

**TABLE S1** | Molecular voucher information for new sequences, GenBank SRA and accession numbers for existing and previously published sequences, and sources of previously published sequence data. Alignments for the Sanger and expanded matrices are in Tabs. S4–S5.

Order	Family	Scientific Name	Voucher(s)	UCE	16S	COI	ENC1	GlyT	HH3	PLAGL2	RAG1	SREB2	TBR
Ophidiiformes	Ophidiidae	<i>Chilara taylori</i>	SIO 95-3	SAMN27750777	AY538967	KF929735	ON365542	ON365546	AY539176	N/A	ON365553	SAMN27750777	SAMN27750777
				Current Study	Smith, Wheeler (2004)	Bentley, Wiley, unpublished	Current Study	Current Study	Smith, Wheeler (2004)		Current Study	Current Study	Current Study
Gobiiformes	Apogonidae	<i>Phaeoptyx pigmentaria</i>	no new sequences	SRR4432423	SRR4432423	AB890090	KF139465	SRR4432423	SRR4432423	KC828072	KF141312	KF140240	KC830436
				Alfaro <i>et al.</i> (2018)	Alfaro <i>et al.</i> (2018)	Mabuchi <i>et al.</i> (2014)	Near <i>et al.</i> (2013)	Alfaro <i>et al.</i> (2018)	Alfaro <i>et al.</i> (2018)	Betancur-R <i>et al.</i> (2013b)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Betancur-R <i>et al.</i> (2013b)
Syngnathiformes	Aulostomidae	<i>Aulostomus chinensis</i>	KUIT 4479/CAS-ICH 218200	SAMN27750772	ON328326	MG816655	SAMN27750772	KF139680	SAMN27750772	KF140683	KF141181	KF140165	KF140305
				Current Study	Current Study	Parenti <i>et al.</i> , unpublished	Current Study	Near <i>et al.</i> (2013)	Current Study	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)
Scombriformes	Scombridae	<i>Scomber scombrus</i>	no new sequences	SRR11016337	DQ027929	DQ027999	KF139607	KF139875	DQ028101	KF140848	KF141355	KF140269	KF140447
				Girard <i>et al.</i> (2020)	Sparks <i>et al.</i> (2005)	Sparks <i>et al.</i> (2005)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Sparks <i>et al.</i> (2005)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)
	Arripidae	<i>Arripis trutta</i>	no new sequences	SRR10484756	AP006810	AP006810	N/A	N/A	N/A	KT883785	EU167760	N/A	N/A
				Friedman <i>et al.</i> (2019)	Yagishita <i>et al.</i> (2009)	Yagishita <i>et al.</i> (2009)				Sanciango <i>et al.</i> (2016)	Mahon (2007)		
Carangiformes	Latidae	<i>Lates calcarifer</i>	AMNH 233713	SRR11016328	DQ532892	KU692587	N/A	SRR11016328	DQ533389	HQ731323	HQ731300	HQ731194	SRR11016328
				Girard <i>et al.</i> (2020)	Smith, Wheeler (2006)	Dahrudin <i>et al.</i> , 2016		Girard <i>et al.</i> (2020)	Smith, Wheeler (2006)	Li <i>et al.</i> (2011)	Li <i>et al.</i> (2011)	Li <i>et al.</i> (2011)	Girard <i>et al.</i> (2020)
Cichliformes	Cichlidae	<i>Cichla temensis</i>	AMNH 226310	SAMN27750778	AY662729	AY662781	JX188934	JX188768	AY662928	JQ352894	JQ353048	JQ353117	JX189248
				Current Study	Sparks, Smith (2004b)	Sparks, Smith (2004b)	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)	Sparks, Smith (2004b)	Near <i>et al.</i> (2012b)	Near <i>et al.</i> (2012b)	Near <i>et al.</i> (2012b)	Wainwright <i>et al.</i> (2012)
Beloniformes	Adrianichthyidae	<i>Oryzias latipes</i>	J. N. Volff, Personal Collection	SAMN27750800	AY655502	AY655532	EF032979	EF032992	AY655594	EF033018	EF095641	EF033031	EF032966
				Current Study	Sparks, Smith (2004a)	Sparks, Smith (2004a)	Li <i>et al.</i> (2007)	Li <i>et al.</i> (2007)	Sparks, Smith (2004a)	Li <i>et al.</i> (2007)	Chen <i>et al.</i> (2007)	Li <i>et al.</i> (2007)	Li <i>et al.</i> (2007)
Scorpaeniformes	Acanthistiidae	<i>Acanthistius ocellatus</i>	AMS I.42844022	SAMN27750768	DQ532831	MH707690	KX230198	KX230244	DQ533328	KX230293	KX230328	SAMN27750768	SAMN27750768
				Current Study	Smith, Wheeler (2006)	Driskell <i>et al.</i> , unpublished	Smith <i>et al.</i> (2016)	Smith <i>et al.</i> (2016)	Smith, Wheeler (2006)	Smith <i>et al.</i> (2016)	Smith <i>et al.</i> (2016)	Current Study	Current Study

TABLE S1 | (Continued)

Order	Family	Scientific Name	Voucher(s)	UCE	16S	COI	ENC1	GlyT	HH3	PLAGL2	RAG1	SREB2	TBR
Scorpaeniformes	Anthiadiidae	<i>Hemanthias leptus</i>	AMNH uncataloged, purchased at fish market in New York City on 20 June 2001 and donated by WLS on 21 June 2001	SAMN27750789	AY539051	KF461187	ON365544	ON365548	AY539260	ON365552	ON365555	SAMN27750789	SAMN27750789
				Current Study	Smith, Wheeler (2004)	Handy <i>et al.</i> , unpublished	Current Study	Current Study	Smith, Wheeler (2004)	Current Study	Current Study	Current Study	Current Study
		<i>Pseudanthias pleurotaenia</i>	SIO uncataloged from specimen donated by Birch Aquarium at Scripps	SAMN27750808	EF120854	FJ583938	N/A	SAMN27750808	EF120895	SAMN27750808	SAMN27750808	SAMN27750808	SAMN27750808
				Current Study	Smith, Craig (2007)	Steinke <i>et al.</i> , 2009		Current Study	Smith, Craig (2007)	Current Study	Current Study	Current Study	Current Study
	Epinephelidae	<i>Epinephelus adscensionis</i>	AMNH uncataloged, purchased at fish market in New York City on 20 June 2001 and donated by WLS on 21 June 2001	SAMN27750784	AY539049	ON365668	ON365543	ON365547	AY539258	ON365551	ON365554	SAMN27750784	SAMN27750784
				Current Study	Smith, Wheeler (2004)	Current Study	Current Study	Current Study	Smith, Wheeler (2004)	Current Study	Current Study	Current Study	Current Study
		<i>Grammistes sexlineatus</i>	KUIT 723/USNM 334460	SAMN27750787	AY539050	MF123912	KF139554	KF139756	AY539259	KF140748	KF141246	KF140207	KF140359
				Current Study	Smith, Wheeler (2004)	Kimmerling <i>et al.</i> (2017)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Smith, Wheeler (2004)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)
	Percidae	<i>Perca flavescens</i>	no new sequences	SRR11016340	AY539055	AY662755	KP965930	KP965944	AY539264	KP965976	KP966008	KC134599	KP966053
				Girard <i>et al.</i> (2020)	Smith, Wheeler (2004)	Sparks, Smith (2004b)	Near <i>et al.</i> (2015)	Near <i>et al.</i> (2015)	Smith, Wheeler (2004)	Near <i>et al.</i> (2015)	Near <i>et al.</i> (2015)	Near, Keck (2013)	Near <i>et al.</i> (2015)

TABLE S1 | (Continued)

Order	Family	Scientific Name	Voucher(s)	UCE	16S	COI	ENC1	GlyT	HH3	PLAGL2	RAG1	SREB2	TBR
Scorpaeniformes	Serranidae	<i>Diplectrum formosum</i>	AMNH uncataloged, collected by WLS ~ 20 miles off the coast of Apalachicola, FL on 20 July 2001 and donated by WLS to AMNH on 14 Dec. 2001	SAMN27750781	AY539048	KY402422	KX230210	KX230255	AY539257	KC828352	KX230335	MH807905	KC830311
				Current Study	Smith, Wheeler (2004)	Matias <i>et al.</i> , unpublished	Smith <i>et al.</i> (2016)	Smith <i>et al.</i> (2016)	Smith, Wheeler (2004)	Betancur-R <i>et al.</i> (2013b)	Smith <i>et al.</i> (2016)	Ghedotti <i>et al.</i> (2018)	Betancur-R <i>et al.</i> (2013b)
		<i>Hypoplectrus puella</i>	no new sequences	SRR4432437	AY072679	HQ573385	JX188924	JX188758	SRR4432437	JX189385	JX189857	N/A	JX189239
				Alfaro <i>et al.</i> (2018)	Pondella <i>et al.</i> (2003)	Victor (2012)	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)	Alfaro <i>et al.</i> (2018)	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)
Centrarchiformes	Centrarchidae	<i>Lepomis cyanellus</i>	no new sequences	SRR11016327	KC427094	KX145607	KF139483	KF139785	MH807865	JQ352862	JF742895	JQ353092	KC830377
				Girard <i>et al.</i> (2020)	Li <i>et al.</i> (2014)	Schoelincx <i>et al.</i> , unpublished	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Ghedotti <i>et al.</i> (2018)	Near <i>et al.</i> (2012b)	Near <i>et al.</i> (2012b)	Near <i>et al.</i> (2012b)	Betancur-R <i>et al.</i> (2013b)
	Microcanthidae	<i>Microcanthus strigatus</i>	KUIT 10811/KUI 41683	SAMN27750797	NC_013182	NC_013182	N/A	N/A	DQ533407	N/A	JX908390	SAMN27750797	SAMN27750797
				Current Study	Yagishita <i>et al.</i> (2009)	Yagishita <i>et al.</i> (2009)			Smith, Wheeler (2006)		Knudsen, Clements, unpublished	Current Study	Current Study
Acanthuriformes	Drepanidae	<i>Drepane africana</i>	FMNH 118168	SAMN27750783	DQ532868	MH807841	N/A	MH807849	DQ533365	MH807870	EF095656	MH807906	MH807920
				Current Study	Smith, Wheeler (2006)	Ghedotti <i>et al.</i> (2018)		Ghedotti <i>et al.</i> (2018)	Smith, Wheeler (2006)	Ghedotti <i>et al.</i> (2018)	Chen <i>et al.</i> (2007)	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)
	Haemulidae	<i>Haemulon vittatum</i>	KUIT 329/USNM 349224	SAMN27750788	JN688748	EU697535	JX188888	JX188721	SAMN27750788	JX189352	JX189824	SAMN27750788	JX189208
				Current Study	Liang <i>et al.</i> (2012)	Rocha <i>et al.</i> (2008)	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)	Current Study	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)	Current Study	Wainwright <i>et al.</i> (2012)
	Lutjanidae	<i>Lutjanus goreensis</i>	no new sequences	SRR4432393	SRR4432393	SRR4432393	N/A	N/A	SRR4432393	SRR4432393	N/A	SRR4432393	SRR4432393
				Alfaro <i>et al.</i> (2018)	Alfaro <i>et al.</i> (2018)	Alfaro <i>et al.</i> (2018)			Alfaro <i>et al.</i> (2018)	Alfaro <i>et al.</i> (2018)		Alfaro <i>et al.</i> (2018)	Alfaro <i>et al.</i> (2018)



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Order	Family	Scientific Name	Voucher(s)	UCE	16S	COI	ENC1	GlyT	HH3	PLAGL2	RAG1	SREB2	TBR
Acanthuriformes	Monodactylidae	<i>Monodactylus argenteus</i>	KUIT 6758/SAIAB 77915	SAMN27750798	DQ532912	MK348203	SAMN27750798	N/A	DQ533409	EU182636	EU182624	N/A	KC830404
				Current Study	Smith, Wheeler (2006)	Divya <i>et al.</i> , unpublished	Current Study		Smith, Wheeler (2006)	Holcroft, Wiley (2008)	Holcroft, Wiley (2008)		Betancur-R <i>et al.</i> (2013b)
Uranoscopiformes	Ammodytidae	<i>Ammodytes hexapterus</i>	KUIT 2550/KUI 29791	SAMN27750770	KJ010573	MH673725	KF139576	KF139665	N/A	KF140667	KF141166	KF140152	KF140290
				Current Study	Elz <i>et al.</i> , unpublished	Turanov <i>et al.</i> , unpublished	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)		Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)
	Cheimarrichthyidae	<i>Cheimarrichthys fosteri</i>	R. McDowell, Ashley River, New Zealand, April 2002	SAMN27750776	DQ532855	AY722120	KF139575	KF139711	DQ533352	KF140714	KF141205	KF140184	SAMN27750776
				Current Study	Smith, Wheeler (2006)	Thacker, Hardman (2005)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Smith, Wheeler (2006)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Current Study
	Leptoscopidae	<i>Lesueurina platycephala</i>	AMS 1.41267006	SAMN27750794	DQ532895	BOLD:AAD1165	KT266288	KT266305	DQ533392	KT266356	KT266416	KT266470	KT266495
				Current Study	Smith, Wheeler (2006)	Appleyard <i>et al.</i> , unpublished	Thacker <i>et al.</i> (2015)	Thacker <i>et al.</i> (2015)	Smith, Wheeler (2006)	Thacker <i>et al.</i> (2015)	Thacker <i>et al.</i> (2015)	Thacker <i>et al.</i> (2015)	Thacker <i>et al.</i> (2015)
Uranoscopidae	<i>Astroscopus ygraecum</i>	KUIT 8305/USNM 388248	SAMN27750771	SAMN27750771	SAMN27750771	JX188979	JX188806	N/A	KC828267	JX189907	JX190047	JX189286	
			Current Study	Current Study	Current Study	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)		Betancur-R <i>et al.</i> (2013b)	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)	
Acropomatiformes	Acropomatidae	<i>Acropoma japonicum</i>	AMNH 239796	SAMN27750769	MH813291	MH807843	Rabosky	Rabosky	MH807861	JQ352858	JQ353019	JQ353088	KF140285
				Current Study	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Near <i>et al.</i> (2012b)	Near <i>et al.</i> (2012b)	Near <i>et al.</i> (2012b)	Near <i>et al.</i> (2013)
		<i>Doederleinia berycoides</i>	KUIT 10758/KUI 41612	SAMN27750782	AP009181	AP009181	Rabosky	MH813445	SAMN27750782	Rabosky	MH807875	Rabosky	Rabosky
				Current Study	Yamanoue <i>et al.</i> (2007)	Yamanoue <i>et al.</i> (2007)	Rabosky <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Current Study	Rabosky <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)



TABLE S1 | (Continued)

Order	Family	Scientific Name	Voucher(s)	UCE	16S	COI	ENC1	GlyT	HH3	PLAGL2	RAG1	SREB2	TBR
Acropomatiformes	Banjosidae	<i>Banjos banjos</i>	KUIT 10628/KUI 41491	SAMN27750773	KT345965	KY371208	KF139468	KF139687	ON365549	KF140689	KF141186	MH807903	KF140309
				Current Study	Liu, Xu, unpublished	Hou, Xie, unpublished	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Current Study	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Ghedotti <i>et al.</i> (2018)	Near <i>et al.</i> (2013)
	Bathyclupeidae	<i>Neobathyclupea argentea</i>	KUIT 8189/MCZ 166172	SAMN27750799	MH813289	MH807842	Rabosky	Rabosky	MH807857, MH807858	KT883781	Rabosky	Rabosky	MH807925
				Current Study	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Sanciangco <i>et al.</i> (2016)	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)
	Champsodontidae	<i>Champsodon cf. snyderi</i>	KUIT 10787/KUI 41640	SAMN27750775	AY539065	JQ681321	KF139578	KF139708	AY539274	KF140710	N/A	KF140181	KF140324
				Current Study	Smith, Wheeler (2004)	Wang <i>et al.</i> , 2012	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Smith, Wheeler (2004)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)
	Creediidae	<i>Crystallodytes cookei</i>	R. Langston, Makapuu Beach, Oahu, Hawaii, Dec. 2001	SAMN27750779	SAMN27750779	SAMN27750779	SAMN27750779	N/A	SAMN27750779	SAMN27750779	SAMN27750779	SAMN27750779	SAMN27750779
				Current Study	Current Study	Current Study	Current Study		Current Study	Current Study	Current Study	Current Study	Current Study
	Dinolestidae	<i>Dinolestes lewini</i>	AMS I.41084034	SAMN27750780	DQ532866	BOLD:AAD2949	Rabosky	Rabosky	DQ533363	Rabosky	EU167828	MH807904	MH807919
				Current Study	Smith, Wheeler (2006)	Miskiewicz, unpublished	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Smith, Wheeler (2006)	Rabosky <i>et al.</i> (2018)	Mahon (2007)	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)
	Epigonidae	<i>Epigonus denticulatus</i>	KUIT 3283/MCZ 155865	SAMN27750785	AP017435	AP017435	N/A	N/A	SAMN27750785	SAMN27750785	SAMN27750785	SAMN27750785	SAMN27750785
				Current Study	Satoh <i>et al.</i> , unpublished	Satoh <i>et al.</i> , unpublished			Current Study	Current Study	Current Study	Current Study	Current Study
	Glaucosomatidae	<i>Glaucosoma hebraicum</i>	AMNH uncataloged, collected 20 April 2002 22° 38' 66" N and 120° 12' 17"	SAMN27750786	MH813293	BOLD:AAD5457	KF139503	KF139752	MH807864	KF140745	KF141242	KF140206	KF140356
				Current Study	Ghedotti <i>et al.</i> (2018)	Evans, unpublished	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Ghedotti <i>et al.</i> (2018)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)
Hemerocoetidae	<i>Acanthaphritis uroorum</i>	no new sequences	N/A	NC_034344	NC_034344	KF139581	N/A	N/A	KF140660	KF141160	KF140151	N/A	
				Satoh <i>et al.</i> (2016)	Satoh <i>et al.</i> (2016)	Near <i>et al.</i> (2013)			Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)		



TABLE S1 | (Continued)

Order	Family	Scientific Name	Voucher(s)	UCE	16S	COI	ENC1	GlyT	HH3	PLAGL2	RAG1	SREB2	TBR
Acropomatiformes	Howellidae	<i>Bathysphyraenops simplex</i>	SIO 11-196	SAMN27750774	SAMN27750774	SAMN27750774	SAMN27750774	SAMN27750774	SAMN27750774	N/A	SAMN27750774	SAMN27750774	SAMN27750774
				Current Study	Current Study	Current Study	Current Study	Current Study	Current Study		Current Study	Current Study	Current Study
		<i>Howella brodiei</i>	KUIT 3098/MCZ 155368	SAMN27750792	DQ532883	KY033633	MH807844, MH807845, MH807846	MH813444	DQ533380	GU368849	GU368831	GU368776	MH807921
			Current Study	Smith, Wheeler (2006)	Kenchington <i>et al.</i> (2017)	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Smith, Wheeler (2006)	Li <i>et al.</i> (2010)	Li <i>et al.</i> (2010)	Li <i>et al.</i> (2010)	Ghedotti <i>et al.</i> (2018)	
	Lateolabracidae	<i>Lateolabrax japonicus</i>	KUIT 10314/NSMT-P 101262	SAMN27750793	DQ532891	BOLD:ABFJ090-06	MH807847, MH807848	MH807850	DQ533388	MH807871	MH807876, MH807877, MH807878	MH807908	MH807922, MH807923
				Current Study	Smith, Wheeler (2006)	Chow <i>et al.</i> , unpublished	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Smith, Wheeler (2006)	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)
	Malakichthyidae	<i>Hemilutjanus macropthalmos</i>	UMSNH 18297	SAMN27750790	ON328327	ON365669	ON365545	SAMN27750790	ON365550	SAMN27750790	SAMN27750790	SAMN27750790	SAMN27750790
				Current Study	Current Study	Current Study	Current Study	Current Study	Current Study	Current Study	Current Study	Current Study	Current Study
		<i>Malakichthys griseus</i>	Y. Yamanoue, Honshu, Japan, Kanagawa Pref., February 2001	SAMN27750795	DQ532903	KY371731	N/A	MH813443	DQ533400	MH807872	N/A	MH807909, MH807910	MH807924
				Current Study	Smith, Wheeler (2006)	Hou, Xie, unpublished		Ghedotti <i>et al.</i> (2018)	Smith, Wheeler (2006)	Ghedotti <i>et al.</i> (2018)		Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)
		<i>Malakichthys wakiyai</i>	KUIT 10854/KUI 41723	SAMN27750796	SAMN27750796	KP266820	N/A	SAMN27750796	SAMN27750796	SAMN27750796	SAMN27750796	SAMN27750796	SAMN27750796
				Current Study	Current Study	Li, Lin, unpublished		Current Study	Current Study	Current Study	Current Study	Current Study	Current Study
	Ostracoberycidae	<i>Ostracoberyx dorygenys</i>	AMNH 240609	SAMN27750801	EF120871	KU892849	KF139532	KF139819	EF120912	KF140795	EU167855	MH807911	KF140401
				Current Study	Smith, Craig (2007)	Chang <i>et al.</i> , unpublished	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Smith, Craig (2007)	Near <i>et al.</i> (2013)	Mahon (2007)	Ghedotti <i>et al.</i> (2018)	Near <i>et al.</i> (2013)
	Pemppheridae	<i>Parapriacanthus ransonneti</i>	KUIT 7174/SALAB 78177	SAMN27750803	MH807836	JF494087	N/A	MH807851, MH807852, MH807853	MH807859	KC828256	EU167857	MH807912	KC830430
				Current Study	Ghedotti <i>et al.</i> (2018)	Steinke <i>et al.</i> , unpublished		Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Betancur-R <i>et al.</i> (2013b)	Mahon (2007)	Ghedotti <i>et al.</i> (2018)	Betancur-R <i>et al.</i> (2013b)



TABLE S1 | (Continued)

Order	Family	Scientific Name	Voucher(s)	UCE	16S	COI	ENC1	GlyT	HH3	PLAGL2	RAG1	SREB2	TBR
Acropomatiformes	Pempheridae	<i>Pempheris oualensis</i>	KUIT 796/USNM 329748	SAMN27750805	SAMN27750805	KJ937295	N/A	MH807854	MH807867	KC828257	EU167858	SAMN27750805	KC830432
				Current Study	Current Study	Randall <i>et al.</i> , unpublished		Ghedotti <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Betancur-R <i>et al.</i> (2013b)	Mahon (2007)	Current Study	Betancur-R <i>et al.</i> (2013b)
	Pempheridae	<i>Pempheris schomburgkii</i>	no new sequences	SRR4432409	JQ938971	KJ937298	KF139533	KF139825	SRR4432409	KF140804	KF141306	SRR4432409	SRR4432409
				Alfaro <i>et al.</i> (2018)	Betancur-R <i>et al.</i> (2013b)	Randall <i>et al.</i> , unpublished	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Alfaro <i>et al.</i> (2018)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Alfaro <i>et al.</i> (2018)	Alfaro <i>et al.</i> (2018)
	Pentacerotidae	<i>Histiopertus typus</i>	KUIT 10504/KUI 41436	SAMN27750791	AP006807	AP006807	KF139535	KF139766	N/A	KF140757	KF141257	SAMN27750791	KF140364
				Current Study	Yagishita <i>et al.</i> (2009)	Yagishita <i>et al.</i> (2009)	Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)		Near <i>et al.</i> (2013)	Near <i>et al.</i> (2013)	Current Study	Near <i>et al.</i> (2013)
	Polyprionidae	<i>Polyprion americanus</i>	G. Sedberry, North Azores, February 1997	SAMN27750806	DQ532940	HQ945983	Rabosky	Rabosky	DQ533437	JQ937559	JQ938266	Rabosky	KC830450
				Current Study	Smith, Wheeler (2006)	Steinke, unpublished	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Smith, Wheeler (2006)	Betancur-R <i>et al.</i> (2013b)	Betancur-R <i>et al.</i> (2013b)	Rabosky <i>et al.</i> (2018)	Betancur-R <i>et al.</i> (2013b)
	Polyprionidae	<i>Polyprion oxygeneios</i>	G. Sedberry, New Zealand, December 1994	SAMN27750807	EF120876	KT883638	N/A	SAMN27750807	EF120917	KT883782	KT883729	SAMN27750807	SAMN27750807
				Current Study	Smith, Craig (2007)	Sanciango <i>et al.</i> (2016)		Current Study	Smith, Craig (2007)	Sanciango <i>et al.</i> (2016)	Sanciango <i>et al.</i> (2016)	Current Study	Current Study
	Scombroptidae	<i>Scombroptus gilberti</i>	KUIT 10731/KUI 41596	SAMN27750809	LC006297	LC006297	Rabosky	Rabosky	MH807860	Rabosky	MH807879	Rabosky	MH807926
				Current Study	Tsunashima <i>et al.</i> (2016)	Tsunashima <i>et al.</i> (2016)	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Ghedotti <i>et al.</i> (2018)
	Stereolepididae	<i>Stereolepis gigas</i>	SIO 03-74	SAMN27750810	DQ532966	GU440534	JX188911	JX188745	DQ533463	JX189372	JX189844	JX189990	JX189229
				Current Study	Smith, Wheeler (2006)	Hastings, Burton, unpublished	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)	Smith, Wheeler (2006)	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)	Wainwright <i>et al.</i> (2012)



TABLE S1 | (Continued)

Order	Family	Scientific Name	Voucher(s)	UCE	16S	COI	ENC1	GlyT	HH3	PLAGL2	RAG1	SREB2	TBR	
Acropomatiformes	Symphysanodontidae	<i>Symphysanodon berryi</i>	no new sequences	N/A	N/A	MH777714	Rabosky	Rabosky	N/A	Rabosky	Rabosky	Rabosky	Rabosky	
						Finnegan <i>et al.</i> , unpublished	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)		Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	
	Synagropidae	<i>Parascombrops philippinensis</i>	KUIT 10658/KUI 41495	SAMN27750802	SAMN27750802	KU943440	Rabosky	Rabosky	SAMN27750802	Rabosky	Rabosky	Rabosky	Rabosky	Rabosky
				Current Study	Current Study	Hastings, Burton, unpublished	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Current Study	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	Rabosky <i>et al.</i> (2018)	
		<i>Parascombrops spinosus</i>	KUIT 8233/MCZ 166196	SAMN27750804	JQ938942	MF041669	N/A	N/A	N/A	JQ937534	N/A	SAMN27750804	SAMN27750804	
				Current Study	Betancur-R <i>et al.</i> (2013b)	Bernard <i>et al.</i> , unpublished				Betancur-R <i>et al.</i> (2013b)		Current Study	Current Study	
		<i>Synagrops bellus</i>	SIO 01-131	SAMN27750811	EF120860	MG856405	EU182646	SAMN27750811	EF120901	EU182634	EU182622	SAMN27750811	SAMN27750811	
				Current Study	Smith, Craig (2007)	Weber <i>et al.</i> , unpublished	Holcroft, Wiley (2008)	Current Study	Smith, Craig (2007)	Holcroft, Wiley (2008)	Holcroft, Wiley (2008)	Current Study	Current Study	
		<i>Synagrops japonicus</i>	KUIT 10843/KUI 41714	SAMN27750812	EF120861	KU943431	SAMN27750812	SAMN27750812	EF120902	SAMN27750812	N/A	SAMN27750812	SAMN27750812	
				Current Study	Smith, Craig (2007)	Stun <i>et al.</i> (2016)	Current Study	Current Study	Smith, Craig (2007)	Current Study		Current Study	Current Study	
	<i>incertae sedis</i>	<i>Schuettea scalaripinnis</i>	no new sequences	N/A	N/A	BOLD:AAI0842	N/A	N/A	N/A	N/A	EU167872	N/A	N/A	
					Pogonoski <i>et al.</i> , unpublished					Mahon (2007)				

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## Neotropical Ichthyology



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