

Table S1. Microorganism genera associated with sea cucumbers.

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
Bacteria			
<i>Acidovorax</i> sp.	<i>Apostichopus japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Acinetobacter schindleri</i>	<i>Holothuria leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Acinetobacter</i> sp.	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
<i>Aeromonas</i> sp.	<i>A. japonicus</i>	PO: Alekseev Bay and Kiyevka Bay, Sea of Japan, Russia	[33]
<i>Agrobacterium</i> sp.	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Ahrensia kielensis</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Aliivibrio logei</i>	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Alteromonas</i> sp.	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Bacillus altitudinis</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus amyloliquefaciens</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Bacillus aquaemaris</i>	<i>H. leucospilota</i>	PO: Dayang Bunting Island, Yan, Kedah Darul Aman, Malaysia	[31]
<i>Bacillus aquimaris</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus aryabhattai</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Bacillus cereus</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Bacillus clarkii</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus clausii</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus farraginis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Bacillus firmus</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Bacillus gibsonii</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus horikoshii</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Bacillus horneckiae</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus hunanensis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]

Table S1. *cont.*

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Bacillus hwaiaensis</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus idriensis</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Bacillus lehensis</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus licheniformis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Bacillus marisflavi</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus megaterium</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus methylotrophicus</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Bacillus murimartini</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus oshimensis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus patagoniensis</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus plakortidis</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus polygoni</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus pseudofirmus</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Bacillus pumilus</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus safensis</i>	<i>Stichopus vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Bacillus stratosphericus</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Bacillus subtilis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Bacillus vietnamensis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]

Table S1. *cont.*

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Bacillus</i> sp.	<i>A. japonicus</i>	PO: Alekseev Bay and Kiyevka Bay, Sea of Japan, Russia	[33]
	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
	<i>Holothuria atra</i>	PO: Pangkor Island, Perak, Malaysia	[30]
	<i>H. leucospilota</i>	PO: Dayang Bunting Island, Yan, Kedah Darul Aman, Malaysia	[31]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Brachybacterium paraconglomeratum</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
<i>Brevibacterium luteolum</i>	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Brevibacterium</i> sp.	<i>A. japonicus</i>	Not mentioned	[23]
<i>Cellulosimicrobium funkei</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Colwellia aestuarii</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Colwellia</i> sp.	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Corynebacterium pilbarens</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Cytophaga</i> sp.	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Dermacoccus nishinomiyaensis</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Dermacoccus profundus</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Dietzia maris</i>	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Enterobacter</i> sp.	<i>A. japonicus</i>	PO: Alekseev Bay and Kiyevka Bay, Sea of Japan, Russia	[33]
<i>Epibacterium mobile</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Erythrobacter vulgaris</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Exiguobacterium acetylicum</i>	<i>Stichopus badionotus</i>	PO: Peninsular Malaysia, Malaysia	[26]
<i>Exiguobacterium aestuarii</i>	<i>H. leucospilota</i>	PO: Dayang Bunting Island, Yan, Kedah Darul Aman, Malaysia	[31]
<i>Exiguobacterium profundum</i>	<i>S. badionotus</i>	PO: Peninsular Malaysia, Malaysia	[26]
<i>Ferrimonas senticii</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Flavobacterium</i> sp.	<i>A. japonicus</i>	PO: Kiyevka Bay, Sea of Japan, Russia	[33]

Table S1. *cont.*

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Geomicrobium halophilum</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Glutamicibacter protophormiae</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
<i>Glutamicibacter</i> sp.	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Gracilibacillus dipsosauri</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Gracilibacillus halotolerans</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Gracilibacillus saliphilus</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Gracilibacillus ureilyticus</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Halobacillus kuroshimensis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
<i>Halobacillus salinus</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Halobacillus trueperi</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Halobacillus</i> sp.	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Halolactibacillus alkaliphilus</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Halomonas denitrificans</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Halomonas</i> sp.	<i>A. japonicus</i>	PO: Kiyevka Bay, Sea of Japan, Russia	[33]
<i>Iamia majanohamensis</i>	<i>Holothuria edulis</i>	PO: Coast of Aka Island, Okinawa prefecture, Japan	[18]
<i>Isoptericola chiayiensis</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Janibacter alkaliphilus</i>	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Janibacter anophelis</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Janibacter melonis</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Klebsiella</i> sp.	<i>H. atra</i>	PO: Pangkor Island, Perak, Malaysia	[30]
<i>Kocuria flava</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Kocuria palustris</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Kytococcus sedentarius</i>	<i>Stichopus chloronotus</i>	PO: Tioman Island, Pahang Darul Makmur, Malaysia	[31]
	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]

Table S1. *cont.*

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Lacinutrix copepodicola</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Lacinutrix</i> sp.	<i>A. japonicus</i>	PO: Funka Bay and Ainuma fishing port, Hokkaido, Japan	[24]
<i>Lysinibacillus fusiformis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Maribacter aquivivus</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Marinobacterium</i> sp.	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
<i>Marinomonas pontica</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Marinomonas</i> sp.	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
<i>Marinosulfonomonas methylotropha</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Microbacterium paraoxydans</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
<i>Microbacterium</i> sp.	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
<i>Micrococcus aloeverae</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Micrococcus aquilus</i>	<i>S. chloronotus</i>	PO: Tioman Island, Pahang Darul Makmur, Malaysia	[31]
<i>Micrococcus endophyticus</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Micrococcus flavus</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Micrococcus luteus</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
	<i>S. chloronotus</i>	PO: Tioman Island, Pahang Darul Makmur, Malaysia	[31]
<i>Micrococcus terreus</i>	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Micrococcus yunnanensis</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
<i>Micrococcus</i> sp.	<i>A. japonicus</i>	PO: Alekseev Bay and Kiyevka Bay, Sea of Japan, Russia	[33]
	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Nocardioides exalbidus</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Nocardiopsis lucentensis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Nocardiopsis salina</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Nocardiopsis terrae</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
<i>Oceanisphaera</i> sp.	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
<i>Oceanobacillus chironomi</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Oceanobacillus iheyensis</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Oceanobacillus kimchii</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Oceanobacillus oncorhynchi</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]

Table S1. *cont.*

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Oceanobacillus picturae</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Oceanobacillus profundus</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Oceanobacillus sojiae</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Octadecabacter</i> sp.	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Ornithinimicrobium kibberense</i>	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Pantoea septica</i>	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Paracoccus marinus</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Paracoccus koreensis</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Paracoccus sulfuroxidans</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Paraoerskovia marina</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Photobacterium rosenbergii</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Planococcus</i> sp.	<i>S. badionotus</i>	PO: Peninsular Malaysia, Malaysia	[26]
<i>Pseudidiomarina</i> sp.	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
<i>Pseudoalteromonas arctica</i>	<i>A. japonicus</i>	PO: Funka Bay and Ainuma fishing port, Hokkaido, Japan	[24]
<i>Pseudoalteromonas burtonensis</i>	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Pseudoalteromonas elyakovii</i>	<i>A. japonicus</i>	PO: Funka Bay and Ainuma fishing port, Hokkaido, Japan	[24]
<i>Pseudoalteromonas lipolytica</i>	<i>A. japonicus</i>	PO: Geomun-do, Yeosu, Korea	[34]
<i>Pseudoalteromonas luteoviolacea</i>	<i>S. badionotus</i>	PO: Peninsular Malaysia, Malaysia	[26]
<i>Pseudoalteromonas marina</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Pseudoalteromonas mariniglutinosa</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Pseudoalteromonas prydzensis</i>	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Pseudoalteromonas tetraodonis</i>	<i>A. japonicus</i>	PO: Geomun-do, Yeosu, Korea	[34]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Pseudoalteromonas</i> sp.	<i>A. japonicus</i>	PO: Kiyevka Bay, Sea of Japan, Russia	[33]
	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
<i>Pseudomonas alcaligenes</i>	<i>H. leucospilota</i>	PO: Dayang Bunting Island, Yan, Kedah Darul Aman, Malaysia	[31]
<i>Pseudomonas cedrina</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]

Table S1. cont.

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Pseudomonas gessardii</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Pseudomonas mosselii</i>	<i>H. leucospilota</i>	PO: Dayang Bunting Island, Yan, Kedah Darul Aman, Malaysia	[31]
<i>Pseudomonas stutzeri</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
	<i>H. leucospilota</i>	PO: Dayang Bunting Island, Yan, Kedah Darul Aman, Malaysia	[31]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Pseudomonas</i> sp.	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
	<i>A. japonicus</i>	PO: Alekseev Bay and Kiyevka Bay, Sea of Japan, Russia	[33]
	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
<i>Pseudopropionibacterium</i> sp.	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Pseudovibrio japonicus</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Psychrobacter celer</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Psychrobacter marincola</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Psychrobacter okhotskensis</i>	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Psychrobacter</i> sp.	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
	<i>S. badionotus</i>	PO: Peninsular Malaysia, Malaysia	[26]
<i>Psychromonas arctica</i>	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Psychroserpens burtonensis</i>	<i>A. japonicus</i>	PO: Funka Bay and Ainuma fishing port, Hokkaido, Japan	[24]
<i>Psychroserpens</i> sp.	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Roseobacter</i> sp.	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Rothia amarae</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
	<i>S. chloronotus</i>	PO: Tioman Island, Pahang Darul Makmur, Malaysia	[31]
<i>Rothia kristinae</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Ruegeria lacuscaerulensis</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Salsuginibacillus kocurii</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Serinicoccus profundus</i>	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Shewanella baltica</i>	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Shewanella frigidimarina</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Shewanella gaetbuli</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Shewanella kaireitica</i>	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Shewanella marisflavi</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]

Table S1. *cont.*

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Shewanella pacifica</i>	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Shewanella</i> sp.	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
<i>Sphingomonas echinoides</i>	<i>S. badionotus</i>	PO: Peninsular Malaysia, Malaysia	[26]
<i>Sphingomonas</i> sp.	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Sporosarcina saromensis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Sporosarcina</i> sp.	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Staphylococcus arlettae</i>	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Staphylococcus cohnii</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Staphylococcus edaphicus</i>	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Staphylococcus haemolyticus</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Staphylococcus pasteurii</i>	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Staphylococcus warneri</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Stenotrophomonas maltophilia</i>	<i>H. leucospilota</i>	PO: Dayang Bunting Island, Yan, Kedah Darul Aman, Malaysia	[31]
<i>Streptomyces cavourensis</i>	<i>S. vastus</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Streptomyces variabilis</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
<i>Streptomyces</i> sp.	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	IO: Larak Island, Persian Gulf, Iran	[19]
<i>Ulvibacter</i> sp.	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Vibrio alginolyticus</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Vibrio azureus</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Vibrio brasiliensis</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Vibrio communis</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Vibrio cyclitrophicus</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Vibrio ezurae</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Vibrio galicus</i>	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]

Table S1. *cont.*

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Vibrio gigantis</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Vibrio haliotocoli</i>	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
<i>Vibrio harveyi</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
	<i>S. badionotus</i>	PO: Peninsular Malaysia, Malaysia	[26]
<i>Vibrio mediterranei</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Vibrio natriegens</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Vibrio neptunius</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Vibrio owensii</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
<i>Vibrio parahaemolyticus</i>	<i>S. badionotus</i>	PO: Peninsular Malaysia, Malaysia	[26]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Vibrio rotiferianus</i>	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Vibrio splendidus</i>	<i>A. japonicus</i>	PO: Funka Bay and Ainuma fishing port, Hokkaido, Japan	[24]
<i>Vibrio tasmaniensis</i>	<i>A. japonicus</i>	PO: Ainuma fishing port, Hokkaido, Japan	[24]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Vibrio</i> sp.	<i>A. japonicus</i>	PO: Alekseev Bay and Kiyevka Bay, Sea of Japan, Russia	[33]
	<i>A. japonicus</i>	PO: Ningde, Fujian, China	[32]
	<i>H. leucospilota</i>	PO: Dayang Bunting Island, Yan, Kedah Darul Aman, Malaysia	[31]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
	<i>H. leucospilota</i>	PO: Sari Ringgung, Lampung, Indonesia	[25]
	<i>S. badionotus</i>	PO: Peninsular Malaysia, Malaysia	[26]
<i>Virgibacillus chiguensis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Virgibacillus dokdonensis</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
	<i>H. leucospilota</i>	PO: Koe-cho, Nagasaki, Japan	[4]
<i>Virgibacillus halodenitrificans</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Virgibacillus marismortui</i>	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Virgibacillus olivae</i>	<i>A. japonicus</i>	PO: Xiaoshi Island, Weihai, China	[6]
<i>Virgibacillus</i> sp.	<i>A. japonicus</i>	PO: Kushima, Omura, Nagasaki, Japan	[17]
<i>Williamsia muralis</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]

Table S1. *cont.*

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Winogradskyella eximia</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Winogradskyella thalassocola</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Zobellia amurskyensis</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
<i>Zobellia russellii</i>	<i>A. japonicus</i>	PO: Funka Bay, Hokkaido, Japan	[24]
Fungi			
<i>Acremonium alternatum</i>	<i>Holothuria poli</i>	AO: Tabarka, Tunisia	[22]
<i>Acremonium charticola</i>	<i>Eupentacta fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Acremonium fusidioides</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Acremonium implicatum</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Acremonium kiliense</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Acremonium striatisporum</i>	<i>E. fraudatrix</i>	PO: Kitovoe Rebro Bay, Sea of Japan, Russia	[21]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Acremonium trachycaulon</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Acrostalagmus luteoalbus</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Alternaria alternata</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Alternaria</i> sp.	Unidentified	PO: Weihai, Yellow Sea, China	[27]
	Unidentified	PO: Zhifu Island, Yantai, China	[28]
<i>Aspergillus awamori</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus creber</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus eburneocreus</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Aspergillus flavus</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Aspergillus foetidus</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus fructus</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus fumigatus</i>	<i>Stichopus japonicus</i>	PO: Lingshan Island, Qingdao, China	[41]
<i>Aspergillus insuetus</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus micronesiensis</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]

Table S1. *cont.*

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Aspergillus nidulans</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus niger</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus ochraceus</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus polyporicola</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus protuberus</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus pseudodeflectus</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus spelaeus</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus sydowii</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus terreus</i>	<i>A. japonicus</i>	PO: Zhifu Island, Yantai, China	[39]
<i>Aspergillus tubingensis</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus versicolor</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Aspergillus</i> sp.	<i>Cucumaria japonica</i>	PO: South China Sea, China	[36]
	<i>Holothuria nobilis</i>	SO: the Antarctic	[35]
	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
	<i>S. japonicus</i>	PO: Lingshan Island, Qingdao, China	[42]
<i>Aureobasidium pullulans</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Auxarthron ostraviense</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Beauveria alba</i>	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Botryophialophora</i> sp.	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Cadophora luteo-olivacea</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Chaetomium globosum</i>	<i>A. japonicus</i>	PO: Chengshantou Island, Weihai, China	[29]
	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Chaetomium olivaceum</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Chaetomium subaffine</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Chaetomium</i> sp.	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Cladosporium atospermum</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>C. japonica</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]

Table S1. *cont.*

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Cladosporium brevicompactum</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>C. japonica</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Cladosporium oxysporum</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Cladosporium sphaerospermum</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>C. japonica</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Dendrodochium</i> sp.	<i>H. nobilis</i>	PO: South China Sea, China	[37]
<i>Dendryphiella arenaria</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Emericella quadrilineata</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Epicoccum</i> st. <i>Phoma</i> sp.	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Epicoccum</i> sp.	<i>A. japonicus</i>	PO: Yantai, China	[40]
	Unidentified	PO: Weihai, Yellow Sea, China	[43]
<i>Fusarium</i> sp.	Unidentified	PO: Yantai, China	[45]
<i>Myriodontium keratinophilum</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Myrothecium verrucaria</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Oidiodendron truncatum</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Oidiodendron</i> sp.	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Paecilomyces lilacinus</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Penicillium adametzii</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Penicillium antarcticum</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Penicillium brevicompactum</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Penicillium chrysogenum</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Penicillium citreonigrum</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Penicillium citrinum</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]

Table S1. *cont.*

Microorganisms	Host Sea Cucumbers	Geographical Location*	References
<i>Penicillium commune</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Penicillium corylophilum</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Penicillium herquei</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Penicillium implicatum</i>	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Penicillium oxalicum</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Penicillium roqueforti</i>	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Penicillium roseopurpureum</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Penicillium skrjabinii</i>	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Penicillium steckii</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Phialemonium</i> sp.	<i>H. nobilis</i>	PO: South China Sea, China	[38]
<i>Phialophorophoma</i> sp.	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Stachybotrys chartarum</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Stilbella aciculosa</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Tilachlidium</i> sp.	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Trichoderma aureoviride</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Trichoderma epimyces</i>	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Trichoderma harzianum</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>H. poli</i>	AO: Tabarka, Tunisia	[22]
<i>Trichoderma viride</i>	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Trichoderma</i> sp.	Unidentified	PO: Chengshantou Island, Weihai, China	[44]
<i>Ulocladium</i> sp.	<i>A. japonicus</i>	PO: Sea of Japan, Primorye, Russia	[20]
	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]
<i>Verticillium tenerum</i>	<i>E. fraudatrix</i>	PO: Sea of Japan, Primorye, Russia	[20]

*Symbols of world principal oceanic areas: AO, Atlantic Ocean; ArO, Arctic Ocean; IO, Indian Ocean; PO, Pacific Ocean; SO, Southern Ocean (Antarctic Ocean).