

Use versus priority in zoological nomenclature: a solution for an old problem

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Abstract. Overlooked senior synonyms often threaten currently used names, and their reintroduction under the Principle of Priority can cause confusion. Familiar names are displaced, and expensive monographs can be made less useful despite having an unchallenged taxonomy. To halt this gradual erosion, the nomenclature in certain works might be formally 'Protected' by the Commission from application of the Principle of Priority. In taxonomic groups so covered, the onus for making formal nomenclatural submissions would fall on those wishing to upset established usage rather than, as at present, on those defending it. Several other advantages of the proposal are discussed.

*'When generic names have come into almost universal use, and are good in themselves, it would save great confusion to allow them to remain. As in property, a certain number of years' undisputed possession might be regarded as a right. It is hard to give up such because it is discovered that an obscure writer badly named an ill-defined group a short time in advance. The new (so-called **old**) name might itself have to be displaced when some other antiquary had unhappily disinterred some older and worse book which had been fortunately forgotten. Surely use is the most complete publication.'* (P. P. Carpenter, 1866).

Introduction

The binominal system of zoological nomenclature is somewhat over two hundred years old. It and the parallel system of botanical nomenclature perhaps form the oldest and most widely accepted 'scientific language'. Mathematical, chemical and certain allied symbolisms excepted, biological nomenclature forms the oldest internationally accepted scientific notation. Its regulation is important.

The use of zoological nomenclature is now governed by the third (1985) edition of the International Code of Zoological Nomenclature, which promotes stability of nomenclature through an accepted set of guidelines. If, in a particular case, existing nomenclature is threatened the Code empowers the International Commission on Zoological Nomenclature [ICZN] to set its Articles aside and hence conserve familiar usage.

But there remains a major obstacle to nomenclatural stability. This is identified below, and a possible solution proposed. The proposal is presented for discussion, to be amended as necessary, rather than as a polished solution. Most examples of the problem that are cited come from the literature on one phylum of animals, but this does not imply a lack of general relevance: probably most taxonomists know relevant examples in their own fields.

The problem

Perhaps the commonest, and yet the most intractable, problem in nomenclature is that posed when a little used senior synonym is recognised of a subsequently introduced name that is more familiar. The Code requires the commonly used name to be rejected, and in consequence all concerned must become familiar with a new name for the taxon. But the Code also permits an alternative procedure: the Commission may suppress the older name and hence ratify continued use of the younger one. Indeed, it is a tenet of the Code that priority should not necessarily upset existing usage (Article 23b). A case must be submitted to the Commission recommending conservation of the widely used junior synonym, which can then remain in use while the case is considered.

But taxonomists often refrain from taking this formal action. This is perhaps partly due to the amount of labour involved in preparing a case and partly to the paucity of adequate libraries around the world. There is perhaps also a fear that refusal of an application might result in an unwanted name becoming ratified. Apparently taxonomists prefer to risk a proportion of the names used in their works becoming gradually superseded and made obsolete by the nomenclatural acts of subsequent workers, for whom the option of using older but unfamiliar names has remained open.

This problem has repercussions in all biological disciplines. Paradoxically, taxonomists themselves may be among the least affected, since their very expertise may enable them to follow with little difficulty a changing nomenclature which would confuse a non-specialist. But many branches of biology of the greatest benefit to man are to an increasing extent in danger of being hampered by fluctuations in nomenclature. They comprise those disciplines in which consideration of numerous taxa forms the basis of the approach, and include forestry and agriculture, pollution monitoring, control of pests and diseases, conservation, education, and ecology. Yet, again paradoxically, such changes are actually *required* under the Code, unless applications are made to the ICZN.

Thus in many fields strict adherence to the Principle of Priority not only fails to support scientific endeavour; it actually hinders it. One example will suffice. T. A. Stephenson's (1928, 1935) Ray Society monograph on the British sea anemones was taxonomically of the highest standard and in addition was both beautifully illustrated and widely available. Yet a recent and less detailed, though excellent, synopsis (Manuel, 1981) covering the anemone fauna (45 species in 35 genera) of the same area, though recognizing nearly all of the specific taxa of Stephenson, employed only about 30 of the original binomina. In four species both genus and species names were changed, in three others the genus names alone, and in four more just the species names. Thus the names of 11 species in a fauna of 45 (or of 38 as recorded by Stephenson) underwent some change. Most of the changes resulted from the disinterment during detailed library work of senior, and therefore valid, synonyms. Several of the names changed were of commonly collected forms familiar to sub-littoral and intertidal biologists. A strong case might have been made for at least some of the names to be conserved by the Commission. Now, a student wishing to use the older and more detailed guide, and much subsequent literature, has to wrestle with some 15 name changes in this small yet well known fauna, in addition to the great problems of identification inherent in the particular group. In this case, nomenclatural usage has been upset to no apparent biological purpose and to the disadvantage of the user.

A work need not introduce many name changes to be detrimental to established usage. Ten papers each introducing a single name change will be just as damaging as a single paper introducing all ten, or even more damaging, since the changes would be scattered and hence some might be overlooked.

Such problems seem to be the norm in the nomenclature of many animal groups. Expensive and comprehensive taxonomic monographs, and many shorter revisionary works, continue to be threatened by relentless application of the Principle of Priority. The excellence of a piece of taxonomy, listing senior synonyms as it should, can cause its own undermining when subsequent workers use these very lists to derive unhelpful nomenclatural changes. Further, it is regrettable that editors of many biological journals and series evidently seldom question the wisdom of strict application of the Principle of Priority. Greater editorial involvement in these matters would be beneficial.

Under the existing provisions of the Code, preparation of cases to protect all the threatened names in a monograph which it would be sensible to continue using will usually be too costly in scientists' time to be considered, and would in any case swamp the International Commission.

After cases are submitted for publication they are scrutinized, published for 'public' consideration and comment, and finally voted on by the Commission. Hence the cases have to be argued cogently, and must be water-tight. Anyone who has submitted a case, or has tried to follow one in detail, will appreciate the amount of time needed for its preparation. The dilemma for a taxonomist is that preparing cases takes him away from his main work. Tracking down the relevant references is usually time consuming, but is necessary since there is a risk that a crucial publication will have been missed and the entire case endangered. For those without access to major libraries these problems increase. An efficient inter-library loan system is not enough, since the nature of the necessary literature searching often takes the worker along a trail of publications and to wait days or even weeks between steps in the trail lengthens it inconveniently. Preparing several cases simultaneously is extremely tedious.

By coincidence, another major work by T. A. Stephenson provides a convenient example of the reluctance of biologists to keep track of changes in nomenclature. Stephenson's last book (Stephenson & Stephenson, 1972), on the ecology of rocky shores throughout the world, drew its biological nomenclature from the literature on a wide variety of animal and plant groups in many countries. Following Stephenson's death in 1961 another eminent intertidal ecologist, the late Professor Sir Maurice Yonge, F.R.S., helped to prepare the text. But after some ten years he evidently felt it necessary to provide the following disclaimer in the Foreword:

'The nomenclature was certainly valid when the original studies were made, but in certain cases it may now be outdated...' (C. M. Yonge, in Stephenson & Stephenson, 1972: viii).

Yonge was among the elite of invertebrate zoologists and marine biologists, yet even he felt it prohibitively difficult to keep track of the nomenclatural changes introduced little by little in the vast literature that Stephenson's book drew upon. Yonge's attitude seems commonplace among active biologists. The message is clear.

The crucial question is whether the majority of name changes are necessary. Are they invoked in the service of biology or merely in that of some nomenclatural microcosm, in which the Principle of Priority is applied without regard for the primary purpose of assisting communication between biologists?

As suggested above, in practice few biologists attempt to conserve nomenclatural usage by presentation of cases to the Commission. Thus fewer than 50 formal applications have been submitted to the ICZN each year. It is true that the authors of many more are advised by the Secretariat that their cases can be accommodated under the Code without rulings by the Commission. But the point that few formal cases are submitted is nevertheless indicative of a reluctance to prepare them. Many taxonomists abide by the Code and change the names, sometimes to the detriment of familiar usage. Others, perhaps the majority, simply continue to use the familiar but invalid, and therefore vulnerable, names. Possibly fear of refusal makes taxonomists reluctant to submit formal cases, but it would seem that the labour of their preparation is more usually the deterrent.

If stability is not to be continually undermined a new, much less tedious, approach to conserving existing usage is essential. Many of the aspects touched upon, and some others, could be discussed at length — non-availability of libraries, the influence on nomenclatural practice of ‘bibliographic archaeologists’, the understandable pressure from some major employers of taxonomists not to indulge in seemingly unproductive nomenclatural activities, and so on. Each might in itself provide the basis for a relevant study. But the problems outlined are sufficiently understood that further elaboration seems unnecessary, and only a solution need be considered.

A solution

The need is to protect a nomenclature painstakingly derived after detailed and informed taxonomic study. The convention of the *nomen oblitum*, by which a senior synonym disused for 50 years could automatically be regarded as rejected, was tried but ultimately abandoned. A new solution is required.

The nomenclature in certain taxonomic works of accepted scientific merit might be ‘Protected’ by specific designation by the Commission. The nomenclature of a work would be protected only from application of the Principle of Priority. The works to be Protected would be recommended by specialist panels of referees. Their recommendations would be published for discussion and, if accepted, would be ratified by the ICZN. This procedure might be adopted with many authoritative works and check-lists already published. An Official List of such ‘Protected Works’ would be compiled by the Commission.

Many animal groups already have an authoritative work which could provide them with a nomenclature base (see Appendix). ‘Protection’ of a work would not be undertaken lightly, and adequate referral to the scientific community would be essential. Clearly, there could be problems arising with taxa occurring also in geographical regions outside the scope of individual works. Such cases could be covered by supplementary provisions. Nor need all works be accepted in their entirety, and any parts of a work that are unacceptable could be excluded from the original Protection. This acknowledges that a synoptic work might be produced before the whole group to which it refers has been fully revised: and also that many regional faunal works do not include a complete range of taxa in all groups, making coverage inconsistent. Clearly the nomenclature in a Protected Work would not be protected from the effects of subsequent taxonomic reassessments. Allowance could be made also for names found to be unsoundly based due to original misidentification of type material, and for others

subsequently found to be invalidated through homonymy. These and other details could undoubtedly be worked out more fully.

Advantages

There are several. The problems caused by the scarcity of much old literature would be greatly diminished. Lengthy involvement of scientists in bibliographic activity would become less necessary. The variety of users mentioned above would benefit.

But, more important still, designating Protected Works would make it difficult for a forgotten senior synonym to be given precedence over a widely accepted later name, *in contrast to the present situation in which this is hard to prevent*. In taxonomic groups covered by Protected Works, the onus for preparing cases would be on those proposing to change established usage, and not as at present on those wishing to conserve it. The taxonomist studying these groups would be freed from pursuing each nomenclatural case to its conclusion, merely to seek approval for the use of names that were widely used anyway. Pragmatism would reign.

Another major advantage is that the proposed procedure would apply equally to cases concerning the names of both familiar taxa and less familiar ones. Hence the current necessity for the Commissioners to debate subjectively whether or not a name were widely-enough known to deserve protection would no longer exist. The risk of inconsistent treatment of cases would be eliminated.

Conclusion

Nomenclatural activities must be streamlined and be made more efficient if they are to serve both science and the communities which fund them. The Principle of Priority, when discussed at length in the 1840s, seemed to provide a straightforward route to a stable nomenclature (detailed account in Heppell, 1981). But the great volume of subsequent literature, and that which can be expected in the future, has made and will continue to make this simplistic approach unworkable. Today there is inadequate safeguard for existing usage.

Partially abandoning the current Principle of Priority, as proposed here, can be argued against on certain grounds. Not least is that a sense of fair play might be compromised, in that the first author to name a taxon might have the name he proposed supplanted by a later one. But for this to occur would usually require that the earlier name will already have been largely overlooked, and that a specialist panel will have acknowledged this when recommending a Protected Work excluding it.

Certain problems inherent in the proposal have been discussed. Doubtless more will be identified. But the Code we now have, being essentially a refinement of the ambition of the 1840s, has become cumbersome and outmoded in the important area outlined here, and hence fails to do its job. Hopefully proposals derived from those discussed will eventually become incorporated into taxonomic practice, and will contribute towards a more stable nomenclature. How this might operate in the nomenclature applied to part of one phylum of animals is discussed in the Appendix.

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Appendix

Examples of possible Protected Works on the phylum Cnidaria

Maybe normally only revisions treating all the world's known taxa of a group would be useful as Protected Works. Local revisions will so often have literature overlap with adjacent regions that nomenclatural problems will occur. Most countries of the world are smaller than the ranges of many of the species occurring in them, and so country-based revisions are usually too parochial for nomenclatural questions to be solved adequately. Exceptionally though, as in the last example given below, a regional work might be so far reaching and so potentially under-pinning of its group that it might nevertheless be selected, but such works are probably few.

Hydrozoa and Scyphozoa

For many years the generic nomenclature of hydroids and hydromedusae has been plagued by the difficulties of connecting the two stages collected separately from their respective habitats, named independently, and only subsequently linked by rearing. Often generic name changes have resulted, to the detriment of nomenclatural stability. But, as more and more life-cycles have become known, the possibility of deriving a unified nomenclature has increased. Thus recently a complete generic synopsis was proposed in which so far as possible such connections were accommodated. Although the nomenclatural consequences were not considered in detail, and the work set out to be taxonomic rather than nomenclatural, nevertheless the names were sensibly derived and Protection of the work might be pragmatic. The work is Bouillon, J., 1985. *Essai de classification des hydropolypes-hydroméduses (Hydrozoa-Cnidaria)*, *Indo-Malayan Zoology*, 1: 29–243.

Anthozoa

J. E. N. Vernon and others, *Scleractinia of eastern Australia*, 5 vols., 1976–1982, *Australian Institute of Marine Science Monograph Series*, Canberra. This monumental work is essentially an account of the corals of the important Great Barrier Reefs, but most of the world's families and genera of reef-building corals are included. The descriptions are full, being based on long series of specimens, and the illustrations are lavish. Type specimens are usually indicated. Designation of the work as 'Protected' would promote nomenclatural stability throughout a much-studied group.

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Note added in proof

Dr R. W. Crosskey has drawn my attention to an article 'A suggested revision of nomenclatural procedure in animal taxonomy' (Howden, H. F., Evans, H. E. & Wilson, E. O. (1968): *Systematic Zoology*, **17**: 188–191), which contained proposals similar to my own. Unfortunately the suggestions were not adequately pursued.



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