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Setting scientific names at all taxonomic ranks in italics facilitates their quick recognition in scientific papers

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Abstract

It is common practice in scientific journals to print genus and species names in italics. This is not only historical as species names were traditionally derived from Greek or Latin. Importantly, it also facilitates the rapid recognition of genus and species names when skimming through manuscripts. However, names above the genus level are not always italicized, except in some journals which have adopted this practice for all scientific names. Since scientific names treated under the various Codes of nomenclature are without exception treated as Latin, there is no reason why names above genus level should be handled differently, particularly as higher taxon names are becoming increasingly relevant in systematic and evolutionary studies and their italicization would aid the unambiguous recognition of formal scientific names distinguishing them from colloquial names. Several leading mycological and botanical journals have already adopted italics for names of all taxa regardless of rank over recent decades, as is the practice in the *International Code of Nomenclature for algae, fungi, and plants,* and we hereby recommend that this practice be taken up broadly in scientific journals and textbooks.

Keywords: Format of names of taxa, Italics, Publication standards, Scientific names, Scientific practice

BACKGROUND

The International Commission on the Taxonomy of Fungi (ICTF) is an international body devoted to its mission of promoting fungal taxonomy by facilitating the development of high scientific standards (Sigler and Hawksworth 1987; Seifert and Rossman 2010; Hawksworth 2015). The ICTF occasionally provides recommendations on publication and scientific standards related to fungal taxonomy, to promote them in the scientific community. Here, we encourage journals to adopt italics for formal scientific names at all ranks to facilitate rapid and unambiguous recognition of formal scientific names governed under nomenclatural Codes within publications, as compared to informal names such as those sometimes used to differentiate clades.

For more than a century it has been common practice in most scientific journals to italicize scientific genus and species names, since regardless of their etymology, these names are Latinised (ICNafp Art. 23; Turland et al. 2018). To highlight text in languages deviating from the main manuscript language, it was common practice to use italics, and very often, whole sentences or expressions were taken from other languages to retain their original content and meaning. This practice declined over time and in most disciplines, only a few foreign (mostly Latinized) language expressions continue to be used, such as de novo, et al., and in vitro. As these expressions are frequently employed, many journals no longer implement italics for them. Similarly, Latin-derived names that are treated as naturalized words,

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such as aquilegia, ascomycetes, and stramenopiles are not italicized when they are not used as formal scientific names. Thus, in a text dealing with ascomycetes, the group under study could either be addressed using the informal name ascomycetes or the formal name, the phylum *Ascomycota*. This distinction is important as formerly, the phylum *Ascomycota* was recognized at class level, as *Ascomycetes*, and so the use of italics, in combination with upper case, clearly sets apart such formal names (and their meaning) from informal ones.

Despite the fact that most publications in the biological sciences no longer italicize foreign language expressions, almost all still require authors to provide names of genera and species in italics. Apart from being a vestige of past publication practice, the main reason for this is that it is much easier to spot names of species set in italics. In addition, placing names of species in italics means that errors that occur during auto-correction of spelling, as often applied in word-processing programs, can be more readily detected and corrected. For example, a species epithet such as *"clandestina"* will be auto-corrected to 'clandestine' and such corrections would easily be missed during proofing if italicization was not used. As scientific taxon names are formal names under the strict rules of nomenclature Codes, they are 'unique identifiers' for taxa that ought to be highlighted in some way.

CURRENT PRACTICE IN THE CODES OF NOMENCLATURE

Algae, fungi, and plants

Scientific names at all ranks are italicized in the text of the current *International Code of Nomenclature for algae, fungi, and plants.* (ICNafp; Turland et al. 2018). This Code (and its preceding Codes and Rules) adopted italics for all scientific names covered by the Code from the earliest editions (e.g. Briquet 1935), apart from those of 1983 and 1988 which italicized names only at family rank and below. That policy was considered "rather illogical" in the next edition (Greuter et al. 1994) and in it, and all four subsequent editions to date, scientific names at all ranks covered by the Code have been placed in italics, while technical terms are not "in order to differentiate them from" scientific names. This practice has increasingly been adopted in a variety of botanical and mycological journals over the last 25 years. While the Code sets no binding standard, considering it "a matter of editorial style and tradition" it suggests editors and authors consider following this practice "in the interest of international uniformity" (Turland et al. 2018).

Cultivated plants

A separate Code, the *International Code of Nomenclature for Cultivated Plants* (ICNCP) regulates the names of plants mostly below the species level which are recognized as cultivars, chimaeras, and some other special categories. This Code separated from the ICN in 1952, which had covered such plants up to that time, and the current edition (Brickell et al. 2016) makes only a single reference to italics; Rec. 8A recommends that the names of the special categories treated under the ICNCP should not be presented in italics to avoid confusion with taxa governed by the ICNafp.

Prokaryotes

The nomenclature of bacterial organisms followed the provisions of the ICNafp, but there was a major issue over the acceptability of living cultures as types which led to the development of a separate Code first published in 1948 (Sneath 1986). The practice of placing scientific names at all ranks in italics has been followed through the various editions of this Code, and the deviation from this applied in the botanical Codes of 1983 and 1988 was ignored. Editors and authors are advised to "preferably indicate scientific names by a different type face, e.g. italic, or some other device to distinguish them from the rest of the text" in the *International Code of Nomenclature of Bacteria* (ICNB; Lapage and Sneath 1992). The Code has been renamed as the *International Code of Nomenclature of Prokaryotes* (ICNP; Parker et al. 2019) which repeats the advice of earlier editions recommending the use of italics for scientific names, and in the text uses them at all higher ranks up to and including class; the ICNP does not regulate names at ranks higher than class.

Viruses

The nomenclature of viruses was first covered along with bacteria in a joint Code, the *International Code of Nomenclature of Bacteria and Viruses* (International Committee on Bacteriological Nomenclature 1958), but subsequently separated and has produced separate reports since 1971. *The International Code of Virus Classification and Nomenclature* (ICVCN; International Committee on Taxonomy of Viruses 2018) mandates the use of italics at all ranks in Rule 3.30 under the Rules of Orthography.

Zoology

The *International Code of Zoological Nomenclature* (ICZN) traditionally regulates names in the family, genus, and species groups and excluded names above the family group, and in Rec. E.2 recommended that genus and species group names were placed in a different type, and noted "italics are usual" (Ride et al. 1985). No recommendation was made over how names at higher ranks should be presented, but most zoologists have not italicized them. There was, however, a reaction to the proposed use of italics for scientific names in the