Alpha-taxonomy in world mammals

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2017-08-23

BSc Hons Biological Sciences

Species & speciation module deliverable

For A/Prof A.M. Muasya

Introduction

Herein I discuss the progress of mammalian alpha-taxonomy from 1975 to 2005. First, I discuss the new species and groups discovered in this period. Second, I focus on the methods employed to diagnose and delimit these mammal species and how these have changes over the the past 30 to 40 years. Third, I will attempt to draw conclusions, if possible, about the speciation mechanisms at work in mammal populations based on the evidence use to delimit those mammal species. And lastly, I will frame these discussions in the context of the species concepts (or lack thereof) typically used in mammalogy and mammalian taxonomy.

Mammal Species of the World, 3rd Edition (MSW3) (Wilson & Reeder 2005) is a reputable database of mammalian taxa (species, sub-specific, and super-specific) and information concerning their treatments (e.g. scientific name, authors' name and year described, original publication citation, distribution, etc. (Wilson & Reeder 2005)) from 1702 to 2005 AD. This data product is a boon to the discussions here. Using the `.csv` file from the MSW3 webpage (https://www.departments.bucknell.edu/biology/resources/msw3/), I explored this dataset in `R` (R Core Team 2017), primarily using the `tidyverse` suite of packages for exploration and visualisation (Wickham 2017).

There is a subset of mammal order that are most taxonomically "active" (Figure 1), such that there are only eight orders in which ≥ 10 new species were described in the period 1975—2005.

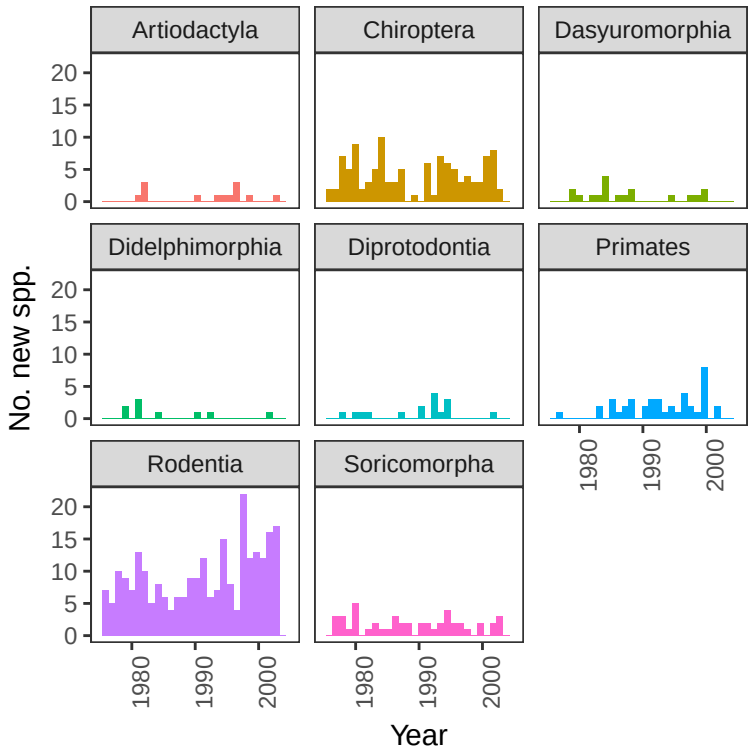

Figure 1: Bar-plots of the number of new species (sensu stricto, excluding sub-specific additions) described each year in the eight most taxonomically active orders of mammal over the period 1975—2005. Data are from MSW3 (see text) (Wilson & Reeder 2005). Taxonomically "active" here implies that $\geq$ 10 new species were described for an order over the 1975—2005 period. These eight orders are those that meet this criterion.

Mammal discoveries, 1975—2005

Lines of evidence

Modes of mammalian speciation

Mammalogical species concepts

Concluding remarks

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e.g. Blah blah blah (Figures \ref{o_vs_h}B, \ref{o_vs_h}C).

e.g. {r timeline, warning = F, fig.height = 7, fig.width = 7, fig.cap ='\\label{timeline} \\footnotesize Timeline of isotopic and hydrological values throughout the winter storm-event during which sampling was carried out (ca. 54 hours range of sampling): \\normalsize \\textbf{A)} \\footnotesize Rain-fall input ($m^{3} h^{-1}$), \\normalsize \\textbf{B)} \\footnotesize stream-flow rate ($m^{3} h^{-1}$) of the Liesbeeck River, and \\normalsize \\textbf{C)}

\\footnotesize $\\delta^{18}O$ (\u2030) and \\normalsize \\textbf{D)} \\footnotesize $\\delta^{2}H$ (\u2030) values for both the rain- and stream-water (keyed).'}

References

R Core Team. 2017. *R: A Language and Environment for Statistical Computing*. 2017. Vienna, Austria: R Foundation for Statistical Computing. Available: https://www.r-project.org/.

Wickham, H. 2017. *tidyverse: Easily Install and Load 'Tidyverse' Packages*. 2017. Available: https://cran.r-project.org/package=tidyverse.

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