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1 **The use of eponyms can also promote gender equity in modern taxonomy**

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22 **Abstract**

23 There is an ongoing debate about how species are named, with several calls to revise naming
24 conventions. The science of describing species, taxonomy, has remained largely unchanged since
25 Linnaeus introduced the binomial system centuries ago. However, naming of species is largely
26 influenced by the societal context in which scientists operate. Working on the mega-diverse
27 group of spiders (more than 52,000 described living species), we show that dedicating species to
28 non-scientists has actually promoted gender equity in recent decades, coinciding with an
29 acceleration in species descriptions. In contrast, eponyms in vertebrates (with most species
30 described long ago) have predominantly been assigned to males by males, with a few notable
31 exceptions. Consequently, conclusions drawn from a given taxon cannot be automatically
32 extended to recently described species. We thus advocate for moderation in species naming, for
33 example, through editorial and peer-review processes, rather than restricting naming practices.

34

35 **Main text**

36 There is an ongoing debate about how species are named, with several calls to revise naming
37 conventions (e.g., Harris & Xavier 2023; Guedes et al., 2023). The science of describing species,
38 taxonomy, has remained largely unchanged since Linnaeus introduced the binomial system
39 centuries ago. However, naming of species is largely influenced by the societal context in which
40 scientists operate (Ceríaco et al. 2016, Mammola et al. 2023, Toussaint et al. 2024). In a hotly
41 debated recent paper, Guedes et al. (2023) specifically argued that eponyms (that is, dedications
42 to people) are predominantly assigned to “[...] *almost universally white, male upper-class*
43 *Europeans*” and advocated for discontinuing their use.

44 Working on the mega-diverse group of spiders (currently with more than 52,000
45 described living species; WSC 2025), we show that eponyms alone only partially follow this
46 trend. Instead, dedicating species to non-scientists has actually promoted gender equity in recent
47 decades, coinciding with an acceleration in species descriptions. In contrast, eponyms in
48 vertebrates have predominantly been assigned to males by males, with a few notable exceptions
49 (Garbino 2023). However, most vertebrate species were described long ago. Consequently, we
50 show that Guedes and colleagues' conclusions about vertebrates cannot be automatically
51 extended to recently described species. Thus, restricting naming practices based on what has

52 happened for vertebrates, rather than on recent and relevant data, may not be a universal solution.
53 Instead, we advocate for moderation in species naming, for example, through editorial and peer-
54 review processes (Orr et al. 2023).

55 We used a dataset of 48,464 classified spider etymologies (i.e., all valid
56 species/subspecies of spiders as of 2020) and 793 distinct first authors of species descriptions
57 (Mammola et al., 2023). We selected all eponyms dedicated to real people for which we could
58 clearly assign a gender (used here as a synonym of sex; 19% of all etymologies, $N = 9832$) (see
59 Hayashi et al. 2024). Most first authors of species description in spider taxonomy are from
60 Europe, followed by Asia and the Americas (Figure 1A). Seventy-nine percent of authors are
61 male, and this percentage is largely constant across biogeographic regions (Figure 1A). Species
62 descriptions by female first authors only appeared in recent decades (Figure 1B).

63 We ran two binomial generalized linear models to test whether the proportion of
64 etymologies dedicated by each first author to scientists or non-scientists was affected by the first
65 author's gender, year of first species description, total years of activity, and continent of origin.
66 The model for dedication to scientists revealed significant effects for gender ($F_{(1,776)} = 7.48$, $p =$
67 0.006), minimum year ($F_{(1,776)} = 49.14$, $p < 0.001$), and year range ($F_{(1,776)} = 192.89$, $p < 0.001$).
68 Specifically, the proportion of dedications to scientists was higher for male than for female
69 authors, increased with increasing year of first species description (i.e., more recent authors use
70 this dedication more often), and decreased with years of activity (the more species described by
71 an author, the more they tended to use other types of etymologies; Figure 2A). Conversely, the
72 effect of continent was not statistically significant ($F_{(5,776)} = 0.15$, $p = 0.981$). We obtained similar
73 results for the model about dedications to non-scientists [gender ($F_{(1,776)} = 7.48$, $p = 0.006$),
74 minimum year ($F_{(1,776)} = 49.14$, $p < 0.001$), year range ($F_{(1,776)} = 192.89$, $p < 0.001$), and
75 continent ($F_{(5,776)} = 0.15$, $p = 0.981$) (Figure 2B)].

76 Next, we randomly sampled 1,000 eponyms (500 dedicated to scientist and 500 to non-
77 scientist) and classified the gender to each eponym. Note that the final sample size was 290 for
78 dedications to scientists and 263 for dedications to non-scientists, as it was not possible to
79 determine the gender for several eponyms, especially older ones. Using this dataset, we
80 generated null models to test whether the observed ratios of male-to-female dedications for
81 scientists and non-scientists are significantly higher than what would be expected if eponyms

82 were assigned by chance. Both the ratio for scientists (Figure 2C) and non-scientists (Figure 2D)
83 were significantly higher than expected by chance, but the strength of this effect, as measured by
84 standard effect size, is over three times greater for dedications to scientists. Specifically, the
85 male-to-female ratio for non-scientists is 1.68, while for scientists, it is 5.74.

86 We found that female scientists are more likely to name new species after non-scientists
87 and the ratio of male to female bias for species' names was much lower within the non-scientist
88 pool. Given the historic bias of male scientists in biology, it is possible that contemporary female
89 scientists have found a different population pool, non-scientists, for the naming of new species
90 Some species named after female scientists include, for example, Hildegard Zapfe (1929-2020),
91 a Chilean arachnologist who studied araneid systematics; Sylvia Marlene Lucas, a Brazilian
92 arachnologist, specialist in tarantulas (Theraphosidae); Barbara Anne York Main (1929-2019), an
93 Australian arachnologist and writer, who was the first woman to receive the Royal Society of
94 Western Australia Medal in 2018; the famous mathematician Maryam Mirzakhani (1977-2017)
95 from Iran or Wanda Wesolowska (1950-), renowned for her prolific work on jumping spiders and
96 for naming more than 500 species. A large number of species were also named after female
97 specimen collectors. Among non-scientists, although most eponyms honor the author's relatives,
98 some pay tribute to famous writers, artists, and athletes, such as Mexican artist Frida Kahlo,
99 British writer Agatha Christie, Filipino violinist Carmencita Lozada, and Colombian athlete
100 Caterine Ibarguen Mena. Historical female figures with notable political influence were also
101 recognized, including Dido, the founder and first queen of the ancient city-state of Carthage.
102 Some eponyms directly reference women who fought for equality and human rights, such as
103 Dandara dos Palmares, an Afro-Brazilian former slave who died fighting against Portuguese
104 colonialism in Brazil. Several spiders are also named from female celebrities, like *Aptostichus*
105 *angelinajolieae* Bond, 2008 or the genera *Marilynia* Lehtinen, 1967 (from Marilyn Monroe) and
106 *Brigittea* Lehtinen, 1967 (tribute to Brigitte Bardot).

107 In conclusion, eponyms, when used thoughtfully and responsibly (i.e. except for a
108 minority of easily identifiable abuses: Chala et al. 2024, which can potentially addressed before
109 publication), eponyms can serve as a powerful tool for inclusivity in the naming of species. This
110 is particularly true for taxa in which most species remain to be named—a common situation
111 among spiders and most invertebrates, but not vertebrates (see Agnarsson et al. 2013 and Moura
112 & Jetz 2011, respectively). At the same time, retaining eponyms is crucial for maintaining

113 taxonomic stability (Vink et al. 2012, Ceriaco et al. 2023), and their use can have additional
114 positive impacts, such as promoting animal conservation, especially in species-rich invertebrate
115 taxa (Blake et al. 2024). This issue extends beyond taxonomy; discussions about naming
116 practices intersect with broader societal debates, including political and cultural discourse on the
117 term 'gender' in the era of Trump politics (Krieger & Gruskin, 2025). This scenario highlights the
118 evolving context in which taxonomic decisions are made. As the scientific community continues
119 to explore the ethical dimensions of naming practices, eponyms stand as a bridge between
120 tradition and progress—celebrating the past while shaping a more equitable and inclusive future
121 for taxonomy.

122

123 **Data availability**

124 The main database used for the analysis is available on Figshare
125 (<https://doi.org/10.6084/m9.figshare.19126658.v1>) and is fully described in Mammola et al.
126 (2023). Derivative databases and the code to reproduce the analysis are available on GitHub
127 (https://github.com/StefanoMammola/Spider_etymologies_sequel_analysis) [link will be made
128 public upon acceptance].

129

130 **Author contribution**

131 JP, CN, AB, YM, CR, and XX classified genders of authors and eponyms. SM ran the analyses
132 and generated figures. JP and SM conceived the study and wrote the first draft with the
133 contribution of DF.

134

135 **Conflict of interest**

136 The authors declare no competing interests.

137

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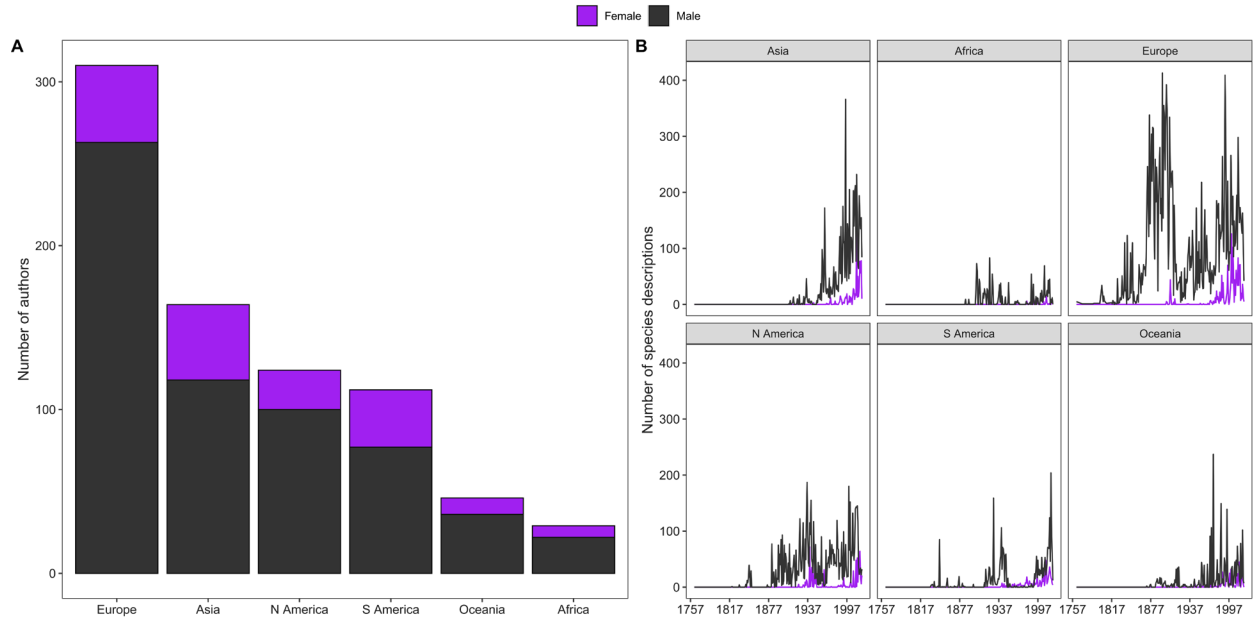
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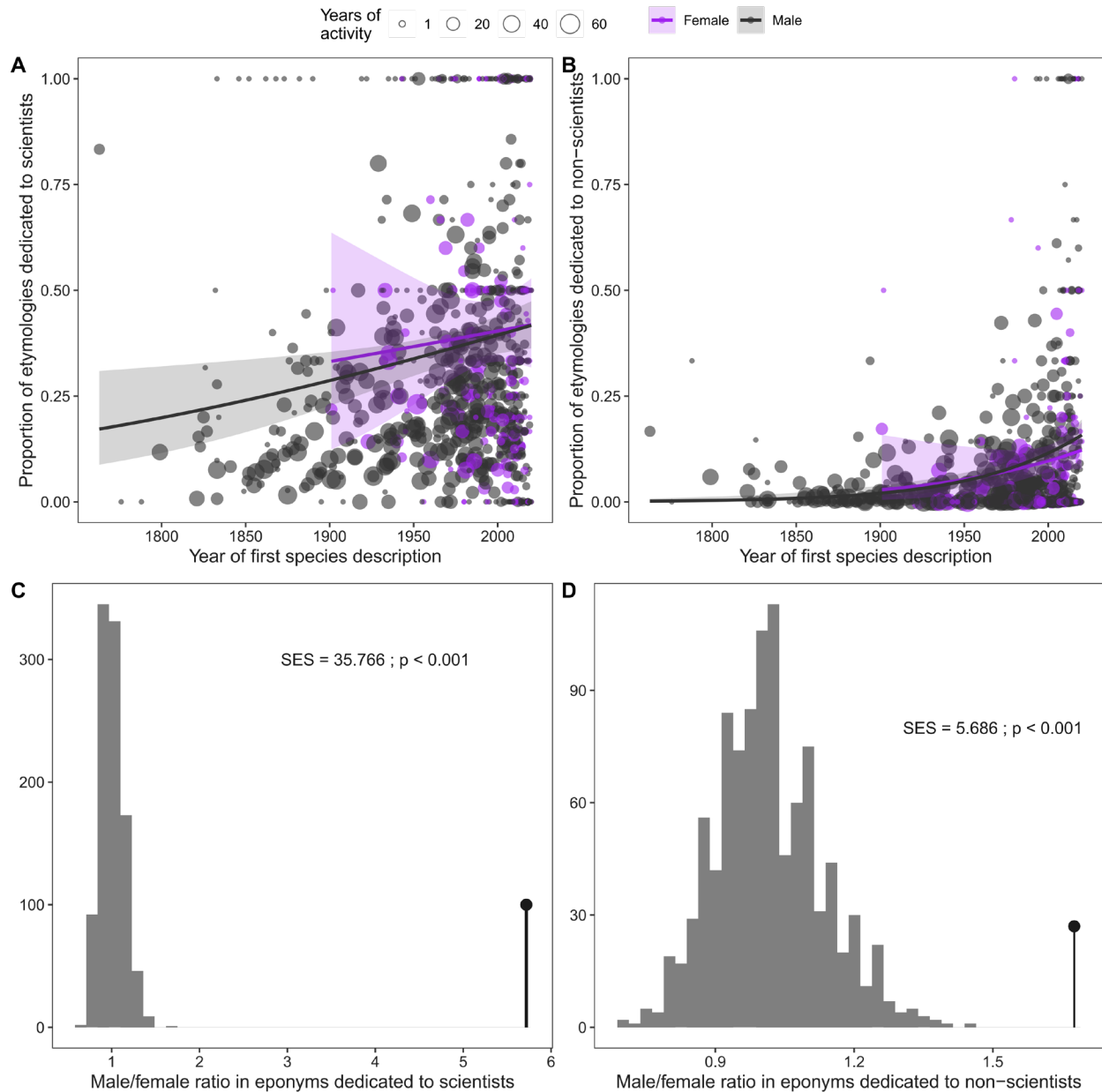
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176

177 **Figure 1. Geographic and temporal trends in spider species descriptions by gender.** A) The
 178 majority of first authors of spider species descriptions are male and originate from Europe, Asia,
 179 and the Americas. The proportion of female first authors remains relatively constant across
 180 continents, at around 20%. B) Temporal distribution of spider species descriptions by male and
 181 female first authors, stratified by continent.



182

183 **Figure 2. Trends in eponym dedications based on author characteristics and gender.** Panels
 184 A and B show the relationship between the proportion of dedications to scientists (A) and non-
 185 scientists (B) and two factors: the year of the first species description (indicating that more
 186 contemporary authors use this type of dedication more frequently) and the number of years of
 187 activity (showing that the longer an author's career, the lower the proportion of dedications).
 188 Male authors generally exhibited a higher proportion of dedications. The model fit (line) and
 189 confidence intervals (shaded area) are derived from three generalized linear models. Each dot

190 represents an author, with dot size proportional to their years of activity. Panels C and D present
191 the results of null models testing whether the observed ratios of male-to-female dedications to
192 scientists (C) and non-scientists (D) are significantly higher than expected by chance. Both ratios
193 were significantly higher than random, but the effect size (measured by standard effect size
194 [SES]) was over three times stronger for dedications to scientists compared to non-scientists.