

## Order GYMNOTIFORMES

Nakedback Knifefishes and Electric Eels

## Family GYMNOTIDAE

Rafinesque 1815



*Gymnotus interruptus*, holotype, 91 mm TL. Photo by Wilson J. E. M. Costa. From: Rangel-Pereira, F. S. 2012. *Gymnotus interruptus*, a new species of electric fish from the Rio de Contas basin, Bahia, Brazil (Teleostei: Gymnotiformes: Gymnotidae). Vertebrate Zoology 62 (3): 363–370.

Nakedback Knifefishes  
Subfamily GYMNOTINAE  
Rafinesque 1815

**Gymnotus**  
Linnaeus 1758

*gymnós* (Gr. γυμνός), bare or naked; *notus*, from *nótos* (Gr. νότος), back, referring to absence of dorsal fin (a trait common to all knifefishes)

***Gymnotus anguillaris* Hoedeman 1962** Latin for eel-like, referring to the long, “eel-like configuration” of its body compared with *G. carapo*

***Gymnotus arapaima* Albert & Crampton 2001** named for *Arapaima gigas* (Arapaimidae), which it resembles in having an elongate and slightly depressed head

***Gymnotus arapiuns* Kim, Crampton & Albert 2020** named for the rio Arapiuns, a blackwater river and tributary of the rio Tapajós in Pará, Brazil, where this knifefish occurs

***Gymnotus ardilai* Maldonado-Ocampo & Albert 2004** in honor of Carlos A. Ardila Rodríguez (b. 1950), President of the Colombian Ichthyological Association (ACICTIOS), for contributions to the knowledge of Colombian ichthyology

***Gymnotus aripuana* Kim, Crampton & Albert 2020** named for the rio Aripuanã in Mato Grosso, Brazil, where this knifefish occurs

***Gymnotus bahianus* Campos-da-Paz & Costa 1996** -*anus* (L.), belonging to: coastal drainages of Bahia, Brazil, where it is endemic

***Gymnotus capanema* Milhomem, Crampton, Pierczeka, Shetka, Silva & Nagamachi 2012** named for the municipality of Capanema, Pará, Brazil, type locality

***Gymnotus capitimaculatus* Rangel-Pereira 2014** *capitis* (L.), of the head; *maculatus* (L.), spotted (author says blotchy), referring to a pair of blotches on ventral portion of head

***Gymnotus carapo* Linnaeus 1758** local Brazilian name for knifefishes

***Gymnotus carapo australis* Craig, Crampton & Albert 2017** Latin for southern, known from southern humid Neotropics of Uruguay and Argentina, the most southernly subspecies

***Gymnotus carapo caatingaensis* Craig, Crampton & Albert 2017** -*ensis*, Latin suffix denoting place: Caatinga ecoregion of northeastern Brazil, where it occurs

***Gymnotus carapo madeirensis* Craig, Crampton & Albert 2017** -*ensis*, Latin

suffix denoting place: upper Río Madeira basin of Bolivia and Peru, where it occurs

***Gymnotus carapo occidentalis* Craig, Crampton & Albert 2017** Latin for western, known from western Amazon basin of Peru (and elsewhere), the most westernly subspecies

***Gymnotus carapo orientalis* Craig, Crampton & Albert 2017** Latin for eastern, known from eastern Amazon basin of Brazil (and elsewhere, but not the most easternly subspecies, which is *G. c. caatingaensis*)

***Gymnotus carapo septentrionalis* Craig, Crampton & Albert 2017** Latin for northern, known from Orinoco basin (Colombia, Venezuela) and Trinidad, the most northernly subspecies

***Gymnotus cataniapo* Mago-Leccia 1994** named for the Río Cataniapo (Amazonas, Venezuela), where most specimens were collected

***Gymnotus chaviro* Maxime & Albert 2009** common name for *Gymnotus* among the Asheninka indigenous people of Peru, where it occurs

***Gymnotus chimarrao* Cognato, Richer-de-Forges, Albert & Crampton 2008** named for *chimarrão*, traditional *mate* tea (*Ilex paraguariensis*) of Rio Grande do Sul, Brazil (where this knifefish occurs), referring to its olive-green ground coloration, similar to the color of dried tea leaves (see *G. cuia* and *Brachyhypopomus bombilla* [Hypopomidae] for other *mate*-related knifefish names)

***Gymnotus choco* Albert, Crampton & Maldonado-Ocampo 2003** named for the Chocó region of the Pacific slope of Colombia, where it occurs

***Gymnotus coatesi* La Monte 1935** in honor of Christopher W. Coates (1899–1974), Curator (later Director), New York Aquarium, and student of electric fishes, who provided holotype (Coates was also the first to use captive electric eels to power light bulbs, a staple exhibit at public aquaria worldwide)

***Gymnotus coropinae* Hoedeman 1962** of Coropina Creek, Suriname, type locality

***Gymnotus cuia* Craig, Malabarba, Crampton & Albert 2018** named for the *cuia* gourd used to drink traditional *mate* popular through this fish's range, referring to its especially deep body and head (and continuing a tradition of *mate*-related names in gymnotiform taxonomy; see *G. chimarrao* and *Brachyhypopomus bombilla* [Hypopomidae])

***Gymnotus curupira* Crampton, Thorsen & Albert 2005** named for Igarapé Curupira, a forest stream near Tefé, Amazonas, Brazil, type locality (the Curupira is a mythical spirit of the Amazon rain forest)

***Gymnotus cylindricus* La Monte 1935** Latin for cylindrical, referring to

its body shape

***Gymnotus darwini* Campos-da-Paz & de Santana 2019** in honor of English naturalist Charles Darwin (1809–1882), “well known from his extensive and genial contribution to the study of evolution through natural selection,” and because holotype and a number of paratypes were collected at the Refúgio Ecológico Charles Darwin in Igarassu, Pernambuco, Brazil, where Darwin himself visited in August 1836 while aboard the H.M.S. *Beagle*

***Gymnotus diamantinensis* Campos-da-Paz 2002** *-ensis*, Latin suffix denoting place: municipality of Diamantino, Mato Grosso, Brazil, type locality

***Gymnotus esmeraldas* Albert & Crampton 2003** named for the Río Esmeraldas drainage, Ecuador, type locality

***Gymnotus eyra* Craig, Correa-Roldán, Ortega, Crampton & Albert 2018** local (Peru) name for red form of the jaguarundi, *Herpailurus yagouaroundi*, continuing a convention of naming *Gymnotus* species after felids (*onca*, *pantherinus*, *tigre*) due to their shared nocturnal, predatory, banded or spotted attributes

***Gymnotus henni* Albert, Crampton & Maldonado-Ocampo 2003** in honor of Carl Eigenmann’s student (and successor) Arthur Wilbur Henn (1890–1959), a “pioneer” in Neotropical ichthyology, who collected holotype in 1913

***Gymnotus inaequilabiatus* (Valenciennes 1839) *inequalis* (L.)**, unequal, uneven or unlike; *labiatus* (L.), lipped, referring to lower jaw projecting beyond the upper, with thick lips on the former and none on the latter

***Gymnotus interruptus* Rangel-Pereira 2012** Latin for interrupted, referring to pale interbands, anterior to vertical through first ventral lateral line ramus, ventrally and/or dorsally fragmented (=interrupted), allowing for the union of adjacent dark bands

***Gymnotus javari* Albert, Crampton & Hagedorn 2003** named for the Río Yavari (or Javari), Loreto Department, Peru, type locality

***Gymnotus jonasi* Albert & Crampton 2001** in honor of naturalist Jonas Alves de Oliveira, Mamirauá Sustainable Development Reserve (Amazonas, Brazil), where this knifefish occurs

***Gymnotus maculosus* Albert & Miller 1995** Latin for spotted, referring to numerous small brown spots, varying in size from two to four times eye diameter, distributed over most of its body

***Gymnotus mamiraua* Albert & Crampton 2001** named for the Mamirauá lake system and Mamirauá Sustainable Development Reserve (Amazonas, Brazil), type locality

***Gymnotus melanopleura* Albert & Crampton 2001** *mélanos* (Gr. μέλανος), genitive of *mélas* (μέλας), black; *pleurá* (Gr. πλευρά), side, referring to dark bands along lateral body surface

***Gymnotus obscurus* Crampton, Thorsen & Albert 2005** Latin for dark, referring to its predominantly dark coloration

***Gymnotus omarorum* Richer-de-Forges, Crampton & Albert 2009** *-orum* (L.), commemorative suffix, plural: in honor of Omar Macadar, a neurologist, and Omar Trujillo-Cenoz (b. 1933), a neuroanatomist, both from Uruguay and both described as “pioneers” in the anatomical and physiological study of electrogenesis in *Gymnotus*

***Gymnotus onca* Albert & Crampton 2001** named for the jaguar *Panthera onca*, referring to its characteristic color pattern of broad irregular dark pigment blotches

***Gymnotus panamensis* Albert & Crampton 2003** *-ensis*, Latin suffix denoting place: Panama, where it is endemic to the Cricamola River drainage

***Gymnotus pantanal* Fernandes, Albert, Daniel-Silva, Lopes, Crampton & Almeida-Toledo 2005** named for the Pantanal Matogrossense of Brazil, the hydrological region where type locality (Rio Miranda, Mato Grosso do Sul) is situated

***Gymnotus pantherinus* (Steindachner 1908)** Latin for panther-like, presumably referring to irregularly shaped spots and dots that are sometimes connected in a zigzag and “halfbow-like” manner (translation)

***Gymnotus paraguensis* Albert & Crampton 2003** *-ensis*, Latin suffix denoting place: Paraguay River basin, Brazil and Paraguay, where it is endemic

***Gymnotus pedanopterus* Mago-Leccia 1994** *pedanós* (Gr. πεδανός), low-growing or short; *pterus*, from *ptéron* (Gr. πτερόν) or *ptéryx* (πτέρυξ), fin, referring to the shortness of its anal-fin rays (although these rays are not mentioned in the description)

***Gymnotus refugio* Giora & Malabarba 2016** Portuguese for sanctuary, referring to its abundance only in two conservation areas of Rio Grande do Sul, Brazil: Refúgio da Vida Silvestre Banhado dos Pachecos, and Parque Estadual de Itapeva

***Gymnotus riberalta* Craig, Correa-Roldán, Ortega, Crampton & Albert 2018** named for Riberalta, Beni Department, Bolivia, type locality

***Gymnotus stenoleucus* Mago-Leccia 1994** *sténos* (Gr. στένος), narrow; *leukós* (Gr. λευκός), white, referring to narrow pale bands on anterior third of body

***Gymnotus sylvius* Albert & Fernandes-Matioli 1999** Latin for Silvio, named for Silvio de Almeida Toledo Filho, a “pioneer” in the electrobiology of *Gymnotus* from southeastern Brazil; also alludes to *sylva* (L.), wood or forest, referring to the Atlantic rainforest where this species dwells

***Gymnotus tigre* Albert & Crampton 2003** Portuguese for tiger, based in its common name in the local aquarium trade, referring to its tiger-like markings

***Gymnotus tiquie* Maxime, Lima & Albert 2011** named for the rio Tiquié, upper Rio Negro basin, Brazil, where this species is known only from small tributaries

***Gymnotus ucamara* Crampton, Lovejoy & Albert 2003** named for the Ucamarca Depression, a geological term for the low-lying region between the lower reaches of the Ucayali and Marañon rivers of Peru (where it occurs), caused by subsidence in the Upper Amazon foreland basin

***Gymnotus varzea* Crampton, Thorsen & Albert 2005** named for the *várzea* (freshwater swamp forest) floodplains near Tefé, Amazonas, Brazil, where this knifefish occurs

Electric Eels  
Subfamily ELECTROPHORINAE  
Gill 1872

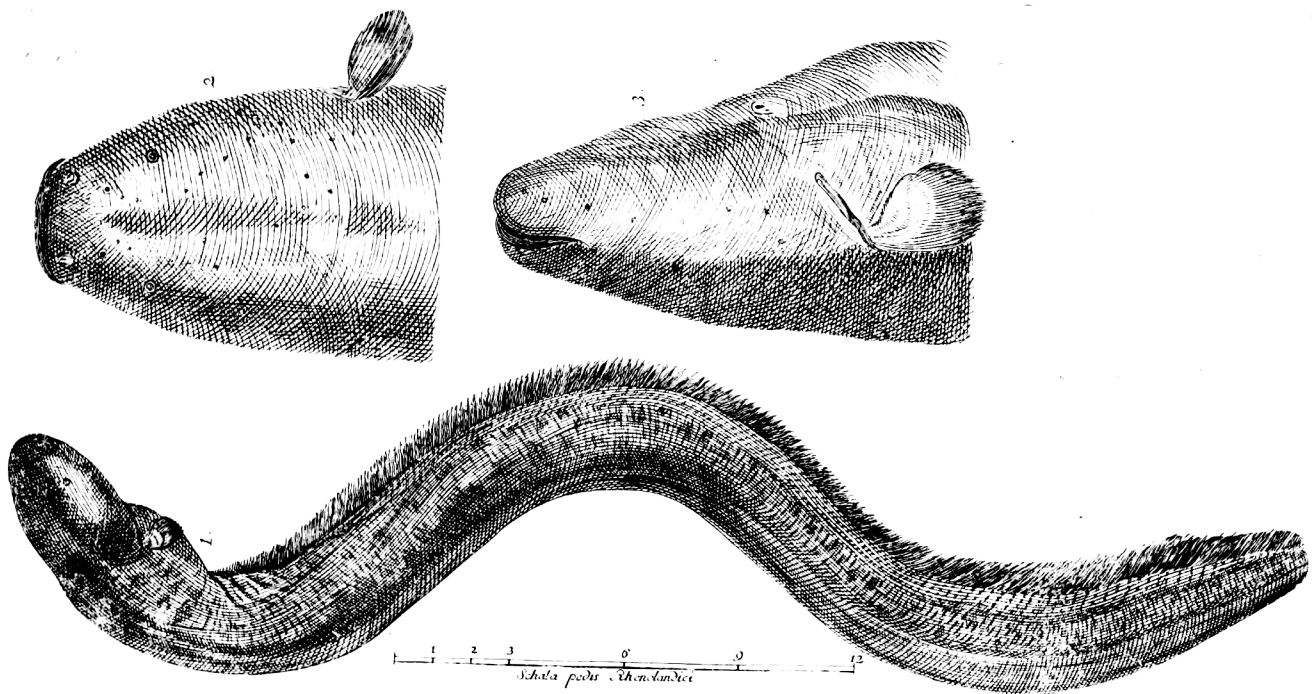
### *Electrophorus* Gill 1864

*electro-*, combining form of *electricus*; *phorus*, from *phoreús* (Gr. φορέυς), bearer or carrier, referring to its ability to generate a powerful electric shock (may also allude to an 18th-century manual capacitive generator of the same name)

***Electrophorus electricus* (Linnaeus 1766)** Neo-Latin for “of amber,” referring to amber’s attractive properties, later applied to objects capable of attracting “light bodies” (e.g., bits of paper) when excited by friction, and then applied even later to the cause (electricity) rather than the property of the attraction, referring to this fish’s ability to generate a powerful electric shock

***Electrophorus multivalvulus* Nakashima 1941** *multi-* (L.), many; *valvulus* (L.), having folding doors, referring to a series of irregular lichen-like skin folds inside the mouth; Nakashima guessed that their function was related to the generation of electricity, but they actually serve as lungs, allowing electric eels to absorb oxygen from atmospheric air [sometimes misspelled as *multivalvulatus*]

***Electrophorus varii* de Santana, Wosiacki, Crampton, Sabaj, Dillman, Mendes-Júnior & Castro e Castro 2019** in honor of Richard P. Vari (1949–2016), National Museum of Natural History, Smithsonian Institution



Probably first-published image of *Electrophorus electricus*. From: Gronow, L. T. 1758. Brief van D. Laurens Theodorus Gronovius aan C. N. over nieuw-ontdekte zeediertjes en byzonderheden van den siddervis of beef-aal (uit het Latyn vertaald). Uitgezogte verhandelingen uit de nieuwste werken van de societeten der wetenschappen in Europa en van andere geleerde mannen 3: 464–478 + foldout plate.

(Washington, D.C., USA), for his contributions to ichthyology [possibly a junior synonym of *E. multivalvulus*]

***Electrophorus voltae* de Santana, Wosiacki, Crampton, Sabaj, Dillman, Castro e Castro, Bastos & Vari 2019** in honor of Alessandro Giuseppe Antonio Anastasio Volta (1745–1827), inventor of electric battery and for whom the “volt” is named (with a discharge of 860 V, this species is the strongest living bioelectricity generator known)

#### UNAVAILABLE NAMES

The following taxa were proposed as subgenera of *Gymnotus* in an electronic-only publication without evidence of ZooBank registration, required per ICZN 8.5.3. The names are therefore unavailable (but may still appear in subsequent publications and websites). Their omission above is not an oversight.

***Lamontianus* Craig, Kim, Tagliacollo & Albert 2019 -anus** (L.), belonging to: Francesca Raymond La Monte (1895–1982), Assistant Curator of Ichthyology, American Museum of Natural History, for her contributions to gymnotiform taxonomy and ichthyology as a whole [*“Lamontiana”* would have been a grammatically preferable spelling]

***Pantherus* Craig, Kim, Tagliacollo & Albert 2019** derived from the name of the jaguar *Panthera onca*, following *G. pantherinus*, the type of this proposed subgenus

***Tigre* Craig, Kim, Tagliacollo & Albert 2019** tautonymous with *G. tigre*, the type of this proposed subgenus

***Tigrinus* Craig, Kim, Tagliacollo & Albert 2019** name derived from the Northern Tiger Cat *Leopardus tigrinus*; “Introducing this name, in combination with the subgenera *Tigre* and *Pantherus*, continues the convention of naming gymnotids for felids, which are often similarly nocturnal, predatory and banded or spotted”

***Tijax* Craig, Kim, Tagliacollo & Albert 2019** Mayan word (and astrological sign) meaning “knife” (as in knifefish); “The Mayan civilization occupied Central America, to which the Gymnotine subgenus is endemic, for almost four thousand years and made numerous cultural and technological advancements, including the only pre-Columbian writing system developed in the Americas”