

Order RAJIFORMES

Softnose Skates or Longtail Skates

Family **ARHYNCHOBATIDAE**

Fowler 1934



Arctoraja sexoculata, holotype, immature male, 346 mm TL. From: Misawa, R., A. M. Orlov, S. Y. Orlova, I. I. Gordeev, H. Ishihara, T. Hamatsu, Y. Ueda, K. Fujiwara, H. Endo and Y. Kai. 2020. *Bathyraja (Arctoraja) sexoculata* sp. nov., a new softnose skate (Rajiformes: Arhynchobatidae) from Simushir Island, Kuril Islands (western North Pacific), with special reference to geographic variations in *Bathyraja (Arctoraja) smirnovi*. Zootaxa 4861 (4): 515–543.

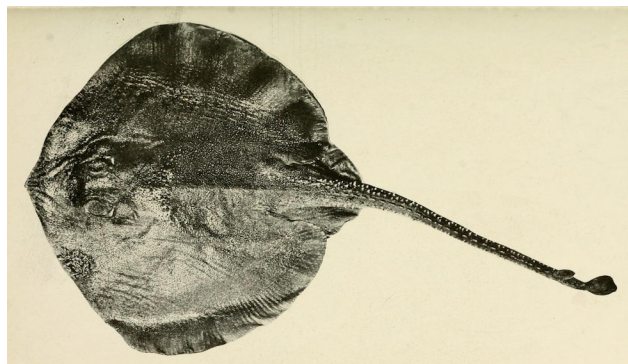
Arctoraja
Ishiyama 1958

arcto-, from *árktos* (Gr. ἄρκτος) north, referring to distribution of *A. smirnovi* and *A. parmifera* in the northern North Pacific and adjacent seas; *raja*, from *raia* (L.), ray or skate [treated as a subgenus of *Bathyraja* by some workers]

Arctoraja parmifera (Bean 1881) *pármē* (Gr. πάρμη), a light shield or buckler; *-fera* (L.), having or bearing, allusion not explained, probably referring to median row of large spines on back and tail

Arctoraja sexoculata (Misawa, Orlov, Orlova, Gordeev & Ishihara 2020) *sex* (L.), six; *oculata* (L.), eyed or having eyes, referring to six white blotches (ocelli) on dorsal disc

Arctoraja simoterus (Ishiyama 1967) *simus* (L.), flat- or pug-nosed; *terus*, possibly from *teres* (L.), rubbed off, rounded or smooth, presumably referring to its snout “broad and remarkably blunt at the tip”



Arhynchobatis asperimus, holotype, female, 640 mm TL. Photo by William J. Sparkes. From: Waite, E. R. 1909. Pisces. Part I. In: Scientific results of the New Zealand government trawling expedition, 1907. Records of the Canterbury Museum 1 (2): 131–155, Pls. 13–23.

Arctoraja smirnovi (Soldatov & Pavlenko 1915) in honor of “Mr. Smirnov,” Inspector of Fishes, who collected fishes from the Sea of Okhotsk

Arhynchobatis
Waite 1909

a- (Gr. ἀ), negative prefix, e.g., without; *rhýnchos* (Gr. ῥύγχος), snout, referring to “absence of a cartilaginous rostral”; *batis* (Gr. βatic), a flat fish, usually applied to a skate or ray

Arhynchobatis asperimus Waite 1909 Latin for very rough, referring to skin on dorsal surface “everywhere covered with closely set spines”

Atlantoraja
Menni 1972

Atlanto-, referring to distribution of *A. castelnaui* and *A. cyclophora* in southwestern Atlantic Ocean; *raja*, from *raia* (L.), ray or skate

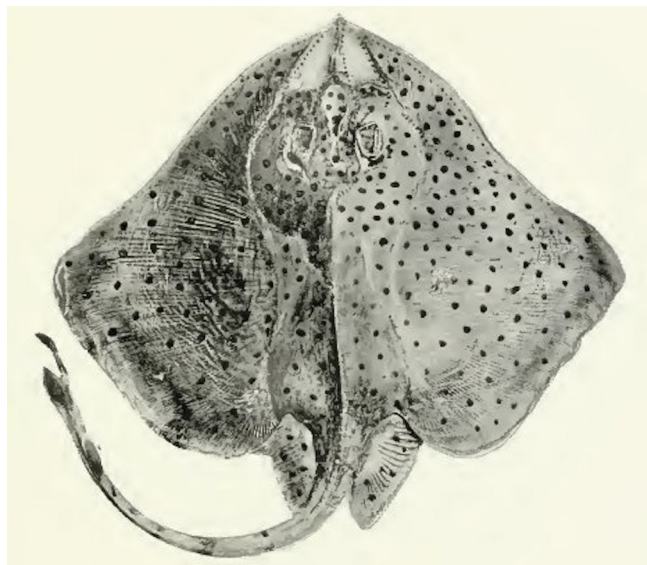
Atlantoraja castelnaui (Miranda Ribeiro 1907) in honor of Francis de Laporte de Castelnau (1810–1880), French naturalist who studied the fishes of Brazil

Atlantoraja cyclophora (Regan 1903) circle-bearing, from *kýklos* (Gr. κύκλος), ring or circle, and *phoreús* (Gr. φορέυς), bearer or carrier, referring to ocellus formed by two concentric black circles on each pectoral fin

Atlantoraja platana (Günther 1880) *-ana* (L.), belonging to: mouth of Río de la Plata (between Uruguay and Argentina), type locality

Bathyraja
Ishiyama 1958

bathýs (Gr. βαθύς), deep, referring to deepwater habitat of *B. trachouros*; *raja*, from *raia* (L.), ray or skate



Atlantoraja castelnaui, paratype, adult male, 360 mm TL. From: Miranda Ribeiro, A. de. 1907. Fauna Brasileira. Peixes. II. Desmobranchios. Arquivos do Museu Nacional de Rio de Janeiro. 14: 132–217, Pls. 1–20.

***Bathyrāja abyssicola* (Gilbert 1896)** *abyssus* (L.), from *ábyssos* (Gr. ἄβυσσος), the deep sea; *-cola* (L.), dweller or inhabitant, referring to deepwater habitat (holotype collected at 2904 m)

***Bathyrāja aguja* (Kendall & Radcliffe 1912)** named for Point Aguja, Peru, type locality

***Bathyrāja albomaculata* (Norman 1937)** *albus* (L.), white; *maculata* (L.), spotted, referring to dorsal surface scattered with small, rounded white spots

***Bathyrāja aleutica* (Gilbert 1896)** *-ica* (L.), belonging to: Aleutians Islands (specifically, Sannak Island), Alaska (USA), type locality

***Bathyrāja andriashevi* Dolganov 1983** in honor of Soviet ichthyologist Anatoly Petrovich Andriashev (1910–2009)¹

***Bathyrāja arctowskii* (Dollo 1904)** in honor of Polish scientist and explorer Henryk Arctowski (1871–1958), oceanographer of the Belgian Antarctic Expedition, during which holotype (an egg case) was collected

***Bathyrāja bergi* Dolganov 1983** in honor of the “great” ichthyologist Lev (also Leo) Semyonovich Berg (1876–1950), “who first gave a description of this species” (translations)¹

***Bathyrāja brachyurops* (Fowler 1910)** *brachýs* (Gr. βραχύς) short; *ourá* (Gr. οὐρά), tail; *óps* (Gr. ὤψ), eye or face (i.e., appearance), replacement name for *Raja brachyura* Günther 1880 (preoccupied by *Raja brachyura* Lafont 1873 in Rajidae), originally referring to its “remarkably short and stout” tail

***Bathyrāja chapmani* Ebert, Alfaro-Shigueto, Velez-Zuazo, Pajuelo & Mabgel 2022** in honor of Demian Chapman, Senior Scientist & Director, Center for Shark Research, Mote Marine Laboratory & Aquarium (Sarasota, Florida, USA), for his contributions to shark and ray conservation and research

***Bathyrāja cousseauae* Díaz de Astarloa & Mabragaña 2004** in honor of ichthyologist María Berta Cousseau (Departamento de Ciencias Marinas, Universidad Nacional de Mar del Plata, Argentina), for her contribution to the marine fishes of Argentina

***Bathyrāja diplotaenia* (Ishiyama 1952)** *diplo-*, from *diplóos* (Gr. διπλός), twofold or double; *taenia*, from *tainía* (Gr. ταινία), band or ribbon, referring to how ventral fin is divided into “double ribbons” (i.e., deeply notched between anterior and posterior lobes)

***Bathyrāja eatonii* (Günther 1876)** in honor of English explorer and naturalist Rev. Alfred Edmund Eaton (1845–1929), who collected holotype

***Bathyrāja fedorovi* Dolganov 1983** in honor of the “well-known”

(translation) Soviet ichthyologist Vladimir Vladimirovich Fedorov (1939–2011), who collected holotype¹

***Bathyrāja griseocauda* (Norman 1937)** *griseus* (Medieval Latin), gray; *cauda* (L.), tail, referring to grayish-brown color of entire or lower surface of tail

***Bathyrāja hesperaficana* Stehmann 1995** *-ana* (L.), belonging to: *hesperius* (L.), western, referring to its West African distribution on the Eastern Central Atlantic slope

***Bathyrāja interrupta* (Gill & Townsend 1897)** Latin for broken apart, referring to row of acutely curved, smooth spines along middle of back, extending from interhumeral region to dorsal, but are “interrupted” along posterior half of disc, where spines are “absent or obsolete”

***Bathyrāja irrada* Hureau & Ozouf-Costaz 1980** Latin for unshaven, referring to its rough, wrinkled appearance

***Bathyrāja ishiharai* Stehmann 2005** in honor of Hajime Ishihara (b. 1950), Stehmann’s “skatology” colleague and friend for more than 25 years, who devoted his life’s research to chondrichthyan fishes, producing important revisions of North Pacific *Bathyrāja*

***Bathyrāja isotrachys* (Günther 1877)** *isos* (Gr. ἴσος), equal; *trachýs* (Gr. τραχύς), jagged or rough, presumably referring to body and tail both covered with “minute asperities, each with a stellate base”

***Bathyrāja kincaidii* (Garman 1908)** in honor of Trevor Kincaid (1872–1970), Canadian-America zoologist and oyster farmer, University of Washington (Seattle, USA), “to whom we are indebted for knowledge of [this] species” (he collected holotype)

***Bathyrāja leucomelanos* Iglésias & Lévy-Hartmann 2012** *leuco-*, from *leukós* (Gr. λευκός), white; *mélanos* (Gr. μέλανος), genitive of *mélas* (μέλας), black, referring to colors of its dorsal and ventral surfaces, respectively

***Bathyrāja lindbergi* Ishiyama & Ishihara 1977** in honor of the late Georgii Ustinovich Lindberg (1894–1976), ichthyologist, Zoological Institute, Russian Academy of Sciences, for his “great work” on western North Pacific zoogeography

***Bathyrāja longicauda* (de Buen 1959)** *longus* (L.), long; *cauda* (L.), tail, referring to its long caudal region, 52.9% of total length in holotype

***Bathyrāja maccaini* Springer 1971** in honor of American zoologist John C. McCain (b. 1939, note Latinization of “Mc” to “Mac”), who collected holotype from aboard the *M/V Hero* in 1967²

***Bathyrāja maclouviana* (Norman 1937)** *-ana* (L.), belonging to: Maclou, Latinization of Malo, source for the historical Spanish (Islas Malvinas) and French (Îles Malouines) names for the Falkland Islands, where this ray occurs

***Bathyrāja maculata* Ishiyama & Ishihara 1977** Latin for spotted, referring to white blotches on dorsal surface

***Bathyrāja magellanica* (Philippi 1902)** *-ica* (L.), belonging to: Straits of Magellan, type locality³

¹ Name dates to 1983 but etymology provided in: Dolganov, V. N. 1985. New species of skates of the family Rajidae from the northwestern Pacific Ocean. *Voprosy Ikhtologii* 25 (3): 415–425. English translation in *Journal of Ichthyology* 25 (3):121–132.

² Biographical footnote: McCain later became a senior research scientist at the University of Petroleum and Minerals, Dhahran, Saudi Arabia, where he investigated the effects of oil spills in the Persian Gulf.

³ While Philippi was preparing his description of *Raja* (now *Bathyrāja*) *magellanica*, Steindachner was independently preparing a description of a ray from the same location (Straits of Magellan). Both were named *Raja magellanica*. Since Philippi’s description appeared in 1902 and Steindachner’s in 1903, the latter has been treated as a junior homonym of the former. Unfortunately, the three specimens upon which Philippi based his description are now lost. Since it is impossible to compare Philippi’s specimens with Steindachner’s, it cannot be said with certainty that they are the same species, different species, or if one may be synonymous with yet another. What’s more, Philippi’s text does not seem to be sufficiently detailed for judging the validity of his taxon. Since Steindachner’s *Raja magellanica* is objectively invalid, Koerber & Kast (2023) proposed a replacement name for it, *Raja cyanoplax*: *cyno-*, from *kyanos* (Gr. κύανος), dark blue, and *phlax* (Gr. πλάξ), anything flat and broad (e.g., flat land, the ocean surface), in reference to “Pampa Azul” (Blue Pampa), a public research project launched by Argentina to assert the country’s geopolitical sovereignty claim over maritime territory. Whether *Raja cyanoplax* replaces *Bathyrāja magellanica* (Philippi 1902) or is recognized as a separate species remains to be seen. Eschmeyer’s Catalog of Fishes treats *Raja cyanoplax* as a valid species in the family Rajidae.



Bathyraja panthera, holotype, live male. From: Orr, J. W., D. E. Stevenson, G. R. Hoff, I. Spies and J. D. McEachran. 2011. *Bathyraja panthera*, a new species of skate (Rajidae: Arhynchobatidae) from the western Aleutian Islands, and resurrection of the subgenus *Arctoraja* Ishiyama. NOAA Professional Papers NMFS No. 11: 1–50.

***Bathyraja mariposa* Stevenson, Orr, Hoff & McEachran 2004** Spanish for butterfly, referring to large yellow patches on pectoral fins, which on some specimens approximates the shape of butterfly wings, and on all specimens resemble elaborate shading patterns often seen on butterfly wings

***Bathyraja matsubarae* (Ishiyama 1952)** in honor of ichthyologist Kiyomatsu Matsubara (1907–1968), Imperial Fisheries Institute (Tokyo), who collected one of the paratypes at a fish market, and “to whom the author is much indebted for many favours”

***Bathyraja meridionalis* Stehmann 1987** Latin for southern, described as the southernmost deepwater species of the genus

***Bathyraja microtrachys* (Osburn & Nichols 1916)** *micro-*, from *mikrós* (Gr. μικρός), small; *trachys* (Gr. τραχύς), jagged or rough, “Upper parts everywhere roughened with fine stellate prickles, these smallest and sparsest on the bases of the pectorals, largest and most closely set on the base of the tail and fine and close set between the eyes”

***Bathyraja minispinosa* Ishiyama & Ishihara 1977** *mini-*, from *minutus* (L.), little or small; *spinosa* (L.), thorny, referring to fine prickles on dorsal surface, which are smooth to the touch

***Bathyraja multispinis* (Norman 1937)** *multi-* (L.), many; *spinis*, from *spinus* (L.), thorn, probably referring to median series of 42 spines extending from nuchal region to first dorsal fin

***Bathyraja murrayi* (Günther 1880)** in honor of John Murray (1841–1914), Canadian-born Scottish marine biologist (and later founder of modern oceanography), of the HMS *Challenger*, from which holotype was collected

***Bathyraja notoroensis* Ishiyama & Ishihara 1977** *-ensis*, Latin suffix denoting place: Noto Peninsula, Sea of Japan, type locality

***Bathyraja pacifica* Last, Stewart & Séret 2016** *-ica* (L.), belonging to: western rim of the Pacific Ocean, near where it occurs

***Bathyraja pallida* (Forster 1967)** Latin for pale, referring to “unusually pale” coloration of dorsal surface

***Bathyraja papilionifera* Stehmann 1985** *papilio* (L.), butterfly; *fero* (L.), to have or bear, referring to butterfly-shaped dark blotch around anus

***Bathyraja panthera* Orr, Stevenson, Hoff, Spies & McEachran 2011** Latin for panther or leopard, referring to distinctive dorsal coloration, often characterized by rosettes of black spots surrounding yellow blotches [placed in *Arctoraja* by some workers]

***Bathyraja peruana* McEachran & Miyake 1984** *-ana* (L.), belonging to: referring to Point Aguja, Peru, type locality

***Bathyraja richardsoni* (Garrick 1961)** in honor of Australian-born zoologist Laurence R. Richardson (1911–1988), Victoria University of

Wellington, “for his extensive contribution to deep water research in New Zealand, and especially in Cook Strait” (type locality)

***Bathyraja scaphiops* (Norman 1937)** *scaphi-*, from *scaphium* (L.), cup; *ôps* (Gr. ὤψ), eye or face (i.e., appearance), presumably based on its vernacular name, Cuphead Skate, allusion not evident

***Bathyraja schroederi* (Krefft 1968)** in honor of American ichthyologist William C. Schroeder (1895–1977), Woods Hole Oceanographic Institution (Massachusetts, USA), for his “outstanding” (translation) contribution to the study of western Atlantic elasmobranchs

***Bathyraja shuntovi* Dolganov 1985** in honor of Vyacheslav P. Shuntov (b. 1937), chief scientist of the Pacific Institute of Scientific Fisheries and Oceanography Center (Vladivostok), where Dolganov was working at the time

***Bathyraja smithii* (Müller & Henle 1841)** in honor of Andrew Smith (1797–1872), Scottish military physician, explorer, ethnologist and zoologist, who collected holotype

***Bathyraja spinicauda* (Jensen 1914)** *spina* (L.), thorn; *cauda* (L.), tail, referring to erect and “slightly bent backwards” spines along middle of tail

***Bathyraja spinosissima* (Beebe & Tee-Van 1941)** Latin for very spiny, referring to dorsal and ventral surfaces “covered thickly and evenly with small, recurved spines” and tail “covered everywhere with small spines, even over the surface of the dorsal fins”

***Bathyraja taranetzi* (Dolganov 1983)** in honor of Anatoly Yakovlevich Taranetz (1910–1941), “eminent expert” (translation) on fishes of the far-eastern seas of the U.S.S.R.¹ [placed in *Rhinoraja* by some workers]

***Bathyraja trachouros* (Ishiyama 1958)** *trachys* (Gr. τραχύς), jagged or rough; *ouros*, presumably a variant spelling of *ourá* (Gr. οὐρά), tail, referring to 20 “enlarged thorns” along middle of tail [treated as a noun]

***Bathyraja trachura* (Gilbert 1892)** rough- or jagged-tailed, from *trachys* (Gr. τραχύς), jagged or rough, and *ourá* (Gr. οὐρά), tail, referring to strong spines on middle of tail

***Bathyraja tunae* Stehmann 2005** in honor of María Cristina Oddone Franco, nicknamed “Tuna,” the “most enthusiastic elasmobranch student” Stehmann has ever met; “The author wishes her luck in her further career, and that all her dreams may come true.”

***Bathyraja tzinovskii* Dolganov 1983** in honor of oceanographer Vladimir Diodorovich Tzinovskiy (b. 1946, also spelled Tzinovsky), P. P. Shirshov Institute of Oceanology (Moscow), who collected holotype¹

***Bathyraja violacea* (Suvorov 1935)** Latin for violet-colored, referring to lilac-violet hues and dark violet vermiculations on dorsal surface

Brochiraja

Last & McEachran 2006

brochus (L.), projecting, referring to projecting thorns on anterior snout; *raja*, from *raia* (L.), ray or skate

***Brochiraja aenigma* Last & McEachran 2006** Latin for enigma, referring to its unresolved taxonomic status (generic placement is provisional since post-juvenile holotype lacks bifurcated thorn on mid-distal rostral cartilage, a diagnostic feature of the genus)

***Brochiraja albilabiata* Last & McEachran 2006** *albus* (L.), white; *labia-* (L.), lipped, referring to distinctive, white-edged mouth, strongly contrasted against a very dark, beard-like patch beneath the mouth

***Brochiraja asperula* (Garrick & Paul 1974)** diminutive of *asper* (L.), rough, referring to “meagre development of prickles on the disc”

***Brochiraja heuresa* Last & Séret 2012** from *heuresis* (Gr. εὕρεσις), a finding or discovery, based on the ancient Greek *Heureka* (“I have found it”) or, in modern English, “*Eureka*,” referring to its being discovered among a collection of skates the authors initially thought represented a different species, *B. aenigma*



Brochiraja heuresa, ventral view of head, holotype, adult male, 355 mm TL. From: Last, P. R. and B. Séret. 2012. Two new softnose skates of the genus *Brochiraja* (Rajoidae: Arhynchobatidae) from the deepwater slopes and banks of the Norfolk Ridge (South-West Pacific). *Zootaxa* 3155: 47–64.

***Brochiraja leveneta* Last & McEachran 2006** *levis* (L.), smooth, referring to “mostly smooth” dorsal surface of disc; *veneta* (L.), sea-colored or blue, referring to color of dorsal disc

***Brochiraja microspinifera* Last & McEachran 2006** *micro-*, from *mikrós* (Gr. μικρός), small, being a dwarfed version of its New Zealand sibling species, *B. spinifera*

***Brochiraja spinifera* (Garrick & Paul 1974)** *spina* (L.), thorn; *-fera* (L.), having or bearing, referring to numerous spines on tail

***Brochiraja vittacauda* Last & Séret 2012** *vitta* (L.), ribbon; *cauda* (L.), tail, referring to unusually broad, ribbon-like lateral skin folds that terminate near tip of tail

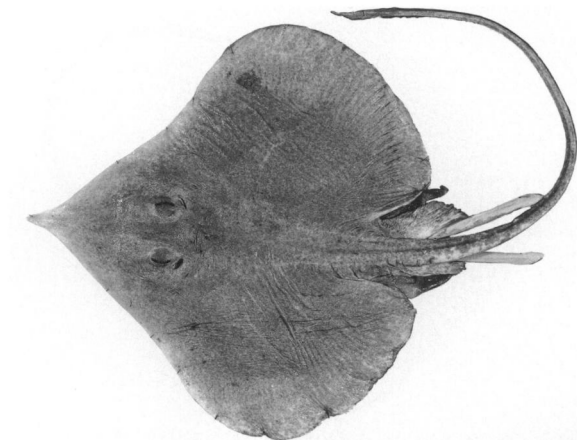
Insentiraja

Yearsley & Last 1992

in- (L. prefix), i.e., not or un-; *sentis* (L.), thorn, referring to absence of thorns on tail and middorsal regions of disc; *raja*, from *raia* (L.), ray or skate

***Insentiraja laxipella* (Yearsley & Last 1992)** *laxus* (L.), loose; *pellis* (L.), skin, referring to flabby integument of ventral surface

***Insentiraja subtilispinosa* (Stehmann 1989)** *subtilis* (L.), very fine; *spinus* (L.), thorny or spinulose, referring to its “extraordinarily fine, velvet-like spinulation” or dermal denticles



Insentiraja laxipella, holotype, mature male, 565 mm TL. From: Yearsley, G. K. and P. R. Last. 1992. *Pavoraja* (*Insentiraja*) *laxipella*, a new subgenus and species of skate (Chondrichthyes: Rajoidae). *Copeia* 1992 (3): 839–850.

Irolita

Whitley 1931

etymology not explained, possibly named for Irolita, a fairy tale princess whose beauty was worthy of the world’s admiration

***Irolita waitii* (McCulloch 1911)** patronym not identified but clearly in



Irolita westraliensis, ventral view showing oronasal region and tooth band, holotype, adult male, 348 mm TL. From: Last, P. R. and D. C. Gledhill. 2008. A new species of round skate, *Irolita westraliensis* sp. nov. (Rajoidae: Arhynchobatidae), from northern Western Australia. CSIRO Marine and Atmospheric Research Paper No. 021: 173–181.

honor of British-Australian zoologist and museum director Edgar R. Waite (1866–1928), whose works on fishes are frequently cited by McCulloch

***Irolita westraliensis* Last & Gledhill 2008** *-ensis*, Latin suffix denoting place: Western Australia, only known area of occurrence

Notoraja

Ishiyama 1958

etymology not explained, perhaps *nótos* (Gr. νότος), south wind (in a broader sense, southern), proposed as a southern subgenus of *Breviraja*, referring to occurrence of *N. tobitukai* in “southernmost regions within the seas inhabited by the northern members” of the genus; *raja*, from *raia* (L.), ray or skate

***Notoraja alisae* Séret & Last 2012** in honor of the of research vessel *Alis* (named for a local wind) of the Institut de Recherche pour le Développement (IRD) in Nouméa, which conducted many exploratory cruises in New Caledonia, and from which holotype was collected



Notoraja hesperindica, adult male, scale bar = 5 cm. From: Weigmann, S., B. Séret and M. F. W. Stehmann. 2021. *Notoraja hesperindica* sp. nov., a new colorful deep-sea softnose skate (Elasmobranchii, Rajiformes, Arhynchobatidae) and first generic record from the western Indian Ocean. *Marine Biodiversity* 51:35: 1–19

***Notoraja azurea* McEachran & Last 2008** Latinization of the French *azure* (blue), referring to striking, metallic-blue dorsal coloration

***Notoraja fijiensis* Séret & Last 2012** *-ensis*, Latin suffix denoting place: Fiji Islands, type locality

***Notoraja hesperindica* Weigmann, Séret & Stehmann 2021** *hesperius* (L.), western; *indicus* (L.), of India, the only member of the genus known from the western Indian Ocean

***Notoraja hirticauda* Last & McEachran 2006** *hirtus* (L.), hairy, rough or bristly; *cauda* (L.), tail, referring to dense covering of fine denticles on both surfaces of tail

***Notoraja inusitata* Séret & Last 2012** Latin for unusual or strange, referring to its “strange” appearance, i.e., head and disc morphology resembling some species of *Sinobatis*, *Bathyraja* and *Insentiraja*

***Notoraja lira* McEachran & Last 2008** Latin for earth or ridge thrown up by a plow, referring to type locality, the Broken Ridge (southeast Indian Ocean), an elevated plateau thrust upward at the juncture of two continental plates

***Notoraja longiventralis* Séret & Last 2012** *longus* (L.), long; *ventralis* (L.), of the belly, referring to very long anterior lobe of pelvic fin

***Notoraja martinezi* Concha, Ebert & Long 2016** in honor of Ecuadorian biologist Jimmy Martínez, World Wildlife Fund, who collected and “kindly provided” holotype

***Notoraja ochroderma* McEachran & Last 1994** *ōchrós* (Gr. ὤχρος), pale or wan; *dérma* (Gr. δέρμα), skin, referring to pale-yellow body color

***Notoraja sapphira* Séret & Last 2009** from *sápheiros* (Gr. σάπφειρος), sapphire, referring to intense blue dorsal coloration, resembling that of a dark sapphire (gemstone)

***Notoraja sereti* White, Last & Mana 2017** in honor of Bernard Séret (b. 1949), the “highly respected” French ichthyologist, “who has contributed greatly to the taxonomy of sharks and rays, and in particular to our knowledge of skates of the genus *Notoraja*”

***Notoraja sticta* McEachran & Last 2008** from *stiktós* (Gr. στικτός), spotted or dappled, referring to strong blotched dorsal coloration

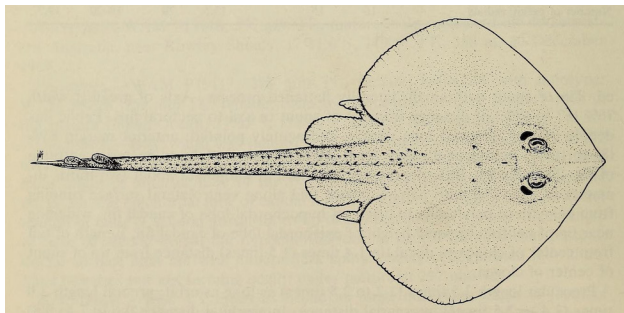
***Notoraja tobitukai* (Hiyama 1940)** in honor of T. Tobituka (no other information available), who directed the trawling fishery survey during which holotype was collected

***Notoraja yurii* Dolganov 2020** in honor of ichthyologist Yuri Nikolayevich Shcherbachev, P. P. Shirshov Institute of Oceanology, Russian Academy of Sciences

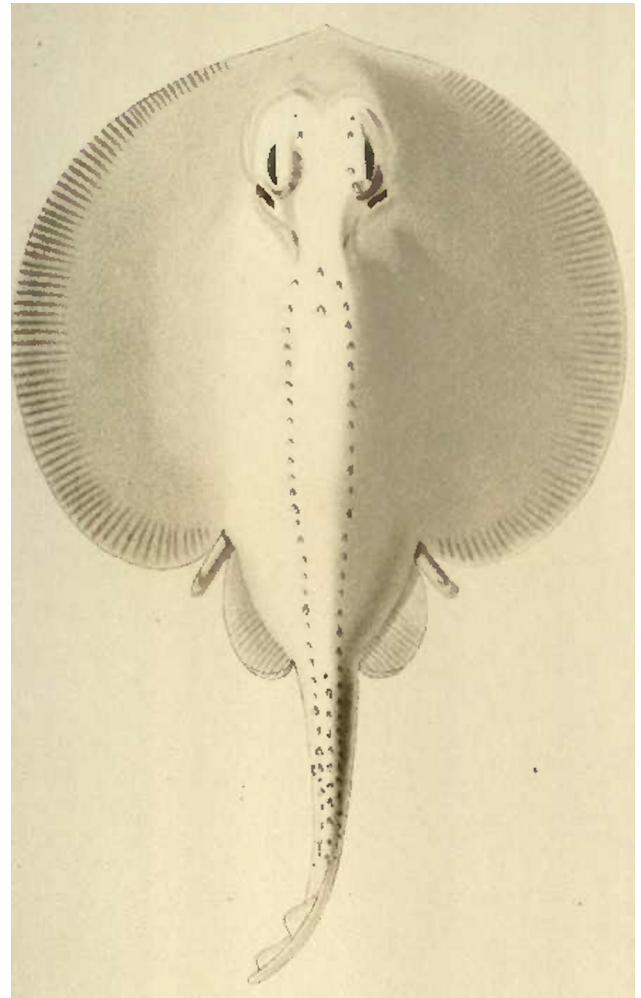
***Pavoraja* Whitley 1939**

pavo (L.), peacock, probably referring to its ornate coloration with small eyespots; *raja*, from *raia* (L.), ray or skate

***Pavoraja alleni* McEachran & Fechhelm 1982** in honor of American-born Australian ichthyologist Gerald R. Allen (b. 1942), Western



Pavoraja alleni, paratype, female, 278 mm TL. Illustration by Janice D. Fechhelm. From: McEachran, J. D. and J. D. Fechhelm. 1982. A new species of skate from western Australia with comments on the status of *Pavoraja* Whitley, 1939 (Chondrichthyes: Rajiformes). Proceedings of the Biological Society of Washington 95 (1): 1–12.



Possibly the first-published image of *Psammobatis scobina*. From: Philippi, R. A. 1892. Algunos peces de Chile. Las rayas, *Callorhynchus* i *Orthogoriscus* Chilenos. Anales del Museo Nacional de Chile. Primera seccion, Zoología No. 3: 1 + 1–16 + 1, Pls. 1–6.

Australia Museum (Perth), who furnished the authors with specimens

***Pavoraja arenaria* Last, Mallick & Yearsley 2008** Latin for sandy, referring to its pale dorsal disc coloration

***Pavoraja mosaica* Last, Mallick & Yearsley 2008** derived from *mosaicus* (L.), an inlay of various colors and geometric patterns, referring to its “striking” dorsal coloration

***Pavoraja nitida* (Günther 1880)** Latin for bright, shining or elegant, allusion not explained, perhaps referring to its color pattern: light and dark brown with dark brown blotches “ornamented” by small, round yellowish ocelli

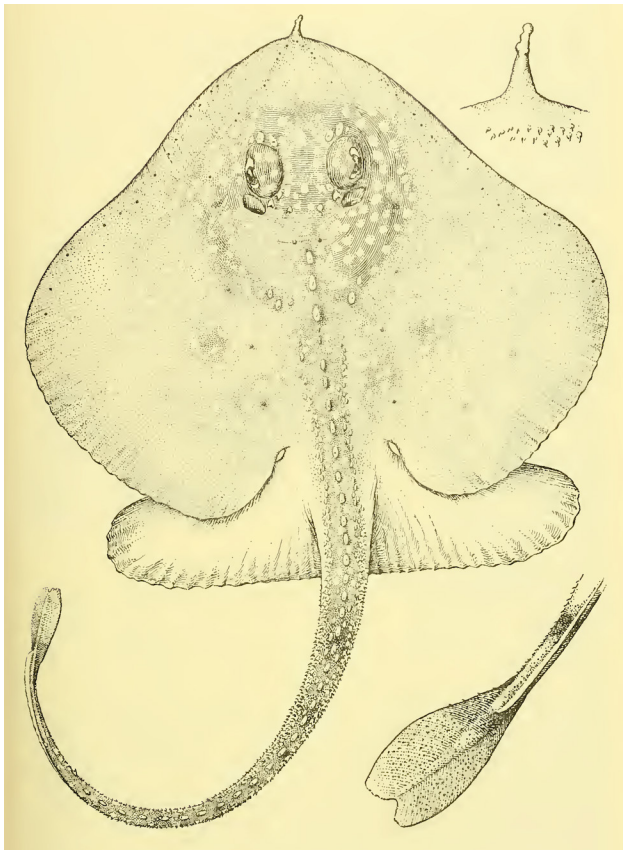
***Pavoraja pseudonitida* Last, Mallick & Yearsley 2008** *pseudo-*, from *pseudēs* (Gr. ψεύδης), false, although this species may superficially resemble *P. nitida*, such an appearance is false

***Pavoraja umbrosa* Last, Mallick & Yearsley 2008** Latin for shady, referring to uniform grayish coloration of dorsal surface of disc

***Psammobatis* Günther 1870**

psámmos (Gr.) ψάμμος, sand, referring to Sandy Point, Magellan Strait, Argentina, type locality of *P. rudis*; *batis* (Gr. βατίς), a flat fish, usually applied to a skate or ray

***Psammobatis bergi* Marini 1932** in honor of Friedrich Wilhelm Karl Berg (1843–1902), also known as Frederico Guillermo (“Carlos”) Berg, born in Latvia, foremost (“el primor”) ichthyologist specializing in the freshwater and marine fishes of Argentina (type locality)



Pseudoraja fischeri, holotype, 479 mm TL, with rostral filament and side view of caudal fin to larger scale. Illustration by E. N. Fischer, for whom the species is named. From: Bigelow, H. B. and W. C. Schroeder. 1954. A new family, a new genus, and two new species of batoid fishes from the Gulf of Mexico. *Breviora* No. 24: 1–16.

***Psammobatis extenta* (Garman 1913)** Latin for extended, presumably referring to its long tail, “extended behind the dorsals,” longer and slenderer than tail of *Raja* (= *Leucoraja*) *erinacea*

***Psammobatis lentiginosa* McEachran 1983** Latin for full of freckles, referring to small spots scattered over dorsal surface of disc and tail

***Psammobatis normani* McEachran 1983** in honor of English ichthyologist J. R. (John Roxborough) Norman (1898–1944), British Museum (Natural History), who first reported this ray (as *P. scobina*) in 1937

***Psammobatis rudis* Günther 1870** Latin for rough, referring to minute spinous tubercles, placed close together, covering all upper parts

***Psammobatis rutrum* Jordan 1891** Latin for shovel, probably referring to bluntly rounded snout with a short, sharply pointed fleshy tip

***Psammobatis scobina* (Philippi 1857)** Latin for rasp, probably referring to rasp-like quality of small sharp spines on dorsal surface

Pseudoraja

Bigelow & Schroeder 1954

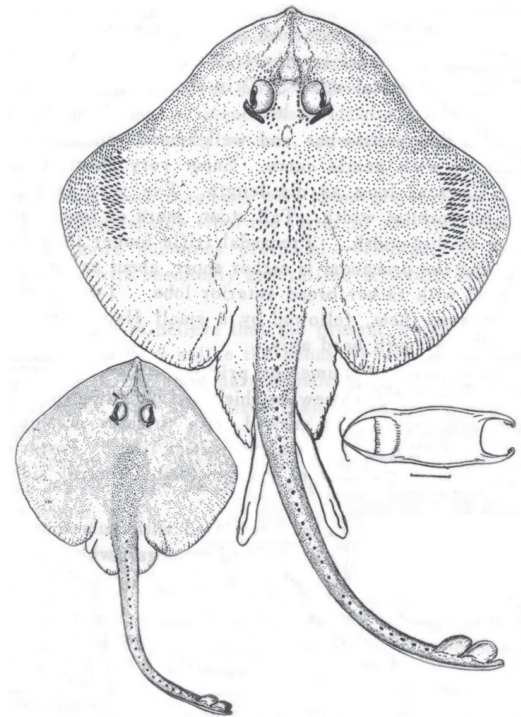
pseudo-, from *pseúdes* (Gr. ψεύδης), false, i.e., a false *Raja*; the authors believed the lack of a dorsal fin and well-developed caudal fin were sufficiently distinct to forbid placement of *P. fischeri* in Rajidae

***Pseudoraja fischeri* Bigelow & Schroeder 1954** in honor of zoological artist E. N. Fischer, for the “skillful portrayals of elasmobranchs” featured in many publications by Bigelow and Schroeder

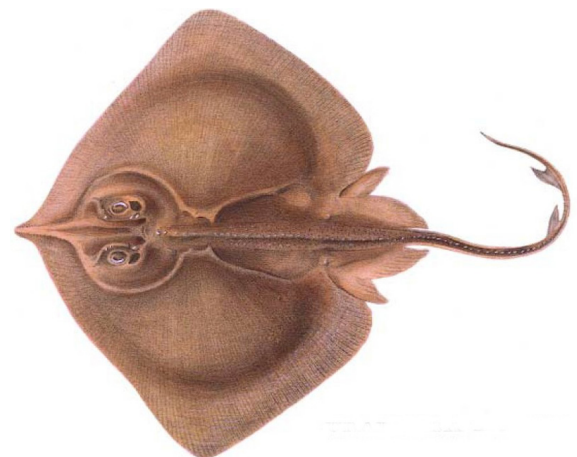
Rhinoraja

Ishiyama 1952

rhinós (Gr. ῥινός), genitive of *rhís* (ῥίς), nose, referring to “peculiar” rostral cartilage that projects forward with slender rod-like bar at tip of snout; *raja*, from *raia* (L.), ray or skate



Rhinoraja odai, holotype (adult male), sub-adult female, and egg case (scale 5 cm). From: Ishiyama, R. 1958. Studies on the rajid fishes (Rajidae) found in the waters around Japan. *Journal of the Shimonoseki College of Fisheries* 7 (2–3): 191–394, Pls. 1–3.



Rioraja agassizii. From: Müller, J. and F. G. J. Henle. 1838–41. *Systematische Beschreibung der Plagiostomen*. Veit und Comp., Berlin. i–xxii + 1–200, 60 pls. [Pp. 1–28 published in 1838, reset pp. 27–28, 29–102 in 1839, i–xxii + 103–200 in 1841.]

***Rhinoraja kujiensis* (Tanaka 1916) -ensis**, Latin suffix denoting place: Kuji, Ibarabi Prefecture, Japan, type locality

***Rhinoraja longicauda* Ishiyama 1952** *longus* (L.), long; *cauda* (L.), tail, referring to pre-dorsal tail length, which is always longer than the disc

***Rhinoraja odai* Ishiyama 1958** in honor of Mikiji Oda (no other information available), who discovered this species at a Miya fish market, off Izu Peninsula, Shizuoka Prefecture, Aichi Province, Japan

Rioraja

Whitley 1939

rio, etymology not explained, perhaps referring to its occurrence off the coast of Rio de Janeiro State, Brazil; *raja*, from *raia* (L.), ray or skate [replacement name for *Uraptera* Müller & Henle 1837, preoccupied by *Uraptera* Billberg 1820 in Lepidoptera]

***Rioraja agassizii* (Müller & Henle 1841)** patronym not identified but clearly in honor of Swiss-born American zoologist-geologist Louis Agassiz (1807–1873), whose five-volume work on fish fossils (1833–1843), including sharks, is cited many times by Müller & Henle

Sympterygia

Müller & Henle 1837

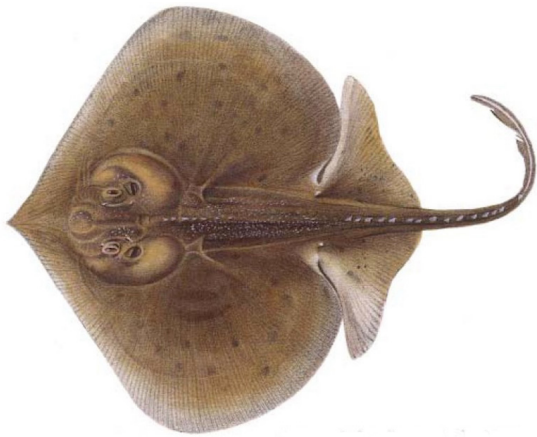
sym (Gr. συμ), together or joined; *pterygia*, from *pterúgion* (Gr. πτερύγιον), diminutive of *ptéryx* (πτέρυξ), wing or fin, referring to how pectoral fins of *S. bonapartii* meet at tip of snout

***Sympterygia acuta* Garman 1877** Latin for sharp or pointed, referring to acute and greatly produced snout

***Sympterygia bonapartii* Müller & Henle 1841** patronym not identified but clearly in honor of French biologist Charles Lucien Bonaparte (1803-1857), whose 1834 treatise on the fauna of Italy introduced several new sharks and rays to science and is cited several times by Müller & Henle

***Sympterygia brevicaudata* (Cope 1877)** *brevis* (L.), short; *caudata* (L.), tailed, “only one-fifth longer than the claspers”

***Sympterygia lima* (Poeppig 1835)** Latin for file, allusion not explained, perhaps referring to ~10 thorny spines in a single row on short, firm and triangular tail, which can be said to resemble a file (hence the common name Filetail Fanskate)



Sympterygia bonapartii. From: Müller, J. and F. G. J. Henle. 1838–41. Systematische Beschreibung der Plagiostomen. Veit und Comp., Berlin. i–xxii + 1–200, 60 pls. [Pp. 1–28 published in 1838, reset pp. 27–28, 29–102 in 1839, i–xxii + 103–200 in 1841.]