Lum/July-December 2022, vol. 3, no. 2

THE FORMATION OF SCIENTIFIC NAMES IN MEXICAN REPTILE SPECIES: RECENT PATTERNS AND IDEAS FOR THE FUTURE

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Abstract

Within the scientific field of phylogenetic systematics, taxonomists describe and name species, genera, and other groups of organisms. As such, taxonomy provides a universal language for classifying biological diversity, and can also shed light on the value systems of human societies through the types of names that are used or not. However, there are few studies that explore the patterns of how scientists name species. In this work, we document the different criteria used by researchers to form the scientific names of the 87 Mexican reptile species described from 2000–2020. We referenced original scientific descriptions to classify the criteria that were used to form the second part of the scientific name, which is known as the specific epithet. The eponymic criterion, which includes only specific epithets that refer to a person or persons, was the most used (48 species; 55.2%), of which only 4.2% were dedicated to female names and only 39.6% were dedicated to Mexican names. It was followed by the descriptive criterion (33 species; 37.9%), with the subcriterion based on morphology-biology being the most used (19 species; 57.6%). Consistent with studies of other animals and plants, our results show imbalances in the formation of eponyms. We suggest that taxonomists who wish to use eponyms consider addressing these imbalances when forming new names. While recognizing the creative freedom enjoyed by taxonomists, we also discuss the advantages of forming new names that refer to diagnostic physical or geographical characteristics of particular species.

Keywords: Eponym, etymology, herpetology, matronym, nomenclature, patronym, taxonomy, systematics.

Resumen

Dentro del campo científico de la sistemática filogenética, la taxonomía describe y nombra especies, géneros y otros grupos de organismos. Como tal, la taxonomía brinda un lenguaje universal para reconocer y clasificar la diversidad biológica y también para arrojar luz sobre los sistemas de valores de las sociedades humanas a través de los tipos de nombres que se usan o no. Sin embargo, hay pocos estudios que exploran los patrones de cómo los científicos nombran las especies. Por lo tanto, en este trabajo documentamos los diferentes criterios utilizados por los investigadores para la formación de los nombres científicos de las 87 especies de reptiles mexicanos descritas entre 2000 y 2020. Hicimos referencia a las descripciones científicas originales para clasificar los criterios que se utilizaron para formar la segunda parte del nombre científico, que se conoce como el epíteto específico. El criterio eponímico, que incluye solo epítetos específicos que se refieren a una persona o personas, fue el más utilizado (48 especies; 55.2%), de los cuales solo 4.2% eran dedicados a nombres femeninos y solo 39.6% eran dedicados a nombres de mexicanos. Le sigue el criterio descriptivo (33 especies; 37.9%), siendo el subcriterio basado en morfología-biología el más utilizado (19 especies; 57.6%). De acuerdo con los estudios de otros animales y plantas, nuestros resultados muestran desequilibrios en la formación de epónimos. Sugerimos que los taxónomos que deseen usar epónimos consideren abordar estos desequilibrios al formar nuevos nombres. Si bien reconocemos la libertad creativa de la que disfrutan los taxónomos, también discutimos las ventajas de formar nuevos nombres que se refieran a características físicas o geográficas diagnósticas de especies particulares.

Palabras clave: Eponímico, etimología, herpetología, matronímico, nomenclatura, patronímico, taxonomía, sistemática.

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INTRODUCTION

Phylogenetic systematics examines organismal diversity by inferring the genealogical relationships of organisms and classifying them accordingly (Hennig, 1965; Wiley, 1981; de Queiroz and Gauthier, 1992; Nixon and Ochoterena, 2001). We can define systematics as a science that categorizes biological diversity in an evolutionary context and that explores the processes that give rise to that diversity. That is, systematic biologists enumerate the species that inhabit the planet, infer how they are related to each other, and explain the mechanisms that determine the observed patterns. The task of modern systematics consists of three main components, which usually operate in an interrelated way: 1) taxonomy, aimed at discovering, describing and naming species and groups of species, 2) phylogenetic analysis, which resolves evolutionary relationships between species and groups of species, and 3) classification, or the grouping of species and supraspecific taxa on the basis of their evolutionary relationships (Systematic Agenda 2000, 1994). Systematics is therefore highly synthetic, and draws on tools and philosophies that relate to many disciplines including anatomy, biogeography, ecology, and genetics (Simpson and Cracraft, 1995; Brower and Schuh, 2021a). In addition, systematics is essential for the conservation of biological diversity (Savage, 1995; Cracraft, 2002; Brower and Schuh, 2021b).

Taxonomy is the operative part of this process, because it provides a language to systematics. As a fundamental pillar of recognizing biodiversity, taxonomists propose the scientific names of taxa, which include species, genera, families, and other organismal groups (Bernardi, 1999; Nixon and Ochoterena, 2001). The formation of these names follows the rules of nomenclature, which promote clear and precise communication among the global scientific community (Nixon and Ochoterena, 2001; Eliosa León and Navarro Carbajal, 2005) and between them and society in general.

The practice of giving scientific names to taxa dates back more than two centuries. In the 18th century, the Swedish naturalist Carl Linnaeus proposed two important rules. First, he stipulated that the scientific name of species should be written in Latin (or Latinized words derived from other languages), because it was a dead language that nobody spoke and, as such, it was stable and unchanging. Second, he stipulated that the full scientific name of a species should be made up of two words, which together are known as the binomial (Bernardi, 1999). The two words of the binomial are the name of the genus and the specific epithet. Those who study animals, including living species as well as extinct species known only from fossils, follow the naming rules that are explained in the International Code of Zoological Nomenclature (ICZN) (Chaos Cador, 2014).

Consistent with the ICZN, a common way of naming species is to reference a person or persons, including real people or mythical figures (Vendetti, 2022). These types of names are usually known as eponyms, and can refer to prominent figures in any field including science, politics, popular culture, or a friend or loved one (Nieto-Montes de Oca, 1996; Mammola *et alii*, 2022). As examples, in the scientific field the beetle *Phyllophaga alvareztoroi* is a species dedicated to Miguel Álvarez del Toro (Morón and Blas, 2006), in recognition of his singular contribution to the knowledge and conservation of nature in Chiapas, Mexico (Luna-Reyes, 1996; Nieto-Montes de Oca, 1996; Aranda, 1997; Flores-Villela and Hodges, 1999). In politics, Benito Pablo Juárez García, who was the first indigenous president of Mexico and was born in the Sierra de Juárez in the state of Oaxaca, is honored with the name of a snake species known only from the Sierra de Juárez (*Geophis juarezi*; Nieto-Montes de Oca, 2003). In popular culture, a genus of grasshopper endemic to Oaxaca whose only known species (*Liladownsia fraile*) was named after Oaxacan singer-songwriter Ana Lila Downs Sánchez, is one of the rare but permissible cases of a genus being named after a person (Woller *et alii*, 2014).

It is also permissible, within the ICZN rules, to use many other strategies to form scientific names. In some cases, scientific names refer to a locality or region where the species occurs (*e.g.*, *Leptosalda chiapensis*, an extinct hemipteran insect that is only known from material within amber from Chiapas, Mexico [Cobben, 1971]). Alternatively, the name can be derived from the habitat of the species (*e.g.*, the frog *Bromeliohyla bromeliacia* [Schmidt, 1933], which lays its eggs and spends much time among plants known as bromeliads). A scientific name can also refer to some aspect of the coloration of the species (*e.g.*, the ocelot *Leopardus pardalis*, a name in which the Latin word *pardus* indicates a "mottled" color pattern), or its shape (*e.g.*, the salamander *Oedipina elongata*, which has a markedly elongated body).

Additionally, a name can be selected in honor of the original ethnic group of the region where a species exists (*e.g.*, the opilionid arachnid *Paramitraceras tzotzil*, [Cruz-López and Francke, 2013], which is endemic to the region where the indigenous Tzotzil people live).

Paradoxically, cases in which a scientific name is based on

subjective characteristics of the species are not rare. Some examples are the lizard *Sceloporus horridus* (which is supposedly "horrid") and the bird *Trogon elegans* (which is supposedly more "elegant" than the other colorful trogon species). In fact, it is possible to name a species following almost any criteria or for almost any reason (Nieto-Montes de Oca, 1996). However, the ICZN (Art. 25) recommends that the names chosen be "appropriate, compact, euphonious, memorable, and do not cause offence" (ICZN, 1999). Informal norms also exist within the scientific community. For example, authors are discouraged from naming a species after themselves. Vendetti and Garland (2019) provide a practical guide to forming new scientific names based on the ICZN rules of Latin usage, while Plata Rosa (2020) offers a light-hearted exploration of surprising and extraordinary scientific names for species from around the world.

The process of naming a new species is, therefore, a scientific activity in which creativity and originality can flourish within the limits set by the ICZN. However, there are few studies that explore the patterns of how species are named (DuBay *et alii*, 2020; Pillon, 2021; Mammola *et alii*, 2022; Vendetti, 2022). Furthermore, we are unaware of any such study that focuses on reptiles. In Mexico, reptiles (excluding birds) are one of the richest groups with more than 970 recognized species (Balderas-Valdivia and González-Hernández, 2021). Every year, multiple new species of Mexican reptiles continue to be described (Clause *et alii*, 2020). For these reasons, patterns of scientific name formation within this group could reflect patterns of name formation in other taxonomic groups, and such patterns could help inform decisions by current taxonomists.

As such, the main objective of this work was to document the different criteria used by researchers to form the specific epithets of Mexican reptile species (lizards, snakes and turtles) described in the years 2000–2020. Furthermore, although we acknowledge that taxonomists have creative freedom to choose specific epithets for species, we also discuss the potential advantages of certain practices for forming such names. We conclude by inviting taxonomists to consider how the application of these strategies might improve public understanding of both taxonomy and biodiversity.

MATERIALS AND METHODS

We generated our taxonomic list of Mexican reptile species described from 2000–2020 using The Reptile Database (Uetz *et alii*, 2021), a scientific database that collects taxonomic information on living reptile species. Our queries of The Reptile Database began and were completed in January 2021, to produce a taxonomic list that included only the species that were considered valid in that database. This list was compared with that available in the Inventario de la Herpetofauna de México 2021 (Inventory of the Herpetofauna of Mexico 2021) (Balderas-Valdivia and González-Hernández, 2021). We found no relevant discrepancies between the two lists.

For each original description we analyzed the etymology section, which is a brief paragraph in modern formal descriptions of new species that explains the reason behind the formation of the specific epithet. Using this information, we categorized the criteria that the authors used for the formation of specific epithets. Following a categorization scheme similar to previous researchers (Mammola *et alii*, 2022; Vendetti, 2022), we use three main categories: Eponym (E), Descriptive (D), and Other (O). In the Eponym criterion, the author who forms the specific epithet refers to one or more real or mythical people using their first and last name, first name only, or last name only. In the Descriptive criterion, the authors refer to one or more morphological or geographical aspects of the organisms. In the Other criterion, the authors formed specific epithets based on information different from that considered in the other two criteria. Names in this category are either only loosely related to the taxon (*e.g.*, in *Abronia cuetzpali*, the specific epithet is derived from the Nahuatl word for "lizard" [Campbell *et alii*, 2016], and *Scincella kikaapoa* is derived from the Kikapue word for "those who walk the earth" [García-Vázquez *et alii*, 2010]), or they honor an ethnic group (*e.g.*, *Kinosternon cora*, named in recognition of the Cora people [Loc-Barragán *et alii*, 2020]).

We further divided the Eponym criterion into several subcriteria. First, we categorized all eponyms as either patronyms (which refer to a man) or matronyms (which refer to a woman). Second, we categorized all eponyms according to the country of origin of the person to whom the species name was dedicated: Mexican or foreigner (any country other than Mexico). In all cases, the etymologies in the original scientific descriptions were sufficiently detailed to unambiguously assign all specific epithets to the appropriate subcategory. Moreover, we categorized the first author of all species descriptions as Mexicans or foreigners based on their country of origin.

Additionally, we further divided the Descriptive criterion into three subcategories: Morphology/Biology (D/M-B), Geography (D/G), and Uncertain (D/U). The subcriterion D/M-B included specific epithets that referenced the coloration,

size, shape, or other characteric of a physical structure *(e.g.,* purple dewlap, short limbs, or unilobed hemipenis), or the habitat preference of the species. In the subcriterion D/G, the specific epithets were derived from the name of the type locality, the state or federal entity where the type locality is located, the town closest to the type locality, or to other aspects of the geographic distribution of the species. Finally, the subcriterion D/U refers to names that indicate phylogenetic or ecological or geographic uncertainty (*e.g.*, the specific epithet meaning "confusion, agitation" in the case of *Geophis turbidus* in reference to past taxonomic confusion associated with this snake species [Pavón-Vázquez *et alii*, 2013], or the specific epithet derived from the Latin "enigma" or "mystery" in reference to the enigmatic nature of the snake *Cenaspis aenigma* [Campbell *et alii*, 2018], or derived from the Greek "seafarer" in *Crotalus thalassoporus* to refer to inter-island introgression likely resulting from oversea dispersal [Meik *et alii*, 2018]). For some species, assigning specific epithets to these subcategories necessitated our review of other parts of the original descriptions, mainly those covering the diagnostic characteristics of the species.

RESULTS

During the period 2000–2020, we identified 87 Mexican reptile species new to science that were given names currently recognized as valid. These comprise 46 lizards (52.9%), 37 snakes (42.5%) and four turtles (4.6%) (Table 1). The average number of new reptile species described per year was four. The largest number of species were described in the last decade, particularly in the years 2014 (11 species; nine lizards and two snakes), 2016 (nine species; two lizards, six snakes and one turtle) and 2018 (12 species; five lizards, six snakes and one turtle) (Figure 1).

The Eponym criterion was the most used (48 species; 55.2%), followed by the Descriptive (33 species; 37.9%) and Other (six species; 6.9%) (Figure 2). Of the specific epithets that were eponyms, all were based on the name of a single person instead of multiple people. Only two eponyms made reference to mythical figures; the rest (95.8%) referred to real people, living or dead. Similarly, almost all eponyms (95.8%) were patronyms dedicated to male names. Only two specific epithets (that of the lizard *Celestus ingridae* [Werler and Campbell, 2004], and the snake *Rhadinella donaji* [Campbell, 2015]) were matronyms based on the name of a woman. Furthermore, of the total number of eponyms, only 18 (37.5%) were based on names of Mexicans (14 Mexican authors chose to honor Mexicans and five foreigners honored Mexicans); all remaining eponyms were based on names of foreigners (23 foreign authors honored foreigners and six Mexican authors chose to honor a foreigner). Of the total species described whose specific epithets were coined applying the Descriptive criteria, those based on the Morphology-Biology subcriterion were most common (19 species; 57.6%), followed by epithets based on the Geography subcriterion (11 species; 33.3%) and the Uncertain subcriterion (three species; 9.1%) (Figure 3).

DISCUSSION

The relative proportions of Mexican lizard, snake, and turtle species described from 2000–2020 generally coincide with these groups' relative proportions out of the total native reptile species richness for Mexico according to Balderas-Valdivia and González-Hernández (2021): lizards, 49.2% of Mexican reptiles (52.9% of species recently described); snakes, 45.3% (42.5%); and turtles, 5.5% (4.6%). Apparently, the COVID-19 pandemic was not a limiting factor for the description of new reptile species in 2020 (the first year of the pandemic), because in that year seven species new to science were described, a relatively large number that was surpassed only in 2014 (11 species), 2016 (nine species) and 2019 (12 species).

The Eponym criterion, in which the specific epithet was dedicated to a person, was the most used (55.2%) by authors to form scientific names of new reptile species described in the two decades prior to 2021. Interestingly, but perhaps not surprisingly, the selection of people honored with scientific names was strongly skewed towards men (95.8%) and towards foreigners (non-Mexicans) (60.4%). The percentage of species named by foreigners and dedicated to foreigners (79.3%) was similar to the percentage named by Mexicans that honor Mexicans (82.4%); there was also no major difference between the species named by foreigners and dedicated to Mexicans (26.3%) relative to those named by Mexicans in honor of foreigners (20.7%).Our finding that eponyms are a majority in reptile names differs from the pattern in spider names, for which eponyms are a minority (Mammola *et alii*, 2022). However, our results generally echo other studies that have examined eponyms in birds (DuBay *et alii*, 2020), molluscs (Vendetti, 2022), and plants (Pillon, 2021). As in these other taxonomic groups, uneven patterns in recent Mexican reptile eponyms probably reflect historical and contemporary imbalances in the community of scientists who study them. These imbalances, in turn, are largely due to discriminatory social pressures against national researchers and especially

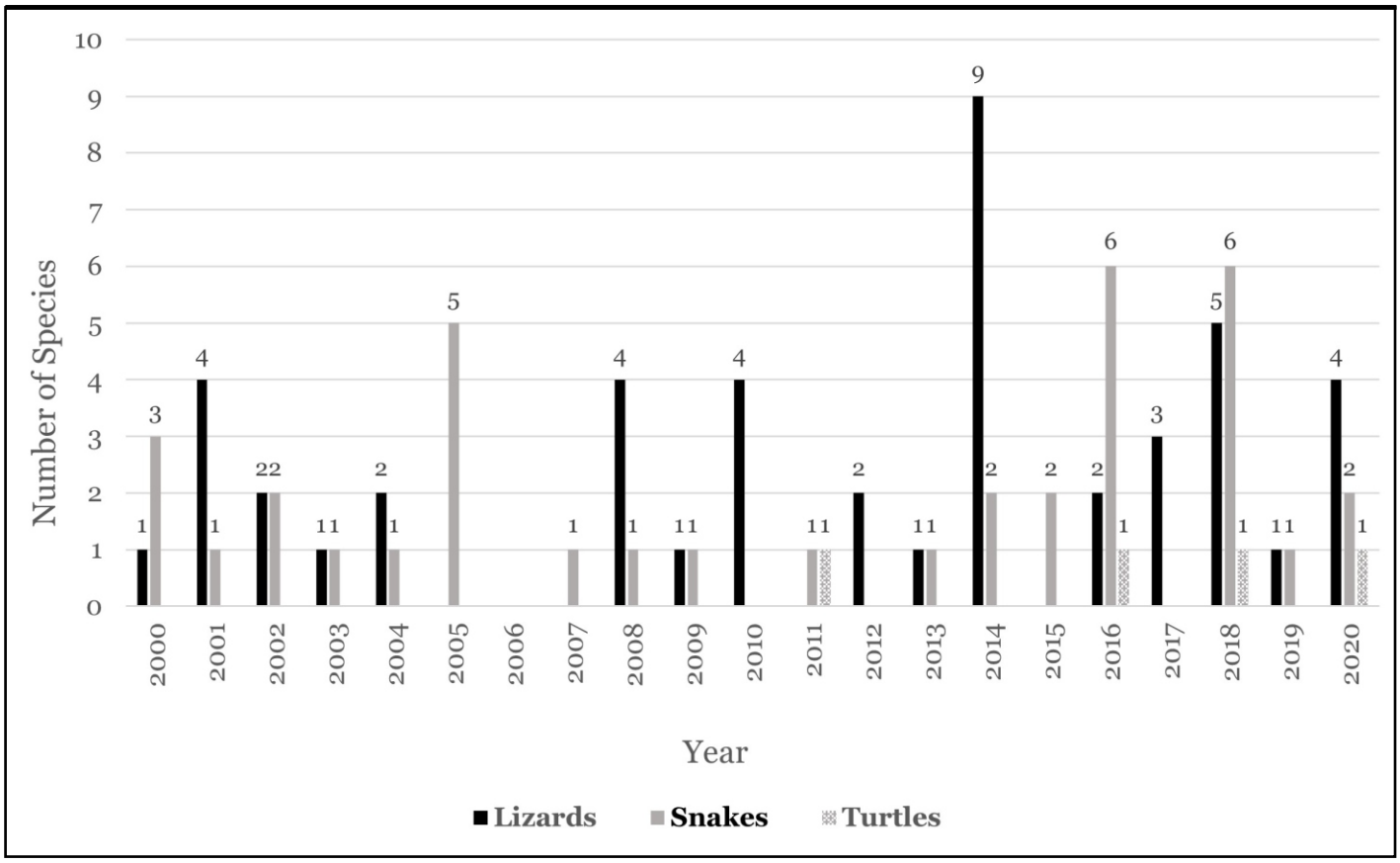

Figure 1. Number of new Mexican reptile species described annually during the period 2000–2020.

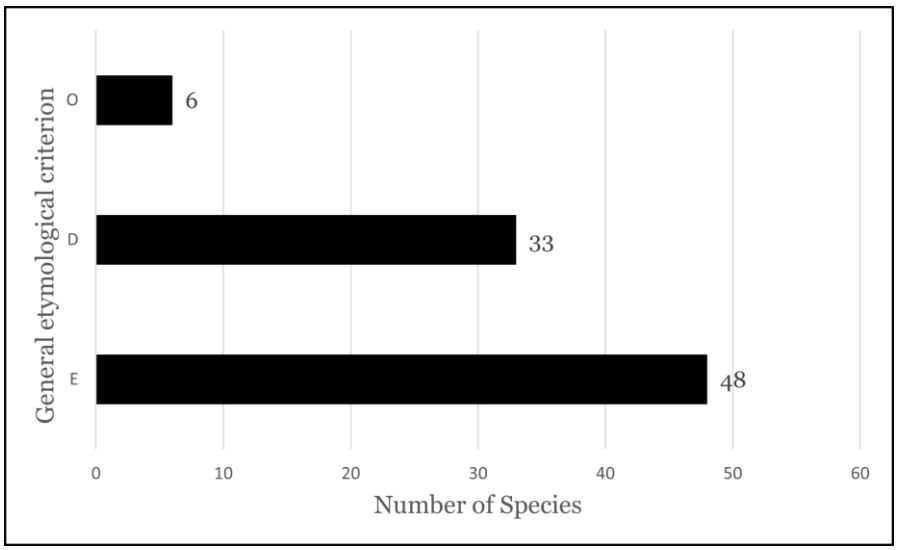

Figure 2. Comparison of type of general etymology associated with the names of Mexican reptile species described during the period 2000–2020. E = Eponym, D = Descriptive and O = Other.

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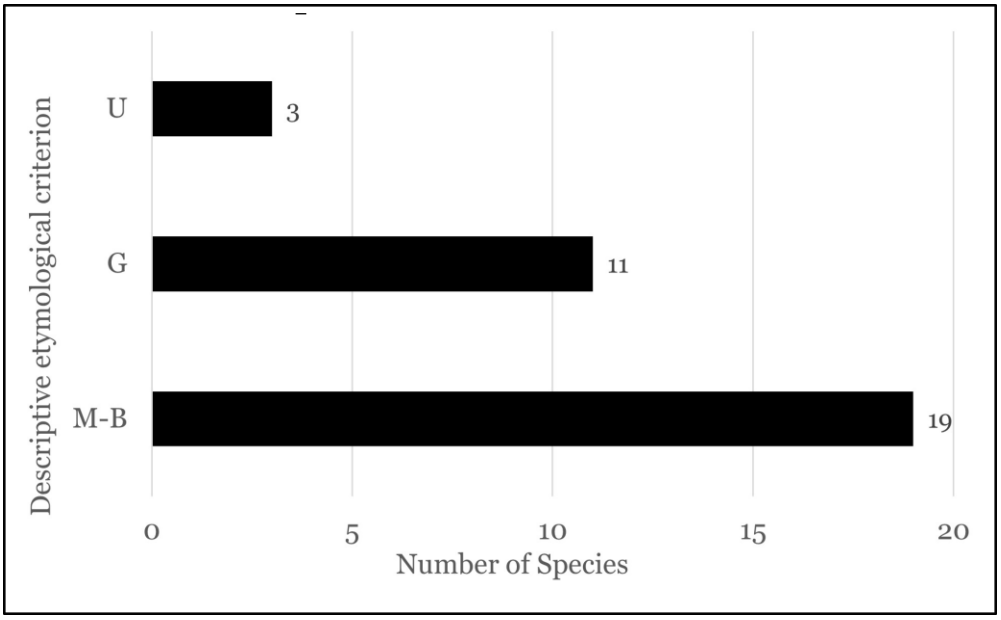

Figure 3. Comparison of Mexican reptile species described during the period 2000–2020 using the Descriptive criterion. D/M-B = Descriptive/Morphology-Biology, D/G = Descriptive/Geography, D/U = Descriptive/Uncertain.

female researchers. This result underscores the need for greater diversity and more equitable collaborations in science, including taxonomy. Far from being exclusive to Mexico, these problems are widespread and have been extensively discussed by other authors (Slobodian *et alii*, 2021; Stefanoudis *et alii*, 2021; Asase *et alii*, 2022; Salvador *et alii*, 2022; Vendetti, 2022).

Using eponyms to form scientific names is allowed by the International Code of Zoological Nomenclature, as long as certain rules are followed. However, here we suggest that evaluating the advantages and disadvantages of eponyms could be useful. Although eponyms can certainly have intrinsic value in honoring people of great scientific or social prestige, or who are personally important to the authors, in most cases eponyms provide no relevant information about the taxa. Names that do link species to their relevant characteristics are typically not as flashy as names that reference a celebrity or political figure, but we argue that such descriptive names can be more effective in promoting a meaningful appreciation of biodiversity among the general public (but see Woller [2014]). The selection of descriptive species names does not prevent researchers from using official scientific descriptions to draw attention to individuals whom the authors wish to recognize. Using the acknowledgments section of a manuscript to dedicate the new species to someone is a perfectly appropriate alternative method, but one that is rarely used.

In contrast, descriptive names are beneficial because they can promote recognition of distinctive aspects of particular species. When such names focus on aspects of morphology or biology, particularly those that help identify the species and distinguish it from others in the same genus, this naming strategy can promote general understanding of the patterns of biological variation. Alternatively, the name can provide information about the localities or regions where the specific taxa are distributed naturally, that is, call attention to their geographic distribution. This type of name might be particularly suitable for species with known geographic distributions that are very restricted. Although we recognize that many species are widely distributed, microendemism is common in new Mexican species for both vertebrate and invertebrate groups, making those species excellent candidates for this strategy of creating new names.

As an illustrative example of the potential advantages of using a descriptive name, we offer the case of a new species of lizard that we recently described from Chiapas, Mexico: the Sierra Morena arboreal alligator lizard, *Abronia morenica* (Clause *et alii*, 2020). When forming the name of this species,

we wanted to draw attention to its morphological and geographical characteristics, specifically its coloration and microendemism. Within this context, our chosen etymology of this species is as follows: "The specific epithet is a feminine adjective in the singular nominative case derived from the Spanish masculine adjective in moreno, which in English roughy translates as dark-haired and/or brown-skinned. This choice refers to the unusual brown dorsal habitus in adult males of this species. The name also extends indirect recognition to the Sierra Morena ejido, whose lands within the Reserva de la Biósfera La Sepultura support the species' only confirmed populations. We offer standard English and Spanish common names as follows: Sierra Morena Arboreal Alligator Lizards, Dragoncito de Sierra Morena" (Clause *et alii*, 2020 p. 338). We take this opportunity to correct an inadvertent mistake in this published etymology, which erroneously reversed the two components: using the suffix *-ica* for the specific epithet denotes a primary acknowledgment towards the Sierra Morena ejido, and therefore an indirect acknowledgment towards the color of the adult males of the species (Vendetti and Garland, 2019).

CONCLUSIONS

Within the ICZN rules and other informal norms (such as discouraging authors from naming species after themselve), taxonomists have complete freedom to creatively form names for animals. This creativity is one of the main reasons why we ourselves were drawn to becoming taxonomists. However, the names that taxonomists give to animals may reflect social biases, and the analysis presented in this article shows that recent naming strategies for Mexican reptiles are highly unbalanced and inequitable in the context of eponyms. Therefore, we invite taxonomists who wish to use eponyms in the future to consider the benefits of broadening the spectrum of human diversity honored by those names. As a courteous best practice, we also recommend that researchers who wish to name a species after a living person always receive permission from that person before doing so (Woller, 2014). Furthermore, we invite taxonomists to consider the idea that names can be more than just labels. Names can simultaneously provide useful information about the appearance or distribution of the taxon, which intrinsically increases the value of the name. We note that eponyms and descriptive names are not necessarily mutually exclusive; a person honored with a species name may share certain attributes of that species, to which the name may indirectly draw attention. For example, the name of the grasshopper genus *Liladownsia* not only refers to the name of the singer Lila Downs, but also refers to relevant geography and morphology, because the singer was born near the type locality of the species and she often uses bright colors

Table 1. Taxonomic list of Mexican reptile species described during the period 2000–2020.

TAXONOMIC CATEGORY AND TAXON	TYPE OF ETYMOLOGY	DESCRIPTION
Class Reptilia **Order Squamata** **Suborder Lacertilia** **Family Anguidae**		
Abronia cuetzpali Campbell, Solano-Zavaleta, Flores-Villela, Caviedes-Solis & Frost 2016.	General (other).	Name derived from the Nahuatl word for "lizard".
Abronia martindelcampoi Flores-Villela & Sánchez-H. 2003.	Eponymic (patronymic, Mexican).	Named in honor of Rafael Martín del Campo y Sánchez.
Abronia morenica Clause, Luna-Reyes & Nieto-Montes de Oca 2020.	Descriptive (morphology/ biology).	Name derived from the Spanish for "dark-haired" or "dark-skinned," in reference to the brown dorsum of adult males in this taxon.
Barisia herrerae Zaldívar-Riverón & Nieto-Montes de Oca 2002.	Eponymic (patronymic, Mexican).	Named in honor of Alfonso L. Herrera.
Celestus ingridae Werler & Campbell 2004.	Eponymic (matronymic, non-Mexican).	Named in honor of Ingrid Longstron Werler.
Elgaria velazquezi Grismer & Hollingsworth 2001.	Eponymic (patronymic, Mexican).	Named in honor of Víctor Velázquez-Solís.
Gerrhonotus farri Bryson Jr. & Graham 2010.	Eponymic (patronymic, non-Mexican).	Named in honor of William L. Farr.
Gerrhonotus lazcanoi Banda-Leal, Nevárez-de los Reyes & Bryson Jr. 2017.	Eponymic (patronymic, Mexican).	Named in honor of David Lazcano.
Gerrhonotus mccoyi Garcia-Vázquez, Contreras-Arquieta, Trujano-Ortega & Nieto-Montes de Oca 2018.	Eponymic (patronymic, non-Mexican).	Named in honor of Clarence Jack McCoy.
Family Anolidae		
Anolis brianjuliani Köhler, Peterson & Méndez de la Cruz 2019.	Eponymic (patronymic, non-Mexican).	Named in honor of Brian Jeffrey Julian.
Anolis carlliebi Köhler, Trejo Pérez, Peterson & Mendez de la Cruz 2014.	Eponymic (patronymic, non-Mexican).	Named in honor of Carl S. Lieb.

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Table 1. Continuation.

Anolis hobartsmithi Nieto-Montes de Oca 2001.	Eponymic (patronymic, non-Mexican).	Named in honor of Hobart Muir Smith.
Anolis immaculogularis Köhler, Trejo Pérez, Peterson & Mendez de la Cruz 2014.	Descriptive (morphology/ biology).	Name derived from the Latin for "not spotted" and for "throat," in reference to the male dewlap that lacks pale spots around the gorgetals.
Anolis nietoi Köhler, Trejo Pérez, Peterson & Mendez de la Cruz 2014.	Eponymic (patronymic, Mexican).	Named in honor of Adrián Nieto-Montes de Oca.
Anolis peucephilus Köhler, Trejo Pérez, Peterson & Mendez de la Cruz 2014	Descriptive (morphology/ biology).	Name derived from the Greek for "pine" and "loving," in reference to the habitat preference of this taxon.
Anolis purpuronectes Gray, Meza-Lázaro, Poe & Nieto-Montes de Oca 2016.	Descriptive (morphology/ biology).	Name derived from the Latin for "purple" and the Greek for "a swimmer," in reference to the dewlap color and ecology of this taxon.
Anolis sacamecatensis Köhler, Trejo Pérez, Peterson & Mendez de la Cruz 2014.	Descriptive (geography).	Name derived from the type locality, Cerro Sacamecates.
Anolis stevepoei Köhler, Trejo Pérez, Peterson & Mendez de la Cruz 2014.	Eponymic (patronymic, non-Mexican).	Named in honor of Steven Poe.
Anolis unilobatus Köhler & Vesely 2010.	Descriptive (morphology/biology).	Name derived from the Latin for "one" and "lobe," in reference to the unilobate hemipenes in males of this taxon.
Anolis zapotecorum Köhler, Trejo Pérez, Peterson & Mendez de la Cruz 2014.	General (other).	Named in honor of the Zapotecan people.
Family Iguanidae		
Ctenosaura oaxacana Köhler & Hasbun 2001.	Descriptive (geography).	Name derived from the Mexican state from which the taxon is known, Oaxaca.
Family Mabuyidae		
Marisora aquilonaria McCranie, Matthews & Hedges 2020.	Descriptive (geography).	Name derived from the Latin for "north, northern, northerly," in reference to it being the most northerly distributed *Marisora* taxon.

Table 1. Continuation.

Marisora lineola McCranie, Matthews & Hedges 2020.	Descriptive (morphology/ biology).	Name derived from the Latin for "diminutive line," in reference to the thin dark brown markings on the body of this taxon.
Marisora syntoma McCranie, Matthews & Hedges 2020.	Descriptive (morphology/ biology).	Name derived from the Greek for "shortened," in reference to the short limbs of this taxon.
Family Phyllodactylidae		
Phyllodactylus benedettii Ramírez-Reyes & Flores-Villela 2018.	Eponymic (patronymic, non-Mexican).	Named in honor of Mario Benedetti.
Phyllodactylus kropotkini Ramírez-Reyes & Flores-Villela 2018.	Eponymic (patronymic, non-Mexican).	Named in honor of Piotr Kropotkin.
Phyllodactylus papenfussi Murphy, Blair & Mendez de la Cruz 2009.	Eponymic (patronymic, non-Mexican).	Named in honor of Theodore J. Papenfuss.
Family Phrynosomatidae		
Phrynosoma sherbrookei Nieto-Montes de Oca, Arenas-Moreno, Beltrán-Sánchez & Leaché 2014.	Eponymic (patronymic, non-Mexican).	Named in honor of Wade C. Sherbrooke.
Sceloporus aurantius Grummer & Bryson Jr. 2014.	Descriptive (morphology/ biology).	Name derived from the Latin for "orange colored," in reference to the orange dorsolateral streak of males in this taxon.
Sceloporus druckercolini Pérez-Ramos & Saldaña de la Riva 2008.	Eponymic (patronymic, Mexican).	Named in honor of René Raúl Drucker-Colín.
Sceloporus edbelli Smith, Chiszar & Lemos-Espinal 2002.	Eponymic (patronymic, non-Mexican).	Named in honor of Edwin L. Bell.
Sceloporus gadsdeni Castañeda-Gaytán & Díaz-Cárdenas in Díaz-Cárdenas et al. 2017.	Eponymic (patronymic, Mexican).	Named in honor of Héctor Gadsden.
Sceloporus lemosespinali Lara-Góngora 2004.	Eponymic (patronymic, Mexican).	Named in honor of Julio A. Lemos-Espinal.
Family Scincidae		
Plestiodon lotus Pavón-Vázquez, Nieto-Montes de Oca, Mendoza-Hernández, Centenero-Alcalá, Cruz-Padilla & Jiménez-Arcos 2017.	Descriptive (morphology/ biology).	Name derived from the Latin for "bathed, clean, elegant," in reference to the fainter lines on the body compared to congeners.

Table 1. Continuation.

Plestiodon nietoi Feria-Ortiz & García-Vázquez 2012.	Eponymic (patronymic, Mexican).	Named in honor of Adrián Nieto-Montes de Oca.
Family Sphenomorphidae		
Scincella kikaapoa García-Vázquez, Canseco-Márquez & Nieto-Montes de Oca 2010.	General (other).	Name derived from the Kikapue word for "those who walk on the land".
Family Xantusiidae		
Lepidophyma cuicateca Canseco-Márquez, Gutiérrez-Mayen & Mendoza-Hernández 2008.	Descriptive (geography).	Name derived from the type locality, Cañada de Cuicatlán.
Lepidophyma inagoi Palacios-Aguilar, Santos-Bibiano & Flores-Villela 2018.	Eponymic (patronymic, Mexican).	Named in honor of Iván Nava González.
Lepidophyma zongolica Garcia-Vázquez, Canseco-Márquez & Aguilar-López 2010.	Descriptive (geography).	Name derived from the type locality, Sierra de Zongolica.
Xantusia jaycolei Bezy, Bezy & Bolles 2008.	Eponymic (patronymic, non- Mexican).	Named in honor of Charles J. (Jay) Cole.
Xantusia sherbrookei Bezy, Bezy & Bolles 2008.	Eponymic (patronymic, non- Mexican).	Named in honor of Wade C. Sherbrooke.
Family Xenosauridae		
Xenosaurus fractus Nieto-Montes de Oca, Sánchez-Vega & Durán-Fuentes 2018.	Descriptive (morphology/ biology).	Name derived from the Latin for "broken" or "fragmented," in reference to the broken dark crossband on the nape of this taxon.
Xenosaurus mendozai Nieto-Montes de Oca, García-Vázquez, Zúñiga-Vega & Schmidt-Ballardo 2013.	Eponymic (patronymic, Mexican).	Named in honor of Fernando Mendoza Quijano.
Xenosaurus penai Pérez Ramos, Saldaña de la Riva & Campbell 2000.	Eponymic (patronymic, Mexican).	Named in honor of Zeferino Uribe Peña.
Xenosaurus phalaroanthereon Nieto-Montes de Oca, Campbell & Flores-Villela 2001.	Descriptive (morphology/biology).	Name derived from the Greek for "white-spotted" and "chin," in reference to the distinctive white chin spots in this taxon.
Xenosaurus tzacualtipantecus Woolrich-Piña & Smith 2012.	Descriptive (geography).	Name derived from the Nahuatl words for "hiding place" and "belonging to a place," in reference to the closest town to the type locality.

Table 1. Continuation.

Suborder Serpentes		
Family Dipsadidae		
Cenaspis aenigma Campbell, Smith & Hall 2018.	Descriptive (uncertain).	Name derived from the Latin for "riddle" or "mystery," in reference to the enigmatic nature of this taxon.
Chersodromus australis Canseco-Márquez, Ramírez-González & Campbell 2018.	Descriptive (geography).	Name derived from the Latin for "southern," in reference to the southernmost distribution of this *Chersodromus* taxon.
Chersodromus nigrum Canseco-Márquez, Ramírez-González & Campbell 2018.	Descriptive (morphology/ biology).	Name derived from the Latin for "black," in reference to the coloration of the dorsal and ventral surface of this taxon.
Coniophanes michoacanensis Flores-Villela & Smith 2009.	Descriptive (geography).	Name derived from the Mexican state where the type locality lies, Michoacán.
Conophis morai Pérez-Higareda, López-Luna & Smith 2002.	Eponymic (patronymic, Mexican).	Named in honor of Roberto Mora.
Geophis juarezi Nieto-Montes de Oca 2003.	Eponymic (patronymic, Mexican).	Named in honor of Don Benito Juárez.
Geophis juliai Pérez-Higareda, Smith & López-Luna 2001.	Eponymic (patronymic, Mexican).	Named in honor of Jordi Juliá Zertuche.
Geophis lorancai Canseco-Márquez, Pavón-Vázquez, López-Luna & Nieto-Montes de Oca 2016.	Eponymic (patronymic, Mexican).	Named in honor of Miguel Ángel de la Torre Loranca.
Geophis occabus Pavón-Vázquez, García-Vázquez, Blancas-Hernández & Nieto-Montes de Oca 2011.	Descriptive (morphology/ biology).	Name derived from the Latin for "collar," in reference to the light nuchal collar in this taxon.
Geophis turbidus Pavón-Vázquez, Canseco-Márquez & Nieto-Montes de Oca 2013.	Descriptive (uncertain).	Name derived from the Latin for "confusion, turmoil," in reference to the past taxonomic confusion associated with this taxon.
Rhadinaea nuchalis García-Vázquez, Pavón-Vázquez, Blancas-Hernández, Blancas-Calva & Centenero-Alcala 2018.	Descriptive (morphology/ biology).	Name derived from the Latin for "nape," in reference to the large nuchal blotches of this taxon.
Rhadinella donaji Campbell 2015.	Eponymic (matronymic, Mexican).	Named in honor of the Princess Donají, of Zapotec legend.

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Table 1. Continuation.

Rhadinella dysmica Campillo, Dávila-Galavíz, Flores-Villela & Campbell 2016.	Descriptive (geography).	Name derived from the Greek for "western," in reference to the westernmost distribution of this *Rhadinella* taxon.
Sibon linearis Pérez-Higareda, López-Luna & Smith 2002.	Descriptive (morphology/ biology).	Name derived from the Latin for "of a line," in reference to the dorsal pattern of this taxon.
Tropidodipsas repleta Smith, Lemos-Espinal, Hartman & Chiszar 2005.	Descriptive (morphology/ biology).	Name derived from the Latin for "well-supplied," in reference to the numerous light rings on the tail and body of this taxon.
Family Colubridae		
Lampropeltis webbi Bryson Jr., Dixon & Lazcano 2005.	Eponymic (patronymic, non-Mexican).	Named in honor of Robert G. Webb.
Salvadora gymnorhachis Hernández-Jiménez, Flores-Villela & Campbell 2019.	Descriptive (morphology/ biology).	Name derived from the Greek for "naked" and "dorsum," in reference to lack of dorsal and incomplete dorsolateral stripes in this taxon.
Tantilla ceboruca Canseco-Márquez, Smith, Ponce-Campos, Flores-Villela & Campbell 2007.	Descriptive (geography).	Name derived from the type locality, Volcán Ceboruco.
Tantilla sertula Wilson & Campbell 2000.	Descriptive (morphology/ biology).	Name derived from the Latin for a "small garland or wreath," in reference to the distinctive dorsal head pattern in this taxon.
Family Natricidae		
Thamnophis bogerti Rossman & Burbrink 2005.	Eponymic (patronymic, non-Mexican).	Named in honor of Charles M. Bogert.
Thamnophis conanti Rossman & Burbrink 2005.	Eponymic (patronymic, non-Mexican).	Named in honor of Roger Conant.
Thamnophis lineri Rossman & Burbrink 2005.	Eponymic (patronymic, non-Mexican).	Named in honor of Ernest A. Liner.
Thamnophis rossmani Conant 2000.	Eponymic (patronymic, non-Mexican).	Named in honor of Douglas Athon Rossman.
Family Elapidae		
Micrurus pachecogili Campbell 2000.	Eponymic (patronymic, Mexican).	Named in honor of Emiglio Pacheco Gil.
Family Leptotyphlopidae	Eponymic (patronymic, non-Mexican).	Named in honor of Alan Resetar.
Epictia resetari Wallach 2016.		

Table 1. Continuation.

Epictia schneideri Wallach 2016.	Eponymic (patronymic, non-Mexican).	Named in honor of Greg Schneider.
Epictia vindumi Wallach 2016.	Eponymic (patronymic, non-Mexican).	Named in honor of Jens Vindum.
Epictia wynni Wallach 2016.	Eponymic (patronymic, non-Mexican).	Named in honor of Addison H. Wynn.
Family Viperidae		
Crotalus campbelli Bryson Jr., Linkem, Dorcas, Lathrop, Jones, Alvarado-Díaz, Grünwald & Murphy 2014.	Eponymic (patronymic, non-Mexican).	Named in honor of Jonathan A. Campbell.
Crotalus ehecatl Carbajal-Márquez, Cedeño-Vázquez, Martínez-Arce, Neri-Castro & Machkour-M'Rabet 2020.	General (other).	Name derived from the Nahuatl word for "the wind" or "Lord of the wind".
Crotalus ericsmithi Campbell & Flores-Villela 2008.	Eponymic (patronymic, non-Mexican).	Named in honor of Eric N. Smith.
Crotalus mictlantecuhtli Carbajal-Márquez, Cedeño-Vázquez, Martínez-Arce, Neri-Castro & Machkour-M'Rabet 2020.	General (other).	Name derived from the Nahuatl word for "Lord of Mictlán" or "Lord of the place of the dead".
Crotalus polisi Meik, Schaack, Flores-Villela & Streicher 2018.	Eponymic (patronymic, non-Mexican).	Named in honor of Gary A. Polis.
Crotalus tancitarensis Alvarado-Díaz & Campbell 2004.	Descriptive (geography).	Name derived from the type locality, Cerro Tancítaro.
Crotalus thalassoporus Meik, Schaack, Flores-Villela & Streicher 2018.	Descriptive (uncertain).	Name derived from the Greek for "seafarer," in reference to inter-island introgression likely resulting from oversea dispersal.
Crotalus tlaloci Bryson Jr., Linkem, Dorcas, Lathrop, Jones, Alvarado-Díaz, Grünwald & Murphy 2014.	Eponymic (patronymic, Mexican).	Named in honor of Tláloc, the Aztec god of rain.
Ophryacus smaragdinus Grünwald, Jones, Franz-Chávez & Ahumada-Carrillo 2015.	Descriptive (morphology/ biology).	Name derived from the Latin for "emerald-green," in reference to the color exhibited by most individuals of this taxon.

Table 1. Continuation.

Order Testudines **Suborder Cryptodira** **Family Testudinidae**		
Gopherus evgoodei Edwards, Karl, Vaughn, Rosen, Meléndez Torres & Murphy 2011.	Eponymic (patronymic, non-Mexican).	Named in honor of Eric V. Goode.
Gopherus morafkai Murphy, Berry, Edwards, Leviton, Lathrop & Riedle 2011.	Eponymic (patronymic, non-Mexican).	Named in honor of David J. Morafka.
Family Kinosternidae		
Kinosternon cora Loc-Barragán, Reyes-Velasco, Woolrich-Piña, Grünwald, Venegas de Anaya, Rangel-Mendoza & López-Luna 2020.	General (other).	Named in honor of the Cora ethnic group, the most widespread indigenous demographic in Nayarit.
Kinosternon vogti López-Luna, Cupul-Magaña, Escobedo-Galván, González-Hernández, Centenero-Alcala, Rangel-Mendoza, Ramírez-Ramírez & Cazares-Hernández 2018.	Eponymic (patronymic, non-Mexican).	Named in honor of Richard Carl Vogt.

in her work that echo the bright colors of these grasshoppers (Woller *et alii*, 2014).

This idea of enhancing the value of names represents, to some extent, a logical extension of the now nearly universal recognition of the need for taxonomy to reflect phylogeny and thus the evolutionary history of organisms (Hennig, 1965; de Queiroz and Gauthier, 1992; Nixon and Ochoterena, 2001). We recognize that these strategies can often be inapplicable or undesirable. For instance, it is difficult or impossible to form relevant descriptive names for morphologically cryptic or widely distributed species, because they lack obvious physical or geographic idiosyncrasies relative to closely related taxa (*e.g.*, see Lara-Tufiño and Nieto-Montes de Oca, 2021). However, where possible, we believe that prioritizing these two ideas for species naming strategies will help make taxonomy a more welcoming scientific discipline, while promoting the formation of names for animals that are rich in meaning. In a world where science and taxonomy are increasingly relevant to human societies, such practices could yield enormous long-term benefits.

ACKNOWLEDGMENTS

We are grateful to Jann Vendetti who provided access to literature and advice to clarify some of the concepts included here. Also to an anonymous reviewer for their comments and to Víctor Hugo Reynoso for his valuable observations and suggestions that substantially improved a previous version of this manuscript. AGC thanks the Natural History Museum of Los Angeles County for financial support during the preparation of this manuscript.

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