

Supplementary material

A new family and two new genera of calcaxonian octocoral, including a redescription of *Pleurogorgia militaris* (Cnidaria: Octocorallia: Chrysogorgiidae) and its placement in a new genus

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Table S1. Primer list and PCR thermal profiles

Region	Primer	Sequence (5'–3')	Annealing temperature	Reference
<i>mtMutS</i>	AnthoCorMSH	AGGAGAATTATTCTAAGTATGG	98°C: 2 min,	Herrera <i>et al.</i> (2010)
	Mut-3458R	TSGAGCAAAAGCCACTCC	(98°C: 15s; 50°C: 15 s, 72°C: 60 s) × 32, 72°C: 2 min	Sánchez <i>et al.</i> (2003)
<i>COI</i>	COI8414-F	CCAGGTAGTATGTTAGGRGA	98°C: 2 min,	McFadden, unpubl. data
	HCO2198	TAAACTTCAGGGTGACCAAAAAATCA	(98°C: 15 s; 45°C: 15 s, 72°C: 60 s) × 32, 72°C: 2 min	Folmer <i>et al.</i> (1994)
<i>18S</i>	18S-Af	AACCTGGTTGATCCTGCCAGT	98°C: 2 min,	Medlin <i>et al.</i> (1988)
	18S-Yr	CAGACAAATCGCTCCACCCAC	(98°C: 15 s; 60°C: 15 s, 72°C: 60 s) × 32, 72°C: 2 min	Medlin <i>et al.</i> (1988)

Table S2. The sequences used in this study

Species	Voucher or isolate	GenBank accession number		
		<i>MutS</i>	<i>COI</i>	<i>18S</i>
<i>Aurogorgia tasmaniensis</i> (<i>Pleurogorgia</i> sp. sensu Pante et al., 2012)	CSIRO8	JN227925	JN874923	JN227963
<i>Ramuligorgia militaris</i>	MBM286491	MT316532	MT316533	
<i>Iridogorgia squarrosa</i>	MBM286539	MK431865	-	-
<i>Iridogorgia densispicula</i>	MBM286538	MK431864	-	-
<i>Iridogorgia splendens</i>	REH1042	JN228005	GQ868330	JN227968
<i>Iridogorgia</i> sp.	MOL601-4	GQ868342	GQ868323	
<i>Iridogorgia magnispiralis</i>	KEL4032	JN227997	DQ860111	FJ526216
<i>Iridogorgia</i> sp. type C	P42258	JN227919	-	-
<i>Iridogorgia fontinalis</i>	YPMIZ38584	EU293802	GQ868321	-
<i>Iridogorgia</i> sp.	YPM-28866	DQ297422	-	-
<i>Iridogorgia</i> sp. type A	SAL22297-2	GQ180145	-	-
<i>Rhodaniridogorgia fragilis</i>	NAS2081	JN228000	JN227954	JN247405
<i>Pseudochrysogorgia bellona</i>	EBI25572	GQ868332	GQ868310	HM590865
<i>Metallogorgia melanotrichos</i>	VER2031	GQ180158	FJ268633	FJ358836
<i>Metallogorgia macrospina</i>	NIWA15642	JN228001	JN227952	JN227966
<i>Chrysogorgia pinnata</i>	USNM1102450	JN227988	JN227956	JN227960
<i>Chrysogorgia monticola</i>	USNM1102452	JN227989	JN227955	JN227961
<i>Chrysogorgia chryseis</i>	CR1062	JN227992	GQ868308	AF052913
<i>Radicipes gracilis</i>	USNM100900	DQ297424	HM590861	HM590864
<i>Radicipes stonei</i>	USNMIZ1418007	MG986912	-	-
<i>Helicogorgia flagellata</i>	SAMH3929	JN227929	JN227953	JN227971
<i>Primnoisis tasmani</i>	TMAGK4275	KT070896	-	-
<i>Primnoisis chatham</i>	NIWA53139	KT070948	-	-
<i>Notisis elongata</i>	TER11082	KX362346	-	-
<i>Isidoidea armata</i>	TER20516	JN227946	JN227951	JN227972
<i>Chelidonisis aurantiaca mexicana</i>	LII09170	KC788274	-	-
<i>Calyptrophora inornata</i>	N11159	MG986936	-	-
<i>Mirostenella articulata</i>	AE093	KP324297	-	-
<i>Thouarella antarctica</i>	AR018	KP324301	-	-
<i>Primnoella antarctica</i>	N26	KP324367	-	-
<i>Dasystenella austasensis</i>	AE021	KP324290	-	-
<i>Perissogorgia vitrea</i>	N9882	MG986915	-	-
<i>Dichotella gemmacea</i>	NTMC014929	GQ342492	-	-
<i>Junceella juncea</i>	RMNHCoel40932	KF915624	-	-
<i>Ctenocella schmitti</i>	JAS238	JN227995	-	-
<i>Stephanogorgia faulkneri</i>	PAL028	JN228004	JN227958	JN227967
<i>Trichogorgia capensis</i>	SAF141	JN227924	JN227959	JN227970
<i>Ifalukella yanii</i>	UF4139	GQ342501	GQ342427	JN874924
<i>Cladarisis nouviana</i>	RUM1072	KX362252	-	-
<i>Keratoisis grayi</i>	5663	KX362308	-	-
<i>Isis hippuris</i>	-	JN383337	-	-
<i>Isidella tentaculum</i>	J2099221	KX362317	-	-

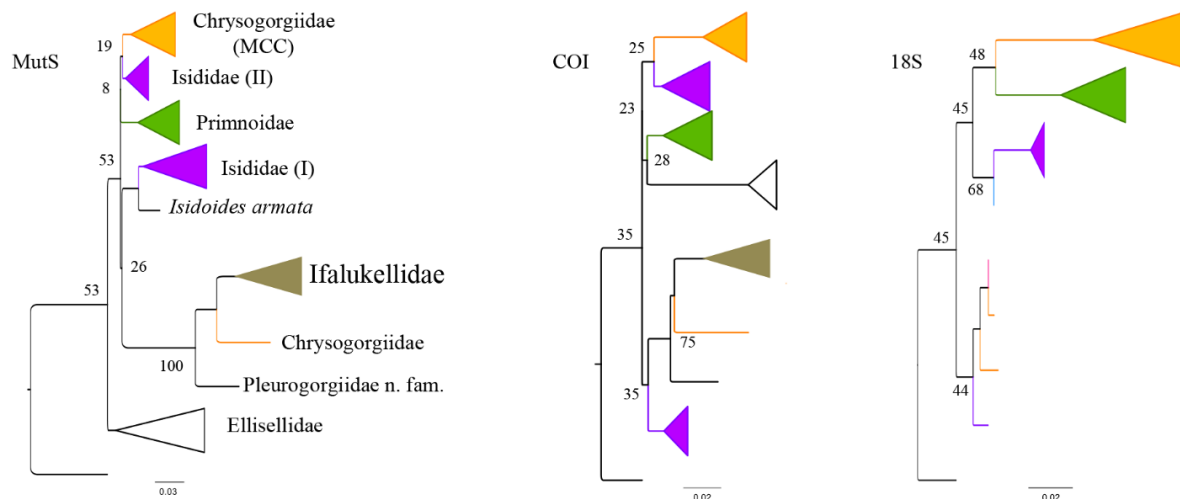


Fig. S1. Maximum likelihood (ML) trees inferred from *mtMutS*, *COI* and *18S*.

References

- Apakupakul, K., Siddall, M. E., and Burreson, E. M. (1999). Higher level relationships of leeches (Annelida: Clitellata: Euhirudinea) based on morphology and gene sequences. *Molecular Phylogenetics and Evolution* **12**, 350–359. [doi:10.1006/mpev.1999.0639](https://doi.org/10.1006/mpev.1999.0639)
- Folmer, O., Black, M., Hoeh, W., Lutz, R., and Vrijenhoek, R. (1994). DNA primers for amplification of mitochondrial cytochrome c oxidase subunit I from diverse metazoan invertebrates. *Molecular Marine Biology and Biotechnology* **3**, 294–299.
- Herrera, S., Baco, A., and Sánchez, J. A. (2010). Molecular systematics of the bubblegum coral genera (Paragorgiidae, Octocorallia) and description of a new deep-sea species. *Molecular Phylogenetics and Evolution* **55**, 123–135. [doi:10.1016/j.ympev.2009.12.007](https://doi.org/10.1016/j.ympev.2009.12.007)
- Medlin, L., Elwood, H. J., Stickel, S., and Sogin, M. L. (1988). The characterization of enzymatically amplified eukaryotic 16S-like rRNA-coding regions. *Gene* **71**, 491–499. [doi:10.1016/0378-1119\(88\)90066-2](https://doi.org/10.1016/0378-1119(88)90066-2)
- Sánchez, J. A., Lasker, H. R., and Taylor, D. J. (2003). Phylogenetic analyses among octocorals (Cnidaria): mitochondrial and nuclear DNA sequences (18S and ssu-rRNA, 18S) support two convergent clades of branching gorgonians. *Molecular Biology and Evolution* **29**, 31–42.