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Interpreting Article 31.2.2 of the Code, *Tanagra bresilia* Linnaeus, and gender agreement—a response to Dickinson *et al.* (2017) towards more positive outcomes

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Dickinson *et al.* (2017) take us to task for misguided interpretation of Art. 31.2.2 of the *International code of zoological nomenclature* (ICZN 1999), hereafter the *Code*, and for overreach in arguing that ‘gender agreement for species-group names is the single biggest cause of nomenclatural instability in zoology’ (Schodde & Bock 2016). Conflation is the argument of false analogy; and here we explain how Dickinson *et al.* (2017) use it to mistake our meaning of Art. 31.2.2, misjudge the noun / adjective status of *Tanagra bresilia* Linnaeus, and misrepresent the impact of gender agreement on species names. As a consequence, we offer suggestions to resolve those ambiguities in Art. 31.2.2 that open it to conflicting interpretation.

1. Article 31.2.2

Some species names in zoology (dual status names) may be either noun or adjective, so the purpose of Art. 31.2.2 is to settle on either noun or adjective for any given taxon in the interests of nomenclatural precision and stability. The Article does this by providing a simple recipe that fixes such names as nouns in their original spelling in cases where the original author neglects to select either noun or adjective. Such neglect is widespread in historical literature, and so Dickinson *et al.*'s (2017) interpretation of the Article is preoccupied with fixed original spelling as the ultimate objective or ‘determinant’. Because of that, however, they impugn Schodde & Bock (2016) for ignoring it and mistaking usage in the ‘original publication’ as the goal, stressing ‘the original publication is not the original binomen’. But Art. 31.2.2 has two functional parts, and it is only the second, where the original author did not take up his / her prerogative, that settles the name as a noun in its original spelling. The first, in contrast, attributes right to the author in the original publication to choose either adjective or noun, thereby giving author action precedence over fixed original spelling. To ensure there is no misunderstanding, we quote the Article:

‘Where the author of a species-group name did not indicate whether he or she regarded it as a noun or as an adjective, and where it may be regarded as either and the evidence of usage is not decisive, it is to be treated as a noun in apposition to the name of its genus (the original spelling is to be retained, with gender ending unchanged; see Article 34.2.1).’

The French version makes the same points. Where Schodde & Bock (2016) were explaining, correctly, usage in the ‘original publication’, they were addressing, equally correctly, the first part of the Article to explain how author action in the original publication functions. This has nothing to do with the second part of the Article which applies only in the absence of author action. Conflating the work of the two parts in the way Dickinson *et al.* (2017) have confused the meaning of the Article as a whole and confounds its interpretation.

The meaning of the Code's Example for Art. 31.2.2 also comes into question here because it is used by Dickinson *et al.* (2017) to support the primacy of fixed original spelling. Critically, the Example fails to mention that the original author did not exercise choice in the case it describes (David & Gosselin 2011). Thus, if it is read literally, it gives the impression that fixed original spelling overrules all. If that reading is accepted, we make two points.

- (1) The Example is presently at variance with the Article in not acknowledging the prerogative of original author action specified in the Article.
- (2) An Example does not form part of the legislative text of the Code—see Art. 89.2. Thus its meaning has no authority when it conflicts with the meaning of an Article.

What the Example makes clear, nevertheless, is that 'evidence of usage' in Art. 31.2.2 excludes customary or prevailing use of noun or adjectival form in general literature as a determinant. Here Dickinson *et al.* (2017) correctly put their finger on the single ill-defined word in the Article: 'usage'. What does it mean for the Article? Dickinson *et al.* (2017) do not elaborate, but the answer, in our view (Schodde & Bock 2016), was reached and ably summarised by David & Gosselin (2011). Rules for determining noun or adjective in dual status names were first introduced in the third edition of the *Code* (ICZN 1985), in near-identical wording in English and French texts. The English text was repeated almost unchanged as Art. 31.2.2 in the current fourth edition (ICZN 1999); but, perhaps because its authors were more aware that uses of 'usage' had diversified in this edition, the French text was substantially re-structured to better reflect, we believe, the particular intent of 'usage' in the Article. David & Gosselin (2011) explain its meaning there thus:

'The phrase 'sans que l'usage qui en est fait ne permette de conclure / without the use that it is put to permitting a conclusion' makes clear that 'usage' relates first of all to use by the author in the original publication. So the word 'decisive' in the English text, means conclusive, and the noun vs. adjective status must be determined from the original publication, not from random subsequent use.'

There are two further reasons for accepting this meaning for Art. 31.2.2. First, it brings to the Article, beyond any other interpretation of 'usage', a precision of definition and clarity of meaning expected by—and from—the Code. Secondly, the late David Ride, Chair of the editorial committee for the current Code, personally advised us that 'usage' by the original author alone was its intended meaning. Expanding that meaning to cover other forms of usage would dissipate the focus of the Article.

To explain how 'usage' in this context enmeshes with other requirements of Art. 31.2.2, we offer one of diverse examples. Species names ending in *-fer*, as in *Lobospingus sigillifer* De Vis, 1897, may be nouns or masculine adjectives. De Vis (1897) did not expressly state that *sigillifer* was a noun or an adjective in the original description. If, however, he had used it with the feminine ending *-fera* for another new species combined with a different, feminine genus in the same paper, *sigillifer* in *Lobospingus* would have been implicitly 'used' as an adjective. Here the author would have indicated his choice through 'usage' in the original publication. As a consequence, De Vis' *sigillifer*, as an adjective, would have to change whenever subsequently combined with a genus of feminine gender, e.g. in *Erythrura trichroa sigillifera* (Blue-faced Finch). But De Vis did not use *sigillifera* in combination with a feminine genus in the paper describing *Lobospingus sigillifer*, and took no original author action at all. In that circumstance, *sigillifer* there stands as a noun, and is fixed in its original spelling as *Erythrura trichroa sigillifer*.

There is still a problem, however: this meaning of 'usage' is not clear from the wording of Art. 31.2.2 in its English text. Here Dickinson *et al.* (2017) have missed an opportunity.

They discuss imprecision and ambiguity in the Article, yet take no initiative to resolve it. We now accept the challenge. Their unspoken view of 'usage' in this case is surely no different from ours and David & Gosselin's (2011) because one of their authors is David himself. Resolution of its intended meaning, then, can be achieved simply and easily by (1) inserting one small phrase in the Article to specify 'usage in the original publication', and (2) prefacing the final clause of its Example with a further clause that explains '...because the author of the name in question, *phobifer*, did not indicate whether it was a noun or an adjective', hence it is to be treated as a noun in apposition...'

2. *Tanagra bresilia* Linnaeus

Is *bresilia* Linnaeus, 1766, for the Brazilian Tanager an indisputable adjective as claimed by Dickinson *et al.* (2017) and used as such by Dickinson & Christidis (2014) in *Ramphocelus bresilius*? Or should it remain the noun *bresilia* in its original spelling under Art. 31.2.2 because its status as noun or adjective cannot be determined conclusively (Schodde & Bock 2016)? Linnaeus (1766) based *Tanagra bresilia* on the *Merula bresilica* of pre-Linnaean authors, explicitly citing the name as *Merula bresilica* in his synonymy. He made no comment on its grammatical status and does not appear to have ever used the name again in the 12th edition of his *Systema* (Linnaeus 1766). In their review of species names affected by Art. 31.2.2, David & Gosselin (2011) interpreted *bresilia* as an adjectival variant of *bresilica* and cited Woods (1944) as their authority, thereby begging the question: why evaluate *bresilia* under Art. 31.2.2 in the first place? Schodde & Bock (2016) then showed that the name was based on the French name for Brazil, that Woods (1944) also specified the ending '-ia' in *bresilia* as a noun form, and that '-ia' is a conventional ending for Latinised nouns for countries with the ending '-ica' for adjectives, e.g. *Britannia* (noun) and *britannica* (adjective). Thus they concluded that *bresilia* could also be interpreted as a noun. Dickinson *et al.* (2017) now shift ground, arguing that because Linnaeus (1766) maintained all of the noun species names that he adopted from pre-Linnaean authors as nouns, and all the pre-Linnaean adjectival names as adjectives, that *bresilia*, derived from the indisputably adjectival *bresilica*, must be an adjective too. This is a valid approach to determining noun / adjective status under 'usage' in Art. 31.2.2—but the question is: is the evidence sufficient to meet the standard of 'decisive' usage required by the Article? We do not think so. To pass that bar, this approach must demonstrate that Linnaeus adopted adjectival pre-Linnaean names as adjectives, and substantival names as nouns, consistently throughout the zoological section of the 12th edition of his *Systema*. This has not been done. Dickinson *et al.* (2017) evaluated only 24 species names in *Tanagra*, which, we argue, form much too small a sample to judge. Furthermore, at least four of the eight adopted adjectival names they quoted are of completely new replacement names, e.g. *rubra* for *canadensis* and *chlorotica* for *nigro-lutea*. Invoking conflation, these usages are irrelevant to Dickinson *et al.*'s argument, and erode it.

That Linnaeus decapitalised *bresilia* does not establish its adjectival status, as noted by Dickinson *et al.* (2017) and others; nor does his use of 'Brasilia' instead of 'Bresilia' for Brazil in his accounts of distribution because that is inferential evidence and not explicit, *pace* Dickinson *et al.* (2017). But there are other questions raised by *bresilia*. Why did Linnaeus change its pre-Linnaean adjectival ending '-ica' to '-ia' unless he wanted to use a noun form? This is perhaps his clearest show of intent in the original publication. Or was '*bresilia*' a misprint for '*bresilica*', inferring adjectival status, or a misprint for *brasilia*, inferring a noun? As noted, Linnaeus provided no explicit, objective indication of what he intended, leaving only circumstantial evidence in synonymy that is open to speculative and ambiguous interpretation. Thus *none* of the explanations offered by David & Gosselin (2011), Schodde & Bock (2016) and Dickinson *et al.* (2017) can be justified as *decisive* in determining whether

bresilia Linnaeus is a noun or an adjective. In such circumstances, Art. 31.2.2 rules that it is to be treated as a noun and its original spelling, *bresilia*, maintained.

3. Nomenclatural instability from gender agreement

Conflation reappears in the case by Dickinson *et al.* (2017) to shift the blame for gender-driven change in species names onto phylo-taxonomic rearrangement, while simultaneously minimising nomenclatural change from Code-regulated fiat. Schodde & Bock (2016) were exclusively concerned with nomenclatural instability resulting from change in the form (spellings) of species-group names caused by gender agreement. This we clarified in our text: gender agreement is 'the single greatest source of regulation-driven change in the spelling of species-group names, often disruptively so'. Phylo-taxonomic rearrangement has nothing to do with this. All it does is shift a species name to another genus, fulfilling an essential purpose in biology to communicate, via nomenclature, new knowledge concerning evolutionary relationships. Instead, what actually changes the form (spelling) of names in taxonomically regrouped species is the present regulation for gender agreement if the name is adjectival or participial. Put simply, if there was no such rule, the form of species names would not change when species are moved between genera.

How significant, then, is destabilisation from gender agreement. As a marker of rule-engendered impact generally, Dickinson *et al.* (2017) use Art. 31.2.2 to show that it affects 0.57% (170) of in-use names among Aves, and many fewer in the rest of zoology, although there may be some faulty arithmetic involved. Other rules, we agree, have a similarly insignificant impact—but not gender agreement. Dickinson *et al.* (2017) estimate that 54% (15,760) of in-use avian species-group names are adjectival. Thus, by their own criteria, 54% of such names—more than half of avian species-group taxa and orders of magnitude greater than the effect of Art. 31.2.2—are susceptible to change by gender agreement. In practice, of course, potential for change will be lessened by adjectival declension and common gender in the generic names among which adjectival names are shifted. A more realistic estimate of its extent may be gained from gender-ending shifts in the 156 to 178 species recognised in the family Meliphagidae (honeyeaters) by Salomonsen (1967), Dickinson (2003) and Dickinson & Christidis (2014), excluding taxa now removed from the family. In these species, gender ending has changed 18 times among ten of them across these works between 1967 and 2014, due solely to combination with different genera. If taxonomic shifts in Meliphagidae are average for the Aves, this extrapolates to a 10–12% change in the spellings of avian species-group names over 50 years. Adding to this are changes that result from historic misinterpretation of the gender of generic names and the noun / adjective status of compound species names (e.g. David & Gosselin 2002a,b). As we have stressed, no other Code regulation approaches gender agreement as a destabiliser of the form of species-group names.

The ornithological—and zoological—communities deserve an honest, open debate as to the pros and cons of gender agreement to inform understanding of its value: is it worth the disturbance that it causes in nomenclature? Its abolition came close in the fourth edition of the *Code* (Ride 1999: XXVI), but was eventually overruled by reaction from the zoological community. Schodde & Bock (2016) have now pressed the case for abolition again. The response by Dickinson *et al.* (2017) adds little: it defeats its own case for retaining gender agreement by miscalculating impact on stability without offering any real reason for retention other than a hand-on-heart 'we support maintenance of gender agreement'. They observe that 'decisions by the Commission that directly affect original spellings are reasons to reject outright abolition of gender agreement'. But why? What would abolition of gender agreement do to such decisions that the present requirement for agreement does

not? The clarifying explanation needed for informed judgement has not been produced. And even where abolition might affect adjectival name forms conserved by Opinions of the Commission, the issue can surely be resolved easily by a ruling from the Commission giving precedence to the forms conserved, in parallel with existing provisions of Art. 32.5.2 that correct 'misformed' original spellings. We find such provisions to be simple, logical and sensible.

In support of the retention case, we recognise the scholarship that names in the grammar of Latin and ancient Greek bring to systematics, and their magnificent history of tradition in zoological literature. This we respect deeply. We are less sure, nevertheless, that those values outweigh nomenclatural destabilisation, particularly for long-accustomed names for familiar species. We are also of the view that the level of understanding of Latin and Greek grammar needed to apply gender agreement properly expects too much of workers already burdened by the complexities of modern systematics. Such understanding prevents all zoologists unfamiliar with those languages from using and practising nomenclature effectively. Others will have a different view. Whether that ensures the survival of gender agreement into the future will depend on future generations of the Commission and the zoological community that it listens to and serves. But if gender agreement does survive, it will continue to bring nomenclatural destabilisation to species names beyond any other regulation in the *Code*, because it will then remain for as long as there is research in evolution and taxonomy, and that will never end.

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