be treated as an exercise in international taxonomic diplomacy. Proffering something that involves change to groups who are historically fairly conservative is politically difficult territory. If it is provided as a *fait accompli* there are those who could feel that it is being foisted upon them by a self-chosen group 'on high'. However, if no detailed enough plan for implementation exists then others will level a criticism of 'all talk, no substance' and it can be difficult to assess the virtues. This is not the place to review in detail the entire previous process, as Alessandro Minelli put it in 2001 "The project was eventually abandoned, mainly owing to manifest difficulties in satisfactorily dealing with already existing names and to unwillingness of many botanists and zoologists alike to part with their traditional rules and to accept registration of new names". These issues will still need to be overcome if the BioCode is to become a reality.

It is worth examining what has changed in the approach to proposing a BioCode. There is a sense of evolution that can be seen in titles of discussions regarding the BioCode. The session in Budapest at the 1996 International Congress of Systematic and Evolutionary Biology (ICSEB) was "The New Nomenclature", in 2009 at the Natural History Museum in London a workshop was held on "Tailoring Biological Nomenclature to User Needs" and at the 2011 ICSEB in Berlin the symposium was entitled "Modernizing the Nomenclatural Codes to meet Future Needs of Scientific Communities". The new BioCode "is most appropriately viewed as a framework over-arching the practices of the current series of codes" (Hawksworth 2011). There appears now to be a more mature, patient approach with staged implementation of the BioCode envisioned, a process where the users of the codes will decide how to implement the new rules alongside the existing ones. "Future date to be determined" (Greuter *et al.* 2011) is a much more amenable tone than "2000n...the urgency of having a *BioCode*... is recognized by indicating a date within the first decade of the millennium." (MacNeill 1997). The recent meeting in Berlin resulted in a very well balanced, positive, non threatening resolution accepted with no opposition by the International Congress of Systematic and Evolutionary Biology (IOSEB 2011).

Reading the BioCode itself is tough going and, like all similar legalistic documents, it is very hard to grasp exactly what the consequences are without actually applying it. It is, thankfully, much shorter and less complicated than the International Code for Botanical Nomenclature (ICBN, MacNeill *et al.* 2006) or the International Code of Zoological Nomenclature (ICZN 1999), one of its advantages. Without real examples it is hard to fully appreciate the implications of the nuts and bolts, but in general it seems to be basically a good idea and there is nothing blatantly unreasonable in it.

From the basic theoretical idea to the reality there are many levels of complexity and the path to implementation is certainly not a simple one. The devil is in the details, but given that details are essentially the specialty of taxonomists and given the much more balanced approach of this biocode, I think there is a chance, that in time at least some of the proposals will be adopted. Would we all have to consult two codes when we coin a name? Theoretically not, if I understand it correctly, after confirming that there isn't an existing name (with the not yet existent lists of accepted names, the Annexes) then new names would be governed by the new BioCode. That is, once it has been ratified by all involved, so it won't happen overnight.

For it to work it has to be across all codes. Few people would disagree with the basic premise that we all want names that are reliable, stable and consistent. In the current internet-based world, utilising the available resources and minimising confusion between names in different kingdoms is an aim that the taxonomic community is almost obliged to address. Now is truly the time of Biodiversity Informatics, much more so than in the 1990s and not just in 'western' countries, for example the impressive *Lista de Espécies da Flora do Brasil* (Forzza *et al.* 2010). There are still obvious issues with the assumption that everyone has access to a computer and internet which will have to be addressed, but it is something that is changing fast, particularly with the increase in mobile phone use and coverage worldwide.

Those that actively care about the codes and nomenclature are, in all honesty, a subset of a subset. Across all kingdoms only some taxonomists are interested in working on the codes, the rest simply want it to work. The recent redrafting process for the 2011 BioCode has been transparent, but that doesn't mean everyone has been looking. For the success of this sort of initiative, true democratic engagement with the wider systematics community is imperative, especially due to the cross kingdom nature. The planned "Milestones for the next triennium" for the new BioCode laid out in the International Union of Biological Sciences (IUBS 2010) website appears to do this quite well and I would encourage involvement and awareness of the relevant issues, particularly for zoologists and botanists as the mycological, bacteriological and cultivated plant communities are already well on the way regarding issues of registration and accepted name lists (Stalpers *et al.* 2009, Tindal 2009, David 2009).

ZooBank is obviously a step in the same direction as the BioCode and the existing infrastructure of The International Plant Name Index (IPNI) would easily lend itself to registration. But the issue of centralisation has the potential to be divisive and a balanced approach that is acceptable to all involved will need to be found. Thus the date in the future and the annexes yet to be decided on. There have been pilots such as the IAPT registration trial and there are certainly lessons that can already be learnt from. The bundled set of papers included on the ICB website and published recently in *Bulletin of Zoological Nomenclature*, give background to the issue of registration in particular. McNeill (2000) addresses many issues including those of accepted name lists. He points out that other past large changes to the botanical code came about when it was obvious in practice that they were an advantage. If further open discussion into the advantages a BioCode could offer the taxonomic community leads to experience of how that practice may work and that turns out to be an improvement, then the changes will remain. But it has to be an unhurried transition, allowing all involved to get up to speed in order to accept change. I think the conditions are good, but there are no guarantees.

In conclusion the new version of the BioCode appears to be being approached in a more relaxed, mature way than its 1996 counterpart with ample room for discussion. The code itself has been modified somewhat, but that same principles apply. These are also essentially the same principles in broad brushstrokes of the first biocode of 1842. Perhaps the international taxonomic community will be more receptive to the suggestions this time round. It will be interesting to see how this process progresses and if/when we will have a unified approach to bionomenclature in action.

References

- David, J.C. (2009) The Cultivated Plant experience *Bulletin of Zoological Nomenclature*, 66(2), 119–121.
- Forzza, R.C., Leitman, P.M., Costa, A.F., Carvalho Jr., A.A., Peixoto, A.L., Walter, B.M.T., Bicudo, C., Zappi, D., Costa, D.P., Lleras, E., Martinelli, G., Lima, H.C., Prado, J., Stehmann, J.R., Baumgratz, J.F.A., Pirani, J.R., Sylvestre, L., Maia, L.C., Lohmann, L.G., Queiroz, L.P., Silveira, M., Coelho, M.N., Mamede, M.C., Bastos, M.N.C., Morim, M.P., Barbosa, M.R., Menezes, M., Hopkins, M., Secco, R., Cavalcanti, T.B. & Souza, V.C. (2010) Lista de Espécies da Flora do Brasil. Jardim Botânico do Rio de Janeiro. Available from <http://floradobrasil.jbrj.gov.br/2010/> (accessed 25 March 2011).
- Greuter, W., Garrity, G., Hawksworth, D.L., Jahn, R., Kirk, P.M., Knapp, S., McNeill, J., Michel, E., Patterson, D.J., Pyle, R. & Tindall, B.J. (2011) Draft BioCode (2011): Principles and Rules Regulating the Naming of Organisms. *Taxon*, 60, 201–212. www.bionomenclature.net, <http://iczn.org/category/biocode/biocode>
- Greuter, W., Hawksworth, D.L., McNeill, J., Mayo, M.A., Minelli, A., Sneath, P.H.A., Tindall, B.J., Trehane, P., Tubbs, P. & IUBS/IUMS International Committee for Bionomenclature. (1996) Draft BioCode: The Prospective International Rules for the Scientific Names of Organisms. *Taxon*, 45, 349–372.
- Hawksworth, D.L. (2011) Introducing the Draft BioCode (2011). *Taxon*, 60(1), 199–200.

- ICZN—International Commission on Zoological Nomenclature (1999) International Code of Zoological Nomenclature Fourth Edition Adopted by the IUBS. The International Trust for Zoological Nomenclature, London.
- IOSEB (2011) Resolution voted on by the Symposium on “Modernising the nomenclatural codes to meet future needs of scientific communities (BioCode)” Available from http://www.bionomenclature.net/documents/IOSEB_VII_resolution.pdf (accessed 26 March 2011).
- IUBS—International Union of Biological Sciences (2010) http://www.iubs.org/prg/biocode_dp.html (accessed 25 March 2011).
- McNeill, J. (1996) General introduction to the *Draft BioCode*. In: International Committee on Bionomenclature (1996) pp. 7–18. Available from <http://www.bgbm.org/iapt/biocode/intro.html> (accessed 26 March 2011).
- McNeill, J. (1997) Introduction to the *Draft BioCode* (1997) Available from <http://www.bgbm.org/iapt/biocode/biointro1997.html> (accessed 26 March 2011).
- McNeill, J. (2000) Naming the Groups: Developing a Stable and Efficient Nomenclature. *Taxon*, 49, 705–720.
- McNeill, J., Barrie, F.R., Burdet, H.M., Demoulin, V., Hawksworth, D.L., Marhold, K., Nicolson, D.H., Prado, J., Silva, P. C., Skog, J.E., Wiersema, J.H. & Turland, N.J. (2006) International Code of Botanical Nomenclature (Vienna Code). *Regnum Vegetabile* 146. A.R.G. Gantner Verlag KG.
- Minelli, A. (2001) Short notes and reviews Zoological nomenclature – reflections on the recent past and ideas for our future agenda. *Bulletin of Zoological Nomenclature*, 58, 164–169.
- Minelli, A. (2008) Zoological vs. botanical nomenclature: a forgotten ‘BioCode’ experiment from the times of the Strickland Code. *Zootaxa*, 1950, 21–38.
- Stalpers, J.A, Robert, V., Stegehuis, G. & Crous, P.W. (2009) MycoBank, the virtual fungal laboratory of tomorrow. *Bulletin of Zoological Nomenclature*, 66(2), 114–117
- Strickland, H.E., Henslow, J.S., Phillips, J., Shuckard, W.E., Richardson, J.B., Waterhouse, G.R., Owen, R., Yarrell, W., Jenyns, L., Darwin, C., Broderip, W.J. & Westwood, J.O. (1842) *Report of a Committee appointed "to consider the rules by which the nomenclature of Zoology may be established on a uniform and permanent basis."* John Murray, London, for the British Association for the Advancement of Science.
- Tindall, B.J. (2009) Registration of names: the bacteriological experience. *Bulletin of Zoological Nomenclature*, 66(2), 117–119.