

Supplementary material

**Host-associated microbiota of yellow stingrays (*Urobatis jamaicensis*)
is shaped by their environment and life history**

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Table S1. Information on the twenty yellow stingrays sampled in this study

Abbreviations: Rep. stat., reproductive status; poss., possible; Sampl. loc., sampling location; Hab., habitat; DOB, date of birth

Sample	Life history	Sex	Rep. stat.	Lesions	Sampling date	Sampl. loc. (Shedd Hab.)	Source Location	Arrival at Shedd
YR-1	wild	male	mature	<i>unknown</i>	5-Oct-2015	Bimini, Bahamas	Bimini, Bahamas	N/A
YR-2	wild	male	mature	<i>unknown</i>	9-Oct-2015	Exuma, Bahamas	Exuma, Bahamas	N/A
YR-3	wild	male	mature	<i>unknown</i>	9-Oct-2015	Exuma, Bahamas	Exuma, Bahamas	N/A
YR-4	wild	male	mature	<i>unknown</i>	9-Oct-2015	Exuma, Bahamas	Exuma, Bahamas	N/A
YR-5	wild	male	mature	<i>unknown</i>	10-Oct-2015	Exuma, Bahamas	Exuma, Bahamas	N/A
YR-6	wild	female	mature	<i>unknown</i>	10-Oct-2015	Bimini, Bahamas	Bimini, Bahamas	N/A
YR-7	wild	female	mature	<i>unknown</i>	10-Oct-2015	Exuma, Bahamas	Exuma, Bahamas	N/A
YR-8	wild	female	mature	<i>unknown</i>	10-Oct-2015	Exuma, Bahamas	Exuma, Bahamas	N/A
YR-9	wild	female	mature	<i>unknown</i>	10-Oct-2015	Bimini, Bahamas	Bimini, Bahamas	N/A
YR-10	wild	female	mature	<i>unknown</i>	10-Oct-2015	Bimini, Bahamas	Bimini, Bahamas	N/A
YR-11	wild-caught	male	mature	none	3-Nov-2015	Shedd Aquarium (CR)	Marathon Key, FL	8-Feb-2011
YR-12	wild-caught	male	mature	none	3-Nov-2015	Shedd Aquarium (CR)	Marathon Key, FL	8-Feb-2011
YR-13	wild-caught	male	mature	none	3-Nov-2015	Shedd Aquarium (CR)	Marathon Key, FL	8-Feb-2011
YR-14	aquarium-born	male	mature	none	10-Nov-2015	Shedd Aquarium (IH)	Shedd Aquarium	15-Dec-2013 (DOB)
YR-15	aquarium-born	male	mature	none	10-Nov-2015	Shedd Aquarium (IH)	Shedd Aquarium	14-Aug-2014 (DOB)
YR-16	aquarium-born	female	mature	poss. goiter	13-Nov-2015	Shedd Aquarium (R-75)	Shedd Aquarium	15-Dec-2013 (DOB)
YR-17	aquarium-born	female	mature	poss. goiter	13-Nov-2015	Shedd Aquarium (R-75)	Shedd Aquarium	14-Aug-2014 (DOB)
YR-18	wild-caught	female	mature	none	13-Nov-2015	Shedd Aquarium (R-75)	Exuma, Bahamas	8-Oct-2009
YR-19	aquarium-born	female	mature	poss. goiter	13-Nov-2015	Shedd Aquarium (R-75)	Shedd Aquarium	9-May-2014 (DOB)
YR-20	wild-caught	female	mature	none	13-Nov-2015	Shedd Aquarium (R-75)	Bimini, Bahamas	8-Oct-2009

Table S2 (a) Shedd habitat water quality information for the three habitats housing the rays sampled in this study and (b) Shedd habitat and husbandry information for the three habitats housing the rays sampled in this study

Water quality data report mean values over the three weeks containing sampling dates. Abbreviations: Loc., location; Hum. acc., human access; Ster. met., sterilization method; Vol., volume; sub., substrate; bw. freq., backwash frequency; veg., vegetables; car., carnivore; W.T., water temperature

<i>(a)</i>							
Habitat	W.T. (°C)	pH	NO ₂ ⁻ (mg L ⁻¹)	NO ₃ ⁻ (mg L ⁻¹)	NH ₃ (mg L ⁻¹)	Salinity	
CR	27.1	8.01	0.045	50.33	0.02	34.9	
IH	26	8.19	0.01	9.5	0	34.9	
R-75	25.3	7.98	0.015	37.9	0.01	32.1	
<i>(b)</i>							
Habitat	Loc.	Hum. acc.	Ster. met.	Vol. (L)	benthic sub.	bw. freq.	Ray diet
CR	indoor	no	ozone	340,687	sand/gravel	bi-weekly	fish ^A , squid, clam, krill, shrimp, shredded veg., car. gel
IH	indoor	no	UV	37,854	sand/gravel	weekly	fish ^A , squid, clam, krill, shrimp, car. gel
R-75	indoor	no	UV	22,712	sand/gravel	bi-weekly	fish ^A , squid, clam, krill, shrimp, car. gel

^AFish included in the diets were silversides (CR, IH, R-75), capelin (IH, R-75), herring (IH, R-75), and smelt (CR).

Table S3. (a) Organism census for Shedd habitat CR, (b) organism census for Shedd habitat IH, and (c) organism census for habitat R-75

Organism	Common name	Population
(a)		
<i>Abudefduf saxatilis</i>	Sergeant major	1
<i>Acanthurus bahianus</i>	Ocean surgeonfish	19
<i>Acanthurus chirurgus</i>	Doctorfish	19
<i>Acanthurus coeruleus</i>	Blue tang	8
<i>Aluterus scriptus</i>	Scrawled filefish	1
<i>Anisotremus surinamensis</i>	Black margate	1
<i>Anisotremus virginicus</i>	Porkfish	1
<i>Atherinomorus stipes</i>	Hardhead silverside	1
<i>Bodianus rufus</i>	Spanish hogfish	2
<i>Cantherhines macrocerus</i>	Whitespotted filefish	2
<i>Cantherhines pullus</i>	Orangespotted filefish	3
<i>Chaetodipterus faber</i>	Atlantic spadefish	5
<i>Chaetodon capistratus</i>	Foureye butterflyfish	10
<i>Chaetodon ocellatus</i>	Spotfin butterflyfish	9
<i>Chaetodon sedentarius</i>	Reef butterflyfish	24
<i>Chaetodon striatus</i>	Banded butterflyfish	16
<i>Chelonia mydas</i>	Atlantic green sea turtle	1
<i>Chromis cyanea</i>	Blue chromis	77
<i>Dactylopterus volitans</i>	Flying gurnard	1
<i>Diodon holocanthus</i>	Balloonfish	1
<i>Elops saurus</i>	Ladyfish	1
<i>Equetus punctatus</i>	Spotted drum	3
<i>Grama loreto</i>	Fairy basslet	23
<i>Grama melacara</i>	Blackcap basslet	4
<i>Gymnothorax funebris</i>	Green moray	1
<i>Haemulon chrysargyreum</i>	Smallmouth grunt	71
<i>Haemulon flavolineatum</i>	French grunt	16
<i>Haemulon melanurum</i>	Cottonwick	1
<i>Haemulon parra</i>	Sailor's grunt	1
<i>Haemulon striatum</i>	Striped grunt	3
<i>Haemulon vittatum</i>	Boga	57
<i>Halichoeres radiatus</i>	Puddingwife	1
<i>Harengula humeralis</i>	Redear herring	2
<i>Heteropriacanthus cruentatus</i>	Glasseye snapper	4
<i>Holacanthus ciliaris</i>	Queen angelfish	1
<i>Holacanthus tricolor</i>	Rock beauty	3
<i>Holocentrus adscensionis</i>	Longjawed squirrelfish	1
<i>Holocentrus rufus</i>	Longspine squirrelfish	4
<i>Hypanus americanus</i>	Southern stingray	2
<i>Hypoplectrus guttavarius</i>	Shy hamlet	6
<i>Hypoplectrus indigo</i>	Indigo hamlet	2
<i>Hypoplectrus puella</i>	Barred hamlet	6
<i>Hypoplectrus randallorum</i>	Tan Hamlet	1
<i>Hypoplectrus unicolor</i>	Butter hamlet	2
<i>Labroides dimidiatus</i>	Bluestreak cleaner wrasse	4
<i>Lachnolaimus maximus</i>	Hogfish	2
<i>Lactophrys triqueter</i>	Smooth trunkfish	1
<i>Lutjanus buccanella</i>	Blackfin snapper	11
<i>Megalops atlanticus</i>	Atlantic tarpon	3
<i>Melichthys niger</i>	Black durgon	5
<i>Mulloidichthys martinicus</i>	Yellow goatfish	21
<i>Myripristis jacobus</i>	Blackbar soldierfish	24
<i>Neoniphon marianus</i>	Longjaw squirrelfish	2
<i>Ocyurus chrysurus</i>	Yellowtail snapper	3
<i>Panulirus argus</i>	Spiny lobster	4
<i>Paranthias furcifer</i>	Creole-fish	3
<i>Pempheris schomburgkii</i>	Glassy sweeper	144

Organism	Common name	Population
<i>Pomacanthus arcuatus</i>	Gray angelfish	1
<i>Pomacanthus paru</i>	French angelfish	1
<i>Prognathodes aculeatus</i>	Longsnout butterflyfish	6
<i>Prognathodes aya</i>	Bank butterfly	2
<i>Pseudupeneus maculatus</i>	Spotted goatfish	60
<i>Rhinoptera bonasus</i>	Cownose ray	4
<i>Rypticus maculatus</i>	Whitespotted soapfish	1
<i>Sargocentron coruscum</i>	Reef squirrelfish	9
<i>Sargocentron vexillarium</i>	Dusky squirrelfish	1
<i>Scarus iseri</i>	Striped parrotfish	15
<i>Scyllarides aequinoctialis</i>	Shovelnose slipper lobster	1
<i>Selene vomer</i>	Lookdown	13
<i>Serranus tabacarius</i>	Tobaccofish	1
<i>Serranus tigrinus</i>	Harlequin bass	6
<i>Sparisoma aurofrenatum</i>	Redband parrotfish	8
<i>Sparisoma viride</i>	Stoplight parrotfish	2
<i>Sphyrna tiburo</i>	Bonnethead shark	3
<i>Stegastes partitus</i>	Bicolor damselfish	1
<i>Urobatis jamaicensis</i>	Yellow stingray	3
<i>Xanthichthys ringens</i>	Sargassum triggerfish	6
	TOTAL SPECIES	77
	POPULATION TOTAL	789
(b)		
<i>Acanthurus coeruleus</i>	Blue tang	1
<i>Apogon binotatus</i>	Barred cardinalfish	2
<i>Bodianus rufus</i>	Spanish hogfish	1
<i>Centropyge argi</i>	Cherubfish	4
<i>Cyclura cyhlura</i>	Bahamian iguana	1
<i>Diodon holocanthus</i>	Balloonfish	1
<i>Equetus punctatus</i>	Spotted drum	2
<i>Eucidaris tribuloides</i>	Slate pencil urchin	2
<i>Eucinostomus melanopterus</i>	Flagfin mojarra	13
<i>Grama loreto</i>	Fairy basslet	16
<i>Gymnothorax funebris</i>	Green moray	1
<i>Haemulon chrysargyreum</i>	Smallmouth grunt	1
<i>Haemulon flavolineatum</i>	French grunt	4
<i>Haemulon plumieri</i>	White grunt	1
<i>Haemulon sciurus</i>	Bluestripe grunt	5
<i>Halichoeres bivittatus</i>	Slippery dick	6
<i>Halichoeres garnoti</i>	Yellowhead wrasse	6
<i>Holocentrus rufus</i>	Longspine squirrelfish	1
<i>Hypoplectrus guttavarius</i>	Shy hamlet	3
<i>Labrisomus nuchipinnis</i>	Hairy blenny	1
<i>Lutjanus buccanella</i>	Blackfin snapper	3
<i>Melichthys niger</i>	Black durgon	1
<i>Mulloidichthys martinicus</i>	Yellow goatfish	1
<i>Opistognathus aurifrons</i>	Yellowhead jawfish	6
<i>Petrochirus diogenes</i>	Giant hermit crab	1
<i>Prognathodes aculeatus</i>	Longsnout butterflyfish	2
<i>Scarus coeruleus</i>	Blue parrotfish	1
<i>Scarus iseri</i>	Striped parrotfish	3
<i>Serranus tabacarius</i>	Tobaccofish	4
<i>Sparisoma aurofrenatum</i>	Redband parrotfish	1
<i>Strongylura notata</i>	Redfin needlefish	1
<i>Thalassoma bifasciatum</i>	Bluehead wrasse	12
<i>Urobatis jamaicensis</i>	Yellow stingray	2
	TOTAL SPECIES	33
	POPULATION TOTAL	110
(c)		

Organism	Common name	Population
<i>Labroides dimidiatus</i>	Bluestreak cleaner wrasse	10
<i>Urobatis jamaicensis</i>	Yellow stingray	18
	TOTAL SPECIES	2
	POPULATION TOTAL	28

Table S4. PERMANOVA and PERMDISP results from comparisons between yellow stingray-associated microbial communities at three body sites using generalized UniFrac values

Abbreviations: d.f., degrees of freedom; SS, sum of squares; Adj., adjusted. Probabilities are statistically significant at

*, $P < 0.05$

Test	d.f.	SS	Pseudo- F	R^2	Adj. P -value	PERMDISP (adj. P -value)
Gill						
wild v. wild-caught	1	0.377	3.918	0.246	0.0005*	0.039*
Skin						
wild v. wild-caught	1	0.436	4.207	0.260	0.0012*	0.019*
wild v. aquarium-born	1	0.363	3.600	0.231	0.0012*	0.011*
wild-caught v. aquarium-born	1	0.112	1.388	0.147	0.1156	0.482
Cloaca						
wild v. wild-caught	1	0.637	6.526	0.334	0.0009*	0.077
wild v. aquarium-born	1	0.470	4.724	0.267	0.0009*	0.022*
wild-caught v. aquarium-born	1	0.185	2.341	0.227	0.0308*	0.783

Table S5. The eight most abundant phyla based on relative abundance per sample

Means (gill: wild $n = 9$, wild-caught $n = 5$, aquarium-born $n = 1$; skin: wild $n = 9$, wild-caught $n = 5$, aquarium-born $n = 5$; cloaca: wild $n = 10$, wild-caught $n = 5$, aquarium-born $n = 5$) plus or minus the standard error of the mean are reported for each phylum. There were no standard error of means reported for aquarium-born gill samples due to sample size ($n = 1$)

	Wild	Wild-caught	Aquarium-born	
Gill	Proteobacteria (61.8% ± 2.50)	Proteobacteria (77.2% ± 5.16)	Proteobacteria (81.3%)	
	Bacteroidetes (24.4% ± 2.56)	Bacteroidetes (7.8% ± 1.90)	Bacteroidetes (6.8%)	
	Cyanobacteria (2.5% ± 0.48)	Verrucomicrobia (5.6% ± 3.49)	unassigned Bacteria (3.4%)	
	Planctomycetes (2.1% ± 0.37)	unassigned Bacteria (3.2% ± 1.03)	Nanoarchaeaeota (3.0%)	
	unassigned Bacteria (1.9% ± 0.39)	Patescibacteria (1.1% ± 0.53)	Patescibacteria (1.5%)	
	Actinobacteria (1.3% ± 0.30)	Firmicutes (1.1% ± 0.54)	Firmicutes (1.2%)	
	Verrucomicrobia (1.3% ± 0.53)	Actinobacteria (0.8% ± 0.27)	Planctomycetes (1.2%)	
	Firmicutes (0.9% ± 0.18)	Lentisphaerae (0.5% ± 0.34)	Omnitrophicaeota (1.1%)	
	Skin	Proteobacteria (65.7% ± 3.65)	Proteobacteria (81.1% ± 2.89)	Proteobacteria (67.6% ± 4.94)
		Bacteroidetes (22.2% ± 3.24)	Bacteroidetes (5.5% ± 0.59)	Bacteroidetes (15.1% ± 3.57)
Cyanobacteria (2.1% ± 0.62)		Firmicutes (3.3% ± 2.02)	Firmicutes (7.1% ± 3.50)	
Actinobacteria (2.1% ± 0.88)		Nanoarchaeaeota (2.3% ± 1.66)	Verrucomicrobia (2.8% ± 2.07)	
Firmicutes (1.7% ± 0.92)		Patescibacteria (1.6% ± 0.49)	Actinobacteria (2.2% ± 0.64)	
Planctomycetes (1.5% ± 0.30)		Actinobacteria (1.3% ± 0.51)	Patescibacteria (1.4% ± 0.94)	
unassigned Bacteria (1.4% ± 0.39)		Epsilonbacteraeota (1.2% ± 1.03)	Planctomycetes (0.6% ± 0.39)	
Verrucomicrobia (0.5% ± 0.16)		Fusobacteria (1.0% ± 0.83)	Nanoarchaeaeota (0.5% ± 0.53)	
Cloaca		Proteobacteria (63.4% ± 2.51)	Proteobacteria (92.5% ± 3.86)	Proteobacteria (77.7% ± 7.17)
		Bacteroidetes (22.3% ± 2.36)	unassigned Bacteria (4.0% ± 2.44)	Bacteroidetes (8.3% ± 3.38)
	Cyanobacteria (2.6% ± 0.34)	Bacteroidetes (1.7% ± 1.00)	Verrucomicrobia (5.8% ± 4.63)	
	Firmicutes (2.3% ± 1.07)	Firmicutes (0.3% ± 0.23)	Actinobacteria (2.5% ± 0.63)	
	Planctomycetes (2.1% ± 0.42)	Actinobacteria (0.3% ± 0.17)	Firmicutes (2.1% ± 0.93)	
	unassigned Bacteria (1.8% ± 0.41)	Calditrichaeota (0.2% ± 0.20)	unassigned Bacteria (1.6% ± 1.18)	
	Verrucomicrobia (1.2% ± 0.23)	Chlamydiae (0.2% ± 0.18)	Epsilonbacteraeota (0.7% ± 0.69)	
	Actinobacteria (1.2% ± 0.37)	Epsilonbacteraeota (0.1% ± 0.11)	Dadabacteria (0.3% ± 0.3)	

Table S6. The eight most abundant families based on relative abundance per sample

Means (gill: wild $n = 9$, wild-caught $n = 5$, aquarium-born $n = 1$; skin: wild $n = 9$, wild-caught $n = 5$, aquarium-born $n = 5$; cloaca: wild $n = 10$, wild-caught $n = 5$, aquarium-born $n = 5$) plus or minus the standard error of the mean are reported for each family. There were no standard error of means reported for aquarium-born gill samples due to sample size ($n = 1$)

	Wild	Wild-caught	Aquarium-born	
Gill	<i>Rhodobacteraceae</i> (11.2% ± 1.84)	<i>Endozoicomonadaceae</i> (17.5% ± 13.40)	<i>Nitrincolaceae</i> (29.4%)	
	<i>Saprospiraceae</i> (10.8% ± 1.98)	<i>Rhodobacteraceae</i> (15.1% ± 7.10)	<i>Rhodobacteraceae</i> (28.16%)	
	<i>Endozoicomonadaceae</i> (9.4% ± 4.03)	<i>Vibrionaceae</i> (14.1% ± 5.06)	<i>Vibrionaceae</i> (4.9%)	
	<i>Vibrionaceae</i> (6.5% ± 1.68)	<i>Colwelliaceae</i> (7.8% ± 4.02)	<i>Saprospiraceae</i> (3.2%)	
	<i>Flavobacteriaceae</i> (3.4% ± 0.51)	<i>Nitrincolaceae</i> (7.8% ± 4.79)	<i>Colwelliaceae</i> (2.4%)	
	<i>Haliaceae</i> (3.1% ± 0.49)	<i>Rubritaleaceae</i> (5.6% ± 3.90)	<i>Saccharospirillaceae</i> (2.2%)	
	<i>Cyclobacteriaceae</i> (2.9% ± 0.68)	<i>Cryomorphaceae</i> (2.8% ± 0.78)	<i>Salinisphaeraceae</i> (2.2%)	
	<i>Cryomorphaceae</i> (2.2% ± 0.69)	<i>Saprospiraceae</i> (1.6% ± 1.19)	<i>Flavobacteriaceae</i> (2.1%)	
	Skin	<i>Rhodobacteraceae</i> (23.6% ± 6.18)	<i>Rhodobacteraceae</i> (17.9% ± 8.93)	<i>Rhodobacteraceae</i> (16.2% ± 5.68)
		<i>Saprospiraceae</i> (10.4% ± 2.46)	<i>Vibrionaceae</i> (15.5% ± 7.79)	<i>Nitrincolaceae</i> (10.7% ± 8.9)
<i>Cyclobacteriaceae</i> (2.7% ± 0.86)		<i>Nitrincolaceae</i> (10. % ± 5.27)	<i>Cryomorphaceae</i> (6.4% ± 8.9)	
<i>Vibrionaceae</i> (2.7% ± 0.36)		<i>Colwelliaceae</i> (8.4% ± 4.65)	<i>Weeksellaceae</i> (4. % ± 8.9)	
<i>Alteromonadaceae</i> (2.7% ± 0.88)		<i>Burkholderiaceae</i> (5.8% ± 5.08)	<i>Alteromonadaceae</i> (3.9% ± 8.9)	
<i>Flavobacteriaceae</i> (2.6% ± 0.38)		<i>Alteromonadaceae</i> (4.6% ± 1.12)	<i>Moraxellaceae</i> (3. % ± 8.9)	
<i>Moraxellaceae</i> (2.3% ± 1.00)		<i>Shewanellaceae</i> (4.2% ± 3.82)	<i>Colwelliaceae</i> (3.5% ± 0.70)	
<i>NS9 marine group</i> (2.1% ± 0.50)		<i>Moraxellaceae</i> (3.2% ± 2.13)	<i>Vibrionaceae</i> (3.5% ± 1.34)	
Cloaca		<i>Vibrionaceae</i> (16.1% ± 4.9)	<i>Vibrionaceae</i> (77.8% ± 9.47)	<i>Vibrionaceae</i> (19.9% ± 12.33)
	<i>Rhodobacteraceae</i> (12.5% ± 2.0)	<i>Rhodobacteraceae</i> (4.8% ± 2.55)	<i>Nitrincolaceae</i> (12.6% ± 5.09)	
	<i>Saprospiraceae</i> (9.7% ± 2.2)	<i>Nitrincolaceae</i> (2.4% ± 1.60)	<i>Rhodobacteraceae</i> (12.1% ± 4.02)	
	<i>Flavobacteriaceae</i> (3.5% ± 0.61)	<i>Colwelliaceae</i> (2.1% ± 1.31)	<i>Burkholderiaceae</i> (6.6% ± 2.50)	
	<i>Cyclobacteriaceae</i> (2.8% ± 0.52)	<i>Spongiibacteraceae</i> (1.1% ± 1.14)	<i>Rubritaleaceae</i> (5.8% ± 4.15)	
	<i>Haliaceae</i> (2.5% ± 0.43)	<i>Cryomorphaceae</i> (0.8% ± 0.55)	<i>Cryomorphaceae</i> (5.3% ± 2.34)	
	<i>SAR116 clade</i> (1.9% ± 0.81)	<i>Flavobacteriaceae</i> (0.4% ± 0.18)	<i>Alteromonadaceae</i> (2.3% ± 1.04)	
	<i>Cryomorphaceae</i> (1.6% ± 0.49)	<i>Burkholderiaceae</i> (0.3% ± 0.15)	<i>Pseudoalteromonadaceae</i> (1.8% ± 1.43)	

Table S7. The eight most abundant orders based on relative abundance per sample

Means (gill: wild $n = 9$, wild-caught $n = 5$, aquarium-born $n = 1$; skin: wild $n = 9$, wild-caught $n = 5$, aquarium-born $n = 5$; cloaca: wild $n = 10$, wild-caught $n = 5$, aquarium-born $n = 5$) plus or minus the standard error of the mean are reported for each order. There were no standard error of means reported for aquarium-born gill samples due to sample size ($n = 1$)

	Wild	Wild-caught	Aquarium-born
Gill	Chitinophagales (11.3% ± 2.17)	Oceanospirillales (26.1% ± 11.76)	Oceanospirillales (33.8%)
	Rhodobacterales (11.2% ± 1.95)	Rhodobacterales (15.2% ± 7.10)	Rhodobacterales (28.2%)
	Oceanospirillales (11.2% ± 4.17)	Vibrionales (14.1% ± 5.06)	Vibrionales (4.9%)
	Flavobacteriales (8.0% ± 0.89)	Alteromonadales (9.6% ± 3.67)	Alteromonadales (3.9%)
	Vibrionales (6.5% ± 1.79)	Verrucomicrobiales (5.6% ± 3.90)	Flavobacteriales (3.6%)
	Cellvibrionales (4.4% ± 0.81)	Flavobacteriales (4.9% ± 1.46)	Chitinophagales (3.4%)
	Cytophagales (3.7% ± 0.94)	Chitinophagales (1.8% ± 1.18)	unassigned Woesearchaeia (3.0%)
	Alteromonadales (3.3% ± 0.47)	Pseudomonadales (1.4% ± 0.32)	SAR11 clade (2.2%)
	Rhodobacterales (23.6% ± 6.55)	Alteromonadales (18.3% ± 5.71)	Flavobacteriales (12.7% ± 4.19)
	Chitinophagales (11.2% ± 2.70)	Rhodobacterales (17.9% ± 8.93)	Rhodobacterales (12.6% ± 5.46)
Flavobacteriales (6.8% ± 1.18)	Vibrionales (15.5% ± 7.79)	Alteromonadales (12.5% ± 3.17)	
Alteromonadales (6.6% ± 1.25)	Oceanospirillales (11.8% ± 5.04)	Oceanospirillales (9.7% ± 4.92)	
Oceanospirillales (3.5% ± 0.84)	Betaproteobacteriales (6.1% ± 5.19)	Pseudomonadales (5.1% ± 0.98)	
Cytophagales (3.4% ± 0.88)	Flavobacteriales (4.2% ± 1.05)	Vibrionales (4.2% ± 1.27)	
Pseudomonadales (2.8% ± 0.77)	Pseudomonadales (3.8% ± 2.22)	Verrucomicrobiales (3.0% ± 2.04)	
Vibrionales (2.7% ± 0.38)	unassigned Woesearchaeia (2.2% ± 1.86)	Cytophagales (2.8% ± 1.77)	
Cloaca	Vibrionales (16.1% ± 4.67)	Vibrionales (77.8% ± 9.47)	Vibrionales (19.9% ± 13.78)
	Rhodobacterales (12.5% ± 1.88)	Rhodobacterales (4.8% ± 2.55)	Oceanospirillales (15.1% ± 4.77)
	Chitinophagales (10.3% ± 2.07)	Oceanospirillales (2.9% ± 1.60)	Rhodobacterales (12.1% ± 4.50)
	Flavobacteriales (6.9% ± 0.82)	Alteromonadales (2.7% ± 1.74)	Flavobacteriales (6.8% ± 3.08)
	Alteromonadales (5.0% ± 0.99)	Cellvibrionales (1.4% ± 1.31)	Betaproteobacteriales (6.6% ± 2.80)
	Cellvibrionales (4.3% ± 0.53)	Flavobacteriales (1.3% ± 0.66)	Verrucomicrobiales (5.8% ± 4.64)
	Cytophagales (3.9% ± 0.63)	unassigned γ -proteobacteria (0.8% ± 0.64)	Alteromonadales (5.0% ± 1.97)
	Oceanospirillales (2.4% ± 0.26)	Betaproteobacteriales (0.4% ± 0.19)	Rhizobiales (3.1% ± 2.37)

Table S8. The eight most abundant genera based on relative abundance per sample

Means (gill: wild $n = 9$, wild-caught $n = 5$, aquarium-born $n = 1$; skin: wild $n = 9$, wild-caught $n = 5$, aquarium-born $n = 5$; cloaca: wild $n = 10$, wild-caught $n = 5$, aquarium-born $n = 5$) plus or minus the standard error of the mean are reported for each genus. Abbreviations: uncult., uncultured. There were no standard error of means reported for aquarium-born gill families due to sample size ($n = 1$)

	Wild	Wild-caught	Aquarium-born
Gill	<i>Endozoicomonas</i> (9.4% ± 6.18)	<i>Endozoicomonas</i> (17.5% ± 13.40)	uncult. Nitrospiraceae (28.2%)
	<i>Lewinella</i> (5.5% ± 2.46)	unassigned Rhodobacteraceae (14.4% ± 7.13)	unassigned Rhodobacteraceae (28.2%)
	<i>Vibrio</i> (4.7% ± 0.86)	<i>Vibrio</i> (11.6% ± 4.27)	<i>Vibrio</i> (4.9%)
	unassigned Rhodobacteraceae (4.6% ± 0.36)	<i>Thalassotalea</i> (7.8% ± 4.04)	unassigned Woeseearchaeia (3.0%)
	<i>HIMB11</i> (Rhodobacteraceae) (2.7% ± 0.88)	uncult. Nitrospiraceae (7.4% ± 4.75)	<i>Thalassotalea</i> (2.4%)
	uncult. Saprospiraceae (2.6% ± 0.38)	<i>Rubritalea</i> (5.4% ± 3.72)	<i>Salinisphaera</i> (2.2%)
	uncult. Cryomorphaceae (2.3% ± 1.00)	uncult. Cryomorphaceae (3.2% ± 0.80)	<i>Litoribacillus</i> (2.2%)
	uncult. Cyclobacteriaceae (2.1% ± 0.50)	<i>Photobacterium</i> (1.9% ± 0.76)	Clade Ia (SAR11) (2.0%)
	Skin	unassigned Rhodobacteraceae (18.0% ± 6.95)	unassigned Rhodobacteraceae (16.8% ± 8.64)
<i>Lewinella</i> (5.3% ± 1.36)		<i>Vibrio</i> (13.1% ± 6.70)	uncult. Nitrospiraceae (9.9% ± 4.27)
uncult. Saprospiraceae (3.1% ± 0.81)		uncult. Nitrospiraceae (8.9% ± 5.74)	uncult. Cryomorphaceae (6.4% ± 2.14)
<i>Vibrio</i> (2.1% ± 0.40)		<i>Thalassotalea</i> (8.3% ± 4.63)	<i>Cloacibacterium</i> (3.7% ± 3.75)
<i>Alteromonas</i> (1.9% ± 0.70)		<i>Shewanella</i> (3.9% ± 3.81)	<i>Acinetobacter</i> (3.5% ± 1.25)
uncult. Cyclobacteriaceae (1.7% ± 0.87)		uncult. Alteromonadaceae (2.6% ± 1.27)	<i>Staphylococcus</i> (3.3% ± 2.79)
<i>HIMB11</i> (Rhodobacteraceae) (1.6% ± 0.86)		uncult. Cryomorphaceae (2.2% ± 0.74)	<i>Vibrio</i> (3.1% ± 1.26)
unassigned NS9 marine group (1.5% ± 0.47)		unassigned Woeseearchaeia (2.2% ± 1.86)	<i>Thalassotalea</i> (2.9% ± 0.70)
Cloaca		<i>Photobacterium</i> (10.3% ± 5.15)	<i>Photobacterium</i> (56.3% ± 16.09)
	unassigned Rhodobacteraceae (6.1% ± 1.27)	<i>Vibrio</i> (21.3% ± 18.79)	uncult. Nitrospiraceae (12.0% ± 5.93)
	<i>Vibrio</i> (4.6% ± 1.23)	unassigned Rhodobacteraceae (4.2% ± 2.38)	unassigned Rhodobacteraceae (10.7% ± 4.79)
	<i>Lewinella</i> (4.43% ± 1.41)	uncult. Nitrospiraceae (2.3% ± 1.65)	<i>Rubritalea</i> (5.8% ± 4.64)
	uncult. Saprospiraceae (3.2% ± 0.58)	<i>Thalassotalea</i> (2.1% ± 1.31)	uncult. Cryomorphaceae (5.3% ± 2.61)
	<i>HIMB11</i> (Rhodobacteraceae) (2.6% ± 1.16)	uncult. Cryomorphaceae (0.8% ± 0.55)	<i>Vibrio</i> (4.7% ± 1.88)
	uncult. Cyclobacteriaceae (1.8% ± 0.43)	unassigned Spongiibacteraceae (0.8% ± 0.84)	<i>Pelmonas</i> (2.7% ± 1.31)
	<i>OM60</i> (<i>NOR5</i>) clade (1.6% ± 0.34)	unassigned γ -proteobacteria (0.8% ± 0.64)	<i>Pseudoalteromonas</i> (1.8% ± 1.60)