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Author: Kok, Philippe J.R.

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SPECIAL ISSUE: NEOTROPICAL HERPETOFAUNA

Special Issue: a few steps back, several steps forward

Philippe J.R. KOK

Department of Ecology and Vertebrate Zoology, Faculty of Biology and Environmental Protection, University of Łódź, Łódź, Poland; e-mail: philippe.kok@biol.uni.lodz.pl

The aim of this Special Issue of the *Journal of Vertebrate Biology* was to bring together a collection of papers focusing on the diversity, taxonomy, phylogeny, evolution or ecology of the Neotropical herpetofauna. All papers submitted dealt with species diversity, and four out of six describe new species, highlighting the hidden species richness in the region (e.g. Vacher et al. 2020, Torres-Carvajal & Terán 2021, Jowers et al. 2023). Most authors used an integrative approach, often based on a molecular perspective.

The Neotropical realm – including the Mexican and Andean transition zone – is one of the eight terrestrial biogeographical regions (Morrone 2014) and has by far the world's highest vertebrate richness and endemism (e.g. Millennium Ecosystem Assessment 2005, Raven et al. 2020, Antonelli 2022). The Neotropics cover most of South America, Central America, southern and central Mexico, and the Antilles (Morrone 2014) and include seven of the 25 world's biodiversity 'hotspots' proposed by Myers et al. (2000). The region harbours an impressive array of habitats and ecosystems, from lush tropical jungles and arid savannahs to rugged mountains and highly isolated barren plateaus, inspiring fiction writers and filmmakers for decades. As everywhere else on this planet, this Eden is threatened by human-induced habitat and climate modifications, which are identified as significant threats to amphibians (e.g. Luedtke et al. 2023) and reptiles (e.g. Caetano et al. 2022, Cox et al. 2022). Large and small-scale deforestation and mining (and associated pollution issues) proceed at alarming rates (e.g. Laurance et al. 2004, Kalamandeen et al. 2018, Stachowicz et al. 2023, Pisconte et al. 2024). Beyond the physical threats to the region and its fauna, the taxonomic stability of the Neotropical herpetofauna is occasionally jeopardised (see recent examples that extend outside the specific area, e.g. Ceríaco et al. 2023 and Jablonski & Dufresnes 2024). This situation arises when some scientists ignore the International Code of Zoological Nomenclature (which rules the scientific naming of animals; ICZN 1999), either for their benefit or to fulfil some dubious political agenda.

A recent example worth noting, since it pertains to an iconic Neotropical reptile, is the paper by Rivas et al. (2024) 'describing' a new species of anaconda, one of the largest extant snakes. Unfortunately, this paper is a digest of bad taxonomic practice (see Moore et al. 2014 and Wood et al. 2020 about 'taxonomic vandalism')*. In brief, among other methodological problems (i.e. the exclusion of molecular data that do not fit the authors' ideas), Rivas et al. (2024) decided not to provide any formal description of the new species, which they report to be solely identified by unspecified molecular characters. They also voluntarily ignore potential published synonyms (i.e. available names for the species), arguing that the Code is based on '*Western science*' and that a much older name '*akayima*' has been in use by locals for '*perhaps even thousands of years*'; therefore, according to the authors, that ancient name (unpublished, so unavailable according to the Code) is a senior synonym and should be adopted. Their actions, at best, violate Article 13 of the Code (ICZN 1999). In a contradictory twist, however, Rivas et al. (2024) still consider themselves the discoverers/authors of the species (as mentioned in their paper, but also widely advertised in online media) rather than crediting authorship to local tribes as their (misguided) decision would logically imply; it seems their capacity for recognising ancestral knowledge has limits. The main problem with this kind of paper is that it

can damage the public's perception of Science and threaten nomenclatural stability, risking taxonomic chaos (Moore et al. 2014, Wood et al. 2020). Perhaps more disturbing is the fact that often substantial publication fees – in this particular case, paid to a publisher that has been termed 'predatory' (Oviedo-García 2021; but see also Richtig et al. 2018, Chandra & Dasgupta 2024, Wilson 2024 for details) – allows any author to publish papers of questionable value, exceptionally rapidly, and possibly without proper peer-review. Thankfully, despite these developments, there are still scientists who meticulously identify, compare and describe the many species that are still scientifically unknown, naming them according to a universal convention before they disappear and alerting the general public and conservationists to their existence. For them, a tiny brown frog is no less valuable than a giant green snake. Because of their highly remote habitats, some of the new species described in this Special Issue, like *Pristimantis kalamandeenae* and *Stefania lathropae* (see full issue for details), have likely been seen alive by only a handful of people. These efforts require painstaking work, which is often only poorly rewarded (see Engel et al. 2021, who provided an excellent Editorial on that matter).

This Special Issue comprises six papers from 21 authors based in nine countries (Belgium, Brazil, Canada, Ecuador, Mexico, Peru, Poland, the UK and the USA). Papers cover diverse Neotropical regions, from the rainforests of Brazil and Guatemala to the highlands of the Andes (up to 2,045 m elevation) and Pantepui (up to 2,419 m elevation). Four papers describe a total of seven new species, five frogs (four in the megadiverse *Pristimantis* genus) and two lizards, while two papers synonymise five species, four of them based on molecular evidence, one based solely on morphology (see the full issue). Although synonymising four species of *Craugastor*, Streicher and colleagues highlight that their molecular data support multiple undescribed species in that genus. The authors discuss how morphology-based species delimitation might be misleading, both underestimating and overestimating species richness in that group. This finding represents an interesting point. In the Western world, we sometimes tend to forget that some of the tools and techniques we use to characterise taxa with an integrative approach (the so-called 'integrative taxonomy', see Cao et al. 2016, Padial et al. 2009, 2010, Pante et al. 2015) are not always readily available to everyone. Sequencing and μCT-scanning, although increasingly affordable, remain too expensive and often inaccessible to financially less secure colleagues. With the advent of molecular biology and integrative taxonomy, it has become harder to publish species descriptions based solely on morphology. I personally recall describing two new lizard genera based on a single specimen outside any molecular phylogenetic context. It is probably a heresy today, but if we want to tackle the taxonomic impediment (e.g. Vinarski 2020), we might take that risk (which we did in this Special Issue with a paper by Melo-Sampaio) when the author is a recognised expert on the topic and backed-up by proper expert peer-review.

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* Note added in press: While this Editorial was in production, two papers appeared formally tackling the nomenclatural issues briefly discussed here (Dubois et al. 2024, Vásquez-Restrepo et al. 2024).

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