Supplementary 2. PCR primers used in this study. PCR conditions of all markers were in 35 cycles.

PCR primers			
Markers	Primers	Sequences (5'-3')	References
COI	FishF1	TCAACCAACCACAAAGACATTGGCAC	Ward *et al.* (2005)
	FishF2	TCGACTAATCATAAAGATATCGGCAC	
	FishR1	TAGACTTCTGGGTGGCCAAAGAATCA	
	FishR2	ACTTCAGGGTGACCGAAGAATCAGAA	
cytb	LopCytbF1	ARCCAGGRCNAAYGGNTYGAAA	Huang (2015)
	LopCytbF2	TTAACCAGGACNARYGGCTTGA	
	LopCytbR2	TTCGRSTTACAARNCCGAKGCTCT	
rhodopsin	RH193F	CNTATGAATAYCCTCAGTACTACC	Chen *et al.* (2003)
	RH1039R	TGCTTGTTCATGCAGATGTAGA	
RAG1	2553F	CTGAGCTGCAGTCAGTACCATAAGATGT	López *et al.* (2004)
	4090R	CTGAGTCCTTGTGAGCTTCCATRAAYTT	

PCR conditions (Huang, 2015)					
Markers	Primary denaturation	Denaturation	Annealing	Extension	Additional extension
COI	94°C , 1 min	94°C , 30 sec	51°C , 30 sec	72°C , 40 sec	72°C , 2 min
cytb	95°C , 4 min	95°C , 40 sec	53°C , 40 sec	72°C , 1 min 15 sec	72°C , 7 min
rhodopsin	95°C , 5 min	95°C , 40 sec	55°C , 40 sec	72°C , 1 min	72°C , 7 min
RAG1	95°C , 5 min	95°C , 40 sec	53°C , 40 sec	72°C , 1 min 30 sec	72°C , 7 min

References

Chen W.-J., Bonillo C., Lecointre G. 2003. Repeatability of clades as a criterion of reliability: A case study for molecular phylogeny of acanthomorpha (teleostei) with larger number of taxa. *Molecular Phylogenetics and Evolution* 26: 262–288. https://doi.org/10.1016/S1055-7903(02)00371-8

Huang C.-S. 2015. *Molecular systematics of the Lophiidae, Ogcocephalidae, and Chaunacidae (Lophiiformes) occurring in Western Pacific Ocean*. Master thesis. National Taiwan University.

López J.A., Chen W.-J., Ortí G. 2004. Esociform Phylogeny. *Copeia* 2004: 449–464. https://doi.org/10.1643/CG-03-087R1

Ward R.D., Zemlak T.S., Innes B.H., Last P.R., Hebert P.D. 2005. DNA barcoding Australia's fish species. *Philosophical Transactions of the Royal Society B*: Biological Sciences 360: 1847–1857. https://doi.org/10.1098/rstb.2005.1716