

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

Biodiversity survey for Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves

Interim Results
Not for public distribution



Credit: Rihel Venuto

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 Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves in November 2022. A total of 12 samples were collected at 3 locations in the park covering different habitats: baia_dos_delfines, cagarras, and sueste (Figure 1). Up to 1,500 mL of seawater was filtered through filter cartridges containing a filter with a 0.8 μ m pore size. After sampling, the filter cartridges were flushed with preservation liquid and shipped to UNESCO. DNA from the 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.



Figure 1: Map of the sampling locations.

DNA sequencing

Sequencing of the DNA from 12 samples resulted in over 18 million sequence reads, from which we collected 34,170 unique sequences or ASVs (Tables 1 and 2).

reads	asvs
18614516	34170

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

locality	materialSampleID	sampleSize	reads	asvs	species
Baia Dos Delfines	EE0442	1260	1692398	9478	43
Baia Dos Golfinhas	EE0440	1500	1524863	8393	36
Baia dos Delfines	EE0451	1200	1491139	6314	48
Baia dos Golfinhos	EE0435	1440	655422	5065	55
Cagarras	EE0446	1500	799574	5621	70
Cagarras	EE0447	1500	1857308	13198	133
Sueste	EE0430	1500	1507657	10974	138
Sueste	EE0441	1500	2361463	14489	173
Sueste	EE0453	1260	2010313	11160	163
Sueste	EE0454	1380	1784372	13475	176
	EE0431	1320	1365441	11899	138
	EE0455	1440	1564566	11124	136

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

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 321 species, including 96 fish species, 4 mammalian species, and 1 turtle species (Table 3). Species from other groups, such as algae, sponges, crustaceans, cnidarians, and molluscs, were also detected (Figures 2 and 3). This number of species detected represents about 22% of the 1,004 species known from Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves in the OBIS database. Of the 321 species detected, 199 are not among the species previously reported from Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves to the UNESCO OBIS database. 4 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.

group	eDNA species	total species	fraction
fish	96	446	0.22
mammals	4	6	0.67
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	5	0.20
EN	1	13	0.08
VU	2	24	0.08

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

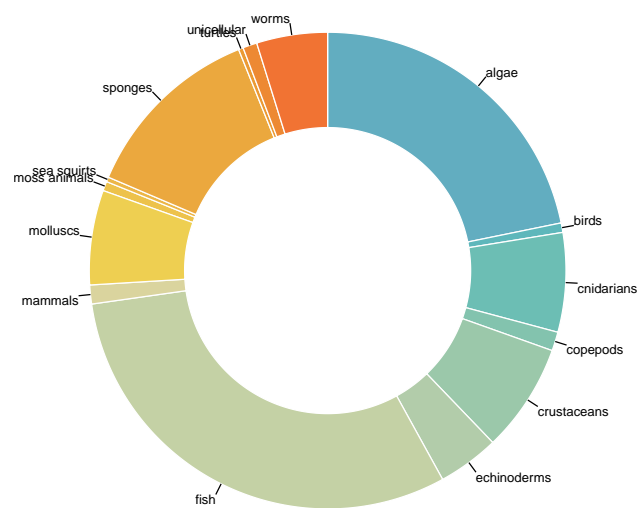


Figure 3: Distribution of detected species across groups.

phylum	class	species	group	category	new	vernacular
Amoebozoa	Discosea	Neoparamoeba aestuarina	unicellular		yes	
Amoebozoa	Myxogastrea	Didymium nigripes	unicellular		yes	
Annelida	Polychaeta	Cirriformia chicoi	worms		yes	
Annelida	Polychaeta	Eurythoe complanata	worms			fireworm
Annelida	Polychaeta	Hermodice carunculata	worms			bearded fireworm
Annelida	Polychaeta	Leodice rubra	worms		yes	
Annelida	Polychaeta	Lumbrineris perkinsi	worms		yes	
Annelida	Polychaeta	Marphysa regalis	worms		yes	
Annelida	Polychaeta	Myrianida pachycera	worms		yes	
Annelida	Polychaeta	Odontosyllis guillermoi	worms		yes	
Annelida	Polychaeta	Phyllochaetopterus verrilli	worms		yes	
Annelida	Polychaeta	Pisone hartmannschroederiae	worms		yes	
Annelida	Polychaeta	Syllis gracilis	worms		yes	
Annelida	Polychaeta	Timarete caribous	worms			
Annelida	Polychaeta	Timarete ceciliae	worms			
Annelida	Polychaeta	Timarete punctata	worms			
Annelida		Siphonosoma vastum	worms		yes	
Arthropoda	Arachnida	Rhombognathus areolatus			yes	
Arthropoda	Copepoda	Calocalanus minutus	copepods		yes	
Arthropoda	Copepoda	Clausocalanus furcatus	copepods			
Arthropoda	Copepoda	Nannocalanus minor	copepods			
Arthropoda	Copepoda	Oithona plumifera	copepods		yes	
Arthropoda	Malacostraca	Achelous ordwayi	crustaceans		yes	
Arthropoda	Malacostraca	Actaea acantha	crustaceans			spinose rubble crab
Arthropoda	Malacostraca	Alpheus cristulifrons	crustaceans			dotted snapping shrimp
Arthropoda	Malacostraca	Alpheus formosus	crustaceans			striped snapping shrimp
Arthropoda	Malacostraca	Alpheus paracrinitus	crustaceans			smoothclaw snapping shrimp
Arthropoda	Malacostraca	Amphithrax aculeatus	crustaceans			
Arthropoda	Malacostraca	Calappa gallus	crustaceans			rough box crab
Arthropoda	Malacostraca	Calappa ocellata	crustaceans		yes	ocellate box crab
Arthropoda	Malacostraca	Clibanarius tricolor	crustaceans			tricolor hermit
Arthropoda	Malacostraca	Cymadusa filosa	crustaceans		yes	
Arthropoda	Malacostraca	Geograpsus lividus	crustaceans		yes	variegate shore crab
Arthropoda	Malacostraca	Grapsus grapsus	crustaceans			Sally lightfoot crab
Arthropoda	Malacostraca	Macrocoeloma subparallelum	crustaceans		yes	
Arthropoda	Malacostraca	Microcassiope minor	crustaceans		yes	
Arthropoda	Malacostraca	Mithraculus forceps	crustaceans			red-ridged clinging crab
Arthropoda	Malacostraca	Neocallichirus grandimana	crustaceans		yes	big-hand ghost shrimp
Arthropoda	Malacostraca	Neogonodactylus bredini	crustaceans		yes	
Arthropoda	Malacostraca	Omalacantha bicornuta	crustaceans			speck-claw decorator crab
Arthropoda	Malacostraca	Panulirus echinatus	crustaceans	LC		brown spiny lobster, langouste brune
Arthropoda	Malacostraca	Pernon gibbesi	crustaceans		yes	flat crab, Sally-pied-léger
Arthropoda	Malacostraca	Plagusia depressa	crustaceans			flattened crab
Arthropoda	Malacostraca	Platypodiella spectabilis	crustaceans			gaudy clown crab
Arthropoda	Malacostraca	Upogebia noronhensis	crustaceans			
Bacillariophyta	Bacillariophyceae	Bellerrochea polymorpha	algae		yes	
Bacillariophyta	Bacillariophyceae	Cylindrotheca closterium	algae		yes	
Bacillariophyta	Bacillariophyceae	Pinnularia acrosphaeria	algae		yes	
Basidiomycota	Agaricomycetes	Schizophyllum commune			yes	
Bryozoa	Gymnolaemata	Amathia evelinae	moss animals		yes	

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phylum	class	species	group	category	new	vernacular
Bryozoa	Gymnolaemata	Amathia vidovici	moss animals		yes	
Chlorarachniophyta	Chlorarachniophyceae	Bigelowiella natans			yes	
Chlorarachniophyta	Chlorarachniophyceae	Chlorarachnion reptans			yes	
Chlorophyta	Chloropicophyceae	Chloroparvula pacifica	algae		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		Chloropicon laureae	algae		yes	
Chlorophyta		Chloropicon mariensis	algae		yes	
Chlorophyta		Chloropicon roscoffensis	algae		yes	
Chlorophyta		Chloropicon sieburthii	algae		yes	
Chordata	Ascidacea	Botrylloides niger	sea squirts		yes	Black synascidia , Synascidie noire
Chordata	Aves	Anas platyrhynchos	birds	LC	yes	mallard, canard colvert
Chordata	Aves	Sula sula	birds	LC		red-footed booby, fou à pieds rouges
Chordata	Elasmobranchii	Ginglymostoma cirratum	fish	VU		nurse shark, requin nourrice
Chordata	Elasmobranchii	Hypanus americanus	fish	NT		
Chordata	Elasmobranchii	Hypanus berthalutzae	fish	VU		
Chordata	Leptocardii	Asymmetron lucayanum			yes	
Chordata	Mammalia	Globicephala macrorhynchus	mammals	LC	yes	short-finned pilot whale, globecéphale tropical
Chordata	Mammalia	Stenella coeruleoalba	mammals	LC	yes	striped dolphin, dauphin bleu et blanc
Chordata	Mammalia	Stenella longirostris	mammals	LC		long-snouted spinner dolphin, dauphin longirostre
Chordata	Mammalia	Tursiops truncatus	mammals	LC	yes	bottlenose dolphin, grand dauphin
Chordata	Teleostei	Abudefduf saxatilis	fish	LC		sergeant major
Chordata	Teleostei	Abudefduf vaigiensis	fish	LC	yes	Indo-Pacific sergeant
Chordata	Teleostei	Acanthostracion polygonium	fish			
Chordata	Teleostei	Acanthurus chirurgus	fish	LC		doctorfish
Chordata	Teleostei	Acanthurus coeruleus	fish	LC		blue tang surgeonfish
Chordata	Teleostei	Acyrtus pauciradiatus	fish			
Chordata	Teleostei	Albula goreensis	fish		yes	
Chordata	Teleostei	Amblycirrhitus pinos	fish	LC		redspotted hawkfish
Chordata	Teleostei	Anisotremus surinamensis	fish	DD		black margate
Chordata	Teleostei	Apogon maculatus	fish	LC		flamefish
Chordata	Teleostei	Bothus ocellatus	fish	LC		eyed flounder
Chordata	Teleostei	Brachygenys chrysargyreum	fish			
Chordata	Teleostei	Bryx dunckeri	fish	LC	yes	pugnose pipefish
Chordata	Teleostei	Canthidermis sufflamen	fish	LC		ocean triggerfish
Chordata	Teleostei	Canthigaster rostrata	fish	LC		sharpnose puffer
Chordata	Teleostei	Caranx bartholomaei	fish	LC		yellow jack
Chordata	Teleostei	Caranx crysos	fish	LC		blue runner, carangue coubali
Chordata	Teleostei	Caranx latus	fish	LC		horse-eye jack
Chordata	Teleostei	Caranx lugubris	fish	LC		black jack
Chordata	Teleostei	Caranx ruber	fish	LC		bar jack
Chordata	Teleostei	Cephalopholis fulva	fish	LC		coney
Chordata	Teleostei	Ceratoscopelus warmingii	fish	LC		Warming's lantern fish
Chordata	Teleostei	Chromis multilineata	fish	LC		brown chromis
Chordata	Teleostei	Coryphaena equiselis	fish	LC	yes	pompano dolphin
Chordata	Teleostei	Coryphopterus glaucofraenum	fish	LC		bridled goby
Chordata	Teleostei	Cryptotomus roseus	fish	LC	yes	bluelip parrotfish
Chordata	Teleostei	Dactylopterus volitans	fish	LC		flying gurnard, grondin volant

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phylum	class	species	group	category	new	vernacular
Chordata	Teleostei	Dactyloscopus tridigitatus	fish	LC		sand stargazer
Chordata	Teleostei	Decapterus macarellus	fish	LC		mackerel scad
Chordata	Teleostei	Doratonotus megalepis	fish	LC		dwarf wrasse
Chordata	Teleostei	Echidna catenata	fish	LC		chain moray
Chordata	Teleostei	Enchelycore nigricans	fish	LC		viper moray
Chordata	Teleostei	Enneanectes altivelis	fish	LC		lofty triplefin
Chordata	Teleostei	Entomacrodus nigricans	fish	LC	yes	pearl blenny
Chordata	Teleostei	Entomacrodus vomerinus	fish	LC		
Chordata	Teleostei	Gnatholepis thompsoni	fish	LC		goldspot goby
Chordata	Teleostei	Gymnothorax funebris	fish	LC		green moray, murène verte
Chordata	Teleostei	Gymnothorax meleagris	fish	LC	yes	turkey moray
Chordata	Teleostei	Gymnothorax miliaris	fish	LC		goldentail moray
Chordata	Teleostei	Gymnothorax moringa	fish	LC		spotted moray
Chordata	Teleostei	Gymnothorax vicinus	fish	LC		purplemouth moray
Chordata	Teleostei	Haemulon aurolineatum	fish	LC	yes	tomtate grunt
Chordata	Teleostei	Haemulon parra	fish	LC		sailors choice
Chordata	Teleostei	Haemulon plumieri	fish	LC	yes	grunt
Chordata	Teleostei	Halichoeres radiatus	fish	LC		puddingwife
Chordata	Teleostei	Harengula humeralis	fish	LC	yes	pilchard
Chordata	Teleostei	Harengula jaguana	fish	LC		scaled sardine
Chordata	Teleostei	Hemiramphus balao	fish	LC	yes	balao
Chordata	Teleostei	Hemiramphus brasiliensis	fish	LC		ballyhoo halfbeak
Chordata	Teleostei	Hemiramphus far	fish		yes	spotted halfbeak
Chordata	Teleostei	Holocentrus adscensionis	fish	LC		squirrelfish
Chordata	Teleostei	Hyporhamphus unifasciatus	fish	LC		common halfbeak
Chordata	Teleostei	Kyphosus vaigiensis	fish	LC		brassy chub
Chordata	Teleostei	Labrisomus nuchipinnis	fish	LC		hairy blenny
Chordata	Teleostei	Lactophrys bicaudalis	fish	LC		spotted trunkfish
Chordata	Teleostei	Lactophrys trigonus	fish	LC		trunkfish
Chordata	Teleostei	Lutjanus jocu	fish	DD		dog snapper
Chordata	Teleostei	Malacanthus plumieri	fish	LC		sand tilefish
Chordata	Teleostei	Malacotenus triangulatus	fish	LC		saddled blenny
Chordata	Teleostei	Melichthys niger	fish	LC		black durgon
Chordata	Teleostei	Mugil cephalus	fish	LC	yes	grey mullet, muge
Chordata	Teleostei	Mugil liza	fish	DD	yes	liza
Chordata	Teleostei	Mulloidichthys martinicus	fish	LC		yellow goatfish
Chordata	Teleostei	Myripristis jacobus	fish	LC		blackbar soldierfish
Chordata	Teleostei	Omobranchus loxozonus	fish	LC	yes	
Chordata	Teleostei	Ophioblennius atlanticus	fish	LC		
Chordata	Teleostei	Paraconger caudilimbatus	fish	LC	yes	margin tail conger
Chordata	Teleostei	Paranthias furcifer	fish			Atlantic creolefish
Chordata	Teleostei	Pempheris schomburgkii	fish	LC		glassy sweeper
Chordata	Teleostei	Phaeoptyx pigmentaria	fish	LC		dusky cardinalfish
Chordata	Teleostei	Platybelone argalus	fish	LC		keeltail needlefish
Chordata	Teleostei	Pseudupeneus maculatus	fish	LC		spotted goatfish
Chordata	Teleostei	Salmo salar	fish	LR/lc	yes	Atlantic salmon, saumon d'Atlantique
Chordata	Teleostei	Scartella cristata	fish	LC		molly miller
Chordata	Teleostei	Selar crumenophthalmus	fish	LC		bigeye scad
Chordata	Teleostei	Sparisoma axillare	fish	DD		
Chordata	Teleostei	Sparisoma chrysoterpum	fish	LC		redtail parrotfish

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phylum	class	species	group	category	new	vernacular
Chordata	Teleostei	Sparisoma frondosum	fish	DD		
Chordata	Teleostei	Sparisoma radians	fish	LC		bucktooth parrotfish
Chordata	Teleostei	Sparisoma rubripinne	fish	LC		redfin parrotfish
Chordata	Teleostei	Sparisoma viride	fish	LC		stoplight parrotfish
Chordata	Teleostei	Sphyræna barracuda	fish	LC		great barracuda
Chordata	Teleostei	Starksia multilepis	fish	LC		
Chordata	Teleostei	Stegastes pictus	fish	LC		
Chordata	Teleostei	Stegastes rocasensis	fish			
Chordata	Teleostei	Thalassoma bifasciatum	fish	LC		bluehead
Chordata	Teleostei	Thalassoma noronhanum	fish	LC		
Chordata	Teleostei	Tomicodon cryptus	fish	LC	yes	
Chordata	Teleostei	Tylosurus acus	fish	LC	yes	agujon needlefish
Chordata	Teleostei	Tylosurus crocodilus	fish	LC	yes	houndfish
Chordata	Teleostei	Uropterygius macularius	fish	LC		marbled moray
Chordata	Teleostei	Xyrichtys novacula	fish	LC		pearly razorfish
Chordata	Teleostei	Xyrichtys splendens	fish	LC		green razorfish
Chordata		Chelonia mydas	turtles	EN		green turtle, tortue verte
Cnidaria	Hexacorallia	Exaiptasia diaphana	cnidarians		yes	
Cnidaria	Hexacorallia	Madracis myriaster	cnidarians		yes	striate finger coral
Cnidaria	Hexacorallia	Montastraea cavernosa	cnidarians	LC	yes	false knob coral
Cnidaria	Hexacorallia	Siderastrea siderea	cnidarians	CR	yes	massive starlet coral
Cnidaria	Hydrozoa	Aglaura hemistoma	cnidarians		yes	American pipit
Cnidaria	Hydrozoa	Bassia bassensis	cnidarians		yes	
Cnidaria	Hydrozoa	Campanularia hincksii	cnidarians		yes	
Cnidaria	Hydrozoa	Clytia gracilis	cnidarians		yes	
Cnidaria	Hydrozoa	Clytia noliformis	cnidarians		yes	
Cnidaria	Hydrozoa	Eudendrium carneum	cnidarians		yes	red stickhydroid
Cnidaria	Hydrozoa	Halistemma rubrum	cnidarians		yes	
Cnidaria	Hydrozoa	Halopteris alternata	cnidarians		yes	
Cnidaria	Hydrozoa	Kirchenpaueria halecioides	cnidarians		yes	
Cnidaria	Hydrozoa	Liriope tetraphylla	cnidarians		yes	
Cnidaria	Hydrozoa	Nanomia bijuga	cnidarians		yes	
Cnidaria	Hydrozoa	Porpita porpita	cnidarians		yes	blue button
Cnidaria	Hydrozoa	Sphaeronectes koellikeri	cnidarians		yes	
Cnidaria	Hydrozoa	Stauridiosarsia nipponica	cnidarians		yes	
Cnidaria	Hydrozoa	Zancleopsis dichotoma	cnidarians		yes	
Cnidaria	Octocorallia	Clavularia crassa	cnidarians	LC	yes	
Cryptophyta	Cryptophyceae	Hemiarma marina			yes	
Ctenophora	Tentaculata	Vallicula multiformis	cnidarians		yes	
Echinodermata	Asteroidea	Astropecten antillensis	echinoderms		yes	
Echinodermata	Asteroidea	Astropecten cingulatus	echinoderms		yes	
Echinodermata	Asteroidea	Linckia guildingi	echinoderms			
Echinodermata	Asteroidea	Mithrodia clavigera	echinoderms		yes	
Echinodermata	Ophiuroidea	Amphipholis squamata	echinoderms			dwarf brittle star
Echinodermata	Ophiuroidea	Ophiactis savignyi	echinoderms			
Echinodermata	Ophiuroidea	Ophiocomella ophiactoides	echinoderms			
Echinodermata	Ophiuroidea	Ophiocomella sexradia	echinoderms		yes	
Echinodermata	Ophiuroidea	Ophioderma appressum	echinoderms			
Echinodermata	Ophiuroidea	Ophioderma cinereum	echinoderms			
Echinodermata	Ophiuroidea	Ophiolepis impressa	echinoderms		yes	

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phylum	class	species	group	category	new	vernacular
Echinodermata	Ophiuroidea	Ophiomastix wendtii	echinoderms		yes	
Echinodermata	Ophiuroidea	Ophiomyxa flaccida	echinoderms		yes	
Haptophyta	Coccolithophyceae	Gephyrocapsa huxleyi	algae		yes	
Haptophyta	Coccolithophyceae	Phaeocystis globosa	algae		yes	
Hemichordata	Enteropneusta	Ptychodera flava			yes	Hawaiian acorn worm
Mollusca	Bivalvia	Brachidontes exustus	molluscs			
Mollusca	Bivalvia	Limaria pellucida	molluscs		yes	
Mollusca	Cephalopoda	Octopus hummelincki	molluscs		yes	bumblebee octopus
Mollusca	Cephalopoda	Octopus insularis	molluscs			Brazil reef octopus
Mollusca	Gastropoda	Aplysia parvula	molluscs		yes	dwarf sea hare, petit lièvre de mer
Mollusca	Gastropoda	Bosellia mimetica	molluscs		yes	
Mollusca	Gastropoda	Columbella mercatoria	molluscs			common dove shell
Mollusca	Gastropoda	Columbella rustica	molluscs		yes	rustic dove shell
Mollusca	Gastropoda	Echinolittorina vermeiji	molluscs			
Mollusca	Gastropoda	Elysia cornigera	molluscs		yes	
Mollusca	Gastropoda	Elysia pawliki	molluscs		yes	
Mollusca	Gastropoda	Haminoea antillarum	molluscs		yes	Antilles glassy-bubble
Mollusca	Gastropoda	Lampasopsis thomae	molluscs			
Mollusca	Gastropoda	Leucozonia ocellata	molluscs			white-spot latirus
Mollusca	Gastropoda	Lucapina suffusa	molluscs		yes	
Mollusca	Gastropoda	Micromelo undatus	molluscs			miniature melo
Mollusca	Gastropoda	Mourgona germaineae	molluscs		yes	
Mollusca	Gastropoda	Pleurobranchus areolatus	molluscs		yes	Atlantic sidegill slug
Mollusca	Gastropoda	Stylocheilus polyomma	molluscs		yes	
Mollusca	Gastropoda	Thuridilla mazda	molluscs		yes	
Myxozoa	Dinophyceae	Biecheleria cincta	unicellular		yes	
Ochrophyta	Pelagophyceae	Aureococcus anophagefferens	algae		yes	
Ochrophyta	Pelagophyceae	Pelagomonas calceolata	algae		yes	
Ochrophyta	Phaeophyceae	Canistrocarpus cervicornis	algae			
Ochrophyta	Phaeophyceae	Colpomenia sinuosa	algae			
Ochrophyta	Phaeophyceae	Dictyota ceylanica	algae		yes	
Ochrophyta	Phaeophyceae	Dictyota ciliolata	algae			
Ochrophyta	Phaeophyceae	Dictyota cymatophila	algae		yes	
Ochrophyta	Phaeophyceae	Dictyota friabilis	algae		yes	
Ochrophyta	Phaeophyceae	Dictyota humifusa	algae		yes	
Ochrophyta	Phaeophyceae	Dictyota mayae	algae		yes	
Ochrophyta	Phaeophyceae	Dictyota pinnatifida	algae		yes	
Ochrophyta	Phaeophyceae	Dictyota rigida	algae		yes	
Ochrophyta	Phaeophyceae	Feldmannia mitchelliae	algae		yes	
Ochrophyta	Phaeophyceae	Hydroclathrus clathratus	algae		yes	
Ochrophyta	Phaeophyceae	Hydroclathrus tenuis	algae		yes	
Ochrophyta	Phaeophyceae	Lobophora canariensis	algae		yes	
Ochrophyta	Phaeophyceae	Padina gymnospora	algae			
Ochrophyta	Phaeophyceae	Rosenvingea intricata	algae		yes	
Porifera	Demospongiae	Acanthotetilla walteri	sponges		yes	
Porifera	Demospongiae	Aiolochroia crassa	sponges			blue bleeder
Porifera	Demospongiae	Callyspongia (Callyspongia) fallax	sponges		yes	
Porifera	Demospongiae	Callyspongia (Cladochalina) aculeata	sponges		yes	
Porifera	Demospongiae	Callyspongia (Cladochalina) diffusa	sponges		yes	
Porifera	Demospongiae	Callyspongia (Cladochalina) plicifera	sponges		yes	

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phylum	class	species	group	category	new	vernacular
Porifera	Demospongiae	Chalinula molitba	sponges		yes	
Porifera	Demospongiae	Chelonaplysilla erecta	sponges		yes	
Porifera	Demospongiae	Chondrosia collectrix	sponges		yes	
Porifera	Demospongiae	Cinachyrella kuekenthali	sponges		yes	
Porifera	Demospongiae	Clathria (Clathria) unica	sponges		yes	
Porifera	Demospongiae	Clathria (Wilsonella) rugosa	sponges		yes	
Porifera	Demospongiae	Cliona celata	sponges		yes	boring sponge, clione jaune
Porifera	Demospongiae	Cliona vermifera	sponges		yes	orange boring sponge
Porifera	Demospongiae	Coelocarteria bartschi	sponges		yes	
Porifera	Demospongiae	Ectyoplasia ferox	sponges			
Porifera	Demospongiae	Fasciospongia cavernosa	sponges		yes	
Porifera	Demospongiae	Gelliodes wilsoni	sponges		yes	
Porifera	Demospongiae	Geodia gibberosa	sponges		yes	white encrusting sponge
Porifera	Demospongiae	Halichondria (Halichondria) bowerbanki	sponges		yes	Bowerbank's halichondria
Porifera	Demospongiae	Haliclona (Reniera) implexiformis	sponges		yes	
Porifera	Demospongiae	Haliclona (Reniera) manglaris	sponges		yes	
Porifera	Demospongiae	Haliclona (Reniera) tubifera	sponges		yes	
Porifera	Demospongiae	Halisarca caerulea	sponges		yes	
Porifera	Demospongiae	Hooperia anfractuosa	sponges		yes	
Porifera	Demospongiae	Igernella notabilis	sponges		yes	
Porifera	Demospongiae	Monanchora arbuscula	sponges			red-white marbled sponge
Porifera	Demospongiae	Mycale (Carmia) cecilia	sponges		yes	
Porifera	Demospongiae	Niphates amorpha	sponges		yes	
Porifera	Demospongiae	Niphates erecta	sponges		yes	lavender rope sponge
Porifera	Demospongiae	Ophlitaspongia papilla	sponges		yes	
Porifera	Demospongiae	Pione vastifica	sponges		yes	boring sponge, clione rouge
Porifera	Demospongiae	Scopalina ruetzleri	sponges		yes	orange lumpy encrusting sponge
Porifera	Demospongiae	Spirastrella cunctatrix	sponges		yes	encrusting orange sponge, éponge encroûtante orange
Porifera	Demospongiae	Spirastrella hartmani	sponges		yes	
Porifera	Demospongiae	Thoosa purpurea	sponges		yes	
Porifera	Demospongiae	Topsentia ophiraphidites	sponges		yes	
Porifera	Homoscleromorpha	Plakinastrella onkodes	sponges		yes	
Porifera	Homoscleromorpha	Plakortis halichondrioides	sponges		yes	
Prasinodermatophyta	Prasinodermatophyceae	Prasinoderma coloniale			yes	
Rhodophyta	Bangiophyceae	Neoporphyra haitanensis	algae		yes	
Rhodophyta	Florideophyceae	Amphiroa beauvoisii	algae		yes	
Rhodophyta	Florideophyceae	Aphanta ligulata	algae		yes	
Rhodophyta	Florideophyceae	Asparagopsis taxiformis	algae		yes	
Rhodophyta	Florideophyceae	Chondria baileyana	algae		yes	
Rhodophyta	Florideophyceae	Coelothrix irregularis	algae		yes	
Rhodophyta	Florideophyceae	Crassiphycus caudatus	algae		yes	
Rhodophyta	Florideophyceae	Dasya collinsiana	algae		yes	
Rhodophyta	Florideophyceae	Dasya spinuligera	algae		yes	
Rhodophyta	Florideophyceae	Digenea arenahauriens	algae		yes	
Rhodophyta	Florideophyceae	Enantiocladia duperreyi	algae		yes	
Rhodophyta	Florideophyceae	Galaxaura rugosa	algae		yes	
Rhodophyta	Florideophyceae	Ganonema farinosum	algae		yes	
Rhodophyta	Florideophyceae	Gracilaria isabellana	algae		yes	
Rhodophyta	Florideophyceae	Gracilariopsis tenuifrons	algae		yes	
Rhodophyta	Florideophyceae	Harveyolithon munitum	algae		yes	

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phylum	class	species	group	category	new	vernacular
Rhodophyta	Florideophyceae	Herposiphonia secunda	algae		yes	
Rhodophyta	Florideophyceae	Hypnea spinella	algae			
Rhodophyta	Florideophyceae	Kapraunia pentamera	algae		yes	
Rhodophyta	Florideophyceae	Laurencia catarinensis	algae		yes	
Rhodophyta	Florideophyceae	Laurencia dendroidea	algae		yes	
Rhodophyta	Florideophyceae	Laurenciella marilzae	algae		yes	
Rhodophyta	Florideophyceae	Liagora ceranoides	algae		yes	
Rhodophyta	Florideophyceae	Lithophyllum corallinae	algae			
Rhodophyta	Florideophyceae	Lithophyllum kaiseri	algae		yes	
Rhodophyta	Florideophyceae	Lophocladia trichoclados	algae		yes	
Rhodophyta	Florideophyceae	Melanothamnus ferulaceus	algae		yes	
Rhodophyta	Florideophyceae	Melanothamnus pseudovillum	algae		yes	
Rhodophyta	Florideophyceae	Melyvonnea erubescens	algae		yes	
Rhodophyta	Florideophyceae	Palisada perforata	algae		yes	
Rhodophyta	Florideophyceae	Pterocladia bartlettii	algae		yes	
Rhodophyta	Florideophyceae	Pterocladia beachiae	algae		yes	
Rhodophyta	Florideophyceae	Rhodachlya hawaiiiana	algae		yes	
Rhodophyta	Florideophyceae	Sebdenia flabellata	algae		yes	
Rhodophyta	Florideophyceae	Tricleocarpa cylindrica	algae		yes	
Rhodophyta	Florideophyceae	Wilsonosiphonia fujiae	algae		yes	
		Amastigomonas debrynei			yes	