



Zoological nomina in the century of extinctions: new proposals

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Abstract

The taxonomic urgency, caused by the combination of the taxonomic gap (wide incompleteness of the taxonomic inventory of living beings on earth) and the biodiversity crisis (major threats of extinction on a large part of the current biodiversity) imposes heavy responsibilities on the scientific community of biologists and particularly of taxonomists. In order to become more efficient in the work of description and naming of the species and other taxa, some changes in traditional working practices should be implemented. Among them, a simplification and standardisation of some nomenclatural Rules and practices, and in particular of the way of writing the scientific names of taxa (nomina) should be considered. Although traditionally considered important, authorship plays no role in the implementation of the nomenclatural Rules concerning availability, allocation and validity of nomina, and the traditional emphasis put on authorship in nomenclature plays in fact a negative role in taxonomy. Removing the names of authors, but not the date, from the nominal-complex by which each taxon is designated would de-emphasise the role of authorship in nomenclature. It would reduce the burden of nomenclatural taxonomic inflation and synonymy load due to nomenclatural nihilism and unwarranted descriptions of new taxa that will later have to be treated as synonyms. Other proposals regarding the standards and length of writing nominal-complexes in publications are offered, which should be beneficial not only to scientific publications using nomina of taxa, but also to the computerisation of nomenclatural information and its electronic diffusion. These proposed changes, some of which are drastic, should not be implemented at once, but in several steps, in order to be progressively adopted by the community of taxonomists.

Keywords: nomenclature; nominal-complex; scientific name; authorship; date; standard formats.

Introduction

Biology has long been a mainly reductionist domain, but these times are over. Most biologists now recognise that studying and understanding the biological facts through a few species only, like *Drosophila melanogaster* or *Mus musculus*, is not sufficient to understand ‘life’, because many characteristics of the living organisms make sense only in the light of evolution (Dobzhansky 1973). The comparative and integrative concepts of biodiversity, ecology, evolution and phylogeny have become crucial in the recent studies of biological patterns and processes.

Being able to deal with the diversity of organisms, and to communicate about them, requires to classify and name them. The first of these tasks is achieved by the discipline of taxonomy, the second by its subdiscipline nomenclature. Nowadays, in Eucaryotes, taxonomy is mostly phylogenetic, i.e., classifications of organisms into species, genera, families and other taxa rely largely on phylogenetic hypotheses regarding the genealogical relationships between organisms. Less than two millions species are currently recognised by taxonomists, yet many additional millions are awaiting discovery, study, description and naming (Hammond 1992; Heywood & Watson 1995; Reaka-Kudla *et al.* 1997; Dirzo & Raven 2003; Chapman 2009; Costello *et al.* 2013)—but at the same time many of them are threatened with extinction at our epoch of the ‘biodiversity crisis’ and of the ‘sixth extinction’ (Wilson 1985; Kolbert 2006). The need of accelerating the process of inventory of the earth’s taxa qualifies as *urgency* in our ‘century of extinctions’ (Dubois 2003, 2010b; Wheeler *et al.* 2004).

Scientific names or *nomina* (Dubois 2000) are the “*key to the big new biology*” (Patterson *et al.* 2010). Because they rely on theoretical formalisation of empirical data (characters) and their correspondence among taxa through homology statements, which are the basis for building models of relationships, they have explanatory, predictive and conceptual powers (Mayr 1982, 1997), and they allow information storage and retrieval, so that “*No other way of naming in science is so powerful*” (Valdecasas *et al.* 2014).

Naming the taxa recognised by taxonomists on the basis of morphological, biological, genetic and phylogenetic data is a peculiar, specialised subdiscipline of taxonomy. It requires the existence of a set of international nomenclatural Rules, i.e., conventions agreed upon by all or most taxonomists worldwide for designating unambiguously any given taxon, as recognised in a given classification, by a single scientific