

Supplementary Material

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1. Collection of samples

Seawater samples for eDNA analysis were collected with Niskin bottles during three oceanographic cruises (TAN1711, ATACAMEX and SO261) conducted in the Kermadec and Atacama trenches of the South Pacific Ocean. The TAN1711 cruise with the RV *Tangaroa* (from November 24th to December 14th, 2017) covered a transect from New Zealand (41°18'S, 174°47'W) to the Northern Kermadec Trench (21°01'S, 175°12'W), involving four oceanographic stations. Both the ATACAMEX cruise with the RV *Cabo de hornos* (from January 28th to February 4st, 2018) and SO261 cruise with RV *Sonne* (March 2nd to April 2nd, 2018) were carried out in the deepest region of the trench (20°19'S — 24°15'S off northern Chile, Fig. 1, Table S1). Each sample was filtered across a hydrophilic 20- μ m nylon membrane (Merck Millipore, Massachusetts, USA) and filtered onto a Sterivex filter using a peristaltic pump. The membrane filter containing captured eDNA and cellular material from the water column was filled with lysis buffer and stored at -80°C.

2. Amplicon generation and sequencing

DNA extraction

DNA extractions were carried out by Genoscope (Évry, France) using the same protocol as described by Alberti et al. (2017)¹ for Tara Oceans water samples. The protocol is based on cryogenic grinding of membrane filters, followed by nucleic acid extraction with NucleoSpin RNA kits combined with the NucleoSpin DNA buffer set (Macherey–Nagel, Düren, Germany). A negative extraction control was performed alongside sample extractions, adding nothing in the place of sample in the first extraction step.

PCR amplification

Primers for PCR amplification used in this study, targeting metazoans with the COI and 18S-V1V2 loci markers.

Locus	Target	Primers	Sequence (5'-3')	Amplicon size (bp)
COI ²	Eukaryotes (pref. Metazoans)	mICOLintF	GGWACWGGWTGAACWGTWTAYCCYCC	~313
		tgHCO2198	TAIACYTCIGGRTGICRAARAAYCA	
18S-V1V2 ³	Eukaryotes (pref. Metazoans)	SSUF04	GCTTGTCTCAAAGATTAAGCC	330-390
		SSURmod	CCTGCTGCCTTCCTTRGA	

The COI metabarcodes were generated using the mICOLintF and tgHCO2198 primers (Table S1, Leray et al. 2013²). The PCR reactions (20 μ L final volume) contained 2.5 ng or less of total DNA template with 0.5 μ M final concentration of each primer, 3% of DMSO, 0.175 mM final concentration of dNTPs, and 1X Advantage 2 Polymerase Mix (Takara Bio, Kusatsu, Japan). Nested PCR amplifications were carried out in triplicates and consisted of an initial denaturation at 95 °C for 10 min, and 16 cycles of 10 s at 95°C, 30 s at 62 °C (-1° C per cycle), 60 s at 68 °C followed by 15 cycles of 95 °C for 10 s, 30 s at 46°C, 68 °C for 60 s, and a final extension of 68 °C for 7 min.

The 18S-V1V2 metabarcodes were generated using the SSUF04 and SSUR22mod primers (Table S1, Sinniger et al., 2016³) and the Phusion High Fidelity PCR Master Mix with GC buffer (ThermoFisher Scientific, Waltham, MA, USA). The PCR reactions (25 μ L final volume) contained 2.5 ng or less of DNA template with 0.4 μ M concentration of each primer, 3% of DMSO, and 1X Phusion Master Mix.

PCR amplifications (98 °C for 30 s; 25 cycles of 10 s at 98 °C, 30 s at 45 °C, 30 s at 72 °C; and 72 °C for 10 min) of all samples were carried out in triplicate in order to smooth the intra-sample variance while obtaining sufficient amounts of amplicons for Illumina sequencing. Amplicon triplicates were pooled and PCR products were purified using 1X AMPure XP beads (Beckman Coulter, Brea, CA, USA) cleanup. Aliquots of purified amplicons were run on an Agilent Bioanalyzer using the DNA High Sensitivity LabChip kit (Agilent Technologies, Santa Clara, CA, USA) to check their lengths, and quantified with a Qubit fluorometer (Invitrogen, Carlsbad, CA, USA).

Clean-up

The PCR products were pooled and cleaned using 1X AMPure XP beads, and amplicon lengths were checked with the DNA High Sensitivity LabChip kit (Agilent Technologies, Santa Clara, CA, USA). Subsequently the concentration of the purified PCR products was quantified with a Qubit fluorometer (Invitrogen, Carlsbad, CA, USA).

Amplicon library preparation

From each purified PCR product pool, one hundred ng were end-repaired, A-tailed and ligated to Illumina adapters on a Biomek FX Laboratory Automation Workstation (Beckman Coulter, Brea, CA, USA). Afterwards, each library was amplified using a Kapa Hifi HotStart NGS library Amplification kit (Kapa Biosystems, Wilmington, MA, USA) and purified again with 1X AMPure XP beads.

Sequencing library quality control

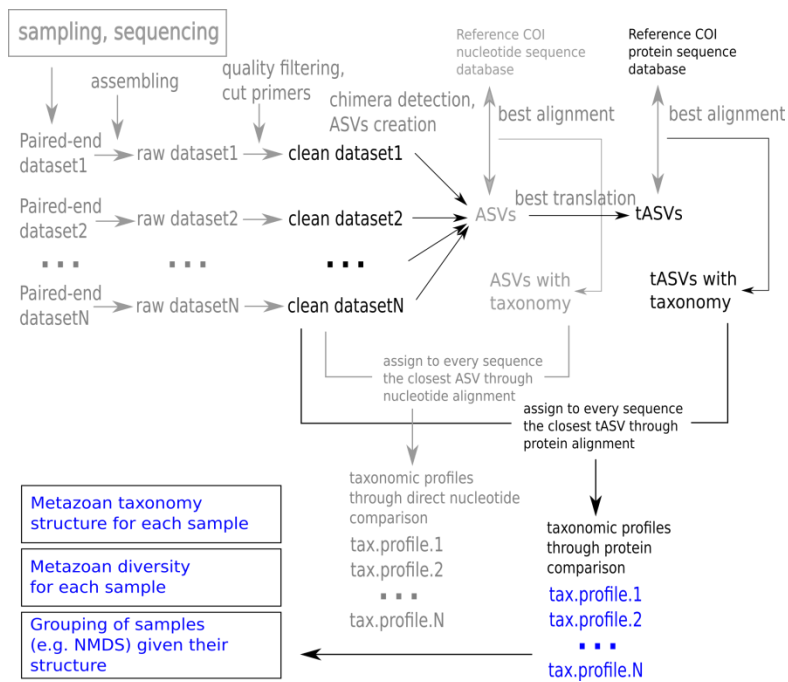
Libraries were quantified with both a Quant-iT dsDNA HS assay kits using a Fluoroskan Ascent microplate fluorometer (Thermo Fisher Scientific, Waltham, MA, USA) and qPCR with the KAPA Library Quantification Kit for Illumina Libraries (Kapa Biosystems, Wilmington, MA, USA) on a MxPro instrument (Agilent Technologies, Santa Clara, CA, USA). A high-throughput microfluidic capillary electrophoresis system (LabChip GX, Perkin Elmer, Waltham, MA, USA) was used to assess the library profiles.

Sequencing procedures

The concentrations of all libraries were normalized to 10 nM by addition of 10 mM Tris-Cl (pH 8.5) and clusters generated according to the Illumina Cbot User Guide (Part # 15006165). Paired-end sequencing (2×250bp) of the libraries was performed on either the HiSeq 4000 or HiSeq 2500 instruments (Illumina, San Diego, CA, USA). In order to enhance the sequence quality and counteracting the low contrast of the first few bp due to adapters and primers, the loading concentration of the libraries was reduced from 12-14 pM to 8-9 pM, while PhiX DNA spike-in was increased (20% instead of 1%). Sequencing was otherwise performed according to the HiSeq 4000 System User Guideline (Part # 15011190) and the HiSeq 2500 System User Guideline (Part # 15035786).

3. Sequence analysis

COI sequence datasets: The following is a sketch of the sequence analysis of the COI metabarcoding sequences:



Paired-end reads were assembled and quality filtered with vsearch⁴ (version 2.17.1), using the parameters maxEE of 0.5, minimum length of 250 bp, and maximum length of 500 bp. The primers in the resulting metabarcoding sequences were detected removed with pTrimmer⁵ (version 1.3.4). The sequences lacking the primers were discarded. All the sequences from all the datasets were then merged into a single file and the unique sequences were discriminated with vsearch. Chimeras were then removed with the same program and in the same process, the Amplicon Sequence Variants (ASVs) were created. To reduce complexity and to establish yet another filtering procedure these ASVs were then translated into protein sequences (translated ASV or tASV), using the longest translation of the six open reading frames using the 33 translation tables (genetic codes) known to date. Since the COI region amplified by the primers has an approximate size of 300 bp, the tASV shorter than 90 amino acids were discarded. The retained tASVs were aligned against a custom reference sequence database of COI sequences with BLASTP (bitscore cutoff of 50). This reference COI sequences database was constructed with the COI protein sequences from the NCBI mitochondrial RefSeq database⁶ plus the complete COI sequences from the COI-arbitrator database⁷ and the bacterial COX1/COI sequences from the COG0843 in the COG database⁸. The bacterial sequences were included because it has been reported that the metazoan COI primers could potentially amplify bacterial sequences⁹, and with this procedure they were identified and discarded for further analysis of metazoa. The sequences from all the datasets were then compared (through BLASTX, with a bitscore cutoff of 50) with the tASVs database and assigned taxonomy accordingly to construct the taxonomic profiles for each sample.

18S V1V2 sequence datasets: The procedure for these datasets was similar to the previously described for the COI sequence datasets, except that in this case the ASVs were directly compared as nucleotide

sequences using BLASTN (parameter task dc-megablast, bitscore cutoff of 50) against the SILVA database¹⁰ (version 138.1), to construct the corresponding taxonomic profiles.

Phylogenetic analyses: The phylogenetic trees of 18S ASVs in the Figures S5, S6 and S7 were constructed as follows. First, reference sequences for hydrozoans, copepods and tunicates were collected from the literature and from respective searches in Genbank, generating separate datasets for each taxonomic group (Tables S5, S6 and S7). These datasets were complemented with the ASVs sequences associated with each taxonomic group according to the previously described procedure (comparison with the SILVA database). Second, these datasets of sequences were then aligned with mafft¹¹ with parameters for high accuracy (defined in the documentation of this software). The respective alignments were used to create phylogenetic trees with IQ-TREE2¹² with parameters (-nt AUTO, -ntop 50, -nbest 10, -nstop 1000 and -bb 1000). Third, the resulting consensus phylogenetic trees (Newick format) were edited with Bosque¹³ (available at <https://inf.imo-chile.cl/software/bosque.html>) and Inkscape.

4. Supplementary figures

Figure S1. Taxonomic composition in terms of presence/absence and relative abundances of the 18S ASVs and COI translated ASVs. The names of the samples are split into three parts, encoding the name of the cruise/station, the water filter size range ("02" for the range 0.2-3 μm , and "3" for the range 3-20 μm), and the depth (meters), respectively. More details about the samples in Table S1. Note that ctenophores and tunicates were not detected with the COI metabarcodes, while placozoans and Porifera were detected in COI but not in the 18S data. These differences most likely reflect the differential taxonomic affinity of the primers already reported in the literature^{14,15}.

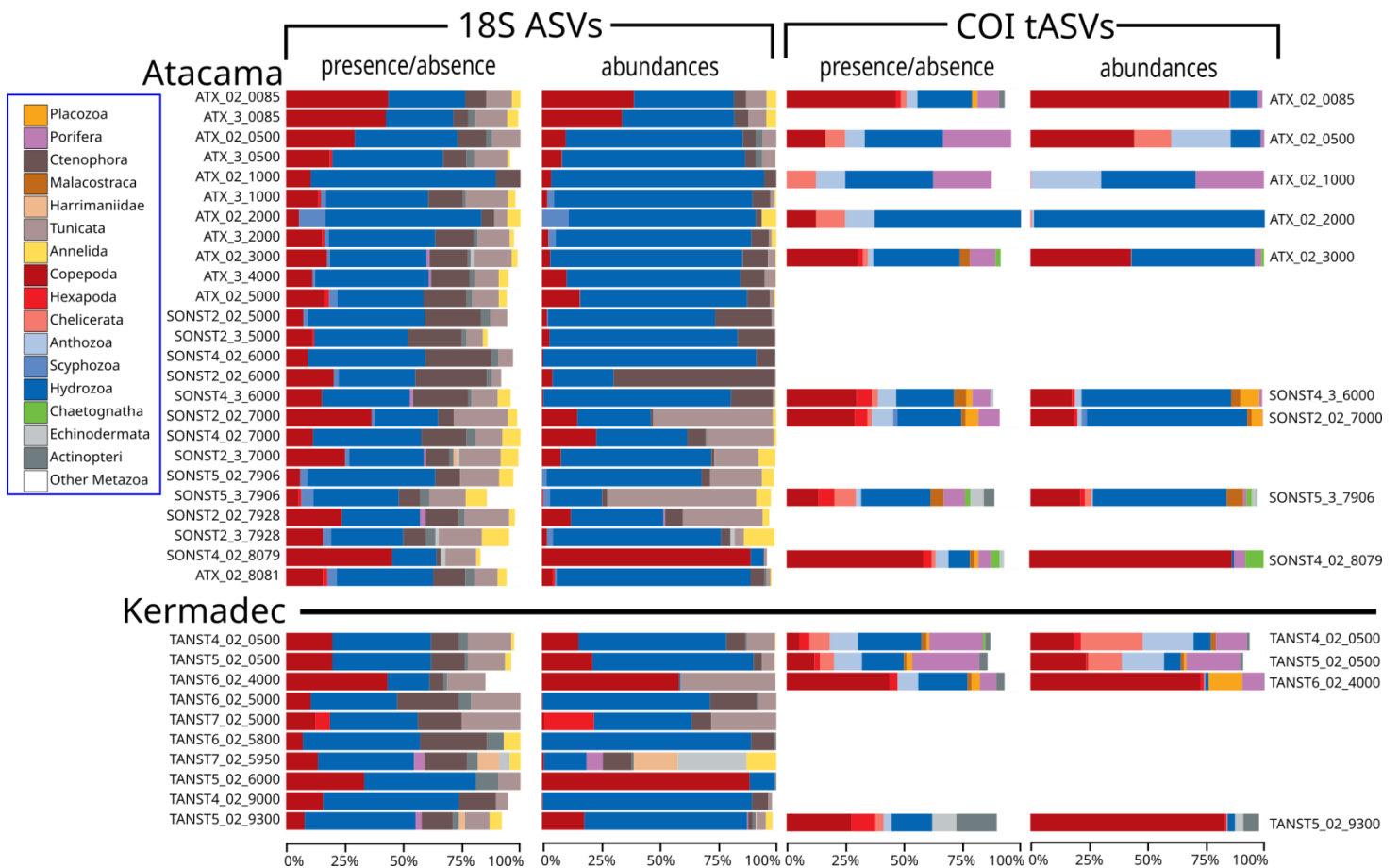


Figure S2. Taxonomic distribution of the 18S ASVs (presence/absence) associated with hydrozoans (a) and copepods (b) at the family taxonomic rank. The names of the samples are split into three parts, encoding the name of the cruise/station, the water filter size range ("02" for the range 0.2-3 μm , and "3" for the range 3-20 μm), and the depth (meters). More details about the samples in Table S1.

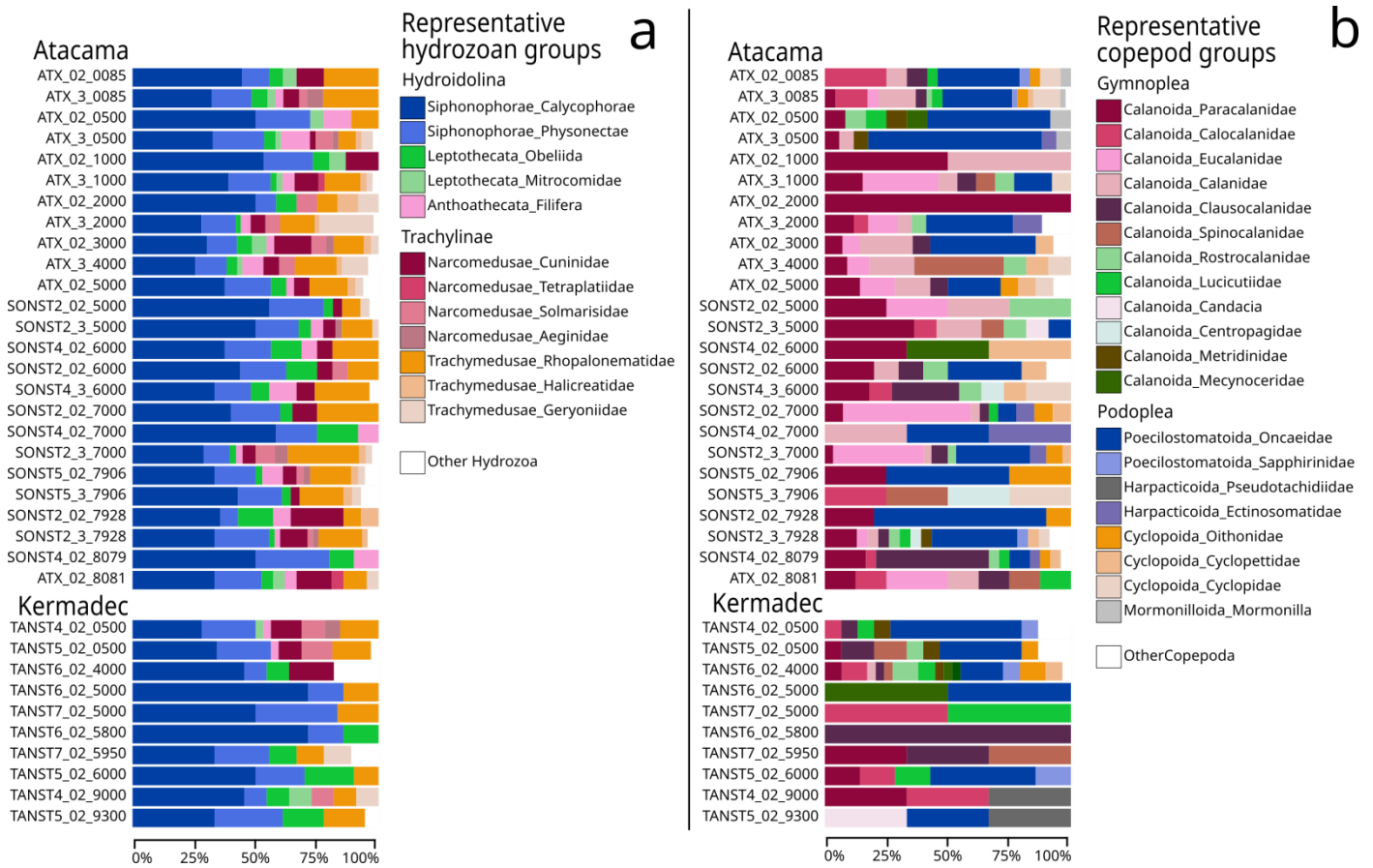
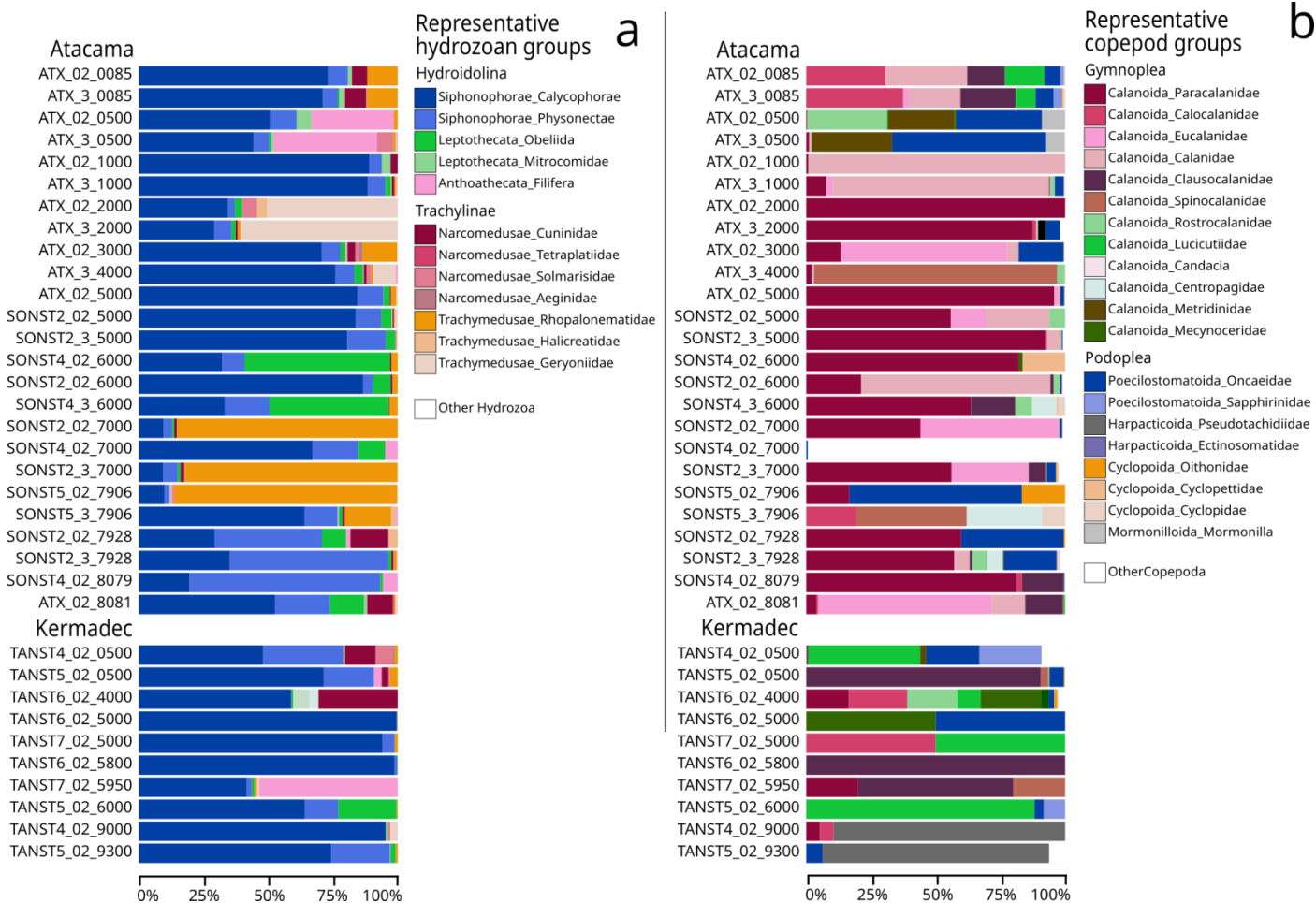


Figure S3. Taxonomic distribution of the 18S ASVs (relative abundances) associated with hydrozoans (a) and copepods (b) at the family taxonomic rank. The names of the samples are split into three parts, encoding the name of the cruise/station, the water filter size range ("02" for the range 0.2-3 μm , and "3" for the range 3-20 μm), and the depth (meters). More details about the samples in Table S1.



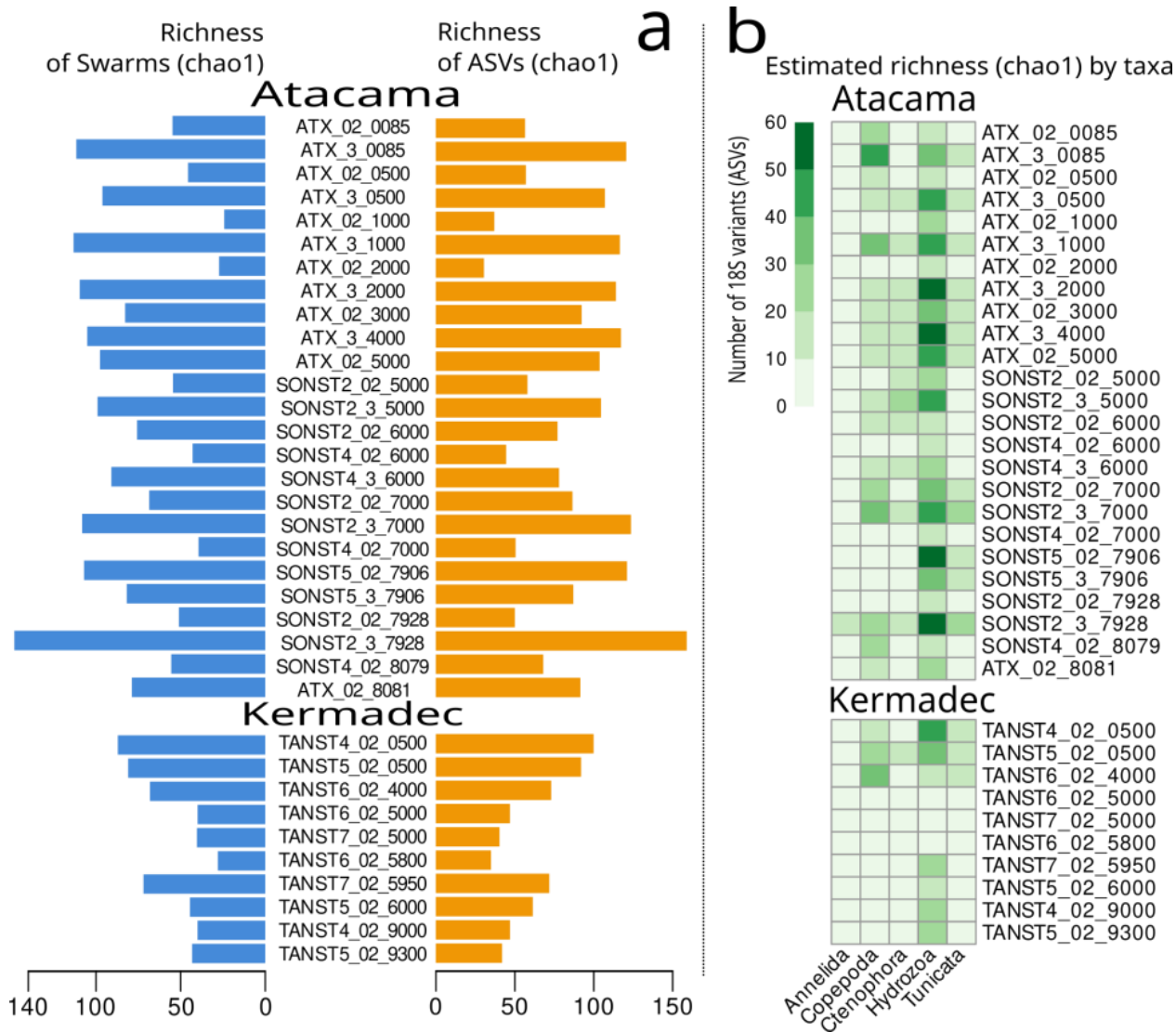


Figure S4. a) Metazoan genetic richness per sample (estimated by chao1) of the “swarm” clusters (left) and ASVs (right), obtained from the 18S metabarcoding sequences. The pattern of genetic richness in relation to depth is very similar between “swarm” clusters and ASVs and only differs in amplitude. **b)** Metazoan genetic richness (estimated by chao1) of the 18S metabarcoding sequences in the most representative taxonomic groups for each sample.

Figure S5. a) Metazoan richness and diversity of the translated metabarcode COI sequences per sample. The diversity was estimated by the Gini-Simpson index (left) and the richness was estimated by the Chao1 index (red bar under the observed richness, right). **b)** Metazoan richness (Chao1) of the translated metabarcode COI sequences in the most relatively abundant taxonomic groups (Fig. 1) for each sample. The nomenclature of the sample names is described in Figure 1.

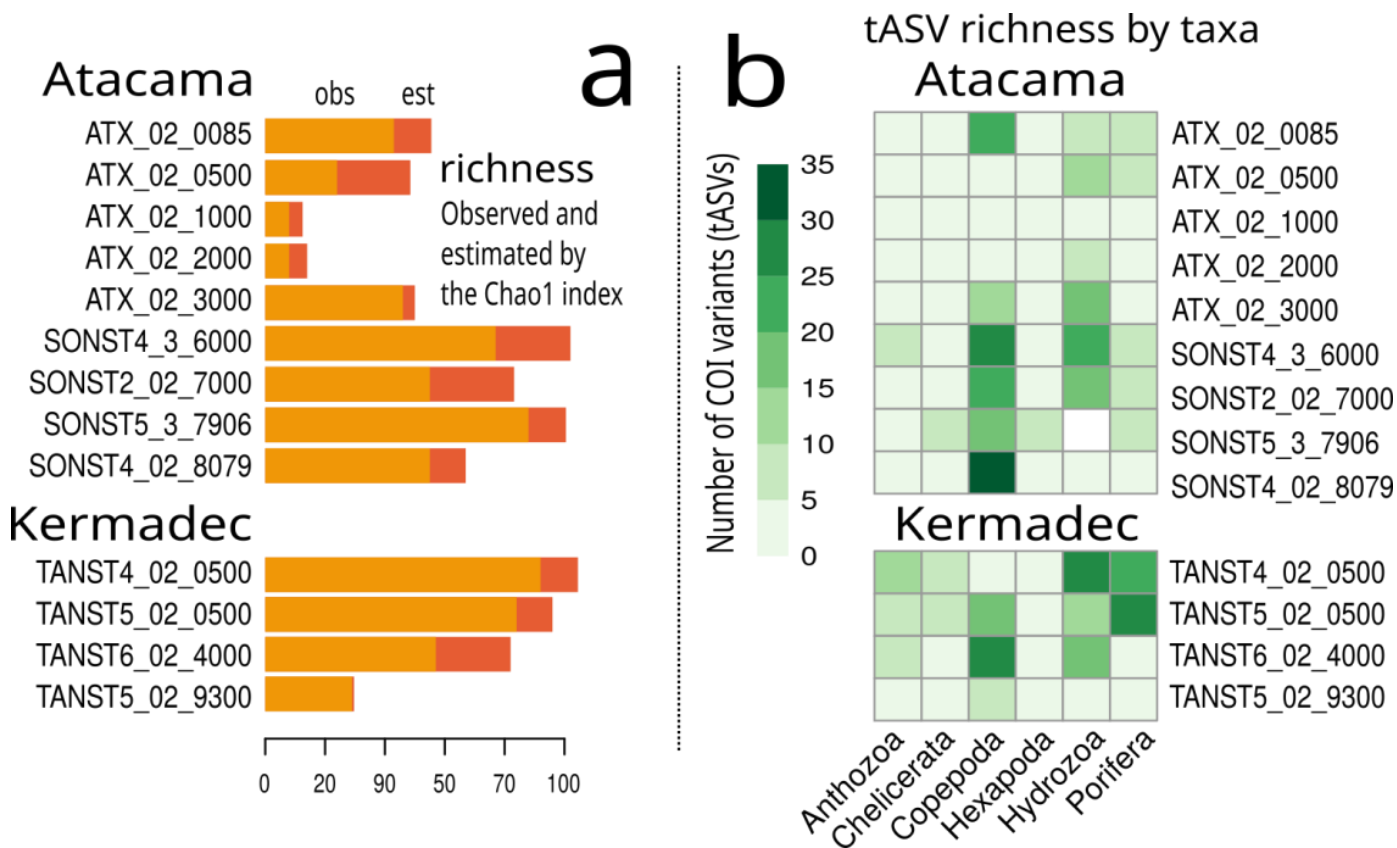


Figure S6. Phylogenetic subtrees of 18S ASVs associated with hydrozoan orders with clades exclusively composed by ASVs generated in this study (general phylogenetic tree shown in Fig. 4a). The ASV sequences are labeled according to their occurrences in the samples from Atacama (A) and Kermadec (K). Additionally, this label includes a code to indicate whether the ASV occurred only in the samples <4000 m depth ('n'), in those > 4000 m depth ('d', abbyso-hadal), or if it was found in both partitions ('u'). Thus, an ASV found only > 4000m in Atacama is labeled 'Ad', whereas an ASV found in both systems only > 4000m is labeled 'AdKd', and so on. The statistical support numbers in the branches are UFBoot values and thus they can directly be interpreted as approximate probabilities. The references sequences used in this tree can be found in Table S5. The subtrees correspond to hydrozoan orders: **a)** Siphonophores, **b)** Rhopalonematidae, **c)** Geryonidae and, **d)** Clytiidae.

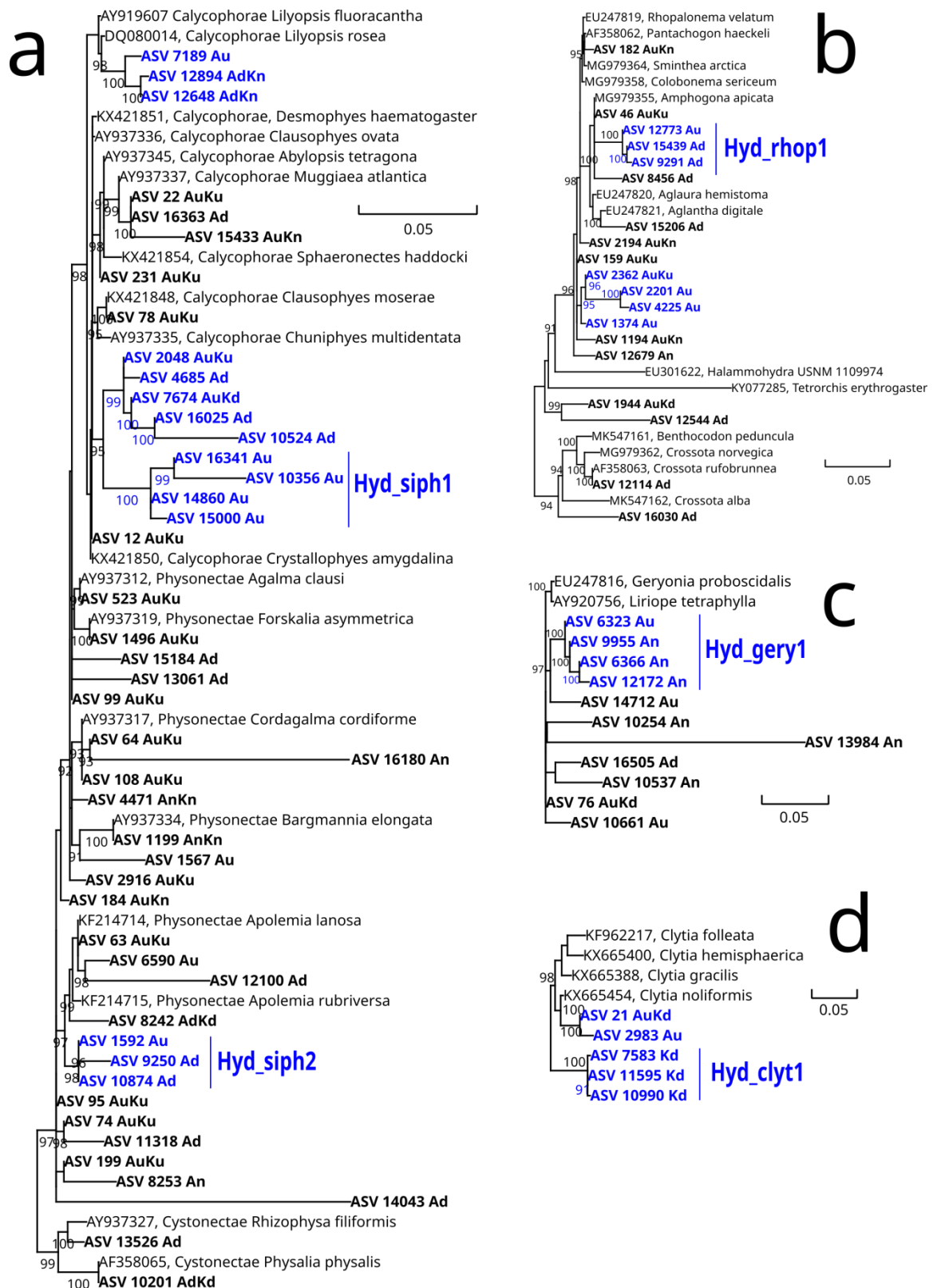


Figure S7. Phylogenetic subtrees of 18S ASVs associated with copepod orders with clades exclusively composed by ASVs generated in this study (general phylogenetic tree shown in Fig. 4b). The ASV sequences are labeled according to their occurrences in the samples from Atacama (A) and Kermadec (K). Additionally, this label includes a code to indicate whether the ASV occurred only in the samples <4000 m depth ('n'), in those > 4000 m depth ('d', abbyso-hadal), or if it was found in both partitions ('u'). The statistical support numbers in the branches are UFBoot values and thus they can directly be interpreted as approximate probabilities. The references sequences used in this tree can be found in Table S6. The subtrees correspond to copepod families: **a)** Oncaeidae, **b)** Clausocalanidae, and **c)** Calanidae (genus cosmocalanus).

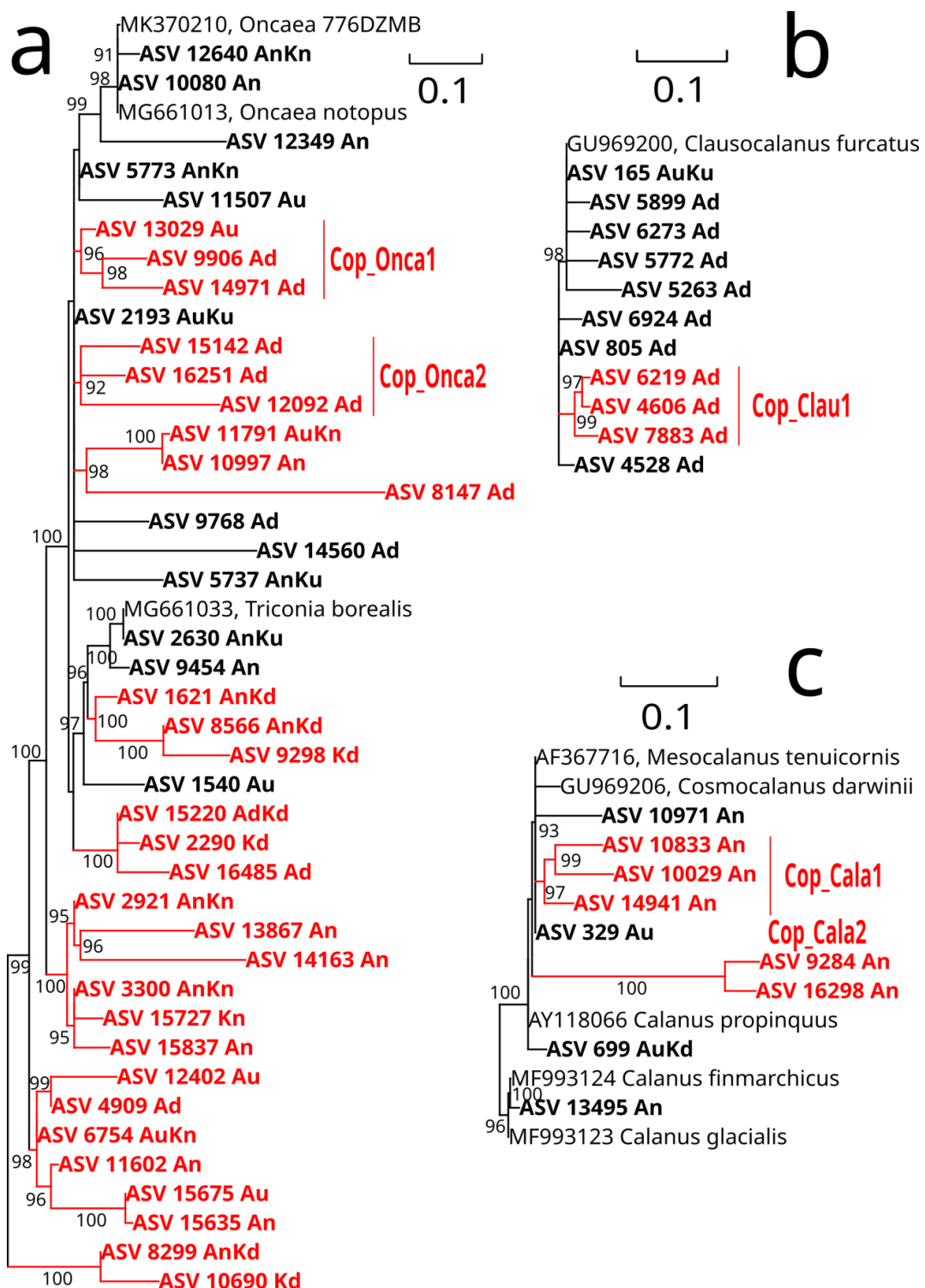
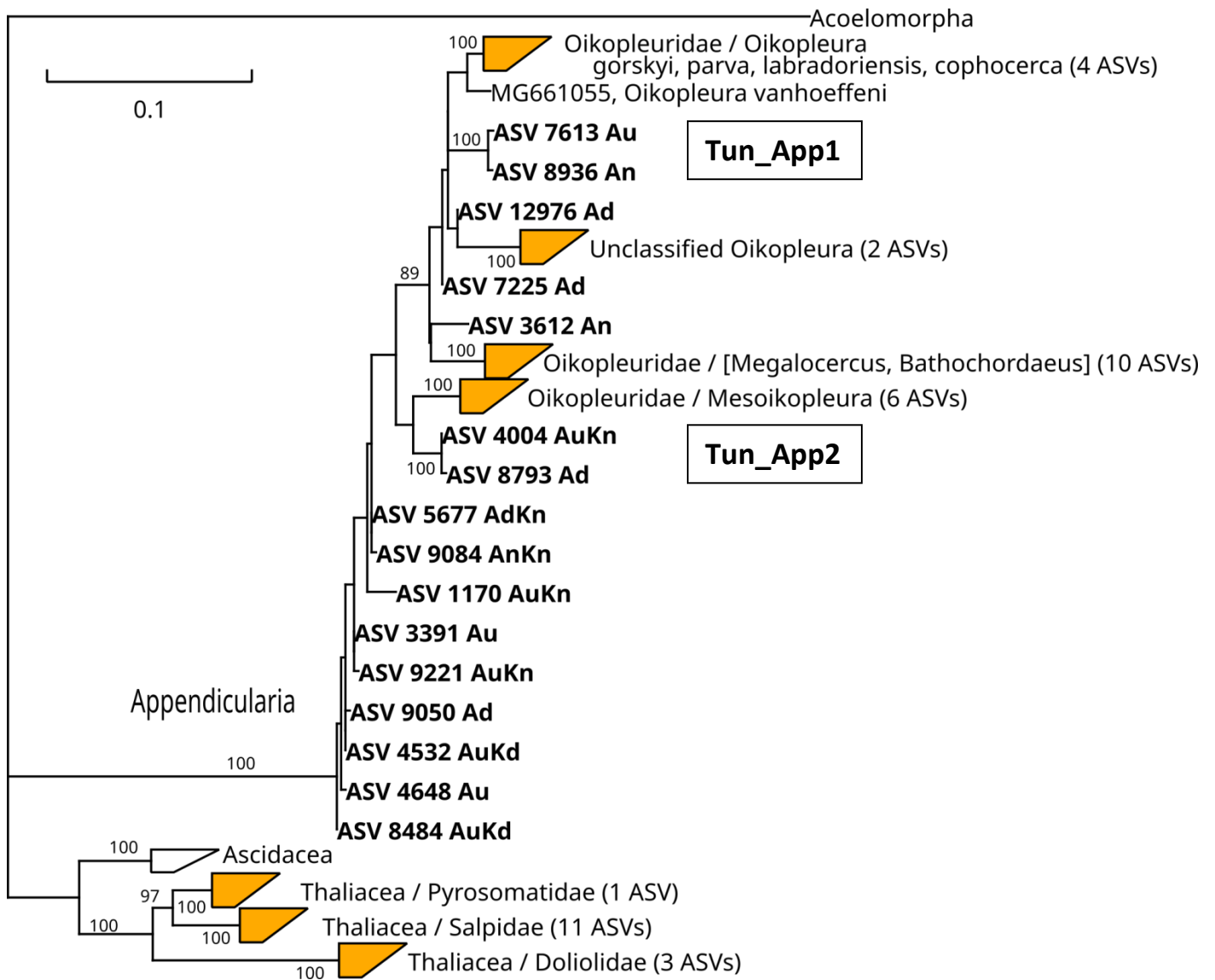


Figure S8. Phylogenetic tree of the 18S ASVs associated with tunicates. The ASV sequences are labeled according to their occurrences in the samples from Atacama (A) and Kermadec (K). Additionally, this label includes a code to indicate whether the ASV occurred only in the samples <4000 m depth ('n'), in those > 4000 m depth ('d', abyssal-hadal), or if it was found in both partitions ('u'). The whole set of reference sequences utilized for these trees can be found in Table S7.



Supplementary tables

Table S1. Sampling locations, filtering conditions and target genes for the metabarcoding analysis. The column named as “Filter” refers to the free living fraction (FL, between 0.2 and 3um) and particulate fraction (PA, between 3 and 20um).

Sample name	Cruise	Trench	St.	Lat.	Lon.	Date	Time	Depth (m)	Filter	Rosette type	Water (L)	Target genes
ATX_02_0085	ATACAMEX	Atacama	1	-23°14'	-71°11'	January 30, 2018	20:18	85	FL	CTD	40	18S,COI
ATX_3_0085	ATACAMEX	Atacama	1	-23°14'	-71°11'	January 30, 2018	20:18	85	PA	CTD	40	18S
ATX_02_0500	ATACAMEX	Atacama	1	-23°14'	-71°11'	January 30, 2018	20:18	500	FL	CTD	40	18S,COI
ATX_3_0500	ATACAMEX	Atacama	1	-23°14'	-71°11'	January 30, 2018	21:18	500	PA	CTD	40	18S
ATX_02_1000	ATACAMEX	Atacama	1	-23°14'	-71°11'	January 30, 2018	22:18	1000	FL	CTD	40	18S,COI
ATX_3_1000	ATACAMEX	Atacama	1	-23°14'	-71°11'	January 30, 2018	23:18	1000	PA	CTD	40	18S
ATX_02_2000	ATACAMEX	Atacama	1	-23°14'	-71°11'	January 30, 2018	0:18	2000	FL	CTD	40	18S,COI
ATX_3_2000	ATACAMEX	Atacama	1	-23°14'	-71°11'	January 30, 2018	1:18	2000	PA	CTD	40	18S
ATX_02_3000	ATACAMEX	Atacama	1	-23°14'	-71°11'	January 30, 2018	2:18	3000	FL	CTD	40	18S,COI
ATX_3_4000	ATACAMEX	Atacama	1	-23°14'	-71°11'	January 30, 2018	3:18	4000	PA	CTD	40	18S
ATX_02_5000	ATACAMEX	Atacama	1	-23°14'	-71°11'	January 30, 2018	4:18	5000	FL	CTD	40	18S
SONST2_02_5000	SONNE	Atacama	2	-21°28'	-71°7'	March 22, 2018	21:03	5000	FL	CTD	15.19	18S
SONST2_3_5000	SONNE	Atacama	2	-21°28'	-71°7'	March 22, 2018	22:03	5000	PA	CTD	15.19	18S
SONST2_02_6000	SONNE	Atacama	2	-21°28'	-71°7'	March 22, 2018	23:03	6000	FL	CTD	23.4	18S
SONST4_02_6000	SONNE	Atacama	4	-23°12'	-71°12'	March 13, 2018	10:36	6000	FL	CTD	42.6	18S
SONST4_3_6000	SONNE	Atacama	4	-23°12'	-71°12'	March 13, 2018	11:36	6000	PA	CTD	42.6	18S,COI
SONST2_02_7000	SONNE	Atacama	2	-21°28'	-71°7'	March 24, 2018	23:05	7000	FL	HR	25.1	18S,COI
SONST2_3_7000	SONNE	Atacama	2	-21°28'	-71°7'	March 24, 2018	23:05	7000	PA	HR	25.1	18S

SONST4_02_7000	SONNE	Atacama	4	-23°12'	-71°12'	March 13, 2018	23:22	7000	FL	HR	25.3	18S
SONST5_02_7906	SONNE	Atacama	5	-23°29'	-71°13'	March 11, 2018	22:32	7906	FL	NL	44.9	18S,COI
SONST5_3_7906	SONNE	Atacama	5	-23°29'	-71°13'	March 11, 2018	22:32	7906	PA	NL	44.9	18S,COI
SONST2_02_7928	SONNE	Atacama	2	-21°28'	-71°7'	March 22, 2018	12:42	7928	FL	NL	20.6	18S
SONST2_3_7928	SONNE	Atacama	2	-21°28'	-71°7'	March 22, 2018	12:42	7928	PA	NL	20.6	18S
SONST4_02_8079	SONNE	Atacama	4	-23°12'	-71°12'	March 14, 2018	18:00	8079	FL	NL	12.9	18S,COI
ATX_02_8081	ATACAMEX	Atacama	1	-23°14'	-71°11'	February 1, 2018	9:55	8081	FL	NL	50	18S
TANST4_02_0500	HADES-ERC	Kermadec	4	-31°08'	-176°48'	December 8, 2017	14:50	500	FL	CTD	31	18S,COI
TANST5_02_0500	HADES-ERC	Kermadec	5	-31°55'	-177°17'	December 10, 2017	1:15	500	FL	CTD	18	18S,COI
TANST6_02_4000	HADES-ERC	Kermadec	6	-32° 09'	177°23'	December 1, 2017	2:45	4000	FL	CTD	18	18S,COI
TANST6_02_5000	HADES-ERC	Kermadec	6	-32° 09'	177°23'	December 1, 2017	2:45	5000	FL	CTD	18.6	18S
TANST7_02_5000	HADES-ERC	Kermadec	7	-32°10'	176°32'	November 28, 2017	21:30	5000	FL	CTD	16	18S
TANST6_02_5800	HADES-ERC	Kermadec	6	-32° 09'	177°23'	December 1, 2017	2:45	5800	FL	CTD	18.7	18S
TANST7_02_5950	HADES-ERC	Kermadec	7	-32°10'	176°32'	November 28, 2017	21:30	5950	FL	CTD	10	18S
TANST5_02_6000	HADES-ERC	Kermadec	5	-31°55'	-177°17'	December 10, 2017	1:15	6000	FL	CTD	18	18S
TANST4_02_9000	HADES-ERC	Kermadec	4	-31°08'	-176°48'	December 8, 2017	0:25	9000	FL	HR	28	COI
TANST5_02_9300	HADES-ERC	Kermadec	5	-31°55'	-177°17'	December 10, 2017	9:40	9300	FL	HR	17.2	18S,COI

Table S2. Number of COI tASVs per metazoan phyla obtained in Atacama. The second and third columns present the biome ranges in which the respective phylum has been documented in the current literature. The fourth column corresponds to the number ASVs exclusively found in the samples above 4000m depth, whereas the fifth column shows the number of ASVs exclusively found in the samples below 4000m depth. The sixth column shows the ASVs that were found both above and below 4000m.

Phylum	Aquatic Biomes	General Biomes	<4000m	>4000m	Ubiq.	Total
Annelida (mostly polychaetes)	Pelagic/Benthic	Marine/Freshwater/Terrestrial	0	0	0	0
Arthropoda (mostly copepods)	Pelagic/Benthic	Marine/Freshwater/Terrestrial	14	53	25	92
Brachiopoda	Benthic	Marine	0	0	0	0
Bryozoa	Pelagic/Benthic	Marine/Freshwater	0	0	0	0
Chaetognatha	Pelagic/Benthic	Marine	0	1	1	2
Chordata (mostly tunicates)	Pelagic/Benthic	Marine/Freshwater/Terrestrial	1	8	0	9
Cnidaria (mostly hydrozoans)	Pelagic/Benthic	Marine/Freshwater	20	37	18	75
Ctenophora	Pelagic/Benthic	Marine/Freshwater	9	7	6	22
Cycliophora	Benthic	Marine	0	0	0	0
Echinodermata	Benthic	Marine	0	6	0	6
Entoprocta	Pelagic/Benthic	Marine/Freshwater	0	0	0	0
Gastrotricha	Benthic	Marine/Freshwater	0	0	0	0
Gnathostomulida	Benthic	Marine	0	0	0	0
Hemichordata	Pelagic/Benthic	Marine	0	0	0	0
Micrognathozoa	Pelagic/Benthic	Freshwater	0	0	0	0
Mollusca	Pelagic/Benthic	Marine/Freshwater/Terrestrial	0	3	1	4
Nematoda	Benthic	Marine/Freshwater/Terrestrial	0	0	0	0
Nemertea	Benthic	Marine/Freshwater/Terrestrial	0	0	0	0
Onychophora	NA	Terrestrial	0	0	0	0
Phronida	Benthic	Marine	0	0	0	0
Placozoa	Pelagic/Benthic	Marine	0	2	1	3
Platyhelminthes	Pelagic/Benthic	Marine	0	0	0	0
Porifera	Pelagic/Benthic	Marine/Freshwater	9	7	6	22
Priapulida	Benthic	Marine	0	0	0	0
Syndermata	Pelagic/Benthic	Marine/Freshwater	0	0	0	0
Tardigrada	Pelagic/Benthic	Marine/Freshwater/Terrestrial	0	0	0	0
Xenacoelomorpha	Pelagic/Benthic	Marine	0	0	0	0

Table S3. Taxonomic affiliation at the family level (when possible) of the 18S ASVs from iconic marine phyla other than Copepoda, Cnidaria and the subphylum Tunicate within Chordata in Atacama.

<i>Simplified taxonomic lineage</i>	<i>ASVs</i>
Annelida;Polychaeta;Echiura;Echiuroidea;Echiuridae;Thalassematinae	1
Annelida;Polychaeta;Palpata;Aciculata;Phyllodocida;Glyceridae	1
Annelida;Polychaeta;Palpata;Aciculata;Phyllodocida;Phyllodocidae	20
Annelida;Polychaeta;Palpata;Aciculata;Phyllodocida;Typhloscolecidae	2
Annelida;Polychaeta;Palpata;Canalipalpata;Flabelligerida;Flabelligeridae	1
Annelida;Polychaeta;Palpata;Canalipalpata;Sabellida;Serpulidae	1
Annelida;Polychaeta;Scolecida;Opheliidae	1
Annelida;Polychaeta;Scolecida;Spionida;Spionidae	1
Annelida;Polychaeta;Sipuncula;...Phascolosomatidae	1
Arthropoda;Chelicerata;Arachnida;Acari;Acariformes	1
Arthropoda;Crustacea;Branchiopoda;...Cycletheriidae	1
Arthropoda;Crustacea;Malacostraca;...Euphausiidae	2
Arthropoda;Crustacea;Malacostraca;...Mysidae	1
Arthropoda;Crustacea;Malacostraca;Decapoda;...Pinnotheridae	1
Arthropoda;Crustacea;Malacostraca;Decapoda;...Xanthidae	1
Arthropoda;Crustacea;Oligostraca;Ostracoda;...Halocyprididae	6
Arthropoda;Hexapoda;Insecta;Dicondylia;Pterygota;Neoptera	6
Chaetognatha;Sagittoidea;...Eukrohniidae	7
Chaetognatha;Sagittoidea;...Sagittidae	10
Chordata;...Actinopteri;...Euteleosteoromorpha;...Acanthomorphata;...Atherinidae	1
Chordata;...Actinopteri;...Euteleosteoromorpha;...Acanthomorphata;...Carangidae	1
Chordata;...Actinopteri;...Euteleosteoromorpha;...Acanthomorphata;...Cyprinodontidae	1
Chordata;...Actinopteri;...Euteleosteoromorpha;...Acanthomorphata;...Gobiidae	1
Chordata;...Actinopteri;...Euteleosteoromorpha;...Acanthomorphata;...Percichthyidae	2
Chordata;...Actinopteri;...Euteleosteoromorpha;...Acanthomorphata;...Sebastidae	2
Chordata;...Actinopteri;...Euteleosteoromorpha;...Retropinnidae	4
Chordata;...Actinopteri;...Otomorpha;...Clupeidae	2
Chordata;...Actinopteri;...Otomorpha;...Cyprinidae	1
Ctenophora;Tentaculata;Cydippida;Dryodoridae	2
Ctenophora;Tentaculata;Cydippida;Haeckeliidae	4
Ctenophora;Tentaculata;Cydippida;Mertensiidae	13
Ctenophora;Tentaculata;Cydippida;Pleurobrachiidae	3
Ctenophora;Tentaculata;Lobata;Lobatolampeidae	1
Ctenophora;Tentaculata;Lobata;Ocyropsidae	2
Ctenophora;Tentaculata;Lobata;unclassified_Lobata	5
Ctenophora;Tentaculata;Platyctenida;Coeloplanidae	3
Echinodermata;Echinozoa;...Elpidiidae	3
Echinodermata;Echinozoa;...Myriotrochidae	2
Hemichordata;Enteropneusta;...Tergivelum_baldwinae	1
Hemichordata;Enteropneusta;Harrimaniidae	2
Mollusca;Bivalvia;Heterodonta;...Lucinidae	1
Mollusca;Gastropoda;Caenogastropoda;...Fasciolariidae	1
Mollusca;Gastropoda;Caenogastropoda;...Muricidae	1
Mollusca;Gastropoda;Heterobranchia;...Cavoliniidae	2
Mollusca;Gastropoda;Heterobranchia;...Limacinidae	1
Porifera;Calcarea;Calcinea;Clathrinida;Leucettidae	1

Porifera;Calcarea;Calcinea;Murrayonida;Lelapiellidae	1
Porifera;Demospongiae;Heteroscleromorpha;Axinellida;Raspailiidae	1
Porifera;Demospongiae;Heteroscleromorpha;Poecilosclerida;Hymedesmiidae	1

Table S4. Taxonomic affiliation at the family level (when possible) of the 18S ASVs from iconic marine phyla other than Copepoda, Cnidaria and the subphylum Tunicate within Chordata in Kermadec.

<i>Simplified taxonomic lineage</i>	ASVs
Annelida;Polychaeta;Palpata;Aciculata;Phyllodocida;Phyllodocidae	2
Annelida;Polychaeta;Palpata;Aciculata;Phyllodocida;Typhloscolecidae	1
Annelida;Polychaeta;Polychaeta_incertae_sedis;Nerillidae	1
Annelida;Polychaeta;Scolecida;Capitellida;Scalibregmatidae	1
Annelida;Polychaeta;Scolecida;Spionida;Cirratulidae	1
Arthropoda;Crustacea;Hexanauplia;Thecostraca;...Peltogastridae	1
Arthropoda;Crustacea;Malacostraca;Eumalacostraca;...Euphausiidae	1
Arthropoda;Hexapoda;Insecta;Dicondylia;Pterygota;Neoptera	1
Arthropoda;Myriapoda;Diplopoda;Helminthomorpha;Sphaerotheriida;Sphaerotheriidae	1
Chaetognatha;Sagittoidea;Aphragmophora;Ctenodontina;Sagittidae	2
Chordata;...Actinopteri;...Euteleosteorpha;...Acanthomorpha;...Atherinomorphae	1
Chordata;...Actinopteri;...Euteleosteorpha;...Acanthomorpha;...Pomacanthidae	1
Chordata;...Actinopteri;...Euteleosteorpha;...Acanthomorpha;...Sebastidae	1
Chordata;...Actinopteri;...Euteleosteorpha;Stomiatii;Osmeriformes;Retropinnidae	3
Chordata;...Actinopteri;...Otomorpha;Clupei;Clupeiformes;Clupeoidei;Clupeidae	2
Ctenophora;Tentaculata;Cydippida;Dryodoridae	2
Ctenophora;Tentaculata;Cydippida;Mertensiidae	8
Ctenophora;Tentaculata;Cydippida;Pleurobrachiidae	1
Ctenophora;Tentaculata;Lobata;Lobatolampeidae	1
Ctenophora;Tentaculata;Lobata;Ocyropsidae	1
Ctenophora;Tentaculata;Lobata;unclassified_Lobata	3
Ctenophora;Tentaculata;Platyctenida;Coeloplanidae	2
Echinodermata;Echinozoa;Holothuroidea;Aspidochirotacea;Elasipodida;Elpidiidae	1
Hemichordata;Enteropneusta;Harrimaniidae	3
Mollusca;Bivalvia;Heterodonta;Euheterodonta;Lucinoida;Thyasiroidea;Thyasiridae	1
Mollusca;Gastropoda;Heterobranchia;Euthyneura;...Cavoliniidae	1
Nemertea;Enopla;Hoplonemertea;Monostilifera;Eumonostilifera;Amphiporidae	1
Platyhelminthes;Rhabditophora;Seriata;Tricladida;Maricola;Procerodoidea;Procerodidae	1
Porifera;Calcarea;Calcaronea;Leucosolenida;Grantiidae	1
Porifera;Calcarea;Calcinea;Clathrinida;Soleneiscidae	1

Table S5. Reference sequences used in the hydrozoan phylogenetic trees (Figs. S5).

Accession Code	Simplified taxonomic lineage
EU190843	Anthozoa Hexacorallia Actinostola crassicornis
EF589071	Anthozoa Hexacorallia Amplexidiscus fenestrafer
X53498	Anthozoa Hexacorallia Anemonia sulcata
Z21671	Anthozoa Hexacorallia Anthopleura kurogane
Z92908	Anthozoa Hexacorallia Antipathes lata
EU190852	Anthozoa Hexacorallia Boloceroides mcmurrichi
EF589065	Anthozoa Hexacorallia Corynactis viridis
Z86097	Anthozoa Hexacorallia Diadumene lineata
Z92904	Anthozoa Hexacorallia Epiactis japonica
Z92905	Anthozoa Hexacorallia Flosmaris mutsuensis
EF589074	Anthozoa Hexacorallia Fungiacyathus marenzelleri
U42453	Anthozoa Hexacorallia Parazoanthus axinellae
EU190871	Anthozoa Hexacorallia Phymanthus loligo
LT631265	Anthozoa Hexacorallia Pseudodiploria clivosa
Z92907	Anthozoa Hexacorallia Rhizopsammia minuta
EF589072	Anthozoa Hexacorallia Rhodactis rhodostoma
Z92906	Anthozoa Hexacorallia Tubastraea coccinea
Z49195	Anthozoa Octocorallia Bellonella rigida
Z92900	Anthozoa Octocorallia Calicogorgia granulosa
KP324638	Anthozoa Octocorallia Dasystenella austasensis
KP324679	Anthozoa Octocorallia Fanellia korema
KP324675	Anthozoa Octocorallia Fanellia medialis
KP324648	Anthozoa Octocorallia Fannyella rossii
Z92903	Anthozoa Octocorallia Leioptilus fimbriatus
KP324716	Anthozoa Octocorallia Metafannyella kuekenthali
KP324636	Anthozoa Octocorallia Onogorgia nodosa
KP324695	Anthozoa Octocorallia Parastenella spinosa
KP324674	Anthozoa Octocorallia Perissogorgia vitrea
KP324702	Anthozoa Octocorallia Primnoella antarctica
KP324736	Anthozoa Octocorallia Primnoella chilensis
KP324715	Anthozoa Octocorallia Primnoella divaricata
Z86106	Anthozoa Octocorallia Virgularia gustaviana
MF599314	Ctenophora Lobatolampea tetragona

LC047805	Cubozoa <i>Alatina philippina</i>
AF358107	Cubozoa <i>Carukia barnesi</i>
AF358108	Cubozoa <i>Carybdea rastonii</i>
AF358104	Cubozoa <i>Chironex fleckeri</i>
AF358103	Cubozoa <i>Chiropsalmus AGC-2001</i>
GQ849084	Cubozoa <i>Malo kingi</i>
LC033479	Cubozoa <i>Meteorona kishinouyei</i>
GQ849086	Cubozoa <i>Tamoya ohboya</i>
EU876578	Hydrozoa Hydroidolina Anthoathecata Capitata Asyncoryne <i>ryniensis</i>
EU876578	Hydrozoa Hydroidolina Anthoathecata Capitata Asyncoryne <i>ryniensis</i>
LT593888	Hydrozoa Hydroidolina Anthoathecata Capitata Cladocorynidae <i>Pteroclava krempfi</i>
GQ424329	Hydrozoa Hydroidolina Anthoathecata Capitata Corynidae <i>Coryne nipponica</i>
GQ424329	Hydrozoa Hydroidolina Anthoathecata Capitata Corynidae <i>Coryne nipponica</i>
EU883544	Hydrozoa Hydroidolina Anthoathecata Capitata Corynidae <i>Dipurena halterata</i>
EU883544	Hydrozoa Hydroidolina Anthoathecata Capitata Corynidae <i>Dipurena halterata</i>
GQ424334	Hydrozoa Hydroidolina Anthoathecata Capitata Corynidae <i>Dipurena reesi</i>
GQ424334	Hydrozoa Hydroidolina Anthoathecata Capitata Corynidae <i>Dipurena reesi</i>
GQ424337	Hydrozoa Hydroidolina Anthoathecata Capitata Corynidae <i>Sarsia lovenii</i>
GQ424337	Hydrozoa Hydroidolina Anthoathecata Capitata Corynidae <i>Sarsia lovenii</i>
GQ424339	Hydrozoa Hydroidolina Anthoathecata Capitata Corynidae <i>Sarsia tubulosa</i>
GQ424339	Hydrozoa Hydroidolina Anthoathecata Capitata Corynidae <i>Sarsia tubulosa</i>
LT631288	Hydrozoa Hydroidolina Anthoathecata Capitata Milleporidae <i>Millepora GA112</i>
LT631287	Hydrozoa Hydroidolina Anthoathecata Capitata Milleporidae <i>Millepora DJ207</i>
LT631288	Hydrozoa Hydroidolina Anthoathecata Capitata Milleporidae <i>Millepora GA112</i>
LT631287	Hydrozoa Hydroidolina Anthoathecata Capitata Milleporidae <i>Millepora DJ207</i>
GQ424344	Hydrozoa Hydroidolina Anthoathecata Capitata Polyorchidae <i>Polyorchis haplus</i>
GQ424344	Hydrozoa Hydroidolina Anthoathecata Capitata Polyorchidae <i>Polyorchis haplus</i>
KF962297	Hydrozoa Hydroidolina Anthoathecata FiliferaIV <i>Turritopsis lata</i>
JQ407395	Hydrozoa Hydroidolina Anthoathecata Filifera <i>Bouillonactinia hooperi</i>
JQ407395	Hydrozoa Hydroidolina Anthoathecata Filifera <i>Bouillonactinia hooperi</i>
JQ407378	Hydrozoa Hydroidolina Anthoathecata Filifera <i>Hydractinia echinata</i>
JQ407378	Hydrozoa Hydroidolina Anthoathecata Filifera <i>Hydractinia echinata</i>
EU272625	Hydrozoa Hydroidolina Anthoathecata Filifera <i>Lizzia blondina</i>
EU448097	Hydrozoa Hydroidolina Anthoathecata Filifera <i>Neoturris breviconis</i>
JQ407388	Hydrozoa Hydroidolina Anthoathecata Filifera <i>Podocoryna borealis</i>
JQ407388	Hydrozoa Hydroidolina Anthoathecata Filifera <i>Podocoryna borealis</i>

EU272634	Hydrozoa Hydroidolina Anthoathecata Filifera Rathkea octopunctata
JQ407403	Hydrozoa Hydroidolina Anthoathecata Filifera Schuchertinia milleri
JQ407403	Hydrozoa Hydroidolina Anthoathecata Filifera Schuchertinia milleri
KT722442	Hydrozoa Hydroidolina Anthoathecata Filifera Turritopsis nutricula
AY920767	Hydrozoa Hydroidolina Anthoathecata Filiferall Fabienna sphaerica
EU272622	Hydrozoa Hydroidolina Anthoathecata Filiferall Hydrichthella epigorgia
EU272622	Hydrozoa Hydroidolina Anthoathecata Filiferall Hydrichthella epigorgia
EU305500	Hydrozoa Hydroidolina Anthoathecata Filiferall Proboscidactyla flavicirrata
EU272631	Hydrozoa Hydroidolina Anthoathecata Filiferall Proboscidactyla ornata
JQ407377	Hydrozoa Hydroidolina Anthoathecata Filiferall Hydractinia symbiolongicarpus
JQ407377	Hydrozoa Hydroidolina Anthoathecata Filiferall Hydractinia symbiolongicarpus
JQ407367	Hydrozoa Hydroidolina Anthoathecata Filiferall Hydractiniidae Clava multicornis
JQ407367	Hydrozoa Hydroidolina Anthoathecata Filiferall Hydractiniidae Clava multicornis
JQ407363	Hydrozoa Hydroidolina Anthoathecata Filiferall Janaria mirabilis
JQ407363	Hydrozoa Hydroidolina Anthoathecata Filiferall Janaria mirabilis
EU272644	Hydrozoa Hydroidolina Anthoathecata Filiferall Lepidopora microstylus
EU272644	Hydrozoa Hydroidolina Anthoathecata Filiferall Lepidopora microstylus
AF358092	Hydrozoa Hydroidolina Anthoathecata Filiferall Podocoryna exigua
AF358092	Hydrozoa Hydroidolina Anthoathecata Filiferall Podocoryna exigua
KT722386	Hydrozoa Hydroidolina Anthoathecata Filiferall Bimeria vestita
KT722386	Hydrozoa Hydroidolina Anthoathecata Filiferall Bimeria vestita
MG788989	Hydrozoa Hydroidolina Anthoathecata Filiferall Bougainvillia carolinensis
EU272606	Hydrozoa Hydroidolina Anthoathecata Filiferall Bougainvillia carolinensis
MG788989	Hydrozoa Hydroidolina Anthoathecata Filiferall Bougainvillia carolinensis
EU272606	Hydrozoa Hydroidolina Anthoathecata Filiferall Bougainvillia carolinensis
EU305490	Hydrozoa Hydroidolina Anthoathecata Filiferall Bougainvillia fulva
EU305490	Hydrozoa Hydroidolina Anthoathecata Filiferall Bougainvillia fulva
FJ550582	Hydrozoa Hydroidolina Anthoathecata Filiferall Bougainvillia muscus
FJ550582	Hydrozoa Hydroidolina Anthoathecata Filiferall Bougainvillia muscus
EU272632	Hydrozoa Hydroidolina Anthoathecata Filiferall Garveia grisea
EU272623	Hydrozoa Hydroidolina Anthoathecata Filiferall Koellikerina fasciculata
EU272623	Hydrozoa Hydroidolina Anthoathecata Filiferall Koellikerina fasciculata
EU272625	Hydrozoa Hydroidolina Anthoathecata Filiferall Lizzia blondina
EU272627	Hydrozoa Hydroidolina Anthoathecata Filiferall Pachycordyle pusilla
EU272634	Hydrozoa Hydroidolina Anthoathecata Filiferall Rathkea octopunctata
EU272635	Hydrozoa Hydroidolina Anthoathecata Filiferall Rhizogeton nudus

KT722442	Hydrozoa Hydroidolina Anthoathecata FiliferaIV Turritopsis nutricula
EU876564	Hydrozoa Hydroidolina Aplanulata Corymorpha bigelowi
EU876564	Hydrozoa Hydroidolina Aplanulata Corymorpha bigelowi
EU876565	Hydrozoa Hydroidolina Aplanulata Corymorpha pendula
EU876565	Hydrozoa Hydroidolina Aplanulata Corymorpha pendula
EU883547	Hydrozoa Hydroidolina Aplanulata Ectopleura marina
EU883547	Hydrozoa Hydroidolina Aplanulata Ectopleura marina
EU876566	Hydrozoa Hydroidolina Aplanulata Hybocodon chilensis
EU876566	Hydrozoa Hydroidolina Aplanulata Hybocodon chilensis
FJ265733	Hydrozoa Hydroidolina Aplanulata Hydra sinensis
FJ265733	Hydrozoa Hydroidolina Aplanulata Hydra sinensis
KF962297	Hydrozoa Hydroidolina FiliferaIV Turritopsis lata
KT722442	Hydrozoa Hydroidolina FiliferaIV Turritopsis nutricula
AF358076	Hydrozoa Hydroidolina Leptothecata Aequoreidae Aequorea forskalea
AF358076	Hydrozoa Hydroidolina Leptothecata Aequoreidae Aequorea forskalea
EU305501	Hydrozoa Hydroidolina Leptothecata Aequoreidae Rhacostoma atlanticum
EU305501	Hydrozoa Hydroidolina Leptothecata Aequoreidae Rhacostoma atlanticum
EU272601	Hydrozoa Hydroidolina Leptothecata Aglaopheniidae Aglaophenia tubiformis
EU272601	Hydrozoa Hydroidolina Leptothecata Aglaopheniidae Aglaophenia tubiformis
AY789739	Hydrozoa Hydroidolina Leptothecata Campanulariidae Campanularia volubilis
AY789739	Hydrozoa Hydroidolina Leptothecata Campanulariidae Campanularia volubilis
AY789737	Hydrozoa Hydroidolina Leptothecata Campanulariidae Orthopyxis integra
AY789737	Hydrozoa Hydroidolina Leptothecata Campanulariidae Orthopyxis integra
AY789738	Hydrozoa Hydroidolina Leptothecata Campanulariidae Rhizocaulus verticillatus
AY789738	Hydrozoa Hydroidolina Leptothecata Campanulariidae Rhizocaulus verticillatus
FJ550549	Hydrozoa Hydroidolina Leptothecata Campanulariidae Silicularia rosea
FJ550549	Hydrozoa Hydroidolina Leptothecata Campanulariidae Silicularia rosea
KF962267	Hydrozoa Hydroidolina Leptothecata Eirenidae Eirene kambara
KF962267	Hydrozoa Hydroidolina Leptothecata Eirenidae Eirene kambara
FJ550588	Hydrozoa Hydroidolina Leptothecata Eirenidae Eirene viridula
FJ550588	Hydrozoa Hydroidolina Leptothecata Eirenidae Eirene viridula
FJ550599	Hydrozoa Hydroidolina Leptothecata Eirenidae Eutima curva
FJ550599	Hydrozoa Hydroidolina Leptothecata Eirenidae Eutima curva
FJ550600	Hydrozoa Hydroidolina Leptothecata Eirenidae Eutima gegenbauri
FJ550600	Hydrozoa Hydroidolina Leptothecata Eirenidae Eutima gegenbauri
KY363986	Hydrozoa Hydroidolina Leptothecata Eirenidae Eutima gracilis

KY363986	Hydrozoa Hydroidolina Leptothecata Eirenidae Eutima gracilis
EU305493	Hydrozoa Hydroidolina Leptothecata Eirenidae Eutima sapinhoa
EU305493	Hydrozoa Hydroidolina Leptothecata Eirenidae Eutima sapinhoa
KY363971	Hydrozoa Hydroidolina Leptothecata Eirenidae Eutonina indicans
KY363971	Hydrozoa Hydroidolina Leptothecata Eirenidae Eutonina indicans
KY363989	Hydrozoa Hydroidolina Leptothecata Eirenidae Helgicirrha cari
KY363989	Hydrozoa Hydroidolina Leptothecata Eirenidae Helgicirrha cari
KY363983	Hydrozoa Hydroidolina Leptothecata Laodiceidae Ptychogena crocea
KY363983	Hydrozoa Hydroidolina Leptothecata Laodiceidae Ptychogena crocea
FJ550535	Hydrozoa Hydroidolina Leptothecata Laodiceidae Staurodiscus gotoi
KY363978	Hydrozoa Hydroidolina Leptothecata Laodiceidae Staurostoma mertensii
KY363978	Hydrozoa Hydroidolina Leptothecata Laodiceidae Staurostoma mertensii
KY363984	Hydrozoa Hydroidolina Leptothecata Mitrocomidae Cyclocanna welshi
KY363984	Hydrozoa Hydroidolina Leptothecata Mitrocomidae Cyclocanna welshi
KY363982	Hydrozoa Hydroidolina Leptothecata Mitrocomidae Earleria quadrata
KY363982	Hydrozoa Hydroidolina Leptothecata Mitrocomidae Earleria quadrata
KY363977	Hydrozoa Hydroidolina Leptothecata Mitrocomidae Halopsis ocellata
KY363977	Hydrozoa Hydroidolina Leptothecata Mitrocomidae Halopsis ocellata
FJ550536	Hydrozoa Hydroidolina Leptothecata Mitrocomidae Mitrocomella niwai
FJ550536	Hydrozoa Hydroidolina Leptothecata Mitrocomidae Mitrocomella niwai
KY363979	Hydrozoa Hydroidolina Leptothecata Mitrocomidae Mitrocomella polydiademata
KY363979	Hydrozoa Hydroidolina Leptothecata Mitrocomidae Mitrocomella polydiademata
KF962217	Hydrozoa Hydroidolina Leptothecata Obeliida Clytiidae Clytia folleata
KF962217	Hydrozoa Hydroidolina Leptothecata Obeliida Clytiidae Clytia folleata
KX665388	Hydrozoa Hydroidolina Leptothecata Obeliida Clytiidae Clytia gracilis
KX665388	Hydrozoa Hydroidolina Leptothecata Obeliida Clytiidae Clytia gracilis
KX665400	Hydrozoa Hydroidolina Leptothecata Obeliida Clytiidae Clytia hemisphaerica
KX665400	Hydrozoa Hydroidolina Leptothecata Obeliida Clytiidae Clytia hemisphaerica
KX665454	Hydrozoa Hydroidolina Leptothecata Obeliida Clytiidae Clytia noliformis
KX665454	Hydrozoa Hydroidolina Leptothecata Obeliida Clytiidae Clytia noliformis
KX665404	Hydrozoa Hydroidolina Leptothecata Obeliida Obeliidae Laomedea angulata
KX665404	Hydrozoa Hydroidolina Leptothecata Obeliida Obeliidae Laomedea angulata
KX665446	Hydrozoa Hydroidolina Leptothecata Obeliida Obeliidae Laomedea calceolifera
KX665446	Hydrozoa Hydroidolina Leptothecata Obeliida Obeliidae Laomedea calceolifera
KX665412	Hydrozoa Hydroidolina Leptothecata Obeliida Obeliidae Obelia bidentata
KX665412	Hydrozoa Hydroidolina Leptothecata Obeliida Obeliidae Obelia bidentata

MG792325	Hydrozoa Hydroidolina Leptothecata Obeliida Obeliidae Obelia dichotoma
MG792325	Hydrozoa Hydroidolina Leptothecata Obeliida Obeliidae Obelia dichotoma
KT722412	Hydrozoa Hydroidolina Leptothecata Obeliida Obeliidae Obelia geniculata
KT722412	Hydrozoa Hydroidolina Leptothecata Obeliida Obeliidae Obelia geniculata
EU305499	Hydrozoa Hydroidolina Leptothecata Plumulariidae Plumularia hyalina
EU305499	Hydrozoa Hydroidolina Leptothecata Plumulariidae Plumularia hyalina
KT722433	Hydrozoa Hydroidolina Leptothecata Sertulariidae Sertularella cylindritheca
KT722433	Hydrozoa Hydroidolina Leptothecata Sertulariidae Sertularella cylindritheca
FJ550540	Hydrozoa Hydroidolina Leptothecata Tiarannidae Modeeria rotunda
FJ550540	Hydrozoa Hydroidolina Leptothecata Tiarannidae Modeeria rotunda
FJ550598	Hydrozoa Hydroidolina Leptothecata Tiarannidae Stegopoma plicatile
FJ550598	Hydrozoa Hydroidolina Leptothecata Tiarannidae Stegopoma plicatile
AF358079	Hydrozoa Hydroidolina Leptothecata Tiaropsidae Tiaropsidium kelseyi
AF358079	Hydrozoa Hydroidolina Leptothecata Tiaropsidae Tiaropsidium kelseyi
FJ550531	Hydrozoa Hydroidolina Leptothecata Tiaropsidae Tiaropsis multicirrata
FJ550531	Hydrozoa Hydroidolina Leptothecata Tiaropsidae Tiaropsis multicirrata
AY937345	Hydrozoa Hydroidolina Siphonophorae Calycophorae Abylopsis tetragona
AY937345	Hydrozoa Hydroidolina Siphonophorae Calycophorae Abylopsis tetragona
KX421847	Hydrozoa Hydroidolina Siphonophorae Calycophorae Chuniphyes moserae
KX421847	Hydrozoa Hydroidolina Siphonophorae Calycophorae Chuniphyes moserae
AY937335	Hydrozoa Hydroidolina Siphonophorae Calycophorae Chuniphyes multidentata
AY937335	Hydrozoa Hydroidolina Siphonophorae Calycophorae Chuniphyes multidentata
KX421848	Hydrozoa Hydroidolina Siphonophorae Calycophorae Clausophyes moserae
KX421848	Hydrozoa Hydroidolina Siphonophorae Calycophorae Clausophyes moserae
AY937336	Hydrozoa Hydroidolina Siphonophorae Calycophorae Clausophyes ovata
AY937336	Hydrozoa Hydroidolina Siphonophorae Calycophorae Clausophyes ovata
KX421850	Hydrozoa Hydroidolina Siphonophorae Calycophorae Crystallophyes amygdalina
KX421850	Hydrozoa Hydroidolina Siphonophorae Calycophorae Crystallophyes amygdalina
AY937318	Hydrozoa Hydroidolina Siphonophorae Calycophorae Diphyes dispar
AY937318	Hydrozoa Hydroidolina Siphonophorae Calycophorae Diphyes dispar
DQ080014	Hydrozoa Hydroidolina Siphonophorae Calycophorae Lilyopsis rosea
DQ080014	Hydrozoa Hydroidolina Siphonophorae Calycophorae Lilyopsis rosea
AY937337	Hydrozoa Hydroidolina Siphonophorae Calycophorae Muggiaea atlantica
AY937337	Hydrozoa Hydroidolina Siphonophorae Calycophorae Muggiaea atlantica
KX421851	Hydrozoa Hydroidolina Siphonophorae Calycophorae Prayidae Desmophyes haematogaster
KX421851	Hydrozoa Hydroidolina Siphonophorae Calycophorae Prayidae Desmophyes haematogaster

AY919607	Hydrozoa Hydroidolina Siphonophorae Calycophorae Prayidae Lilyopsis fluoracantha
AY919607	Hydrozoa Hydroidolina Siphonophorae Calycophorae Prayidae Lilyopsis fluoracantha
KX421854	Hydrozoa Hydroidolina Siphonophorae Calycophorae Sphaeronectes haddocki
KX421854	Hydrozoa Hydroidolina Siphonophorae Calycophorae Sphaeronectes haddocki
AF358065	Hydrozoa Hydroidolina Siphonophorae Cystonectae Physalia physalis
AF358065	Hydrozoa Hydroidolina Siphonophorae Cystonectae Physalia physalis
AY937327	Hydrozoa Hydroidolina Siphonophorae Cystonectae Rhizophysa filiformis
AY937327	Hydrozoa Hydroidolina Siphonophorae Cystonectae Rhizophysa filiformis
AY937312	Hydrozoa Hydroidolina Siphonophorae Physonectae Agalma clausi
AY937312	Hydrozoa Hydroidolina Siphonophorae Physonectae Agalma clausi
KF214714	Hydrozoa Hydroidolina Siphonophorae Physonectae Apolemia lanosa
KF214714	Hydrozoa Hydroidolina Siphonophorae Physonectae Apolemia lanosa
KF214715	Hydrozoa Hydroidolina Siphonophorae Physonectae Apolemia rubriversa
KF214715	Hydrozoa Hydroidolina Siphonophorae Physonectae Apolemia rubriversa
AY937334	Hydrozoa Hydroidolina Siphonophorae Physonectae Bargmannia elongata
AY937334	Hydrozoa Hydroidolina Siphonophorae Physonectae Bargmannia elongata
AY937317	Hydrozoa Hydroidolina Siphonophorae Physonectae Cordagalma cordiforme
AY937317	Hydrozoa Hydroidolina Siphonophorae Physonectae Cordagalma cordiforme
AY937319	Hydrozoa Hydroidolina Siphonophorae Physonectae Forskalia asymmetrica
AY937319	Hydrozoa Hydroidolina Siphonophorae Physonectae Forskalia asymmetrica
EU301622	Hydrozoa Trachylinae Actinulida Halammohydra BB-2008
EU301622	Hydrozoa Trachylinae Actinulida Halammohydra BB-2008
EU301622	Hydrozoa Trachylinae Actinulida Halammohydra USNM 1109974
EU301622	Hydrozoa Trachylinae Actinulida Halammohydra USNM 1109974
KY077286	Hydrozoa Trachylinae Limnomedusae Astrohydra japonica
KY077286	Hydrozoa Trachylinae Limnomedusae Astrohydra japonica
KF771643	Hydrozoa Trachylinae Limnomedusae Craspedacusta sowerbii
KF771643	Hydrozoa Trachylinae Limnomedusae Craspedacusta sowerbii
AY920755	Hydrozoa Trachylinae Limnomedusae Limnocnida tanganjicae
AY920755	Hydrozoa Trachylinae Limnomedusae Limnocnida tanganjicae
AF358056	Hydrozoa Trachylinae Limnomedusae Maeotias marginata
AF358056	Hydrozoa Trachylinae Limnomedusae Maeotias marginata
EU247813	Hydrozoa Trachylinae Narcomedusae Aeginidae Aegina citrea
EU247813	Hydrozoa Trachylinae Narcomedusae Aeginidae Aegina citrea
MG979347	Hydrozoa Trachylinae Narcomedusae Aeginidae Aeginopsis laurentii
MG979347	Hydrozoa Trachylinae Narcomedusae Aeginidae Aeginopsis laurentii

KY007605	Hydrozoa Trachylinae Narcomedusae Aeginidae Aeginura grimaldii
KY007605	Hydrozoa Trachylinae Narcomedusae Aeginidae Aeginura grimaldii
MG979341	Hydrozoa Trachylinae Narcomedusae Aeginidae Bathykorus bouilloni
MG979341	Hydrozoa Trachylinae Narcomedusae Aeginidae Bathykorus bouilloni
EU247812	Hydrozoa Trachylinae Narcomedusae Aeginidae Solmundella bitentaculata
EU247812	Hydrozoa Trachylinae Narcomedusae Aeginidae Solmundella bitentaculata
AF358059	Hydrozoa Trachylinae Narcomedusae Cuninidae Cunina frugifera
AF358059	Hydrozoa Trachylinae Narcomedusae Cuninidae Cunina frugifera
KY007606	Hydrozoa Trachylinae Narcomedusae Cuninidae Cunina octonaria
KY007606	Hydrozoa Trachylinae Narcomedusae Cuninidae Cunina octonaria
KY007607	Hydrozoa Trachylinae Narcomedusae Cuninidae Sigiweddellia sp BB-2016
KY007607	Hydrozoa Trachylinae Narcomedusae Cuninidae Sigiweddellia sp BB-2016
MG979342	Hydrozoa Trachylinae Narcomedusae Cuninidae Solmissus albescens
MG979342	Hydrozoa Trachylinae Narcomedusae Cuninidae Solmissus albescens
AF358060	Hydrozoa Trachylinae Narcomedusae Cuninidae Solmissus marshalli
AF358060	Hydrozoa Trachylinae Narcomedusae Cuninidae Solmissus marshalli
MG979344	Hydrozoa Trachylinae Narcomedusae Solmarisidae Pegantha martagon
MG979344	Hydrozoa Trachylinae Narcomedusae Solmarisidae Pegantha martagon
MG979345	Hydrozoa Trachylinae Narcomedusae Solmarisidae Pegantha rubiginosa
MG979345	Hydrozoa Trachylinae Narcomedusae Solmarisidae Pegantha rubiginosa
MG979346	Hydrozoa Trachylinae Narcomedusae Solmarisidae Solmaris DLSI359
MG979346	Hydrozoa Trachylinae Narcomedusae Solmarisidae Solmaris DLSI359
MG979348	Hydrozoa Trachylinae Narcomedusae Tetraplatiidae Tetraplatia chuni
MG979348	Hydrozoa Trachylinae Narcomedusae Tetraplatiidae Tetraplatia chuni
DQ002501	Hydrozoa Trachylinae Narcomedusae Tetraplatiidae Tetraplatia volitans
DQ002501	Hydrozoa Trachylinae Narcomedusae Tetraplatiidae Tetraplatia volitans
EU247816	Hydrozoa Trachylinae Trachymedusae Geryoniidae Geryonia proboscidalis
EU247816	Hydrozoa Trachylinae Trachymedusae Geryoniidae Geryonia proboscidalis
AY920756	Hydrozoa Trachylinae Trachymedusae Geryoniidae Liriope tetraphylla
AY920756	Hydrozoa Trachylinae Trachymedusae Geryoniidae Liriope tetraphylla
EU247822	Hydrozoa Trachylinae Trachymedusae Halicreatidae Botrynuma brucei
EU247826	Hydrozoa Trachylinae Trachymedusae Halicreatidae Halicreas minimum
EU247825	Hydrozoa Trachylinae Trachymedusae Halicreatidae Haliscera conica
MG979352	Hydrozoa Trachylinae Trachymedusae Halicreatidae Halitrephes maasi
EU247821	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Aglantha digitale
EU247821	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Aglantha digitale

EU247820	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Aglaura hemistoma
EU247820	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Aglaura hemistoma
MG979355	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Amphogona apicata
MG979355	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Amphogona apicata
MK547161	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Benthocodon peduncula
MK547161	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Benthocodon peduncula
MG979358	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Colobonema sericeum
MG979358	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Colobonema sericeum
MK547162	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Crossota alba
MK547162	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Crossota alba
MG979362	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Crossota norvegica
MG979362	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Crossota norvegica
AF358063	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Crossota rufobrunnea
AF358063	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Crossota rufobrunnea
AF358062	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Pantachogon haeckeli
AF358062	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Pantachogon haeckeli
EU247819	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Rhopalonema velatum
EU247819	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Rhopalonema velatum
MG979364	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Sminthea arctica
MG979364	Hydrozoa Trachylinae Trachymedusae Rhopalonematidae Sminthea arctica
KY077285	Hydrozoa Trachylinae Trachymedusae Tetrorchis erythrogaster
KY077285	Hydrozoa Trachylinae Trachymedusae Tetrorchis erythrogaster
AY920771	Scyphozoa Cassiopea xamachana
AF358100	Scyphozoa Catostylus AGC-2001
KY610843	Scyphozoa Chrysaora chinensis
AF358099	Scyphozoa Chrysaora melanaster
KY212123	Scyphozoa Chrysaora pacifica
JX845355	Scyphozoa Cyanea nozakii
HM194791	Scyphozoa Deepstaria enigmatica
KY610748	Scyphozoa Lobonema smithii
AF358096	Scyphozoa Phacellophora camtschatica
HM194792	Scyphozoa Poralia rufescens
AY920772	Scyphozoa Rhizostome sp. AGC-2005
JX845352	Scyphozoa Rhopilema esculentum
AF358101	Scyphozoa Stomolophus meleagris
KU308576	Staurozoa Calvadosia cruciformis

KU308571	Staurozoa <i>Calvadosia cruxmelitensis</i>
KU308558	Staurozoa <i>Depastromorpha africana</i>
AF358102	Staurozoa <i>Haliclystus sanjuanensis</i>
AY845345	Staurozoa <i>Lucernaria janetae</i>

Table S6. Reference sequences used in the phylogenetic tree of Copepoda (Fig. S6).

Accession Code	Simplified taxonomic lineage
JX995284	Calanoida Acartia clausii
GU969197	Calanoida Acartia danae
KY859764	Calanoida Acartia hudsonica
GU969198	Calanoida Acartia negligens
GU969196	Calanoida Acartia omorii
GU969157	Calanoida Acartia pacifica
KT030253	Calanoida Acartia steueri
GU350740	Calanoida Acartia tonsa
MG660981	Calanoida Aetideidae Chiridiella reductella
MG660938	Calanoida Aetideidae Chiridius obtusifrons
AB625971	Calanoida Aetideidae Euchirella amoena
MG660908	Calanoida Aetideidae Gaetanus brevispinus
MG660879	Calanoida Aetideidae Gaetanus tenuispinus
MG661009	Calanoida Aetideidae Jaschnovia brevis
MF796518	Calanoida Aetideidae Prolutamator hadalis
MG660990	Calanoida Aetideidae Pseudochirella batillipa
AB625972	Calanoida Aetideidae Undeuchaeta major
HM997058	Calanoida Arietellidae Paraugaptilus buchani
MG660988	Calanoida Augaptilidae Haloptilus acutifrons
GU969152	Calanoida Augaptilidae Haloptilus longicornis
MG660876	Calanoida Augaptilidae Pseudaugaptilus polaris
MG661046	Calanoida Augaptilidae Pseudhaloptilus pacificus
MG660956	Calanoida Bathypontiidae Temorites brevis
MG660955	Calanoida Bathypontiidae Temorites brevis
JQ911941	Calanoida Bestiolina similis
MF993124	Calanoida Calanidae Calanus Calanidae Calanus finmarchicus
MF993123	Calanoida Calanidae Calanus Calanidae Calanus glacialis
AY118066	Calanoida Calanidae Calanus Calanidae Calanus propinquus
AF367716	Calanoida Calanidae Mesocalanus tenuicornis
JQ911943	Calanoida Calocalanidae Calocalanus curtus
GU969160	Calanoida Calocalanidae Calocalanus pavo
GU969146	Calanoida Calocalanidae Calocalanus plumulosus
AB625973	Calanoida Candacia bipinnata

GU969213	Calanoida Candacia bispinosa
AB625974	Calanoida Candacia columbiae
GU969145	Calanoida Candacia discaudata
GU969199	Calanoida Candacia pachydactyla
GU969161	Calanoida Candacia truncata
GU969163	Calanoida Centropagidae Centropages abdominalis
GU969158	Calanoida Centropagidae Centropages furcatus
JX995295	Calanoida Centropagidae Centropages hamatus
GU969162	Calanoida Centropagidae Centropages tenuiremis
JX995298	Calanoida Centropagidae Centropages typicus
JX995304	Calanoida Centropagidae Isias clavipes
GU969144	Calanoida Centropagidae Sinocalanus tenellus
GU969200	Calanoida Clausocalanidae Clausocalanus furcatus
JX995321	Calanoida Clausocalanidae Pseudocalanus elongatus
JX995324	Calanoida Clausocalanidae Pseudocalanus moultoni
GU969206	Calanoida Cosmocalanus darwinii
AY339147	Calanoida Diaptomidae Arctodiaptomus dorsalis
AY339149	Calanoida Diaptomidae Eudiaptomus graciloides
JX945140	Calanoida Diaptomidae Hemidiaptomus roubau
AY339155	Calanoida Diaptomidae Leptodiaptomus sicilis
AY339156	Calanoida Diaptomidae Mastigodiaptomus nesus
AY339159	Calanoida Diaptomidae Skistodiaptomus oregonensis
AY339161	Calanoida Diaptomidae Skistodiaptomus pygmaeus
MG661001	Calanoida Eucalanidae Eucalanus bungii
GU969202	Calanoida Eucalanidae Eucalanus elongatus
GU969148	Calanoida Eucalanidae Pareucalanus attenuatus
GU969190	Calanoida Eucalanidae Rhincalanus cornutus
GU969191	Calanoida Eucalanidae Rhincalanus nasutus
GU969168	Calanoida Eucalanidae Subeucalanus crassus
GU969169	Calanoida Eucalanidae Subeucalanus mucronatus
GU969143	Calanoida Eucalanidae Subeucalanus subtenuis
KR048714	Calanoida Eurytemora pacifica
MG661044	Calanoida Heterorhabdidae Heterorhabdus norvegicus
AB625959	Calanoida Heterorhabdidae Heterorhabdus tanneri
AB625968	Calanoida Heterorhabdidae Heterostylites major
LC107407	Calanoida Heterorhabdidae Mesorhabdus brevicaudatus

MG661043	Calanoida Heterorhabdidae Paraheterorhabdus compactus
MG660995	Calanoida Lucicutiidae Lucicutia anomala
AB625965	Calanoida Lucicutiidae Lucicutia ovaliformis
MG660916	Calanoida Lucicutiidae Lucicutia polaris
MG660912	Calanoida Lucicutiidae Lucicutia pseudopolaris
GU969203	Calanoida Mecynoceridae Mecynocera clausi
AB625967	Calanoida Metridinidae Metridia asymmetrica
GU969176	Calanoida Metridinidae Metridia gerlachei
GU969183	Calanoida Metridinidae Pleuromamma abdominalis
GU969185	Calanoida Metridinidae Pleuromamma antarctica
GU969184	Calanoida Metridinidae Pleuromamma borealis
GU969186	Calanoida Metridinidae Pleuromamma xiphias
HM997057	Calanoida Nullosetigeridae Nullosetigera auctiseta
JQ911936	Calanoida Paracalanidae Acrocalanus andersoni
JQ911937	Calanoida Paracalanidae Acrocalanus gibber
JQ911938	Calanoida Paracalanidae Acrocalanus gracilis
JQ911939	Calanoida Paracalanidae Acrocalanus longicornis
GU969201	Calanoida Paracalanidae Acrocalanus monachus
JQ911941	Calanoida Paracalanidae Bestiolina similis
GU969180	Calanoida Paracalanidae Paracalanus aculeatus
JQ911956	Calanoida Paracalanidae Paracalanus denudatus
JF326205	Calanoida Paracalanidae Paracalanus parvus
JQ911957	Calanoida Paracalanidae Paracalanus quasimodo
JQ911958	Calanoida Paracalanidae Paracalanus tropicus
MG660954	Calanoida Phaennidae Onchocalanus cristogerens
MF959837	Calanoida Phaennidae Xanthocalanus LM24
MG661040	Calanoida Phaennidae Xanthocalanus polarsternae
MG661041	Calanoida Phaennidae Xanthocalanus profundus
JX984662	Calanoida Pseudodiaptomidae Pseudodiaptomus annandalei
JX984663	Calanoida Pseudodiaptomidae Pseudodiaptomus aurivillii
KC815329	Calanoida Pseudodiaptomidae Pseudodiaptomus euryhalinus
GU969194	Calanoida Pseudodiaptomidae Pseudodiaptomus inopinus
KR048712	Calanoida Pseudodiaptomidae Pseudodiaptomus marinus
GU969193	Calanoida Pseudodiaptomidae Pseudodiaptomus poplesia
MF959838	Calanoida Rostrocalanidae Rostrocalanus cognatus
MF959839	Calanoida Rostrocalanidae Rostrocalanus JR11

KU247619	Calanoida Spinocalanidae Mimocalanus crassus
KU247638	Calanoida Spinocalanidae Monacilla tenera
KU247634	Calanoida Spinocalanidae Mospicalanus schielae
MF796501	Calanoida Spinocalanidae Spinocalanus abyssalis
MG660997	Calanoida Spinocalanidae Spinocalanus antarcticus
AY192563	Calanoida Subeucalanus pileatus
KX400986	Calanoida Temoridae Eurytemora affinis
KX400986	Calanoida Temoridae Eurytemora affinis
MN567280	Calanoida Temoridae Eurytemora americana
KX400977	Calanoida Temoridae Eurytemora carolleae
GU969209	Calanoida Temoridae Temora discaudata
JX995310	Calanoida Temoridae Temora longicornis
GU969210	Calanoida Temoridae Temora stylifera
GU969211	Calanoida Temoridae Temora turbinata
HM997066	Calanoida Temoridae Temoropia mayumbaensis
AB292213	Chelicerata Pycnogonida Pycnogonum tenue
Hexapoda	Collembola Crossodonthina koreana
Hexapoda	Collembola Cyphoderus javanus
Hexapoda	Collembola Hypogastrura dolsana
Hexapoda	Collembola Lepidocyrtus paradoxus
Hexapoda	Collembola Podura aquatica
KR048724	Cyclopoida Bonnierilla curvicaudata
FJ214952	Cyclopoida Cyclopettidae Paracyclops nana
MF077729	Cyclopoida Cyclopicina longifurcata
AY626999	Cyclopoida Cyclopidae Acanthocyclops viridis
KR048733	Cyclopoida Cyclopidae Apocyclops borneoensis
AY626997	Cyclopoida Cyclopidae Apocyclops royi
EF532821	Cyclopoida Cyclopidae Cyclops insignis
EF532820	Cyclopoida Cyclopidae Cyclops kolensis
AJ746335	Cyclopoida Cyclopidae Eucyclops dumonti
L81940	Cyclopoida Cyclopidae Eucyclops serrulatus
AJ746333	Cyclopoida Cyclopidae Eucyclops speratus
KR048727	Cyclopoida Cyclopidae Megacyclops viridis
MH571998	Cyclopoida Cyclopidae Mesocyclops pehpeiensis
DQ107580	Cyclopoida Cyclopidae Thermocyclops WEN
KR048729	Cyclopoida Cyclopidae Tropocyclops ishidai

JF288757	Cyclopoida Oithonidae Oithona brevicornis
KJ814022	Cyclopoida Oithonidae Oithona davisae
GU969179	Cyclopoida Oithonidae Oithona similis
KR048731	Cyclopoida Pachypygus curvatus
KR048766	Cyclopoida Rhynchomolgidae Critomoligus vicinus
JF781541	Cyclopoida Rhynchomolgidae Doridicola agilis
KR048761	Cyclopoida Rhynchomolgidae Zamoligus cavernularius
MN536876	Harpacticoida Aegisthidae Cerviniella brodskayae
MF077767	Harpacticoida Aegisthidae Cerviniopsis longicaudata
MN536817	Harpacticoida Aegisthidae Pontostratiotes fontani
MF077716	Harpacticoida Ectinosomatidae Bradya DZMB037
AY627016	Harpacticoida Ectinosomatidae Bradya Greenland-RJH-2004
MF077759	Harpacticoida Ectinosomatidae Parabrydia dilatata
EU370430	Harpacticoida Harpacticidae Tigriopus fulvus
EU054307	Harpacticoida Harpacticidae Tigriopus japonicus
MK075972	Harpacticoida Nannopodidae Nannopus bulbiseta
MK075968	Harpacticoida Nannopodidae Nannopus minutus
MK075984	Harpacticoida Nannopodidae Nannopus parvipilis
MK075964	Harpacticoida Nannopodidae Nannopus serratus
MF077760	Harpacticoida Pseudotachidiidae Pseudotachidius bipartitus
MF077748	Harpacticoida Pseudotachidiidae Xylora bathyalis
EU368600	Hexapoda Diplura Dicellurata Catajapyx aquilonaris
AY037168	Hexapoda Diplura Dicellurata Parajapyx emeryanus
AF173234	Hexapoda Diplura Rhabdura Campodea tillyardi
AY145134	Hexapoda Diplura Rhabdura Octostigma sinensis
AY145137	Hexapoda Diplura Rhabdura Pseudlibanocampa sinensis
EU368613	Hexapoda Insecta Archaeognatha Machilidae Lepismachilis y-signata
EU368614	Hexapoda Insecta Archaeognatha Machilidae Pedetontus okajimae
AF370788	Hexapoda Insecta Archaeognatha Meinertellidae Allomachilis froggatti
JQ581037	Hexapoda Insecta Coleoptera Diabrotica virgifera
MH746297	Hexapoda Insecta Coleoptera Hoplopactus lateralis
AY121133	Hexapoda Insecta Dermaptera Chelisoches morio
KX069007	Hexapoda Insecta Dermaptera Irdex papuanus
GAYK02035584	Hexapoda Insecta Mecoptera Boreus hyemalis
AY521864	Hexapoda Insecta Megaloptera Sialis hamata
JQ581037	Hexapoda Insecta Neoptera Coleoptera Diabrotica virgifera

MH746297	Hexapoda Insecta Neoptera Coleoptera Hoplopactus lateralis
AY121133	Hexapoda Insecta Neoptera Dermaptera Chelisoches morio
KX069007	Hexapoda Insecta Neoptera Dermaptera Irdex papuanus
AF440198	Hexapoda Insecta Neoptera Diptera Anopheles maculatus
AF322422	Hexapoda Insecta Neoptera Diptera Oestromyia leporina
AF322421	Hexapoda Insecta Neoptera Diptera Ornithomya avicularia
AF322419	Hexapoda Insecta Neoptera Diptera Sarcophaga bullata
KT188467	Hexapoda Insecta Neoptera Hemiptera Bannacoris arboreus
KT188471	Hexapoda Insecta Neoptera Hemiptera Lestonia haustorifera
KT188473	Hexapoda Insecta Neoptera Hemiptera Sagriva vittata
AF286289	Hexapoda Insecta Neoptera Holometabola Mecoptera Chorista Chorista australis
KR068932	Hexapoda Insecta Neoptera Lepidoptera Aidos perfusa admiranda
MG100879	Hexapoda Insecta Neoptera Lepidoptera Leguminivora glycinivorella
KR068953	Hexapoda Insecta Neoptera Lepidoptera Perola murina
AF286296	Hexapoda Insecta Neoptera Mecoptera Brachypanorpa carolinensis
X89493	Hexapoda Insecta Neoptera Mecoptera Panorpa germanica
AY521864	Hexapoda Insecta Neoptera Megaloptera Sialis hamata
Z97565	Hexapoda Insecta Neoptera Orthoptera Caelifera Cylindraustralia kochii
KM853181	Hexapoda Insecta Neoptera Orthoptera Caelifera Ellipes minuta
Z97567	Hexapoda Insecta Neoptera Orthoptera Caelifera Euschmidtia cruciformis
Z97586	Hexapoda Insecta Neoptera Orthoptera Caelifera Tanaocerus koebeli
Z97566	Hexapoda Insecta Neoptera Orthoptera Ensidera Cyphoderris monstrosa
Z97564	Hexapoda Insecta Neoptera Orthoptera Ensifera Comicus campestris
ET713455	Hexapoda Insecta Neoptera Orthoptera Ensifera Hemiandrus subantarcticus
ET676721	Hexapoda Insecta Neoptera Orthoptera Ensifera Motuweta riparia
EF622722	Hexapoda Insecta Neoptera Plecoptera Despaxia augusta
AY121148	Hexapoda Insecta Neoptera Plecoptera Isoperla davisi
U68400	Hexapoda Insecta Neoptera Plecoptera Mesoperlina pecircai
Z97595	Hexapoda Insecta Neoptera Plecoptera Nemoura meieri
EF622698	Hexapoda Insecta Neoptera Polyneoptera Plecoptera Neuroperla schedingi
X89486	Hexapoda Insecta Neoptera Siphonaptera Archaeopsylla erinacei
EU336056	Hexapoda Insecta Neoptera Siphonaptera Rhadinopsylla masculana
AF423886	Hexapoda Insecta Neoptera Siphonaptera Thrassis bacchi gladiolus
EU336105	Hexapoda Insecta Neoptera Siphonaptera Uropsylla tasmanica
KM463948	Hexapoda Insecta Neoptera Trichoptera Asynarchus nigriculus
KM463952	Hexapoda Insecta Neoptera Trichoptera Limnephilus picturatus

AF286300	Hexapoda Insecta Neoptera Trichoptera Oecetis avara
AF286292	Hexapoda Insecta Neoptera Trichoptera Pycnopsyche lepida
AY521892	Hexapoda Insecta Neoptera Zoraptera Zorotypus hubbardi
KM246626	Hexapoda Insecta Neoptera Zoraptera Zorotypus medoensis
AY521891	Hexapoda Insecta Neoptera Zoraptera Zorotypus novobritannicus
ET713455	Hexapoda Insecta Orthoptera Hemiandrus subantarcticus
ET676721	Hexapoda Insecta Orthoptera Motuweta riparia
AY121148	Hexapoda Insecta Plecoptera Isoperla davisii
EU368597	Hexapoda Protura Acerentomata Acerentomon franzi
AY037169	Hexapoda Protura Acerentomata Baculentulus tienmushanensis
EU557242	Hexapoda Protura Acerentomata Hesperentomon pectigastrulum
EU557254	Hexapoda Protura Eosentomata Eosentomon megaglenum
EU557253	Hexapoda Protura Eosentomata Eosentomon orientale
EU557252	Hexapoda Protura Eosentomata Zhongguohentomon piligeroum
AY596359	Hexapoda Protura Sinentomata Fujientomon dicestum
AY596358	Hexapoda Protura Sinentomata Sinentomon erythranum
EF582897	Malacostraca Amphipoda Crangonyx pseudogracilis
EF582931	Malacostraca Amphipoda Gammarus takesensis
AB295408	Malacostraca Amphipoda Jassa slatteryi
U33181	Malacostraca Decapoda Astacus astacus
DQ925828	Malacostraca Decapoda Cymonomoides delli
AY743956	Malacostraca Decapoda Hippolyte pleuracanthus
MG677849	Malacostraca Euphausiacea Stylocheiron maximum
MG677856	Malacostraca Euphausiacea Thysanopoda aequalis
HM138863	Malacostraca Hoplocarida Coronis scolopendra
KM074038	Malacostraca Hoplocarida Haptosquilla hamifera
EF116546	Malacostraca Isopoda Betamorphia fusiformis
KY951738	Malacostraca Isopoda Ketosoma weneri
EF682249	Malacostraca Isopoda Notopais magnifica
KY951740	Malacostraca Isopoda Thaumastosoma platycarpus
MF077710	Misophrioida Archimisophria discoveryi
MF077709	Misophrioida Benthomisophria cornuta
MF077778	Misophrioida Benthomisophria palliata
MF077772	Misophrioida Misophriella DZMB392
LC320120	Misophrioida Misophriidae HT-2017
JF781532	Misophrioida Misophriopsis okinawensis

KR048782	Monstrilloida Cymbasoma reticulatum
KR048787	Monstrilloida Maemonstrilla simplex
DQ538495	Monstrilloida Monstrilla clavata
MF077738	Monstrilloida Monstrilla helgolandica
KR048783	Monstrilloida Monstrilopsis SYB-2016
MF077786	Mormonilloida Mormonilla DZMBK37
MF077740	Mormonilloida Mormonilla phasma
MF077739	Mormonilloida Neomormonilla minor
KR048768	Poecilostomatoida Bomolochidae Bomolochus bellones
KR048747	Poecilostomatoida Bomolochidae Nothobomolochus thambus
JF781555	Poecilostomatoida Catiniidae Catinia plana
KR048753	Poecilostomatoida Chondracanthidae Acanthochondria spirigera
L34046	Poecilostomatoida Chondracanthidae Chondracanthus lophii
MF077732	Poecilostomatoida Chondracanthidae Chondracanthus merluccii
JF781553	Poecilostomatoida Clausidiidae Clausidium vancouverense
KR048764	Poecilostomatoida Clausidiidae Conchylurus dispar
KR048763	Poecilostomatoida Clausidiidae Conchylurus quintus
KR048744	Poecilostomatoida Clausidiidae Hemicyclops ctenidis
KR048769	Poecilostomatoida Clausidiidae Hemicyclops tanakai
JF781552	Poecilostomatoida Clausidiidae Hemicyclops thalassius
GU969165	Poecilostomatoida Corycaeidae Corycaeus speciosus
MF077730	Poecilostomatoida Corycaeidae Ditrichocorycaeus anglicus
DQ107577	Poecilostomatoida Ergasilidae Ergasilus peregrinus
DQ107569	Poecilostomatoida Ergasilidae Ergasilus tumidus
DQ107578	Poecilostomatoida Ergasilidae Ergasilus yaluzangbus
DQ107576	Poecilostomatoida Ergasilidae Paraergasilus brevidigitus
DQ107563	Poecilostomatoida Ergasilidae Sinergasilus polycolpus
DQ107561	Poecilostomatoida Ergasilidae Sinergasilus undulatus
MK370210	Poecilostomatoida Oncaeidae Oncaea 776DZMB
MG661013	Poecilostomatoida Oncaeidae Oncaea notopus
MG661033	Poecilostomatoida Oncaeidae Triconia borealis
GU969173	Poecilostomatoida Sapphirinidae Sapphirina darwinii
GU969208	Poecilostomatoida Sapphirinidae Sapphirina scarlata
MF077781	Progymnoplea Platycopioidea Platycopia perplexa
MF077704	Progymnoplea Platycopioidea Nanocopia minuta
FJ447452	Siphonostomatoida Achtheinus oblongus

EF088411	Siphonostomatoida <i>Caligus pelamydis</i>
KR048772	Siphonostomatoida <i>Hatschekia japonica</i>
EF088414	Siphonostomatoida <i>Lepeophtheirus pollachius</i>
FJ447428	Siphonostomatoida <i>Nemesis lamna</i>
FJ447445	Siphonostomatoida <i>Nesippus orientalis</i>
LC054034	Siphonostomatoida <i>Rhizorhina ohtsukai</i>

Table S7. Reference sequences used in the phylogenetic tree of tunicates (Fig. S7).

Accession code	Simplified taxonomic lineage
MK621850	Tunicata Appendicularia Copelata Oikopleuridae Oikopleura_gorskyi
MK621851	Tunicata Appendicularia Copelata Oikopleuridae Oikopleura_cophocerca
MK621864	Tunicata Appendicularia Copelata Oikopleuridae Mesoikopleura_haranti
MK621845	Tunicata Appendicularia Copelata Oikopleuridae Oikopleura_parva
MK621852	Tunicata Appendicularia Copelata Oikopleuridae Oikopleura_labradoriensis
MG661055	Tunicata Appendicularia Copelata Oikopleuridae Oikopleura_vanhoeffeni
MK621854	Tunicata Appendicularia Copelata Oikopleuridae Folia_mediterranea
L12434	Tunicata Ascidiacea Stolidobranchia Molgulidae Molgula Molgula_provisionalis
L12430	Tunicata Ascidiacea Stolidobranchia Molgulidae Molgula Molgula_occulta
L12432	Tunicata Ascidiacea Stolidobranchia Molgulidae Molgula Molgula_oculata
L12418	Tunicata Ascidiacea Stolidobranchia Molgulidae Molgula Molgula_bleizi
L12441	Tunicata Ascidiacea Stolidobranchia Styelidae Polycarpa Polycarpa_pomaria
L12413	Tunicata Ascidiacea Stolidobranchia Styelidae Cnemidocarpa Cnemidocarpa_finmarkiensis
L12422	Tunicata Ascidiacea Stolidobranchia Molgulidae Molgula Molgula_complanata
L12420	Tunicata Ascidiacea Stolidobranchia Molgulidae Molgula Molgula_citrina
AB013013	Tunicata Thaliacea Doliolida Doliolidae Doliolum Doliolum_nationalis
AB013011	Tunicata Thaliacea Pyrosomata Pyrosomatidae Pyrosoma Pyrosoma_atlanticum
AB013012	Tunicata Thaliacea Doliolida Doliolidae Doliolum Doliolum_nationalis
AB013015	Tunicata Appendicularia Copelata Oikopleuridae Oikopleura Oikopleura_sp.
AB013016	Tunicata Ascidiacea Stolidobranchia Pyuridae Halocynthia Halocynthia_roretzi
X53538	Tunicata Ascidiacea Stolidobranchia Pyuridae Herdmania Herdmania_momus
AB211066	Tunicata Ascidiacea Stolidobranchia Styelidae Botryllus Botryllus_schlosseri
JQ917223	Tunicata Thaliacea Salpida Salpidae Pegea Pegea_confoederata
KT387603	Tunicata Ascidiacea Stolidobranchia Pyuridae Microcosmus Microcosmus_exasperatus
FM244859	Tunicata Ascidiacea Stolidobranchia Styelidae Asterocarpa Asterocarpa_humilis
FM244856	Tunicata Ascidiacea Stolidobranchia Pyuridae Pyura Pyura_dura
FM244865	Tunicata Thaliacea Salpida Salpidae Ihlea Ihlea_racovitzai
FM244854	Tunicata Ascidiacea Stolidobranchia Pyuridae Microcosmus Microcosmus_sabatieri
FM244863	Tunicata Thaliacea Pyrosomata Pyrosomatidae Pyrosomella Pyrosomella_verticillata
FM244855	Tunicata Ascidiacea Stolidobranchia Pyuridae Microcosmus Microcosmus_squamiger
FM244869	Tunicata Appendicularia Copelata Oikopleuridae Oikopleura Oikopleura_labradoriensis
FM244850	Tunicata Ascidiacea Stolidobranchia Molgulidae Molgula Molgula_occidentalis
FM244868	Tunicata Appendicularia Copelata Oikopleuridae Megalocercus Megalocercus_huxleyi

FM244857	Tunicata Ascidiacea Stolidobranchia Pyuridae Pyura Pyura_gangelion
FM244851	Tunicata Ascidiacea Stolidobranchia Pyuridae Halocynthia Halocynthia_spinosa
FM244860	Tunicata Ascidiacea Stolidobranchia Styelidae Polycarpa Polycarpa_mytiligera
KT881545	Tunicata Appendicularia Copelata Oikopleuridae Bathochordaeus Bathochordaeus_charon
JF961807	Tunicata Ascidiacea Stolidobranchia Pyuridae Pyura Pyura_praeputialis
FM244853	Tunicata Ascidiacea Stolidobranchia Pyuridae Microcosmus Microcosmus_polymorphus
JF961794	Tunicata Ascidiacea Stolidobranchia Pyuridae Pyura Pyura_herdmani
KR057223	Tunicata Thaliacea Salpida Salpidae Brooksia Brooksia_lacromae
JN565044	Tunicata Ascidiacea Stolidobranchia Hexacrobylidae Oligotrema Oligotrema_lyra
AY903922	Tunicata Ascidiacea Stolidobranchia Styelidae Metandrocarpa Metandrocarpa_taylori
AY903926	Tunicata Ascidiacea Stolidobranchia Pyuridae Pyura Pyura_haustor
AY903923	Tunicata Ascidiacea Stolidobranchia Styelidae Styela Styela_gibbsii
AY903925	Tunicata Ascidiacea Stolidobranchia Pyuridae Halocynthia Halocynthia_igaboja
AY903924	Tunicata Ascidiacea Stolidobranchia Pyuridae Boltenia Boltenia_villosa
AY903921	Tunicata Ascidiacea Stolidobranchia Molgulidae Molgula Molgula_retortiformis
AY903927	Tunicata Ascidiacea Stolidobranchia Styelidae Botrylloides Botrylloides_violaceus
AF165827	Tunicata Ascidiacea Stolidobranchia Pyuridae Herdmania Herdmania_momus
HQ015387	Tunicata Thaliacea Salpida Salpidae Pegea Pegea_confoederata
HQ015406	Tunicata Thaliacea Salpida Salpidae Salpa Salpa_thompsoni
HQ015403	Tunicata Thaliacea Salpida Salpidae Brooksia Brooksia_rostrata
HQ015389	Tunicata Thaliacea Salpida Salpidae Soestia Soestia_zonaria
HQ015411	Tunicata Thaliacea Salpida Salpidae Ritteriella Ritteriella_retracta
HQ015386	Tunicata Thaliacea Salpida Salpidae Pegea Pegea_confoederata
HQ015405	Tunicata Thaliacea Salpida Salpidae Salpa Salpa_aspera
KJ818250	Tunicata Ascidiacea Stolidobranchia Styelidae Styela Styela_plicata
HQ015394	Tunicata Thaliacea Salpida Salpidae Cyclosalpa Cyclosalpa_polae
HQ015415	Tunicata Thaliacea Salpida Salpidae Thalia Thalia_democratica
HQ015390	Tunicata Thaliacea Salpida Salpidae Thetys Thetys_vagina
HQ015379	Tunicata Thaliacea Pyrosomata Pyrosomatidae Pyrostremma Pyrostremma_spinsum
HQ015400	Tunicata Thaliacea Salpida Salpidae Iasis Iasis_cylindrica
DQ346655	Tunicata Ascidiacea Stolidobranchia Styelidae Symplegma Symplegma_viride
D14366	Tunicata Thaliacea Salpida Salpidae Thalia Thalia_democratica
DQ346654	Tunicata Ascidiacea Stolidobranchia Styelidae Polycarpa Polycarpa_papillata

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