



UNIVERSITY OF
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MASTER THESIS

Mitogenomic analyses of the two cold-water
octocorals *Alcyonium digitatum* and *Primnoa*
resedaeformis

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Abstract

Mitochondrial genome sequencing is an active and productive field in current research of animal species. The application of Next-Generation Sequencing techniques has significantly improved the process retrieving valuable molecular data.

In this study, the mitogenomes from two cold-water octocorals from the north Atlantic region (Norwegian waters) were completely sequenced, using the IonTorrent PGM technology. While one species (*Alcyonium digitatum*, L. 1758) represents the shallow water soft corals, the other species (*Primnoa resedaeformis*, L. 1812) is a deep-sea gorgonian species. Thus, according to classic taxonomy these two octocoral species are expected to be distantly related.

The resulting mitogenomes are in the line with previous research of related species and are similar in gene content and order to the inferred ancestral type of mitogenome organization in octocorals. At the same time, several interesting sequence features were explored. Deviations from the common pattern among octocorals are expressed in nucleotide sequence heterogeneity and intergenic space structure.

Phylogeny analyses highlighted the relationships of these species based on whole mitogenome sequences of all available octocorals. Here, the two studied species group together, and forming a separate branch among octocorals. This observation is very surprising since *Alcyonium digitatum* and *Primnoa resedaeformis* represent soft corals and gorgonians, respectively. These interesting results provide a basis for further studies of mitochondrial genomes of cold-water octocoral variation in both species.

List of abbreviations

As	Antisense
atp6	F0 ATP synthetase complex, subunit 6 gene
atp8	F0 ATP synthetase complex, subunit 8 gene
Bp	Base pair(s)
cox1	Cytochrome oxidase, subunit 1 gene
cox2	Cytochrome oxidase, subunit 2 gene
cox3	Cytochrome oxidase, subunit 3 gene
cob	Cytochrome b gene
DNA	Deoxyribonucleic acid
etc	et cetera
GTR	General Time Reversible
IGR	Intergenic region
IPTG	Isoprpyil β -D-1-thiogalactopyranoside
Kb	Kilobase(s)
ML	Maximum Likelihood
Met	Methionine
Msh-1 (mtMutS; mutS)	Mutation Suppressor Homolog 1; mitochondrial mutation supressor gene
mtDNA	Mitochondrial DNA
nd1	NADH dehydrogenase, subunit 1 gene
nd2	NADH dehydrogenase, subunit 2 gene
nd3	NADH dehydrogenase, subunit 3 gene
nd4	NADH dehydrogenase, subunit 4 gene
nd4L	NADH dehydrogenase, subunit 4L gene
nd5	NADH dehydrogenase, subunit 5 gene
nd6	NADH dehydrogenase, subunit 6 gene
NGS	Next-generation sequencing
Nt	Nucleotide(s)
ORF	Open reading frame
PCR	Polymerase chain reaction
RNA	Ribonucleic acid
RPM	Rounds per minute
rRNA	Ribosomal RNA
rl	Ribosomal large subunit gene
rs	Ribosomal small subunit gene
Sec	Second(s)
tRNA	Transfer RNA
trnM	Transfer RNA (f-Met) gene
Xgal	5-bromo-4-chloro-3-indolyl- β -D-galactopyranoside

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Introduction

Cnidaria

Cnidaria is a taxon of special interest to biologist. The phylum Cnidaria is a basal group of animals that originated early in the metazoan evolution *Proceedings of the National Academy of Sciences*. Phylum consists of approximately 9000 species with main groups represented by Anthozoans, Cubozoans, Staurozoans, Hydrozoans and Scyphozoans. Despite of their ancestry, cnidarians exhibit high morphological plasticity and variability in the reproductive traits and life cycles (McFadden et al., 2001). They are simply organized animals with little bilateral symmetry. Some animals possess sack-like body and are sessile while others have an actively swimming medusa lifeform. While diverse life forms can be observed in this taxon, all animals inhabit marine environments with a few exceptions of freshwater-dwelling organisms (for instance, freshwater hydra *H. oligactis*).

In contempt of their morphological simplicity, cnidarians are the key species in some types of ecosystems. Particularly, corals shelter up to one-third of marine fauna species (Plaisance et al., 2011), provide unique conditions to microorganisms, and are hot points of biodiversity in marine and oceanic environments (Sunagawa et al., 2010).

Corals are among the most prominent organisms within this taxon. They form a class Anthozoa with two main assemblages – Hexacorallia and Octocorallia, respectively. Both groups consist mostly of colonial forms that participate in reef-building by creating dense beds on the ocean's floor. Therefore, both groups contribute to creation of important benthic ecosystems.

Mentioned subclasses are different in their morphology (Daly et al., 2007). Octocorals have eight-fold symmetry and simple tissue organization. They are composed of mesoglea, forming a dense matrix, and continuous epidermis, connecting the whole colony. An outer tissue, called coenenchyme, is often solidified. Body plan also includes eight mesenteries and eight tentacles. Colonies are polymorphic in their color. Animals prefer different habitats, but usually it is depths in the range of 3 to 50 m (Moen, 2004).

Hexacorallia is a well-studied group (63 complete mitogenome sequences available in GenBank) while the importance of Octocorallia was reflected in studies more recently (23 complete mitogenome sequences available in GenBank). Moreover, tropical species are best studied and described (Iguchi et al., 2012; Shinzato et al., 2011; Stanley Jr, 2003; Weis et al., 2008), thus species from another locations are interesting objects for further investigations.

Genomic studies of coral genomes are very promising in many respects: molecular techniques applied to species from unusual life conditions can result in obtaining new valuable information, molecular tools (such as primers, markers, etc.) and products (drugs, GFP-like proteins, toxins and venoms) as well as valuable information about diversity of basic animal groups.



Figure 1. A) An example of *Alcyonium digitatum* presented in yellow and white morphs

B) An example of a part of *Primnoa resedaeformis*

Photo: A) JC Schou B) Leo Shapiro Both images are taken from eol.org

Mitogenome research

The complete sequences of mitochondrial genomes have become a useful tool in current research on cnidarians (Chapman et al., 2010; Kayal and Lavrov, 2008). Compared to variably organized and complex nuclear genomes, mitogenome sequences are relatively easy to assemble and annotate. Moreover, the mitochondrial genome contains a stable set of genes and is readily amenable to comparative analyses. After first mitogenomes have been sequenced and assembled, a cascade of molecular data, describing mitochondrial DNA (mtDNA) organization and functioning, appeared. A variety of feature characteristics of the mitogenome has recently been uncovered, and these studies improved our basic knowledge of organelle genome (Emblem et al., 2014; Shao et al., 2012). The broad use of mtDNA makes it a suitable marker in population studies and phylogeny inferences in detecting SNPs, variability, and selective sweeps in coding sequences. Research on mitochondrial genome structure also contributes in exploring nuclear genomes since it represents a first step in the understanding of organism function at a basic level.

Application of Next Generation Sequencing (NGS) has revolutionized the current field of research (Miller et al., 2011). However, a combination of NGS and different techniques in mitogenome research is probably the most powerful approach. This because it, will ensure both efficient processing and quality of the sequences. Thus, NGS reads can be successfully combined and verified with techniques such as PCR, molecular cloning and Sanger sequencing (Johansen et al., 2010).

Such comprehensive data can be used to characterize marine populations, species and communities, as a basis of nature conservation strategies, and establishment of protected marine areas (Shinzato et al., 2011). This becomes more important as the anthropogenic impact on the environment is increasing. Marine habitats contain prominent ecosystems threatened by human induced exploitation (underwater mining, fishery, etc.), pollution, ocean acidification processes, and climate change (Hofmann et al., 2008). New molecular data will also facilitate blue biotechnology, bioprospecting and its vast propagations in pharmaceuticals and therapy (Bruckner, 2002; Cho et al., 2009; Otero-González et al., 2010).

Therefore, the application of genomics supported by NGS in marine species research is of high priority.

Previous knowledge about octocoral mitogenomes

There are no complete nuclear genome sequences of octocorals up to date, but previous studies in other cnidarians revealed unexpected complexity of cnidarian nuclear and mitochondrial genomes (Beagley et al., 1995; Chapman et al., 2010). Indeed, specific features are abundant within this phylum in either genomes. Here, focus will be mainly on the mitogenome since it is an object of interest.

Anthozoan mitogenomes are usually organized in a circular DNA molecule with the size range from 16 to 25 Kb in hexacorals and 18-19 Kb in octocorals. Those species which have linear DNA can also have several mitochromosomes of different size. However, hexacoral and octocoral genomes have noticeable differences in both gene content and genome organization. Both genomes contain typical 13 essential protein-coding genes, coding for proteins involved in oxydative phosphorylation processes, 2 ribosomal RNA subunits and a transfer RNA (f-Met),

which is common for both subclasses. In addition, hexacoral genomes have homing endonuclease gene, another transfer RNA gene (Tryptophane) and group I introns.

Octocoral mitochondrial genome composition is highly conserved, but gene order is often rearranged. It consists of typical 14 protein-coding genes and specific gene *msh-1* (Mutation Suppressor Homolog 1; *mtMutS*), found only in octocorals. Genes are usually separated by intergenic regions (IGR) – short non-coding sequences of up to 100 nucleotides. Some more details are presented in the Table 1.

Table 1. Mitochondrion genome content in two Anthozoan subclasses

Mitogenome feature	Octocorallia	Hexacorallia
Size (Kb)	18-19	16-25
Topology	circular	circular
Protein coding genes	14	14
rRNA genes	2	2
tRNA genes	1	2
HEG	No	Yes
Introns	No	Yes
<i>msh-1</i>	Yes	No

Idea and realization of the project

The chosen species are very promising candidates for mitogenome sequencing study. Both species are common cold-water soft corals from the North Atlantic region, that belong to the Alcyonacea – the order in the Octocorallia subclass. While *Alcyonium digitatum* (“Dead men’s fingers”) is a soft coral within the family Alcyoniidae found in shallow waters, *Primnoa resedaeformis* belongs to the deep sea gorgonian family Primnoidae. Taxonomically these species are expected to be distantly related octocorals, but little molecular data about are available in databases to challenge the relationship analysis.

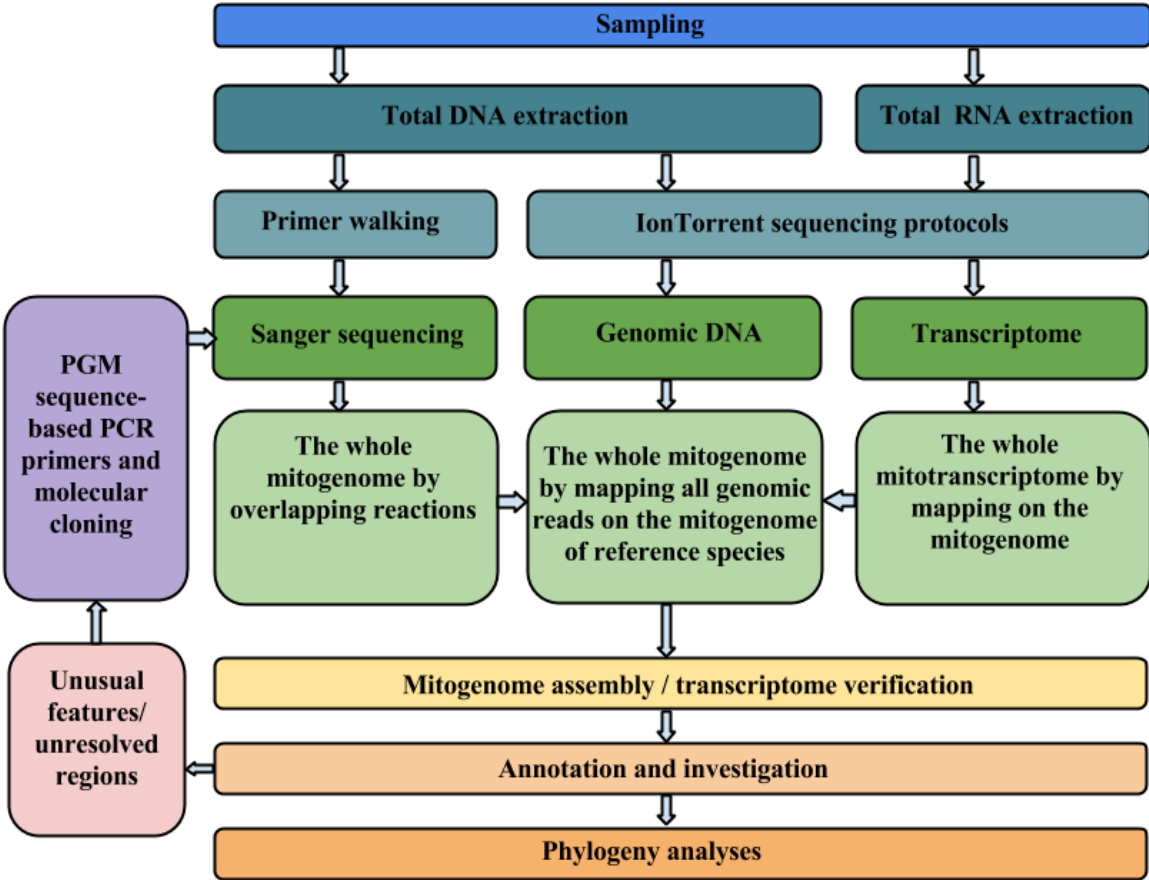
The present study applied Ion semiconductor sequencing technology to mitogenome and mitotranscriptome sequencing of two octocoral species (Fig.2). For the purpose of verifying the results obtained by IonTorrent sequencing, we used Sanger sequencing amplified mtDNA regions.

Molecular cloning procedures were chosen as an additional approach that would also improve the resolution of the sequence. This technique is effective for verification of poorly resolved parts of the mitogenome since it is able to produce clean sequencing data and improved coverage of problematic DNA regions. Transcriptome sequencing output is used for verification of gene sequences as well as identifying abundant transcripts. Thus, we were able to obtain a high quality mitogenome sequence from both study species.

The acquired mitogenomes were used together with the set of available published octocoral mitogenomes species for the reconstruction of phylogenetic relations.

The use of Ion semiconductor sequencing has also a key advantage because a pool of whole genomic DNA reads that is created during preparation procedures. These reads can be used for the further studies.

Figure 2. Workflow scheme of experiments in the present study.



Materials and methods

Sample collections

Live *P. resedaeformis* samples were collected at a *Lophelia pertusa* reef at Nord-Leksa, Norway (63°36'N;9°24'E) at 150-200 m depth using the ROV Minerva, RV Gunnerus (NTNU, Trondheim). Samples were stored in absolute ethanol at -20°C for DNA extraction. Samples for RNA extraction were homogenized in TRIzol and frozen at -80°C, or stored in RNeasy® RNA Stabilization solution (Life Technologies™) at -20 °C in order to prevent RNA degradation.

Live *A. digitatum* samples were collected by scuba-divers at Mørkvedbukta Research station (67°16'N; 14°33'E), Bodø, Norway at 3-5 m depth. Samples were preserved in absolute ethanol at -20°C for DNA extraction. Samples for RNA extraction were frozen at -80°C, or stored in RNeasy® solution and frozen at -20 °C in order to prevent RNA degradation.

Nucleic acid isolation

Coral tissue samples (2-5 mg) were mechanically homogenized in 2 ml MagNa Lyser Green Beads Tube (Roche) with Precellys 24 homogenizer (Bertin Technologies™) at 10000 rpm until complete homogenization. Total genomic DNA was extracted with Epicentre MasterPure™ Complete DNA and RNA Kit (Illumina™) and Urea protocol (see Appendix). Both protocols exploit broad range specificity Proteinase K. The Urea protocol also includes phenol/chloroform and chloroform/isoamyl extractions together with ethanol precipitation. The Epicentre kit contains manufactured protein precipitation agents.

Standard TRIzol protocol (Chomczynski, 1987), modified for cod (MG group) was used to extract total RNA from both fresh tissue and frozen samples. Standard requirements for work with RNA were considered as previously described (Nielsen, 2011). RNaseZap®Solution (Life Technologies™) was used to clean working surfaces from RNAses.

For the purpose of measuring the amount of nucleic acid in the probe and the purity of sample, several basic methods were used. Qubit™ dsDNA BR Assay kit (Invitrogen™) and High sensitivity RNA Assay kit (Invitrogen™) protocols were used directly after extraction procedures to assess approximate amount of material to work with.

Qubit® 2.0 Fluorometer (Invitrogen™) measurements are based on the fluorescence of the probe after binding with fluorescent agents. Nanodrop® ND-1000 (Thermo Fisher Scientific™) device was used to analyze concentration and purity of the sample. This device exploits a ratio of different wavelengths as a standard value of a pure sample. Agilent 2200 Tape Station System (Agilent Technologies) device was used to assess length of molecules and sample molarity after shearing and amplifying as well as other procedures, when proceeding to library and template preparations. Genomic DNA Screen Tape and High Sensitivity RNA Screen Tapes were used.

All measurements were done according to manufacturer's instructions and with negative control sample.

PCR

Only parts of protein coding genes of the studied species mitogenomes are available in online databases. Therefore, PCR primers were constructed using these sequences and also using multiple alignments of different octocoral species sequences. These octocoral-specific primers were combined randomly (except using forward and reverse primer for one gene in the same reaction) in PCR reactions. The strategy was to obtain amplification of different regions and find an overlapping reactions whose products would cover the whole mitogenome.

Primers used for PCR and Sanger sequencing reactions are listed in the Appendix B. PCR kit from TaKaRa (TaKaRa Bio Inc.) was used when preparing master mix. TaKaRa *LaTaq* Polymerase was chosen because of abilities to amplify long amplicons, as well as its proofreading properties (TaKaRa Bio Inc., 2004). Reaction mixture is presented in the Table 2. All preparation steps were performed on ice.

Table 2. Reaction mixture for PCR

Component	Amount, µl
DNA sample	1
Primer, F	1
Primer, R	1
LA Taq Polymerase	0,2
dNTP mix	4
Mg ²⁺ Buffer	2,5
Millipore water	15,3

Thermocycling conditions were as following: initial denaturation at 94°C for 5 minutes, 25 cycles of 94°C for 30 seconds, 55°C for 30 seconds, 72°C for 4 minutes and final elongation at 72°C 4 minutes. Annealing temperatures were set according to the melting temperatures (T_m) of the primers. Reactions were run with a negative control in order to check for contamination.

Visualization by agarose gel

DNA fragments were separated on 1% agarose gel (1 g of Ultra-pure Agarose (Invitrogen™) per 100 ml of 0,5 TBE buffer) with SYBR® Safe (Invitrogen™) (4 µl per 100 ml). 1 Kb+ DNA Ladder (Invitrogen™) was used to determine size of products. PCR products were mixed with Blue Bromophenol 6x loading dye (1 µl of dye per 5 µl of product) before loading into wells. Products were visualized using Gel Logic 200 Imaging system (Kodak™) and Safe Imager™. Qiagex II Gel Extraction Kit (150) (Agarose Gel Extraction protocol) (Qiagen) kit was applied for products purification from gel.

Sanger Sequencing

Successfully amplified products were Sanger sequenced (BigDye v.3.1) to verify sequences difficult to determine by IonTorrent. PCR primers were diluted 10-fold for the use in sequencing reactions. The reaction mixture is presented in the Table 3. Thermocycling conditions were as follows: initial denaturation at 96°C for 5 minutes, 25 cycles of 96°C for 10 seconds, 50°C for 5 seconds, and 60°C for 4 minutes. Reaction was performed at the Molecular Biology Lab, UiN, Bodø and samples were shipped to UiT/UNN afterwards where were processed on a 3130 xl GeneticAnalyzer® (Applied Biosystems™).

Table 3. Reaction mixture for Sanger sequencing

Component	Amount,µl
PCR product (gel extracted)	2
Big dye enzyme	1
Big dye Buffer 5x	1
Forward/Reverse primer	3
Nuclease-free water	3

Ion Torrent sequencing protocols

E-Gel® electrophoresis system was applied for size selection when preparing a template to further steps. E-Gel is a compact device that uses ready-made and stained E-Gel® SizeSelect™ Agarose Gels (2%), and works as a usual electrophoresis chamber. This procedure helps to select a part of library with desirable size.

Real-time quantitative PCR (qPCR) procedure was done in order to calculate the exact amount of molecules ligated with adapters from both ends. This procedure was done using StepOnePlus Real-Time PCR system (Life Technologies™) and Ion Library Taqman Quantitation kit.

Emulsion PCR was performed with Ion One Touch™ 2 System with Ion PGM™ Template OT2 200- and 400 kits (Life Technologies™) and checked with Qubit Quantitation Assay (Life Technologies™) kit.

Whole genome sequencing was done by using Ion Torrent™ PGM and 316 v.2 sequencing chips. Ion Torrent Low Input Protocols were used because of low (50-100 ng) extraction output from nucleic acid isolation procedures. Sequence quality was assessed based on the sequencing run report and manual inspection of tracer.

Low Input RiboMinus™ Eukaryote System v2 kit (Ambion™) protocol and MicroPoly(A)Purist Kit protocol were used to purify samples from rRNA and enrich PolyA RNA, respectively. Ion Total RNA Seq kit v2 was used to convert RNA into cDNA by reverse transcription reaction and to prepare a template for further work. Ion One Touch™ kits for 200- and 400 bp and 316 v.2 sequencing chips were used. Quality control was performed by analyzing the sequencing summary. All procedures were performed according to user manuals from manufacturers.

Bioinformatics

FinchTV (Geospiza Inc.) was used for the quality score inspection of Sanger sequenced DNA fragments as well as the length.

CLC Genomics Workbench (Qiagen™) software was used as a basic bioinformatic tool for further analyses. Mapping of all reads on mitogenome of the reference species sequences was done in order to sort out all nuclear reads. *C. rubrum* mitogenome was used as a reference for

P. resedaeformis and *P. resedaeformis* subsequently as a reference for *A. digitatum*. Both length and similarity fractions were set to be equal 0.8 in the purpose of increasing robustness. The resulted mitochondrial reads were used for further mitogenome *de novo* assembly based on overlapping parts of these reads. MITOS webpage assembly tool (<http://mitos.bioinf.uni-leipzig.de/>) and MITObim script (MITOchondrial Baiting and Iterative Mapping) (Hahn et al., 2013) were used for further verifications of genome assembly and annotation. The latter is a MIRA assembler based Perl-script that requires no mapping on a reference mitogenome. The *cox1* gene was used as a setout for assembly with "--quick" option. Mapping of all protein coding genes from complete octocoral mitogenomes (see Appendix D) available in GenBank was done for detection of protein coding sequences. Multiple alignments with the same set of species and genes were built then to evaluate reading frames, assess quality of assembly and annotate a mitogenome. Reading frames were also verified with EMBOSS Transeq web page and CLC Workbench with all 6 reading frames and Mold Mitochondrial genetic code settings. European Bioinformatic Institute resources (ebi.ac.uk) and NCBI (ncbi.nlm.nih.gov) resources were also used to detect similarity between sequences (BLAST algorithms), and to translate sequences into proteins, obtain sequences from databases.

Molecular cloning

Cloning was performed for the purpose of amplification of irresolute regions detected after the assembly. In this study *mutS* gene sequence was cloned since this gene is very variable and needs auxiliary sequencing techniques. Primers were made based on PGM sequencing results and listed in the Appendix. These 10-fold diluted PCR primers were used to amplify DNA fragments coding for *mutS* gene. PCR reaction conditions were the same as those for ordinary reaction (see PCR). Gel electrophoresis on 1% agarose gel was done then for excising products. Gel purification step was performed with Qiagen kit (see PCR). Samples were frozen in Eppendorf LoBind® Tubes (Eppendorf™) at -20 °C then until further procedures.

Topo® TA Cloning® kit for sequencing and One Shot® Top 10 Competent Cells (Life Technologies) were used to perform transformation reaction – an insertion reaction where amplified PCR product is introduced in bacterial genome by a vector. The amounts of PCR product in transformation reactions were 2 and 4 µl in order to get the most suitable amount of colonies. All growth media were prepared according to user guides and manuals.

Kanamycin (50 mg/ml) was used as an antibiotic agent for selection of insert-containing vectors. Either reaction was made in a 50 ml tube filled with 45 ml of LB medium with 45 µl of kanamycin added. Each reaction was triplicated on separate plates with amount of S.O.C. medium-combined cells of 50, 100, and 150 µl, respectively. 40 µl of Xgal and 40 µl of IPTG (100 mM) were added directly on agar plates. Ampicillin was used as antibiotic agent for negative control. To confirm insertion of gene into bacteria PCR was performed directly on bacteria clones using M13 primers. Standard 1% agarose gel electrophoresis was performed to visualize the result.

White colonies were collected using a pipet tip and transferred into LB-medium and incubated in a Multitron Standard Incubation Shaker (Infors HT™) at 150 rpm in 37 °C overnight. Cultures were transferred in Eppendorf LoBind® Tubes (Eppendorf™) and plasmids were purified with PureLink® Quick Plasmid Miniprep Kit (Invitrogen™) according to manufacturer's protocol.

Purified products were prepared to Sanger sequencing. Reaction mixture for Sanger sequencing reaction: 5µl of purified plasmid DNA, 3 µl of M-13 sequencing primer, 1 µl of BigDye 5x sequencing buffer (Applied Biosystems), 1 µl of BigDye 3.1 enzyme and nucleotide mix (Applied Biosystems). Reaction was performed in GeneAmp 9700 thermocycler with following settings and then shipped to UiT/ UNN, Tromsø (see Sanger sequencing).

Phylogenetic analysis

The present study focused on the relations of the species under investigation within the octocoral class. Two different datasets were used for estimating distance between the studied species and all available octocoral mitogenomes.

First dataset includes a concatenated alignment of all *mutS* genes+corresponding genes from the studied species. This approach was used for estimating distance between sequences of *mutS* gene since it is a specific sequence presented only in mitogenomes of octocorals.

Second dataset is a re-annotated mitogenome where the protein coding genes were sequentially concatenated in a following order: *atp6* and *atp8* genes, *cox1-3* genes, *nd 1-4, 4L, 5-6* genes,

mutS and *cob*. These reconstructed full-length mitogenomes were used in multiple alignments and building phylogenetic trees. Intergenic regions and ribosomal genes were omitted in analyses. *C. granulosa* was used as outgroup for both datasets since taxonomy of this species is somewhat contradictory and places this species outside Octocorallia. Alignments, distance and model tests and ML phylogenetic trees were done in the CLC Genomics Workbench (Qiagen™) software package as well as distance and model tests. Common model was GTR+G+T. Bootstrapping value in ML trees was 1000.

Results

Coral samples, preservations and extractions

Tentacles, epidermal tissue, and coenenchyme were used for nucleic acid extraction procedures. Both extraction methods were suitable for DNA isolation from the coral tissues but notable difference in the output was observed. The Epicentre kit was used for DNA extraction and further library preparation of *P. resedaeformis* samples. The Urea protocol was used for DNA extraction from *A. digitatum* samples because the Epicentre kit gave oversharing (Fig.3) of DNA and insufficiently short fragments (based on size-selection results).

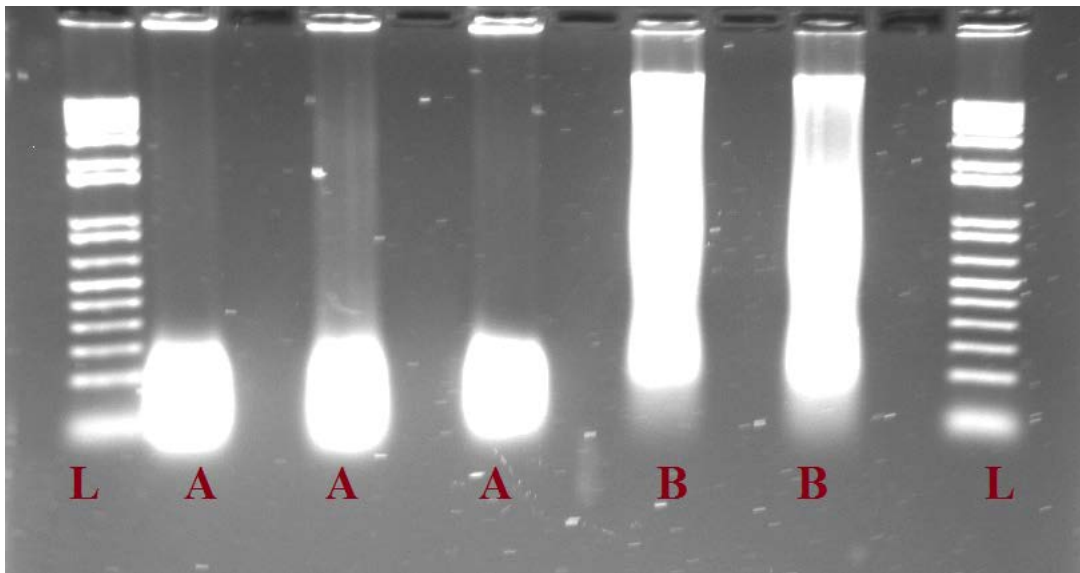


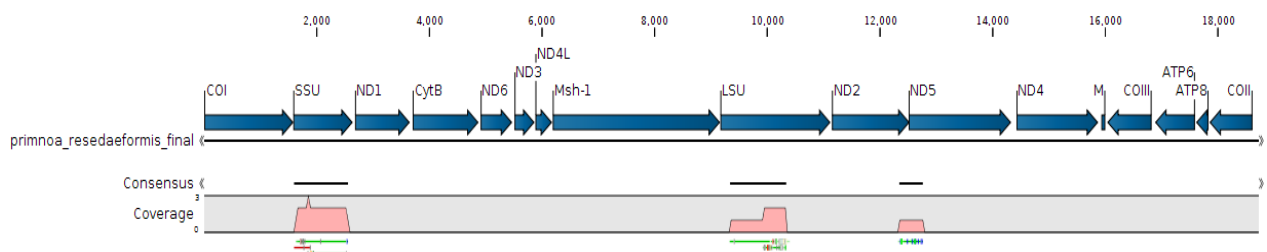
Figure 3. Agarose gel analysis of total DNA isolated from *A. digitatum* with two different methods - the Epicentre kit (lanes A) and the Urea protocol (lanes B). DNA size ladder (L).

PCR and Sanger sequencing

Fragments of different sizes were amplified from DNA of both species, successful primer combinations are listed in the Appendix B. Most amplified products were obtained from *P. resedaeformis* DNA, and few were gained from *A. digitatum* DNA. The largest product sizes were fragments of 1.5 to 2 kb in length which were subjected to Sanger sequencing. A total of 41 DNA fragments were Sanger sequenced. Obtained sequences were in the range of 200 bp to 1200 bp in sizes, and cover different parts of protein coding regions and RNA genes. However, length and quality scores of reads were appropriate and sufficient only in 12 fragments amplified from *P. resedaeformis* DNA and 2 from *A. digitatum*. Sanger sequences with low quality scores were removed. The most amplified regions are sequences between forward and reverse primers for *nd4L*, *rns* and *rnl* genes.

We initially intended to cover the whole mitogenome with overlapping reactions, but this approach resulted only in amplification of several fragments of the mitogenome. However, sequenced fragments are identical to corresponding regions in the whole mitogenome sequences and give strong support to Ion Torrent sequencing results (Fig.4.).

Figure 4. Mapping of all Sanger sequenced fragments on linearized view of the mitogenome of *P.resedaeformis*



Ion Torrent PGM sequencing

DNA sequencing

Two new mitochondrial genomes were sequenced in this study. The complete mitogenome sequences are presented in Appendix D. Fragments of approximately 400 bp (Appendix C) were obtained during the size-selection procedure when preparing the *P. resedaeformis* libraries. The total number of reads obtained for *P. resedaeformis* was 2.8 million (2.765.810) (Appendix C), which corresponds to a coverage of 146 times. Furthermore, the mitogenome was found to have a GC content of 36.6 %. Fragments of approximately 400 bp were obtained during the size-selection procedure when preparing the *A. digitatum* libraries. The complete mitogenome was sequenced using 316 v 2 chip. Similar to that of *P. resedaeformis*, the *A. digitatum* sequencing generated 3.0 million reads (3.018.931) with a mitogenome coverage of 159 and GC content of 37%.

Mitotranscriptome sequencing

Sequencing of the *P. resedaeformis* transcriptome resulted in 25.947 reads with a mean read length of 67 bp. Furthermore, the chip 25 %, the poly - clonality was 36 % and usable reads only 18%. In comparison, the *A. digitatum* transcriptome sequencing was much more efficient. Here, 1.2 million (1.200.348) reads were obtained, with mean read length of 155 bp. Chip loading and usable reads were twice as much (54% and 35%, respectively), and the poly - clonality significantly lower (28%).

Assembly and annotation of mitogenomes

Contigs of 18.726 bp and 18.790 bp were obtained from *P. resedaeformis* and *A. digitatum*, respectively, and represent the complete mitogenomes. Assembly was also performed using the MITOBIM script, with identical results. However, assembly with MITOS gave somewhat different results that include duplicated genes and additional transfer RNA genes not found by the other approaches.

Assembly and annotation revealed surprising similarity between the two mitogenomes. The *A. digitatum* and *P. resedaeformis* mitogenomes are less than 19 Kb, which is a consistent among octocorals. Both mitogenomes contain 14 protein-coding genes (Fig. 5) - 7 Complex I genes (*nad* 1, 2, 3, 4, 4L, 5, and 6), one Complex III gene (*cob*), 3 Complex IV genes (*cox* 1, 2 and 3), 2 Complex V genes (*atp6* and *atp8*) and a specific octocoral *msh-1* (Mutation Suppressor Homolog; mtMutS) gene. Protein-coding sequences are located on both strands and have a typical ancestral (Table 9) octocoral organization: *cox1* - *rns* - *nd1* - *cob* - *nd6* - *nd3* - *nd4L* - *mutS* - *rnl* - *nd2* - *nd5* - *nd4* - *trnM* (as) - *cox3* (as) - *atp6* (as) - *atp8* (as) - *cox2* (as). Length of intergenic regions is 760 nucleotides in the mitogenome of *A. digitatum* and 648 nucleotides in those of *P. resedaeformis* and fall within the common range for octocorals (414 to 957 bp). The content percentage of the whole mitogenomes is presented in Table 4.

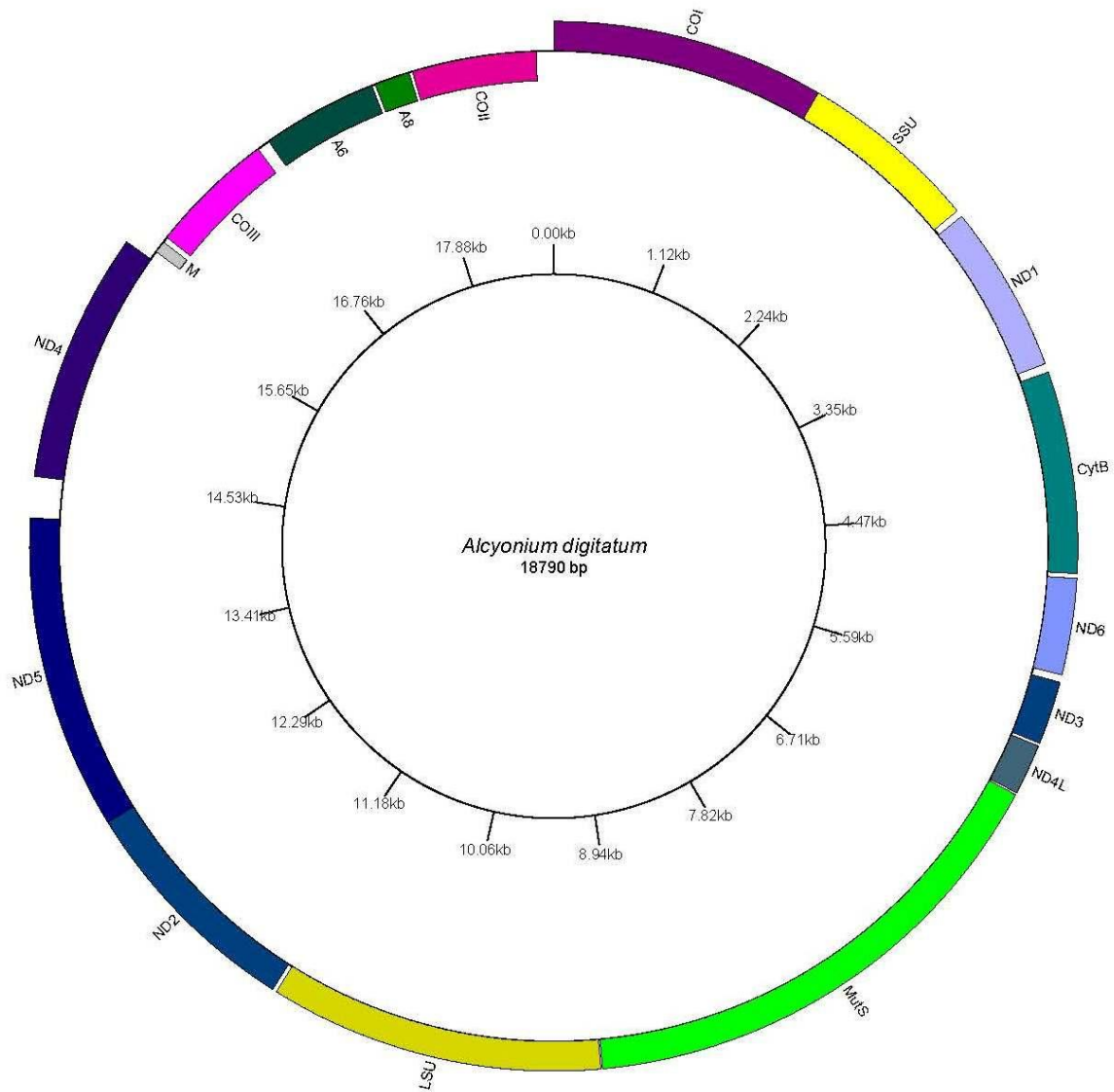
Table 4. Mitogenome composition in studied species

	<i>A. digitatum</i> ,%	<i>P. resedaeformis</i> ,%
Functional genes	74.8	75.2
RNA genes	15.85	16
IGRs	9.35	8.8

Table 5. Annotation of mtDNA genes and intergenic regions (IGRs) in *A. digitatum* and *P. resedaeformis*

Genes and IGRs	<i>Alcyonium digitatum</i> , position	Size, nt (aa)	<i>Sinularia peculiaris</i> NC_018379 Size, nt (aa)	<i>Narella hawaiiensis</i> NC_026192 Size, nt (aa)	Size, nt (aa)	<i>Primnoa resedaeformis</i> , position	Genes and IGRs
<i>cox1</i>	1-1582	1582 (527) ATG/T	1582 (527) ATG/T	1597 (532) AGT/T	1582 (527)	1-1582	<i>cox1</i>
<i>igr-1</i>	1582	0	0	-6	0	1582	<i>igr-1</i>
<i>rns</i>	1583-2624	1042	1051	1126	1052	1583-2634	<i>rns</i>
<i>igr-2</i>	2625-2666	42	47	-1	44	2635-2678	<i>igr-2</i>
<i>nd1</i>	2667-3635	969 (322) ATG/TAG	969 (322) ATG/TAG	981(326) ATG/TAG	969 (322) ATG/TAG	2679-3647	<i>nd1</i>
<i>igr-3</i>	3636-3686	51	27	144	54	3648-3701	<i>igr-3</i>
<i>cob</i>	3687-4853	1167 (388) ATG/TAA	1167 (388) ATG/TAG	1161(386) ATG/TAG	1167 (388) ATG/TAG	3702-4868	<i>cob</i>
<i>igr-4</i>	4854-4880	27	40	22	40	4869-4908	<i>igr-4</i>
<i>nd6</i>	4881-5438	558(185) ATG/TAG	558(185) ATG/TAG	564 (187) ATG/TAG	558(185) ATG/TAG	4909-5466	<i>nd6</i>
<i>igr-5</i>	5439-5481	43	55	43	43	5467-5509	<i>igr-5</i>
<i>nd3</i>	5482-5847	366 (121) ATG/TAG	354 (117) ATG/TAG	354 (117) ATG/TAG	354 (117) ATG/TAG	5510-5863	<i>nd3</i>
<i>igr-6</i>	5848-5865	18	19	28	19	5864-5882	<i>igr-6</i>
<i>nd4L</i>	5866-6159	294 (94) ATG/TAA	294 (97) ATG/TAA	294 (97) ATG/TAA	294 (97) ATG/TAA	5883-6176	<i>nd4L</i>
<i>igr-7</i>	6160-6172	13	13	28	13	6177-6191	<i>igr-7</i>
<i>mutS</i>	6173-9115	2943 (980) ATG/TAA	2973 (990) ATG/TAA	2937 (978) ATG/TAG	2970 (989) ATG/TAA	6190-9159	<i>mutS</i>
<i>igr-8</i>	9116-9124	9	9	17	9	9160-9169	<i>igr-8</i>
<i>rnl</i>	9125-11061	1937	1968	2211	1948	9169-11116	<i>rnl</i>
<i>igr-9</i>	11062-11087	26	31	0	28	11117-11144	<i>igr-9</i>
<i>nd2</i>	11088-12449	1362 (453) ATG/TAG	1374 (457) ATG/TAG	1149 (379) ATG/TAG	1374 (457) ATG/TAG	11145-12518	<i>nd2</i>
<i>igr-10</i>	12437-12449	-13	-13	-13	-13	12506-12518	<i>igr-10</i>
<i>nd5</i>	12437-14254	1818 (605) ATG/TAG	1818 (605) ATG/TAA	1872 (623) ATG/TAG	1818 (605) ATG/TAG	12506-14323	<i>nd5</i>
<i>igr-11</i>	14255-14493	239	96	43	97	14324-14420	<i>igr-11</i>
<i>nd4</i>	14494-15941	1449 (482) ATG/TAA	1449 (482) ATG/TAA	1449 (482) ATG/TAA	1449 (482) ATG/TAA	14421-15869	<i>nd4</i>
<i>igr-12</i>	15942-15988	56	57	62	59	15870-15928	<i>igr-12</i>
<i>trnM(as)</i>	15989-16069	71	71	71	71	15829-15898	<i>trnM(as)</i>
<i>igr-13</i>	16070-16106	37	39	44	36	16000-16035	<i>igr-13</i>
<i>cox3(as)</i>	16107-16872	766 (261) ATG/TAG	766 (261) ATG/TAA	766 (261) ATG/TAG	766 (261) ATG/TAG	16036-16821	<i>cox3(as)</i>
<i>igr-14</i>	16873-16954	62	64	47	64	16822-16885	<i>igr-14</i>
<i>atp6</i>	16955-17662	708 (235) ATG/TAA	708 (235) ATG/TAA	708 (235) ATG/TAA	708 (235) ATG/TAA	16886-17593	<i>atp6</i>
<i>igr-15</i>	17663-17685	23	24	20	23	17594-17616	<i>igr-15</i>
<i>atp8</i>	17686-17901	216 (71) ATG/TAG	216 (71) ATG/TAA	216 (71) ATG/TAG	216 (71) ATG/TAG	17617-17832	<i>atp8</i>
<i>igr-16</i>	17902-17922	21	22	22	21	17833-17853	<i>igr-16</i>
<i>cox2</i>	17923-18684	762 (251) ATG/TAG	762 (251) ATG/TAG	762 (251) ATG/TAG	762 (251) ATG/TAG	17854-18615	<i>cox2</i>
<i>igr-17</i>	18685-18790	106	112	112	111	18616-18726	<i>igr-17</i>
<i>mtDNA</i>		18790	18742	18838	18726		<i>mtDNA</i>

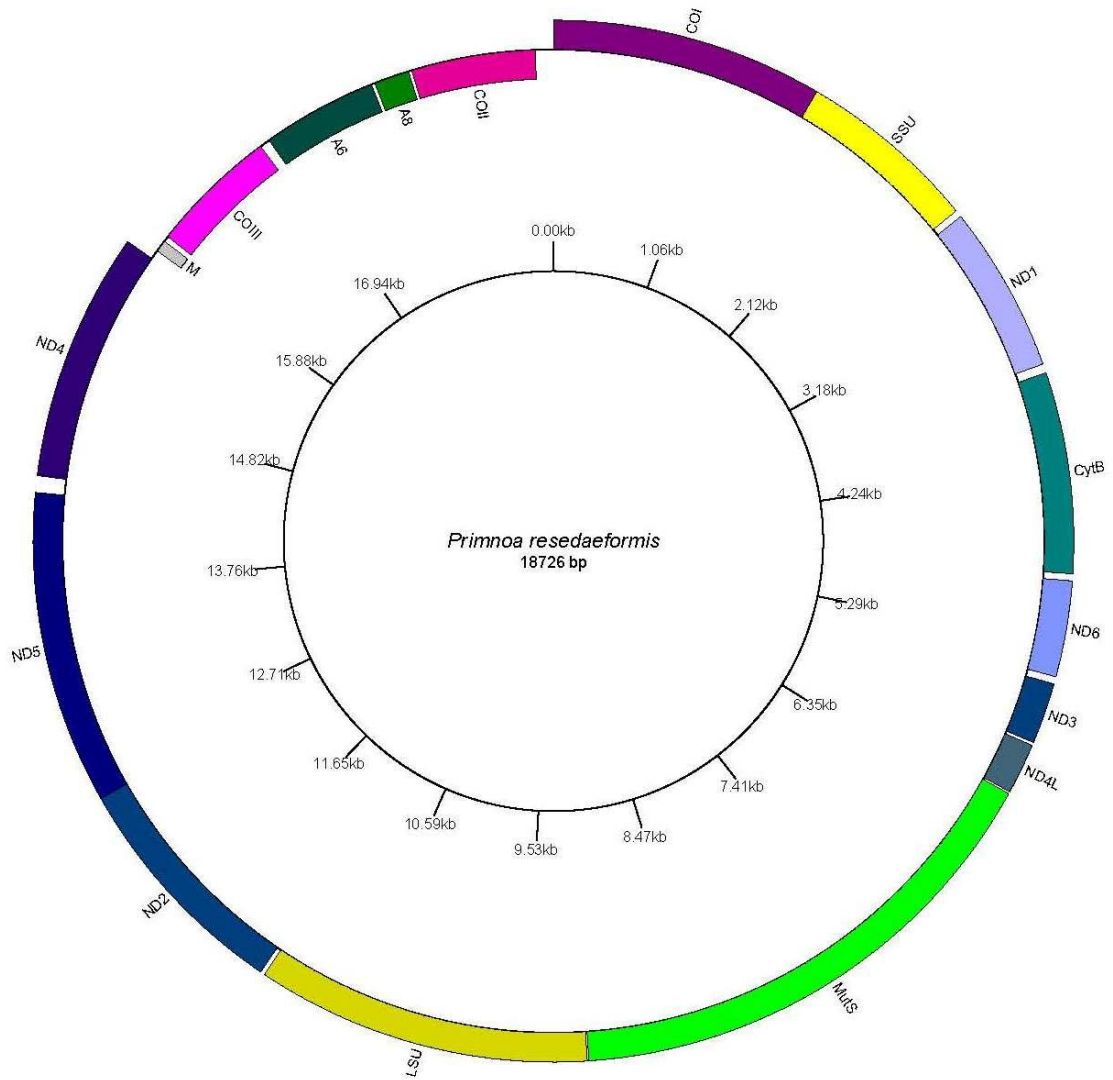
Figure 5 A. Mitogenome organization in newly sequenced mitogenome of *A. digitatum*



A circular view of the *A. digitatum* mitochondrial genome

Blue, Complex I genes, Pink, Complex IV genes, Green, Complex V genes, Emerald, Complex III genes, Bright green, MutS gene, Yellow, rRNA genes. Genes on heavy and light strands are annotated on outer and inner circles, respectively.

Figure 5 B. Mitogenome organization in newly sequenced mitogenome of *P. resedaeformis*



A circular view of the *P. resedaeformis* mitochondrial genome

Blue, Complex I genes, Pink, Complex IV genes, Green, Complex V genes, Emerald, Complex III genes, Bright green, MutS gene, Yellow, rRNA genes. Genes on heavy and light strands are annotated on outer and inner circles, respectively.

Sequence feature analysis

Mitogenome

The major part of the mitogenome comprises protein-coding sequences. Since the function of these proteins is crucially important, there is a high degree of conservation in the nucleotide sequences. A comparison of available octocoral mitogenomes was done in order to detect variability in length nucleotide sequences of protein coding genes. Visual inspection of alignments revealed low variability in the nucleotide and protein sequences as well as in the length of genes.

Complex I genes (*nad1*, 2, 3, 4, 4L, 5, and 6)

The *nd1* gene is conserved in both nucleotide and protein sequences. Only several nucleotides are found to be different from other octocorals, which give no difference in amino acid sequence since these are synonymous substitutions. The length of the gene is the same in *A. digitatum* and *P. resedaeformis*, and 3 nt (corresponding to one amino acid) shorter than in most of other species (Table 6).

Table 6. Length variability in Complex I genes

Species	nd1, nt	nd2, nt	nd3, nt	nd4, nt	nd4L, nt	nd5, nt	nd6, nt
<i>Alcyonium digitatum</i>	969	1362	366	1449	294	1818	558
<i>Primnoa resedaeformis</i>	969	1374	354	1449	294	1818	558
<i>Acanella eburnea</i>	981	1322	348	1449	294	1818	552
<i>Antillogorgia bipinnata</i>	972	1093	354	1449	294	1818	558
<i>Briarum asbestinum</i>	972	1164	354	1449	294	1818	558
<i>Corallium elatius</i>	972	1140	354	1449	294	1818	555
<i>Corallium konojoi</i>	972	1140	354	1449	294	1818	555
<i>Corallium rubrum</i>	972	1140	354	1449	294	1818	555
<i>Dendronephthya castanea</i>	972	1158	354	1449	294	1818	558
<i>Dendronephthya gigantea</i>	972	1039	354	1449	294	1818	558
<i>Dendronephthya mollis</i>	972	1158	354	1449	294	1818	558
<i>Dendronephthya suensoni</i>	972	1158	354	1449	294	1818	558
<i>Echinogorgia complexa</i>	972	1152	354	1449	294	1818	558
<i>Euplexaura crassa</i>	972	1158	354	1449	294	1818	558
<i>Junceella fragilis</i>	981	1122	354	1449	294	1818	555
<i>Keratoisidinae sp. BAL 208-1</i>	981	1320	348	1449	294	1812	552
<i>Narella hawaiiensis</i>	981	1140	354	1449	294	1872	564
<i>Paracorallium japonicum</i>	972	1140	354	1449	294	1818	555
<i>Paraminabea alderladei</i>	972	1140	354	1449	294	1818	549
<i>Scleronephthya gracillimum</i>	972	888	354	1449	294	1818	558
<i>Sibagorgia cauliflora</i>	996	1140	354	1449	294	1842	555
<i>Sinularia peculiaris</i>	972	1374	354	1449	294	1818	558
<i>Heiopora coerulea</i>	981	1356	354	1461	294	1818	558
<i>Renilla muelleri</i>	981	1356	354	1449	294	1818	555
<i>Stylatula elongata</i>	981	1383	354	1449	294	1818	555

The *nd2* gene is more variable in size and sequences (Fig. 7). Notable differences are found at the 5'-end of nucleotide alignment *A. digitatum* and *P. resedaeformis*. Both genomes contain a large region of 228 nucleotides that exceeds the gene sequences in most other octocorals. Moreover, this region is invariable between the studied species and is similar to those of more distantly related species (e.g. *H. coerulea*, *S. elongata* and *R. muelleri*). Gaps are found across the alignment as a result of a pronounced nucleotide variations in corresponding gene in other octocorals. The 3'-end is also variable and is the only part of the alignment where there is a significant difference between *A. digitatum* and *P. resedaeformis* (409-416 aa positions in *A. digitatum*). The *nd3* gene also reveals heterogeneity in the nucleotide sequence of *A. digitatum* which has 12 inserted nucleotides at the 5'-end. This region is unique in comparison to other congeneric species. The protein alignment also reflects this difference (see Fig.6) while the other parts in both sequences show conservation in nucleotide and amino acid positions.

Figure 6. A variable 5'-end region in the protein sequence of *nd3* gene in *A. digitatum*

		20		40		60		
alcyonium_digitatum_nd3	ME	RNME	F	KGI	L	ILL	IVS	GTL
primnoa_resedaeiformis_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
sinularia_peculiaris_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
narella_hawaiinensis_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
paraminabea_aldersladei_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
scleronephtya_gracillum_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
dendronephtya_castanea_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
dendronephtya_gigantea_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
dendronephtya_mollis_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
dendronephtya_suensoni_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
junceella_fragilis_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
keratoisidinae_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
echinogorgia_complexa_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
euplexaura_crassa_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
jeudopterogorgia_bipinnata_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
acanella_eburnea_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
sibogagorgia_cauliflora_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
briareum_asbestinum_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
corallium_elatius_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
corallium_konojoi_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
corallium_rubrum_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
paracorallium_japonicum_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
heliopora_coerulea_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
stylatula_elongata_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
renilla_muelleri_nd3	ME	- - -	F	KGI	L	ILL	IVS	GTL
Consensus	ME	- - -	F	KGI	L	ILL	IVS	GTL
Conservation								

The *nd4* gene length and its amino acid sequence is consistent within octocorals, but some nucleotide variations are still observed. 31 nucleotide substitutions differ *A. digitatum* and *P. resedaeiformis* from other octocorals though protein structure is very similar within this class.

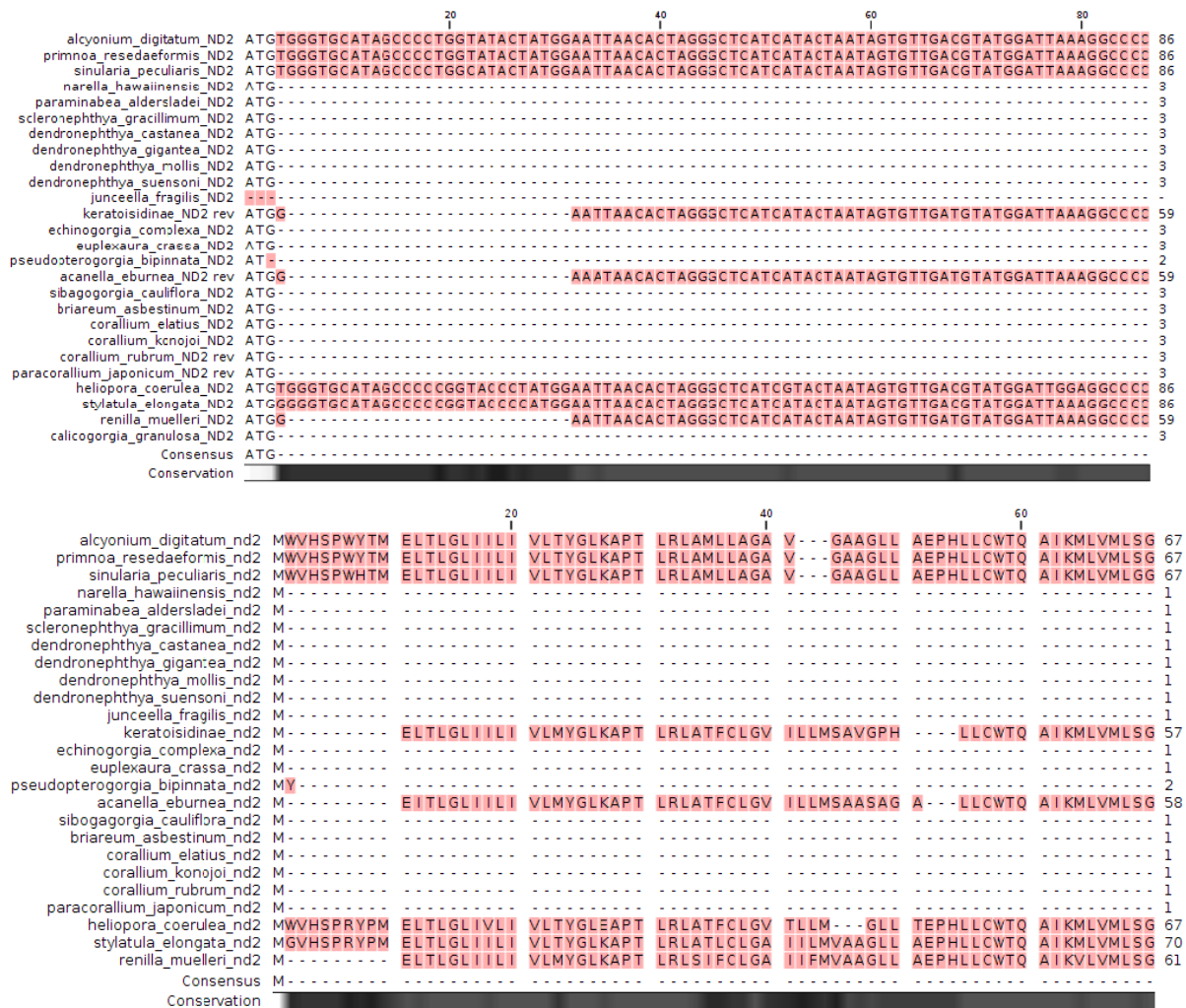
The *nd4L* gene length is the most conserved gene in both length and amino acid sequence among all the octocorals. However, some minor differences on the nucleotide level are still present, resulting on occasional synonymous substitutions.

The *nd5* gene length differs scarcely within octocorals with common size slightly exceeding 1800 nucleotides. Some variable nucleotide positions are met in the gene sequence, but these result in very few amino acids substitutions. Two regions with large gaps are caused the presence of *S. cauliflora* and *N. hawaiinensis*.

Finally, the *nd6* gene shows little and synonymous nucleotide variation resulting in similar amino acid sequences.

Full alignments can be examined in the Appendix E.

Figure 7. An example of the variable 5'-end region in *nd2* gene sequence (nucleotide-upper, protein-lower) in the studied species.



Complex III gene (*cob*)

One of the longest genes among octocorals is *cob* which is 1167 bp in both *Alcyonium digitatum* and *Primnoa resedaeformis* (the longest among octocorals is found in *C. rubrum* and *P. japonicum* in 1194 bp). The nucleotide sequences have similarity between the studied species, but appear to contain more substitutions than other genes. 5'-end heterogeneity is seen in 6 nucleotide positions presented only in *Alcyonium digitatum*, *Primnoa resedaeformis* and *S. peculiaris* and thus making a gap in the nucleotide alignment. 38 nucleotide positions are variable and another

12 are the same in studied species, but different in another octocorals. Aminoacid variation is 16 positions and studied species differ between each other and 8 amino acid positions.

Full alignments can be examined in the Appendix E.

Fig. 8. 5'- heterogeneity in the nucleotide sequences of *cob* in the studied species



Complex IV genes (*cox 1, 2 and 3*)

The studied species possess almost the shortest *cox1* genes among octocorals (Table 7). The nucleotide sequence variation is due to 37 transition-transversion events in different positions throughout the gene sequence. Some of these positions contribute to amino acid variations forming a non-synonymous substitutions. As a result, amino acids with uncharged groups are replaced with amino acid with hydrophobic or charged groups. Most of the nucleotide variations fall outside the Folmer region (29-736 bp positions region used for barcoding) leaving it relatively conserved. The amino acid sequence remains conserved, but some heterogeneity is found at the 3'-end (Fig.9). Sequences in both species lack 5 terminal amino acid residues, which is not common for other species.

Figure 9. 3'-heterogeneity in the protein alignment of *cox1* gene.



Incomplete termination codon found in COI gene sequences in both genomes indicating that this region undergoes polyA restoration (RNA editing) in order to be a functional mRNA.

The *cox2* contains 11 variable positions in the nucleotide sequence that reside mainly in the 230-700 bp region of the gene. Several gaps are introduced in the nucleotide alignment of *cox2* gene. They represent differences often found in the sequences of the Isidinae family species and other distantly related octocorals. However, most of the substitutions are synonymous and only two amino acids are different between *A. digitatum* and *P. resedaeformis*. Three other amino acids residues differ in the studied species from the other representatives of octocorals while the overall amino acid sequence is unchanged.

The *cox3* has 24 variable nucleotide positions and each contributes to amino acid sequence change. Eight amino acid residues are different in the studied species and most of variation is represented by changing amino acid with hydrophobic group on those with positive.

Full alignments can be examined in the Appendix E.

Table 7. Length variability in Complex IV genes

Species	<i>cox1</i> , nt	<i>cox2</i> , nt	<i>cox3</i> , nt
<i>Alcyonium digitatum</i>	1582	762	786
<i>Primnoa resedaeformis</i>	1582	762	786
<i>Acanella eburnea</i>	1597	762	786
<i>Antillogorgia bipinnata</i>	1597	762	786
<i>Briareum asbestinum</i>	1582	762	786
<i>Corallium elatius</i>	1597	762	786
<i>Corallium konojoi</i>	1597	762	786
<i>Corallium rubrum</i>	1597	762	786
<i>Dendronephthya castanea</i>	1597	762	786
<i>Dendronephthya gigantea</i>	1597	762	786
<i>Dendronephthya mollis</i>	1597	762	786
<i>Dendronephthya suensoni</i>	1597	762	786
<i>Echinogorgia complexa</i>	1597	762	786
<i>Euplexaura crassa</i>	1597	762	786
<i>Junceella fragilis</i>	1569	762	786
<i>Keratoisidinae sp. BAL 208-1</i>	1597	762	786
<i>Narella hawaiiensis</i>	1597	762	786
<i>Paracorallium japonicum</i>	1597	762	786
<i>Paraminabea aldersladei</i>	1596	762	786
<i>Scleronephthya gracillimum</i>	1597	762	786
<i>Sibagogorgia cauliflora</i>	1597	762	786
<i>Sinularia peculiaris</i>	1582	762	786
<i>Heiopora coerulea</i>	1653	762	819
<i>Renilla muelleri</i>	1566	762	786
<i>Stylatula elongata</i>	1566	762	786

Complex V genes (*atp6* and *atp8*)

The *atp6* nucleotide sequence has a little nucleotide variability of 19 positions and gaps introduced by *C. rubrum* and *P. japonicum*. The amino acid sequence shows more conservation. Only 5 amino acids are variable and are replaced by amino acids with different side chain group only once.

The *atp8* gene sequences are highly similar between *Alcyonium digitatum*, *Primnoa resedaeformis* and other octocoral species and differ with 3 amino acids. Length in both Complex V genes is highly conserved inside octocorals (Table 8).

Full alignments can be examined in the Appendix E.

Table 8. Length variability in Complex V genes

Species	<i>atp6, nt</i>	<i>atp8, nt</i>
<i>Alcyonium digitatum</i>	708	218
<i>Primnoa resedaeformis</i>	708	218
<i>Acanella eburnea</i>	714	218
<i>Antillogorgia bipinnata</i>	708	219
<i>Briareum asbestinum</i>	708	218
<i>Corallium elatius</i>	708	218
<i>Corallium konojoi</i>	708	218
<i>Corallium rubrum</i>	708	218
<i>Dendronephthya castanea</i>	708	218
<i>Dendronephthya gigantea</i>	708	218
<i>Dendronephthya mollis</i>	708	218
<i>Dendronephthya suenisoni</i>	708	218
<i>Echinogorgia complexa</i>	708	218
<i>Euplexaura crassa</i>	708	218
<i>Junceella fragilis</i>	708	218
<i>Keratoisidinae sp. BAL 208-1</i>	717	218
<i>Narella hawaiiensis</i>	708	218
<i>Paracorallium japonicum</i>	708	218
<i>Paraminabca aldersladei</i>	708	218
<i>Scleronephthya gracillimum</i>	708	218
<i>Sibagogorgia cauliflora</i>	708	218
<i>Sinularia peculiaris</i>	708	218
<i>Heiopora coerulea</i>	708	218
<i>Renilla muelleri</i>	708	218
<i>Stylatula elongata</i>	708	218

mutS

This gene has the greatest variability in both nucleotide, protein alignments and size, as seen in the presented alignments. Sequencing revealed that *Alcyonium digitatum* possesses one of the shortest *mutS* genes among octocorals - 2943 bp (the shortest *mutS* genes are 2937 in *Narella* and 2940 in) and 2970 bp in *P. resedaeformis*.

Several gaps presented in the nucleotide sequence brought by distantly related species. Number of variable nucleotide positions is 115. The amino acid sequence is also more variable than in other genes. *A. digitatum* amino acid sequence in *mutS* gene is shorter than those of *P. resedaeformis* and 52 amino acid positions are variable (Fig.10) and thus represent interesting features of *mutS* gene in studied species. Protein annotation revealed differences in the length of helices and sheets in the secondary structure (Appendix F) though overall structures remains recognizable in all octocorals.

Function of this gene is still putative and its description is addressed in the Discussion section.

Full alignments can be examined in the Appendix E together with predicted secondary structure scheme.

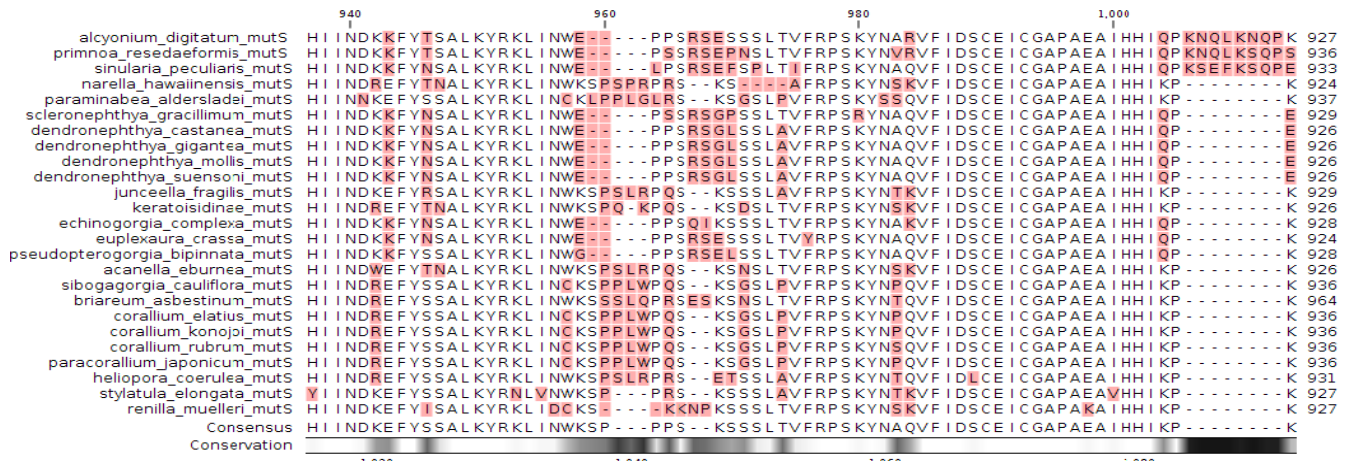


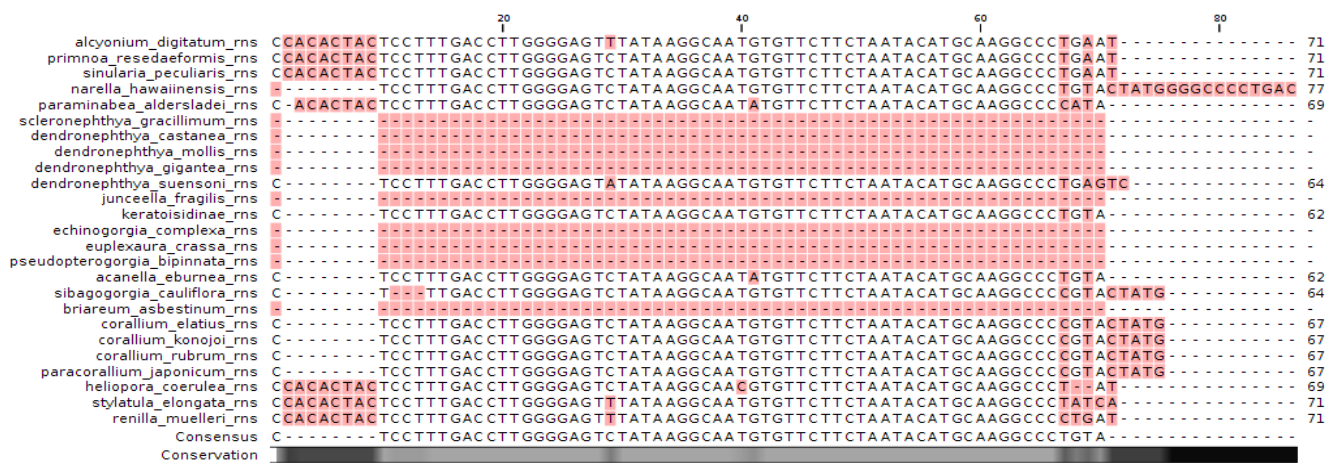
Fig. 10. An example of a variable region in *mutS* protein alignment in octocorals.

rRNA genes

This group of genes is expected to have the most conserved nucleotide sequence throughout the mitogenome since their function is crucial to the organellar translation machinery. Multiple alignments support these expectation in general but several interesting features are discovered at the same time.

Length variation in *rns* is 28 nucleotides between *A. digitatum* and *P. resedaeformis*. Nucleotide sequences are very similar with only one region with pronounced variation (720-740 bp position). Several gaps are introduced into the alignment by *N. hawaiiensis* and *B. asbestinum* highlighting distance between species. Sequence of *A. digitatum* has several deletions in different regions across the sequence.

Fig. 11. A region of the sequence variability in *rns*.



Despite of expected level of similarity, nucleotide sequences of *rnl* possess interesting features. First, there are several large gaps of 25-60 nucleotide positions in different regions of the gene. As it is presented in the alignment, these gaps brought mainly by distantly related species.

There are frequently occurred nucleotide positions that are deleted in the *A. digitatum* sequence.

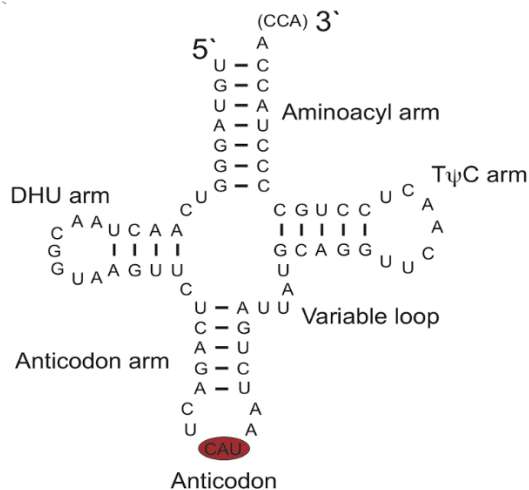
A. digitatum has the shortest *rnl* sequence among the octocorals (1937 bp), and those corresponding gene in *P. resedaeformis* is 1948 bp.

tRNA f-Met sequence is highly conserved among octocorals. Only one nucleotide difference is found between (in the anticodon arm) in *P. resedaeformis* and *A. digitatum*, which is also reflected in a highly secondary structures (Fig.12).

Figure 12. Predicted secondary structure of tRNA f-Met in the studied species

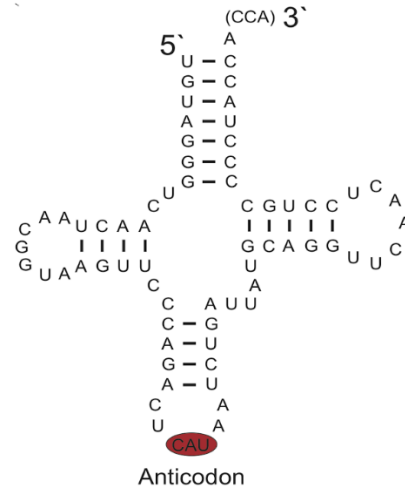
A

Alcyonium digitatum
tRNA f-Met



B

Primnoa resedaeformis
tRNA f-Met



In general, variabilities in the gene sequences are mainly located in the 5'-end or 3'-end heterogeneities. These differences are by transitions - transversions events, as well as insertions and deletions. Most variations in nucleotide sequences include *mutS*, *cob* and *nd2* genes. The longest gene is *mutS* in both mitogenomes. In *P. resedaeformis* it is 2970 bp and in *A. digitatum*, is 2943 bp and is the shortest *mutS* gene sequenced among octocorals. The shortest gene in the mitogenomes is *atp8* subunit, which is 216 bp long in both newly sequenced genomes and also in all sequenced octocorals up to date. Gene length variation is most apparent in *nd2* and *mutS* genes while other gene sequences remain more stable.

Codon usage is almost the same in both species with ATG as a start codon and TAA or TAG as a stop codon. The only protein coding sequence where stop codons are not the same is *cob* gene. Here, TAA is the stop codon in *A. digitatum* and TAG in *P. resedaeformis*. Codon usage in all other protein-coding genes is the same in both genomes (Table 5).

Overall genome organization is highly compact in both species - all genes are involved in oxidative phosphorylation (except *mutS* which origin and function is still under the discussion)

and are essential for performing key biochemical processes in the mitochondrion. A comparison of nucleotide sequences in coding regions revealed surprising level of similarity between *A. digitatum* and *P. resedaeformis* and a significant correlation with those of octocorals. Gene order matches Ancestral class (Table 9).

Table 9. Gene order classes in Octocorallia. The studied species are not followed by accession numbers.

Name	Classification	Size, nt	Geneorder class	Accession number
<i>Alcyonium digitatum</i>	Alcyonacea; Alcyoniina; Alcyoniidae; Alcyonium	18790	Ancestral	
<i>Primnoa resedaeformis</i>	Alcyonacea; Calcaxonina; Primnoidae; Primnoa	18726	Ancestral	
<i>Acanella eburnea</i>	Alcyonacea; Calcaxonina; Isididae; Acanella	18616	Keratoisidinae	NC_011016
<i>Antillogorgia bipinnata</i>	Alcyonacea; Holaxonia; Gorgoniidae; Antillogorgia	18733	Ancestral	NC_008157
<i>Briareum asbestinum</i>	Alcyonacea; Scleraxonia; Briareidae; Briareum	18632	Ancestral	NC_008073
<i>Corallium elatius</i>	Alcyonacea; Scleraxonia; Coralliidae; Corallium	18969	Konojoi	NC_022804
<i>Corallium konojoi</i>	Alcyonacea; Scleraxonia; Coralliidae; Corallium	18969	Konojoi	NC_015406
<i>Corallium rubrum</i>	Alcyonacea; Scleraxonia; Coralliidae; Corallium	18915	Konojoi	NC_022864
<i>Dendronephthya castanea</i>	Alcyonacea; Alcyoniina; Nephtheidae; Dendronephthya	18907	Ancestral	NC_023343
<i>Dendronephthya gigantea</i>	Alcyonacea; Alcyoniina; Nephtheidae; Dendronephthya	18842	Ancestral	NC_013573
<i>Dendronephthya mollis</i>	Alcyonacea; Alcyoniina; Nephtheidae; Dendronephthya	18844	Ancestral	NC_020456
<i>Dendronephthya suensoni</i>	Alcyonacea; Alcyoniina; Nephtheidae; Dendronephthya	18851	Ancestral	NC_022809
<i>Echinogorgia complexa</i>	Alcyonacea; Holaxonia; Paramuriceidae; Echinogorgia	19445	Ancestral	NC_020457
<i>Euplexaura crassa</i>	Alcyonacea; Holaxonia; Plexauridae; Euplexaura	18647	Ancestral	NC_020458
<i>Junceella fragilis</i>	Alcyonacea; Calcaxonina; Ellisellidae; Junceella	18724	Ancestral	NC_024181
<i>Keratoisidinae sp. BAL 208-1</i>	Alcyonacea; Calcaxonina; Isididae; unclassified Isididae	18923	Keratoisidinae	NC_010764
<i>Narella hawaiiensis</i>	Alcyonacea; Calcaxonina; Primnoidae; Narella	18838	Ancestral	NC_026192
<i>Paracorallium japonicum</i>	Alcyonacea; Scleraxonia; Coralliidae; Paracorallium	18913	Japonicum	NC_015405
<i>Paraminabea aldersladei</i>	Alcyonacea; Alcyoniina; Alcyoniidae; Paraminabea	19886	Ancestral	NC_018790
<i>Scleronephthya gracillimum</i>	Alcyonacea; Alcyoniina; Nephtheidae; Scleronephthya	18950	Ancestral	NC_023344
<i>Sibagogorgia cauliflora</i>	Alcyonacea; Scleraxonia; Paragorgiidae; Sibagogorgia	19030	Return to ancestral	NC_026193
<i>Sinularia peculiaris</i>	Alcyonacea; Alcyoniina; Alcyoniidae; Sinularia	18742	Ancestral	NC_018379
<i>Heiopora coerulea</i>	Helioporacea; Helioporidae; Heiopora	18957	Ancestral	NC_020375
<i>Renilla muelleri</i>	Pennatulacea; Sessiliflorae; Renillidae; Renilla	18643	Ancestral	NC_018378
<i>Stylatula elongata</i>	Pennatulacea; Subselliflorae; Virgulariidae; Stylatula	18733	Ancestral	NC_018380

IGR structure

Most intergenic regions (IGRs) show length and sequence similarity between *A. digitatum* and *P. resedaeformis*, but still several interesting features are noted.

First, *igr-1* is zero nucleotides in length which appears as highly conserved feature among the octocorals and shared by both *A. digitatum* and *P. resedaeformis*. Another example of

resemblance in the intergenic region structure is *igr-10*. This region is in fact negative in both genomes (13 nt overlap between 3'-end of *nd2* and 5'-end of *nd5* genes) and octocorals studied. Then, the largest IGR is *igr-11*, separate *nd5* and *nd4*. In *A. digitatum* it is 239 bp and in *P. resedaeformis* it consists of only 97 bp.

Mitotranscriptome

Mito - transcriptome sequencing gave different output for *A. digitatum* and *P. resedaeformis*. This may be because of different kits for rRNA depletion were used. Sequencing of *P. resedaeformis* resulted in low coverage (48 times and less) but a lot of transcripts of different genes gave nearly whole-mitogenome coverage. Most mapped transcripts correspond to ribosomal RNA subunits and *cox* genes (Fig.13). Some partial transcripts of *cob*, *nd2* and 2 subunits are also present though these are fragmented and scarce.

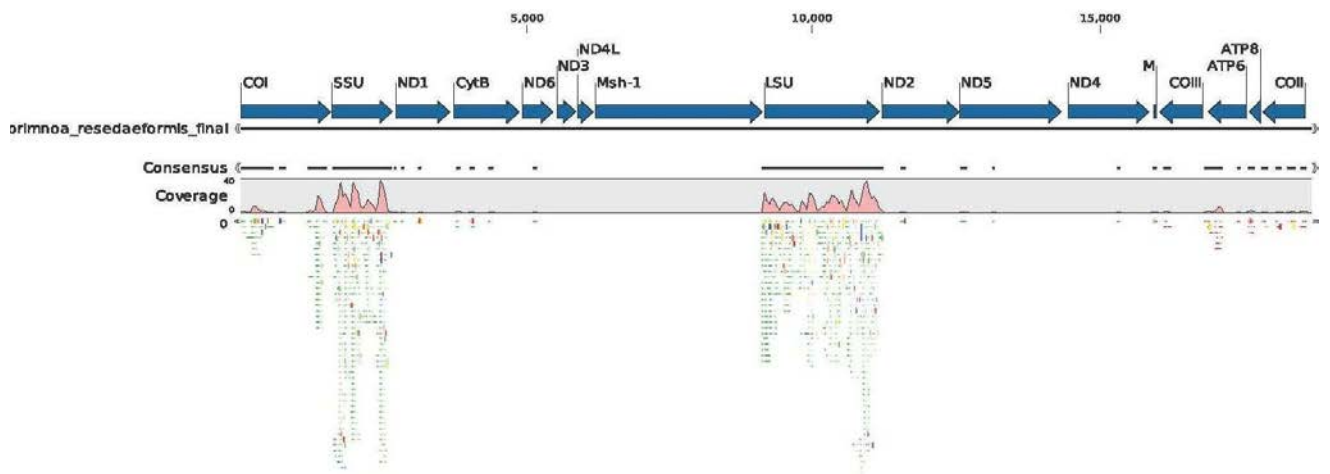


Figure 13. Transcriptome sequence mapping of the *P. resedaeformis* mitogenome

Sequencing of the *A. digitatum* mito-transcriptome resulted in 130 times coverage. *rns*, *rnl* genes and some parts of *cox1* and *nd5* map the most of the transcripts (Fig. 14).

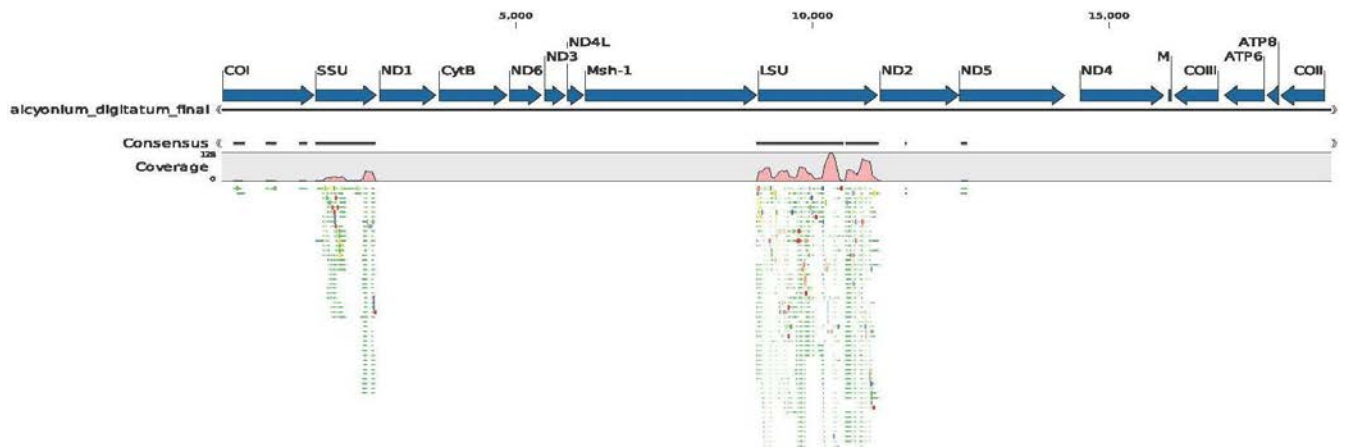


Figure 14. Transcriptome sequence mapping of *A. digitatum* mitogenome

Molecular cloning

Sequencing, assembly and annotation revealed a region of high variability. Though the gene sequence has no frame shifts, it was subjected to molecular cloning procedures with the intention of amplifying by genetically transformed *E.coli* and further verification by Sanger sequencing.

Transformation reaction was successfully performed and resulted in white colonies of genetically modified *E.coli*. Insertion of *mutS* gene was experimentally proved by PCR. Sanger sequenced fragments are in the range of 700 - 1000 bp. Mapping of fragments (see Fig. 15) on corresponding genomes gives strong support for Ion Torrent sequenced mitogenomes and this highly variable region, particularly.

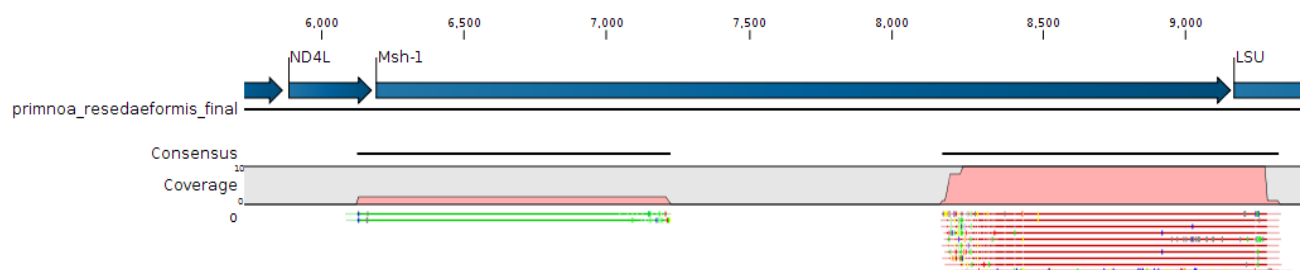


Figure 15. An example of mapping of cloned and Sanger sequenced fragments of *mutS* gene on the mitogenome of *P. resedaeformis*. Products cover 5'-end and 3'-end of the gene sequence.

Phylogenetic analysis

1. Dataset 1: concatenated multiple alignments of *mutS* gene
2. Dataset 2: concatenated multiple alignments of re-annotated protein-coding sequence

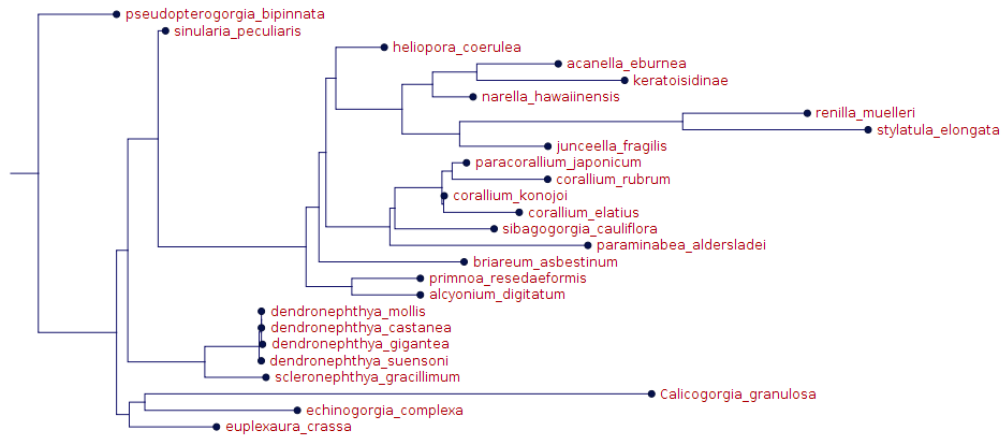


Figure 16. Phylogenetic tree based on dataset 1: distance between *mutS* gene sequences in octocorals.

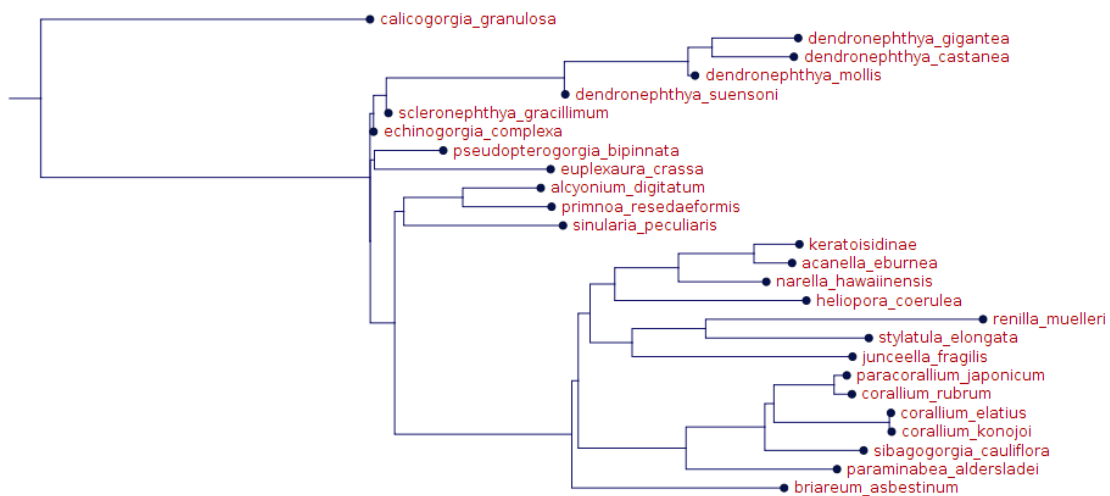


Figure 17. Phylogenetic tree based on dataset 2: distance between re-annotated protein coding sequences in octocorals.

As can be seen from the Figure 16, distance in the nucleotide sequence of *mutS* gene between *P. resedaeformis* and *A. digitatum* is small, suggesting that these species are related.

Figure 17 represents strong support for previous tree, where the studied species are grouped together. Tree topology is apparently similar, but branch lengths are changed.

Discussion

Octocoral mitogenomes

Two new mitogenomes of the octocoral species *A. digitatum* and *P. resedaeformis* were assembled and annotated based on the sequenced data produced by the current study. They were found to correspond closely in size, gene arrangement and gene sequences with previously sequenced octocorals. We explored sequence features of the two novel mitogenomes in comparison with other available octocoral mitogenome sequences.

We found a relatively low level of nucleotide variations among octocoral species in most of protein coding genes and rRNA genes. Such scant variability is in the line with several findings of recent studies. Most studies agree there is a result of a general tendency for mitogenome size reduction within Metazoa (Bernt et al., 2013; Osigus et al., 2013), economically organized mitogenomes are especially pronounced in Octocorallia.

Another plausible reason for the low level of variability could be the presence of an active *mutS* gene. The *MutS* gene seems to be a specific and obligatory gene for all octocoral mitochondrial genomes. Actively expressed *mutS* gene seems to prevent mutations by DNA mismatch repair, which would slow down evolutionary rates of the mitogenome in general. Based on the complete octocoral mitogenome sequences published so far, *mutS* seems to be actively expressed in all species.

Both origin and function of this gene are still under the discussion. However, in a comprehensive study researchers compared amino acid sequences of octocoral, bacterial and viral *mutS*-family proteins. As a result, horizontal gene transfer and non-eukaryotic origin of this gene was proposed. Functional gene product was strongly suggested by the authors due to the presence of all required domains and a deduced protein structure that indicates involvement in mismatch repair (Bilewitch and Degnan, 2011).

Paradoxically, this gene is also the most variable within the class harboring more nucleotide and amino acid variation than the remaining protein coding genes among octocorals. Thus, the *mutS* sequence has been shown to evolve faster than other parts of mitogenome of octocorals (France and Hoover, 2001; van der Ham et al., 2009). Strong positive selection for continued presence of *mtMutS* gene in the mitogenome deduced as an explanation of this phenomenon (Bilewitch and Degnan, 2011).

In the studied species, *mutS* gene also possess notable variability. The sequence of this gene in *A. digitatum* is almost the shortest within the class and differs significantly from the corresponding region in *P. resedaeformis*.

Another variable part of the mitogenomes is the *nd2* gene sequence. As it was presented in the alignments, this region is also an example of outstanding variability expressed in large 5'-heterogeneous part of the gene. It is also obvious from the alignment that the studied species are close in this sequence to more distantly related species - *H. coerulea*, *S. elongata* and *R. muelleri*. The protein alignment reflects these differences. The rest of the gene sequence is recognizable within the set of octocoral species.

These variable gene sequences are interesting topic for future research. Here, a gene product variability and structure can be studied within the class. Sequencing of several species of *Alcyonium* and *Primnoa* can be applied for studying gene sequence mobility and protein structure variability and function within the family.

Furthemore, our finding is the shortest *cox1* genes that also possess incomplete termination codon T. It was documented in most species from Alcyonacea family in this region and seems to be common in these organisms (*cox1* octocoral papers). Incomplete termination codon indicates posttranscriptional modifications such as polyA restore. Unfortunately, no transcript were sequenced from this region of the sequence. Therefore, it is a feature to be determined in further investigations.

In addition to previous findings, IGR structure and gene sequences are very similar in Alcyonacea family and remain relatively conserved within the class. Total sizes presented in the Results are within the common range (414 to 957 bp) of intergenic spacers for octocorals (McFadden et al., 2010). An interesting feature observed in the studied mitogenomes is the *igr-11* of *A. digitatum*. This *igr* is among the most variable regions in the intergenic space of octocoral mitochondrion. In *A. digitatum* demonstrates a distinguished size that exceeds the length of *igr-11* in closely related species twice. Curiously, this region in *P. resedaeformis* does not show such deviation from congeneric species.

An interesting feature which could be detected here is a presence of repeated sequences that are pervasive across Metazoa mitogenomes (Nardi et al., 2012). They are believed to contribute to frequent appearance of mutation. Author, however, mentions, that a tendency to possess repeated sequences is met in groups with more flexible mitogenome lengths. Thus, they could

be expected in the mitogenomes of Hexacorallia rather than Octocorallia. Test of repeated sequences was not carried out, but described feature of *A. digitatum* is interesting to investigate thoroughly.

It would also be useful to explore *igr* content closely for the purpose of detection a replication origin. Though replication origin is not well documented in Cnidarians (Bernt et al., 2013), it is believed to reside in the *igr-17* that separates *cox2* and *cox1* genes (Uda et al., 2011), where authors found a hairpin-forming sequence. Therefore, screening for secondary structure can lead to detection of this region.

Gene overlaps represent another remarkable feature of octocoral intergenic architecture and are believed to prevent rearrangement events (Brugler and France, 2008). Indeed, it was observed in *igr-10* that can serve as an example of such features. This region is highly consistent within octocoral mitogenomes and “holds” *nd2* and *nd5* genes together by 13 nucleotides overlap. As a result, *nd2* and *nd5* genes are placed together in all mitogenomes within octocorals despite of gene order class. It is reflected in the overall mitogenome organisation where rearrangements do not change this region.

Evolutionary rates of octocoral genomes are suggested to be 5 times slower than rates of nuclear genome (Chen et al., 2009). Furthermore, when it comes to comparison with another groups of animals, a 50-100 times slower rates of mtDNA in octocorals are suggested (Hellberg, 2006). Lower evolutionary rates of mitochondrial protein coding genes are equilibrated by higher tendencies for gene rearrangements in the mitogenome (Uda et al., 2011). These rearrangements reflect evolutionary history of this phylum which is expressed in gene segments shuffling and duplication (Figueroa and Baco, 2014; Park et al., 2012). Given events are believed to appear at several times, with ancestral class as an initial state and *konojoi* and *japonicum* classes as variations of those. A new trend - return to ancestral state - was also described in mitogenome of *S. cauliflora*. Our investigations allow to define sequenced mitogenomes as matching Ancestral gene order class (Figueroa and Baco, 2014).

Nucleotide sequence alignment of both ribosomal RNA subunits show expected level of similarity. However, as presented in the alignments, sequences still possess regions with gaps and dissimilarities. Nucleotide variations are abundant in these genes, and this information can be successfully used for phylogenetic reconstructions. The use of rRNA genes in phylogenetic analyses is discussed in the next chapter.

Octocorallia. tRNA retention is documented within Cnidaria (Beagley et al., 1995; Flot et al., 2008). Within Octocorallia only tRNA fMet complement is presented in mitogenomes and obligatory for all representatives. This transfer RNA contains formyl-methionine - a start-codon that initiates translation of protein-coding genes. Other tRNAs are imported in the mitochondrion space by cytosolic transportation.

Mitotranscriptome sequencing revealed actively expressed genes. Genes with high coverage are validating annotation. However, coverage and quality of reads are moderate. This can be caused by kits used for the library preparation. More specific and sensitive isolation protocols and kits can be suggested for successful extraction of non-degraded RNA and library preparation process.

In the end, our data is in the line with previous knowledge and main tendencies of taxa of interest, although curious details revealed. There are also several suggestions that can improve further studies.

Mitochondria enrichment protocols can be proposed for more successful output from mtDNA extraction procedures. Dense sampling could also help in creation of representative dataset. Here, sampling for suborder and family representatives will highlight the reason of deviation from common patterns. Moreover, this strategy would allow detailed phylogenetic analyses and improve currently unresolved taxa. Particularly, sampling and mitogenome sequencing of species from Helioporacea, Pennatulacea and other groups will increase the resolution of analyses. Sampling of specimens of *A. digitatum* and *P. resedaeformis* would promote detecting of SNPs, selective sweeps, haplotype diversity and population structure characteristics.

Phylogenetic assays

Anthozoan subclasses have diverged 500 million years ago and are clearly separated in phylogenetic trees (Kayal et al., 2013). No intermediate groups between Octocorallia and Hexacorallia documented. Application of NGS revealed differences in the mitogenome content of this subclasses (Emblem et al., 2014). However, some nodes still remain unresolved in cnidarian tree of life and, particularly in octocorals (Park et al., 2011). Anthozoan phylogeny is an example of such group and its origin has also been questioned since mitogenome content became uncovered.

Paraphyly of this group was suggested by (Park et al., 2012). This study exploits large data set of protein coding genes and concludes that Octocorallia is rather a sister taxa to Medusozoa and Hexacorallia is likely to be divergent (Kayal et al., 2013). Osigus et al. (2013) also suggest Octocorallia to be a sister group to monophyletic Medusozoa and Hexacorallia grouping outside or together with sponges (Demospongiae and Homoscleromorpha). These recent studies exploit comprehensive datasets based on protein-coding sequences of all (or nearly all) genes. This approach is beneficial.

Some studies suggest phylogenetic inferences based on one or several genes (Morris et al., 2012). However, this strategy is not successful. As was discussed earlier, octocoral mitogenomes are very special in their invariability. Because of these specific features of octocoral mitogenomes, it is not completely correct to use single gene sequence or even a combination of them, as was shown by McFadden et al. (2011). “Octocoral barcoding” based on *cox1+mtMutS+igr1* was suggested by the authors in the attempt of applying barcoding approach in this group of animals. A combination of genes was used since the *cox1* gene sequence is insufficiently variable in octocorals, and the *mutS* gene sequence is too variable, oppositely. This approach would be suitable in the absence of complete mitogenome sequences, but it would not reflect the whole set of relationships between species. Since more molecular data become available, the use of phylogeny inferences based solely on one (or few) gene sequence become incorrect.

Re-annotated and consequently concatenated mitogenomes are advantageous for the use in revealing phylogenetic relationships (Kayal et al., 2013). Although, higher levels of phylogenetic require an addition of rRNA genes and, in some cases, sequences of intergenic regions.

Nuclear genes are also used in the phylogenetic reconstructions. In Sánchez et al. (2003) 18S rRNA was added to mitochondrial 16S rRNA coding sequence. Different branching patterns were observed in the resulting trees, though topology was recognizable in general. This could be a result of an influence of different rates of sequence evolution in either genomes, as was discussed earlier. Despite in the given study phylogenetic analysis is based on a single gene sequence, usefulness of combining nuclear and mitochondrial gene sequences was shown. Involvement of nuclear genes would facilitate the phylogenetic analyses, but requires nuclear gene sequences and experience in interpretation of phylogenetic analyses.

In our analyses, *A. digitatum* and *P. resedaeformis* were used in the phylogenetic analyses and are grouped together in both phylogenetic trees. High bootstrap value gives strong support for the results. It is a remarkable result since species belong to the two different families – Alcyoniina and Calcaxonia. It was suggested in Sánchez et al. (2003), these families could be polyphyletic, based on 16S sequences. However, if more coding sequences were used, the resulted phylogenetic analysis would be more robust. A good strategy for resolving phylogenetic uncertainties is to involve a combination of protein coding genes, ribosomal RNA subunits sequences, and intergenic regions. This can be an interesting topic for further studies.

Moreover, if more sequenced mitogenomes of Calcaxonia were available, it would significantly improve phylogenetic tree resolution. Therefore, further studies are crucially important for adequate conclusions.

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Appendix A

Nucleic acid extraction protocols

DNA extraction protocols

Urea protocol

- 1) Add 500 µl tissue Tissue lysis buffer in MagNalyser tube
- 2) Add small piece of tissue (half a pea or smaller)
- 3) Homogenize
- 4) Add 20 µl (20 mg/ml) proteinase K
- 5) Incubate in 55°C 1-2 hours.
- 6) Transfer homogenate to new Eppendorf tube
- 7) Add 500 µl of phenol/chloroform (basic pH), vortex well to mix
- 8) Spin 10000 rpm 10 min, transfer water phase to new tube
- 9) Do the extraction (add another portion of phenol-chloroform) again until the layer between the two phases is almost clear (first time it is often white and fat)
- 10) Extract one time with chloroform/isoamyl (same volume as the waterphase), vortex and spin
- 11) Transfer water phase again, precipitate the DNA in the water phase by adding 2,5x volume of 100% EtOH and 1/10 volume 3M NaAc, mix
- 12) Put in -20 °C freezer for 1 hour
- 13) Spin down in cold centrifuge 13000 rpm 30 min.
- 14) Wash the pellet with 1 ml 70% EtOH (several times if much salt, pipet up-down, vortex, spin 10 min 4 °C 13 rpm)
- 15) Rehydrate the pellet in 20 µl clean water or LowTE. Keep in -20 freezer

RNA extraction protocols

Standard TRIzol protocol, originally modified for cod, MG group ()

1. 500-700 µl Trizol in MagNalyser tube
2. Add small piece of tissue (half a pea or smaller)
3. Homogenize until fully homogenized
4. Add 0,2 x volume of cold chloroform, incubate on ice for 20 min, shake occasionally
5. Centrifuge at 4°C 20 min 9000 rpm
6. Transfer water phase to a new Eppendorf tube

7. Precipitate RNA by adding 1x volume of cold isopropanol, incubate at 4 °C for 1 hour
8. Centrifuge at 13000 rpm for 30 min
9. Remove supernatant carefully, wash with 1 ml cold 80% EtOH, centrifuge 5 min at 13000 rpm.
10. Remove all EtOH with a pipette carefully
11. Leave to dry for a few minutes and resuspend in water (20 µl or wanted volume).

Appendix B

PCR primers

Table A1 contains primers used in this study. Primers were used for amplification in PCR and sequencing by Sanger method. Primers constructed by Aase Emblem, UiN. Forward primers named F and reverse primers named as R, respectively.

Name	Sequence (5' → 3'), length	Vol for 100 µmol	GC-content, %	Use for PCR/sequencing
Pre mutS_F	CTGCCATGAGTGGGCATAGTC(21)	233	57.1	P/S
Pre mutS_R	GACTATGCCCACTCATGGCAG (21)	302	57.1	P
Pre COI_F	GCAGTGGACATGGCCATATTCAG (23)	279	52.2	P/S
Pre COI_R	CTGAATATGGCCATGTCCACTGC (23)	288	52.2	P/S
Pre ND4_F	GGAGTTCTCACCTCAACTAG (20)	326	50	P/S
Pre ND4_R	CTAGTTGAGGTGAGAACTCC(20)	282	50	P/S
Pre ND4L_F	CTGTCGCAGCTGCCGAGTCTGC(22)	261	68.2	P/S
Pre ND4L_R	GCAGACTCGGCAGCTGCGACAG(22)	282	68.2	P/S
Pre CytB_F	GCTATCCCTTATGTAGGCACAG(22)	314	50	P/S
Pre CytB_R	CTGTGCCTACATAAGGGATAGC (22)	256	50	P
Pre ND1_F	GCCCGGGCATCGTACTAGCTG(21)	340	66.7	P
Pre ND1_R	CAGCTAGTACGATGCCCGGGC(21)	300	66.7	P
Pre CO2_F	GTCAGTGTTCGAGCTATGTG(21)	342	52.4	P/S
Pre CO2_R	CACATAGCTCGGAACACTGAC(21)	247	52.4	P
Pre CO3_F	CAGTAACARGGGCACATCACGC(22)	292	54.5	P
Pre CO3_R	GCGTGATGTGCCCATGTACTG(22)	352	54.5	P/S

Pre ND5_F	CTCCATAGCATCTGGCAACC(20)	258	55	P/S
Pre ND5_R	GGTTGCCAGATGCTATGGAG(20)	326	55	P/S
Pre ND2_F	GCGCTAAGATAGTAGCCCTG(20)	334	55	P
Pre ND2_R	CAGGGCTACTATCTTAGCGC(20)	294	55	P/S
Oct_SSU1_F	GACCTTGGGGAGTCTATAAG(20)	383	50	P/S
Oct_SSU1_R	CTTATAGACTCCCCAAGGTC(20)	328	50	P
Oct_SSU2_F	GGCAGCAGTAGAGAATCTTG(20)	368	50	P/S
Oct_SSU2_R	CAAGATTCTCTACTGCTGCC(20)	406	50	P
Oct_SSU3_F	GCATTAGGCGTTAAAGTATG(20)	442	40	P
Oct_SSU3_R	CATACTTTAACGCCTAATGC(20)	407	40	P/S
Oct_SSU4_F	CAAGTTAAGGATACGAGACGC(21)	255	47.6	P/S
Oct_SSU4_R	GCGTCTCGTATCCTTAACTTG(21)	421	47.6	P
Oct_Met_F	GAGTTGAACCTACATAACCAG(21)	372	42.9	P
Oct_Met_R	CTGGTTATGTAGGTTCAACTC(21)	367	42.9	P/S
Oct_LSU1_F	GAGATTCCGTACGTAGCGG(19)	342	57.9	P/S
Oct_LSU1_R	CCGCTACGTACGGAATCTC(19)	430	57.9	P
Oct_LSU2_F	CTTGGATGAGCTGTGGTTAGC(21)	313	52.4	P/S
Oct_LSU2_R	GCTAACCACAGCTCATCCAAG(21)	312	52.4	P/S
Oct_LSU3_F	CACTGAATGAGCTAGGAAACC(21)	328	47.6	P/S
Oct_LSU3_R	GGTTTCCTAGCTCATTCAGTG(21)	348	47.6	P
Oct_LSU4_F	CGTAATCAACTTCTGGCTGCTGC(23)	350	52.2	P/S
Oct_LSU4_R	GCAGCAGCCAGAAGTTGATTACG(23)	341	52.2	P/S
Pri_ND2_F	ACCGTTACTAAGTGCAGTCGG(21)	386	52.4	P
Pri_ND2_R	TCCGACTGCACTTAGTAACGG(21)	371	52.4	P/S
Pri_ND2b_F	AGGCAGATGGATAGAGTCCG(20)	381	55	P/S
Pri_ND2b_R	TCGGACTCTATCCATCTG(20)	387	55	P/S

Successful primer combinations

Table A2 contains successful combinations of PCR primers and lists the reactions whose products were subjected to Sanger sequencing.

Species	Primer F	Primer R	Sanger sequenced product
<i>P. resedaeformis</i>	PremutSF	PreND2R	DNA+PreND2R
<i>P. resedaeformis</i>	mutS F	PreND4LR	DNA+PreND4LR
<i>P. resedaeformis</i>	CytBF	PreND4LR	DNA+PreND4LR
<i>P. resedaeformis</i>	PreCOI F	PreND5R	DNA+PreND5R
<i>P. resedaeformis</i>	PreCOIF	PreND4LR	DNA+PreND4LR
<i>P. resedaeformis</i>	PreCO2F	PreCOIR	DNA+PreCOIR
<i>P. resedaeformis</i>	PreCOII F	Pre COIII R	
<i>P. resedaeformis</i>	PreND4F	PreND4L F	DNA+PreND4L F
<i>P. resedaeformis</i>	PreND5F	PreCO III R	
<i>P. resedaeformis</i>	PreND4LF	PreND2R	
<i>P. resedaeformis</i>	PreND4LF	PreND4R	
<i>P. resedaeformis</i>	LSU1 F	LSU4R	DNA+LSU1F, DNA+LSU4R
<i>P. resedaeformis</i>	LSU3F	PriND2bR	DNA+LSU3F
<i>P. resedaeformis</i>	SSU1 F	LSU4R	DNA+SSU1 F
<i>P. resedaeformis</i>	LSU4F	MetR	
<i>P. resedaeformis</i>	SSU2F	MetR	DNA+SSU2F
<i>P. resedaeformis</i>	SSU4F	SSU3R	DNA+SSU4F, DNA+SSU3R
<i>P. resedaeformis</i>	PriND2bF	LSU3R	
<i>P. resedaeformis</i>	SSU1F	LSU4R	
<i>A. digitatum</i>	OctLSU2F	OctND2R	DNA+OctLSU2F, DNA+OctND2R

PCR primers used for cloning

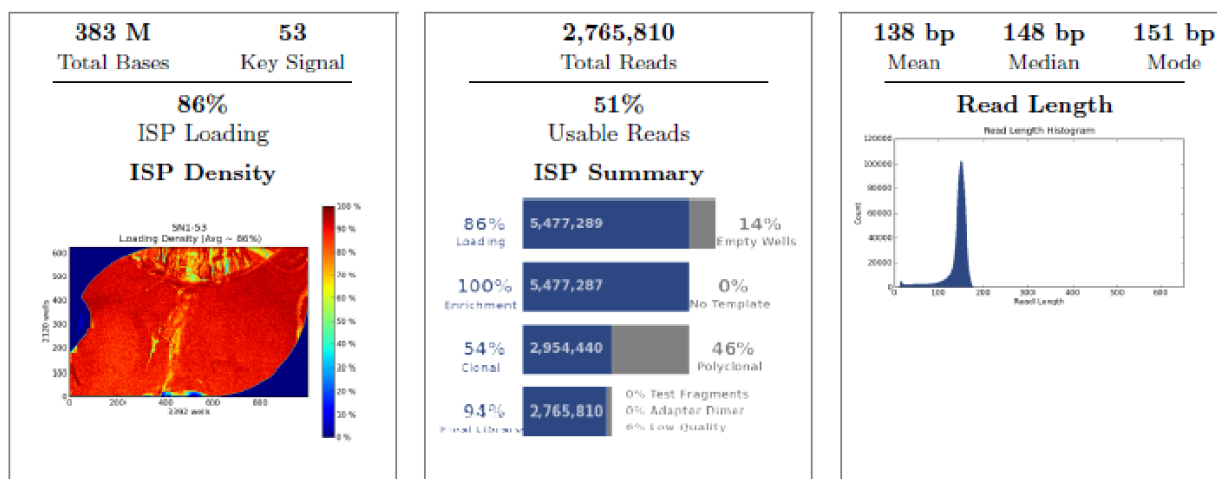
Table A3 includes primers used for molecular cloning. Primers are based on the IonTorrent assembled mitogenome regions. They were constructed by Å. Emblem and ordered from Eurofins Genomics.

Name	Sequence (5'→3'), length	Vol for 100µmol	GC-content, %	Use for PCR/cloning
Pr_MutS_F	ACGTGGTACAATTGCTGTTC(21)	308	45	P/C
Pr_MutS_F2	CTGTCGCAGCTGCCGAGTCTG(21)	317	66.7	P/C
Pr_MutS_R	TCCTCATAGTCTAGTAAGATG(21)	312	38.1	P/C
Pr_MutS_R2	CGCTATCGCTCGCCGCT(21)	303	71.4	P/C

Appendix C

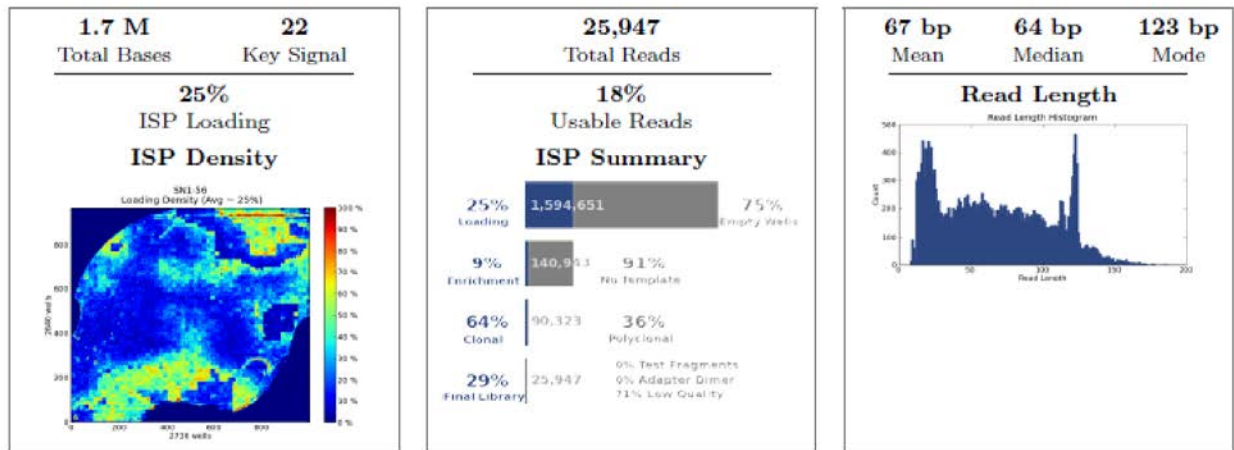
Sequencing run summary on *P. resedaeformis* DNA

Run Summary



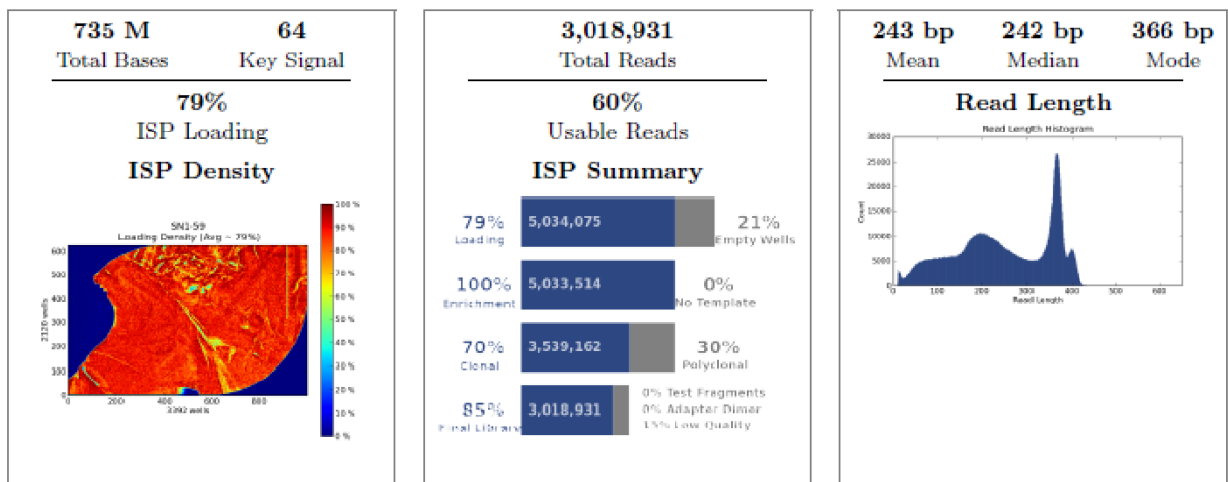
Sequencing run summary on *P. resedaeformis* cDNA

Run Summary



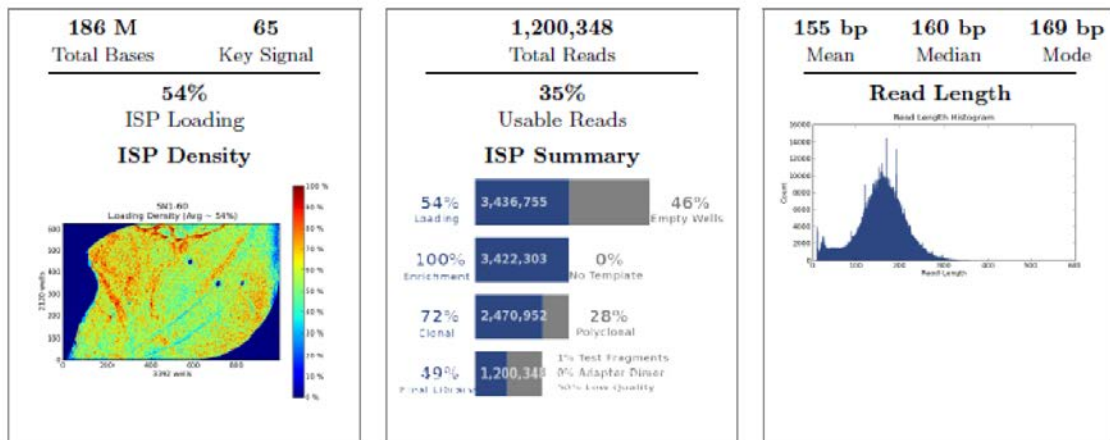
Sequencing run summary on *A. digitatum* DNA

Run Summary



Sequencing run summary on *A. digitatum* cDNA

Run Summary



Appendix D

Alcyonium digitatum mitogenome sequence

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Appendix E

Multiple nucleotide alignments of protein coding and rRNA genes of *A. digitatum*, *P. resedaeformis* and all available complete mitochondrial genome

Atp6 gene

		20	40	60	80	
alcyonium_digitatum_atp6	AT	-----GT	CAGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
primnoa_resedaeformis_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
sinularia_peculiaris_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
narella_hawaiiensis_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
paraminabea_aldersladei_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
scleronephthya_gracillimum_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
dendronephthya_castanea_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
dendronephthya_gigantea_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
dendronephthya_mollis_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
dendronephthya_suensoni_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
junceella_fragilis_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
keratoisidinae_atp6	AT	GTATAACAT	GGCAGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
echinogorgia_complexa_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
euplexaura_crassa_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
pseudopterogorgia_bipinnata_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
acanella_eburnea_atp6	AT	A	GTCAT GGCAGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
sibagorgia_cauliflora_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
corallium_elatus_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
corallium_konojoi_atp6	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
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calicogorgia_atp6_rev	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
Consensus	AT	-----GGC	AGCTTCTTCTTTGATCA	ATTTAATGTAGTTCGGATAA	TTGGGGGATA	AATTAATAA
Conservation						
		100	120	140	160	
alcyonium_digitatum_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
primnoa_resedaeformis_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
sinularia_peculiaris_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
narella_hawaiiensis_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
paraminabea_aldersladei_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
scleronephthya_gracillimum_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
dendronephthya_castanea_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
dendronephthya_gigantea_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
dendronephthya_mollis_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
dendronephthya_suensoni_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
junceella_fragilis_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
keratoisidinae_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
echinogorgia_complexa_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
euplexaura_crassa_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
pseudopterogorgia_bipinnata_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
acanella_eburnea_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
sibagorgia_cauliflora_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
corallium_elatus_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
corallium_konojoi_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
corallium_rubrum_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
paracorallium_japonicum_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
briareum_asbestinum_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
heliopora_coerulea_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
stylatula_elongata_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
renilla_muelleri_atp6	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
calicogorgia_atp6_rev	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
Consensus	CTT	ATCCTA	TTAGTGTAATA	TTAATAGGAAGT	TGTTCA	TATAAA
Conservation						

		540		560		580		600	
alcyonium_digitatum_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
primnoa_resedaeiformis_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
sinularia_peculiaris_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
narella_hawaiiensis_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
paraminabea_aldersladei_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
scleronephthya_gracillimum_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
dendronephthya_castanea_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
dendronephthya_gigantea_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
dendronephthya_mollis_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
dendronephthya_suensoni_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
junceella_fragilis_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
keratoisidinae_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
echinogorgia_complexa_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
euplexaura_crassa_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
pseudopterogorgia_bipinnata_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
acanella_eburnea_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
sibagogorgia cauliflora_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
corallium_elatius_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
corallium_konojoi_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
corallium_rubrum_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
paracorallium_japonicum_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
briareum_asbestinum_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
heliopora_coerulea_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
stylatula_elongata_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
renilla_muelleri_atp6	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
calicogorgia_atp6 rev	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600
Consensus	GGGCACCTTTTATTTGCTATATTAGCAAGTTTTGGGTTT								GCCCAATATTA 600

Conservation

		620		640		660		680	
alcyonium_digitatum_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATAAAT 687
primnoa_resedaeiformis_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
sinularia_peculiaris_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
narella_hawaiiensis_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
paraminabea_aldersladei_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
scleronephthya_gracillimum_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
dendronephthya_castanea_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
dendronephthya_gigantea_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
dendronephthya_mollis_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
dendronephthya_suensoni_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
junceella_fragilis_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
keratoisidinae_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
echinogorgia_complexa_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
euplexaura_crassa_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
pseudopterogorgia_bipinnata_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
acanella_eburnea_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
sibagogorgia cauliflora_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
corallium_elatius_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
corallium_konojoi_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
corallium_rubrum_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
paracorallium_japonicum_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
briareum_asbestinum_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
heliopora_coerulea_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
stylatula_elongata_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
renilla_muelleri_atp6	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
calicogorgia_atp6 rev	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687
Consensus	GTAATGGTTTTTATACTTACTAGAAATTGCCGTGGCTCTGATT								CAAGCATATGTAATTTGCTGTTAACTACCATATACATTAAT 687

Conservation

		700	
alcyonium_digitatum_atp6	GATACTCTAAATTTACATTA		708
primnoa_resedaeiformis_atp6	GATACTCTAAATCTACATTA		708
sinularia_peculiaris_atp6	GATACTCTAAATCTACATTA		708
narella_hawaiiensis_atp6	GATACTCTAAATCTACATTA		708
paraminabea_aldersladei_atp6	GATACTCTAAATCTACATTA		708
scleronephthya_gracillimum_atp6	GATACTCTAAATCTACATTA		708
dendronephthya_castanea_atp6	GATACTCTAAATCTACATTA		708
dendronephthya_gigantea_atp6	GATACTCTAAATCTACATTA		708
dendronephthya_mollis_atp6	GATACTCTAAATCTACATTA		708
dendronephthya_suensoni_atp6	GATACTCTAAATCTACATTA		708
junceella_fragilis_atp6	GATACTCTAAATCTACATTA		708
keratoisidinae_atp6	GATACTCTAAATCTACATTA		708
echinogorgia_complexa_atp6	GATACTCTAAATCTACATTA		708
euplexaura_crassa_atp6	GATACTCTAAATCTACATTA		708
pseudopterogorgia_bipinnata_atp6	GATACTCTAAATCTACATTA		708
acanella_eburnea_atp6	GATACTCTAAATCTACATTA		714
sibagogorgia cauliflora_atp6	GATACTCTAAATCTACATTA		708
corallium_elatius_atp6	GATACTCTAAATCTACATTA		708
corallium_konojoi_atp6	GATACTCTAAATCTACATTA		708
corallium_rubrum_atp6	GATACTCTAAATCTACATTA		708
paracorallium_japonicum_atp6	GATACTCTAAATCTACATTA		708
briareum_asbestinum_atp6	GATACTCTAAATCTACATTA		708
heliopora_coerulea_atp6	GATACTCTAAATCTACATTA		708
stylatula_elongata_atp6	GATACTCTAAATCTACATTA		708
renilla_muelleri_atp6	GATACTCTAAATCTACATTA		708
calicogorgia_atp6 rev	GATACTCTAAATCTACATTA		708
Consensus	GATACTCTAAATCTACATTA		

Conservation

Atp8 gene

	20	40	60	80	
alcyonium_digitatum_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
primnoa_resedaeformis_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
sinularia_peculiaris_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
narella_hawaiiensis_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
paraminabea_aldersladei_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
scleronephthya_gracillimum_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
dendronephthya_castanea_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
dendronephthya_gigantea_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
dendronephthya_mollis_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
junceella_fragilis_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
keratoisidinae_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
echinogorgia_complexa_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
euplexaura_crassa_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
pseudopteroorgia_bipinnata_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
acanella_eburnea_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
sibagorgia_cauliflora_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
briareum_asbestinum_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
corallium_elatius_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
corallium_konojoi_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
corallium_rubrum_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
paracorallium_japonicum_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
heliopora_coerulea_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
stylatula_elongata_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
renilla_muelleri_atp8	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
Consensus	ATGCCTC	ACTTAGATATAAC	CGCTTATTTAACTCAATATAGCTGGACATTAATAATCTTTGTTAGCACTTTATAGTATTATGAGTTT	A 87	
Conservation					
	100	120	140	160	
alcyonium_digitatum_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
primnoa_resedaeformis_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
sinularia_peculiaris_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
narella_hawaiiensis_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
paraminabea_aldersladei_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
scleronephthya_gracillimum_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
dendronephthya_castanea_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
dendronephthya_gigantea_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
dendronephthya_mollis_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
junceella_fragilis_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
keratoisidinae_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
echinogorgia_complexa_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
euplexaura_crassa_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
pseudopteroorgia_bipinnata_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
acanella_eburnea_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
sibagorgia_cauliflora_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
briareum_asbestinum_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
corallium_elatius_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
corallium_konojoi_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
corallium_rubrum_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
paracorallium_japonicum_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
heliopora_coerulea_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
stylatula_elongata_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
renilla_muelleri_atp8	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
Consensus	TTTATTTT	ACCTAAAATTCAA	AATAA	TTACGTAAGAAGTATACTACAGGAAGAGGGGGCAGCCCTTAAAGG	ACTCGGGGTT 174
Conservation					
	180	200			
alcyonium_digitatum_atp8	AATCGAGCATATGCTATACTACAAGATATCCTCCGCAGATAG	--	216		
primnoa_resedaeformis_atp8	GATCGAGCATATGTTATACTACAAGATATACTCCGCAGATAG	--	216		
sinularia_peculiaris_atp8	AATAGAGCATATGCTATACTACAAGATATACTCCGTAATAA	--	216		
narella_hawaiiensis_atp8	AATAGAGCATATGCTATACTACAAGATATACTCCATAGATAG	--	216		
paraminabea_aldersladei_atp8	AATAAAGCATATGCTATACTACAAGATATACTTCATAGATAG	--	216		
scleronephthya_gracillimum_atp8	AATCGAGCATATGCTATACTACAAGATATACTCCGTAGATAG	--	216		
dendronephthya_castanea_atp8	AATCGAGCATATGCTATACTACAAGATATACTCCGTAGATAG	--	216		
dendronephthya_gigantea_atp8	AATCGAGCATATGCTATACTACAAGATATACTCCGTAGATAG	--	216		
dendronephthya_mollis_atp8	AATCGAGCATATGCTATACTACAAGATATACTCCGTAGATAG	--	216		
dendronephthya_suensoni_atp8	AATCGAGCATATGCTATACTACAAGATATACTCCGTAGATAG	--	216		
junceella_fragilis_atp8	AATAAAGCATATGCTATACTACAAGATATACTCCATAGATAG	--	216		
keratoisidinae_atp8	AATAGAGCATATGCTATACTACAAGATATACTCCATAGATAG	--	216		
echinogorgia_complexa_atp8	AATCGAGCATATGCTATACTACAAGATATACTCCGTAGATAA	--	216		
euplexaura_crassa_atp8	AATCGAGCATATGCTATACTACAAGATATACTCCGTAGATAG	--	216		
pseudopteroorgia_bipinnata_atp8	AATCGAGCATATGCTATACTACAAGATATACTCCGTAGATAAG	--	218		
acanella_eburnea_atp8	AATAGAGCATATGCTATACTACAAGATATACTCCATAGATAG	--	216		
sibagorgia_cauliflora_atp8	AATAAAGCATATGCTATACTACAAGATATACTCCATAGATAG	--	216		
briareum_asbestinum_atp8	AATAAAGCATATGCTATACTACAAGATATACTCCATAAATAGG	--	218		
corallium_elatius_atp8	AATAAAGCATATGCTATACTACAAGATATACTCCATAGATAG	--	216		
corallium_konojoi_atp8	AATAAAGCATATGCTATACTACAAGATATACTCCATAGATAG	--	216		
corallium_rubrum_atp8	AATAAAGCATATGCTATACTACAAGATATACTCCATAGATAG	--	216		
paracorallium_japonicum_atp8	AATAAAGCATATGCTATACTACAAGATATACTCCATAGATAG	--	216		
heliopora_coerulea_atp8	AATAGAGCATATGCTATACTACAAGATATACTCCATAGATAG	--	216		
stylatula_elongata_atp8	AATAGAGCATATGCTATACTACAAGATATACTCCACAATAA	--	216		
renilla_muelleri_atp8	AATAGAGCATATGCTATACTACAAGATATACTTCATAGATAG	--	216		
Consensus	AATAGAGCATATGCTATACTACAAGATATACTCCATAGATAG	--			
Conservation					

Table with 3 columns: Species, Position (720-760), and Sequence. Lists various species like alcyonium_digitatum_cox1 and their corresponding DNA sequences with highlighted mutations.

Table with 3 columns: Species, Position (780-860), and Sequence. Continuation of species and sequence data with highlighted mutations.

Table with 3 columns: Species, Position (880-940), and Sequence. Continuation of species and sequence data with highlighted mutations.

Table with 3 columns: Species, Position (960-1020), and Sequence. Continuation of species and sequence data with highlighted mutations.


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1,280      1,400      1,420      1,440      1,460
alcyonium_digitatum_cox1 AGCTGTAGTGGCTCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
primnoa_resedaeformis_cox1 AGCTATAATGGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
sinularia_peculiaris_cox1 AGCTGTAAATAGCTGGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
narella_hawaiinensis_cox1 AGCTATAATAGCACTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
paraminabea_aldersladei_cox1 AGCTATAATAGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
scleronephthya_gracillimum_cox1 AGCTGTAAATAGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
dendronephthya_castanea_cox1 GGCTGTAAATAGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
dendronephthya_gigantea_cox1 GGCTGTAAATAGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
dendronephthya_mollis_cox1 GGCTGTAAATAGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
dendronephthya_suensoni_cox1 AGCTGTAAATAGCACTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
junceella_fragilis_cox1 AGCTGTAAATAGCACTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
keratoisidinae_cox1 AGCTATAATAGCACTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
echinogorgia_complexa_cox1 AGCTGTAAATAGCTCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
euplexaura_crassa_cox1 AGCTGTAAATAGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
pseudopteroorgia_bipinnata_cox1 AGCTGTAAATAGCTCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
acanella_eburnea_cox1 AGCTATAATAGCACTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
sibagogorgia_cauliflora_cox1 AGCTATAATAGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
briareum_asbestinum_cox1 AGCTGTAAATAGCACTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
corallium_elatus_cox1 AGCTATAATAGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
corallium_konojoi_cox1 AGCTATAATAGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
corallium_rubrum_cox1 AGCTATAATAGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
paracorallium_japonicum_cox1 AGCTGTAAATAGCACTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
heliopora_coerulea_cox1 AGCTGTAAATAGCACTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
stylatula_elongata_cox1 GGCTATAATAGCACTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
renilla_muelleri_cox1 AGCTATAATAGCACTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG 1462
Consensus AGCTGTAAATAGCCCTAGTAGGAATTATATGTTTATATACCTTGTCTTATGAGGCATTAGCAGCCGAAAGACCATTTAAAGGGTGGG
Conservation

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1,480      1,500      1,520      1,540
alcyonium_digitatum_cox1 CAACCTTCGCCTAACTCGTTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
primnoa_resedaeformis_cox1 CAACCTTCGCCTAACTCGTTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
sinularia_peculiaris_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
narella_hawaiinensis_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
paraminabea_aldersladei_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
scleronephthya_gracillimum_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
dendronephthya_castanea_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
dendronephthya_gigantea_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
dendronephthya_mollis_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
dendronephthya_suensoni_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
junceella_fragilis_cox1 CAGCTTCACTACTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
keratoisidinae_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
echinogorgia_complexa_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
euplexaura_crassa_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
pseudopteroorgia_bipinnata_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
acanella_eburnea_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
sibagogorgia_cauliflora_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
briareum_asbestinum_cox1 CAGCTTCCCTCAGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
corallium_elatus_cox1 CAGCTTCCCTCAGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
corallium_konojoi_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
corallium_rubrum_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
paracorallium_japonicum_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
heliopora_coerulea_cox1 CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
stylatula_elongata_cox1 AAGCTTCGTCTACTTCACTTATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
renilla_muelleri_cox1 AAGCTTCGTCTACTTCACTTATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT 1548
Consensus CAACCTTCGCCTGGCTCATTAGAGTGGTCTTTATCTTCGCCGCTGCTTTTCATACCTATAATGAATACCGTTTGTCTATCAGCGT
Conservation

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1,560      1,580      1,600      1,620
alcyonium_digitatum_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTT----- 1582
primnoa_resedaeformis_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTT----- 1582
sinularia_peculiaris_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTT----- 1582
narella_hawaiinensis_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
paraminabea_aldersladei_cox1 GAAATTGATTCCTGGGGATCTCTCTATATTATTTCCATTTGGGGATTAA----- 1596
scleronephthya_gracillimum_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
dendronephthya_castanea_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
dendronephthya_gigantea_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
dendronephthya_mollis_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
dendronephthya_suensoni_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
junceella_fragilis_cox1 A-----GTAAATAGTCTGTCTA-----ACATA----- 1568
keratoisidinae_cox1 AAAATTGAGTCCTGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
echinogorgia_complexa_cox1 AAGTTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
euplexaura_crassa_cox1 AAAATTGAGTCCTGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
pseudopteroorgia_bipinnata_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
acanella_eburnea_cox1 AAAATTGAGTCCTGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
sibagogorgia_cauliflora_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
briareum_asbestinum_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1582
corallium_elatus_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
corallium_konojoi_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
corallium_rubrum_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
paracorallium_japonicum_cox1 AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT----- 1597
heliopora_coerulea_cox1 AAAATTGAGTCCTGGGGATGATTTAAATATTATTTCCACACTACTCCTTTGACCTTGGGGAGTCTATAAGGCCAAGCGTGTCTCTATAA 1634
stylatula_elongata_cox1 A-----GTAAATAGTCTGTCTA-----ACATA----- 1565
renilla_muelleri_cox1 A-----GAAATCTGTCTAAATA-----ACATA----- 1565
Consensus AAAATTGAGTCATGGGGATGATTTAAATATTATTTCCACACTACTCCTTT-----
Conservation

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1,640
alcyonium_digitatum_cox1 -----> 1582
primnoa_resedaeformis_cox1 ----- 1582
sinularia_peculiaris_cox1 ----- 1582
narella_hawaiinensis_cox1 ----- 1597
paraminabea_aldersladei_cox1 ----- 1596
scleronephthya_gracillimum_cox1 ----- 1597
dendronephthya_castanea_cox1 ----- 1597
dendronephthya_gigantea_cox1 ----- 1597
dendronephthya_mollis_cox1 ----- 1597
dendronephthya_suensoni_cox1 ----- 1597
junceella_fragilis_cox1 ----- 1568
keratoisidinae_cox1 ----- 1597
echinogorgia_complexa_cox1 ----- 1597
euplexaura_crassa_cox1 ----- 1597
pseudopteroorgia_bipinnata_cox1 ----- 1597
acanella_eburnea_cox1 ----- 1597
sibagogorgia_cauliflora_cox1 ----- 1597
briareum_asbestinum_cox1 ----- 1582
corallium_elatus_cox1 ----- 1597
corallium_konojoi_cox1 ----- 1597
corallium_rubrum_cox1 ----- 1597
paracorallium_japonicum_cox1 ----- 1597
heliopora_coerulea_cox1 TACATGCAAGGCCCTATAG 1653
stylatula_elongata_cox1 ----- 1566
renilla_muelleri_cox1 ----- 1566
Consensus -----
Conservation

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	700	720	740	760	
alcyonium_digitatum_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
primnoa_resedaeiformis_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
sinularia_peculiaris_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
narella_hawaiinensis_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
paraminabea_aldersladei_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
scleronephthya_gracillimum_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
dendronephthya_castanea_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
dendronephthya_gigantea_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
dendronephthya_mollis_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
dendronephthya_suensoni_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
junceella_fragilis_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
keratoisidinae_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
echinogorgia_complexa_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
euplexaura_crassa_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
pseudopterogorgia_bipinnata_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
acanella_eburnea_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
sibagorgia_cauliflora_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
briareum_asbestinum_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
corallium_elatius_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
corallium_konojoi_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
corallium_rubrum_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
paracorallium_japonicum_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
heliopora_coerulea_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
stylatula_elongata_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
renilla_muelleri_cox2	GTTATAGAA	GCCGTTAGCATGGATAAA	TATATCAGCTGGC	TATCTTCATTA	TGTGATGATC
Consensus	GTTATAGAA GCCGTTAGCATGGATAAA TATATCAGCTGGC TATCTTCATTA TGTGATGATC				
Conservation	<hr/>				

Cox3 gene

	20	40	60	80	
alcyonium_digitatum_cox3	ATGAG	-----	-----	-----	-----
primnoa_resedaeiformis_cox3	ATGAG	-----	-----	-----	-----
sinularia_peculiaris_cox3	ATGAG	-----	-----	-----	-----
narella_hawaiinensis_cox3	ATGAG	-----	-----	-----	-----
paraminabea_aldersladei_cox3	ATGAG	-----	-----	-----	-----
scleronephthya_gracillimum_cox3	ATGAG	-----	-----	-----	-----
dendronephthya_castanea_cox3	ATGAG	-----	-----	-----	-----
dendronephthya_gigantea_cox3	ATGAG	-----	-----	-----	-----
dendronephthya_mollis_cox3	ATGAG	-----	-----	-----	-----
dendronephthya_suensoni_cox3	ATGAG	-----	-----	-----	-----
junceella_fragilis_cox3	ATGAG	-----	-----	-----	-----
keratoisidinae_cox3	ATGAG	-----	-----	-----	-----
echinogorgia_complexa_cox3	ATGAG	-----	-----	-----	-----
euplexaura_crassa_cox3	ATGAG	-----	-----	-----	-----
pseudopterogorgia_bipinnata_cox3	ATGAG	-----	-----	-----	-----
acanella_eburnea_cox3	ATGAG	-----	-----	-----	-----
sibagorgia_cauliflora_cox3	ATGAG	-----	-----	-----	-----
briareum_asbestinum_cox3	ATGAG	-----	-----	-----	-----
corallium_elatius_cox3	ATGAG	-----	-----	-----	-----
corallium_konojoi_cox3	ATGAG	-----	-----	-----	-----
corallium_rubrum_cox3	ATGAG	-----	-----	-----	-----
paracorallium_japonicum_cox3	ATGAG	-----	-----	-----	-----
heliopora_coerulea_cox3	ATGAG	GTGCATACAGGTAGGAGTATTAGTCTCCATGAG	-----	-----	-----
stylatula_elongata_cox3	ATGAG	-----	-----	-----	-----
renilla_muelleri_cox3	ATGAG	-----	-----	-----	-----
Consensus	ATGAG-----				
Conservation	<hr/>				
	100	120	140	160	
alcyonium_digitatum_cox3	A	CAGGGGCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
primnoa_resedaeiformis_cox3	A	CAGGGGCAATTGGGGCA	CTACTGTTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
sinularia_peculiaris_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
narella_hawaiinensis_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
paraminabea_aldersladei_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
scleronephthya_gracillimum_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
dendronephthya_castanea_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
dendronephthya_gigantea_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
dendronephthya_mollis_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
dendronephthya_suensoni_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
junceella_fragilis_cox3	T	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
keratoisidinae_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
echinogorgia_complexa_cox3	A	TAGGCTCAATTGGGGCA	CTACTGTTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
euplexaura_crassa_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
pseudopterogorgia_bipinnata_cox3	A	TAGGCTCAATTGGGGCA	CTACTGTTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
acanella_eburnea_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
sibagorgia_cauliflora_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
briareum_asbestinum_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
corallium_elatius_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
corallium_konojoi_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
corallium_rubrum_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
paracorallium_japonicum_cox3	A	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
heliopora_coerulea_cox3	A	CGGGCTCAATTGGGGCA	TTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
stylatula_elongata_cox3	T	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
renilla_muelleri_cox3	T	TAGGCTCAATTGGGGCA	CTACTGATTACAGTA	GGCTCAGTATTA	TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA
Consensus	ATAGGCTCAATTGGGGCACTACTGATTACAGTAGGCTCAGTATTA TATTTTCATTATAGTTACATGGATAATGTATTTAGGGCA				
Conservation	<hr/>				

Nd2 gene

	20	40	60	80	
alcyonium_digitatum_ND2	ATG TGGGTGCATAGCCCTGGTATACTATGGAA TTAACACTAGGGCTCATCATACTAATAGTGTGGCGTATGGATTAAGGCC	86			
primnoa_resedaeformis_ND2	ATG TGGGTGCATAGCCCTGGTATACTATGGAA TTAACACTAGGGCTCATCATACTAATAGTGTGGCGTATGGATTAAGGCC	86			
sinularia_peculiaris_ND2	ATG TGGGTGCATAGCCCTGGTATACTATGGAA TTAACACTAGGGCTCATCATACTAATAGTGTGGCGTATGGATTAAGGCC	86			
narella_hawaiiensis_ND2	ATG	3			
paraminabea_aldersladei_ND2	ATG	3			
scleronephthya_gracillimum_ND2	ATG	3			
dendronephthya_castanea_ND2	ATG	3			
dendronephthya_gigantea_ND2	ATG	3			
dendronephthya_mollis_ND2	ATG	3			
dendronephthya_suenoni_ND2	ATG	3			
junceella_fragilis_ND2	ATG	3			
keratoisidinae_ND2_rev	ATG G AATTAACACTAGGGCTCATCATACTAATAGTGTGGCGTATGGATTAAGGCC	59			
echinogorgia_complexa_ND2	ATG	3			
euplexaura_crassa_ND2	ATG	3			
pseudopteroorgia_bipinnata_ND2	AT G AATTAACACTAGGGCTCATCATACTAATAGTGTGGCGTATGGATTAAGGCC	59			
acanella_eburnea_ND2_rev	ATG G AATTAACACTAGGGCTCATCATACTAATAGTGTGGCGTATGGATTAAGGCC	59			
sibagogorgia_cauliflora_ND2	ATG	3			
briareum_asbestinum_ND2	ATG	3			
corallium_elatius_ND2	ATG	3			
corallium_konojoi_ND2	ATG	3			
corallium_rubrum_ND2_rev	ATG	3			
paracorallium_japonicum_ND2_rev	ATG	3			
heliopora_cerulea_ND2	ATG TGGGTGCATAGCCCTGGTATACTATGGAA TTAACACTAGGGCTCATCATACTAATAGTGTGGCGTATGGATTAAGGCC	86			
stylatula_elongata_ND2	ATG GGGTGCATAGCCCTGGTATACTATGGAA TTAACACTAGGGCTCATCATACTAATAGTGTGGCGTATGGATTAAGGCC	86			
renilla_muelleri_ND2	ATG G AATTAACACTAGGGCTCATCATACTAATAGTGTGGCGTATGGATTAAGGCC	59			
calicogorgia_granulosa_ND2	ATG	3			
Consensus	ATG				
Conservation	.....			
	100	120	140	160	
alcyonium_digitatum_ND2	GACTTTAAGATTAGCTATGCTACTTTGCGGGTGCTG	TGGGGCTGCTGGGCTATTAGCTGAGGCCCATCTACTATGTT	163		
primnoa_resedaeformis_ND2	GACTTTAAGATTAGCTATGCTACTTTGCGGGTGCTG	TGGGGCTGCTGGGCTATTAGCTGAGGCCCATCTACTATGTT	163		
sinularia_peculiaris_ND2	GACTTTAAGATTAGCTATGCTACTTTGCGGGTGCTG	TGGGGCTGCTGGGCTATTAGCTGAGGCCCATCTACTATGTT	163		
narella_hawaiiensis_ND2	3		
paraminabea_aldersladei_ND2	3		
scleronephthya_gracillimum_ND2	3		
dendronephthya_castanea_ND2	3		
dendronephthya_gigantea_ND2	3		
dendronephthya_mollis_ND2	3		
dendronephthya_suenoni_ND2	3		
junceella_fragilis_ND2	3		
keratoisidinae_ND2_rev	GACTCTAAGATTAGCAACATCTGTTTAGGAGTTATACTACTTATGAGTGCTG	TGGGGCCCATCTGCTATGTT	133		
echinogorgia_complexa_ND2	3		
euplexaura_crassa_ND2	3		
pseudopteroorgia_bipinnata_ND2	2		
acanella_eburnea_ND2_rev	GACTCTAAGATTAGCAACATCTGTTTAGGAGTTATACTACTTATGAGTGCTGCT	CCGCTGGAGG ... TCTGCTATGTT	136		
sibagogorgia_cauliflora_ND2	3		
briareum_asbestinum_ND2	3		
corallium_elatius_ND2	3		
corallium_konojoi_ND2	3		
corallium_rubrum_ND2_rev	3		
paracorallium_japonicum_ND2_rev	3		
heliopora_cerulea_ND2	GACCCTAAGATTAGCAACATCTGTTTAGGAGTTACACTACTTATGAGG	GTTATTAACTGAGGCCCATTTGCTATGTT	163		
stylatula_elongata_ND2	GACTCTAAGATTAGCGACATTAAGCTTAGGAGCTATAAATCTTATGGTAGCTGGGTTATTAGCTGAGGCCCATCTGCTATGTT	172			
renilla_muelleri_ND2	TACTCTAAGATTATCAATATTTGTTTGGGGCTATAAATATTTAGTAGCTGGGTTATTAGCTGAGGCCCATCTGCTATGTT	145			
calicogorgia_granulosa_ND2	3		
Consensus			
Conservation			
	180	200	220	240	
alcyonium_digitatum_ND2	GGACACAGGCTATTAAGATGTTGGTGATGCTTAAGCGGGTTAGCTATACTATGTATGCTGGACATCGAACATCGCATCGATCAAGC	249			
primnoa_resedaeformis_ND2	GGACACAGGCTATTAAGATGTTGGTGATGCTTAAGCGGGTTAGCTATACTATGTATGCTGGACATCGAACATCGCATCGATCAAGC	249			
sinularia_peculiaris_ND2	GGACACAGGCTATTAAGATGTTGGTGATGCTTAAGCGGGTTAGCTATACTATGTATGCTGGACATCGAACATCGCATCGATCAAGC	249			
narella_hawaiiensis_ND2	3		
paraminabea_aldersladei_ND2	3		
scleronephthya_gracillimum_ND2	3		
dendronephthya_castanea_ND2	3		
dendronephthya_gigantea_ND2	3		
dendronephthya_mollis_ND2	3		
dendronephthya_suenoni_ND2	3		
junceella_fragilis_ND2	3		
keratoisidinae_ND2_rev	GGACACAGGCTATTAAGATGTTGGTGATGCTTAAGCGGGTTAGCCATACTATGTATGCTGGACATCGAACATCGCATCGATCAAGC	219			
echinogorgia_complexa_ND2	3		
euplexaura_crassa_ND2	3		
pseudopteroorgia_bipinnata_ND2	2		
acanella_eburnea_ND2_rev	GGACACAGGCTATTAAGATGTTGGTGATGCTTAAGCGGGTTAGCCATACTATGTATGCTGGACATCGAACATCGCATCGATCAAGC	222			
sibagogorgia_cauliflora_ND2	3		
briareum_asbestinum_ND2	3		
corallium_elatius_ND2	3		
corallium_konojoi_ND2	3		
corallium_rubrum_ND2_rev	3		
paracorallium_japonicum_ND2_rev	3		
heliopora_cerulea_ND2	GGACACAGGCTATTAAGATGTTGGTGATGCTTAAGCGGGTTAGCCATACTATGTATGCTGGACATCGAACATCGCATCGATCAAGC	249			
stylatula_elongata_ND2	GGACACAGGCTATTAAGATGTTGGTGATGCTTAAGCGGGTTAGCCATACTATGTATGCTGGACATCGAACATCGCATCGATCAAGC	258			
renilla_muelleri_ND2	GGACACAGGCTATTAAGATGTTGGTGATGCTTAAGCGGGTTAGCCATACTATGTATGCTGGACATCGAACATCGCATCGATCAAGC	231			
calicogorgia_granulosa_ND2	3		
Consensus			
Conservation			
	260	280	300	320	340
alcyonium_digitatum_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	334			
primnoa_resedaeformis_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	334			
sinularia_peculiaris_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	334			
narella_hawaiiensis_ND2	3		
paraminabea_aldersladei_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
scleronephthya_gracillimum_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
dendronephthya_castanea_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
dendronephthya_gigantea_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
dendronephthya_mollis_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
dendronephthya_suenoni_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
junceella_fragilis_ND2	3		
keratoisidinae_ND2_rev	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	82			
echinogorgia_complexa_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
euplexaura_crassa_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
pseudopteroorgia_bipinnata_ND2	5		
acanella_eburnea_ND2_rev	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
sibagogorgia_cauliflora_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	307			
briareum_asbestinum_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
corallium_elatius_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
corallium_konojoi_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
corallium_rubrum_ND2_rev	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
paracorallium_japonicum_ND2_rev	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
heliopora_cerulea_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	334			
stylatula_elongata_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	343			
renilla_muelleri_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	316			
calicogorgia_granulosa_ND2	TCTTTATTGATTTTAAAGTATCTTAGGTAATTTATTACTTATTGGG-TCAACAAATTTAATTCCTATATATTTAGCATTAGAAA	118			
Consensus			
Conservation			

	360	380	400	420	
alcyonium_digitatum_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
primnoa_resedaeiformis_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
sinularia_peculiaris_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
narella_hawaiiensis_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
paraminabea_aldersladei_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
scleronephthya_gracillimum_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
dendronephthya_castanea_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
dendronephthya_gigantea_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
dendronephthya_mollis_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
dendronephthya_suenosoni_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
junceella_fragilis_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
keratoisidinae_ND2_rev	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
echinogorgia_complexa_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
euplexaura_crassa_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
pseudopteroergorgia_bipinnata_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
acanella_eburnea_ND2_rev	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
sibagogorgia_caulliflora_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
briareum_asbestinum_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
corallium_elatius_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
corallium_konojoi_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
corallium_rubrum_ND2_rev	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
paracorallium_japonicum_ND2_rev	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
helopora_coerulea_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
stylatula_elongata_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
renilla_muelleri_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
calicogorgia_granulosa_ND2	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
Consensus	TGCAAA	CATTAT	TGTTAT	CTTTAG	TGGCCT
Conservation					
	440	460	480	500	
alcyonium_digitatum_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
primnoa_resedaeiformis_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
sinularia_peculiaris_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
narella_hawaiiensis_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
paraminabea_aldersladei_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
scleronephthya_gracillimum_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
dendronephthya_castanea_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
dendronephthya_gigantea_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
dendronephthya_mollis_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
dendronephthya_suenosoni_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
junceella_fragilis_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
keratoisidinae_ND2_rev	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
echinogorgia_complexa_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
euplexaura_crassa_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
pseudopteroergorgia_bipinnata_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
acanella_eburnea_ND2_rev	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
sibagogorgia_caulliflora_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
briareum_asbestinum_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
corallium_elatius_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
corallium_konojoi_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
corallium_rubrum_ND2_rev	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
paracorallium_japonicum_ND2_rev	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
helopora_coerulea_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
stylatula_elongata_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
renilla_muelleri_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
calicogorgia_granulosa_ND2	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
Consensus	GGGGCA	CTATCT	TCGGGG	TATTC	CTGTTGGT
Conservation					
	520	540	560	580	600
alcyonium_digitatum_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
primnoa_resedaeiformis_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
sinularia_peculiaris_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
narella_hawaiiensis_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
paraminabea_aldersladei_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
scleronephthya_gracillimum_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
dendronephthya_castanea_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
dendronephthya_gigantea_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
dendronephthya_mollis_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
dendronephthya_suenosoni_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
junceella_fragilis_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
keratoisidinae_ND2_rev	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
echinogorgia_complexa_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
euplexaura_crassa_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
pseudopteroergorgia_bipinnata_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
acanella_eburnea_ND2_rev	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
sibagogorgia_caulliflora_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
briareum_asbestinum_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
corallium_elatius_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
corallium_konojoi_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
corallium_rubrum_ND2_rev	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
paracorallium_japonicum_ND2_rev	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
helopora_coerulea_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
stylatula_elongata_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
renilla_muelleri_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
calicogorgia_granulosa_ND2	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
Consensus	GAGTAT	AGTATCT	TGGAAC	CATTAG	CTGGTA
Conservation					
	620	640	660	680	
alcyonium_digitatum_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
primnoa_resedaeiformis_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
sinularia_peculiaris_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
narella_hawaiiensis_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
paraminabea_aldersladei_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
scleronephthya_gracillimum_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
dendronephthya_castanea_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
dendronephthya_gigantea_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
dendronephthya_mollis_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
dendronephthya_suenosoni_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
junceella_fragilis_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
keratoisidinae_ND2_rev	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
echinogorgia_complexa_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
euplexaura_crassa_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
pseudopteroergorgia_bipinnata_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
acanella_eburnea_ND2_rev	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
sibagogorgia_caulliflora_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
briareum_asbestinum_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
corallium_elatius_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
corallium_konojoi_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
corallium_rubrum_ND2_rev	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
paracorallium_japonicum_ND2_rev	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
helopora_coerulea_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
stylatula_elongata_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
renilla_muelleri_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
calicogorgia_granulosa_ND2	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
Consensus	TGTGGG	CCCCGATG	TATACG	AAGGGG	CTCAAC
Conservation					

1,040 1,060 1,080 1,100
alcyonium_digitatum_ND2 AGGAAATCCCCCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 1108
primnoa_resedaeiformis_ND2 AGGAAATCCCCCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 1108
sinularia_peculiaris_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 1108
narella_hawaiiensis_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
paraminabea_aldersladei_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
scleronephthya_gracillimum_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
dendronephthya_castanea_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
dendronephthya_gigantea_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 775
dendronephthya_mollis_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
dendronephthya_suensoni_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
junceella_fragilis_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 856
keratoisidinae_ND2 rev AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 1072
echinogorgia_complexa_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
euplexaura_crassa_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
pseudopterogorgia_bipinnata_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 829
acanella_eburnea_ND2 rev AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 1075
sibagorgia_cauliflora_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
briareum_asbestinum_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
corallium_elatius_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
corallium_konojoi_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
corallium_rubrum_ND2 rev AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
paracorallium_japonicum_ND2 rev AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
heliopora_coerulea_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 1108
stylatula_elongata_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 1117
renilla_muelleri_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 1090
calicogorgia_granulosa_ND2 AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA 892
Consensus AGGAATTCCTCTTTAATTTGGGTTTTAAGTAAAGGTTATATTATCTTAGCAGCTGTTGGTCAAGGCTACTATCTTAGCGCTTTAA
Conservation

1,120 1,140 1,160 1,180 1,200
alcyonium_digitatum_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 1194
primnoa_resedaeiformis_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 1194
sinularia_peculiaris_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 1194
narella_hawaiiensis_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
paraminabea_aldersladei_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
scleronephthya_gracillimum_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 888
dendronephthya_castanea_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
dendronephthya_gigantea_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 861
dendronephthya_mollis_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
dendronephthya_suensoni_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
junceella_fragilis_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 942
keratoisidinae_ND2 rev TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 1158
echinogorgia_complexa_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
euplexaura_crassa_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
pseudopterogorgia_bipinnata_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 915
acanella_eburnea_ND2 rev TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 1161
sibagorgia_cauliflora_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
briareum_asbestinum_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
corallium_elatius_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
corallium_konojoi_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
corallium_rubrum_ND2 rev TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
paracorallium_japonicum_ND2 rev TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
heliopora_coerulea_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 1194
stylatula_elongata_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 1203
renilla_muelleri_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 1176
calicogorgia_granulosa_ND2 TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA 978
Consensus TAGCTTTAGTCTGTTCCGATAGCTGGAGTTTATACCTTAGATTAGTAAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTAAGTAAAATTA
Conservation

1,220 1,240 1,260 1,280
alcyonium_digitatum_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AGCATCGGAGGAAACGGGTTTAGGCAAGGCAATATAA 1260
primnoa_resedaeiformis_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGGTAAAGCATCGGAGAAACGGGTTTAGGCAAGGCAATATAA 1272
sinularia_peculiaris_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGGTAGCGTAGCACCGGAGGAAACGGGTTTAGGCAAGGCAATATAA 1272
narella_hawaiiensis_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AGCAGGTTTAGGCAAGGCAATATAA 1038
paraminabea_aldersladei_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AAACAGGTTTAGGCAAGGCAATATAA 1038
scleronephthya_gracillimum_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AAACAGGTTTAGGCAAGGCAATATAA 888
dendronephthya_castanea_ND2 GTAAT - AACAAAGATACTAAAT - - - - - TCTCCAGTGGAGCGTAGCACCGGAGGAAACGGGTTTAGGCAAGGCAATATAA 1056
dendronephthya_gigantea_ND2 GTAAT - AACAAAGATACTAAAT - - - - - TCTCCAGTGGAGCGTAGCACCGGAGGAAACGGGTTTAGGCAAGGCAATATAA 939
dendronephthya_mollis_ND2 GTAAT - AACAAAGATACTAAAT - - - - - TCTCCAGTGGAGCGTAGCACCGGAGGAAACGGGTTTAGGCAAGGCAATATAA 1056
dendronephthya_suensoni_ND2 GTAAT - AACAAAGATACTAAAT - - - - - TCTCCAGTGGAGCGTAGCACCGGAGGAAACGGGTTTAGGCAAGGCAATATAA 1056
junceella_fragilis_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGGTAGCGTAGCATCGAAGGAGACGGGTTTAGGCAAGGCAATATAA 1020
keratoisidinae_ND2 rev GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AGCAGGTTTAGGCAAGGCAATATAA 1218
echinogorgia_complexa_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AGCACGTTTAGGCAAGGCAATATAA 1050
euplexaura_crassa_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGGAGCGTAGCACCGGAGGAAACGGGTTTAGGCAAGGCAATATAA 1056
pseudopterogorgia_bipinnata_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGGAGCGTAGCACCGGAGAAACGGGTTTAGGCAAGGCAATATAA 993
acanella_eburnea_ND2 rev GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AGCAGGTTTAGGCAAGGCAATATAA 1221
sibagorgia_cauliflora_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AAACAGGTTTAGGCAAGGCAATATAA 1038
briareum_asbestinum_ND2 GTAAT - AACAAATATACTAAATATAACCGCTCTAACAGGGGGCTAGTA - CGGGTTTTGTGGGCAAGGCAATATAA 1062
corallium_elatius_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AAACAGGTTTAGGCAAGGCAATATAA 1038
corallium_konojoi_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AAACAGGTTTAGGCAAGGCAATATAA 1038
corallium_rubrum_ND2 rev GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AAACAGGTTTAGGCAAGGCAATATAA 1038
paracorallium_japonicum_ND2 rev GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AAACAGGTTTAGGCAAGGCAATATAA 1038
heliopora_coerulea_ND2 GTAAT - AGCAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - AGCGGGTTTTGGGAAAGGCAATATAA 1254
stylatula_elongata_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTAGTACGTTAGCATCGAAGGAGAAAGTTTAGGCAAGGCAATATAA 1281
renilla_muelleri_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTAAACGTTAGCATTAAGGAAACAGGTTTAGGCAAGGCAATATAA 1254
calicogorgia_granulosa_ND2 GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTAGTAGCTAGTAAAGGAGCAAGGTTTAGGCAAGGCAATATAA 1056
Consensus GTAAT - AACAAATATACTAAAT - - - - - TCTCCAGTGG - - - - - TAGCA - CGGAGGAAACGGGTTTAGGCAAGGCAATATAA
Conservation

1,300 1,320 1,340 1,360
alcyonium_digitatum_ND2 GGGGCAAGCTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATATTTTAGATTTAT 1346
primnoa_resedaeiformis_ND2 GGGGCAAGCTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATATTTTAGATTTAT 1358
sinularia_peculiaris_ND2 GGGGCAAGCTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATATTTTAGATTTAT 1358
narella_hawaiiensis_ND2 GGGGCAAGCTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATATTTTAGATTTAT 1124
paraminabea_aldersladei_ND2 GGGGCAAGCTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATATTTTAGATTTAT 1124
scleronephthya_gracillimum_ND2 GGGGCAAGCTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATATTTTAGATTTAT 888
dendronephthya_castanea_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTAATTATTTAGATTTAT 1142
dendronephthya_gigantea_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTAATTATTTAGATTTAT 1025
dendronephthya_mollis_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTAATTATTTAGATTTAT 1142
dendronephthya_suensoni_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTAATTATTTAGATTTAT 1142
junceella_fragilis_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1106
keratoisidinae_ND2 rev GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1304
echinogorgia_complexa_ND2 GGGGCAAGCTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTAATTATTTAGATTTAT 1136
euplexaura_crassa_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1142
pseudopterogorgia_bipinnata_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1079
acanella_eburnea_ND2 rev GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1307
sibagorgia_cauliflora_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1124
briareum_asbestinum_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1148
corallium_elatius_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1124
corallium_konojoi_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1124
corallium_rubrum_ND2 rev GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1124
paracorallium_japonicum_ND2 rev GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1124
heliopora_coerulea_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1340
stylatula_elongata_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1367
renilla_muelleri_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1340
calicogorgia_granulosa_ND2 GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT 1142
Consensus GGGGCAAGTTTATATTTAGTATTAACAATATAGATATGTCCTAGTTTGTCTTTTCAGTAAACACATTTGATTTTAGATTTAT
Conservation

alcyonium_digitatum_ND2	CCCATGTATCTTCTAG	1362
primnoa_resedaeiformis_ND2	CCCATGTATCTTCTAG	1374
sinularia_peculiaris_ND2	CCCATGTATCTTCTAG	1374
narella_hawaiiensis_ND2	TTCCATGTATCTTCTAG	1140
paraminabea_aldersladei_ND2	TTCCATGTATCTTCTAG	1140
scleronephthya_gracillimum_ND2	TTCCATGTATCTTCTAG	888
dendronephthya_castanea_ND2	CCCATGTATCTTCTAG	1158
dendronephthya_gigantea_ND2	CCCATGTATCTTCTAG	1039
dendronephthya_mollis_ND2	CCCATGTATCTTCTAG	1158
dendronephthya_suensoni_ND2	CCCATGTATCTTCTAG	1158
junceella_fragilis_ND2	TTCCATGTATCTTCTAG	1122
keratoisidinae_ND2_rev	TTCCATGTATCTTCTAG	1320
echinogorgia_complexa_ND2	CCCATGTATCTTCTAG	1152
euplexaura_crassa_ND2	CCCATGTATCTTCTAG	1158
pseudopterogorgia_bipinnata_ND2	CCCATGTATCTTCTAG	1093
acanella_eburnea_ND2_rev	TTCCATGTATCTTCTAG	1322
sibogorgia_cauliflora_ND2	TTCCATGTATCTTCTAG	1140
briareum_asbestinum_ND2	TTCCATGTATCTTCTAG	1164
corallium_elatus_ND2	TTCCATGTATCTTCTAG	1140
corallium_konojoi_ND2	TTCCATGTATCTTCTAG	1140
corallium_rubrum_ND2_rev	TTCCATGTATCTTCTAG	1140
paracorallium_japonicum_ND2_rev	TTCCATGTATCTTCTAG	1140
heliopora_coerulea_ND2	TTCCATGTATCTTCTAG	1356
stylatula_elongata_ND2	TTCCATGTATCTTCTAG	1356
renilla_muelleri_ND2	TTCCATGTATCTTCTAG	1356
calicogorgia_granulosa_ND2	CCCATGTATCTTCTAG	1158
Consensus	CCCATGTATCTTCTAG	
Conservation		

Nd3 gene

alcyonium_digitatum_nd3	ATGGAGAGGAATATGGAGTTCAAAGGAATACTAATACTACTTATCGTTAGCGGACATTATCAATTTAATTTTAGGGGCATCTTAT	87
primnoa_resedaeiformis_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
sinularia_peculiaris_nd3	ATGGAG-----TTAAAGGAATACTAATACTACTTATCGTAGCGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
narella_hawaiiensis_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
paraminabea_aldersladei_nd3_rev	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
scleronephthya_gracillimum_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
dendronephthya_castanea_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
dendronephthya_mollis_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
dendronephthya_suensoni_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
dendronephthya_gigantea_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
junceella_fragilis_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
keratoisidinae_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
echinogorgia_complexa_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
euplexaura_crassa_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
pseudopterogorgia_bipinnata_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
sibogorgia_cauliflora_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
acanella_eburnea_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
briareum_asbestinum_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
corallium_elatus_nd3_rev	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
corallium_konojoi_nd3_rev	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
corallium_rubrum_nd3_rev	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
paracorallium_japonicum_nd3_rev	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
heliopora_coerulea_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
stylatula_elongata_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
renilla_muelleri_nd3	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	75
Consensus	ATGGAG-----TTCAAAGGAATACTAATACTACTTATCGTTAGCGGGACATTATCAATTTAATTTTAGGGGCATCTTAT	
Conservation		
alcyonium_digitatum_nd3	CTATTAGGATATAAAACAACCTGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	174
primnoa_resedaeiformis_nd3	CTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
sinularia_peculiaris_nd3	TTATTAGGATATAAAACAACCTGATATGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
narella_hawaiiensis_nd3	CTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
paraminabea_aldersladei_nd3_rev	CTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
scleronephthya_gracillimum_nd3	CTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
dendronephthya_castanea_nd3	CTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
dendronephthya_mollis_nd3	CTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
dendronephthya_suensoni_nd3	CTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
dendronephthya_gigantea_nd3	CTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
junceella_fragilis_nd3	CTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
keratoisidinae_nd3	CTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
echinogorgia_complexa_nd3	TTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
euplexaura_crassa_nd3	CTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
pseudopterogorgia_bipinnata_nd3	CTATTAGGATATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
sibogorgia_cauliflora_nd3	CTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
acanella_eburnea_nd3	CTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
briareum_asbestinum_nd3	CTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
corallium_elatus_nd3_rev	CTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
corallium_konojoi_nd3_rev	CTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
corallium_rubrum_nd3_rev	CTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
paracorallium_japonicum_nd3_rev	CTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
heliopora_coerulea_nd3	TTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
stylatula_elongata_nd3	TTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
renilla_muelleri_nd3	TTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	162
Consensus	CTATTAGGAAATAAAACAACCCGATATGGAAAAAGGTGTCAGTCTATGAGTGTGGGTTTGATCCTTTTGAT AAC CCGGGGAATCCCTTC	
Conservation		

	180	200	220	240	260
alcyonium_digitatum_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	261
primnoa_resedaeformis_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
sinularia_peculiaris_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
narella_hawaiiensis_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
paraminabea_aldersladei_nd3_rev	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
scleronephthya_gracillimum_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
dendronephthya_castanea_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
dendronephthya_mollis_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
dendronephthya_suensoni_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
dendronephthya_gigantea_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
junceella_fragilis_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
keratoisidinae_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
echinogorgia_complexa_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
euplexaura_crassa_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
pseudopterogorgia_bipinnata_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
sibogagorgia_cauliflora_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
acanella_eburnea_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
briareum_asbestinum_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
corallium_elatus_nd3_rev	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
corallium_konojoi_nd3_rev	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
corallium_rubrum_nd3_rev	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
paracorallium_japonicum_nd3_rev	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
heliopora_coerulea_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
stylatula_elongata_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
renilla_muelleri_nd3	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
Consensus	TCCGTTAGATTTCTTAAATGGATCTTGT	TTTTTAAATTTTGATCTTGAAATATCTTT	TTATTTCCCTGGGCTGTG	ACATATATG	249
Conservation					

	280	300	320	340	360
alcyonium_digitatum_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	348			
primnoa_resedaeformis_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
sinularia_peculiaris_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
narella_hawaiiensis_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
paraminabea_aldersladei_nd3_rev	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
scleronephthya_gracillimum_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
dendronephthya_castanea_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
dendronephthya_mollis_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
dendronephthya_suensoni_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
dendronephthya_gigantea_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
junceella_fragilis_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
keratoisidinae_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
echinogorgia_complexa_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
euplexaura_crassa_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
pseudopterogorgia_bipinnata_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
sibogagorgia_cauliflora_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
acanella_eburnea_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
briareum_asbestinum_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
corallium_elatus_nd3_rev	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
corallium_konojoi_nd3_rev	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
corallium_rubrum_nd3_rev	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
paracorallium_japonicum_nd3_rev	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
heliopora_coerulea_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
stylatula_elongata_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
renilla_muelleri_nd3	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
Consensus	GGCTTACCTTTATTTGGATATGGGTTGTTATGTTATTTTATTTATCTTAACTTTAGGGTTAATTTATGAGTGGATAGAAAGGAGGC	336			
Conservation					

350

alcyonium_digitatum_nd3	TTAGAGTGGGAAAAC TAG C	367
primnoa_resedaeformis_nd3	TTAGAGTGGGAAAAC TAG -	354
sinularia_peculiaris_nd3	TTAGAGTGGGAAAAC TAG -	354
narella_hawaiiensis_nd3	TTAGAA TGGGAAAAGCTAG -	354
paraminabea_aldersladei_nd3_rev	TTAGAGTGGGAAAGGCTAG -	354
scleronephthya_gracillimum_nd3	TTAGAGTGGGAAAAC TAG -	354
dendronephthya_castanea_nd3	TTAGAGTGGGAAAAC TAG -	354
dendronephthya_mollis_nd3	TTAGAGTGGGAAAAC TAG -	354
dendronephthya_suensoni_nd3	TTAGAGTGGGAAAAC TAG -	354
dendronephthya_gigantea_nd3	TTAGAGTGGGAAAAC TAG -	354
junceella_fragilis_nd3	TTAGAA TGGGAAAAT TAA -	354
keratoisidinae_nd3	TTAGAA TGGGGAAGCTAG -	348
echinogorgia_complexa_nd3	TTAGAGTGGGAAAAC TAG -	354
euplexaura_crassa_nd3	TTAGAGTGGGAAAAC TAG -	354
pseudopterogorgia_bipinnata_nd3	TTAGAGTGGGAGAACTAG -	354
sibogagorgia_cauliflora_nd3	TTAGAGTGGGAGGGCTAG -	354
acanella_eburnea_nd3	TTAGAA TGGGAAAAGCTAG -	348
briareum_asbestinum_nd3	TTAGAGTGGGAGAACTAG -	354
corallium_elatus_nd3_rev	TTAGAGTGGGAGGGCTAG -	354
corallium_konojoi_nd3_rev	TTAGAGTGGGAGGGCTAG -	354
corallium_rubrum_nd3_rev	TTAGAGTGGGAGGGCTAG -	354
paracorallium_japonicum_nd3_rev	TTAGAGTGGGAGGGCTAG -	354
heliopora_coerulea_nd3	TTAGAA TGGGAAAAC TAA -	354
stylatula_elongata_nd3	TTAGAGTGGGAAAAT TAA -	354
renilla_muelleri_nd3	TTAGAA TGGGAAAAT TAA -	354
Consensus	TTAGAGTGGGAAAAC TAG -	
Conservation		

	180	200	220	240	260	
alcyonium_digitatum_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
primnoa_resedaeiformis_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
sinularia_peculiaris_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
narella_hawaiiensis_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
paraminabea_alderladei_nD4L_rev	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
scleronephthya_gracillimum_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
dendronephthya_castanea_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
dendronephthya_gigantea_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
dendronephthya_mollis_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
dendronephthya_suensoni_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
junceella_fragilis_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
keratoisidinae_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
echinogorgia_complexa_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
euplexaura_crassa_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
pseudopteroergorgia_bipinnata_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
acanella_eburnea_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
sibogorgia_cauliflora_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
briareum_asbestinum_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
corallium_elatus_nD4L_rev	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
corallium_konojoi_nD4L_rev	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
corallium_rubrum_nD4L_rev	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
paracorallium_japonicum_nD4L_rev	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
heliopora_coerulea_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
stylatula_elongata_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
renilla_muelleri_nD4L	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
Consensus	GCGATTG	TGATTCTAAC	TGTCGACGTCGCCAGT	TGCTATCGGT	TTAGCCATTATGGTTAACTATTAACCGTTTACGTGGTACAATT	261
Conservation						

	280	
alcyonium_digitatum_nD4L	GCTGTT	CGAGCC
primnoa_resedaeiformis_nD4L	GCTGTT	CGAGCC
sinularia_peculiaris_nD4L	GCTGTT	CGAGCC
narella_hawaiiensis_nD4L	GCTGTT	CGAGCC
paraminabea_alderladei_nD4L_rev	GCTGTT	CGAGCC
scleronephthya_gracillimum_nD4L	GCTGTT	CGAGCC
dendronephthya_castanea_nD4L	GCTGTT	CGAGCC
dendronephthya_gigantea_nD4L	GCTGTT	CGAGCC
dendronephthya_mollis_nD4L	GCTGTT	CGAGCC
dendronephthya_suensoni_nD4L	GCTGTT	CGAGCC
junceella_fragilis_nD4L	GCTGTT	CGAGCC
keratoisidinae_nD4L	GCTGTT	CGAGCC
echinogorgia_complexa_nD4L	GCTGTT	CGAGCC
euplexaura_crassa_nD4L	GCTGTT	CGAGCC
pseudopteroergorgia_bipinnata_nD4L	GCTGTT	CGAGCC
acanella_eburnea_nD4L	GCTGTT	CGAGCC
sibogorgia_cauliflora_nD4L	GCTGTT	CGAGCC
briareum_asbestinum_nD4L	GCTGTT	CGAGCC
corallium_elatus_nD4L_rev	GCTGTT	CGAGCC
corallium_konojoi_nD4L_rev	GCTGTT	CGAGCC
corallium_rubrum_nD4L_rev	GCTGTT	CGAGCC
paracorallium_japonicum_nD4L_rev	GCTGTT	CGAGCC
heliopora_coerulea_nD4L	GCTGTT	CGAGCC
stylatula_elongata_nD4L	GCTGTT	CGAGCC
renilla_muelleri_nD4L	GCTGTT	CGAGCC
Consensus	GCTGTT	CGAGCC
Conservation		

Nd5 gene

	20	40	60	80
alcyonium_digitatum_nD5	ATG	TAT	TAA	TAA
primnoa_resedaeiformis_nD5	ATG	TAT	TAA	TAA
sinularia_peculiaris_nD5	ATG	TAT	TAA	TAA
narella_hawaiiensis_nD5	ATG	TAT	TAA	TAA
paraminabea_alderladei_nD5	ATG	TAT	TAA	TAA
scleronephthya_gracillimum_nD5	ATG	TAT	TAA	TAA
dendronephthya_castanea_nD5	ATG	TAT	TAA	TAA
dendronephthya_gigantea_nD5	ATG	TAT	TAA	TAA
dendronephthya_mollis_nD5	ATG	TAT	TAA	TAA
dendronephthya_suensoni_nD5	ATG	TAT	TAA	TAA
junceella_fragilis_nD5	ATG	TAT	TAA	TAA
keratoisidinae_nD5_rev	ATG	TAT	TAA	TAA
echinogorgia_complexa_nD5	ATG	TAT	TAA	TAA
euplexaura_crassa_nD5	ATG	TAT	TAA	TAA
pseudopteroergorgia_bipinnata_nD5	ATG	TAT	TAA	TAA
acanella_eburnea_nD5_rev	ATG	TAT	TAA	TAA
sibogorgia_cauliflora_nD5	ATG	TAT	TAA	TAA
briareum_asbestinum_nD5	ATG	TAT	TAA	TAA
corallium_elatus_nD5	ATG	TAT	TAA	TAA
corallium_konojoi_nD5	ATG	TAT	TAA	TAA
corallium_rubrum_nD5_rev	ATG	TAT	TAA	TAA
paracorallium_japonicum_nD5_rev	ATG	TAT	TAA	TAA
heliopora_coerulea_nD5	ATG	TAT	TAA	TAA
stylatula_elongata_nD5	ATG	TAT	TAA	TAA
renilla_muelleri_nD5	ATG	TAT	TAA	TAA
Consensus	ATG	TAT	TAA	TAA
Conservation				

	100	120	140	160
alcyonium_digitatum_nD5	CTTG	TAA	AG	TT
primnoa_resedaeiformis_nD5	CTTG	TAA	AG	TT
sinularia_peculiaris_nD5	CTTG	TAA	AG	TT
narella_hawaiiensis_nD5	CTTG	TAA	AG	TT
paraminabea_alderladei_nD5	CTTG	TAA	AG	TT
scleronephthya_gracillimum_nD5	CTTG	TAA	AG	TT
dendronephthya_castanea_nD5	CTTG	TAA	AG	TT
dendronephthya_gigantea_nD5	CTTG	TAA	AG	TT
dendronephthya_mollis_nD5	CTTG	TAA	AG	TT
dendronephthya_suensoni_nD5	CTTG	TAA	AG	TT
junceella_fragilis_nD5	CTTG	TAA	AG	TT
keratoisidinae_nD5_rev	CTTG	TAA	AG	TT
echinogorgia_complexa_nD5	CTTG	TAA	AG	TT
euplexaura_crassa_nD5	CTTG	TAA	AG	TT
pseudopteroergorgia_bipinnata_nD5	CTTG	TAA	AG	TT
acanella_eburnea_nD5_rev	CTTG	TAA	AG	TT
sibogorgia_cauliflora_nD5	CTTG	TAA	AG	TT
briareum_asbestinum_nD5	CTTG	TAA	AG	TT
corallium_elatus_nD5	CTTG	TAA	AG	TT
corallium_konojoi_nD5	CTTG	TAA	AG	TT
corallium_rubrum_nD5_rev	CTTG	TAA	AG	TT
paracorallium_japonicum_nD5_rev	CTTG	TAA	AG	TT
heliopora_coerulea_nD5	CTTG	TAA	AG	TT
stylatula_elongata_nD5	CTTG	TAA	AG	TT
renilla_muelleri_nD5	CTTG	TAA	AG	TT
Consensus	CTTG	TAA	AG	TT
Conservation				

alcyonium_digitatum_nd5	TTAG	1818
primnoa_resedaeformis_nd5	TTAG	1818
sinularia_peculiaris_nd5	TTA	1818
narella_hawaiinensis_nd5	TTAG	1872
paraminabea_alderladei_nd5	TTAG	1818
scleronephthya_gracillimum_nd5	TTAG	1818
dendronephthya_castanea_nd5	TTAG	1818
dendronephthya_gigantea_nd5	TTAG	1818
dendronephthya_mollis_nd5	TTAG	1818
dendronephthya_suensoni_nd5	TTAG	1818
junceella_fragilis_nd5	CTAG	1818
keratoisidinae_nd5_rev	TTAG	1812
echinogorgia_complexa_nd5	TTA	1818
euplexaura_crassa_nd5	TTAG	1818
pseudopterogorgia_bipinnata_nd5	TTAG	1818
acanella_eburnea_nd5_rev	TTAG	1812
sibogagorgia cauliflora_nd5	TTAG	1842
briareum_asbestinum_nd5	TTA	1818
corallium_elatius_nd5	TTAG	1818
corallium_konojoi_nd5	TTAG	1818
corallium_rubrum_nd5_rev	TTAG	1818
paracorallium_japonicum_nd5_rev	TTAG	1818
heliopora_coerulea_nd5	TTAG	1818
stylatula_elongata_nd5	TTAG	1818
renilla_muelleri_nd5	CTAG	1818
Consensus	TTAG	
Conservation		

Nd6 gene

		20	40	60	80
alcyonium_digitatum_nd6	ATGAATA	ATCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTAC	CCGAATCCTGTTTATTCAGTA	87	
primnoa_resedaeformis_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTAC	CCGAATCCTGTTTATTCAGTA	87		
sinularia_peculiaris_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGT	CATATCTACGCCGAATCCTGTTTATTCAGTA	87		
narella_hawaiinensis_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
paraminabea_alderladei_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	72			
scleronephthya_gracillimum_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
dendronephthya_castanea_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
dendronephthya_gigantea_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
dendronephthya_mollis_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
dendronephthya_suensoni_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
junceella_fragilis_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
keratoisidinae_nd6	ATGATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
echinogorgia_complexa_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
euplexaura_crassa_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
pseudopterogorgia_bipinnata_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
acanella_eburnea_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
sibogagorgia cauliflora_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
briareum_asbestinum_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
corallium_elatius_nd6_rev	GTGAATAGCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
corallium_konojoi_nd6_rev	GTGAATAGCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
corallium_rubrum_nd6_rev	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
paracorallium_japonicum_nd6_rev	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
heliopora_coerulea_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
stylatula_elongata_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
renilla_muelleri_nd6	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA	87			
Consensus	ATGAATAGTCTATTTATGATATTCCTTAGGAATAGTTGGAGCTAGTCTTATGGTTATATCTACGCCGAATCCTGTTTATTCAGTA				
Conservation					

		100	120	140	160
alcyonium_digitatum_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
primnoa_resedaeformis_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
sinularia_peculiaris_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
narella_hawaiinensis_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCA	TTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174	
paraminabea_alderladei_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCA	TTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	159	
scleronephthya_gracillimum_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
dendronephthya_castanea_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
dendronephthya_gigantea_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
dendronephthya_mollis_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
dendronephthya_suensoni_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
junceella_fragilis_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCA	TTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174	
keratoisidinae_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCA	TTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174	
echinogorgia_complexa_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
euplexaura_crassa_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
pseudopterogorgia_bipinnata_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
acanella_eburnea_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCA	TTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174	
sibogagorgia cauliflora_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
briareum_asbestinum_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCA	TTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174	
corallium_elatius_nd6_rev	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
corallium_konojoi_nd6_rev	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
corallium_rubrum_nd6_rev	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
paracorallium_japonicum_nd6_rev	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
heliopora_coerulea_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
stylatula_elongata_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
renilla_muelleri_nd6	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC	174		
Consensus	TTCTGGTTAGTTAT	GCCTTTGTTAATGCTGCTGTTATGTTTATATCGTTGGGATTAGACTATATAGGCTTAATATTTATAAATTGTC			
Conservation					


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          440          460          480          500          520
alcyonium_digitatum_nd6 CTACTAGTCGCTATGATAGGGGCTATATTATTAGCTAAGCAGCCAAATTCACCTTTTATATAAATCCCATGGTGAATCAATACGT 513
primnoa_resedaeformis_nd6 CTACTAGTCGCTATGATAGGGGCTATATTATTAGCTAAGCAGCCAAATTCACCTTTTATATAAATCCCATAGTGAATCAATACGT 513
sinularia_peculiaris_nd6 CTACTAGTCGCTATGATAGGGGCTATATTATTAGCTAAGCAGCCAAATTCACCTTTTATATAAATCCCATGGTGAATCAATACGT 513
narella_hawaiiensis_nd6 CTACTAGTCGCCATGGTGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGG 519
paraminabea_alderladei_nd6 CTACTAGTAGCCATGGTGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--GACGT 504
scleronephthya_gracillimum_nd6 CTACTAGTAGCTATGATAGGGGCTATATTATTAGCTAAGCAGCCAAATTCACCTTTTATATAAATCCCATGGTGAATCAATACGT 513
dendronephthya_castanea_nd6 TTACTAGTAGCTATGATAGGGGCTATATTATTAGCTAAGCAGCCAAATTCACCTTTTGGTATAAATTCATGGTGAATCAATACGT 513
dendronephthya_gigantea_nd6 TTACTAGTAGCTATGATAGGGGCTATATTATTAGCTAAGCAGCCAAATTCACCTTTTGGTATAAATTCATGGTGAATCAATACGT 513
dendronephthya_mollis_nd6 TTACTAGTAGCTATGATAGGGGCTATATTATTAGCTAAGCAGCCAAATTCACCTTTTGGTATAAATTCATGGTGAATCAATACGT 513
dendronephthya_suensoni_nd6 TTACTAGTAGCTATGATAGGGGCTATATTATTAGCTAAGCAGCCAAATTCACCTTTTGGTATAAATTCATGGTGAATCAATACGT 513
junceella_fragilis_nd6 CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT 510
keratoisidinae_nd6 CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT 510
echinogorgia_complexa_nd6 CTACTAGTCGCTATGATAGGGGCTATATTATTAGCTAAGCAGCCAAATTCACCTTTTATATAAATCCCATGGTGAATCAATACGT 513
euplexaura_crassa_nd6 CTACTAGTCGCTATGATAGGGGCTATATTATTAGCTAAGCAGCCAAATTCACCTTCTTTATATAAATCCCATGGTGAATCAATACGT 513
pseudopterogorgia_bipinnata_nd6 CTACTAGTCGCTATGATAGGGGCTATATTATTAGCTAAGCAGCCAAATTCACCTTTTATATAAATCCCATGGTGAATCAATACGT 513
acanella_eburnea_nd6 CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT 510
sibogagorgia_cauliflora_nd6 CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT 510
briareum_asbestinum_nd6 CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT 510
corallium_elatius_nd6_rev CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT 510
corallium_konojoi_nd6_rev CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT 510
paracorallium_japonicum_nd6_rev CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT 510
heliopora_coerulea_nd6 CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT 510
stylatula_elongata_nd6 CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT 510
renilla_muelleri_nd6 CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT 510
Consensus CTACTAGTCGCCATGGTAGGGGCTATATTATTAGCTAAGCAGCCAAATACACCTTCTTTATATAAATCCCAAGTAGAGA--TACGT
Conservation

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          540          560
alcyonium_digitatum_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 558
primnoa_resedaeformis_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 558
sinularia_peculiaris_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 558
narella_hawaiiensis_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 564
paraminabea_alderladei_nd6 AGTAGGCCAAGATCTCTTCTTCTGCAAAATCAGCAGAGAGCACCCTTTAG 549
scleronephthya_gracillimum_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 558
dendronephthya_castanea_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 558
dendronephthya_gigantea_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 558
dendronephthya_mollis_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 558
dendronephthya_suensoni_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 558
junceella_fragilis_nd6 GGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 555
keratoisidinae_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 552
echinogorgia_complexa_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 558
euplexaura_crassa_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 558
pseudopterogorgia_bipinnata_nd6 AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG 558
acanella_eburnea_nd6 AGTAGGCCAAGATCTCTTCTTCTGCAAAATCAGCAGAGAGCACCCTTTAG 555
sibogagorgia_cauliflora_nd6 AGTAGGCCAAGATCTCTTCTTCTGCAAAATCAGCAGAGAGCACCCTTTAG 555
briareum_asbestinum_nd6 AGTAGGCCAAGATCTCTTCTTCTGCAAAATCAGCAGAGAGCACCCTTTAG 555
corallium_elatius_nd6_rev AGTAGGCCAAGATCTCTTCTTCTGCAAAATCAGCAGAGAGCACCCTTTAG 555
corallium_konojoi_nd6_rev AGTAGGCCAAGATCTCTTCTTCTGCAAAATCAGCAGAGAGCACCCTTTAG 555
paracorallium_japonicum_nd6_rev AGTAGGCCAAGATCTCTTCTTCTGCAAAATCAGCAGAGAGCACCCTTTAG 555
heliopora_coerulea_nd6 AGTAGGCCAAGATCTCTTCTTCTGCAAAATCAGCAGAGAGCACCCTTTAG 558
stylatula_elongata_nd6 AGTAGGCCAAGATCTCTTCTTCTGCAAAATCAGCAGAGAGCACCCTTTAG 555
renilla_muelleri_nd6 AGTAGGCCAAGATCTCTTCTTCTGCAAAATCAGCAGAGAGCACCCTTTAG 555
Consensus AGTAGGCCAAGATCTCTTCTTCTACAAATCAGCAGAGAGCACCCTTTAG
Conservation

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MutS gene

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          20          40          60          80
alcyonium_digitatum_mutS ATGAA-----CAGATCCCTATGCAATATTTCAACTTACGGGAGGAGAATTATTC 50
primnoa_resedaeformis_mutS ATGAA-----CCAGATCCCTATGCAATATTTCAACTTACGGGAGGAGAATTATTC 50
sinularia_peculiaris_mutS ATGAA-----TCAGATACCTATGCAATATTTTAACTTACGGGAGGAGAATTATTC 50
narella_hawaiiensis_mutS ATG-----CAGTATTTCAACTTAAATGGAGGAGAATTATTC 35
paraminabea_alderladei_mutS GTGAA-----CCAAGTACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
scleronephthya_gracillimum_mutS ATGAG-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
dendronephthya_castanea_mutS ATGAG-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
dendronephthya_gigantea_mutS ATGAG-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
dendronephthya_mollis_mutS ATGAG-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
dendronephthya_suensoni_mutS ATGAG-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
junceella_fragilis_mutS ATGA-----CCAAGTACCTGTGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
keratoisidinae_mutS_rev ATGGGAACCTT---CGCTCTGTATAATGCCCTTAGCAAGGGCCAAATACCTGTACAGTATTTTAACTTAAATGGAGGAGAATTATTC 83
echinogorgia_complexa_mutS ATGAA-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
euplexaura_crassa_mutS ATGAA-----CCAGATACCTATGCAATATTTTCAACTTAAATGGAGGAGAATTATTC 50
briareum_asbestinum_mutS ATGAG-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
pseudopterogorgia_bipinnata_mutS ATGAA-----CCAGATACCTGTGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
acanella_eburnea_mutS_rev ATGGGAACCTTATTCGCTCTGTAC---GCCCTTGCAAGGGCCAAATACCTGTACAGTATTTTAACTTAAATGGAGGAGAATTATTC 83
sibogagorgia_cauliflora_mutS ATGAG-----CCAAATACCTGTGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
corallium_elatius_mutS ATGAG-----CCAGGTACCTATGCAATATTTTCAACTTAAATGGAGGAGAATTATTC 50
corallium_konojoi_mutS ATGAG-----CCAGGTACCTATGCAATATTTTCAACTTAAATGGAGGAGAATTATTC 50
corallium_rubrum_mutS ATGAG-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
paracorallium_japonicum_mutS ATGAG-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
heliopora_coerulea_mutS ATG-----CAGTATTTTAACTTAAATGGAGGAGAATTATTC 35
stylatula_elongata_mutS ATGAG-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
renilla_muelleri_mutS ATGAG-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC 50
Consensus ATGAG-----CCAAATACCTATGCAATATTTTAACTTAAATGGAGGAGAATTATTC
Conservation

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Sequence alignment for region 100-160. Species include *alcyonium digitatum*, *primnoa resedaeformis*, *sinularia peculiaris*, *narella hawaiiensis*, *paraminabea aldersladei*, *scleronephthya gracillimum*, *dendronephthya castanea*, *dendronephthya gigantea*, *dendronephthya mollis*, *dendronephthya suensoni*, *junceella fragilis*, *keratoisidinae*, *echinogorgia complexa*, *euplexaura crassa*, *briareum asbestinum*, *pseudopterogorgia bipinnata*, *acanella eburnea*, *sibagogorgia cauliflora*, *corallium elatius*, *corallium konojoi*, *corallium rubrum*, *paracorallium japonicum*, *heliopora coerulea*, *stylatula elongata*, *renilla muelleri*. Consensus and Conservation are shown below the alignment.

Sequence alignment for region 180-240. Species list continues. Consensus and Conservation are shown below the alignment.

Sequence alignment for region 260-320. Species list continues. Consensus and Conservation are shown below the alignment.

Sequence alignment for region 360-420. Species list continues. Consensus and Conservation are shown below the alignment.

440 460 480 500
alcyonium_digitatum_muts GGCCAAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAGGACTGTTCC 435
primnoa_resedaeiformis_muts GGCCAAAACA-----ACGTCGAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAGGACTGTTCC 435
sinularia_peculiaris_muts GGCCAAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGGAATTTCA-----GAGAATGTTCC 435
narella_hawaiiensis_muts GGCCAAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAGACTGTTCC 438
paraminabea_aldersladei_muts GGCCAAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCGTTGGAATTTA-----GAGACTGTTCC 450
scleronephthya_gracillimum_muts GGCCAAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCGGTCAGTTGTAATTTA-----GAGACTGTTCC 438
dendronephthya_castanea_muts GACCAAAACA-----ACGCGCAGTGTCTCAGGTTCTACTCTCTCAGTTGTAATTTA-----GAGACTGTTCC 435
dendronephthya_gigantea_muts GACCAAAACA-----ACGCGCAGTGTCTCAGGTTCTACTCTCTCAGTTGTAATTTA-----GAGACTGTTCC 435
dendronephthya_mollis_muts GACCAAAACA-----ACGCGCAGTGTCTCAGGTTCTACTCTCTCAGTTGTAATTTA-----GAGACTGTTCC 435
dendronephthya_suensoni_muts GACCAAAACA-----ACGCGCAGTGTCTCAGGTTCTACTCTCTCAGTTGTAATTTA-----GAGACTGTTCC 435
junceella_fragilis_muts GGCCAAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAAGAATGTTCC 438
keratoisidinae_muts rev GGCTTAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAAGAATGTTCC 468
echinogorgia_complexa_muts GGCCAAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAGGACTGTTCC 435
euplexaura_crassa_muts GGCCAAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAGGACTGTTCC 435
briareum_asbestinum_muts GACCAAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA TCTCAGGAATTTA GAGGACTGTTCC 447
pseudotergorgia_bipinnata_muts GGCCAAAACA-----ACGCGCGGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAGGACTGTTCC 435
acanella_eburnea_muts rev GGCTTAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAAGAATGTTCC 468
sibagorgia_californica_muts GGCCAAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGGAATTTA-----GAGACTGTTCC 447
corallium_elatius_muts GGCCGAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCGATGGAATTTA-----GAGACTGTTCC 447
corallium_konojoi_muts GGCCGAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCGATGGAATTTA-----GAGACTGTTCC 447
corallium_rubrum_muts rev GGCCGAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCGATGGAATTTA-----GAGACTGTTCC 447
paracorallium_japonicum_muts rev GGCCGAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCGTTGGAATTTA-----GAGACTGTTCC 447
heliopora_coerulea_muts GACC TAAACA-----ACGTCGAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAGACTGTTCC 432
stylatula_elongata_muts GGCTTAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAGACTGTTCC 438
renilla_muelleri_muts GGCC TAAACAGCCAAACAACGCGCAGTATCTCAAAATTTATTCTCTCAGTTGTAATTTA-----GAAGAATGTTCC 447
Consensus GGCCAAAACA-----ACGCGCAGTATCTCAGGTTTATTCTCTCAGTTGTAATTTA-----GAGACTGTTCC
Conservation

520 540 560 580 600
alcyonium_digitatum_muts GAGTTATCCTATGGTTATCAATTTATTTTCTC-----AAGCAGCTTATTAGGTTATTCCTTATT 497
primnoa_resedaeiformis_muts GAGTTATCCTATGGTTATCAATTTATTTTCTC-----AAGCAGCTTACTAGGTATTACTTTATT 497
sinularia_peculiaris_muts GAATTTATCCTATGGTTATCAATTTATTTTCTC-----AAGCAGCTTACTAGGTATTACTTTATT 497
narella_hawaiiensis_muts GAATTTATCCTATGGTTATCAATTTATTTTCTC-----AAAGATGATTTACTAGGTATTACTTTATT 497
paraminabea_aldersladei_muts GAATTTGCTTATGTGATATCAATTTATTTT-----AAAGATGACTTACTAGGTATTACTTTATT 509
scleronephthya_gracillimum_muts GAATTTATCCTATGGTTATCAATTTATTTTCTC-----AAGCAGCTTATTAGGTATTACTTTATT 500
dendronephthya_castanea_muts GAGTTATCCTATGGTTATCAATTTATTTTCTC-----AAGCAGCTTATTAGGTATTACTTTATT 497
dendronephthya_gigantea_muts GAGTTATCCTATGGTTATCAATTTATTTTCTC-----AAGCAGCTTATTAGGTATTACTTTATT 497
dendronephthya_mollis_muts GAGTTATCCTATGGTTATCAATTTATTTTCTC-----AAGCAGCTTATTAGGTATTACTTTATT 497
dendronephthya_suensoni_muts GAGTTATCCTATGGTTATCAATTTATTTTCTC-----AAGCAGCTTATTAGGTATTACTTTATT 497
junceella_fragilis_muts GAATTTATCCTATGGTTATCAATTTATTTT-----AAAGATGACTTACTAGGTATTACTTTATT 497
keratoisidinae_muts rev GAA T TAT C C T A T G T G A T C A A T T A T T T T-----AAAGATGACTTACTAGGTATTACTTTATT 527
echinogorgia_complexa_muts GAA T T A G C C A T A T G T G T T A T C A T T T A T T T T C T C-----A A G G A A G A C T T A A T G G G A T T C C T T A T T 497
euplexaura_crassa_muts GAA T T A T C C C A T A T G T G T T A T C A T T T A T T T T-----A A G A A G A C T T A T T A G G T A T T A C T C T T 497
briareum_asbestinum_muts GAA T T G C C T A T A T G A T A T C A A T T A T T A T C C A T A G A C A G G A A A T C A G G A G A T A T T A A G A T A C T A C T T A T T 533
pseudotergorgia_bipinnata_muts GAA T T A G C C T A T G T A T A T C A A T T A T T A T T C C A T A G A C A G G A A A T C A G G A G A T A T T A A G A T A C T A C T T A T T 533
acanella_eburnea_muts rev GAA T T A T C C T A T G T G A T A T C A A T T A T T T C T C-----A A A G A T G A C T T A C T A G G T A T T A C T T A T T 527
sibagorgia_californica_muts GAGTTATCCTATGGTTATCAATTTATTTT-----AAAGATGACTTACTAGGTATTACTTTATT 506
corallium_elatius_muts GAATTTATCCTATGGTTATCAATTTATTTT-----GGAGATGACTTACTAGGTATTACTTTATT 506
corallium_konojoi_muts GAATTTATCCTATGGTTATCAATTTATTTT-----GGAGATGACTTACTAGGTATTACTTTATT 506
corallium_rubrum_muts rev GAATTTATCCTATGGTTATCAATTTATTTT-----AAAGATGACTTACTAGGTATTACTTTATT 506
paracorallium_japonicum_muts rev GAATTTATCCTATGGTTATCAATTTATTTT-----AAAGATGACTTACTAGGTATTACTTTATT 506
heliopora_coerulea_muts GAATTTATCCTATGGTTATCAATTTATTTT-----AAAGATGACTTACTAGGTATTACTTTATT 491
stylatula_elongata_muts GAATTTATCCTATGGTTATCAATTTATTTT-----AAAGATGACTTACTAGGTATTACTTTATT 497
renilla_muelleri_muts GAATTTATCCTATGGTTATCAATTTATTTT-----AAAGATGACTTACTAGGTATTACTTTATT 506
Consensus GAATTTATCCTATGGTTATCAATTTATTTT-----AAAGATGACTTACTAGGTATTACTTTATT
Conservation

620 640 660 680
alcyonium_digitatum_muts CTTCAGCCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
primnoa_resedaeiformis_muts TTTCAGTTATGAATGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
sinularia_peculiaris_muts TTTCAGCATGAATGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
narella_hawaiiensis_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
paraminabea_aldersladei_muts TTTCAGCATGAATGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
scleronephthya_gracillimum_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 586
dendronephthya_castanea_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
dendronephthya_gigantea_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
dendronephthya_mollis_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
dendronephthya_suensoni_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
junceella_fragilis_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
keratoisidinae_muts rev TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 613
echinogorgia_complexa_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
euplexaura_crassa_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
briareum_asbestinum_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 619
pseudotergorgia_bipinnata_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
acanella_eburnea_muts rev TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 613
sibagorgia_californica_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
corallium_elatius_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 592
corallium_konojoi_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 592
corallium_rubrum_muts rev TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 592
paracorallium_japonicum_muts rev TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 577
heliopora_coerulea_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 592
stylatula_elongata_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 583
renilla_muelleri_muts TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA 592
Consensus TTTCAGCATGAAGGGGCGATAGTATAATGTTTCTGCTCTTTGGCGGACAGGATAAGTAGCCGCTTATTAATCAGTTATCGTA
Conservation

700 720 740 760
alcyonium_digitatum_muts TTAGAGAAATAGTAAATTTGGGCAAACTC-----GGGGGCCGCTCTCAGAGATTTTAAATATAGTAAATATATAT 642
primnoa_resedaeiformis_muts TTAGAGAAATAGTAAATTTGGGCCAACTC-----GGGAGCCGGCTCAGAGATTTTAAATAAATATATATAT 651
sinularia_peculiaris_muts TTAGAGAAATAGTAAATTTGGGCGAATC-----GGGGGTTGGCTAATTAATTTAAATAAGATATATAAG 651
narella_hawaiiensis_muts TTAAAGAGGTAGTAAATTTGGGCGGACTC-----GGGGCCAACTCAGGGAT-----ACTAAATAAGATATATGG 648
paraminabea_aldersladei_muts TTAAAGAGGTAGTAAATTTGGGCGGACTC-----GGGCCCGAATTCAGGGAT-----ACTAAATAAGATATATGG 660
scleronephthya_gracillimum_muts TTAGAGAAATAGTAAATTTGGGTAAACTT-----GGAGCGTGGCTATATTTTTTAAATAAATATATAT 654
dendronephthya_castanea_muts TTAGAGAAATAGTAAATTTGGGTAAACTT-----GGGGTTGGCTTAGATATTTTAACAATAAATATATAT 651
dendronephthya_gigantea_muts TTAGAGAAATAGTAAATTTGGGTAAACTT-----GGGGTTGGCTTAGATATTTTAACAATAAATATATAT 651
dendronephthya_mollis_muts TTAGAGAAATAGTAAATTTGGGTAAACTT-----GGGGTTGGCTTAGATATTTTAACAATAAATATATAT 651
dendronephthya_suensoni_muts TTAGAGAAATAGTAAATTTGGGTAAACTT-----GGGGTTGGCTTAGATATTTTAACAATAAATATATAT 651
junceella_fragilis_muts TTAAAGAGGTAGTAAATTTGGGTGACTC-----GGGGACAACTCAGGGAT-----ACTAAATAAGATATATGG 648
keratoisidinae_muts rev TTAAAGAGGTAGTAAATTTGGGCGAATC-----GGAGGCCAATTTGGAT-----ACTAAATAAGATATATGG 678
echinogorgia_complexa_muts TTAGAGAAATAGTAAATTTGGGCAAACTC-----AGGGGTTGGCTCAGAGATTTTAAATAAGATATATCAT 651
euplexaura_crassa_muts TTAGAGAAATAGTAAATTTGGGCAAACTC-----GGGGTTGGCTCAGAGATTTTAAATAAATATATATAT 651
briareum_asbestinum_muts TTAGAGAAATAGTAAATTTGGGCGAATC CCAAAGAGTGCCGGGAGCAAGGCGGATTTCAAGGAT-----ACTAAATAAGATATATGG 702
pseudotergorgia_bipinnata_muts TTAGAGAAATAGTAAATTTGGGTAGACTC-----AGGGGCGGTCTCAGAGATTTTAAATTTAATAATATATAT 651
acanella_eburnea_muts rev TTAAAGAGGTAGTAAATTTGGGCGAATC-----GGAGGCCAATTTGGAT-----ACTAAATAAGATATATGG 678
sibagorgia_californica_muts TTAAAGAGGTAGTAAATTTGGGCGAATC-----GGGGGCCAATTCAGGGAT-----ACTAAATAAGATATATGG 657
corallium_elatius_muts TTAAAGAGGTAGTAAATTTGGGCGGACTC-----GGGGCTAACTCAGGGAT-----ACTAAATAAGATATATGG 657
corallium_konojoi_muts TTAAAGAGGTAGTAAATTTGGGCGGACTC-----GGGGCTAACTCAGGGAT-----ACTAAATAAGATATATGG 657
corallium_rubrum_muts rev TTAAAGAGGTAGTAAATTTGGGCGGACTC-----GGGGCTAACTCAGGGAT-----ACTAAATAAGATATATGG 657
paracorallium_japonicum_muts rev TTAAAGAGGTAGTAAATTTGGGCGGACTC-----GGGGCTAACTCAGGGAT-----ACTAAATAAGATATATGG 657
heliopora_coerulea_muts TTAAAGAGGTAGTAAATTTGGGCGGACTC-----GGGGCTAACTCAGGGAT-----ACTAAATAAGATATATGG 657
stylatula_elongata_muts TTAAAGAGGTAGTAAATTTGGGCGAATC-----GGGGGCCAATTCAGGGAT-----ACTAAATAAGATATATGG 648
renilla_muelleri_muts TTAAAGAGGTAGTAAATTTGGGCGGACTC-----GGGGCTAACTCAGGGAT-----ACTAAATAAGATATATGG 645
Consensus TTAAAGAGGTAGTAAATTTGGGCGGACTC-----GGGGCCGACTCAGGGAT-----ACTAAATAAGATATATGG
Conservation

alcyonium_digitatum_mutS TTATAATTGGTTATATTATTCCCTCTGAACCAATGCTAAATTTGAGTTATGGGGGAAGTAATAAAC----- 714
primnoa_resedaeformis_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 723
sinularia_peculiaris_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 723
narella_hawaiiensis_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 730
paraminabea_aldersladei_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 743
scleronophthya_gracillimum_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 726
dendronephthya_castanea_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 723
dendronephthya_gigantea_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 723
dendronephthya_mollis_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 723
dendronephthya_suenoniu_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 723
junceella_fragilis_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 711
keratoisidinae_mutS rev TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 741
echinogorgia_complexa_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 723
euplexaura_crassa_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 723
briareum_asbestinum_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 788
pseudopterogorgia_bipinnata_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 723
acanella_eburnea_mutS rev TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 741
sibagorgia_cauliflora_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 740
corallium_elatius_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 740
corallium_konojoi_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 740
corallium_rubrum_mutS rev TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 740
paracorallium_japonicum_mutS rev TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 740
heliopora_coerulea_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 724
stylatula_elongata_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 716
renilla_muelleri_mutS TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC----- 701

Consensus TTATAATTGGTTGAATTATTTCCTCTGAAACCAATGCTAAATTTGAGTTATGGGGGAAGCACTAAC-----
Conservation

alcyonium_digitatum_mutS -----AATTTCGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 793
primnoa_resedaeformis_mutS -----AAGCTTCCGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 802
sinularia_peculiaris_mutS -----AACTTAACGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATAGGCATTA 802
narella_hawaiiensis_mutS -----GCCTATCCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATAGGCATTA 808
paraminabea_aldersladei_mutS TATAGGTATAGCCTGTTCTGTTCTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATAGGCATTA 829
scleronophthya_gracillimum_mutS -----AAGCTTCCGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 805
dendronephthya_castanea_mutS -----AAGCTTCCGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 802
dendronephthya_gigantea_mutS -----AAGCTTCCGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 802
dendronephthya_mollis_mutS -----AAGCTTCCGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 802
dendronephthya_suenoniu_mutS -----AAGCTTCCGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 802
junceella_fragilis_mutS -----CCGCTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 784
keratoisidinae_mutS rev -----CCGCTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 814
echinogorgia_complexa_mutS -----AAGCTTCCGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 802
euplexaura_crassa_mutS -----AAGCTTCCGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 802
briareum_asbestinum_mutS CTTATAGGTCAGCTTCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 874
pseudopterogorgia_bipinnata_mutS -----GATTTACCGTGTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 802
acanella_eburnea_mutS rev -----CBGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 814
sibagorgia_cauliflora_mutS CATAG-----CAGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 820
corallium_elatius_mutS CATAG-----CAGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 820
corallium_konojoi_mutS CATAG-----CAGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 820
corallium_rubrum_mutS rev CATAG-----CAGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 820
paracorallium_japonicum_mutS rev CATAG-----CAGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 820
heliopora_coerulea_mutS -----CCGCTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 796
stylatula_elongata_mutS -----CCGCTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 784
renilla_muelleri_mutS -----CCCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA 781

Consensus -----AAGCTTCCGCTGTTATTTATCTTATAGGTCAGAAATTAATAAGGAGTGGCTTTTGTCCATATTTATATGGGCATTA
Conservation

alcyonium_digitatum_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGCA 879
primnoa_resedaeformis_mutS ATCCAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 888
sinularia_peculiaris_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGCA 888
narella_hawaiiensis_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 888
paraminabea_aldersladei_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 894
scleronophthya_gracillimum_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 891
dendronephthya_castanea_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 888
dendronephthya_gigantea_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 888
dendronephthya_mollis_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 888
dendronephthya_suenoniu_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 888
junceella_fragilis_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 888
keratoisidinae_mutS rev ATGAAAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 970
echinogorgia_complexa_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 888
euplexaura_crassa_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 888
pseudopterogorgia_bipinnata_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 860
acanella_eburnea_mutS rev ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 900
sibagorgia_cauliflora_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 906
corallium_elatius_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 906
corallium_konojoi_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 906
corallium_rubrum_mutS rev ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 906
paracorallium_japonicum_mutS rev ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 882
heliopora_coerulea_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 906
stylatula_elongata_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 870
renilla_muelleri_mutS ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA 870

Consensus ACAGAGAGTGGTTAACAAAAATTTCAAGAATATACCCCTTAGTAGAATATTTCAAAGTACTTGGACAGAAAATGTTAATCAGGTA
Conservation

alcyonium_digitatum_mutS AATCTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 965
primnoa_resedaeformis_mutS AATCTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 974
sinularia_peculiaris_mutS AATCTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 974
narella_hawaiiensis_mutS AATCTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 974
paraminabea_aldersladei_mutS AATCTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 1001
scleronophthya_gracillimum_mutS AATCTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 977
dendronephthya_castanea_mutS AATTTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 974
dendronephthya_gigantea_mutS AATTTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 974
dendronephthya_mollis_mutS AATTTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 974
dendronephthya_suenoniu_mutS AATTTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 974
junceella_fragilis_mutS AATTTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 956
keratoisidinae_mutS rev AATCTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 986
echinogorgia_complexa_mutS AATTTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 974
euplexaura_crassa_mutS AATCTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 974
briareum_asbestinum_mutS AATTTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 1046
pseudopterogorgia_bipinnata_mutS AATTTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 974
acanella_eburnea_mutS rev AATCTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 986
sibagorgia_cauliflora_mutS AATTTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 992
corallium_elatius_mutS AGTATAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 992
corallium_konojoi_mutS AGTATAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 992
corallium_rubrum_mutS rev AGTATAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 992
paracorallium_japonicum_mutS rev AGTATAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 992
heliopora_coerulea_mutS AATTTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 968
stylatula_elongata_mutS AATCTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 956
renilla_muelleri_mutS AATCTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA 953

Consensus AATTTAATTAGCCTTTTAGGAATATTACAAATTTATTAAGAATCGAAATCCTAATCTTATTAAGAATCTCAACTCTCCGAGTGTTA
Conservation

1,480 1,500 1,520 1,540
alcyonium_digitatum_muts --CCACCTAAAAGTAAAGTCAAATTTACCACTCTTATTGTCTGCTAATCAACTAA TAAGTAAATTAACAAATAATAA----- 1365
primnoa_resedaeformis_muts --CCACCTAAAAGTAAAGTCAAATTTACCACTCTTATTGTCTGCTAATCAACTAA TAAGTAAATTAATAATAATAA----- 1378
sinularia_peculiaris_muts --TCCCTAAAAGTAAAGTCAAATTTACCACTCTTATTGTCTGCTAATCAAGTAA TAAGTAAATTAATAATAATAA----- 1376
narella_hawaiinensis_muts --CCACCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1384
paraminabea_aldersladei_muts --CTACCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1408
scleronephthya_gracillimum_muts --CCACCTAAAAGTAAAGTCAAATTTACCACTCTTATTGTCTGCTAATCAACTAA TAAGTAAATTAACAAATAATAA----- 1381
dendronephthya_castanea_muts --CCACCTAAAAGTAAAGTCAAATTTACCACTCTTATTGTCTGCTAATCAACTAA TAAGTAAATTAACAAATAATAA----- 1378
dendronephthya_gigantea_muts --CCACCTAAAAGTAAAGTCAAATTTACCACTCTTATTGTCTGCTAATCAACTAA TAAGTAAATTAACAAATAATAA----- 1378
dendronephthya_mollis_muts --CCACCTAAAAGTAAAGTCAAATTTACCACTCTTATTGTCTGCTAATCAACTAA TAAGTAAATTAACAAATAATAA----- 1378
junceella_fragilis_muts --CCACCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1365
keratoisidinae_muts_rev --CCACCTAAAAGTAAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1393
echinogorgia_complexa_muts --CCACCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1378
euplexaura_crassa_muts --CCACCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1366
briareum_asbestinum_muts --CCACCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1453
pseudopteroorgia_bipinnata_muts --CCACCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1378
acanella_eburnea_muts_rev --CCACCTAAAAGTAAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1390
sibagorgia_cauliflora_muts --CCACCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1399
corallium_elatius_muts --CCCTCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1399
corallium_konojoi_muts --CCCTCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1399
paracorallium_japonicum_muts_rev --CCACCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1399
heliopora_coerulea_muts --CCGCCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1377
stylatula_elongata_muts --TCCACCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1383
renilla_muelleri_muts --TACCGCTAAAAGTGAATCAAATTTACCACTCTTATTGTCTGCTAATAAATTA TAAGGCTATTACTTCTTTATTAAC----- 1380
Consensus -----
Conservation

1,560 1,580 1,600 1,620
alcyonium_digitatum_muts -----TTCAATTAACCCCTTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1418
primnoa_resedaeformis_muts -----GAATTAATATTCATTAACCCCTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1439
sinularia_peculiaris_muts -----CATTAATTAACCCCTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1430
narella_hawaiinensis_muts -----AAAGTCCCTTCAATTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1430
paraminabea_aldersladei_muts -----AAATGCCCCCTCAATTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1457
scleronephthya_gracillimum_muts -----GAATTAATATTCATTAACCCCTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1442
dendronephthya_castanea_muts -----GAATTAATGTTCAATTAACCCCTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1439
dendronephthya_gigantea_muts -----GAATTAATGTTCAATTAACCCCTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1439
dendronephthya_mollis_muts -----GAATTAATGTTCAATTAACCCCTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1439
dendronephthya_suensoni_muts -----GAATTAATGTTCAATTAACCCCTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1439
junceella_fragilis_muts -----CCCCGGCACCTGGCAATTCGAGCTGGCCAGTCTCAATTC-----AGAGCCTTAATTGAGGAAAT 1430
keratoisidinae_muts_rev -----GGTCCCTTCAATTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1442
echinogorgia_complexa_muts -----GTATAAATATTCATTAACCCCTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1439
euplexaura_crassa_muts -----GAATTAATATTCATTAACCCCTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1427
briareum_asbestinum_muts -----AAATTAATTAACCCCTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1439
pseudopteroorgia_bipinnata_muts -----GAATTAATATTCATTAACCCCTTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1439
acanella_eburnea_muts_rev -----AAATGCCCCCTCAATTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1439
sibagorgia_cauliflora_muts -----AACTGCCCTTCAATTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1448
corallium_elatius_muts -----AACTGCCCTTCAATTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1448
corallium_konojoi_muts -----AACTGCCCTTCAATTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1448
paracorallium_japonicum_muts_rev -----AACTGCCCTTCAATTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1448
heliopora_coerulea_muts -----GAGGCGATACCGCTTCAATTCAGTCTGGCCCAATT-----AGAAATGCTAATTGAGGAAAT 1442
stylatula_elongata_muts -----CACC-----TGGCAATTCGAGCTTTGCGACTGATTCACCTCAATT-----AGAAATGCTAATTGAGGAAAT 1442
renilla_muelleri_muts -----CACT-----TGGCAATTCGAGCTTTGCGACTGATTCACCTCAATT-----AGAAATGCTAATTGAGGAAAT 1439
Consensus -----
Conservation

1,640 1,660 1,680 1,700 1,720
alcyonium_digitatum_muts AGGTCGAAATTTCCAGCACAGATAAATCTTTAGTGTATTTAAAGAAGCTATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1504
primnoa_resedaeformis_muts AGGCCGAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAAGCTATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1525
sinularia_peculiaris_muts AGACCGAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1516
narella_hawaiinensis_muts AGATATATTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1516
paraminabea_aldersladei_muts AAATAGATTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1543
scleronephthya_gracillimum_muts AGGCCAAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1528
dendronephthya_castanea_muts AGGCCGAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1525
dendronephthya_gigantea_muts AGGCCGAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1525
dendronephthya_mollis_muts AGGCCGAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1525
dendronephthya_suensoni_muts AGGCCGAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1525
junceella_fragilis_muts AGAAAGAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1516
keratoisidinae_muts_rev ATCTCTATTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1528
echinogorgia_complexa_muts AGGCCGAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1525
euplexaura_crassa_muts AGGCCGAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1513
briareum_asbestinum_muts AGATAGATTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1609
pseudopteroorgia_bipinnata_muts AGGCCGAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1525
acanella_eburnea_muts_rev ATCTCTATTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1525
sibagorgia_cauliflora_muts AGATCGATTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1534
corallium_elatius_muts AGCCGAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1534
corallium_konojoi_muts AGATCGATTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1534
paracorallium_japonicum_muts_rev AGATCGATTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1534
heliopora_coerulea_muts AGATCGATTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1528
stylatula_elongata_muts AAAGATTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1528
renilla_muelleri_muts AGGCCAATTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC 1525
Consensus AGACCAGTTTTCCAGGCAAGATAAATCTTTAGTGTATTTAAAGAATATATTACAGCCAACTGATAAATCTAACTAATCTTCTTTGTAC
Conservation

1,740 1,760 1,780 1,800
alcyonium_digitatum_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1590
primnoa_resedaeformis_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1611
sinularia_peculiaris_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1602
narella_hawaiinensis_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1602
paraminabea_aldersladei_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1629
scleronephthya_gracillimum_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1614
dendronephthya_castanea_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1611
dendronephthya_gigantea_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1611
dendronephthya_mollis_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1611
dendronephthya_suensoni_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1611
junceella_fragilis_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1602
keratoisidinae_muts_rev AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1614
echinogorgia_complexa_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1611
euplexaura_crassa_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1599
briareum_asbestinum_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1611
pseudopteroorgia_bipinnata_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1611
acanella_eburnea_muts_rev AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1611
sibagorgia_cauliflora_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1620
corallium_elatius_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1620
corallium_konojoi_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1620
paracorallium_japonicum_muts_rev AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1620
heliopora_coerulea_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1614
stylatula_elongata_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1614
renilla_muelleri_muts AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT 1611
Consensus AACACAAACTTTAAAGGCCAACCTTACAGAGTGGGCGAACAGACTTCAAATATTGTGTTTCAAGATACAATTTCTATCAAAGCT
Conservation

2,160 2,180 2,200 2,220
alcyonium_digitatum_muts ATTCAATTACTAAACCTTGGTTAATACCTAA--CTAAATCCCAACAGCCCAACAAACAAAGGGTAAATAGAGCAATTAAC 1987
primnoa_reseadaeformis_muts ATTCAATTATACTAAACCTTGGTTAATACCTAG--CTAAATCCCA-----ACAACCAAAGGGTAAATAGAGCAATTAAC 2014
sinularia_peculiaris_muts ATTCAATTACTAAACCTTGGTTAATACCTAA--CTAAATCCCA-----ACAACCAAAGGGTAAATAGAGCAATTAAC 2005
narella_hawaiiensis_muts GTTTAATTTACTAGACCTTGGTTAATACCAA--GTGG--CTAGGGTATTAAGCAAGGGTAAATAGAGCAATTAAC 2005
paraminaeba_aldersladei_muts GTTTAATTTACTAAACCTTGGTTAATACCAATTTA--CACTAGTACCGGCCCA-----GCTAGGGTAAATAGAGCAATTAAC 2038
scleronephthya_gracillimum_muts GTTCAATTACTAAACCTTGGTTAATACCTAG--CAAAATACCA-----ACAACCAAAGGGTAAATAGAGCAATTAAC 2017
dendronephthya_castanea_muts GTTCAATTTACTAAACCTTGGTTAAGCG--TTAA--ACAACCA-----ACAACCAAAGGGTAAATAGAGCAATTAAC 2008
dendronephthya_gigantea_muts GTTCAATTTACTAAACCTTGGTTAAGCG--TTAA--ACAACCA-----ACAACCAAAGGGTAAATAGAGCAATTAAC 2008
dendronephthya_mollis_muts GTTCAATTTACTAAACCTTGGTTAAGCG--TTAA--ACAACCA-----ACAACCAAAGGGTAAATAGAGCAATTAAC 2008
dendronephthya_suensoni_muts GTTCAATTTACTAAACCTTGGTTAAGCG--TTAA--ACAACCA-----ACAACCAAAGGGTAAATAGAGCAATTAAC 2008
juceella_fragilis_muts GTTTAATTTACTAGACCTTGGTTGGAAG--TTAA--GAGAGCAAGGGTAAATAGAGCAATTAAC 2008
keratoisidinae_muts_rev GTTTAATTTACTAGACCTTGGTTTGAAGA--TTAA--CTGACCAAAAGCTAAAGGGTAAATAGAGCAATTAAC 2002
echinogorgia_complexa_muts GTTTAATTTACTAAACCTTGGTTAAGCG--TTAA--CGAAGTCCCA-----ACAACCAAAGGGTAAATAGAGCAATTAAC 2014
euplexaura_crassa_muts GTTTAATTTACTAAACCTTGGTTAAGCG--TTAA--CAAAATCCCA-----ACAACCAAAGGGTAAATAGAGCAATTAAC 2002
briareum_asbestinum_muts GTTTAATTTACTAGGCGGATTAATACGGACA--TAA--ACCTGCACTGACCAAGGCC--TAAGGGTAAATAGAGCAATTAAC 2107
pseudopteroorgia_bipinnata_muts GTTTAATTTACTAAACCTTGGTTAAGCG--TTAA--CGAATCCCA-----ACAACCAAAGGGTAAATAGAGCAATTAAC 2014
acanella_eburnea_muts_rev GTTTAATTTACTAGACCTTGGTTTGAAGA--TTAA--CTGACCAAAAGCTAAAGGGTAAATAGAGCAATTAAC 1999
sibagorgia_cauliflora_muts GTTTAATTTACTAAACCTTGGTTAAGCG--TTAA--CGAACCTAATCTAGCTACGCGGCCCAAAAGCTAAAGGGTAAATAGAGCAATTAAC 2035
corallium_elatius_muts GTTTAATTTACTAAACCTTGGTTAAGCG--TTAA--CGAACCTAATCTAGCTACGCGGCCCAAAAGCTAAAGGGTAAATAGAGCAATTAAC 2035
corallium_konojoi_muts GTTTAATTTACTAAACCTTGGTTAAGCG--TTAA--CGAACCTAATCTAGCTACGCGGCCCAAAAGCTAAAGGGTAAATAGAGCAATTAAC 2035
corallium_rubrum_muts_rev GTTTAATTTACTAAACCTTGGTTAAGCG--TTAA--CGAACCTAATCTAGCTACGCGGCCCAAAAGCTAAAGGGTAAATAGAGCAATTAAC 2035
paracorallium_japonicum_muts_rev GTTTAATTTACTAAACCTTGGTTAAGCG--TTAA--CGAACCTAATCTAGCTACGCGGCCCAAAAGCTAAAGGGTAAATAGAGCAATTAAC 2035
heliopora_coerulea_muts GTTTAATTTACTAGCGCTTGGTTAATAGCTA--TTAA--CTGACCAAAAGCTAAAGGGTAAATAGAGCAATTAAC 2014
stylatula_elongata_muts GTTTAATTTACTAGCGCTTGGTTGCGAG--TTAA--GAGAGCTAAAGGGTAAATAGAGCAATTAAC 2011
renilla_muelleri_muts GTTTAATTTACTAGCGCTTGGTTGCGAG--TTAA--GAGAGCTAAAGGGTAAATAGAGCAATTAAC 2011
Consensus GTTTAATTTACTAAACCTTGGTTAATACNNA--CTAA--ANACCA-----ACAACCAAAGGGTAAATAGAGCAATTAAC
Conservation

2,240 2,260 2,280 2,300 2,320
alcyonium_digitatum_muts TCGGACACCCATTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2073
primnoa_reseadaeformis_muts TAGCACACCCATTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2100
sinularia_peculiaris_muts TAGCACACCCATTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2091
narella_hawaiiensis_muts TAGCACACCCATTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2091
paraminaeba_aldersladei_muts TAGCACATCCATTAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2124
scleronephthya_gracillimum_muts TCGGACACCCGCTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2103
dendronephthya_castanea_muts TCGGACACCCACTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2094
dendronephthya_gigantea_muts TCGGACACCCACTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2094
dendronephthya_mollis_muts TCGGACACCCACTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2094
dendronephthya_suensoni_muts TCGGACACCCACTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2094
juceella_fragilis_muts TAGCACACCCATTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2088
keratoisidinae_muts_rev TAGCACATCCATTAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2100
echinogorgia_complexa_muts TAGCGCACCCATTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2100
euplexaura_crassa_muts TAGCACACCCATTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2088
briareum_asbestinum_muts TAGCACATCCGTTAATAAGCAATTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2193
pseudopteroorgia_bipinnata_muts TAGCACACCCATTAGTAGAACAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2100
acanella_eburnea_muts_rev TAGCACATCCATTAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2085
sibagorgia_cauliflora_muts TCGGACACCCATTAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2121
corallium_elatius_muts TCGGACACCCATTAAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2121
corallium_konojoi_muts TCGGACACCCATTAAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2121
corallium_rubrum_muts_rev TCGGACACCCATTAAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2121
paracorallium_japonicum_muts_rev TCGGACACCCATTAAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2121
heliopora_coerulea_muts TAGCACACCCATTAAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2100
stylatula_elongata_muts TCGGACACCCACTAAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2097
renilla_muelleri_muts TCGCACACCCATTAAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA 2097
Consensus TAGCACACCCATTAAAGAAGCAGTTAAACACTCAAGGAAGAATGTGTAGCTCATATAATAGTTTAGAGGATAAGGGAATGTTAA
Conservation

2,340 2,360 2,380 2,400
alcyonium_digitatum_muts TTCTCAGTAAATGGTGGGGCAATCTACTTTACTAGAGCAATTTGGAGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2159
primnoa_reseadaeformis_muts TTCTCAGTAAATGGTGGAGCAATCTACTTTACTAGAGCAATTTGGAGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2186
sinularia_peculiaris_muts TTCTCAGTAAATGGTGGGGCAATCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2177
narella_hawaiiensis_muts TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2177
paraminaeba_aldersladei_muts TTCTCAGTAAATGGTGGGGTAAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2210
scleronephthya_gracillimum_muts TTCTCAGTAAATGGTGGAGCAATCTACTTTACTAGAGCAATTTGGAGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2189
dendronephthya_castanea_muts TTCTCAGTAAATGGTGGAGCAATCTACTTTACTAGAGCAATTTGGAGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2180
dendronephthya_gigantea_muts TTCTCAGTAAATGGTGGAGCAATCTACTTTACTAGAGCAATTTGGAGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2180
dendronephthya_mollis_muts TTCTCAGTAAATGGTGGAGCAATCTACTTTACTAGAGCAATTTGGAGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2180
dendronephthya_suensoni_muts TTCTCAGTAAATGGTGGAGCAATCTACTTTACTAGAGCAATTTGGAGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2180
juceella_fragilis_muts TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGAGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2180
keratoisidinae_muts_rev TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2174
echinogorgia_complexa_muts TTCTCAGTAAATGGTGGAGCAATCTACTTTACTAGAGCAATTTGGAGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2186
euplexaura_crassa_muts TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2174
briareum_asbestinum_muts TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2279
pseudopteroorgia_bipinnata_muts TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2174
acanella_eburnea_muts_rev TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2171
sibagorgia_cauliflora_muts TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2207
corallium_elatius_muts TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2207
corallium_konojoi_muts TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2207
corallium_rubrum_muts_rev TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2207
paracorallium_japonicum_muts_rev TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2207
heliopora_coerulea_muts TTCTCAGTAAATGGTGGAGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2186
stylatula_elongata_muts TTCTCGGTAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2183
renilla_muelleri_muts TTCTCGGTAATGGTGGGGTAAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC 2183
Consensus TTCTCAGTAAATGGTGGGGCAAGTCTACTTTACTAGAGCAATTTGGGGTCAACGTAATCTTAGCTCAAGCAGGAATGTATGTAGC
Conservation

2,420 2,440 2,460 2,480
alcyonium_digitatum_muts TGCAGATTCAATTAAGTAAAGACCTTAACACTTTAACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2245
primnoa_reseadaeformis_muts TGCAGATTCAATTAAGTAAAGACCTTAACACTTTAACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2272
sinularia_peculiaris_muts TGCAGATTCAATTAAGTAAAGCCTTAACACTTTAACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2263
narella_hawaiiensis_muts TGCAGATTCAATTAAGTAAAGACCCTACCACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2263
paraminaeba_aldersladei_muts TGCAGATTTAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2296
scleronephthya_gracillimum_muts TGCAGATTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2275
dendronephthya_castanea_muts TGCAGACTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2266
dendronephthya_gigantea_muts TGCAGACTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2266
dendronephthya_mollis_muts TGCAGACTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2266
dendronephthya_suensoni_muts TGCAGACTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2266
juceella_fragilis_muts TGCAGATTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2266
keratoisidinae_muts_rev TGCAGATTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2260
echinogorgia_complexa_muts TGCAGACTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2272
euplexaura_crassa_muts TGCAGATTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2260
briareum_asbestinum_muts TGCAGATTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2365
pseudopteroorgia_bipinnata_muts TGCAGATTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2272
acanella_eburnea_muts_rev TGCAGATTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2257
sibagorgia_cauliflora_muts TGCAGACTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2293
corallium_elatius_muts TGCAGACTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2293
corallium_konojoi_muts TGCAGACTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2293
corallium_rubrum_muts_rev TGCAGACTCAATTAAGTAAAGTACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2293
paracorallium_japonicum_muts_rev TGCAGATTCAATTAAGTAAAGTACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2292
heliopora_coerulea_muts TGCAGACTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2273
stylatula_elongata_muts TGCAGACTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2269
renilla_muelleri_muts TGCAGACTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT 2269
Consensus TGCAGATTCAATTAAGTAAAGACCTTAACACTTTAATACTCGTATTTTAGGGGGGATGATCTTCATAAAGGCCAAGGTACTT
Conservation

	2,840	2,860	2,880	2,900	2,920	
alcyonium_digitatum_muts	ACAAGTGCCTTGA	AATCGTAACTCT	ATTAACTGGGAGC	CACCA-----	-TCCCAGGT----	GAGTCTAGTTC
primnoa_resedaeformis_muts	ACAAGTGCCTTGA	AATCGTAACTCT	ATTAACTGGGAGC	CACCA-----	-TCCCAGGT----	GAGTCTAGTTC
sinularia_peculiaris_muts	AATAGTGCCTTGA	AATCGTAACTCT	ATTAACTGGGAGC	TAACA-----	-TCCCAGGT----	GAGTCTAGTTC
narella_hawaiiensis_muts	AGTAACTGCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	CCCCAGGCCCC	GAGTCTAGTTC
paraminaea_aldersladei_muts	AGTAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	CCCTTGGGCTC	GAGTCTAGTTC
scleronephthya_gracillimum_muts	AATAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
dendronephthya_castanea_muts	AATAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
dendronephthya_gigantea_muts	AATAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
dendronephthya_mollis_muts	AATAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
dendronephthya_suensoni_muts	AATAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
junceella_fragilis_muts	AGAAGCGCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	CCCTGCTGAGG	CCCCAAAGT
keratoisidinae_muts rev	AGTAACTGCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	CCAAAAGTCC	-----
echinogorgia_complexa_muts	AATAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
euplexaura_crassa_muts	AATAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
briareum_asbestinum_muts	AGCAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	CTCTCTACAG	CCCCGAAAGT
pseudopteroergorgia_bipinnata_muts	AGTAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
acanella_eburnea_muts rev	AGTAACTGCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	CCCTGCTGCGG	CCCCAAAGT
sibagorgia_cauliflora_muts	AGTAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	CCCTTGTGG	CCCCAAAGT
corallium_elatus_muts	AGTAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
corallium_konojoi_muts	AGTAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
corallium_rubrum_muts rev	AGTAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
paracorallium_japonicum_muts rev	AGTAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
heliopora_coerulea_muts	AGTAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
stylatula_elongata_muts	AGTAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
renilla_muelleri_muts	AGTAGTGCCTT	AAAAATCGTAA	AACTCTAAAT	TGGGAGTCA	-----	TCCCAGGT----
Consensus	AGTAGTGCCTTGA	AATCGTAACTCT	ATTAACTGGGAGC	CACCA-----	-TCCCAGGT----	GAGTCTAGTTC
Conservation	-----	-----	-----	-----	-----	-----

	2,940	2,960	2,980	3,000	
alcyonium_digitatum_muts	AGTTCCTCGTCC	CTAAATAAATG	CTCAGGTTTTT	ATTGATTCG	TGGAATAATG
primnoa_resedaeformis_muts	AGTTCCTCGTCC	CTAAATAAATG	CTCAGGTTTTT	ATTGATTCG	TGGAATAATG
sinularia_peculiaris_muts	AATATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
narella_hawaiiensis_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
paraminaea_aldersladei_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
scleronephthya_gracillimum_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
dendronephthya_castanea_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
dendronephthya_gigantea_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
dendronephthya_mollis_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
dendronephthya_suensoni_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
junceella_fragilis_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
keratoisidinae_muts rev	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
echinogorgia_complexa_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
euplexaura_crassa_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
briareum_asbestinum_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
pseudopteroergorgia_bipinnata_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
acanella_eburnea_muts rev	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
sibagorgia_cauliflora_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
corallium_elatus_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
corallium_konojoi_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
corallium_rubrum_muts rev	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
paracorallium_japonicum_muts rev	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
heliopora_coerulea_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
stylatula_elongata_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
renilla_muelleri_muts	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
Consensus	AGTATTCGCGC	CTTCTAAATA	TAATGCTCA	AGTTTTTAT	TGATTCGTTG
Conservation	-----	-----	-----	-----	-----

	3,020	3,040	3,060	3,080	
alcyonium_digitatum_muts	TTCAACCTAAGAA	TCAACTAAA	AAAAATCAAC	CCAGAAAT	TATGTAATAGA
primnoa_resedaeformis_muts	TTCAACCTAAGAA	TCAACTAAA	AAAAATCAAC	CCAGAAAT	TATGTAATAGA
sinularia_peculiaris_muts	TTCAACCTAAGAA	TCAACTAAA	AAAAATCAAC	CCAGAAAT	TATGTAATAGA
narella_hawaiiensis_muts	TTAAACCTAAGAG	-----	-----	-----	-----
paraminaea_aldersladei_muts	TTAAACCTAAGAA	-----	-----	-----	-----
scleronephthya_gracillimum_muts	TTCAACCTAAGAA	-----	-----	-----	-----
dendronephthya_castanea_muts	TTCAACCTAAGAA	-----	-----	-----	-----
dendronephthya_gigantea_muts	TTCAACCTAAGAA	-----	-----	-----	-----
dendronephthya_mollis_muts	TTCAACCTAAGAA	-----	-----	-----	-----
dendronephthya_suensoni_muts	TTCAACCTAAGAA	-----	-----	-----	-----
junceella_fragilis_muts	TTAAGCCTAAGAA	-----	-----	-----	-----
keratoisidinae_muts rev	TTAAGCCTAAGAG	-----	-----	-----	-----
echinogorgia_complexa_muts	TTCAACCTAAGAA	-----	-----	-----	-----
euplexaura_crassa_muts	TTCAACCTAAGAA	-----	-----	-----	-----
briareum_asbestinum_muts	TTAAGCCTAAGAG	-----	-----	-----	-----
pseudopteroergorgia_bipinnata_muts	TTCAACCTAAGAA	-----	-----	-----	-----
acanella_eburnea_muts rev	TTAAGCCTAAGAG	-----	-----	-----	-----
sibagorgia_cauliflora_muts	TTCAACCTAAGAA	-----	-----	-----	-----
corallium_elatus_muts	TTAAGCCTAAGAG	-----	-----	-----	-----
corallium_konojoi_muts	TTAAGCCTAAGAG	-----	-----	-----	-----
corallium_rubrum_muts rev	TTAAGCCTAAGAG	-----	-----	-----	-----
paracorallium_japonicum_muts rev	TTAAGCCTAAGAG	-----	-----	-----	-----
heliopora_coerulea_muts	TTAAGCCTAAGAG	-----	-----	-----	-----
stylatula_elongata_muts	TTAAGCCTAAGAG	-----	-----	-----	-----
renilla_muelleri_muts	TTAAGCCTAAGAG	-----	-----	-----	-----
Consensus	TTAAGCCTAAGAA	-----	-----	-----	-----
Conservation	-----	-----	-----	-----	-----

	3,100	3,120	3,140	3,160	3,180
alcyonium_digitatum_muts	-----	-----	-----	-----	-----
primnoa_resedaeformis_muts	-----	-----	-----	-----	-----
sinularia_peculiaris_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
narella_hawaiiensis_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
paraminaea_aldersladei_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
scleronephthya_gracillimum_muts	-----	-----	-----	-----	-----
dendronephthya_castanea_muts	-----	-----	-----	-----	-----
dendronephthya_gigantea_muts	-----	-----	-----	-----	-----
dendronephthya_mollis_muts	-----	-----	-----	-----	-----
dendronephthya_suensoni_muts	-----	-----	-----	-----	-----
junceella_fragilis_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
keratoisidinae_muts rev	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
echinogorgia_complexa_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
euplexaura_crassa_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
briareum_asbestinum_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
pseudopteroergorgia_bipinnata_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
acanella_eburnea_muts rev	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
sibagorgia_cauliflora_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
corallium_elatus_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
corallium_konojoi_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
corallium_rubrum_muts rev	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
paracorallium_japonicum_muts rev	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
heliopora_coerulea_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
stylatula_elongata_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
renilla_muelleri_muts	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
Consensus	AATCGAAGAT	CTAACTTTGGT	GCCAGTCTG	CTCAATTTAGAT	ATTCATAGAA
Conservation	-----	-----	-----	-----	-----

880 900 920 940

alcyonium_digitatum_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGCAATTTAGTATCTTGGTGTATTTTATTGCCCTTTGTTCC 946
 primnoa_resedaeformis_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGCAATTTAGTATCTTGGTGTATTTTATTGCCCTTTGTTCC 946
 sinularia_peculiaris_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGCAATTTAGTATCTTGGTGTATTTTATTGCCCTTTATTATC 946
 narella_hawaiiensis_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGCAATTTAGTATCTTGGTGTATTTTATTGCCCTTTATTATC 940
 paraminabea_alderladei_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGCAATTTAGTATCTTGGTGTATTTTATTGCCCTTTATTATC 940
 scleronephthya_gracillimum_cob TATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
 dendronephthya_castanea_cob TATATTTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
 dendronephthya_gigantea_cob TATATTTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 922
 dendronephthya_mollis_cob TATATTTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 922
 dendronephthya_suensoni_cob TATATTTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
 junceella_fragilis_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 922
 keratoisidinae_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
 echinogorgia_complexa_cob TATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 922
 euplexaura_crassa_cob TATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 922
 pseudopteroergorgia_bipinnata_cob TATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 922
 sibagogorgia_cauliflora_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
 acanella_eburnea_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
 briareum_asbestinum_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 922
 corallium_elatius_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
 corallium_konojoi_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
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 paracorallium_japonicum_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
 heliopora_coerulea_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
 stylatula_elongata_cob CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
 renilla_muelleri_cob TATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC 940
 Consensus CATACTACGCTCTATACCCAACAAGCTTGGGGGGGCTTGGCTATGGTATTTAGTATCTTGGTGTATTATTATTGCCCTTTATTATC
 Conservation

960 980 1,000 1,020

alcyonium_digitatum_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1032
 primnoa_resedaeformis_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1032
 sinularia_peculiaris_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1032
 narella_hawaiiensis_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1026
 paraminabea_alderladei_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1008
 scleronephthya_gracillimum_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1026
 dendronephthya_castanea_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1026
 dendronephthya_gigantea_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1008
 dendronephthya_mollis_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1008
 dendronephthya_suensoni_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1026
 junceella_fragilis_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1008
 keratoisidinae_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1026
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 corallium_konojoi_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1026
 corallium_rubrum_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1026
 paracorallium_japonicum_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1026
 heliopora_coerulea_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1026
 stylatula_elongata_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1026
 renilla_muelleri_cob ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT 1026
 Consensus ATACTAGTAAATTAAGAGCTTTAAACATTTAGGCCCTTAGTAAATAAGCATTTTGGTTTTTAGTAGCTGATTTTGTATTTAATAACT
 Conservation

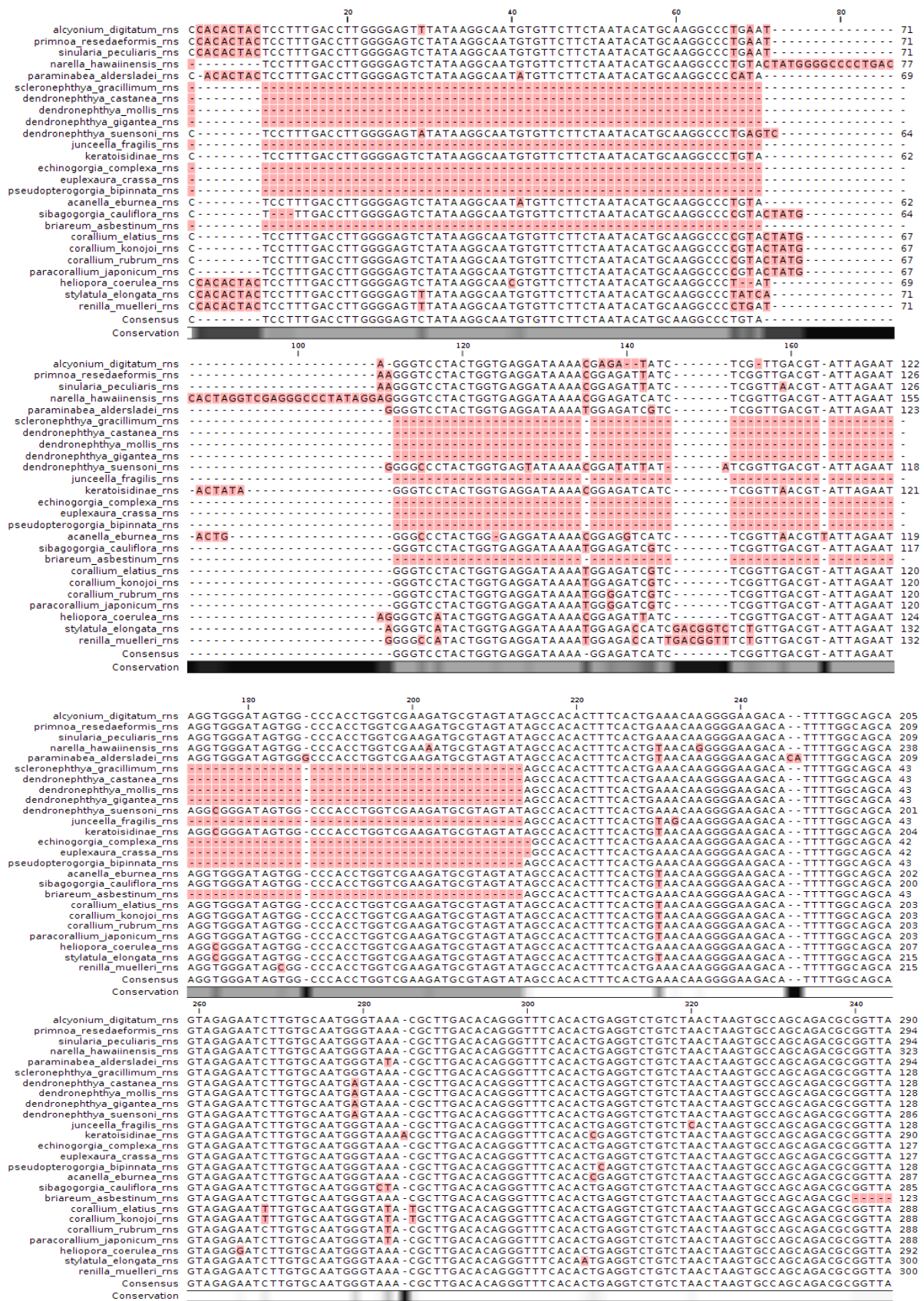
1,040 1,060 1,080 1,100

alcyonium_digitatum_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTGATACTACTTTTGCCTACTTCTTAGTATT 1118
 primnoa_resedaeformis_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1118
 sinularia_peculiaris_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 narella_hawaiiensis_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 paraminabea_alderladei_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1094
 scleronephthya_gracillimum_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 dendronephthya_castanea_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 dendronephthya_gigantea_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1094
 dendronephthya_mollis_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1094
 dendronephthya_suensoni_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 junceella_fragilis_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1094
 keratoisidinae_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 echinogorgia_complexa_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1094
 euplexaura_crassa_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1094
 pseudopteroergorgia_bipinnata_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1094
 sibagogorgia_cauliflora_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 acanella_eburnea_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 briareum_asbestinum_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1094
 corallium_elatius_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 corallium_konojoi_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 corallium_rubrum_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 paracorallium_japonicum_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 heliopora_coerulea_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 stylatula_elongata_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 renilla_muelleri_cob TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT 1112
 Consensus TGGTTAGGAGCTAAAGCAGTAGAGGACCCGTATATTAGATTTGGTCAATTTGCTTCTTATATTACTTTTGCCTACTTCTTAGTATT
 Conservation

1,120 1,140 1,160 1,180 1,200

alcyonium_digitatum_cob GATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGCA-----TGAAGTAA 1167
 primnoa_resedaeformis_cob GATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGCA-----TGAAGTAA 1167
 sinularia_peculiaris_cob GGTCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGTA-----TGAAGTAA 1167
 narella_hawaiiensis_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA 1161
 paraminabea_alderladei_cob AGTCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA 1167
 scleronephthya_gracillimum_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGTA-----TAAAGTAA 1155
 dendronephthya_castanea_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA 1155
 dendronephthya_gigantea_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA 1137
 dendronephthya_mollis_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA 1137
 dendronephthya_suensoni_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA 1155
 junceella_fragilis_cob AGTCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TGAAGTAA 1143
 keratoisidinae_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAGAGTAA 1161
 echinogorgia_complexa_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGTA-----TAAAGTAA 1137
 euplexaura_crassa_cob GGTCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGTA-----TGAAGTAA 1143
 pseudopteroergorgia_bipinnata_cob GATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGTA-----TAAAGTAA 1143
 sibagogorgia_cauliflora_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGTA-----TAAAGTAA 1161
 acanella_eburnea_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA 1161
 briareum_asbestinum_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TGAAGTAA 1161
 corallium_elatius_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TGAAGTAA 1161
 corallium_konojoi_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA 1161
 corallium_rubrum_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA 1161
 paracorallium_japonicum_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA 1194
 heliopora_coerulea_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA 1161
 stylatula_elongata_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TGAAGTAA 1161
 renilla_muelleri_cob AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TGAAGTAA 1161
 Consensus AATCCCCTTTGTTAGGCTGGGTAGAAAACCAATTGCTCCGGA-----TAAAGTAA
 Conservation

Rns gene



360 380 400 420
alcyonium_digitatum_... AACCTAGAGG...
primnoa_resedaeformis_... AACCTAGAGG...
sinularia_peculiaris_... AACCTAGAGG...
narella_hawaiiensis_... AACCTAGAGG...
paraminabea_alder... AACCTAGAGG...
scleronephthya_gracillimum_... AACCTAGAGG...
dendronephthya_castanea_... AACCTAGAGG...
dendronephthya_mollis_... AACCTAGAGG...
dendronephthya_gigantea_... AACCTAGAGG...
dendronephthya_suensoni_... AACCTAGAGG...
junceella_fragilis_... AACCTAGAGG...
keratoisidinae_... AACCTAGAGG...
echinogorgia_complexa_... AACCTAGAGG...
euplexaura_crassa_... AACCTAGAGG...
pseudopteroergorgia_bipinnata_... AACCTAGAGG...
acanella_eburnea_... AACCTAGAGG...
sibagogorgia_californa_... AACCTAGAGG...
briareum_asbestinum_... AACCTAGAGG...
corallium_elatius_... AACCTAGAGG...
corallium_konojoi_... AACCTAGAGG...
corallium_rubrum_... AACCTAGAGG...
paracorallium_japonicum_... AACCTAGAGG...
heliopora_coerulea_... AACCTAGAGG...
stylatula_elongata_... AACCTAGAGG...
renilla_muelleri_... AACCTAGAGG...
Consensus AACCTAGAGG...
Conservation

440 460 480 500
alcyonium_digitatum_... TAGCGGTAAAATGTT...
primnoa_resedaeformis_... TAGCGGTAAAATGTT...
sinularia_peculiaris_... TAGCGGTAAAATGTT...
narella_hawaiiensis_... TAGCGGTAAAATGTT...
paraminabea_alder... TAGCGGTAAAATGTT...
scleronephthya_gracillimum_... TAGCGGTAAAATGTT...
dendronephthya_castanea_... TAGCGGTAAAATGTT...
dendronephthya_mollis_... TAGCGGTAAAATGTT...
dendronephthya_gigantea_... TAGCGGTAAAATGTT...
dendronephthya_suensoni_... TAGCGGTAAAATGTT...
junceella_fragilis_... TAGCGGTAAAATGTT...
keratoisidinae_... TAGCGGTAAAATGTT...
echinogorgia_complexa_... TAGCGGTAAAATGTT...
euplexaura_crassa_... TAGCGGTAAAATGTT...
pseudopteroergorgia_bipinnata_... TAGCGGTAAAATGTT...
acanella_eburnea_... TAGCGGTAAAATGTT...
sibagogorgia_californa_... TAGCGGTAAAATGTT...
briareum_asbestinum_... TAGCGGTAAAATGTT...
corallium_elatius_... TAGCGGTAAAATGTT...
corallium_konojoi_... TAGCGGTAAAATGTT...
corallium_rubrum_... TAGCGGTAAAATGTT...
paracorallium_japonicum_... TAGCGGTAAAATGTT...
heliopora_coerulea_... TAGCGGTAAAATGTT...
stylatula_elongata_... TAGCGGTAAAATGTT...
renilla_muelleri_... TAGCGGTAAAATGTT...
Consensus TAGCGGTAAAATGTT...
Conservation

520 540 560 580 600
alcyonium_digitatum_... AAGCTTGGATAGTAACAGGA...
primnoa_resedaeformis_... AAGCTTGGATAGTAACAGGA...
sinularia_peculiaris_... AAGCTTGGATAGTAACAGGA...
narella_hawaiiensis_... AAGCTTGGATAGTAACAGGA...
paraminabea_alder... AAGCTTGGATAGTAACAGGA...
scleronephthya_gracillimum_... AAGCTTGGATAGTAACAGGA...
dendronephthya_castanea_... AAGCTTGGATAGTAACAGGA...
dendronephthya_mollis_... AAGCTTGGATAGTAACAGGA...
dendronephthya_gigantea_... AAGCTTGGATAGTAACAGGA...
dendronephthya_suensoni_... AAGCTTGGATAGTAACAGGA...
junceella_fragilis_... AAGCTTGGATAGTAACAGGA...
keratoisidinae_... AAGCTTGGATAGTAACAGGA...
echinogorgia_complexa_... AAGCTTGGATAGTAACAGGA...
euplexaura_crassa_... AAGCTTGGATAGTAACAGGA...
pseudopteroergorgia_bipinnata_... AAGCTTGGATAGTAACAGGA...
acanella_eburnea_... AAGCTTGGATAGTAACAGGA...
sibagogorgia_californa_... AAGCTTGGATAGTAACAGGA...
briareum_asbestinum_... AAGCTTGGATAGTAACAGGA...
corallium_elatius_... AAGCTTGGATAGTAACAGGA...
corallium_konojoi_... AAGCTTGGATAGTAACAGGA...
corallium_rubrum_... AAGCTTGGATAGTAACAGGA...
paracorallium_japonicum_... AAGCTTGGATAGTAACAGGA...
heliopora_coerulea_... AAGCTTGGATAGTAACAGGA...
stylatula_elongata_... AAGCTTGGATAGTAACAGGA...
renilla_muelleri_... AAGCTTGGATAGTAACAGGA...
Consensus AAGCTTGGATAGTAACAGGA...
Conservation

620 640 660 680
alcyonium_digitatum_... TAGCCTGAATACTATGAT...
primnoa_resedaeformis_... TAGCCTGAATACTATGAT...
sinularia_peculiaris_... TAGCCTGAATACTATGAT...
narella_hawaiiensis_... TAGCCTGAATACTATGAT...
paraminabea_alder... TAGCCTGAATACTATGAT...
scleronephthya_gracillimum_... TAGCCTGAATACTATGAT...
dendronephthya_castanea_... TAGCCTGAATACTATGAT...
dendronephthya_mollis_... TAGCCTGAATACTATGAT...
dendronephthya_gigantea_... TAGCCTGAATACTATGAT...
dendronephthya_suensoni_... TAGCCTGAATACTATGAT...
junceella_fragilis_... TAGCCTGAATACTATGAT...
keratoisidinae_... TAGCCTGAATACTATGAT...
echinogorgia_complexa_... TAGCCTGAATACTATGAT...
euplexaura_crassa_... TAGCCTGAATACTATGAT...
pseudopteroergorgia_bipinnata_... TAGCCTGAATACTATGAT...
acanella_eburnea_... TAGCCTGAATACTATGAT...
sibagogorgia_californa_... TAGCCTGAATACTATGAT...
briareum_asbestinum_... TAGCCTGAATACTATGAT...
corallium_elatius_... TAGCCTGAATACTATGAT...
corallium_konojoi_... TAGCCTGAATACTATGAT...
corallium_rubrum_... TAGCCTGAATACTATGAT...
paracorallium_japonicum_... TAGCCTGAATACTATGAT...
heliopora_coerulea_... TAGCCTGAATACTATGAT...
stylatula_elongata_... TAGCCTGAATACTATGAT...
renilla_muelleri_... TAGCCTGAATACTATGAT...
Consensus TAGCCTGAATACTATGAT...
Conservation

540 560 580 600
alcyonium_digitatum_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCACAGGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 565
primnoa_resedaeformis_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCACAGGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 570
sinularia_peculiaris_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 575
narella_hawaiinensis_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTC 580
paraminabea_aldersladei_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTC 585
scleronephthya_gracillimum_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 573
dendronephthya_castanea_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 570
dendronephthya_gigantea_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 570
dendronephthya_mollis_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 570
dendronephthya_suensoni_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 570
junceella_fragilis_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 570
keratoisidinae_rn1_rev TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 570
echinogorgia_complexa_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 569
euplexaura_crassa_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 567
pseudopteroergorgia_bipinnata_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 570
acanella_eburnea_rn1_rev TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 598
sibagogorgia cauliflora_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTC 582
briareum_asbestinum_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA 578
corallium_elatus_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTC 586
corallium_konojo_i_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTC 586
corallium_rubrum_rn1_rev TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTC 586
paracorallium_japonicum_rn1_rev TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTC 574
heliopora_coerulea_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTC 582
stylatula_elongata_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTC 582
renilla_muelleri_rn1 TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTC 582
Consensus TGGTTCCTACGAAACTTATCTTAGTAAGGCGCCAAAGTTGATTC--GCCCCAAACCCGGGGG-CCTGAATTAAGTGGTG-TAGTA

Conservation
620 640 660 680
alcyonium_digitatum_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 651
primnoa_resedaeformis_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 657
sinularia_peculiaris_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 657
narella_hawaiinensis_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 677
paraminabea_aldersladei_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 676
scleronephthya_gracillimum_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 660
dendronephthya_castanea_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 657
dendronephthya_gigantea_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 657
dendronephthya_mollis_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 657
dendronephthya_suensoni_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 657
junceella_fragilis_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 657
keratoisidinae_rn1_rev AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 669
echinogorgia_complexa_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 656
euplexaura_crassa_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 654
pseudopteroergorgia_bipinnata_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 657
acanella_eburnea_rn1_rev AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 685
sibagogorgia cauliflora_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 669
briareum_asbestinum_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 673
corallium_elatus_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 673
corallium_konojo_i_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 673
corallium_rubrum_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 673
paracorallium_japonicum_rn1_rev AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 661
heliopora_coerulea_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 669
stylatula_elongata_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 669
renilla_muelleri_rn1 AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG 669
Consensus AGACTATGGCGATAAGGCCCTTAGTCAAGAGGGTAAGCCCTAACCCAGAAATTAAGTCACTAATACAGATTAAGTGTATAAAGAGG

Conservation
700 720 740 760 780
alcyonium_digitatum_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 673
primnoa_resedaeformis_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 679
sinularia_peculiaris_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 679
narella_hawaiinensis_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 699
paraminabea_aldersladei_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 698
scleronephthya_gracillimum_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 692
dendronephthya_castanea_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 744
dendronephthya_gigantea_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 679
dendronephthya_mollis_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 679
dendronephthya_suensoni_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 679
junceella_fragilis_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 679
keratoisidinae_rn1_rev GTTCAAACCTTAGACAA-----ACAGGAA 691
echinogorgia_complexa_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 678
euplexaura_crassa_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 676
pseudopteroergorgia_bipinnata_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 707
acanella_eburnea_rn1_rev GTTCAAACCTTAGACAA-----ACAGGAA 707
sibagogorgia cauliflora_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 691
briareum_asbestinum_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 687
corallium_elatus_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 695
corallium_konojo_i_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 695
corallium_rubrum_rn1_rev GTTCAAACCTTAGACAA-----ACAGGAA 695
paracorallium_japonicum_rn1_rev GTTCAAACCTTAGACAA-----ACAGGAA 695
heliopora_coerulea_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 683
stylatula_elongata_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 691
renilla_muelleri_rn1 GTTCAAACCTTAGACAA-----ACAGGAA 691
Consensus GTTCAAACCTTAGACAA-----ACAGGAA

Conservation
800 820 840 860
alcyonium_digitatum_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 760
primnoa_resedaeformis_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 766
sinularia_peculiaris_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 766
narella_hawaiinensis_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 786
paraminabea_aldersladei_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 785
scleronephthya_gracillimum_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 769
dendronephthya_castanea_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 831
dendronephthya_gigantea_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 766
dendronephthya_mollis_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 766
dendronephthya_suensoni_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 766
junceella_fragilis_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 766
keratoisidinae_rn1_rev GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 777
echinogorgia_complexa_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 765
euplexaura_crassa_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 763
pseudopteroergorgia_bipinnata_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 766
acanella_eburnea_rn1_rev GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 794
sibagogorgia cauliflora_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 778
briareum_asbestinum_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 774
corallium_elatus_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 782
corallium_konojo_i_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 782
corallium_rubrum_rn1_rev GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 782
paracorallium_japonicum_rn1_rev GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 770
heliopora_coerulea_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 778
stylatula_elongata_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 778
renilla_muelleri_rn1 GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC 778
Consensus GTAGGCTTGGAAAACAGCCATCTGTCACAGGAAACGTAAGAGTTCACTGAAATGAGCTAGGAACTTAAGAATTAAGCGCGCTAAATC

890 900 910 920 930 940

alcyonium_digitatum_rnl TGTAACAGAAATCTGGAAGCCAGAATGCCAA**CGGTAAG**GGAAG-----TATCAACTGGCTTGGTAGTAGAGCGTTCT 831
 primnoa_resedaeformis_rnl TGTAACAGAAATCTGGAAGCCAGATGCCAA**CGGTAAG**GGAAG-----TATCAACTGGCTTGGTAGTAGAGCGTTCT 837
 sinularia_peculiaris_rnl TGTAACAGAAATCTGGAAGCCAGATGCCAA**CGGTAAG**GGAAG-----TATCAACTGGCTTGGTAGTAGAGCGTTCT 853
 narella_hawaiiensis_rnl TGTAACAGAAATCTGGAAGCCATCGGCCAA**CGGTAAG**GGAAG-----CACCACCTGGCTTGGTAGTAGAGCGTTCT 857
 paraminabea_aldersladei_rnl TGGAACAGAAATCTGGAAGCC**TGCGGC**CAAT**CGGCAAG**GAAG-----G-CAACTGGCTTGGTAGTAGAGCGTTCT 852
 scleronephthya_gracillimum_rnl TGTAACAGAAATCTGGAAGCCAGAC**CGCTAA**-----GGAAG-----CATCAACTGGCTTGGTAGTAGAGCGTTCT 834
 dendronephthya_castanea_rnl TGTAACAGAAATCTGGAAGCCAGAC**CGCTAA**-----GGAAG-----CATCAACTGGCTTGGTAGTAGAGCGTTCT 836
 dendronephthya_gigantea_rnl TGTAACAGAAATCTGGAAGCCAGAC**CGCTAA**-----GGAAG-----CATCAACTGGCTTGGTAGTAGAGCGTTCT 831
 dendronephthya_mollis_rnl TGTAACAGAAATCTGGAAGCCAGAC**CGCTAA**-----GGAAG-----CATCAACTGGCTTGGTAGTAGAGCGTTCT 831
 dendronephthya_suensoni_rnl TGTAACAGAAATCTGGAAGCCAGAC**CGCTAA**-----GGAAG-----CATCAACTGGCTTGGTAGTAGAGCGTTCT 831
 junceella_fragilis_rnl TGTAACAGAAATCTGGAAGCC-----**CGCTAA**-----GGAAG-----CATCAACTGGCTTGGTAGTAGAGCGTTCT 815
 keratoisidinae_rnl_rev TGTAACAGAAATCTGGAAGCC-----**CGCTAA**-----GGAAG-----CATCAACTGGCTTGGTAGTAGAGCGTTCT 822
 echinogorgia_complexa_rnl TGTAACAGAAATCTGGAAGCCAGAT**CGCTAA**-----GG-----CATCAACTGGCTTGGTAGTAGAGCGTTCT 827
 euplexaura_crassa_rnl TGTAACAGAAATCTGGAAGCCAG**CGCTAA**-----GG-----CATCAACTGGCTTGGTAGTAGAGCGTTCT 816
 pseudopterogorgia_bipinnata_rnl TGTAACAGAAATCTGGAAGCCAGAC**CGCTAA**-----GGAG-----CATCAACTGGCTTGGTAGTAGAGCGTTCT 831
 acanella_eburnea_rnl_rev TGTAACAGAAATCTGGAAGCC**CGCTAA**-----GGAG-----CATCAACTGGCTTGGTAGTAGAGCGTTCT 839
 sibagorgia_cauliflora_rnl TGTAACAGAAATCTGGAAGCCATCGGCCAA**CGGCAAA**AGG-----GTCACACTGGCTTGGTAGTAGAGCGTTCT 848
 briareum_asbestinum_rnl TGTAACAGAAATCTGGAAGCCAT**CGCTAA**-----GG-----TATCAACTGGCTTGGTAGTAGAGCGTTCT 833
 corallium_elatius_rnl TGTAACAGAAATCTGGAAGCC**CGGCAAA**AGG-----GTCACACTGGCTTGGTAGTAGAGCGTTCT 852
 corallium_konojoi_rnl TGTAACAGAAATCTGGAAGCC**CGGCAAA**AGG-----GTCACACTGGCTTGGTAGTAGAGCGTTCT 852
 corallium_rubrum_rnl TGTAACAGAAATCTGGAAGCC**CGGCAAA**AGG-----GTCACACTGGCTTGGTAGTAGAGCGTTCT 852
 paracorallium_japonicum_rnl TGTAACAGAAATCTGGAAGCC**CGGCAAA**AGG-----GTCACACTGGCTTGGTAGTAGAGCGTTCT 852
 heliopora_coerulea_rnl TGTAACAGAAATCTGGAAGCC**CGGCAAA**AGG-----GTCACACTGGCTTGGTAGTAGAGCGTTCT 819
 stylatula_elongata_rnl TGTAACAGAAATCTGGAAGCC**CGGCAAA**AGG-----GTCACACTGGCTTGGTAGTAGAGCGTTCT 849
 renilla_muelleri_rnl TGTAACAGAAATCTGGAAGCC**CGGCAAA**AGG-----GTCACACTGGCTTGGTAGTAGAGCGTTCT 849
 Consensus
 Conservation

960 970 980 990 1,000 1,010 1,020 1,030 1,040

alcyonium_digitatum_rnl GTA**GGCACG**ATAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 915
 primnoa_resedaeformis_rnl GTA**GGCACG**ATAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 922
 sinularia_peculiaris_rnl GTA**GGCACG**ATAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 938
 narella_hawaiiensis_rnl GTA-----TGT**ATAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 932
 paraminabea_aldersladei_rnl GTA-----TGT**ATAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 927
 scleronephthya_gracillimum_rnl GTA**GGCACG**ATAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 921
 dendronephthya_castanea_rnl GTA**GGCACG**ATAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 918
 dendronephthya_gigantea_rnl GTA**GGCACG**ATAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 983
 dendronephthya_mollis_rnl GTA**GGCACG**ATAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 918
 dendronephthya_suensoni_rnl GTA**GGCACG**ATAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 918
 junceella_fragilis_rnl GTA-----TG**CATC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 890
 keratoisidinae_rnl_rev GTA-----TGT**ATAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 890
 echinogorgia_complexa_rnl GTA**GGCACG**ATAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 914
 euplexaura_crassa_rnl GTA**GGCACG**ATAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 914
 pseudopterogorgia_bipinnata_rnl GTA**GGCACG**ATAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 918
 acanella_eburnea_rnl_rev GTA-----TGT**ATAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 914
 sibagorgia_cauliflora_rnl GTA-----TGT**ACAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 923
 briareum_asbestinum_rnl GTA-----TGT**ACAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 905
 corallium_elatius_rnl TG**GTG**-----TGT**ACAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 927
 corallium_konojoi_rnl TG**GTG**-----TGT**ACAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 927
 corallium_rubrum_rnl_rev GTA-----TGT**ACAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 927
 paracorallium_japonicum_rnl_rev GTA-----TGT**ACAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 927
 heliopora_coerulea_rnl GTA**GACACG**GTAGTGCACACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 903
 stylatula_elongata_rnl GTA-----TGT**ACAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 924
 renilla_muelleri_rnl GTA-----TGT**ACAC**ACCTCGTGAGATAAACAGAAAGTGAATGCAAGCATGAGTAGTACAAGATCA**TTCC**CAAAATAA**T** 924
 Consensus
 Conservation

1,060 1,070 1,080 1,090 1,100 1,110 1,120

alcyonium_digitatum_rnl ----A**-----**TATACAGCTTCTAAGGGCATT----ACGCCCGATG**ATT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACGA 990
 primnoa_resedaeformis_rnl ----A**-----**TATACAGCTTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACGA 998
 sinularia_peculiaris_rnl ----AGATATATACAGCTTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1018
 narella_hawaiiensis_rnl ----ATAGTTATACAGCTTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1012
 paraminabea_aldersladei_rnl ----ATATTTATACAGCTTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1007
 scleronephthya_gracillimum_rnl **ATATAT**ATATATACAGCTTCTAAGGGCATT----AT**GCCCG**ATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 997
 dendronephthya_castanea_rnl **ATATAT**ATATATACAGCTTCTAAGGGCATT----AT**GCCCG**ATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1067
 dendronephthya_gigantea_rnl **ATATAT**ATATATACAGCTTCTAAGGGCATT----AT**GCCCG**ATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1002
 dendronephthya_mollis_rnl **ATATAT**ATATATACAGCTTCTAAGGGCATT----AT**GCCCG**ATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1002
 dendronephthya_suensoni_rnl **ATATAT**ATATATACAGCTTCTAAGGGCATT----AT**GCCCG**ATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1000
 junceella_fragilis_rnl ----ATGTTTATACAGCT**CT**CTAAGGGCATT----**CGCCCG**ATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 968
 keratoisidinae_rnl_rev ----ATATTTATACAGCTTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 970
 echinogorgia_complexa_rnl **ACA**-----**CA**CGCTCTAAGGGCATT----**CGCCCG**ATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 988
 euplexaura_crassa_rnl **ATA**-----**CA**CGCTCTAAGGGCATT----**CGCCCG**ATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 972
 pseudopterogorgia_bipinnata_rnl **ATA**-----**CA**CGCTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 992
 acanella_eburnea_rnl_rev ----ATATTTATACAGCTTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 994
 sibagorgia_cauliflora_rnl ----ATATTTATACAGCTTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1003
 briareum_asbestinum_rnl ----ATATTTATACAGCTTCTAAGGGC**ATT**----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 985
 corallium_elatius_rnl ----ATATTTATACAGCTTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1007
 corallium_konojoi_rnl ----ATATTTATACAGCTTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1007
 corallium_rubrum_rnl_rev ----ATATTTATACAGCTTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1007
 paracorallium_japonicum_rnl_rev ----ATATTTATACAGCTTCTAAGGGCATT----ACGCCCGATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1007
 heliopora_coerulea_rnl ----**GT**ATTTATACAGCTTCTAAGGGCATT----**CGCCCG**ATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 983
 stylatula_elongata_rnl ----ATGTTTATACAGCT**CT**CTAAGGGCATT----**CGCCCG**ATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1004
 renilla_muelleri_rnl ----ATGTTTATACAGCT**CT**CTAAGGGCATT**ATTG**TG**CGCCCG**ATGGA**TT**ATAAATCTTGTA**CTG**TTCAGGAAAA**AT**TTAT**GGT**ACTT 1007
 Consensus
 Conservation

1,140 1,160 1,180 1,200

alcyonium_digitatum_rnl AG**TA**-----**CC**TT**TAAC**TGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1054
 primnoa_resedaeformis_rnl AG**TA**-----**CC**TT**CAAC**TGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1062
 sinularia_peculiaris_rnl **GT****TA**-----**CC**TT**CAAG**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1082
 narella_hawaiiensis_rnl AG**CA**-----**CT**TT**CGAT**TGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1076
 paraminabea_aldersladei_rnl AG**CA**-----**CC**TT**CAAT**TGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1071
 scleronephthya_gracillimum_rnl **CG****TA**-----**CC**TT**CAAC**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1061
 dendronephthya_castanea_rnl **CG****TA**-----**CC**TT**CAAC**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1131
 dendronephthya_gigantea_rnl **CG****TA**-----**CC**TT**CAAC**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1066
 dendronephthya_mollis_rnl **CG****TA**-----**CC**TT**CAAC**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1066
 dendronephthya_suensoni_rnl **CG****TA**-----**CC**TT**CAAC**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1064
 junceella_fragilis_rnl **AGC****ACT**-----**GAC**T**TAC**TTT**GG**TTGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1039
 keratoisidinae_rnl_rev **AGC****E**-----**GA**T**TG**TTGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1028
 echinogorgia_complexa_rnl **GT****TA**-----**CC**TT**CAAC**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1050
 euplexaura_crassa_rnl **GT****TA**-----**CC**TT**CAAC**TGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1036
 pseudopterogorgia_bipinnata_rnl **AG****TA**-----**CC**TT**TTAG**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1058
 acanella_eburnea_rnl_rev **AG****CA**-----**CT**TT**CGAT**TGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1058
 sibagorgia_cauliflora_rnl **AG****CA**-----**CC**TT**TTAG**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1067
 briareum_asbestinum_rnl **AGC****ACTAGTACATAGT**AGT**ACGGAAGTCGTA**-----**CC**TT**CAAC**TGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1072
 corallium_elatius_rnl **AG****CA**-----**CC**TT**TTAG**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1071
 corallium_konojoi_rnl **AG****CA**-----**CC**TT**TTAT**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1071
 corallium_rubrum_rnl_rev **AG****CA**-----**CC**TT**TTAT**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1071
 paracorallium_japonicum_rnl_rev **AG****CA**-----**CC**TT**TTAT**TGTTATTTATGGGACT**ATAT**CTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1071
 heliopora_coerulea_rnl **AG****GA**-----**CC**TT**TTAG**TGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1047
 stylatula_elongata_rnl **AGC****ACT**-----**GAT**T**TAC**TTT**GG**TTGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1076
 renilla_muelleri_rnl **AGC****ACA**-----**TA****C**TT**TG**TTGTTATTTATGGGACTAGATCTAGGCATAA**TTT**CTT**TA**AGGAA**CT**CGGCA 1075
 Consensus
 Conservation

1,920 1,940 1,960 1,980 2,000

alcyonium_digitatum_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1788
 primnoa_resedaeformis_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1799
 sinularia_peculiaris_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1819
 narella_hawaiiensis_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1832
 paraminabea_aldersladei_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1852
 scleronephthya_gracillimum_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1798
 dendronephthya_castanea_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1868
 dendronephthya_gigantea_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1803
 dendronephthya_mollis_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1803
 dendronephthya_suensoni_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1801
 junceella_fragilis_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1775
 keratoisidinae_rml_rev GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1782
 echinogorgia_complexa_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1787
 euplexaura_crassa_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1772
 pseudopteroergorgia_bipinnata_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1793
 acanella_eburnea_rml_rev GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1811
 sibagogorgia_cauliflora_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1892
 briareum_asbestinum_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1823
 corallium_elatius_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1837
 corallium_konojoi_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1837
 corallium_rubrum_rml_rev GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1825
 paracorallium_japonicum_rml_rev GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1825
 heliopora_coerulea_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1826
 stylatula_elongata_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1819
 renilla_muelleri_rml GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT 1818
 Consensus GGTGC TGTGAAGGTACCTTAGGTTGGCTGTTGCACCATGAAAAACCGTACATGATTGAGTTTCAGAGCGTGGTGACACAGCTCGGT
 Conservation

2,020 2,040 2,060 2,080

alcyonium_digitatum_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1875
 primnoa_resedaeformis_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1886
 sinularia_peculiaris_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1906
 narella_hawaiiensis_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1899
 paraminabea_aldersladei_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1922
 scleronephthya_gracillimum_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1885
 dendronephthya_castanea_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1955
 dendronephthya_gigantea_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1890
 dendronephthya_mollis_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1890
 dendronephthya_suensoni_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1882
 junceella_fragilis_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1862
 keratoisidinae_rml_rev TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1868
 echinogorgia_complexa_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1873
 euplexaura_crassa_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1859
 pseudopteroergorgia_bipinnata_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1880
 acanella_eburnea_rml_rev TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1897
 sibagogorgia_cauliflora_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1898
 briareum_asbestinum_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1910
 corallium_elatius_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1924
 corallium_konojoi_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1924
 corallium_rubrum_rml_rev TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1912
 paracorallium_japonicum_rml_rev TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1912
 heliopora_coerulea_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1913
 stylatula_elongata_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1906
 renilla_muelleri_rml TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC 1905
 Consensus TTCTATCTACAATGTTCAATCCCAACTTTTTCTGAGTCTAGTACGCAAGGAATGGTCTCAGCGATGCTCGACTATATGGGCCCATC
 Conservation

2,100 2,120 2,140 2,160

alcyonium_digitatum_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1937
 primnoa_resedaeformis_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1948
 sinularia_peculiaris_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1968
 narella_hawaiiensis_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1968
 paraminabea_aldersladei_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1991
 scleronephthya_gracillimum_rml GATGTAATTAACCTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGAT 1957
 dendronephthya_castanea_rml GATGTAATTAACCTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGAT 2027
 dendronephthya_gigantea_rml GATGTAATTAACCTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGAT 1962
 dendronephthya_mollis_rml GATGTAATTAACCTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGAT 1962
 dendronephthya_suensoni_rml GATGTAATTAACCTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGAT 1960
 junceella_fragilis_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1925
 keratoisidinae_rml_rev GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1931
 echinogorgia_complexa_rml GATGTAATTAACCTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGAT 1945
 euplexaura_crassa_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1945
 pseudopteroergorgia_bipinnata_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1967
 acanella_eburnea_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1961
 sibagogorgia_cauliflora_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1978
 briareum_asbestinum_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1997
 corallium_elatius_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1983
 corallium_konojoi_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1983
 corallium_rubrum_rml_rev GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1996
 paracorallium_japonicum_rml_rev GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1996
 heliopora_coerulea_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1975
 stylatula_elongata_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1968
 renilla_muelleri_rml GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT 1967
 Consensus GACGTAATCAACTTCGGCTGCTGCAAGAAGGAGAAACAAAGGGTTTAGGGATTAATAAGGT
 Conservation

2,180 2,200 2,220 2,240 2,260

alcyonium_digitatum_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2073
 primnoa_resedaeformis_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2078
 sinularia_peculiaris_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2044
 narella_hawaiiensis_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2114
 paraminabea_aldersladei_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2049
 scleronephthya_gracillimum_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2049
 dendronephthya_castanea_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2047
 dendronephthya_gigantea_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2007
 dendronephthya_mollis_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 1961
 dendronephthya_suensoni_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2032
 junceella_fragilis_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2032
 keratoisidinae_rml_rev GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2054
 echinogorgia_complexa_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 1961
 euplexaura_crassa_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2065
 pseudopteroergorgia_bipinnata_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2084
 acanella_eburnea_rml_rev GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2070
 sibagogorgia_cauliflora_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2070
 briareum_asbestinum_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2083
 corallium_elatius_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 2083
 corallium_konojoi_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 1975
 corallium_rubrum_rml_rev GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 1968
 paracorallium_japonicum_rml_rev GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG 1967
 heliopora_coerulea_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG
 stylatula_elongata_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG
 renilla_muelleri_rml GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG
 Consensus GGTGCCATGTGGGTGCATAGCCCTGGGACCTATGGAATTAACACTAGGGCTCATCATACTAATAGTGTGATGATGGA TTAAG
 Conservation

	2,280	2,300	2,320	2,340	
alcyonium_digitatum_rnl	.....	.....	.....	.....	1937
primnoa_resedaeiformis_rnl	.....	.....	.....	.....	1948
sinularia_peculiaris_rnl	.....	.....	.....	.....	1968
narella_hawaiinensis_rnl	GCCCCGACTCTAAGATTAGCAACATTTCTGTTTGGAGTTACTACTTATGAGTGTCTGGGG	.....	.....	.....	2154
paraminabea_aldersladei_rnl	GCTACTACTCTAAGATTAGCAACACTCTGTTTGGAGTTACTACTTATGAGTGTCTGGGG	.....	.....	.....	2165
scleronephthya_gracillimum_rnl	GCCCCTACTTTAAGATTAGCTATGCTACTTGGGGG	.....	.....	.....	2113
dendronephthya_castanea_rnl	GCCCCTACTTTAAGATTAGCTATGCTACTTGGGGG	.....	.....	.....	2183
dendronephthya_gigantea_rnl	GCCCCTACTTTAAGATTAGCTATGCTACTTGGGGG	.....	.....	.....	2118
dendronephthya_mollis_rnl	GCCCCTACTTTAAGATTAGCTATGCTACTTGGGGG	.....	.....	.....	2118
dendronephthya_suensoni_rnl	GCCCCCCTCTAAGATTAGCTATGCTACTTGGGGG	.....	.....	.....	2116
junceella_fragilis_rnl	GCCCCGTCTCTAAGATTAGCAACATTTCTGTTTGGAGCTACTACTTATGAGTGTCTGGGG	.....	.....	.....	2094
keratoisidinae_rnl_rev	.....	.....	.....	.....	1961
echinogorgia_complexa_rnl	GCCCCTACTTTAAGATTAGCTATGCTACTTGGGGG	.....	.....	.....	2101
euplexaura_crassa_rnl	GCCCCGACTTTAAGATTAGCTATGCTACTTGGGGTGTCTGGGG	.....	.....	.....	2110
pseudopteroergorgia_bipinnata_rnl	GCTCCGACTTTAAGATTAGCTATGCTACTTGGGGTGTCTGGGG	.....	.....	.....	2132
acanella_eburnea_rnl_rev	.....	.....	.....	.....	1961
sibagorgia_cauliflora_rnl	GCCCCGACTCTAAGATTAGCAATATTTCTGTTTGGGTTTACACTACTTATGAGTGTCTGGGG	.....	.....	.....	2152
briareum_asbestinum_rnl	GCCCCAAGCTCTAAGATTAGCAACATTTCTGTTTGGAGTTACTACTTCTGAGTGTCTGGGG	.....	.....	.....	2171
corallium_elatius_rnl	GCCCCGACTCTAAGATTAGCAATATTTCTGTTTGGGAGTGACACTACTTGTGGGTGTCTGGGG	.....	.....	.....	2157
corallium_konojoi_rnl	GCCCCGACTCTAAGATTAGCAATATTTCTGTTTGGGAGTGACACTACTTGTGGGTGTCTGGGG	.....	.....	.....	2157
corallium_rubrum_rnl_rev	GCCCCGACTCTAAGATTAGCAATATTTCTGTTTGGGAGTGACACTACTTATGAGTGTCTGGGG	.....	.....	.....	2170
paracorallium_japonicum_rnl_rev	GCCCCGACTCTAAGATTAGCAATATTTCTGTTTGGGAGTGACACTACTTATGAGTGTCTGGGG	.....	.....	.....	2170
heliopora_coerulea_rnl	.....	.....	.....	.....	1975
stylatula_elongata_rnl	.....	.....	.....	.....	1968
renilla_muelleri_rnl	.....	.....	.....	.....	1967
Consensus	GCCCCGACTCTAAGATTAGCAACTACTATGTTTGGG	.....	.....	.....
Conservation	.....	.....	.....	.....

	2,360	2,380	2,400	2,420	
alcyonium_digitatum_rnl	.....	.....	.....	.....	1937
primnoa_resedaeiformis_rnl	.....	.....	.....	.....	1948
sinularia_peculiaris_rnl	.....	.....	.....	.....	1968
narella_hawaiinensis_rnl	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTAAGCGGTTAGCCATACTGTGT	.....	.....	.....	2211
paraminabea_aldersladei_rnl	TGTTGGCCGAGGCTATTAAGATGTTGGTAAAGTAAAGTGGTTAGCCATACTATGT	.....	.....	.....	2222
scleronephthya_gracillimum_rnl	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTTAGTGGTTAGCTAT	.....	.....	.....	2163
dendronephthya_castanea_rnl	TGTTGGACACAGGCGATTAAGATGTTGGTGATGCTTAGTGGTTAGCTATACT	.....	.....	.....	2236
dendronephthya_gigantea_rnl	TGTTGGACACAGGCGATTAAGATGTTGGTGATGCTTAGTGGTTAGCTATACT	.....	.....	.....	2197
dendronephthya_mollis_rnl	TGTTGGACACAGGCGATTAAGATGTTGGTGATGCTTAGTGGTTAGCTATACT	.....	.....	.....	2171
dendronephthya_suensoni_rnl	TGTTGGACACAGGCGATTAAGATGTTGGTGATGCTTAGTGGTTAGCTATACT	.....	.....	.....	2169
junceella_fragilis_rnl	TGTTGGACACAGGCTATTAAGATGTTGGTAAAGTAAAGTGGTTAGCCGACT	.....	.....	.....	2173
keratoisidinae_rnl_rev	.....	.....	.....	.....	1961
echinogorgia_complexa_rnl	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTTAGTGGTTAGCTATACT	.....	.....	.....	2154
euplexaura_crassa_rnl	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTAAGTGGTTAGCCATACT	.....	.....	.....	2163
pseudopteroergorgia_bipinnata_rnl	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTAAGTGGTGGCTCTACT	.....	.....	.....	2211
acanella_eburnea_rnl_rev	.....	.....	.....	.....	1961
sibagorgia_cauliflora_rnl	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTAAGTGGTTAGCCATACT	.....	.....	.....	2235
briareum_asbestinum_rnl	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTAAGTGGTTAGCCATACT	.....	.....	.....	2224
corallium_elatius_rnl	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTAAGTGGTTAGCCATTTCT	.....	.....	.....	2236
corallium_konojoi_rnl	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTAAGTGGTTAGCCATTTCT	.....	.....	.....	2236
corallium_rubrum_rnl_rev	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTAAGTGGTTAGCCATACT	.....	.....	.....	2249
paracorallium_japonicum_rnl_rev	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTAAGTGGTTAGCCATACT	.....	.....	.....	2249
heliopora_coerulea_rnl	.....	.....	.....	.....	1975
stylatula_elongata_rnl	.....	.....	.....	.....	1968
renilla_muelleri_rnl	.....	.....	.....	.....	1967
Consensus	TGTTGGACACAGGCTATTAAGATGTTGGTGATGCTAAGTGGTTAGCCATACT	.....	.....	.....
Conservation	.....	.....	.....	.....

tRNA f-Met

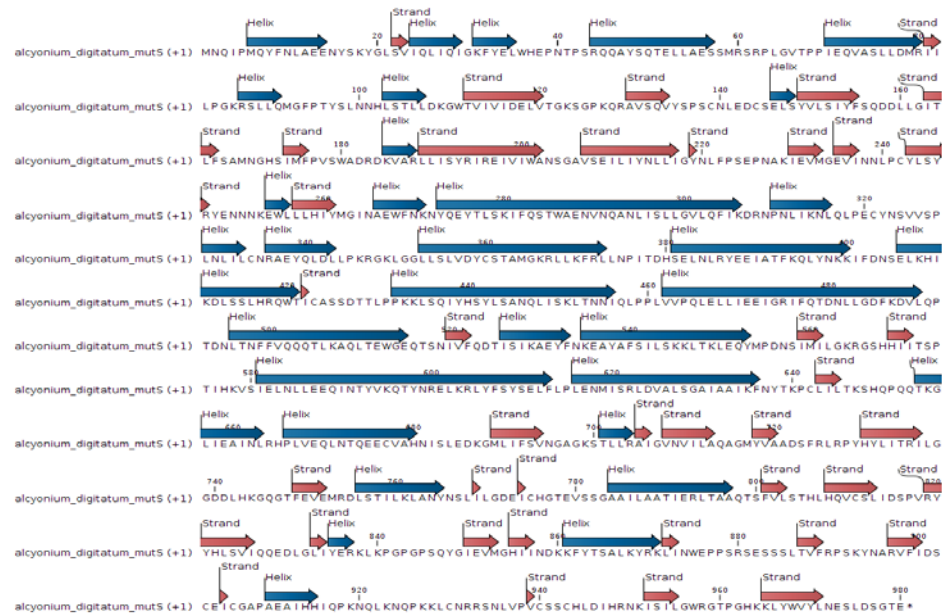
	20	40	60	
alcyonium_digitatum_Met_rev	TG - GTAGGGGAG - - - GAGTTGAACCTGCATAATCAGATTATGAGTCTGAGAACTTACCGTTAGTTGACCTAC	71		
primnoa_resedaeiformis_tRNA_Met_rev	TG - GTAGGGGAG - - - GAGTTGAACCTGCATAATCAGATTATGAGTCTGGGAACTTACCGTTAGTTGACCTAC	71		
sinularia_peculiaris_tRNA_Met_rev	- - - GTAGGGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
narella_hawaiinensis_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
paraminabea_aldersladei_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
scleronephthya_gracillimum_tRNA_Met_rev	- - - GTAGGGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGGTTATGTTAGGTTCAACTCC - - - TGCCCTACCA	71		
dendronephthya_castanea_tRNA_Met_rev	- - - GTAGGGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGGTTATGTTAGGTTCAACTCC - - - TGCCCTACCA	71		
dendronephthya_gigantea_tRNA_Met_rev	- - - GTAGGGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGGTTATGTTAGGTTCAACTCC - - - TGCCCTACCA	71		
dendronephthya_mollis_tRNA_Met_rev	- - - GTAGGGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGGTTATGTTAGGTTCAACTCC - - - TGCCCTACCA	71		
dendronephthya_suensoni_tRNA_Met_rev	TG - GTAGGGGAG - - - GAGTTGAACCTGCATAATCAGATTATGAGTCTGAGAACTTACCGTTAGTTGACCTAC	71		
junceella_fragilis_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
keratoisidinae_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
echinogorgia_complexa_tRNA_Met_rev	- - - GTAGGGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
euplexaura_crassa_tRNA_Met_rev	- - - GTAGGGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
pseudopteroergorgia_bipinnata_tRNA_Met_rev	- - - GTAGGGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
acanella_eburnea_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
sibagorgia_cauliflora_tRNA_Met_rev	GCTTGTAGAGTCAACTAACGGTAAGTTCTCAGCTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCTCTACCA	71		
briareum_asbestinum_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
corallium_elatius_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGCTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCTCTACCA	71		
corallium_konojoi_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGCTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCTCTACCA	71		
corallium_rubrum_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGCTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCTCTACCA	71		
paracorallium_japonicum_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGCTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCTCTACCA	71		
heliopora_coerulea_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
stylatula_elongata_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
renilla_muelleri_tRNA_Met_rev	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA	71		
Consensus	- - - GTAGAGTCAACTAACGGTAAGTTCTCAGACTCATAATCTGATTATGCAGGTTCAACTCC - - - TGCCCTACCA			
Conservation	.....	.....	.....

Appendix F

Protein sequence of *mtMutS* gene in *A. digitatum*

MNQIPMQYFNLAENYSKYGLSVIQLIQIGKFYELWHEPNTSPSSQQAYSQTELLAESSMR
SRPLGVTPPIEQVASLLDMSMMLPGKSSLLQMGFPTYSLNNHLSTLLDKGWTVMVIDEL
VTGKSGPKQRAVSQVYSPSCNLEDCSELSYVLSIYFSQDDLLGITLFSAMNGHSMMPVVS
WADSDKVARLLISYRISEMVIWANS GAVSEILMYNLLIGYNLFPSEPNKIEVMGEVMNN
LPCYLSYSYENNNKEWLLLHIYMGINAEWFKNYQEYTL SKMFQSTWAENVN QANLISL
LGVLFQFIKDRNPNIKLNQLPECYNSVVSPLNMLCNRAEYQLDLLPKSGKLGGLLSLVD
YCSTAMGKSLKFSLLNPITDHSELNLR YEEIATFKQLYNKKMFDNSELKHIKDLSSLHRQ
WTMCASSDTTLPK KLSQIYHSYLSANQLMSKLTNNIQLPPLVVPQLELLIEEMGRIFQTD
NLLGDFKDVLPQTDNLTNFFVQQQTLKAQLTEWGEQTSNIVFQDTISIKAEYFNKEAYAF
SILSKKLT KLEQYMPDNSIMMLGKSGSHHMITSP TIHKVSIELNLL EEQINTYVKQTYNRE
LKSLYFSYSELFLPLENMISSLDVALSGAIAAIFKNYTKPCLMLTKSHQPQQT KGLMEAIN
LRHPLVEQLNTQEECVAHNISLEDKGM LMFVNGAGKSTLLSAIGVNVILAQAGMYVAA
DSFSLSPYHYLITRILGGDDLHKGGQT FEVEMSDLSTMLKLANYNLMLGDEICHGTEVS
SGAAMLAATIESL TAAQTSFVLS THLHQVCSLIDSPVRY YHLSVIQQEDLGLIYERK LKPG
PGPSQY GIEVMGHMINDKKFYTSAL KYRKLINWEPSPRSSESSLTVFRPSKY NARVFDSC
EMCGAPAEAIHHIQPKNQLKNQPKKLCN SSSNLVPVCSSCHLDIHSNKISILGWSGTPGHK
KLYWVYLNESLDSGTE*

Protein annotation of *mtMutS* gene in *A. digitatum*



Protein sequence of *mtMutS* gene in *P. resedaeformis*

MNQIPMQYFNLAENYSKYGLSVIQLIQIGKFYELWHEPDTSSSQQAYSQAELLAESSMR
 SQPLGVTPIIEQVASLLDMSMMLPGKSSLLQMGFPIYSLTTHLSTLLDKGWTVMVIDELV
 TGKSGPKQRAVSQVYSPSCNLEDCSELSYVLSIYFSQDDLLGITLFSVMNGHSMMFPVSW
 TDSKVARLLINYRISEMVIWANSAGSEILMNKMYNLLIGWNLPSEPNKMEVMGEA
 LTNLPCYLSYSYENNNKEWLLLHIYMGINAEFWNKNYQEYTL SKMFQSTWTENVNQVN
 LISLLGVLQFIKDRNPNIKLNQLPECYNSVVSPLNMLCNRAEYQLDLLPKSGKLGGLLS
 LVDYCSTAMGKSLKFRLLNPITDHSSELNLR YEEIATFKQLLDKMKMFDNSELKHIKDLSSL
 HRQWAMCASSDTTLPKKLSQIYHSYLFANQLMSKLMNNKWINIQLPPSVGPQLELLIEE
 MGRV FQADNLLGDFKDVLPQTDNLTNFFVQQQTLKAQLTEWAEQTSNIVFQDTISIKAE
 YFNKEGYAFSILPKKLIKLEQYLTNASMSDNSIMMLGKSGSHHMITSPAIHKVSIELNLE
 EQINTYVKQTYNRELKSLYFSYSELFLPLVNMISLSDVALSGAIAAIKFNKYPCLMLAKS
 QQTGKLM EAINLRHPLVEQLNTQEECVAHNISLEDKGLMFMFSVNGAGKSTLLSAIGVNV
 LAQAGMYVAADSFSLSPYHYLITRILGGDDLHKGQGTFEVEMSDLSTMLKLANYSMLML
 GDEICHGTEVSSGAAMLAATIESLTAQTSFVLS THLHQVCSLIDSPVRY YHLSVIQQEDL
 GLIYERKLPKPGPSQYGI EVMGHMINDK KFYTSALKYRKLINWEPSSRSEPNSLTVFRPS
 KYNVRVFDSC E MCGAPAEAIHHIQPKNQLKSQPSKLCNSSSNLVPVCSCHLDIHSNKISI
 LGWKGTPGHK KLYWVYLNESLDSGTE*

Protein annotation of *mtMutS* gene in *P. resedaeformis*

