

UNESCO environmental DNA (eDNA) Expeditions in marine World
Heritage sites

Biodiversity survey for Archipiélago de Revillagigedo

Interim Results Based on 50% of Samples Analyzed
Not for public distribution

About eDNA Expeditions

UNESCO's eDNA Expeditions is a global, citizen science initiative that is conducted with the intention to measure marine biodiversity and predict the impact climate change on marine community composition across UNESCO World Heritage marine sites.

eDNA is a cost effective and minimally invasive method to measure biodiversity in any given area. Marine species continuously shed DNA into the water around them in the form of waste, mucus, or cells. By extracting this DNA from water samples, and subsequently multiplying and sequencing specific regions within these DNA strands, a wide variety of species can be detected without removing any organisms from their environment. The regions in the DNA targeted for sequencing are selected depending on the scope of the study: while some markers are suitable to obtain a broad overview of biodiversity across many groups of species, other markers are particularly suited to get high resolution insight for a more specific taxonomic group such as fish. The UNESCO eDNA Expeditions initiative combines a number of markers tailored for marine vertebrates (fish, mammals, and turtles). A general marker was added to also allow detection of species from other groups such as invertebrates, which can give a broader insight in the marine species diversity in a given area.

Between September 2022 and May 2023, UNESCO organized eDNA sampling campaigns in 21 marine World Heritage sites across 17 countries around the world. At every World Heritage site, about 20 samples were collected from different habitats. Over 250 young people participated in the local sampling expeditions. They were guided by local experts and park management staff, using protocols and eDNA sampling equipment provided by UNESCO.

Biodiversity inventories generated from the samples are being combined with existing species distribution data from public biodiversity databases such as the Ocean Biodiversity Information System (OBIS) in view of obtaining a comprehensive overview of marine life across marine World Heritage sites. Through the use of climate scenarios and species distribution models, an estimate will be made of the impact of climate change, in particular rising temperatures, on local biodiversity and its potential future distribution patterns.

More information about the initiative and a press kit are available on the UNESCO website: <https://www.unesco.org/en/edna-expeditions>.

Results

Sampling and sample processing

eDNA sampling was conducted in Archipiélago de Revillagigedo in April 2023. A total of 20 samples were collected at 4 locations in the park covering different habitats: “San Benedicto” “Las Cuevitas” “Isla Clarion, Punta Tosca, and Roca Partida (Figure 1). Up to 1,800 mL of seawater was filtered through filter cartridges containing a filter with a 0.8 µm pore size. After sampling, the filter cartridges were flushed with preservation liquid and shipped to UNESCO. From the 20 samples, 20 have now (December 2023) been processed. A second batch of samples will be processed by January 2024. DNA from these samples was extracted and amplified, and subsequently sent to the sequencing facility at KU Leuven in Belgium, a specialized university eDNA lab contracted by UNESCO for this work. PCR amplification was done using five primer pairs selected to capture as much biodiversity as possible in the target groups of the study: fish, mammals, and turtles. The results in this preliminary report are based on a first batch of 20 samples that were analyzed covering all locations that were sampled in the World Heritage site.

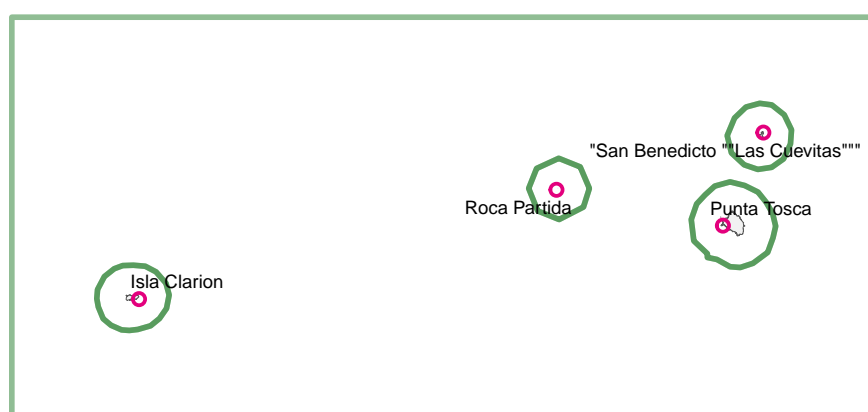


Figure 1: Map of the sampling locations.

DNA sequencing

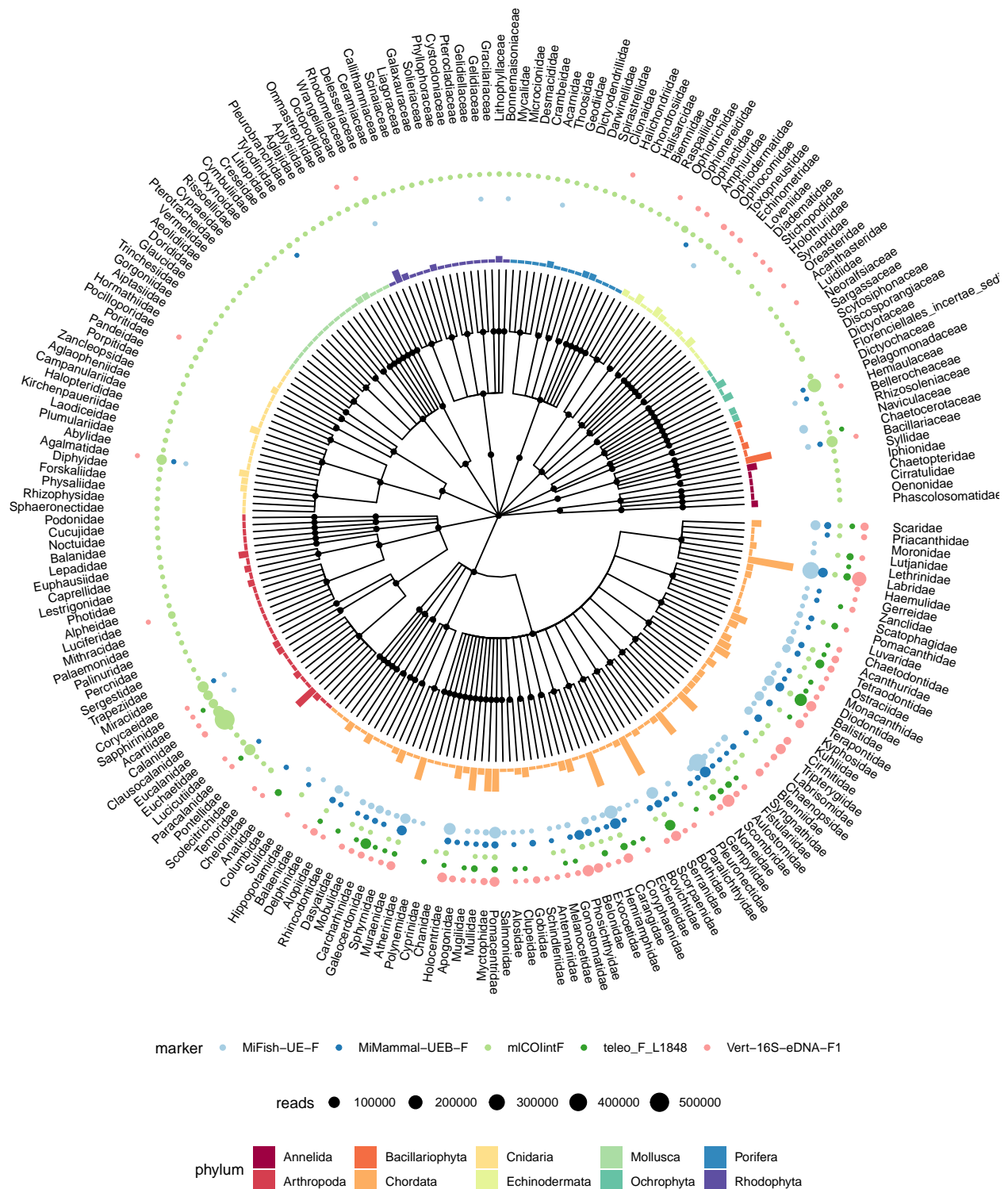
Sequencing of the DNA from 20 samples resulted in over 23 million sequence reads, from which we collected 31,263 unique sequences or ASVs (Tables 1 and 2).

reads	asvs
23866925	31263

Table 1: Reads, ASVs, and species across all samples.

Species identification

The marker sequences obtained from sequencing were matched with sequence reference databases built using public data available from the National Center for Biotechnology Information (NCBI). This resulted in the identification of 430 species, including 191 fish species, 5 mammalian species, and 5 turtle species (Table 3). Species from other groups, such as algae, cnidarians, echinoderms, copepods, and molluscs, were also detected (Figures 2 and 3). This number of species detected represents about 35% of the 1,592 species known from Archipiélago de Revillagigedo in the OBIS database. Of the 430 species detected, 254 are not among the species previously reported from Archipiélago de Revillagigedo to the UNESCO OBIS database. 18 of the detected species are listed as threatened on the IUCN Red List (Table 4). A full list of species is added at the end of this report.



locality	materialSampleID	sampleSize	reads	asvs	species
"San Benedicto ""Las Cuevitas"""	EE0065	1740	876866	7798	159
"San Benedicto ""Las Cuevitas"""	EE0134	1740	1443258	9888	200
"San Benedicto ""Las Cuevitas"""	EE0136	1800	2021089	12359	250
"San Benedicto ""Las Cuevitas"""	EE0229	1560	1138845	9523	195
Isla Clarion	EE0098	1260	971563	7719	102
Isla Clarion	EE0100	1620	975021	9099	92
Isla Clarion	EE0106	1800	1597412	9739	157
Isla Clarion	EE0129	1800	1130165	9468	147
Isla Clarion	EE0131	1500	803681	8061	114
Isla Clarion	EE0137	1800	1793579	11691	145
Isla Clarion	EE0139	1800	1107094	10640	180
Isla Clarion	EE0215	1800	1407166	10559	169
Punta Tosca	EE0060	1800	958908	8662	95
Punta Tosca	EE0064	1500	855753	6252	95
Punta Tosca	EE0111	1800	1745149	9559	107
Punta Tosca	EE0135	1800	1074853	7853	94
Roca Partida	EE0101	1800	965406	7634	46
Roca Partida	EE0128	1800	611298	6672	54
Roca Partida	EE0142	1800	969341	7726	88
Roca Partida	EE0230	1800	914553	6930	68

Table 2: Reads, ASVs, and species by sample.

group	eDNA species	total species	fraction
fish	191	542	0.35
mammals	5	18	0.28
turtles	1	4	0.25

Table 3: Number of species in the three target groups, from the OBIS database and from eDNA sampling.

category	eDNA species	total species	fraction
CR	1	6	0.17
EN	6	15	0.40
VU	11	55	0.20

Table 4: Number of species by IUCN Red List category, from the OBIS database and from eDNA sampling.

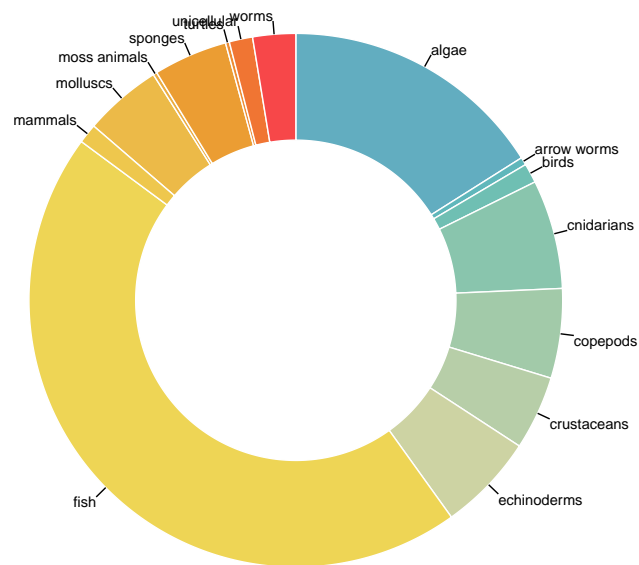


Figure 3: Distribution of detected species across groups.

phylum	class	species	group	category	new	vernacular
Amoebozoa	Discosea	Neoparamoeba aestuarina	unicellular		yes	
Amoebozoa	Discosea	Neoparamoeba pemaquidensis	unicellular		yes	
Annelida	Polychaeta	Eusyllis kupfferi	worms		yes	
Annelida	Polychaeta	Iphone henshawi	worms		yes	
Annelida	Polychaeta	Odontosyllis phosphorea	worms		yes	
Annelida	Polychaeta	Oenone fulgida	worms		yes	
Annelida	Polychaeta	Phyllochaetopterus verrilli	worms		yes	
Annelida	Polychaeta	Proceraea madeirensis	worms		yes	
Annelida	Polychaeta	Timarete punctata	worms		yes	
Annelida		Phascolosoma (Phascolosoma) nigrescens	worms		yes	
Annelida		Phascolosoma (Phascolosoma) perlucens	worms		yes	
Arthropoda	Branchiopoda	Pseudevadne tergestina	crustaceans		yes	
Arthropoda	Copepoda	Acartia (Acartia) negligens	copepods		yes	
Arthropoda	Copepoda	Acrocalanus gracilis	copepods		yes	
Arthropoda	Copepoda	Calocalanus pavo	copepods		yes	
Arthropoda	Copepoda	Calocalanus plumulosus	copepods		yes	
Arthropoda	Copepoda	Calocalanus styliremis	copepods		yes	
Arthropoda	Copepoda	Clausocalanus furcatus	copepods		yes	
Arthropoda	Copepoda	Copilia mirabilis	copepods		yes	
Arthropoda	Copepoda	Ditrichocorycaeus andrewsi	copepods		yes	
Arthropoda	Copepoda	Euchaeta indica	copepods		yes	
Arthropoda	Copepoda	Farranula gibbula	copepods		yes	
Arthropoda	Copepoda	Labidocera detruncata	copepods		yes	
Arthropoda	Copepoda	Lucicutia flavicornis	copepods		yes	
Arthropoda	Copepoda	Macrosetella gracilis	copepods		yes	
Arthropoda	Copepoda	Mecynocera clausi	copepods		yes	
Arthropoda	Copepoda	Paracalanus denudatus	copepods		yes	
Arthropoda	Copepoda	Paracalanus indicus	copepods		yes	
Arthropoda	Copepoda	Pontellina plumata	copepods		yes	
Arthropoda	Copepoda	Sapphirina stellata	copepods		yes	
Arthropoda	Copepoda	Scolecithrix danae	copepods		yes	
Arthropoda	Copepoda	Subeucalanus subcrassus	copepods		yes	
Arthropoda	Copepoda	Subeucalanus subtenuis	copepods		yes	
Arthropoda	Copepoda	Temora discaudata	copepods		yes	
Arthropoda	Copepoda	Undinula vulgaris	copepods		yes	
Arthropoda	Hexapoda	Agrotis malefida			yes	
Arthropoda	Hexapoda	Oryzaephilus surinamensis			yes	
Arthropoda	Malacostraca	Alpheus paracrinitus	crustaceans			smoothclaw snapping shrimp
Arthropoda	Malacostraca	Brachycarpus biunguiculatus	crustaceans			twoclaw shrimp
Arthropoda	Malacostraca	Caprella verrucosa	crustaceans		yes	
Arthropoda	Malacostraca	Euphausia distinguenda	crustaceans		yes	
Arthropoda	Malacostraca	Euphausia tenera	crustaceans		yes	
Arthropoda	Malacostraca	Gammaropsis digitata	crustaceans		yes	
Arthropoda	Malacostraca	Hansarsia gracilis	crustaceans		yes	
Arthropoda	Malacostraca	Hyperietta vosseleri	crustaceans		yes	
Arthropoda	Malacostraca	Hyperioides sibaginis	crustaceans		yes	
Arthropoda	Malacostraca	Lucifer typus	crustaceans		yes	standard lucifer prawn, gamba des monts sous-marins
Arthropoda	Malacostraca	Microphrys platysoma	crustaceans			
Arthropoda	Malacostraca	Neosergestes edwardsii	crustaceans		yes	
Arthropoda	Malacostraca	Panulirus penicillatus	crustaceans	LC		pronghorn spiny lobster, grosses têtes

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phylum	class	species	group	category	new	vernacular
Arthropoda	Malacostraca	Percnon abbreviatum	crustaceans			
Arthropoda	Malacostraca	Synalpheus sanlucasi	crustaceans		yes	
Arthropoda	Malacostraca	Trapezia bidentata	crustaceans			
Arthropoda	Thecostraca	Balanus trigonus	crustaceans		yes	
Arthropoda	Thecostraca	Conchoderma virgatum	crustaceans		yes	
Bacillariophyta	Bacillariophyceae	Bellerochea polymorpha	algae		yes	
Bacillariophyta	Bacillariophyceae	Chaetoceros curvisetus	algae		yes	
Bacillariophyta	Bacillariophyceae	Cylindrotheca closterium	algae			
Bacillariophyta	Bacillariophyceae	Eucampia striata	algae		yes	
Bacillariophyta	Bacillariophyceae	Eucampia zodiacus	algae			
Bacillariophyta	Bacillariophyceae	Haslea pseudostrearia	algae		yes	
Bacillariophyta	Bacillariophyceae	Navicula minima	algae		yes	
Bacillariophyta	Bacillariophyceae	Pseudo-nitzschia abrensis	algae		yes	
Bacillariophyta	Bacillariophyceae	Pseudo-nitzschia caciantha	algae		yes	
Bacillariophyta	Bacillariophyceae	Pseudo-nitzschia decipiens	algae		yes	
Bacillariophyta	Bacillariophyceae	Pseudo-nitzschia lundholmiae	algae		yes	
Bacillariophyta	Bacillariophyceae	Pseudo-nitzschia pseudodelicatissima	algae		yes	
Bacillariophyta	Bacillariophyceae	Pseudo-nitzschia sabit	algae		yes	
Bacillariophyta	Bacillariophyceae	Pseudo-nitzschia subpifica	algae		yes	
Bacillariophyta	Bacillariophyceae	Sundstroemia setigera	algae		yes	
Bigyra	Bicoecia	Cafeteria roenbergensis			yes	
Bryozoa	Gymnolaemata	Bugula neritina	moss animals		yes	Common bugula, Brown bryozoan, bugule brune
Cercozoa	Chlorarachnea	Bigelowiella natans	unicellular		yes	
Cercozoa	Chlorarachnea	Chlorarachnion reptans	unicellular		yes	
Chaetognatha	Sagittoidea	Flaccisagitta enflata	arrow worms		yes	
Chaetognatha	Sagittoidea	Krohnitta subtilis	arrow worms		yes	
Chlorophyta	Mamiellophyceae	Bathycoccus prasinos	algae		yes	
Chlorophyta	Mamiellophyceae	Dolichomastix tenuilepis	algae		yes	
Chlorophyta	Mamiellophyceae	Micromonas commoda	algae		yes	
Chlorophyta	Mamiellophyceae	Micromonas pusilla	algae		yes	
Chlorophyta	Pyramimonadophyceae	Prasinoderma coloniale	algae		yes	
Chlorophyta	Pyramimonadophyceae	Pseudoscourfieldia marina	algae		yes	
Chlorophyta	Trebouxiophyceae	Prototheca ciferrii	algae		yes	
Chlorophyta		Chloroparvula pacifica	algae		yes	
Chlorophyta		Chloropicon laurae	algae		yes	
Chlorophyta		Chloropicon mariensis	algae		yes	
Chlorophyta		Chloropicon primus	algae		yes	
Chlorophyta		Chloropicon roscoffensis	algae		yes	
Chlorophyta		Chloropicon sieburthii	algae		yes	
Chordata	Aves	Cairina moschata	birds	LC	yes	
Chordata	Aves	Columba livia	birds	LC	yes	
Chordata	Aves	Sula dactylatra	birds	LC		blue-faced booby, Fou masqué
Chordata	Aves	Sula leucogaster	birds	LC		brown booby, fou brun
Chordata	Aves	Sula sula	birds	LC		red-footed booby, fou à pieds rouges
Chordata	Elasmobranchii	Alopias pelagicus	fish	EN		thresher shark, renard pélagique
Chordata	Elasmobranchii	Carcharhinus albimarginatus	fish	VU		silvertip shark
Chordata	Elasmobranchii	Carcharhinus brevipinna	fish	VU	yes	spinner shark
Chordata	Elasmobranchii	Carcharhinus falciformis	fish	VU		silky shark
Chordata	Elasmobranchii	Galeocerdo cuvier	fish	NT	yes	tiger shark
Chordata	Elasmobranchii	Hypanus longus	fish	VU		

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phylum	class	species	group	category	new	vernacular
Chordata	Elasmobranchii	Mobula birostris	fish	EN	yes	
Chordata	Elasmobranchii	Mobula thurstoni	fish	EN	yes	smoothtail mobula
Chordata	Elasmobranchii	Rhincodon typus	fish	EN		whale shark, requin baleine
Chordata	Elasmobranchii	Sphyrna lewini	fish	CR		scalloped hammerhead
Chordata	Elasmobranchii	Trienodon obesus	fish	VU		whitetip reef shark
Chordata	Mammalia	Eubalaena australis	mammals	LC	yes	southern right whale, baleine du Cap
Chordata	Mammalia	Hippopotamus amphibius	mammals	VU	yes	
Chordata	Mammalia	Pseudorca crassidens	mammals	NT		false killer whale, faux-orque
Chordata	Mammalia	Stenella coeruleoalba	mammals	LC		striped dolphin, dauphin bleu et blanc
Chordata	Mammalia	Tursiops truncatus	mammals	LC		bottlenose dolphin, grand dauphin
Chordata	Teleostei	Abantennarius sanguineus	fish			
Chordata	Teleostei	Ablennes hians	fish	LC		flat needlefish
Chordata	Teleostei	Acanthemblemaria aspera	fish	LC	yes	roughhead blenny
Chordata	Teleostei	Acanthemblemaria crockeri	fish	LC		browncheek blenny
Chordata	Teleostei	Acanthocybium solandri	fish	LC		wahoo
Chordata	Teleostei	Acanthurus nigricans	fish	LC		backsurgeonfish
Chordata	Teleostei	Acanthurus triostegus	fish	LC		convict surgeonfish
Chordata	Teleostei	Acanthurus xanthopterus	fish	LC		yellowfin surgeonfish
Chordata	Teleostei	Alphestes immaculatus	fish	LC		Pacific mutton hamlet
Chordata	Teleostei	Aluterus monoceros	fish	LC		unicorn leatherjacket
Chordata	Teleostei	Aluterus scriptus	fish	LC		scrawled filefish
Chordata	Teleostei	Anisotremus interruptus	fish	LC		burrito grunt
Chordata	Teleostei	Anisotremus scapularis	fish	LC	yes	
Chordata	Teleostei	Apogon guadalupensis	fish	LC		Guadalupe cardinalfish
Chordata	Teleostei	Apogon imberbis	fish	LC	yes	
Chordata	Teleostei	Arothron meleagris	fish	LC		Guineafowl puffer
Chordata	Teleostei	Atherinomorus lacunosus	fish	LC	yes	robust silverside
Chordata	Teleostei	Aulostomus chinensis	fish	LC		Chinese trumpetfish
Chordata	Teleostei	Auxis thazard	fish	LC		frigate tuna, auxide
Chordata	Teleostei	Axoclinus multicinctus	fish	VU		multibarred triplefin
Chordata	Teleostei	Axoclinus storeyae	fish	LC	yes	
Chordata	Teleostei	Azurina hirundo	fish	NT		swallow damselfish
Chordata	Teleostei	Bodianus diplotaenia	fish	LC		Mexican hogfish
Chordata	Teleostei	Bolinichthys longipes	fish	LC		
Chordata	Teleostei	Bothus mancus	fish	LC		tropical flounder
Chordata	Teleostei	Bovichtus argentinus	fish		yes	
Chordata	Teleostei	Calotomus carolinus	fish	LC		Caroline's parrotfish
Chordata	Teleostei	Cantherhines dumerilii	fish	LC		barred filefish
Chordata	Teleostei	Canthigaster janthinoptera	fish	LC	yes	spotted puffer
Chordata	Teleostei	Caranx caballus	fish	LC		green jack
Chordata	Teleostei	Caranx lugubris	fish	LC		black jack
Chordata	Teleostei	Caranx melampygus	fish	LC		bluefin trevally
Chordata	Teleostei	Caranx sexfasciatus	fish	LC		bigeye trevally
Chordata	Teleostei	Cephalopholis cruentata	fish	LC		graysby
Chordata	Teleostei	Cephalopholis microprion	fish	LC	yes	
Chordata	Teleostei	Cephalopholis panamensis	fish	LC		Panama graysby
Chordata	Teleostei	Cephalopholis sexmaculata	fish	LC	yes	sixspot grouper
Chordata	Teleostei	Cephalopholis sonnerati	fish	LC	yes	tomato hind
Chordata	Teleostei	Chaenomugil proboscideus	fish	LC		snouted mullet
Chordata	Teleostei	Chanos chanos	fish	LC	yes	milkfish, chano

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phylum	class	species	group	category	new	vernacular
Chordata	Teleostei	Chilomycterus reticulatus	fish	LC		spotfin burrfish
Chordata	Teleostei	Chlorurus sordidus	fish	LC	yes	
Chordata	Teleostei	Cirrhitichthys oxycephalus	fish	LC		pixy hawkfish
Chordata	Teleostei	Cirrhitus rivulatus	fish	LC		giant hawkfish
Chordata	Teleostei	Clupea harengus	fish	LC	yes	herring, hareng de l'Atlantique
Chordata	Teleostei	Coryphaena equiselis	fish	LC		pompano dolphin
Chordata	Teleostei	Coryphopterus urospilus	fish	LC		redlight goby
Chordata	Teleostei	Cubiceps pauciradiatus	fish	LC		bigeye cigarfish
Chordata	Teleostei	Cubiceps whiteleggii	fish		yes	
Chordata	Teleostei	Cymolutes praetextatus	fish	LC	yes	
Chordata	Teleostei	Cyprinus carpio	fish	VU	yes	carp, carpe
Chordata	Teleostei	Decapterus macarellus	fish	LC		mackerel scad
Chordata	Teleostei	Decapterus macrosoma	fish	LC	yes	shortfin scad
Chordata	Teleostei	Diaphus splendidus	fish	LC	yes	
Chordata	Teleostei	Dicentrarchus punctatus	fish	LC	yes	spotted sea-bass, bar moucheté
Chordata	Teleostei	Diodon holocanthus	fish	LC		balloonfish
Chordata	Teleostei	Diodon hystrix	fish	LC		spot-fin porcupinefish
Chordata	Teleostei	Diodon liturosus	fish		yes	black-blotched porcupinefish
Chordata	Teleostei	Diogenichthys laternatus	fish	LC		Diogenes lanternfish
Chordata	Teleostei	Diplophos taenia	fish	LC		Pacific portholefish
Chordata	Teleostei	Doryrhamphus excisus	fish	LC		bluestripe pipefish
Chordata	Teleostei	Elagatis bipinnulata	fish	LC		rainbow runner
Chordata	Teleostei	Enchelycore nigricans	fish	LC	yes	viper moray
Chordata	Teleostei	Entomacrodus caudofasciatus	fish	LC	yes	
Chordata	Teleostei	Entomacrodus chiostrictus	fish	LC		notchfin blenny
Chordata	Teleostei	Entomacrodus sealei	fish	LC	yes	
Chordata	Teleostei	Epinephelus clippertonensis	fish	LC		
Chordata	Teleostei	Eucinostomus dowii	fish	LC	yes	Pacific spotfin mojarra
Chordata	Teleostei	Euthynnus affinis	fish	LC		kawakawa, thonine orientale
Chordata	Teleostei	Euthynnus lineatus	fish	LC		black skipjack, thonine noire
Chordata	Teleostei	Exocoetus volitans	fish	LC		flying fish, poisson volant
Chordata	Teleostei	Fistularia commersonii	fish	LC		cornetfish
Chordata	Teleostei	Forcipiger flavissimus	fish	LC		forcepsfish
Chordata	Teleostei	Gempylus serpens	fish	LC		snake mackerel
Chordata	Teleostei	Gerres cinereus	fish	LC	yes	yellowfin mojarra
Chordata	Teleostei	Gymnomuraena zebra	fish	LC		zebra moray
Chordata	Teleostei	Gymnothorax buroensis	fish	LC	yes	vagrant moray
Chordata	Teleostei	Gymnothorax castaneus	fish	LC		Panamic green moray
Chordata	Teleostei	Gymnothorax flavimarginatus	fish	LC		yellowmargin moray
Chordata	Teleostei	Halichoeres insularis	fish	VU		Socorro wrasse
Chordata	Teleostei	Halichoeres melanotis	fish	LC		golden wrasse
Chordata	Teleostei	Halichoeres nicholsi	fish	LC		spinster wrasse
Chordata	Teleostei	Halichoeres notospilus	fish	LC		banded wrasse
Chordata	Teleostei	Heteropriacanthus cruentatus	fish	LC		glasseye snapper
Chordata	Teleostei	Holacanthus passer	fish	LC		king angelfish
Chordata	Teleostei	Hygophum reinhardtii	fish	LC		Reinhardt's lantern fish
Chordata	Teleostei	Hyporthodus cifuentesii	fish	LC		
Chordata	Teleostei	Hypsoblennius brevipinnis	fish	LC	yes	barnaclebill blenny
Chordata	Teleostei	Iniistius pavo	fish	LC		peacock razorfish
Chordata	Teleostei	Istiblennius edentulus	fish	LC	yes	rockskipper

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phylum	class	species	group	category	new	vernacular
Chordata	Teleostei	Johnrandallia nigrirostris	fish	LC		barberfish
Chordata	Teleostei	Katsuwonus pelamis	fish	LC		skipjack tuna, bonite à ventre rayé
Chordata	Teleostei	Kuhlia mugil	fish	LC		barred flagtail
Chordata	Teleostei	Kyphosus elegans	fish	LC		Cortez sea chub
Chordata	Teleostei	Kyphosus pacificus	fish			
Chordata	Teleostei	Kyphosus vaigiensis	fish	LC		brassy chub
Chordata	Teleostei	Labrisomus multiporosus	fish	LC		porehead blenny
Chordata	Teleostei	Labrisomus xanti	fish	LC		largemouth blenny
Chordata	Teleostei	Lagocephalus lagocephalus	fish	LC		oceanic puffer
Chordata	Teleostei	Lampanyctus parvicauda	fish	LC		
Chordata	Teleostei	Lampanyctus simulator	fish	LC	yes	False lanternfish
Chordata	Teleostei	Lethrinus laticaudis	fish	LC	yes	
Chordata	Teleostei	Lutjanus argentimaculatus	fish	LC	yes	river snapper
Chordata	Teleostei	Lutjanus kasmira	fish	LC	yes	common bluestripe snapper
Chordata	Teleostei	Luvarus imperialis	fish	LC		luvar, louvureau
Chordata	Teleostei	Lythrypnus dalli	fish	LC	yes	bluebanded goby
Chordata	Teleostei	Lythrypnus rhizophora	fish	DD		spottedcheek goby
Chordata	Teleostei	Melanocetus johnsonii	fish	LC	yes	Humpback anglerfish
Chordata	Teleostei	Melichthys niger	fish	LC		black durgon
Chordata	Teleostei	Melichthys vidua	fish	LC		pinktail triggerfish
Chordata	Teleostei	Microspathodon chrysurus	fish	LC	yes	yellowtail damselfish
Chordata	Teleostei	Microspathodon dorsalis	fish	LC		giant damselfish
Chordata	Teleostei	Mugil bananensis	fish	LC	yes	
Chordata	Teleostei	Mugil capurrii	fish	LC	yes	
Chordata	Teleostei	Mugil cephalus	fish	LC	yes	grey mullet, muge
Chordata	Teleostei	Mugil curema	fish	LC		silverside mullet
Chordata	Teleostei	Mugil liza	fish	DD	yes	liza
Chordata	Teleostei	Mulloidichthys martinicus	fish	LC	yes	yellow goatfish
Chordata	Teleostei	Mulloidichthys vanicolensis	fish	LC	yes	yellowfin goatfish
Chordata	Teleostei	Myctophum aulolaternatum	fish	LC		
Chordata	Teleostei	Myripristis berndti	fish	LC		blotcheye soldierfish
Chordata	Teleostei	Myripristis leiognathus	fish	LC		Panamic soldierfish
Chordata	Teleostei	Novaculichthys taeniourus	fish	LC		rockmover wrasse
Chordata	Teleostei	Oncorhynchus kisutch	fish		yes	Coho salmon, saumon coho
Chordata	Teleostei	Ophioblennius atlanticus	fish	LC		
Chordata	Teleostei	Ophioblennius steindachneri	fish	LC		Panamic fanged blenny
Chordata	Teleostei	Ostracion meleagris	fish			whitespotted boxfish
Chordata	Teleostei	Oxyporhamphus micropterus	fish			smallwing flyingfish
Chordata	Teleostei	Paralichthys californicus	fish	LC	yes	California halibut
Chordata	Teleostei	Paranthias colonus	fish			Pacific creolefish
Chordata	Teleostei	Pelates quadrilineatus	fish		yes	fourlined terapon
Chordata	Teleostei	Planiliza macrolepis	fish	LC	yes	
Chordata	Teleostei	Platichthys stellatus	fish	LC	yes	starry flounder, flet étiolé
Chordata	Teleostei	Platybelone argalus	fish	LC		keeltail needlefish
Chordata	Teleostei	Plectroglyphidodon dickii	fish	NT	yes	blackbar devil
Chordata	Teleostei	Plectrypops lima	fish	LC		
Chordata	Teleostei	Polydactylus plebeius	fish		yes	striped threadfin, barbure rayé
Chordata	Teleostei	Prionurus laticlavus	fish	LC		razor surgeonfish
Chordata	Teleostei	Prionurus punctatus	fish	LC		yellowtail surgeonfish
Chordata	Teleostei	Pronotogrammus multifasciatus	fish	LC		threadfin bass

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phylum	class	species	group	category	new	vernacular
Chordata	Teleostei	Pseudogramma thaumasia	fish			
Chordata	Teleostei	Remora remora	fish	LC		remora
Chordata	Teleostei	Rypticus saponaceus	fish	LC	yes	greater soapfish
Chordata	Teleostei	Sardinops sagax	fish	LC		California pilchard, pilchard sudaméricain
Chordata	Teleostei	Sargocentron suborbitale	fish			
Chordata	Teleostei	Scarus rubroviolaceus	fish	LC		ember parrotfish
Chordata	Teleostei	Schindleria praematura	fish	LC		
Chordata	Teleostei	Scomber australasicus	fish	LC		spotted chub mackerel
Chordata	Teleostei	Scomber japonicus	fish	LC		Atlantic chub mackerel, maquereaux blanc
Chordata	Teleostei	Scorpaenodes evides	fish	LC	yes	
Chordata	Teleostei	Scorpaenodes xyris	fish	LC		rainbow scorpionfish
Chordata	Teleostei	Scuticaria tigrina	fish	LC		tiger reef eel
Chordata	Teleostei	Selar crumenophthalmus	fish	LC		bigeye scad
Chordata	Teleostei	Selenotoca multifasciata	fish	LC	yes	
Chordata	Teleostei	Seriola lalandi	fish	LC		yellowtail, sérieole chicard
Chordata	Teleostei	Seriola rivoliana	fish	LC		Almaco jack, sérieole limon
Chordata	Teleostei	Serranus aequidens	fish	LC		deepwater serrano
Chordata	Teleostei	Sprattus sprattus	fish	LC	yes	European sprat, sprat
Chordata	Teleostei	Stegastes arcifrons	fish	LC	yes	
Chordata	Teleostei	Stegastes beebei	fish	VU	yes	
Chordata	Teleostei	Stegastes partitus	fish	LC	yes	bicolor damselfish
Chordata	Teleostei	Stethojulis albobittata	fish	LC	yes	bluelined wrasse
Chordata	Teleostei	Stethojulis bandanensis	fish	LC		
Chordata	Teleostei	Sufflamen verres	fish	LC		orangeside triggerfish
Chordata	Teleostei	Syacium maculiferum	fish	DD	yes	
Chordata	Teleostei	Thalassoma lucasanum	fish	LC		Cortez rainbow wrasse
Chordata	Teleostei	Thalassoma lutescens	fish	LC		
Chordata	Teleostei	Thalassoma purpureum	fish	LC	yes	surge wrasse
Chordata	Teleostei	Thalassoma robertsoni	fish	VU	yes	
Chordata	Teleostei	Thunnus alalunga	fish	LC		albacore, thon blanc
Chordata	Teleostei	Tylosurus acus	fish	LC		agujon needlefish
Chordata	Teleostei	Tylosurus crocodilus	fish	LC	yes	houndfish
Chordata	Teleostei	Uraspis secunda	fish	LC		cottonmouth jack
Chordata	Teleostei	Uropterygius macrocephalus	fish	LC		largehead moray
Chordata	Teleostei	Vinciguerria lucetia	fish	LC		
Chordata	Teleostei	Vinciguerria nimbaria	fish	LC	yes	oceanic lightfish
Chordata	Teleostei	Woodsia nonsuchae	fish	LC	yes	bigeye lightfish
Chordata	Teleostei	Xanthichthys mento	fish	LC		redtail triggerfish
Chordata	Teleostei	Xanthichthys ringens	fish	LC		Sargassum triggerfish
Chordata	Teleostei	Zanclus cornutus	fish	LC		Moorish idol
Chordata		Chelonia mydas	turtles	EN		green turtle, tortue verte
Cnidaria	Anthozoa	Calliactis polypus	cnidarians		yes	
Cnidaria	Anthozoa	Exaiptasia diaphana	cnidarians		yes	
Cnidaria	Anthozoa	Pacificorgia irene	cnidarians		yes	
Cnidaria	Anthozoa	Pocillopora damicornis	cnidarians	LC		cauliflower coral
Cnidaria	Anthozoa	Pocillopora verrucosa	cnidarians	LC		cauliflower coral
Cnidaria	Anthozoa	Porites lutea	cnidarians	LC		hump coral
Cnidaria	Hydrozoa	Abyslopsis eschscholtzii	cnidarians		yes	
Cnidaria	Hydrozoa	Agalma elegans	cnidarians		yes	
Cnidaria	Hydrozoa	Aglaophenia prominens	cnidarians		yes	

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phylum	class	species	group	category	new	vernacular
Cnidaria	Hydrozoa	Athorybia rosacea	cnidarians		yes	
Cnidaria	Hydrozoa	Clytia gracilis	cnidarians			
Cnidaria	Hydrozoa	Clytia linearis	cnidarians		yes	
Cnidaria	Hydrozoa	Diphyes bojani	cnidarians		yes	
Cnidaria	Hydrozoa	Diphyes dispar	cnidarians		yes	
Cnidaria	Hydrozoa	Forskalia edwardsii	cnidarians		yes	
Cnidaria	Hydrozoa	Forskalia tholoides	cnidarians		yes	
Cnidaria	Hydrozoa	Halopteris alternata	cnidarians			
Cnidaria	Hydrozoa	Kirchenpaueria halecioides	cnidarians		yes	
Cnidaria	Hydrozoa	Laodicea undulata	cnidarians			
Cnidaria	Hydrozoa	Larsonia pterophylla	cnidarians		yes	
Cnidaria	Hydrozoa	Nanomia bijuga	cnidarians		yes	
Cnidaria	Hydrozoa	Obelia dichotoma	cnidarians			sea thread hydroid
Cnidaria	Hydrozoa	Physalia physalis	cnidarians		yes	Portuguese man-of-war, galère portugaise
Cnidaria	Hydrozoa	Plumularia setacea	cnidarians			little seabristle
Cnidaria	Hydrozoa	Porpita porpita	cnidarians		yes	blue button
Cnidaria	Hydrozoa	Rhizophysa filiformis	cnidarians		yes	
Cnidaria	Hydrozoa	Sphaeroneustes koellikeri	cnidarians		yes	
Cnidaria	Hydrozoa	Zancleopsis dichotoma	cnidarians		yes	
Cryptophyta	Cryptophyceae	Hemiarma marina			yes	
Echinodermata	Asteroidea	Acanthaster planci	echinoderms			crown-of-thorns
Echinodermata	Asteroidea	Luidia magnifica	echinoderms		yes	
Echinodermata	Asteroidea	Pentaceraster cumingi	echinoderms			
Echinodermata	Echinoidea	Diadema mexicanum	echinoderms			
Echinodermata	Echinoidea	Echinometra oblonga	echinoderms			
Echinodermata	Echinoidea	Echinothrix calamaris	echinoderms		yes	banded sea urchin
Echinodermata	Echinoidea	Lovenia cordiformis	echinoderms			
Echinodermata	Echinoidea	Toxopneustes roseus	echinoderms			
Echinodermata	Echinoidea	Triopneustes gratilla	echinoderms		yes	collector urchin
Echinodermata	Holothuroidea	Euapta lappa	echinoderms		yes	
Echinodermata	Holothuroidea	Holothuria (Mertensiothuria) hilla	echinoderms			
Echinodermata	Holothuroidea	Holothuria (Platyperona) difficilis	echinoderms			
Echinodermata	Holothuroidea	Holothuria (Stauropora) pervicax	echinoderms		yes	
Echinodermata	Holothuroidea	Isostichopus fuscus	echinoderms	EN		
Echinodermata	Ophiuroidea	Amphipholis squamata	echinoderms		yes	dwarf brittle star
Echinodermata	Ophiuroidea	Ophiactis picteti	echinoderms		yes	
Echinodermata	Ophiuroidea	Ophiactis savignyi	echinoderms			
Echinodermata	Ophiuroidea	Ophiactis simplex	echinoderms		yes	
Echinodermata	Ophiuroidea	Ophiocoma erinaceus	echinoderms		yes	
Echinodermata	Ophiuroidea	Ophiocomella alexandri	echinoderms			
Echinodermata	Ophiuroidea	Ophiocomella sexradia	echinoderms			
Echinodermata	Ophiuroidea	Ophioderma panamense	echinoderms			
Echinodermata	Ophiuroidea	Ophionereis annulata	echinoderms			
Echinodermata	Ophiuroidea	Ophiothela mirabilis	echinoderms		yes	
Echinodermata	Ophiuroidea	Ophiothrix (Ophiothrix) spiculata	echinoderms		yes	
Haptophyta	Coccolithophyceae	Chrysochromulina tobinii	algae		yes	
Haptophyta	Coccolithophyceae	Emiliania huxleyi	algae		yes	
Haptophyta	Coccolithophyceae	Phaeocystis globosa	algae		yes	
Hemichordata	Enteropneusta	Ptychodera flava			yes	Hawaiian acorn worm
Mollusca	Cephalopoda	Octopus hubbsorum	molluscs	LC		

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phylum	class	species	group	category	new	vernacular
Mollusca	Cephalopoda	Sthenoteuthis oualaniensis	molluscs	LC		purpleback flying squid
Mollusca	Gastropoda	Corolla spectabilis	molluscs		yes	
Mollusca	Gastropoda	Creseis virgula	molluscs		yes	
Mollusca	Gastropoda	Cupolaconcha meroclista	molluscs		yes	
Mollusca	Gastropoda	Doriopsis pecten	molluscs		yes	
Mollusca	Gastropoda	Firoida desmarestia	molluscs		yes	
Mollusca	Gastropoda	Glaucus atlanticus	molluscs		yes	sea swallow
Mollusca	Gastropoda	Limenandra nodosa	molluscs		yes	
Mollusca	Gastropoda	Litiopa melanostoma	molluscs		yes	
Mollusca	Gastropoda	Naria albuginosa	molluscs			aubergine cowry
Mollusca	Gastropoda	Navanax enigmaticus	molluscs			
Mollusca	Gastropoda	Niparaya regiscorona	molluscs		yes	
Mollusca	Gastropoda	Oxynoe viridis	molluscs		yes	
Mollusca	Gastropoda	Phestilla lugubris	molluscs		yes	
Mollusca	Gastropoda	Pleurobranchus digueti	molluscs		yes	
Mollusca	Gastropoda	Pleurobranchus peronii	molluscs		yes	
Mollusca	Gastropoda	Rissoella japonica	molluscs		yes	
Mollusca	Gastropoda	Stylocheilus rickettsi	molluscs		yes	
Mollusca	Gastropoda	Tyrodina fungina	molluscs		yes	
Myzozoa	Dinophyceae	Karenia brevis	unicellular		yes	
Myzozoa	Dinophyceae	Protoceratium reticulatum	unicellular		yes	
Nemertea	Hoploneurtea	Diplomma serpentina	worms		yes	
Nemertea	Palaeoneurtea	Cephalotrichella echinicola	worms		yes	
Ochrophyta	Dictyochophyceae	Octactis octonaria	algae			
Ochrophyta	Dictyochophyceae	Pseudochattonella farcimen	algae		yes	
Ochrophyta	Dictyochophyceae	Vicicitus globosus	algae		yes	
Ochrophyta	Pelagophyceae	Aureococcus anophagefferens	algae		yes	
Ochrophyta	Pelagophyceae	Pelagomonas calceolata	algae		yes	
Ochrophyta	Phaeophyceae	Colpomenia sinuosa	algae		yes	
Ochrophyta	Phaeophyceae	Dictyota flabellata	algae		yes	
Ochrophyta	Phaeophyceae	Dictyota humifusa	algae		yes	
Ochrophyta	Phaeophyceae	Diplura simplex	algae		yes	
Ochrophyta	Phaeophyceae	Discosporangium mesarthrocarpum	algae		yes	
Ochrophyta	Phaeophyceae	Hydroclathrus tilesii	algae		yes	
Ochrophyta	Phaeophyceae	Lobophora obscura	algae		yes	
Ochrophyta	Phaeophyceae	Neoralsia expansa	algae		yes	
Ochrophyta	Phaeophyceae	Sargassum oligocystum	algae		yes	
Porifera	Demospongiae	Chelonaplysilla erecta	sponges		yes	
Porifera	Demospongiae	Chondrosia collectrix	sponges		yes	
Porifera	Demospongiae	Clathria (Clathria) unica	sponges		yes	
Porifera	Demospongiae	Cliona vermifera	sponges			orange boring sponge
Porifera	Demospongiae	Crambe crambe	sponges		yes	orange-red encrusting sponge, éponge encroûtante orange-rouge
Porifera	Demospongiae	Desmapsamma anchorata	sponges		yes	
Porifera	Demospongiae	Dictyodendrilla cavernosa	sponges		yes	
Porifera	Demospongiae	Geodia californica	sponges		yes	
Porifera	Demospongiae	Halichondria (Halichondria) bowerbanki	sponges		yes	Bowerbank's halichondria
Porifera	Demospongiae	Halisarca dujardinii	sponges		yes	soft horny sponge, éponge de Dujardin
Porifera	Demospongiae	Hymeniacidon perlevis	sponges		yes	crumb-of-bread sponge
Porifera	Demospongiae	Mycale (Carmia) cecilia	sponges		yes	
Porifera	Demospongiae	Paracornulum dubium	sponges		yes	

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phylum	class	species	group	category	new	vernacular
Porifera	Demospongiae	Pione vastifica	sponges		yes	boring sponge, clione rouge
Porifera	Demospongiae	Sigmaxinella hipposiderus	sponges		yes	
Porifera	Demospongiae	Sollasella moretonensis	sponges		yes	
Porifera	Demospongiae	Spirastrella cunctatrix	sponges		yes	encrusting orange sponge, éponge encroûtante orange
Porifera	Demospongiae	Thoosa calpulli	sponges			
Porifera	Demospongiae	Thoosa purpurea	sponges			
Rhodophyta	Florideophyceae	Amphiroa foliacea	algae		yes	
Rhodophyta	Florideophyceae	Amphiroa valonioides	algae			
Rhodophyta	Florideophyceae	Antithamnion antillanum	algae		yes	
Rhodophyta	Florideophyceae	Asparagopsis taxiformis	algae			
Rhodophyta	Florideophyceae	Callithamnion tetragonum	algae		yes	
Rhodophyta	Florideophyceae	Dasya caraibica	algae		yes	
Rhodophyta	Florideophyceae	Digenea rafaellii	algae		yes	
Rhodophyta	Florideophyceae	Galaxaura filamentosa	algae			
Rhodophyta	Florideophyceae	Ganonema farinosum	algae		yes	
Rhodophyta	Florideophyceae	Gelidiella acerosa	algae			
Rhodophyta	Florideophyceae	Gelidium arborescens	algae		yes	
Rhodophyta	Florideophyceae	Gracilariopsis lemaneiformis	algae		yes	
Rhodophyta	Florideophyceae	Gymnogongrus guadalupensis	algae		yes	
Rhodophyta	Florideophyceae	Herposiphonia insidiosa	algae		yes	
Rhodophyta	Florideophyceae	Hypnea pannosa	algae			
Rhodophyta	Florideophyceae	Janczewskia hawaiiiana	algae		yes	
Rhodophyta	Florideophyceae	Melanothamnus ramireziae	algae		yes	
Rhodophyta	Florideophyceae	Monosporus indicus	algae		yes	
Rhodophyta	Florideophyceae	Pterocladia capillacea	algae			
Rhodophyta	Florideophyceae	Rhodoptilum plumosum	algae		yes	
Rhodophyta	Florideophyceae	Sarconema filiforme	algae		yes	
Rhodophyta	Florideophyceae	Scinaia furcata	algae		yes	
Rhodophyta	Florideophyceae	Stenopeltis gracilis	algae		yes	
		Amastigomonas debruynei			yes	