

## **Nomenclatural availability of preliminary electronic versions of taxonomic papers: in need of a clear definition**

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**Abstract.** The question of the nomenclatural availability of preliminary electronic versions of taxonomic papers, distributed online ‘ahead of print’ by some journals and publishing companies, is addressed again. We disagree with Krell’s suggestion to ‘distinguish between content and bibliographical metadata’. The concept of ‘bibliographical metadata’ does not exist in the Code and should not be incorporated into it. The citation of publication date, issue and page numbers are part of the relevant information that is useful in bibliographic references, in text citations and in synonymic lists that appear in taxonomic publications (which have a much longer life than most other publications), and should be considered part of the ‘content’ of a taxonomic paper. In particular, the page of first appearance of a name or of a nomenclatural act is traditionally cited in taxonomic revisions, monographs, faunas and catalogues, whether printed or stored in online databases, and this information is very useful for serious taxonomists. Having two different sets of information in this respect, in a first version of the work first published online but then discarded from the website of the journal, and in a subsequent one included into a journal issue, would be an indisputable source of confusion, which would not be solved by calling artificially both these versions the ‘version of record’ as if they were identical. The fact that ‘pagination is not regulated’ by the Code is fully irrelevant here: many aspects of taxonomic works are not regulated by the Code but are of crucial importance for the discipline of taxonomy. Krell’s proposal is motivated, according to his own words, by some publishers’ desire to make their publications more ‘attractive as outlets of taxonomic research’. But the purpose of the Code is not to make some journals more attractive than others; it is to help working taxonomists in their daily work, to make it easier, more straightforward, efficient, reliable and useful, and less prone to ambiguity. We recommend rejecting Krell’s suggestion. On the other hand, we make the new proposal of the creation of a ‘label’ to which some online journals and publishing companies might adhere, taking the engagement to publish online only one single version of each paper, with its final date, issue number and pagination. Authors will then have the possibility to choose their publication outlet among those having this label or those following the practice of ‘early view’. Currently, such preliminary versions of papers are unavailable under the 2012 Amendment of the Code.

### **Who is the Code for?**

Nomenclatural availability of works, names and nomenclatural acts is the first step of the nomenclatural process. Whenever dealing with problems of homonymy or synonymy between names, it is crucial to know the date when each name was made

available, because priority of publication is the main criterion of precedence among names and nomenclatural acts, although other criteria are used in some cases (see Dubois, 2013). Authorship is also linked to availability, but it is much less important than date, as it plays no role in the nomenclatural process itself (Dubois, 2015). The date of availability of a name is the date of public distribution of the work which not only contains the new name but also complies with the conditions of the Code (ICZN, 1999) regarding availability.

We recently (Dubois et al., 2015) pointed out the fact that preliminary electronic versions of taxonomic papers are not nomenclaturally available because of Article 9.9 of the 2012 Amendment of the Code which writes that ‘preliminary versions of works accessible electronically in advance of publication’ are not ‘published works within the meaning of the Code’. This completes Article 8, which requires that, to be nomenclaturally available, a publication must ‘be issued for the purpose of providing a public and permanent scientific record’ (Article 8.1.1) and have a ‘fixed content and layout’ (Article 8.1.3.2). We stated that, according to this Amendment, only the final version, with the final publication date, Volume and issue number, and pagination, provided nomenclatural availability to the new names and nomenclatural acts they may contain. Krell (2015) argued against this conclusion, on the ground that ‘page numbers are simply a finding aid’ and that following our arguments would render ‘journals with a print version less attractive as outlets for taxonomic research’.

We understand this as meaning that the existence of preliminary electronic versions (preview) of papers is seen by some commercial publishers at least as an argument of promotion for their journals, which is supposed to give them some advantage in the commercial competition with the journals that do not practice this. It appears to us that Krell suggests the Code should be modified in order to comply with the request of these publishers to continue their current practice despite the statement of the Code that preliminary online publications are not nomenclaturally available.

This leads us to ask the following question: for whom is the Code intended? Is it for authors of taxonomic papers or is it for commercial publishers? Should the requests of the latter be considered more important than those of taxonomists? According to the Preamble of the Code, ‘The objects of the Code are to promote stability and universality in the scientific names of animals and to ensure that the name of each taxon is unique and distinct’. Both taxonomists and publishers should work in order to fulfil these aims in the most straightforward way.

### **Metadata**

Metadata can be defined as a ‘structured information that describes, explains, locates, or otherwise makes it easier to retrieve, use or manage an information resource, especially in a distributed network environment like for example the internet or an organization’ (De Carvalho Moura et al., 1998). The difference between an unpublished work and a publication is that the latter is in a ‘final’ form which is recognized as such by the scientific community. This distinction was easy to do on technical grounds with the printing method, as a written or typed manuscript and a printed document are readily distinguishable, the only possible confusions being between the final published document and a ‘proof sheet’ (see Article 9.5) or a ‘separate’ distributed in advance of the specified date of publication (see Articles

21.8.1–2). But electronic publications cannot be distinguished on technical grounds only, as the same techniques are used for manuscripts, proofs at various stages, preliminary publications and final publications, and, a point that should not be neglected, it is to be expected that such techniques will have a very short existence and will soon be replaced by others. For this reason the NISO/ALPSP JAV Technical Working Group provided a very useful analysis of various situations encountered regarding the different ‘Journal Article Versions’ of electronic publications (NISO 2008). It is clear from this work that the practices are not yet stabilised and will still move, so that the working group did not only provide a description of the current situation but also proposed ‘conventions and best practices’, mostly directed towards publishers, where they suggest what ‘should’ be done, but only the future will tell if these recommendations will be followed. Unfortunately, this NISO working group does not seem to have included specialists of nomenclature, as some particularities of this discipline were ignored, in particular the fact that nomenclature follows an (untold) Principle of Nomenclatural Foundation (Dubois 2011, pp. 16–17), according to which a nomenclatural act once published cannot be ‘corrected’ or modified subsequently, except by the Commission acting under its plenary powers.

The NISO recommendations proposed that the metadata associated with documents should include descriptors of the various stages of a journal article lifecycle. Five major stages were recognized, four of which (Author’s Original, Submitted Manuscript under Review, Accepted Manuscript, Proof) clearly cannot be considered as published in the frame of the Code, whereas the fifth stage, Version of Record (VoR), must be considered published. The NISO proposal mentioned the possibility that in some cases two further steps be recognized, the Corrected Version of Record (CVoR) including corrections, and the Enhanced Version of Record (EVoR) including modifications. According to the JAV Working Group, documents of all three VOR categories have to be considered published, but they are clearly different *versions*, not the same document. In many fields of science, the most important version, which must be cited, is the last updated version, i.e. the VoR, the CVoR or the EVoR, but this is not true in nomenclature. If the two stages after VOR are evaluated in the light of the Code, they are all different *publications* as they have different contents and layouts, and different publication dates, and any new name or nomenclatural act they may contain is available from the first published version (VoR), if this version complies with the requirement of having been ‘issued for the purpose of providing a public and permanent scientific record’. In zoological nomenclature, any so-called ‘correction’ of the original VoR qualifies as a new publication and may have nomenclatural consequences: for example, a ‘correction’ of spelling of a new name published after the original publication is a subsequent spelling which has a status distinct from that of the original spelling (Article 33), except in the very particular and exceptional case of an ‘incorrect original spelling’ (Articles 32.4–5).

In our paper we had mentioned some elements that are sometimes changed between the ‘preliminary online version’ of a paper and its ‘final version’. These included the date, the Volume and issue, the pagination and the layout (e.g. even *vs.* uneven page), but this is not a closed list. Dubois et al. (2013) had discussed several examples in which the preliminary online version and the final version differed in other aspects of the ‘content and layout’ of the text, figures and tables.

Cranston et al. (2015) and Krell (2015) stated that some elements of electronically published papers were metadata that should not be considered part of the ‘original content’ of a paper. This is a purely arbitrary statement. In the Articles of the 2012 Amendment cited above, there is not the slightest indication that some of the elements of a paper are not concerned by the requirement of absence of modification in content and layout (see Article 8.1, especially 8.1.3.2). This is straightforward: it means that any change introduced in a work published online disqualifies it as a document providing ‘public and permanent scientific record’ (Article 8.1.1). Following Cranston et al. (2015), Krell’s (2015, p. 29) proposal reads as follows: ‘**Version of Record.** The final version of a publication that has immutable content and layout and will be archived (this excludes electronic supplements that are not part of the archived work itself). Bibliographical details, such as page numbering, issue and Volume number, of a Version of Record can change or be added, e.g. if it gets included into a journal issue after publication’. This proposal is not Code-compliant and has no support in the centennial practices of zootaxonomists and in the basic philosophy of the Code, which is that an original publication cannot be modified *at all* subsequently, because then it would become another publication.

We do not think that it is useful to introduce the term ‘metadata’ into the Code, but if so, such a change should be guided by what has been the usage in zoological nomenclature so far, regarding the way different versions of printed papers have been treated concerning availability and other nomenclatural issues.

#### **Pagination, issue and Volume, publication date**

Dubois et al. (2015) stated that changes of pagination of a paper resulted in a different document, therefore a distinct publication. Preliminary online versions that are unpaginated or that have a ‘provisional’ numbering of pages starting on page 1 do not allow subsequent citation of the exact page of appearance of a nomen or nomenclatural act as indicated by a page number in a paper. We stated that this would be a source of ambiguity for taxonomists but Krell (2015) dismissed this statement, arguing that ‘Citations of page numbers are simply a finding aid’. He considered that the absence of the final pagination in the preview document ‘is not a problem for the Code, since pagination is not regulated. Pages or pagination are mentioned in only two Recommendations of the Code (...) and not in any mandatory part of the Code’. In the same line of thought, some might argue that, when dealing with electronic publication, the function ‘search’ may allow us to find the relevant information in a ‘portable document’ (PDF) and that we do not need to have a page number.

The JAV Working Group discussed a ‘Base Case’ in which a paper was first published online, ‘without issue pagination, but with a DOI for identification’ (NISO, 2008, p. 7). This group considered this unpaginated version as the VoR, giving the ‘official publication date’. Then they wrote: ‘When the print issue is scheduled to be compiled, the publisher adds Volume, issue, and page numbers [VoR—addition of bibliographical details not sufficient enough to change status of VoR]. The article is published in print and electronic form with pagination and added features (e.g., citation tracking), and the author adds a URL link to this version [VoR]. The published version of the article remains available from the publisher’s site, or from a third-party aggregator’s site, or from an archival site [VoR].’

We disagree with these statements, at least for publications that contain nomenclatural novelties. As shown in detail by Dubois et al. (2013), a DOI is by no means a reliable indicator of permanency of a document, as a PDF can be largely modified and keep the same DOI. In nomenclature, this may have important consequences, for example when the original spelling of a name is changed (even by a single letter) but the DOI kept the same. The statement ‘not sufficient enough to change status of VoR’ is unsubstantiated: what is the meaning of ‘sufficient’ in this phrase, and sufficient for which purpose? Finally, the version of the paper which ‘remains available from the publisher’s site’ is the paginated one, which replaces the unpaginated on the publisher’s website and the latter then becomes inaccessible to the readers. Therefore, in our opinion, at least for the purpose of zoological nomenclature, a change in the pagination of a document results in a new version of this document.

Page numbers are indeed a ‘finding aid’, but they are nevertheless part of the paper! A page number allows pinpointing a particular citation or nomenclatural act. This device is sometimes used within the text of a paper itself, not only in the header or footer of the page, for example when some information to be found in another part of the paper is referred to in the text as “see page 253”. In such cases, considering this as ‘bibliographical metadata’ would require to consider that a change of this page number in the text, in order to agree with the new pagination, does not modify the ‘layout and content’, which is absurd.

An electronic search may be very time consuming if the terms searched appear many times in a work, and above all it does not allow to point to a particular occurrence, citation or information, so an ambiguity may subsist. Furthermore, the search function cannot be used when one is working on a paper print of a PDF, and when several hundred pages are involved this may not be very ergonomic.

Such a discussion may appear to focus on trivial details for outsiders of taxonomic research or newcomers in the field, but not for professional and amateur taxonomists involved in a real daily research work in taxonomy. As a matter of fact, the core of taxonomic research is not the isolated description of species, genera or other taxa, but revisions and large monographs (including some databases) dealing with taxonomic groups or faunas. Thousands of synonymic lists have been and are still being published in these works, in which the first pages of appearance of all nomina and nomenclatural acts are given. Krell himself (2010, 2012; Krell et al., 2012) published synonymic lists and papers which mention pagination. In such works, which may cover large Volumes or series of Volumes, hundreds or thousands of names, nomenclatural acts and references are cited, and having the reference not only of the work but also of the page where a precise information appears is a very important help for serious work. Especially when it concerns long monographs of several hundred pages, this mention of the page allows saving working time and energy, and it avoids confusions between homonymous names. For example, in Latreille (1804), the name *Apodes* designates three distinct taxa, mentioned on pages 73, 75 and 103, so that citing the name *Apodes* as of Latreille (1804) without mention of the page and looking for it with an electronic search option would not allow knowing which of these three homonymous names is concerned.

Taxonomy is a domain where it is not enough to know ‘vaguely’ what has been written in previous publications, as if this information had become ‘well known’ and trivial. In taxonomy, every time the classification of a taxon (e.g., a family or a genus)

is revised, challenged and eventually modified, this is liable to introduce changes in the nomenclature, and this should be checked carefully before publishing nomenclatural novelties. For example, whenever there is a change in the concept of a taxonomic species, resulting in the distinction of two species instead of one, the proper course to follow is not to immediately describe the 'second' species as new (although this tends nowadays to become standard practice for some authors and in some journals), but first to check whether there exists already an available name for it, that would have remained 'hidden' or 'sleeping' in the synonymy of the 'first' species (or even of a third one). Page reference is also useful in various other situations, e.g. for checking the validity and priority of a subsequent type species designation for a genus, or of a first reviser action choosing between two spellings or two competing synchronous synonyms or homonyms. In the absence of reference to a page, finding this information may be a very long and tedious task. Taxonomic research permanently requires one to go back to ancient literature. If the work at stake is an electronic one, except during the short period between the 'early view' and the 'in print version', the only document which will be available online for decades and for all users will be the final one, the first one having disappeared from the screens for ever. Citing this 'phantom reference' would then only be a source of confusion, doubt and instability.

No quibble about metadata will be able to erase the fact that a paper paginated from page 1 to page 26, or without pagination, is not identical with a paper paginated from page 136 to 161, that a paper published without mention of the number of the Volume where it will be included is not identical with a paper having the same 'content' but referred to Volume **134**, that a paper dated 2013 is not identical with a paper dated 2014, or even dated 11 February 2014 is not the same as one dated 4 June 2014, etc. These distinctions have always been made in taxonomy and even if the content is the same, the publications must be considered distinct.

Contrary to many publications in other fields of research, taxonomic publications are cited for many decades, and this demands to treat them differently from standard scientific publications which are often obsolete after 20 years or less. The confusion that might be introduced in the taxonomic literature by the existence and citation of two different documents differing by their metadata is not worth the small 'advantage' that a hurried publication online might have in a few rare cases. Taxonomy does not need quick publications, it needs serious and solid ones. A major motivation for shortening the publication delay of a taxonomic work is not scientific, it is the importance given by many taxonomists for being credited with the 'authorship' of new names, a motivation which is a terrible nuisance for the science of taxonomy (Dubois, 2008, 2015). The delay between the preliminary work with provisional metadata and the final one with the definitive ones will in general be of a few weeks or months, at most of a few years. This is a drop of water in the ocean of time which is the working time of taxonomy. If Krell's advice was followed, this might 'please' some publishers and authors, but taxonomists would have to carry for ever the confusing situation of citing two documents which are supposedly the same but are in fact different. In 50 years from now, if taxonomy still exists, we would still have to find in synonymies of revisions and monographs some references to a final document with definitive page and issue numbers, and in parallel some other references to the 'same' work but in a provisional version with different page numbers and no issue

number—although this version would have been available online only for a few weeks or months and then have disappeared from all websites and have become unavailable to the whole scientific community, except the individuals or institutions that would have downloaded it during the small period of its availability as a ‘preview’ document. This is not serious!

As active practising taxonomists, we do not want to have to deal with unpaginated works or with works with floating or labile information on page and issue numbers and even on date according to the version, or with unknown Volume and issue and just a publication year, which may change later like in the example discussed by Dubois et al. (2015). We are sure that many taxonomists having a real and permanent occupation with this domain of research agree with us, and that if asked whether the pagination is relevant information in a taxonomic publication, the majority of active and experienced researchers will reply ‘Yes’.

It is true that the Code does not regulate pagination, but this does not mean that two documents differing in page numbers are considered identical in nomenclatural practice. The Code does not prescribe the citation of page numbers and so what? The Code is not a Code of taxonomy or of bibliography; it is a Code of nomenclature. It does not have to legislate on matters that are outside nomenclatural rules, such as the way references should be cited (including that of the Code itself, by the way) or whether it is important and useful or not to cite the pages where some information appears in papers. If considered relevant here, the same argument would need to be considered relevant for about 99 % of the contents of taxonomic publications, which are not properly nomenclatural. The Code does not prescribe the use of a microscope to study specimens or a sequencer to study nucleic acids. These are elements which are needed for a good taxonomic work, irrespective of nomenclatural rules. The question is not ‘is it in the Code?’ but ‘for taxonomists, is the abandonment of pagination and issue numbers progress or not? Is it useful, does it have advantages?’ This is the only metric that should be considered for nomenclatural rules, not the fact that this abandonment may be viewed as more practical, comfortable or attractive.

In disciplines that do not have the constraints of zoological nomenclature about the ‘availability’ of works, names and nomenclatural acts, there may be no disadvantage in using prepublications. But there is such a disadvantage in nomenclature, and therefore publications that include nomenclatural information should be treated differently. Prepublications are not necessary and useful in taxonomy and should be abandoned in this domain. Taxonomists should be prudent not to be pushed into these problems by outsiders of the field. The journals that are not ready to make this difference and to follow the requirements of taxonomists should be abandoned by the latter. We do not need ‘ad hoc’ solutions like an imaginary ‘version of record’ that would in fact cover several distinct versions in order to cope with artificial problems created by an ill-devised publication policy. As there is clearly no advantage for taxonomy in the use of prepublications, they should not be used in our discipline and the Code should not be modified accordingly. There should exist only one version of taxonomic papers, that is all.

Unfortunately, even if it is recognized that Article 9.9 does indeed refuse availability to ‘early views’ that differ from the final version of a work even by ‘details’ like the pagination, this will not solve completely the problems raised by the publication of such ‘early views’ of taxonomic papers since 2012. The vast majority

of zoologists only download the ‘early views’ of papers, when they exist, as soon as their publication is announced—especially those dealing with the taxonomic groups on which they are working. Furthermore, many colleagues tend to distribute their works to colleagues as soon as these are released online, therefore as ‘early views’ for the journals that do publish them. When it comes to citing these works, many authors will often fail to go back to the site of the journal to download the ‘final version’. Therefore more and more works will tend to be cited in their ‘early view’ versions, and ‘real’ references of these works may tend to become rarer in bibliographies. But if a researcher later develops interest to a subject, he/she will download the ‘final’ version as it will be the only one accessible on the publisher’s website. Therefore there will progressively exist two groups of references for each of these articles—thus leading some authors in the more or less remote future to question whether they refer to the same work or not.

A short-term solution to this problem would be that, from now on, taxonomists decide to ‘boycott’, at least for the publication of their papers having nomenclatural implications, the journals that practice this two-shot publishing system. This might help the publishers of these journals to understand that they are on the wrong track and to change their practices.

In conclusion, we consider that under NISO’s terminology, the paginated document should be considered the VoR of the publication, and the unpaginated as an anterior version, unavailable in nomenclature for not having been ‘*issued for the purpose of providing a public and permanent scientific record*’. This version could not be referred to the NISO category of Proof, and would deserve to be recognized as a distinct category that could be called ‘Preliminary Online Version’ (POV). This category would include both unedited versions of the manuscripts in Word format made available online by some journals (see examples in Dubois et al., 2013) as well as formatted versions still unpaginated and unreferred to an issue of the journal as discussed above. In one situation however, the formatted but still unpaginated version could be the VoR: if this online version, duly registered and archived in order to comply with the 2012 criteria of availability of online publications, remained the only one available on the publisher’s website. If later a paginated version was published on paper, this second version would be an EVoR. However, we are not aware that any journal so far has adopted this publication policy.

### **Distinct versions of paper publications**

In paper publications, any ‘version’ of a work (e.g. ‘second’ edition, ‘revised edition’, etc.) has to be considered a different publication. This applies in particular to ‘preprints’ of works, ‘unambiguously imprinted with their own date of publication’, as stated in Article 21.8.2 of the 2012 Amendment. It is important to note the fact that ‘preprints’ and ‘final prints’, if they bear different dates, are always to be considered as distinct publications, even if their content is the same. This is because, in the meaning of the Code, a publication is not only a content, but also a material object, and if any characteristic of this object (such as its date, issue number, pagination) changes it becomes a different publication. This important distinction seems to be difficult to understand by some activists in favour of e-publications, who do not care for the format and layout but consider that a publication is an immaterial document having only a ‘content’, whether in one format or another.

Inclusion of a text first released as an autonomous work into a Volume, e.g. in a periodical, with a different pagination and other possible changes, results in a different publication, whether or not changes were brought into ‘details’ like the spellings of names. This distinction also applies to most ‘reprints’. Reprints may contain errors, misprints or voluntary changes, e.g. so-called ‘corrections’ of the spellings of names. Except in the case when a work is reprinted exactly identically, through usage either of the same printing plates or of a procedure or technique, such as photocopy or scanning, allowing to produce a strict facsimile, ‘reprints’ are different works whenever they result from a new typesetting, sometimes with different formats, different printing fonts, etc. Even when the greatest care is taken not to introduce changes, it is always possible for a small printing mistake to creep into a reprint not being a strict facsimile obtained without going through a new stage of typesetting. When such an error concerns the spelling of a name, it has nomenclatural consequences. Examples of misprints in the spellings of names that have been introduced, certainly unintentionally, in reprints of taxonomic works, are the name *Trichechus* in the 1894 reprint of Linnaeus (1758) (see Dubois, 2010, p. 19) and the names *Cincinnatiurus*, *Rallus* and *Thryothorus* in the 1883 reprint of Vieillot (1816) (see David & Dubois, 2011).

This rationale, which has been consistently used for paper-printed works, should be applied in the same way to electronic publications. The mere fact that changes have been brought to the pagination or metadata mentioned in a work is evidence that the document has been modified, and that the possibility therefore exists that other changes have been brought to other parts of the content. Such changes may be voluntary, such as the ‘corrections’ in the spellings of names mentioned by Dubois et al. (2015), but even when they are not, as soon as a document is modified, be it only in its page numbers, such surreptitious changes can occur. No confidence in this respect can be put in the publishers who practice ‘early view’, because, as reminded above, they use the same digital object identifier (DOI) for the ‘early view’ and the ‘final version’, thus showing that they do not attach any importance to these questions. Taxonomists have enough work to do, and are not enough in number considering the huge task in front of them to inventory the vanishing species of our planet, not to have to lose their time comparing two documents line by line and word by word in order to ascertain that their contents are strictly identical.

Some journals indeed mention on their websites that the first versions of the papers they publish are ‘early views’: in such cases there is no doubt that these early views are unavailable preliminary publications, even when they are strictly identical to the final ones. But such information is not provided by other journals. To avoid this problem, it is necessary that all metadata concerning the history of a publication and its different versions be noted in the document itself and do not have to be searched from external sources. Anyway, for taxonomic use can be considered ‘published’ only the version(s) that remain(s) permanently and publicly accessible, in order to comply with the requirement of ‘public and permanent scientific record’.

### **ZooBank**

For the same reasons, as stated by Dubois et al. (2013, 2015), in our opinion, no subsequent change should be allowed in the information already entered in a ZooBank file, because this would open the door to innumerable manipulations.

There should not only exist a single version of each paper released by a publisher, but also a single ZooBank record, entered *before* the publication of this version, fixed, protected and unable to be modified or completed subsequently. In the rare cases of ‘acceptable errors’ as described in Article 8.5.3.3 of the 2012 Amendment, the fact that the file has been modified should be duly mentioned in the file itself, with details on the changes effected, their date and who was responsible for them. The date of such changes is important, because of course taxonomists who would have used this record before the change could not be aware of it, and this may have had consequences in their nomenclatural work. If new versions of a paper are released, they should have their own ZooBank reference to allow the follow-up of the different avatars of a work by users.

### Grey zone

We agree with Krell that zoological nomenclature has entered a kind of ‘grey zone’ with the publication of the 2012 Amendment. Before this publication, it was clear that new names and nomenclatural acts published only online were unavailable. After that date, they *may* be available, but there are a number of conditions to be met for this availability to be obtained. Furthermore, for the first time in the history of zoological nomenclature, checking that some of these conditions are complied with relies on information which is external to the publications where the names and nomenclatural acts are published, which is a source of confusions and problems (Dubois et al., 2013, 2015). We still think that the promulgation of the 2012 Amendment was too early and that the strong advice of some authors not to allow electronic publication for new names and nomenclatural acts (see references in Dubois et al., 2013, p. 6) was justified. The existence of online publications was too recent, not enough experience of the situations and problems had been accumulated, and many of the problems to come had not yet been anticipated. By hurrying to publish this Amendment to comply with the request of some publishers (but not of the community of taxonomists, most of whom were probably happy to publish in traditional journals having also an online version but still published on paper like *Zootaxa*), the Commission has opened a Pandora’s box which will be difficult to close. It is noteworthy that this Amendment was adopted by a majority of the Commission’s members but not unanimously, although, given the importance of this Amendment for the future of zoological nomenclature, unanimity would have appeared to be a reasonable condition for its adoption.

Be it as it may, this Amendment is now part of the Code, and for the zoologists who wish to respect the Code and to comply with it in their publications, it should be followed, until a new Amendment replaces it, or a new edition of the Code published. But we think that, like all provisions of the Code, it must be strictly followed, not interpreted in the light of its supposed ‘spirit’ or ‘intentions’. A juridical text like the Code does not include intentions, but Rules. If some of these Rules are unclear, then they must be improved, but until this is done the greatest efforts should be made to follow the Rules strictly, without phantasms and embellishments. Encouraging the non-respect of this Amendment, e.g. in ignoring its Article 9.9, is not doing a service to the community of taxonomists. It amounts to saying that, only a few months after its implementation, this Amendment was already obsolete. This

cannot be an encouragement for authors, editors and publishers to respect and follow this Amendment or the rest of the Code.

Krell (2015, p. 30) advocates a more ‘permissive’ approach to rules of nomenclature. He writes: ‘In this transitional period, we should interpret the existing rules rather pragmatically and liberally’. We do not think this is good advice at a time when there is already a strong tendency in the community of authors of papers having taxonomic content, some of whom are in fact not taxonomists but ecologists, phylogeneticists or geneticists, to deliberately ignore or circumvent the Rules of the Code, or to ‘interpret’ them in such a way that they are no longer Rules, but mere ‘advice’ that one is free to follow or not, thus increasing nomenclatural chaos, confusion and miscommunication.

Krell tends to express ‘confidence’ in the publishers and editors to follow the Rules, but this interpretation is not borne out by the facts. As documented by many examples (see Dubois, 2003, p. 515; 2011, p. 10), more and more authors, editors and journals tend to ignore some basic Rules of the Code, not to say the basic functioning of zoological nomenclature. When famous and ‘respected’ journals like *Science* (e.g. Bossuyt & Milinkovitch, 2001), the *Zoological Journal of the Linnean Society* (e.g. Emerson & Ward, 1998) or *Molecular Phylogenetics & Evolution* (e.g. Vieites et al., 2011) publish nomina nuda, we think that the situation is preoccupying. The same is true when an editorial of *Nature* (Anonymous, 2013) makes fun of ‘the code’s requirement that species descriptions must be always “available”’, thus demonstrating a full misunderstanding of the meaning of this term in the Code, or when *Science* publishes comments on the nomenclatural concept of ‘type’ that simply highlight the fact that their author has no idea of the function of a name-bearing specimen, which is nomenclatural and not taxonomic: ‘The traditional system groups organisms in part according to their resemblance to a representative ‘type’ specimen (. . .). Under the traditional system, a taxonomist (. . .) selects the most representative species to be the ‘type’ for each genus, then the most representative genus to be the type of the family, and so forth. (. . .) as new specimens with similar characteristics are found, they are deemed part of a known species, a new species, or even a new genus based on how closely they resemble the type specimen.’ (Pennisi, 2001, p. 2304). A recent worrying example is the publication in the journal *Systematic Entomology* of a paper (Al khatib [sic] et al., 2014) which failed to provide some basic information indispensable for the nomenclatural availability of 11 new species names, this information being relegated to a Word document attached to the paper as an online ‘Supplementary Information’ (see Al Khatib [sic] et al., 2015), despite the clear warning against this practice given by Dubois et al. (2013). This latter case is particularly worthy of attention, as the first author of Cranston et al. (2015)’s paper, as well as several of the ‘systematists and editors’, supposedly competent in zoological nomenclature, highlighted in this paper as having ‘reviewed and endorsed’ its recommendations regarding ‘metadata’ and ‘versions of record’, are editors of *Systematic Entomology*. . .

Encouraging the community to ‘interpret the existing rules rather pragmatically and liberally’ would only increase this strong trend towards ‘deregulation’ of zoological nomenclature, and it can be predicted that if this lax attitude towards the Rules was supported there would be no turning back. Already now, many papers are published online which contain new names and nomenclatural acts but which do not comply with the 2012 Amendment (see e.g. Chaabane et al., 2015). If we continue to

encourage such practices, some members of the community will consider this as a green light for doing whatever comes into their mind.

Cranston et al.'s (2015) claims in favour of 'metadata' and 'versions of record' were supported by various editors and taxonomists but also by administrative editors and publication managers who are not scientifically concerned by nomenclatural issues. It is true that these people are involved in the process of publication of taxonomic papers, but this also applies to printers, website managers, computer manufacturers or paper producers, so why not invite them also to give their advice on nomenclatural issues? Most publishers of journals and books containing taxonomic novelties or nomenclatural acts are not competent in these domains—and sometimes are proud of it, as shown by the citations above from *Nature* and *Science*. Well-known and wealthy publishers of journals having high impact factors are not 'protected' by these indexes from the risk of publishing fatal nomenclatural flaws. This even applies from time to time to leading taxonomic journals, including the best ones.

Contrary to Krell, we think that as long as we are in the 'grey zone', which may last for years or decades, taxonomists should be particularly attentive to a strict application of the Rules currently in force, including those of the 2012 Amendment, rather than interpreting them or indulging in wishful thinking. It is legitimate and useful for individual zoologists or groups of zoologists to express their opinions about these matters and to provide proposals of new Rules or modifications of the Rules, as we have done ourselves, but none of them should decide personally to implement these proposals in their works. If such practices were encouraged in this particularly difficult period for zoological nomenclature, it would be increasingly difficult or impossible to come back to a respect of the Rules in the taxonomic literature, and nomenclatural chaos and miscommunication would spread even more.

### **Proposal of a label**

In our 2015 paper, we proposed that the journals who wish so might adhere voluntarily to a 'charter' and be given a 'label'. The latter would just state that the adhering publishers and journals agree to respect the following specifications: (1) these journals publish only one 'final' version, bearing a unique DOI, of each of their papers having taxonomic and nomenclatural implications; (2) the label appears on the first or last page of each paper; (3) the record corresponding to this paper in ZooBank, registered before its publication, is not liable to be surreptitiously changed (if changes acceptable under the Code are needed, they will be duly notified in this ZooBank record). This label could be registered, for example by the Commission if it is interested, and its mention would appear in databases dealing with periodicals (such as ZooBank). If the Commission is not interested or willing to care for this label, an independent association could certainly do it.

The label of a periodical or publisher could be withdrawn as soon as a violation of the charter was reported to the body in charge of the label. This would not require being 'voted' upon by any committee or commission. The simple fact, if demonstrated (through the comparison of two PDFs), would be enough. A fixed period (e.g. of 3 years) would then be required before a possible readmission on the list of periodicals bearing the label.

The Code should not be modified to comply with the technical needs of some publishers. All publishers, even the most modest ones, should have the same rights

and obligations, and it is the duty of publishers who wish to publish taxonomic works to take all necessary steps to adapt to the Code, not the reverse.

In the end, the decision on these matters will have to be taken by the Commission when it decides to vote on possible modifications of the Code. But when it comes to vote on these matters, in our opinion, only the members of the Commission who are not involved personally in the publication of taxonomic journals, be it as publishers or as editors, should take part in the vote. Accepting their participation in the vote on this matter, which will have an influence on the publication policies of periodicals and books, would no doubt be a case of ‘conflict of interest’, a problem about which the international scientific community has become more and more conscious and concerned. The Code should be written and adopted by taxonomists and on the basis of the needs of taxonomists alone.

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