

Supplementary Information:

Table S1. Mitogenomic dataset of barracuda fish species for comparative and phylogenetic analyses. Mitogenome of Blackspot threadfin within the family Polynemidae used as an outgroup taxon for phylogenetic construction.

Family	Organism Name	Accession No	Langht (bp)	References
Sphyraenidae	<i>Sphyraena sphyraena</i>	OQ434241	16841	This Study
	<i>Sphyraena japonica</i>	AP012501	16760	[38]
	<i>Sphyraena jello</i>	KT445895	16699	[39]
	<i>Sphyraena pinguis</i>	MN967008	16620	[40]
	<i>Sphyraena barracuda</i>	AP006828	16707	[38]
	<i>Sphyraena borealis</i>	OR581010	16739	GenBank
Polynemidae	<i>Polydactylus sextarius</i>	KP259870	16836	[53]

Table S2. Comparison of intergenic nucleotides and overlapping regions of six *Sphyræna* mitogenomes genes.

	<i>S. sphyraena</i>			<i>S. jello</i>			<i>S. pinguis</i>			<i>S. barracuda</i>				<i>S. japonica</i>			<i>S. borealis</i>		
genes	start	end	IN	start	end	IN	start	end	IN	start	end	IN	genes	start	end	IN	start	end	IN
F	1	70	0	1	69	0	1	68	0	1	69	0	F	1	69	0	1	68	0
12S	71	1035	0	70	1022	0	69	1022	0	70	1022	0	12S	70	1022	0	69	1023	0
V	1036	1108	0	1023	1095	0	1023	1094	0	1023	1095	0	V	1023	1094	0	1024	1095	0
16S	1109	2889	127	1096	2838	115	1095	2839	48	1096	2838	115	16S	1095	2913	0	1096	2912	0
L2	3017	3090	0	2954	3027	0	2888	2961	3	2954	3027	0	L2	2914	2987	0	2913	2986	0
ND1	3091	4065	5	3028	4002	5	2965	3936	4	3028	4002	5	ND1	2988	3961	0	2987	3961	1
I	4071	4141	-1	4008	4078	-1	3941	4010	-1	4008	4078	-1	I	3962	4030	-1	3963	4032	-1
Q	4141	4211	8	4078	4148	8	4010	4080	-1	4078	4148	8	Q	4030	4100	-1	4032	4102	-1
M	4220	4289	0	4157	4225	0	4080	4150	1	4157	4225	0	M	4100	4169	7	4102	4171	7
ND2	4290	5351	30	4226	5275	42	4152	5198	7	4226	5275	42	ND2	4177	5232	0	4179	5228	15
W	5382	5452	3	5318	5389	2	5206	5278	0	5318	5388	3	A	5233	5301	44	5244	5312	21
A	5456	5524	1	5392	5460	1	5279	5347	1	5392	5460	1	W	5346	5415	22	5334	5404	58
N	5526	5598	47	5462	5534	38	5349	5421	36	5462	5534	38	N	5438	5510	51	5463	5535	39
C	5646	5712	12	5573	5638	1	5458	5522	0	5573	5638	1	C	5562	5629	-1	5575	5640	0
Y	5725	5794	1	5640	5711	1	5523	5592	1	5640	5709	1	Y	5629	5698	1	5641	5708	1
COI	5796	7352	-5	5713	7275	-12	5594	7156	-9	5711	7273	-12	COI	5700	7259	-9	5710	7266	-5
S2	7348	7418	3	7264	7334	3	7148	7218	3	7262	7332	3	S2	7251	7321	3	7262	7332	3
D	7422	7493	10	7338	7409	5	7222	7290	7	7336	7407	5	D	7325	7397	8	7336	7407	8
COII	7504	8194	0	7415	8105	0	7298	7988	0	7413	8103	0	COII	7406	8096	0	7416	8106	0
K	8195	8268	8	8106	8180	5	7989	8063	5	8104	8178	5	K	8097	8172	4	8107	8181	5
ATP8	8277	8444	-10	8186	8353	-10	8069	8236	-10	8184	8351	-10	ATP8	8177	8344	-10	8187	8354	-10
ATP6	8435	9117	0	8344	9027	-1	8227	8909	0	8342	9024	0	ATP6	8335	9017	0	8345	9028	-1
COIII	9118	9902	0	9027	9811	0	8910	9695	6	9025	9809	0	COIII	9018	9802	0	9028	9812	0
G	9903	9972	1	9812	9882	0	9702	9771	0	9810	9880	0	G	9803	9872	0	9813	9882	0
ND3	9974	10322	0	9883	10231	0	9772	10120	0	9881	10229	0	ND3	9873	10221	0	9883	10231	0
R	10323	10391	0	10232	10300	0	10121	10189	0	10230	10298	0	R	10222	10292	0	10232	10300	0
ND4L	10392	10688	-7	10301	10597	-7	10190	10486	-7	10299	10595	-7	ND4L	10293	10589	-7	10301	10597	-7
ND4	10682	12062	0	10591	11971	0	10480	11860	0	10589	11969	0	ND4	10583	11963	0	10591	11971	0
H	12063	12131	0	11972	12040	0	11861	11930	0	11970	12038	0	H	11964	12032	0	11972	12040	0
S1	12132	12199	5	12041	12108	4	11931	11998	4	12039	12106	4	S1	12033	12100	4	12041	12108	3
L1	12205	12278	0	12113	12185	0	12003	12075	0	12111	12183	0	L1	12105	12177	0	12112	12184	0
ND5	12279	14117	-4	12186	14024	-4	12076	13914	-4	12184	14022	-4	ND5	12178	14016	-4	12185	14023	-4
ND6	14114	14635	0	14021	14542	0	13911	14432	0	14019	14540	0	ND6	14013	14537	0	14020	14541	0
E	14636	14704	3	14543	14611	3	14433	14501	4	14541	14609	3	E	14538	14607	5	14542	14610	3
Cytb	14708	15848	0	14615	15755	0	14506	15646	0	14613	15753	0	Cytb	14613	15757	0	14614	15758	0
T	15849	15921	-1	15756	15828	-1	15647	15717	0	15754	15826	-1	T	15758	15830	-1	15759	15830	-1
P	15921	15991	0	15828	15900	0	15718	15788	0	15826	15898	0	P	15830	15901	0	15830	15900	0
CR	15992	16841		15901	16699		15789	16620		15899	16707		CR	15902	16760		15901	16739	

Table S3. Comparison of start and stop codons of six *Sphyræna* mitogenomes PCGs.

Genes	<i>S. sphyræna</i>		<i>S. japonica</i>		<i>S. jello</i>		<i>S. pinguis</i>		<i>S. barracuda</i>		<i>S. borealis</i>	
	start	stop	start	stop	start	stop	start	stop	start	stop	start	stop
ND1	ATG	TAA	ATG	TA-	ATG	TAA	ATG	TAA	ATG	TAA	ATG	TAA
ND2	ATG	TAA	ATG	AGA	ATG	TAA	ATG	TAA	ATG	TAA	ATG	TAG
COI	GTG	AGA	GTG	AGG	GTG	AGG	GTG	AGG	GTG	AGG	GTG	AGA
COII	ATG	T--	ATG	T--	ATG	T--	ATG	T--	ATG	T--	ATG	T--
ATP8	ATG	TAA	ATG	TAA	ATG	TAA	ATG	TAA	ATG	TAA	ATG	TAA
ATP6	TTG	TA-	ATG	TA-	ATG	TAA	ATG	TA-	ATG	TA-	ATG	TAA
COIII	ATG	TA-	ATG	TA-	ATG	TA-	ATG	TAG	ATG	TA-	ATG	TA-
ND3	ATG	T--	GTG	T--	ATG	T--	ATG	T--	ATG	T--	ATG	T--
ND4L	ATG	TAA	ATG	TAA	ATG	TAA	ATG	TAA	ATG	TAA	ATG	TAA
ND4	ATG	T--	GTG	T--	ATG	T--	ATG	T--	ATG	T--	ATG	T--
ND5	ATG	TAA	GTG	TAG	ATG	TAA	ATG	TAA	ATG	TAA	ATG	TAA
ND6	ATG	TAA	ATG	TAA	ATG	TAG	ATG	TAA	ATG	TAG	ATG	TAA
Cyt b	ATG	T--	ATG	TA-	ATG	T--	ATG	T--	ATG	T--	ATG	TA-

Table S4. Comparison of anti-codons of six *Sphyraena* mitogenomes tRNA genes.

Genes	<i>S. sphyraena</i>	<i>S. jello</i>	<i>S. pinguis</i>	<i>S. barracuda</i>	Genes	<i>S. japonica</i>	<i>S. borealis</i>
F	AAG	AAG	AAG	AAG	F	AAG	AAG
V	CAU	CAU	CAU	CAU	V	CAU	CAU
L2	AAU	AAU	AAU	AAU	L2	AAU	AAU
I	UAG	UAG	UAG	UAG	I	UAG	UAG
Q	GUU	GUU	GUU	GUU	Q	GUU	GUU
M	UAC	UAC	UAC	UAC	M	UAC	UAC
W	ACU	ACU	ACU	ACU	A	CGU	CGU
A	CGU	CGU	CGU	CGU	W	ACU	ACU
N	UUG	UUG	UUG	UUG	N	UUG	UUG
C	ACG	ACG	ACG	ACG	C	ACG	ACG
Y	AUG	AUG	AUG	AUG	Y	AUG	AUG
S2	AGU	AGU	AGU	AGU	S2	AGU	AGU
D	CUG	CUG	CUG	CUG	D	CUG	CUG
K	UUU	UUU	UUU	UUU	K	UUU	UUU
G	CCU	CCU	CCU	CCU	G	CCU	CCU
R	GCU	GCU	GCU	GCU	R	GCU	GCU
H	GUG	GUG	GUG	GUG	H	GUG	GUG
S1	UCG	UCG	UCG	UCG	S1	UCG	UCG
L1	GAU	GAU	GAU	GAU	L1	GAU	GAU
E	CUU	CUU	CUU	CUU	E	CUU	CUU
T	UGU	UGU	UGU	UGU	T	UGU	UGU
P	GGU	GGU	GGU	GGU	P	GGU	GGU