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Gender representation in molluscan eponyms: disparities and legacy

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Abstract: Scientific names that refer to people are called eponyms and are chosen by species authors as honorific, meaningful, or symbolic. Herein, female and male personal eponyms were analyzed from a dataset of 4,915 molluscan species within eight regions worldwide. Eponyms were 12.5% of all species names, within which 10.6% (n = 65) were female and 89.4% (n = 550) were male. Among gastropods, female eponyms accounted for 3.4–18.9% of eponymous species names; male eponyms were 81.1–96.6%. Among bivalves, species names within five of eight regions included no female eponyms. Cephalopod and chiton species included 22 male eponyms and no female eponyms. Scientists and naturalists were honored as the source of 29.2% of female eponyms and 64.6% of male eponyms. First names were the source of 63.1% of female eponyms and 4.6% of male eponyms. Last names were the source of 93.8% of male eponyms and 35.4% of female eponyms. The most eponyms for a woman (n = 4) honor 20th century American malacologist, A. Myra Keen; the most eponyms for a man (n = 6) honor two 19th century English naturalists, Thomas Nuttall and Robert Swinhoe. Gender asymmetry in molluscan eponyms likely reflects barriers to women's participation in malacology, taxonomy, and systematics until the late 20th century. Recognition of this inequity should inform discussions about female representation in scientific names and provide context for understanding the history of eponyms and the people they honor.

Key words: women, Mollusca, nomenclature, taxonomy, inequity

Eponyms are scientific species names that refer to a person or persons. They may honor someone influential within a research community, a specimen collector, the species author's family member, friend, spouse, or a historical figure, fictional character, celebrity, or other individual(s), real or imagined (ICZN 1999, Mammola *et al.* 2022). Although genus names may be altered or replaced in taxonomic revisions, species names, unless synonymized, endure unchanged in perpetuity. Malacologists and others who learn and use eponymous scientific names are often unaware of their source. However and importantly, knowing the identity of an eponym can reveal some of that name's history, the societal and cultural norms at the time of naming, and the influences, affections, and proclivities of species authors. It can also reveal various forms of bias (DuBay *et al.* 2020, Pillon 2021). Because the preponderance of eponyms are genitive nouns that usually indicate the honored person to be female or male, it is possible to isolate these names and determine those referred to. Herein, I undertook this task with the aim of assessing gender within molluscan eponyms among gastropods, bivalves, cephalopods, and chitons from regions around the world.

The rules governing the construction of eponyms and other types of species names are found within the International Code of Zoological Nomenclature (often called 'the Code'), in Articles 11, 31, and 34 (ICZN 1999, Vendetti and Garland 2019). To create an eponym as a Latinized noun in the genitive case, a suffix is added to a person's first, last, or full name that matches the gender of that person. For a girl or woman, -ae is added, so that possible eponyms of 'Daisy Gómez' are *Genus daisyae*, *Genus gomezae*, or *Genus daisygomezae*. For a boy or man, -i is added, such that eponyms of 'James Chang' are *Genus jamesi*, *Genus changi*, or *Genus jameschangi.* Although there is no guidance in the Code for species named after a person of non-binary gender, the suffix -is could be added to their name as described above (Vendetti and Garland 2019). For two or more female names, -arum is added; for two or more male names or any group including at least one male person, -orum is added. Eponyms can also end in adjectival suffixes that match the gender of the genus, such as, -[i]ana (feminine), -[i]anus (masculine), and -[i]anum (neuter), and -ia (feminine), -ius (masculine), and -ium (neuter). Unaltered personal names may also be eponyms if they are used as nouns in apposition, as in *Etheostoma jimmycarter* Layman and Mayden, 2012 (a fish), but these are usually reserved for mythical figures, famous people from history, or fictional characters.

Given the obstacles to women's participation in malacology and other natural history research (Wellenreuther and Otto 2016), especially during the 18th to 20th centuries when many species were named, I hypothesized that there would be fewer female than male eponyms among molluscan taxa. Consistent with this hypothesis is a prediction that eponymous species would largely honor species authors' male colleagues, mentors, collectors, collaborators, or researchers. However, as an alternate hypothesis, I considered that as many or more mollusk species might be named for women than men if those names referred to a species author's wife (often research collaborators), mother, sister, daughter, female friend, or female historical figure, goddess, or fictional woman.

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MATERIALS AND METHODS

The iNaturalist online biodiversity network and database (iNaturalist contributors 2022) was used to identify global geographic and political regions with terrestrial, freshwater, and marine habitats in which there were identified gastropods, bivalves, cephalopods, and chitons (polyplacophorans). Scaphopods and aplacophorans (solenogastres and caudofoveata) were not included in this analysis because they were poorly represented in iNaturalist. Eight global regions within Africa, the Americas, Asia, Europe, and Oceania were chosen, each of which had at least 500 identified species of gastropods, 100 species of bivalves, 10 species of cephalopods, and 5 species of chitons. These regions were, 1) Southern California, comprising California's 10 southernmost counties; 2) a section of the Southern U.S., including Texas, Louisiana, Mississippi, Alabama, Georgia, Florida, South Carolina, and North Carolina, 3) the island of Taiwan, 4) The Republic of India, 5) the Republic of South Africa, 6) Central America, from Guatemala and Belize to Panama, 7) Italy, and 8) New Zealand. Six hundred and fifteen (n = 615) taxa from each region were analyzed for eponyms, which included the most common 500 species of gastropods, 100 species of bivalves, 10 species of cephalopods, and 5 species of chitons.

The size of these species bins represented the most species of each molluscan class found in all regions within iNaturalist when the data were compiled (April 2022). That is, if there were 15 cephalopod species identified within iNaturalist from off the coast of India, 10 from Southern California, and 25 from South Africa, only the 10 most commonly identified species from each region were considered. All observations used in this analysis were also of research grade status, which meant that their species identity had been verified by at least two iNaturalist identifiers (2022). The total dataset included 4,915 species, (and not 4,920 because five species were present in multiple regions). Although regional species lists are comparable subsamples of molluscan biodiversity, they likely over-represent taxa that are macroscopic, conspicuous, abundant, and readily identifiable.

Putative eponyms were recognized by their suffixes as genitive nouns, adjectives, or nouns in apposition and entered into a spreadsheet (Microsoft Excel). Each name was then evaluated as a human personal eponym or not, then as female or male from its published etymology or name description. Etymologies were also used to determine names as derived from a first name (given name) or last name (surname or 'family name'). When there was no etymology, the source of an eponym was established, if possible, using other information such as the species author's family members, friends, research colleagues, collectors, or others mentioned elsewhere in the publication. The online resources MolluscaBase/WoRMS (MolluscaBase eds. 2022) and the Biodiversity Heritage Library (Rinaldo and Norton 2009) were used to locate primary literature and search within species descriptions. To identify eponym origins, the biographical information within '2,400 years of Malacology' (Coan and Kabat 2022) and 'Shellers from the Past and the Present' (Poppe and Poppe 2022) were also used.

For practicality, an abbreviated list of male eponyms equal in number to that of female eponyms (n = 65, see Results), was compiled by arbitrarily choosing eight male gastropod eponyms from species found in Central America, Italy, New Zealand, Southern California, the Southern U.S., India, and South Africa, and nine from Taiwan. Name categories for eponyms were decided based on how the source of each eponym was described by the species author(s). When this information was absent, the relevant role or occupation of the person honored with a species name was considered as the name category. The category of scientist/naturalist was used instead of 'malacologist' or simply 'scientist' because prior to the professionalization of natural history studies in much of the Western world by the early 1900s, most writing, collecting, and documenting of biodiversity was done by avocational naturalists who often made contributions across organismal groups and would not necessarily be considered scientists by modern standards (Benson 1986).

RESULTS

The molluscan faunal lists of all eight localities (615 taxa per locality) included 4,915 species of which 12.5% were eponyms (Table 1, Table 2). Of these eponymous names, 10.6% (n = 65) were female and 89.4% (n = 550) were male (Table 1). Among all species surveyed, female eponyms were 1.3%, and male eponyms were 11.2%. The percentage of female eponyms was greatest for the Southern U.S. (16%, n = 12), followed closely by Southern California (15.1%, n = 15). India had the fewest total eponyms (5.4%, n = 33), the greatest percentage of male eponyms (97%, n=32) and the fewest female eponyms (3.0%, n = 1). New Zealand had the most total eponymous names (21.3%, n = 131) and the most female (n = 16) and male (n = 115) eponyms (Table 1). However, eight of New Zealand's 16 female eponyms had no etymologies, and six were female first names in apposition, *e.g.*, *Phrixgnathus celia* F. W. Hutton, 1883 and *Semicassis sophia* (Brazier, 1872). Of the 65 female eponyms in the full dataset, thirteen (18.5%) had no etymologies or name sources that could be determined (Table 3). By contrast, only two male eponyms (3.1%) were of unknown origin (Table 3).

Among eponymous gastropods, India had the smallest percentage of female names (3.4%, n = 1) and Southern California had the largest (18.9%, n = 14) (Table 2). Among bivalves, Southern California, the Southern U.S., and New Zealand had one, one, and two female eponyms respectively,

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Table 1. Molluscan eponyms among 615 species in each of eight worldwide regions, as percent and total (n). The total number of eponyms within 4,915 molluscan species surveyed was 615: 10.6% female and 89.4% male. Each region's species list was generated in iNaturalist (www.iNaturalist.org). Data broken down by molluscan class are in Table 2.

	% eponyms	Of eponymous species		Of species surveyed	
Region	**(total)**	**% fem.**	**% male**	**% fem.**	**% male**
Southern California	16.1 (99)	15.1 (15)	85.6 (84)	2.4	13.6
Southern U.S.	12.2 (75)	16.0 (12)	84.0 (63)	1.9	10.2
Taiwan	10.7 (66)	6.0 (4)	94.0 (62)	0.6	10.1
India	5.4 (33)	3.0 (1)	97.0 (32)	0.2	5.2
South Africa	10.2 (63)	9.5 (6)	90.5 (57)	1.0	9.2
Central America	12.2 (75)	5.3 (4)	94.7 (71)	0.6	11.5
Italy	11.9 (73)	9.5 (7)	90.0 (66)	1.1	10.9
New Zealand	21.3 (131)	12.2 (16)	87.8 (115)	2.6	18.7
Totals	**12.5 (615)**	**10.6 (65)**	**89.4 (550)**	**1.3**	**11.2**

out of 100 species; the other regions (*i.e.*, Taiwan, India, South Africa, Central America, and Italy) had none. Among cephalopods and chitons (15 per region, n = 120 total), there were 22 male eponyms and no female eponyms. It is a coincidence that the number of species surveyed per region (n = 615) is the same as the number of eponyms identified within the dataset (Table 1, Table 2).

The largest name category for both female and male eponyms was scientist/naturalist, followed by collector (Table 3). Among female eponyms, the categories of daughter, wife, and mother were female by definition. The categories of illustrator and mythical figure need not have been exclusively female but were in this dataset. Sea captain/admiral and diplomat/naturalist were solely male; one species was named for a husband, and no species were named for sons or fathers (Table 3, Supplemental Tables 1, 2).

In some cases, determining an eponym's inclusion in these categories was subjective. For example, *Actinodoris krusensternii* Gray, 1850 (now *Dendrodoris krusensternii*) has no etymology, but within the text the species author, Gray (1850) referred to the Krusenstern Atlas and its creator, Admiral Adam Johann von Krusenstern, a Russian explorer. Therefore, the source of this eponym was considered as von Krusenstern, a 'sea captain/admiral' but could have been 'cartographer' or 'explorer', as von Krusenstern was both. Conversely, the etymology of the dorid nudibranch *Limacia inesae* Toms, Pola, Von der Heyden and Gosliner, 2021 unambiguously described the species name as honoring the daughter of one of the paper's authors (Toms *et al.* 2021). Additionally, the number of species named for a male species author's wife would have been six instead of three if several women for whom species were named (by their malacologist husbands) were not credited herein as scientists, illustrators, or collectors. These include the dorid nudibranch *Felimare porterae* named for Willamette Porter Cockerell (1870–1957), a collector, whose husband was Theodore D. A. Cockerell; the aeolid nudibranch *Anteaeolidiella oliviae* and sacoglossan *Hermaea oliviae* named for Olive Knowles Hornbrook MacFarland (1872–1962), an illustrator, whose husband was Frank M. MacFarland (1869–1951); and the dorid nudibranch *Tyrinna evelinae* named for Eveline du Bois-Reymond Marcus (1901–1990), a mollusk scientist, whose husband was Ernst G. Gotthelf Marcus (1893–1968).

Of the dataset's 65 female eponyms, the most named for any woman (n = 4) honor Stanford University Earth Sciences professor and malacologist, Angeline Myra Keen (1905–1986), known as A. Myra Keen or Myra Keen, who specialized in Californian and Panamic shelled gastropods (Figure 1). Three of these species are from California: the pharid bivalve, *Ensis myrae* Berry, 1954; nudibranch gastropod, *Tritonicula myrakeenae* (Bertsch and Osuna, 1986); and littorinid gastropod, *Littorina keenae* Rosewater, 1978; and one is from the Western Atlantic, the lucinid bivalve, *Callucina keenae* (Chavan, 1971). Dr. Keen was an influential 20th century American malacologist whose legacy within California and beyond continues today (Moore 1987). As one example, the author (J. Vendetti) is Dr. Keen's academic 'granddaughter': her Ph.D. advisor, Dr. Carole Hickman at UC Berkeley, was a Ph.D. student of Dr. Keen's at Stanford University. Other women for whom species were named in this dataset include the malacologists Eveline du Bois-Reymond Marcus (n = 3) and Jessica Hope MacPherson (1919–2018) (n = 1), collector Mary Lathrop Andrews (1837–1908) (n = 2), and marine biologists Isobel Bennett (1909–2008) (n = 1) and Diva Diniz Corrêa (1918–1993) (n = 1).

Within the 550 male eponyms, six species are named for Thomas Nuttall (1786–1859), an English naturalist who collected throughout the U.S. (Coville 1899), and Robert Swinhoe (1836–1877), an English diplomat and naturalist who collected in China and Taiwan (Chang 1991). No other

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Table 2. Molluscan eponyms among 615 species in eight regions, as percent and total (n), female (fem.) and male, broken down by four molluscan classes: gastropods, bivalves, cephalopods, and chitons. Each region's species list was generated in iNaturalist. 'Of species surveyed' refers to the eponyms within all species surveyed of each molluscan class per region, *i.e.*, 500, 100, 10, or 5.

		% eponyms	Of eponymous species		Of species surveyed	
	Region	(total)	% fem.	% male	% fem.	% male
Gastropods (n = 500)	Southern California	14.8 (74)	18.9	81.1	2.8	12.0
	Southern U.S.	13.0 (65)	16.9	83.1	2.2	10.8
	Taiwan	10.6 (53)	7.5	92.5	0.8	9.8
	India	5.8 (29)	3.4	96.6	0.2	5.6
	South Africa	10.4 (52)	11.3	86.8	1.2	9.2
	Central America	13.4 (67)	6.0	94.0	0.8	12.6
	Italy	13.2 (65)	10.8	89.2	1.4	11.6
	New Zealand	21.6 (108)	12.9	87.0	2.8	18.8
Bivalves (n = 100)	Southern California	21.0	4.8	95.2	1.0	20.0
	Southern U.S.	7.0	14.3	85.7	1.0	6.0
	Taiwan	11.0	0.0	100.0	0.0	11.0
	India	2.0	0.0	100.0	0.0	2.0
	South Africa	9.0	0.0	100.0	0.0	9.0
	Central America	5.0	0.0	100.0	0.0	5.0
	Italy	6.0	0.0	100.0	0.0	6.0
	New Zealand	19.0	10.5	89.5	2.0	17.0
Cephalopods (n = 10)	Southern California	10.0	0.0	100.0	0.0	10.0
	Southern U.S.	30.0	0.0	100.0	0.0	30.0
	Taiwan	10.0	0.0	100.0	0.0	10.0
	India	10.0	0.0	100.0	0.0	10.0
	South Africa	10.0	0.0	100.0	0.0	10.0
	Central America	20.0	0.0	100.0	0.0	20.0
	Italy	10.0	0.0	100.0	0.0	10.0
	New Zealand	30.0	0.0	100.0	0.0	30.0
Chitons (n = 5)	Southern California	60.0	0.0	100.0	0.0	60.0
	Southern U.S.	0.0	0.0	0.0	0.0	0.0
	Taiwan	20.0	0.0	100.0	0.0	20.0
	India	20.0	0.0	100.0	0.0	20.0
	South Africa	20.0	0.0	100.0	0.0	20.0
	Central America	20.0	0.0	100.0	0.0	20.0
	Italy	20.0	0.0	100.0	0.0	20.0
	New Zealand	20.0	0.0	100.0	0.0	20.0

individuals have more species named for them in this dataset. The species named for Nuttall are bivalves found in Southern California, which were described by Conrad (1837) from Nuttall's collection. The species named for Swinhoe are land and freshwater gastropods from Taiwan, described by Pfeiffer (1866) and H. Adams (1866). Other men for whom species were named in this dataset include the naturalist Pierre Marie Arthur Morelet (1809–1892), and malacologists William H. Dall, (1845–1927), Henry A. Pilsbry (1862–1957), and Shintarō Hirase (1884–1939).

Of the dataset's 65 female eponyms, 63.1% (n = 41) were derived from first names, *e.g.*, *Atrimitra idae* (Melvill, 1893) [for Ida S. Oldroyd] and *Elysia margaritae* Fez, 1962 [for Margarita Ebanez]. Last names were the source of 35.4% (n = 23) of female eponyms, and 1.5% (n = 1) were composed of a first and last name (Table 3). Among the 65 male eponyms in the abbreviated dataset, 4.6% (n = 3) were derived from the honoree's first name and 93.8% (n = 61) from their last name, *e.g.*, *Glyptostoma newberryanum* (W.G. Binney, 1858) [for John S. Newberry] and *Helicostyla okadai* Kuroda, 1932 [for Yaichiro K. Okada] (Table 3). Counted as both male and female eponyms were four species with the genitive masculine plural suffix -orum; which in this dataset referred to a man and woman, *e.g.*, *Coryphellina marcusorum* (Gosliner and Kuzirian, 1990) for Ernst Marcus and Eveline du Bois-Reymond Marcus.

Notably, Latin suffixes alone were not always sufficient to determine the gender of the person(s) honored by an eponym, and in some cases, what appeared to be personal

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Table 3. Molluscan female and male eponyms in name categories identifying the honorees' role or relationship to the species author, and the source of the species name as first/given name, last name/surname, both, or nickname. Female eponyms (n = 65) were all such species names within the dataset's 4,915 taxa; male eponyms (n = 65) were a subset of the dataset's 550 male eponyms. Data are as percent and total (n). 'Unknown' indicates that the source of the eponym was unable to be determined.

Female eponyms of mollusks (n = 65)		**Male eponyms of mollusks (n = 65)**	
Name category	**% (n)**	**Name category**	**% (n)**
Scientist/Naturalist	29.2 (19)	Scientist/Naturalist	64.6 (42)
Collector	21.5 (14)	Collector	20.0 (13)
Unknown	18.5 (13)	Unknown	3.1 (2)
Daughter	10.8 (7)	Sea Captain/Admiral	4.6 (3)
Mother	4.6 (3)	Diplomat/naturalist	4.6 (3)
Wife	4.6 (3)	Husband	1.5 (1)
Mythical figure	4.6 (3)	Graduate Student	1.5 (1)
Illustrator	3.1 (2)	–	–
Supporter	1.5 (1)	–	–
Colleague	1.5 (1)	–	–
Name source	**% (n)**	**Name source**	**% (n)**
First name	63.1 (41)	First name	4.6 (3)
Last name	35.4 (23)	Last name	93.8 (61)
First and last name	1.5 (1)	Nickname	1.5 (1)

eponyms referred to non-human entities, geographic places, or other Latin nouns. For example, in the sea hare *Aplysia juliana* (Quoy and Gaimard, 1832), the latinized 'juliana' honors Julien François Desjardins, a male French naturalist. In the sacoglossan sea slug *Thuridilla vataae* (Risbec, 1928), Vata is not a woman's name but refers to the Bay of Vata in New Caledonia. Likewise, the trochid gastropod *Maurea waikanae* (Oliver, 1926) is named for the New Zealand town of Waikanae, not Ms. Waikan; and the aporrhaid gastropod *Aporrhais pespelecani* (Linnaeus, 1758) does not honor a Mr. Pespelecan, but instead is Latin for 'pelican foot'.

DISCUSSION

The gender disparities in molluscan eponyms analyzed herein are stark, with nearly 8.5 times more male than female names (Tables 1–3). This result is consistent with the hypothesis that eponymous mollusks largely honor male naturalists, scientists, and other men involved in malacology. Indeed, the number of species named for female scientists or naturalists (29.2%, n = 19) was less than half the number of species named for male scientists or naturalists (64.6%, n = 42), in the abbreviated dataset. Interestingly, female and male specimen collectors were nearly equally honored by eponyms (Table 3), though their life experiences were often very different.

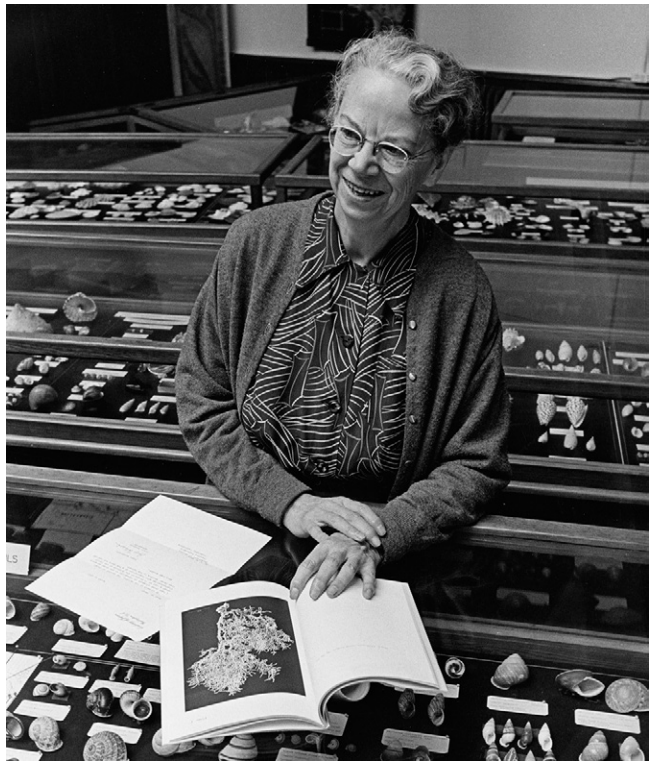


Figure 1. Angeline Myra Keen, malacologist and Stanford University professor, with book gift from the Emperor of Japan, 1967. Stanford News Service records (SC0122: 4783-3), Dept. of Special Collections and University Archives, Stanford University Libraries, Stanford, California. Available at: https://purl.stanford.edu/hg804qr6153.

For example, many collectors in the 18th and 19th centuries were privileged and wealthy European men who traveled to European colonies, extracting and transferring local specimens to natural history museums in London, Paris, and Berlin. These include Thomas Norris (1765–1852), Jean-Jacques Dussumier (1792–1883), and Hans Fruhstorfer (1866–1922). Such a life was not the case for female collectors. Unlike their male counterparts, no woman in this dataset was a wealthy globetrotter free or commissioned to travel and collect internationally. And those women who were prolific collectors domestically, *e.g.*, Mary Lathrop Andrews in the U.S., were often acknowledged in scientific papers by their husband's name if they were married, *i.e.*, 'Mrs. George Andrews' (Binney 1879, Binney 1883, Simpson 1900). The phenomenon of women's name identity being functionally erased after marriage is treated by Bosmajian (1972) and Stannard (1977).

Inequity in gender representation among molluscan eponyms can be explained, in part, by the historical dearth of women studying mollusks at the level of professional researcher, curator, and professor. In the U.S. and elsewhere, women were largely dissuaded or excluded from study and employment in much of science until the passage of legislation

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in the 20th century (Hill 2012, Horrocks 2019). Prior to the professionalization of science in the 19th century, most natural history and scientific societies also prohibited women, as these were intended for curious and well-off 'gentlemen' of European ancestry (Bell and McEwan 1996, Eastman 2006, Lightman 2006), though there are exceptions (Coan1989, Tellez 2017).

Therefore, far fewer women than men influenced taxonomy and systematics as naturalists and 'advanced amateurs' in the 1800–1900s. When women did collections-related work in museums it was usually as artists and illustrators, assistants to curators, and specimen preparators; nearly all were unmarried and many were poorly paid or unpaid (Jackson and Jones 2007, Madsen-Brooks 2013, Byrne 2019). Married women working in natural history museums were often the wives of male curators and took unofficial museum positions as assistants and volunteers or were given titles but no pay (Jackson and Jones 2007). Both married and unmarried women were varyingly credited for their contributions to published research (Rossiter 1993, Pillon 2021).

Much of women's exclusion from scientific spheres was due to sexism that dictated their roles and occupations as subordinate to men, as well as misogynist assertions that women were unfit for intellectual rigor (Darwin 1874, Lowie and Hollingworth 1916, Wellenreuther and Otto 2016). For example, once women were admitted into natural science departments at colleges and universities (often decades after men) in the mid to late 1800s or later, they were often barred from participating in fieldwork that prepared their male classmates for graduate school or post-graduate careers (Ainley 1994, Campbell 2000). Importantly, the pernicious 'marriage bar' of the 19th and 20th centuries systematically excluded many women from senior positions in science because it forced single women to resign their position after marrying. These rules, sometimes written into law, were also used to justify considering married women and widows as ineligible for employment (Sawer 1996, Toogood *et al.* 2020). Although these policies became less prevalent in the 1920–30s, marriage bars were legal in the U.S. until the passage of the Civil Rights Act in 1964 (Foley 2022). Elsewhere, marriage bars in public service were outlawed later, *e.g.*, 1966 in Australia and 1973 in Ireland (Colley 2018, Foley 2022). Indeed, Jessica Hope MacPherson, Curator of Molluscs at the National Museum of Victoria, Australia resigned her position of nearly 20 years after marrying in 1965 (Gillanders and Heupel 2019); see also Helen Lowe-McConnell (Parenti and Stiassny 2016) and Cynthia Longfield (Byrne 2019). A more thorough treatment of barriers to women's participation in taxonomy, natural history, and evolutionary biology, is presented by Maroske and May (2018), Bronstein and Bolnick (2018), and Wellenreuther and Otto (2016). Accounts of women's contributions to malacology, especially when access and opportunities were limited, are found in Coan and Kellogg (1990), Norwood (1997), Morse (2004), Mikkelsen (2010), Allcock *et al.* (2015), Knatz (2016), and Byrne *et al.* (2018).

In several instances herein, even when a species name was intended to honor a female person, errors or intentional changes masculinized it. For example, the etymology of the dorid nudibranch *Cadlina limbaughi* Lance, 1962 states that it honors the late Conrad Limbaugh and his surviving wife Nan Limbaugh, but the proposed name was *C. limbaughi* not *C. limbaughorum* (Lance 1962). Likewise, Willett (1939) named a species of velutinid gastropod for Mrs. Rubie E. Sharon with the name *Lamellaria sharoni* Willett, 1939 not *L. sharonae*, and Binney (1879) honored 'Mrs. Andrews' with the masculine name *Mesodon andrewsi* for a polygyrid land snail. Most egregious is the narrative reported by Coan and Petit (2011) of Gray (1800–1875), whose assimineid gastropod species *Assiminea francesiae* Wood, 1828, was named for Gray's sister Frances but was changed from *francesiae* to *francesii* by Rev. Joseph Goodall (1760–1840) prior to being published (Wood 1828). Gray (1867) remarked that Goodall also inexplicably masculinized *Nerita smithiae* to *Nerita smithii* and *Turbo maugerae* to *Turbo maugeri*, positing that maybe Goodall "did not think it right that a shell should be named after a woman". Notably, in 1892 American malacologist William H. Dall named a vitrinellid gastropod as *Vitrinella williamsoni* and not *V. williamsonae* for malacologist and woman Martha Burton Williamson (1843–1922) because, he argued, the surname 'Williamson' was masculine (Dall in Williamson 1892, Knatz 2016). Dall added that in naming the species *V. williamsoni*, "the *usual* genitive ending is preserved" [emphasis mine] (Dall in Williamson 1892). It is unclear what Dall considered unusual about a feminine Latin genitive suffix.

In contrast to *V. williamsoni* of Dall, female first names as the basis of eponyms were more common than last names (Table 3). Among female eponyms, first names as a source were 1.8 times more common than last names. Female first names among female eponyms were nearly 14 times more common (63.1%, n = 41) than men's first names among male eponyms (4.6%, n = 3) (Table 3). Within male eponyms, those based on last names were 15 times more common than names derived from first names (Table 3). This imbalance is consistent with the results of two analyses of eponyms in non-molluscan groups, wherein, among 183 bird eponyms, female first names were the source of 59% of female eponyms, while male first names were the source of only 1% of male eponyms (DuBay *et al.* 2020). And, among eponyms of New Caledonian flora, 68% of female eponyms were derived from female first names, but only 2% of male eponyms were derived from male first names (Pillon 2021).

Potential explanations for the disparity in use of first versus last names in eponymous mollusks, birds, plants, and likely other taxonomic groups, are many. Maybe species authors preferred to use the first name of a single woman

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because her last name would change upon marrying. As an example, a Southern California malacologist, pioneering diver, specimen collector, and benefactor of the endowed malacology curatorship at the Natural History Museum of Los Angeles County, was born Twila Langdon in 1911 and died as Twila (Langdon) Smoot Bratcher Critchlow in 2006; the additional names due to several marriages (McLean 2007). Conceivably, like Dall, some species authors could have considered masculine surnames like Williamson as requiring a masculine suffix even when honoring a girl or woman, and chose to use a first name instead. Perhaps male species authors opted to use the first name of their wife when naming a species after her instead of using their shared last name (if they shared one). In two examples herein, Ernst Marcus (1893–1968) named the dorid nudibranch *Tyrinna evelinae* (Er. Marcus, 1958) for his wife Eveline, and Frank MacFarland (1869–1951) named the aeolid nudibranch *Anteaeolidiella oliviae* (MacFarland, 1966) after his wife Olive. In the single example in this dataset of a wife naming a mollusk after her husband, Dolores (Saunders) Dundee (1927–1985) named the terrestrial slug *Laevicaulis haroldi* Dundee, 1980 (now *Eleutherocaulis haroldi*) after her husband Harold. Finally, maybe a species author showed deference by using someone's last name as the source of an eponym, and such deference was afforded to men more than women.

Eponyms and other species names can also reveal the abuses and injustices of colonialism and racism. Although the ICZN calls on species authors to construct names that do not cause offense (Recommendation 25c, ICZN 1999), mollusks and other taxonomic groups include problematic names that were derogatory when published or have subsequently become so (Driver and Bond 2021, Pillon 2021, Smith and Figueiredo 2022, Tracy 2022). Within the dataset analyzed herein, one such name is *Unio caffer* Krauss, 1848, a unionoid mussel from South Africa. The species name evokes British colonial influence in South Africa (*e.g.*, British Kaffraria, sometimes spelled Caffraria or Cafferia) and racism by people of European heritage toward indigenous South Africans (*e.g.*, in Flemyng 1853). The name itself, often spelled with a 'k' instead of a 'c', is also a pejorative term for Black South Africans and has been considered hate speech in South Africa since 2015 (Mbowa 2020, Koopman 2021). The species author, Christian Ferdinand F. Krauss (1812–1890), used the same epithet for several South African gastropods in the genera *Ancylus*, *Bulimus*, and *Conus*, none of which have etymologies (Herbert and Warén 1999). Krauss was a curator at the Stuttgart State Museum of Natural History in Germany (Merker and Staniczek 2018) and is considered the 'father of South African malacology' (Herbert and Warén 1999). Further exploration and discussion of the topic of problematic scientific names is beyond the scope of this paper but merits its own treatment (Eichhorn *et al.* 2019, Kean 2019, Koopman 2021).

Currently in the U.S., colleges and universities graduate more women then men with undergraduate and master's degrees in the biological sciences (NCSES 2019). However, among employed Ph.Ds in this field, women trail men (NCSES 2019) and in senior positions such as full professor and museum curator, men outnumber women by even larger margins (Wellenreuther and Otto 2016, NCSES 2019). Reasons for this asymmetry are varied and debated (De Welde and Laursen 2011, Pollack 2013, Shipman 2015, Cabay *et al.* 2018). What is clear, is that the disparity between the number of male and female molluscan eponyms is a consequence and reminder of a culture of exclusion that stymied women's participation in taxonomy and molluscan science until the mid to late 1900s. Recognizing this and other biases within taxonomy and sytematics should inspire important conversations about who participates in science, how and why scientific names are chosen, and the legacy of those names.

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Supplemental Table 1. Female eponyms (n = 65), their derivation, and species author(s) from an iNaturalist-generated dataset of 4,915 molluscan taxa from Southern California, the Southern United States, Taiwan, India, South Africa, Central America, Italy, and New Zealand. Nearly species are gastropods; bivalves are indicated with a[B]. Genus names reflect accepted taxonomy at the time of publishing.

Species name	Eponym Category	Name Derivation	Species author and year described	Person from whom the name is derived	Geographic region
Littorina keenae	scientist/naturalist	last name	Rosewater, 1978	A. Myra Keen	So. California
Felimare porterae	collector	last name	Cockerell, 1901	Wilmatte Porter Cockerell	So. California
Epitonium sawinae	collector	last name	Dall, 1903	Lillie J. Sawin	So. California
Anteaeolidiella oliviae	illustrator	first name	MacFarland, 1966	Olive Knowles Hornbrook	So. California
Atrimitra idae	scientist/naturalist	first name	Melvill, 1893	Ida Shepard Oldroyd	So. California
Tritonicula myrakeenae	scientist/naturalist	first and last	Bertsch and Osuna, 1986	A. Myra Keen	So. California
Hainotis sharonae	collector	last name	Willett, 1939	Rubie E. Sharon	So. California
Doto amyra	mythical figure	first name	Er. Marcus, 1961	Character from Scottish poem	So. California
Doriopsilla rowena	mythical figure	first name	Er. Marcus and Ev.Marcus, 1967	Character in Anglo-Saxon mythology	So. California
Corambe steinbergae	scientist/naturalist	last name	Lance, 1962	Joan E. Steinberg	So. California
Cuthona divae	scientist/naturalist	first name	Er. Marcus, 1961	Diva Diniz Correa	So. California
Hermaea oliviae	illustrator	first name	MacFarland, 1966	Olive Hornbrock MacFarland	So. California
Atalodoris jannae	daughter	first name	Millen, 1987	Janna [daughter of author]	So. California
Ensis myrae[B]	scientist/naturalist	first name	S. S. Berry, 1954	A. Myra Keen	So. California
Cadlina limbaughorum	wife	last name	Lance, 1962	Conrad Limbaugh and Nan Limbaugh	So. California
Chromodoris annae	mother	first name	Bergh, 1877	Unable to be determined	Taiwan
Phyllidiopsis shireenae	scientist/naturalist	first name	Brunckhorst, 1990	Shireen Fahey	Taiwan
Pleurolidia juliae	scientist/naturalist	first name	Burn, 1966	Julie Booth	Taiwan
Hypselodoris katherinae	colleague	first name	Gosliner and Johnson, 2018	Katherine Piatek	Taiwan
Coriocella hibyae	collector	last name	Wellens, 1991	Mrs. I. Hiby	India
Goniobranchus heatherae	daughter	first name	Gosliner, 1994	Heather Erica Gosliner	South Africa
Chromodoris celinae	mother	first name	Tibiriçá *et al.*, 2018	M. Celina Junqueira de Azevedo	South Africa
Phyllodesmium macphersonae	scientist/naturalist	last name	Burn, 1962	J. H. Macpherson	South Africa
Chromodoris annae	mother	first name	Bergh, 1877	Anne Sophie Kirstine Pedersen	South Africa
Halgerda jennyae	collector	first name	Tibiriçá, Pola, and Cervera, 2018	Jenny Strömvoll	South Africa
Afrorhytida burseyae	scientist/naturalist	last name	Herbert and Moussalli, 2010	Mary Bursey	South Africa
Pseudozonaria annettae	wife	first name	Dall, 1909	Annette Dall Whitney	Central America
Tyrinna evelinae	scientist/naturalist	first name	Er. Marcus, 1958	Eveline du Bois-Reymond Marcus	Central America
Favorinus elenalexiae	daughters	first name	García and Troncoso, 2001	Elena and Alexi	Central America
Polybranchia schmekelae	scientist/naturalist	last name	Medrano *et al.*, 2018	Luise Schmekel	Central America
Neverita josephinia	unknown	first name	Risso, 1826	Unable to be determined	Italy
Solatopupa juliana	unknown	first name	Issel, 1866	Unable to be determined	Italy
Trinchesia morrowae	scientist/naturalist	last name	Korshunova *et al.*, 2019	Christine Morrow	Italy
Cochlostoma henricae	unknown	unknown	Strobel, 1851	Unable to be determined	Italy
Acicula szigethyannae	scientist/naturalist	last name	Subai, 1977	Anna Szigethy	Italy
Elysia margaritae	collector	first name	Fez, 1962	Margarita Ebanez	Italy
Limacia inesae	daughter	first name	Toms *et al.*, 2021	Ines Pola	Italy

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Supplemental Table 1. Continued.

Species name	Eponym Category	Name Derivation	Species author and year described	Person from whom the name is derived	Geographic region
Amborhytida dunniae	collector	last name	Gray, 1840	Mrs. Dunn	New Zealand
Glaucilla bennettae	scientist/naturalist	last name	Churchill *et al.*, 2014	Isobel Bennett	New Zealand
Allodiscus mahlfeldae	scientist/naturalist	last name	Marshall and Barker, 2008	Karin Mahlfeld	New Zealand
Galeojanolus ionnae	unknown	first name	M. C. Miller, 1971	Unable to be determined	New Zealand
Schizoglossa worthyae	collector	last name	Powell, 1949	I. Worthy	New Zealand
Phrixgnathus ariel	unknown	first name	Hutton, 1883	Unable to be determined	New Zealand
Laoma mariae	unknown	first name	Gray, 1843	Unable to be determined	New Zealand
Ranfurlya constanceae	daughter	first name	Suter, 1903	Constance H. Stuart Milnes Gaskell	New Zealand
Allodiscus adriana	unknown	first name	Hutton, 1883	Unable to be determined	New Zealand
Gyraulus corinna	unknown	first name	Gray, 1850	Unable to be determined	New Zealand
Semicassis sophia	unknown	first name	Brazier, 1872	Unable to be determined	New Zealand
Phrixgnathus celia	unknown	first name	F. W. Hutton, 1883	Unable to be determined	New Zealand
Allodiscus cassandra	mythical figure	first name	F. W. Hutton, 1883	Character in Greek mythology	New Zealand
Charopa bianca	unknown	first name	F. W. Hutton, 1883	Unable to be determined	New Zealand
Macomona liliana[B]	wife	first name	Iredale, 1915	Lilian Marguerite Medland	New Zealand
Acar sandersonae[B]	collector	last name	Powell, 1933	F. W. Sanderson	New Zealand
Coryphellina marcusorum	scientist/naturalist	first name	Gosliner and Kuzirian, 1990	Ernst Marcus and Eveline du Bois-Reymond Marcus	Southern US
Learchis evelinae	scientist/naturalist	first name	Edmunds and Just, 1983	Eveline du Bois-Reymond Marcus	Southern US
Felimare juliae	daughter	first name	DaCosta *et al.*, 2010	Julia Carvalho Schrödl	Southern US
Spurilla dupontae	collector	last name	Carmona *et al.*, 2014	Anne DuPont	Southern US
Mesomphix andrewsae	collector	last name	Pilsbry, 1895	Mary Lathrop Andrews	Southern US
Mesodon andrewsae	collector	last name	W.G. Binney, 1879	Mary Lathrop Andrews	Southern US
Conus sennottorum	collector	last name	Rehder and Abbott, 1951	John and Gladys Sennott	Southern US
Felimare olgae	supporter	first name	Ortea and Bacallado, 2007	Olga Ucelay Sabina	Southern US
Tritonicula hamnerorum	collector	last name	Gosliner and Ghiselin, 1987	William and Peggy Hamner	Southern US
Elimia annettae	unknown	first name	Goodrich, 1941	Unable to be determined	Southern US
Callucina keenae[B]	scientist/naturalist	last name	Chavan, 1971	A. Myra Keen	Southern US
Felimare ruthae	daughter	first name	Ev. Marcus and Hughes, 1974	Ruth Hughes	Southern US

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Supplemental Table 2. A random sample of male eponyms (n = 65) with their derivation and species author(s) from 550 male eponyms within an iNaturalist-generated dataset of 4,915 molluscan taxa from Southern California, the Southern United States, Taiwan, India, South Africa, Central America, Italy, and New Zealand. All species are gastropods. Genus names reflect accepted taxonomy at the time of publishing.

Species name	Eponym Category	Name Derivation	Species author and year described	Person from whom the name is derived	Geographic region
Norrisia norrisii	collector	last name	Menke, 1850	Thomas Norris	So. California
Tegula eiseni	scientist/naturalist	last name	Jordan, 1936	Gustavus Augustus Eisen	So. California
Kelletia kelletii	sea captain	last name	Forbes, 1852	Vice Admiral Sir Henry Kellett	So. California
Limacia mcdonaldi	scientist/naturalist	last name	Uribe *et al.*, 2017	Gary McDonald	So. California
Bulla gouldiana	scientist/naturalist	last name	Pilsbry, 1895	Augustus Addison Gould	So. California
Roperia poulsoni	collector	last name	P. P. Carpenter, 1864	Charles Augustus Poulson	So. California
Helminthoglytpa traskii	scientist/naturalist	last name	Newcomb, 1861	John Boardman Trask	So. California
Glyptostoma newberryanum	scientist/naturalist	last name	W.G. Binney, 1858	John Strong Newberry	So. California
Nesiohelix swinhoei	diplomat/naturalist	last name	L. Pfeiffer, 1866	Robert Swinhoe	Taiwan
Parmarion martensi	scientist/naturalist	last name	Simroth, 1893	Eduard von Martens	Taiwan
Plectotropis mackensii	unknown	last name	A. Adams and Reeve, 1850	Unable to be determined	Taiwan
Dioryx swinhoei	diplomat/naturalist	last name	H. Adams, 1866	Robert Swinhoe	Taiwan
Meghimatium fruhstorferi	collector	last name	Collinge, 1901	Hans Fruhstorfer	Taiwan
Dolicheulota swinhoei	diplomat/naturalist	last name	L. Pfeiffer, 1866	Robert Swinhoe	Taiwan
Helicostyla okadai	scientist/naturalist	last name	Kuroda, 1932	Yō K. Okada	Taiwan
Mariaella dussumieri	collector	last name	L. Pfeiffer, 1855	Jean-Jacques Dussumier	Taiwan
Satsuma wenshini	scientist/naturalist	first name	Wu and Tsai, 2014	Wen-Shin Lin	Taiwan
Oxychilus draparnaudi	scientist/naturalist	last name	Beck, 1837	Jacques P. Raymond Draparnaud	India
Laevicaulis haroldi	husband	first name	Dundee, 1980	Harold Abraham Dundee	India
Elysia hirasei	scientist/naturalist	last name	Baba, 1955	Shintarō Hirase	India
Mariaella beddomei	scientist/naturalist	last name	Godwin-Auste, 1888	Richard Henry Beddome	India
Smaragdinella sieboldi	scientist/naturalist	last name	A. Adams, 1864	Karl (Carl) Theodor Ernst von Siebold	India
Indothais blanfordi	scientist/naturalist	last name	Melvill, 1893	William Thomas Blanford	India
Aplysia rudmani	scientist/naturalist	last name	Bebbington, 1974	William B. Rudman	India
Dendrodoris krusensternii	sea captain	last name	Gray, 1850	Adam Johann von Krusenstern	India
Urocyclus kirkii	scientist/naturalist	last name	Gray, 1864	John Kirk	South Africa
Oxystele antoni	collector	last name	D. G. Herbert, 2015	Hermann Eduard Anton	South Africa
Scutellastra argenvillei	scientist/naturalist	last name	Krauss, 1848	Antoine-Joseph Dezallier d'Argenville	South Africa
Limacia jellyi	collector	first name	Toms *et al.*, 2021	Francis Ian (Jelly) Gelletic	South Africa
Metachatina kraussi	scientist/naturalist	last name	L. Pfeiffer, 1846	Christian Ferdinand Friedrich Krauss	South Africa
Aplysia juliana	scientist/naturalist	first name	Quoy and Gaimard, 1832	Julien Desjardins	South Africa
Chromodoris hamiltoni	graduate student	last name	Rudman, 1977	Hamish Hamilton	South Africa
Helcion dunkeri	scientist/naturalist	last name	Krauss, 1848	Wilhelm B. R. Hadrian Dunker	South Africa
Chromolaichma dalli	scientist/naturalist	last name	Bergh, 1879	William Healey Dall	Central America
Leidyula moreleti	scientist/naturalist	last name	Crosse and P. Fischer, 1872	Pierre Marie Arthur Morelet	Central America
Halotudora kuesteri	scientist/naturalist	last name	L. Pfeiffer, 1852	Heinrich Carl Küster	Central America

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Supplemental Table 2. Continued.

Species name	Eponym Category	Name Derivation	Species author and year described	Person from whom the name is derived	Geographic region
Felimare agassizii	scientist/naturalist	last name	Bergh, 1894	Alexander E. Rodolphe Agassiz	Central America
Pseudozonaria robertsi	collector	last name	Hidalgo, 1906	Sherwood Raymond Roberts	Central America
Crepidula lessonii	scientist/naturalist	last name	Broderip, 1834	René Primevère Lesson	Central America
Euglandina ghiesbreghti	scientist/naturalist	last name	L. Pfeiffer, 1856	Auguste Boniface Ghiesbreght	Central America
Neocyclotus dysoni	collector	last name	L. Pfeiffer, 1851	David Dyson	Central America
Bursatella leachii	scientist/naturalist	last name	Blainville, 1817	William Elford Leach	Italy
Limax dacampi	scientist/naturalist	last name	Menegazzi, 1855	Benedetto Da Campo	Italy
Thuridilla hopei	collector	last name	Vérany, 1853	M. Hope	Italy
Tandonia sowerbyi	scientist/naturalist	last name	A. Férussac, 1832	James Sowerby	Italy
Limax strobeli	scientist/naturalist	last name	Pini, 1876	Pellegrino Strobel	Italy
Luisella babai	scientist/naturalist	last name	Schmekel, 1972	Kikutaro Baba	Italy
Felimida krohni	scientist/naturalist	last name	Vérany, 1846	August David Krohn	Italy
Berthellina edwardsii	scientist/naturalist	last name	Vayssière, 1897	Henri Milne-Edwards	Italy
Cabestana spengleri	scientist/naturalist	last name	Perry, 1811	Lorentz [Lorenz] Spengler	New Zealand
Paryphanta busbyi	collector	last name	Gray, 1840	James Busby	New Zealand
Dendrodoris krusensternii	sea captain	last name	Gray, 1850	Adam Johann von Krusenstern	New Zealand
Bulla quoyii	scientist/naturalist	last name	J. E. Gray, 1843	Jean-René Constant Quoy	New Zealand
Powelliphanta hochstetteri	scientist/naturalist	last name	L. Pfeiffer, 1861	Christian G. F. Ritter von Hochstetter	New Zealand
Tonna tankervillii	collector	last name	Hanley, 1860	Charles Bennet	New Zealand
Tritia burchardi	unknown	last name	Dunker, 1849	Unable to be determined	New Zealand
Rabdotus mooreanus	scientist/naturalist	last name	Pfeiffer, 1868	Louis [Ludwig] Carl Pfeiffer	New Zealand
Daedalochila dorfeuilliana	scientist/naturalist	last name	Lea, 1838	Joseph Dorfeuille	Southern US
Sinistrofulgur pulleyi	scientist/naturalist	last name	Hollister, 1958	Thomas Pulley	Southern US
Patera roemeri	scientist/naturalist	last name	Pfeiffer, 1848	Carl Ferdinand von Roemer	Southern US
Drymaeus dormani	collector	last name	W. G. Binney, 1857	O. S. Dorman	Southern US
Vermicularia fargoi	collector	last name	Olsson, 1951	William Fargo	Southern US
Lobiger souverbii	scientist/naturalist	last name	P. Fischer, 1857	Saint-Martin Souverbie	Southern US
Vermicularia knorrii	scientist/naturalist	last name	Deshayes, 1843	Georg Wolfgang Knorr	Southern US
Beckianum beckianum	scientist/naturalist	last name	L. Pfeiffer, 1846	Henrik Henriksen Beck	Southern US