



Primary, secondary and tertiary syntypes and virtual lectotype designation in zoological nomenclature, with comments on the recent designation of a lectotype for *Elephas maximus* Linnaeus, 1758

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Abstract

The role of primary, secondary and tertiary syntypes in solving nomenclatural problems, especially those related to old nomina from the eighteenth and nineteenth centuries, is discussed. The very useful but rarely implemented procedure of designating virtual lectotypes, i.e., specimens that can be traced as belonging to the original syntypic series but currently non-extant (e.g., lost, destroyed, misplaced, or originally being a live animal of which only an illustration remains), is here highlighted as potentially opening the way for a neotype designation that better suits stability in zoological nomenclature. This is particularly true when mixed syntypic series, i.e., those comprising specimens belonging to more than one species, are involved. We illustrate the advantages of this procedure by showing that a secondary syntype of *Elephas maximus* Linnaeus, 1758, although currently missing, would have been a better candidate to lectotype designation than the still available specimen actually selected recently as the lectotype of this species based on molecular data. We welcome the use of molecular data to solve nomenclatural problems, but point out that a thorough knowledge of the *International Code of zoological Nomenclature* is essential if the best decisions are to be taken.

Key words: *International Code of zoological Nomenclature*, nomenclatural problems, syntypes, lectotype, neotype, type-locality, elephant, Ceylon, Sri Lanka

Introduction

According to the *International Code of zoological Nomenclature* (Anonymous 1999; ‘the Code’ below), the process that leads to the valid nomen (‘scientific name’ in the Code) of any zoological taxon (classificatory unit) in any given classification has to go through three successive stages (Dubois 2005, 2011): availability, allocation and validity. This system is theory-free regarding taxonomy (classification paradigm) and ostensional, i.e., the allocation of a nomen to a taxon (or several taxa) is not made through a definition (either intensional or extensional) of the nomen or of the taxon, but through pointing to a specimen or several specimens that is/are the bearer(s) or onomatophore (‘name-bearing type’) of the taxon’s nomen. This allocation is made either directly through ‘type specimens’ (or onymophoronts) in the case of nomina of the species-series (‘species group’), or indirectly, through nominal taxa (‘type species’ or ‘type genera’) in the higher nominal-series (genus- or family-series) (for details see e.g. Dubois & Ohler 1997a and Dubois 2000,

In many cases, when a type-series is heterogeneous, it will be much preferable to designate as lectotype, instead of a still extant specimen, a missing specimen (destroyed, lost, never collected or unavailable), but mentioned, described or figured in a work cited in the original publication as providing information on the new taxon. This will stabilise the allocation of the nomen and provide a precise type-locality. This is the procedure of virtual lectotype designation, which relies on the distinction between three categories of syntypes first defined by Dubois & Ohler (1997a): primary, secondary and tertiary.

Designation of a specimen now lost, but belonging in one of these three categories of syntypes (with a preference for primary over secondary, and secondary over tertiary syntypes, but no obligation to follow this preference) has two major advantages: (1) it avoids the designation as lectotype of the still extant specimen(s) that might cause a nomenclatural problem; (2) it allows to fix the type-locality (or onymotope) of the taxon to the locality of collection of the lectotype, which in some cases may allow clarifying the status of the nomen in current classifications. Once a lectotype has been designated for the taxon, all the other original syntypes have lost their ‘nomen-bearing’ status and cannot be a cause of nomenclatural problems any more. The fact that the lectotype has been lost may, in its turn, be a cause of problems in some cases (e.g., the impossibility to carry out molecular studies on this specimen), but then, the fact that it is missing has ‘opened the way’ to the straightforward designation of a neotype, which was not possible, except through intervention of the Commission making use of its plenary powers, as long as the lectotype had been chosen among syntypes still in existence.

The four-step process in such cases, described already by Dubois & Ohler (1995, 1997a–b), Kottelat & Persat (2005), Nemésio & Rasmussen (2009, 2011) and Dubois (2011), and again above, can be summarised as follows: (1) first, to designate as lectotype one of the primary, secondary or tertiary syntypes that corresponds to the current use of the nomen, and if possible coming from a precise type-locality; (2) this results in a type-locality restriction for the nominal taxon; (3) if necessary, then, state that this specimen is now lost and why this raises nomenclatural problems; (4) then designate a neotype, originating from the restricted type-locality. In our opinion, this procedure is the most appropriate one to solve many nomenclatural problems associated with the taxonomic allocation of old nomina published in ancient works. We wish it had been followed for the designation of a lectotype for *Elephas maximus* Linnaeus, 1758, and we hope it will be so in future works.

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