

**Additional file 16: Figure S5. Aligned nucleotide sequences of the origin of L-strand replication (blue and magenta letters) in mt genomes of 250 fishes.**

Species name abbreviation followed by aligned sequences. See Additional file 1 for abbreviation of species name. Blue and magenta letters denote the stem and loop, respectively. Framed rectangle denotes conserved motif sequence. Underline indicates AA stem sequences of the tRNA-Asn gene.

			o <sub>L</sub>						
Scca	ATTG	--GAAAGAGGGCGCGA	----	GTTTTA	-----	TGTTCCGCCCTCTTC	-----	GA	<b>GGCCG</b>
Muma	AGAT	--CCGAAAGAGGGCGG	----	CGGAATGTTTTT	-----	CCGCCCTCTTCG	-----		<b>GGCCG</b>
Erca	GATT	--CGAAGGAGGGCGG	----	CCTTCGGTTTTT	-----	CCGCCCTCCTTC	-----		<b>GGCCA</b>
Pose	GGAT	--CCGAAAGGAGGGCGG	----	CTTTGAGATTTT	-----	CCGCCCTCCTTCG	-----		<b>GGCCG</b>
Actr	TAGA	--TGAAGGAGGGCGG	----	TCCCCCTCCT	-----	CCGCCCTCTTCA	-----		<b>GGCCG</b>
Scal	TAGA	--TGAAGGAGGGCGG	----	TATGCCCTCCCCT	-----	CCGCCCTCCTCA	-----		<b>GAGCCG</b>
Posp	TAGA	--TGAAGGAGGGCGG	----	TCCTCCTATTT	-----	CCGACCTCCTCA	-----		<b>GGCCG</b>
Atsp	TGCA	--GAAGGAGGGCGGACGG	----	TTCCGTCTC	-----	CCTTCGCGCCCTTC	-----		<b>GGCCG</b>
Leoc	AGAT	--GAAGGAGGGCGGA	----	CGGTTCCGCCCTTTT	-----	TCCGCCCTCCTTC	-----		<b>GGCCG</b>
Amca	GGTG	--CTGAAAGAGGGCGG	----	CAAAGCTGCCGCT	-----	CCGCCCTCTTCG	-----		<b>GGCCG</b>
Osbi	GATG	--GAAGGAGGGCGG	----	CATTGCCTCACT	-----	CCGCCCTCCTTC	-----		<b>GGCCA</b>
Pabu	GTAG	--ATAGGAGGGCGG	----	CGTCGATTTT	-----	CCGCCCTCCTAT	-----	TCG	<b>GGCCG</b>
Hial	ATGA	--GAAGGAGGGCGGG	----	CCCTCCCCCT	-----	CCCCGCCCTCCTTC	-----		<b>GGCCG</b>
Elha	ATTG	--GGAGGAGGGCGG	----	CGGCCCTCACT	-----	CCGCCCTCCTCC	-----		<b>GGCCG</b>
Mlcy	GGTG	--GGGTGAGGGCGG	----	CGGATTTTACT	-----	CCGCCCTCCATCC	-----		<b>GGCCG</b>
Algl		not found							
Ptgi	TTGT	--GAAGGAGGGCGG	----	CCGAACACCCCCT	-----	CCGCCCTCCTTC	-----		<b>GGCCG</b>
Alaf	ATCA	--GAAGGAGGGCGG	----	CTTTCCCTGGTT	-----	CCGCCCTCCTTC	-----		<b>GGCCG</b>
Nock	ATCG	--GAAGGAAGGCGG	----	CTTTCCCTGGTT	-----	CCGCCCTCTTC	-----		<b>GGCCG</b>
Anja	GTGG	--ATGGGGGGGGG	----	TTACCCCTTTC	-----	CCCCCCCCCAT	---	ATTGATTCGA	<b>GGCCA</b>
Gyki	AGAT	--GAAGGGGCGAG	----	AGGCCCC	-----	CTCCCCCTTC	-----		<b>GAGCCG</b>
Syka	AGAT	--GGAGGAGGGCGG	----	CAATTGCCCT	-----	CCGCCCTCCTCC	-----		<b>GGCCG</b>
Opma	GATG	--GAGGGGCGGAG	----	AAGCCCCCTCCTC	-----	CGCCAGAGCCAGACTC	-----	TTT	<b>CGGG</b>
Comy	AATA	--CAGGGGAGGGG	----	CGCCCCCCCCCT	-----	CCCTCCCCCTG	-----	CT	<b>GTCCG</b>
Sasp	AAGA	--CCGGCGGGCGGCA	----	TTTTA	-----	ATGCCGTTCCGTTCCCGCCG	-----		<b>ATGCTG</b>
Eupe	TGTT	--CTGGCGGGGGGGCG	----	TATTTA	-----	CGCCTAACCCGTTCCCGCCAG	-----	TCC	<b>CTCCG</b>
Enja	GGAT	--GAAAGGGGCGG	----	CGGAGGCATTTT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Same	GGAT	--GAAGGAGGGCGGAG	----	GCCCCCT	-----	CTCCGCCCTCTTC	-----		<b>GGCCG</b>
Chch	AGAT	--GAAAGGGGCGGA	----	ATTAGCCTTG	-----	TCCGCCCTTTC	-----		<b>GGCCG</b>
Grgr	GAAA	--TGAAGGGGCGG	----	CGCCGACTCCGGCATCCCCCT	-----	CCGCCCTTCA	-----		<b>GGCCA</b>
Caau	AGAT	--GAAAAGGGCGGCAAA	----	TTGAGTC	-----	TTTCGCCCTTTC	-----		<b>GGCCG</b>
Cyca	AGAT	--GAAAAGGGCGG	----	CAAATTGAGTCATT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Dare	AGAT	--GAAAAGGGCGG	----	CAACTTGGGCCATT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Cost	AGAT	--GAAAGGGCGG	----	CGAATCGGCTCATT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Leec	AGAT	--GAAAGGGCGG	----	CATCGGCCATT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Fola	GATG	--GAAAGCGG	----	GCAATCGCCTCATT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Clmc	ATGG	--GAAAGGGGCGG	----	CATAGTCTCTTT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Phin	AGAT	--GAAAGGGGCGG	----	CGGGAATTTT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Icpu	AGAT	--GAAAGGGGCGGA	----	GGCGGGTTT	-----	TCCGCCCTTTC	-----		<b>GGCCA</b>
Psto	AGAT	--GAAGGGGCGGAGGAA	----	AGT	-----	TTTTTCGCCCTTTC	-----		<b>GGCCG</b>
Cora	AGAT	--GAAAGGGGCGG	----	ACGGACATTT	-----	TCCGCCCTTTC	-----		<b>GGCCG</b>
Eisp	AGAT	--GAAAGGGGCGG	----	CGGAATTGTTT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Apal	AGAT	--GAAAGGGGCGG	----	CGGATTTT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Eslu	GGAT	--GAAAGGGGCGG	----	CGACTCCCCGCT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Dape	GATG	--GAAAGGGGCGG	----	CGAAGCCCTT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Glse	AGAT	--GAAGAAGGGGCGGA	----	CGCCCTCTC	-----	TCCGCCCTCTTC	-----		<b>GGCCG</b>
Naar	GGAT	--GAAGAAGGGGCGG	----	CGACCCCCCT	-----	CCGCCCTCTTC	-----		<b>GGCCG</b>
Lioc	TCAC	--CGAAGAAGGGGCGGAG	----	ATTGCT	-----	CTCCGCCCTCTTCG	-----		<b>AGCCA</b>
Opso	AGAT	--GAAGAAGGGGCGG	----	CGGTCCCTTCT	-----	CCGCCCTCTTC	-----		<b>GGCCG</b>
Alte	GATG	--GAAAGGGGCGG	----	CTTCCCTTGT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Plap	GATG	--GAAAGGGGCGGACG	----	CCGGCTC	-----	GTTCCGCCCTTTC	-----		<b>GGCCG</b>
Plal	TAGT	--AGGGGCGGCGC	----	CCC	-----	GCCCCGCCCTT	-----	TCG	<b>GGCCG</b>
Sami	GGAT	--GAGGGGCGG	----	CGCCCCGCT	-----	CCGCCCTTTC	-----		<b>GGCCG</b>
Rere	GATG	--AAGAGGGGCGG	----	CGGCC	-----	CCGCATGCCCTTTT	-----	TCG	<b>GGCCG</b>
Gama	AGAT	--GAGAAGGGGCGG	----	GCCCT	-----	CGCAGCGCCCTTTTC	-----		<b>GGCCG</b>
Onmy	AGAT	--GAAAGGGGCGGGG	----	CCCCC	-----	CCCCTCGCTCGCCCTTTC	-----		<b>GGCCG</b>
Sasa	AGAT	--GAAAGGGGCGGTGG	----	CCCCA	-----	CCGCTCCGCCCTTTC	-----		<b>GGCCG</b>

Cola	GGAT--GAAAGGGGGCGGTGG-----CCCCA-----CCGCTCCGCCCCCTTTC-----GGGCCA
Dita	AGAT--GAGAGGGGGCGCG-----GCC-----CGCGGCCCTTTC-----GGGCCG
Sigr	GATG--GGAAGGGGGCGCG-----GCC-----CGCCGCCTCTTTC-----GGGCCG
Chsl	AGAG--GAAAGCGGGCG-----CGCA-----GCTGCCTTTC-----GGGCCG
Atja	AGAT--GAAAGGGGGCGGA-----TTGCCCTGGT-----TCGCCCCCTTTC-----GGGCCA
lido	AGAT--GAAAGGGGGCGGA-----TTGCCGCGGT-----TCGCCCCCTTTC-----GGGCCA
Auja	AGAT--GAAAGGGGGCG-----CGACCCTCGGT-----CGCCCTTTC-----GGGCCG
Chag	AGAT--GAAAGGGGGCG-----CAATGCCCGCGCT-----CGCCCTTTC-----GGGCCG
Hami	GATA--GAAAGGGGGCG-----CATTGCCCGTT-----CGCCCTTTC-----GAGGCCG
Saun	AGAT--CGAAAGGGGGCG-----CTATTCTACTTGT-----CGCCCTTTCG-----GGGCCG
Nema	GATG--GAAAGGGGGCGGCGAGAACG--CGCC-----CGTTCCGCCCCCTTTC-----GGGCCA
Disp	AGAT--CAGAGGGGGCG-----TAATCTTACCCT-----CGCCCTCTG-----GGCC
Myaf	TGCT--GGGGGGGGGGGG-----RAWTTTNCCTT-----CCCCTCCCCCCCC-----CCGCTC
Lagu	GTGG--GAGAGTGTGGAATGGGGTAGGGGTGGGGGGGGCGT--TCCCC----- --ACCCCTCCCCCTCCCCCTGTGCCCATTCCTATAACTTC--GAGGCCA
Trtr	TGTC--CGAAAGGGGGCGGGG-----CG-----CCCCGCTTCCCG-----CATCCCT
Zucr	GGAC--AAAGGGGGGGG-----CGGCCCGTTTT-----CCCGCCCTTT-----AACCC
Pxja	GATG--GAAAGGGGGCGGAC-----TATTAT-----GTCCATTTTCGCCCTTTC-----GGGCCG
Pxlo	GATG--GAAAGGGGGCGGAC-----TTTT-----GTCCATCTCGCCCTTTC-----GGGCCG
Pctr	GGTG--GGAAGGGGGCG-----CGCCCTTT-----CGCCCTTTC-----GGGCCA
Apsa	GATG--GAAAGGGGGCGGA-----CGCCCGCTTT-----TCGCCCCCTTTC-----GGGCCG
Cabe	CGTA--GGCGAATGGCGCGGT-----CGAGATGTTTT-----ACCGCCGCC-----CCGCC
Bzze	ATCA--GAAAGGGGGCGCGGG-----TTCCCG-----CCCTCGCGCCCTTTC-----GGGCCG
Siim	GATG--GAAGGGGGCGA-----TAGGAATTGCTGT-----TCGCCCTTC-----GGGCCG
Ctru	GATT--GAAAGGGGGCGCCAGC-----CGCTC-----GCTCGCCCTTTC-----GGGCCA
Dpbr	ATGG--GAAAGGGGGCG-----CAGCCCGCTTGT-----CGCCCTTTC-----GGGCCA
Caki	TAGA--TGAAGGGGGCG-----ACTGTCCGTTTT-----CGCCCTTTC-----GGGCCG
Phja	TAGA--TGAAGGGGGCGA-----CAAATCCCCCT-----TTCGCCCTTTC-----GGGCCG
Brne	GTCA--GGGTGAAGGTA-----TTTTG-----TACCATTCACTT-----CACTATC
Gamo	TAGA--TGAAGGGGGCGA-----CATTGCGCCCT-----TCGCCCTTTC-----GGGCCG
Lolo	TAGA--TGAAGGGGGCGA-----CATTGCGCCCT-----TCGCCCTTTC-----GGGCCG
Batr	not found
Prmy	GGAT--CCGAGGGGGCGGA-----CCCCCCCCCT-----TCGCCCTCGG-----GGGCC
Lose	AGAT--CGAAAGGGGGCGGAA-----ATTCCGCC-----TTCGCCCTTTCG-----GGGCC
Loam	GATG--GAAAGGGGGCGGA-----TTATCCGCCGATT-----TCGCCCTTTC-----GGGCC
Chab	GATG--GAAAGGGGGCGAC-----AGATCCG-----GTTTCGCCCTTTC-----GGGCCG
Chto	GATG--GAAAGGGGGCGAC-----AGTCCG-----GTTTCGCCCTTTC-----GGGCCA
Majo	ATGA--AAGGAGGGG-----TTCCTC-----CCCCTCCTT-----CCCTTTCAGGCCG
Hlst	AAAA--TGCGGACGGC-----AGCATCTTTCG-----GGCGTCCGCA-----AATTGGACC
Clpe	ATGT--GAAAGGGGGCGACGG-----CCCGT-----CCTCGCCCTTTC-----GGGCCA
Mlmr	GATG--GAAAGGGGGCGGA-----CAGCCCGCGTT-----TCGCCCTTTC-----GGGCCA
Crcr	AGAG--GGGGAGGGCGGA-----TGGAAATTT-----TCGCCCTGTTTC-----GGATCCG
Muce	AAGG--GGGGAGGGCGGA-----TAGGATTT-----TCGCCCTGTTTC-----GGATCCG
Bege	GATT--GAAAGGGGGCGGAT-----CGTCTCGTTTT-----ATCGCCCTTTC-----GGGCCG
Mela	AGAT--GAAAGGGGGCGAC-----GGCGTGTTT-----GTCCGCCCTTTC-----GGGCCG
Hats	AGAT--GAAAGGGGGCGGAT-----CGCCCGTTTT-----ATCGCCCTTTC-----GGGCCG
Orla	GATG--GAAAGGGGGCGGA-----CGTCCCGTTTT-----TCGCCCTTTC-----GGGCCG
Cosa	GATG--GAAAGGGGGCGGAT-----CGGCTCGTTTT-----ATCGCCCTTTC-----GGGCCG
Exvo	GATT--GAAAGGGGGCGGAT-----CGAAGTGTGTT-----ATCGCCCTTTC-----GGGCCG
Depa	GATG--GAAAGGGGGCGGA-----TCGGCCGATTTA-----TCGCCCTTTC-----GGGCCG
Rima	GATC--GAAGAGGGCGGAT-----CGGCTTCTTT-----ATCGCCCTTTC-----CGGGCCG
Fuol	GATT--GAAAAGAGGGCGGAT-----CGGACTCGTTTT-----ATCGCCTTTC-----GGGCCG
Gmaf	GATT--GAAAGGGAGCGGAT-----CGTCGATTT-----ATCGCTCCCTTTC-----GGAGCCG
Xeei	GATG--GAAAGGGGGCGGAT-----CGTTCGATTT-----ATCGCCCTTTC-----GGGCCG
Pros	TGTG--GAAAATGGCGCATC-----CGCC-----GGTCCGCATTTTC-----GGGCCG
Scmi	GATG--GAAAATGGCGCAC-----CTGCC-----GGTCCGCATTTTC-----GGGCCG
Rolo	GATG--GAAAGGGGGCGCGCC-----ATTT-----GGTCCGCCCTTTC-----GGGCCG
Cere	GATG--GAAGGGGGGGATT-----CGCTC-----GGTCCGCCCTTTC-----GGGCCG
Daga	GATG--GAAGGGGGCG-----CGACCCTCGT-----CGCCCATTC-----GGAGCCG
Anco	GATG--GAAAGGGGGCGCGC-----ATCCGCTCG-----GTCCGCCCTTTC-----GGGCCG
Dmve	GGTT--CGAGAGGGGGCG-----CGACCGCCCGGT-----CGCCCTCTCG-----GGGCCG
Dmar	ATGG--GAAAGGGGGCGCGCC-----TGC-----GGTCCGCCCTTTC-----GGGCCG
Anka	GATG--GAAAGGGGGCGGATT-----CCGCTC-----GGTCCGCCCTTTC-----GGGCC
Moja	GATG--GAAAGGGGGCGCGC-----ATCCGCTC-----GGTCCGCCCTTTC-----GGGCCG
Hoja	GATT--GAAAGGGGGCGGCTT-----CCAGCTT-----GGTCCGCCCTTTC-----GGGCCG

Bede	AGAT	--GAAAGGGGCGGCGC	-----	CCCCCT	-----	GCTCGCCCCCTTTC	-----	GGGCCC
Besp	AGAT	--GAAAAGGGGCGGCGCC	-----	ATCT	-----	GGTCCGCCCTTTTC	-----	GGGCCC
Mybe	AGAT	--GAAAGGGGCGCGGAT	-----	AATGTG	-----	GTCCGCCCCCTTTC	-----	GGGCCC
Osja	AGAT	--GAAAGGGGCGG	-----	CAGAGGGGCGGTT	-----	CGCCCCCTTTC	-----	GGGCCC
Sgro	AGAT	--GAAAGGGGCGG	-----	CTTCATTCTTGATT	-----	CGCCCCCTTTC	-----	GGGCCC
Pzpa	GGAT	--TAGAAAGGGAA	-----	CACCCTCT	-----	TTCCCTTCTA	-----	GGCCA
Zeja	GGAT	--TAGAAAGGGGCGAG	-----	ACTGCCCC	-----	CTTCCCCCTTCTA	-----	GGCCA
Zne	GGAT	--TAGAAAGGGGG	-----	CATTAGCCCCCTT	-----	CCCCCTTCTA	-----	GGCCC
Zefa	GGAT	--TAGAAAGGGGG	-----	CGACGCCCCCTT	-----	CCCCCTTCTA	-----	GGCCC
Acni	ATGA	--GAAAGGGGG	-----	CGACGCCCCCTT	-----	CCCCCTTTC	-----	AAGCCA
Ncrh	ATGA	--GAAAGGGGG	-----	CGACGCCCCCTT	-----	CCCCCTTTC	-----	AAGCCA
Agca	GATT	--GAAAGGGGCGGAT	-----	TGCAAGTTGGATT	-----	ATCCGCCCCCTTTC	-----	GGGCCC
Hydy	TGAT	--GAAAGGGGCGGA	-----	ACCGTCCGATTC	-----	TCCGCCCCCTTTC	-----	GGGACC
Gsac	CGAT	--GAAAGGGGCGGAA	-----	CAGTCCGCATC	-----	TTCCGCCCCCTTTC	-----	GGGTCC
Pevo	GTAG	--ATGAAAGGGGCGGAA	-----	CCCCTCCCCCTT	-----	TTCCGCCCGCTTTCGT	-----	GGCCC
Hiku	AGAT	--GAAAGGGGCGGAA	-----	TTTCCCGCT	-----	TTCCGCCCCCTTTC	-----	GGGCCC
Inpa	ATGG	--GAAGGGGCGGAA	-----	GCTTT	-----	TTTCGCCCCCTTTC	-----	GGGCCC
Auch	AGTT	--CGGAAGGGGCGG	-----	CAACCGTCCCT	-----	CGGCCCTTCG	-----	GGCCA
Fico	AGAT	--GAAAGGGGCGGAAAG	-----	CATCTGTTAT	-----	CTTCCGCCCCCTTTC	-----	GGGCCC
MacS	GATG	--GAAAGGGGCGGA	-----	AAACCCCGCCTC	-----	TCCGCCCCCTTTC	-----	GGGCCC
Moal	GGAT	--AAAAGAGCGGA	-----	GAATTTTT	-----	TCCGCTCTTTT	-----	GGGCCC
Syma	AGAT	--GAAAGGGGCGGC	-----	CGAGGCGGAAATT	-----	GCCGCCCCCTTTC	-----	GGGCCC
Mafa	GATT	--GAAAGGGGCGG	-----	GGGAGGATTTT	-----	CGGCCCTTTC	-----	GGGCCC
Dcpe	ATCG	--GAAGGGGCGGGGA	-----	CGCCCCCTCCTT	-----	TCCCGCCCCCTTC	-----	GGGCCC
Dcti	GTTG	--GAAGGGGCGGGG	-----	AAATTTTTCCCCCGC	-----	TCCCGCCCCCTTC	-----	GGGCCC
Hehi	ATTA	--GAAAGGGGCGG	-----	CATTCCGCCCGTT	-----	CGGCCCTTTC	-----	GGGCCC
Stam	ATGG	--GAAAGGGGCGGA	-----	CAATTTTGCGCATC	-----	TCCGCCCCCTTTC	-----	GGGCCC
Hogi	GATT	--GAAAGGGGCGGA	-----	CAGCTTTGTTTT	-----	TCCGCCCCCTTTC	-----	GGGCCC
Erzo	GATG	--GAAAGGGGCGGA	-----	CAAGGCTGCCAATC	-----	TCCGCCCCCTTTC	-----	GGGCCC
Hxot	GATG	--GAAAGGGAGCGGA	-----	ACAGTTTGCCATC	-----	TCCGCTCCCTTTC	-----	GGGTCC
Core	GATG	--GAAAGGGAGCGGA	-----	CAGCATGCTCATT	-----	TCCGCTCCCTTTC	-----	GGGTCC
Apve	GATA	--GAAAGGGGCGGA	-----	CAGCATGTCCATC	-----	TCCGCCCCCTTTC	-----	GGGTCC
Ltjp	GATT	--GAAAGGGGCGGA	-----	TGAGCCCGTTGATT	-----	TCCGCCCCCTTTC	-----	GGGCCC
Laja	GATG	--GAGAGGGGCGGA	-----	TTCTCGTGGT	-----	TCCGCCCCCTTTC	-----	GGGCCC
Syja	GATG	--GAAAGGGGCGGA	-----	TTTTCTCGGT	-----	TCCGCCCCCTTTC	-----	GGGCCC
Epme	GATT	--GAAAGGGGCGGGTGAA	-----	TCTAAGTTATT	-----	TTACCCGCCCCCTTTC	-----	GGGCCC
Grse	AGGT	--CGAAAGGGGCGGATG	-----	CGCCCGCGGTT	-----	TATCCGCCCTTTCG	-----	GGCCC
Clja	TGGA	--CGAAAGGGAGCGGATCAA	-----	CTCGGATT	-----	TTATCCGCTCCCTTTCG	-----	GGCCC
Ogcy	GATG	--GAAAGGGGCGGC	-----	TCT	-----	GCCCCCTTTC	-----	GGAGCCC
Plna	GATG	--AAGGGGCGGAT	-----	TACAATTGTTTT	-----	ATCCGCCCCCTT	-----	TCGGGCCC
Lema	GATG	--GAAAGGGGCGGA	-----	CGGCTCATCGCCTT	-----	TCCGCCCCCTTTC	-----	GGGCCC
Etzo	ATGG	--GAAAGGGGCGGA	-----	CAGGCCCTGTTT	-----	TCCGCCCCCTTTC	-----	GGGCCC
Apse	GATG	--GAAAGGGGCGGA	-----	CACCGCGGTTT	-----	TCCGCCCCCTTTC	-----	GGGCCC
Epde	GATG	--GAAAGGGGCGGA	-----	CTGCCCCCGATT	-----	TCCGCCCCCTTTC	-----	GGGCCC
Sija	GATG	--GAAAGGGGCGGAT	-----	CGGAATTTTT	-----	ATCCGCCCCCTTTC	-----	GGGTCC
Bsja	GATG	--GAAAGGGGCGGA	-----	TATTGAATATCCGCC	-----	TCCGCCCCCTTTC	-----	GGGCCC
Ecna	AGAT	--GAAAGGGGCGGA	-----	CATTATAAATGTT	-----	TCCGCCCCCTTTC	-----	GGGCCC
Cohi	ATTG	--ATGGGCGGG	-----	CGGATTTTT	-----	CCCGCCCAT	-----	TTTCCGAGCCC
Caar	AGAT	--GAAAGGGGCGGAT	-----	TGTGTTTGATT	-----	ATCCGCCCCCTTTC	-----	GGGCCC
Came	AGAT	--GAAAGGGGCGGAT	-----	TGATTCTGATT	-----	ATCCGCCCCCTTTC	-----	GGGCCC
Mema	GATG	--GAAAGGGGCGGAT	-----	CAATAAGTTGATT	-----	ATCCGCCCCCTTTC	-----	GGGCCC
Lenu	GATT	--GAAAGGGGCGGGT	-----	CAGAGTTTGTTA	-----	ACCCGCCCTTTC	-----	GGGCCC
Brja	GGAT	--GAGCGGAGCGGAAAGGA	-----	AGTC	-----	TTTTTTCGCTCCGTT	-----	GGGCCC
Plma	AGAT	--GAAAGGAGCGGAAA	-----	AAGTCTGTAC	-----	TTTCGCTCCTTTC	-----	GGGCCC
Emst	GATG	--GAAAGGGGCGGA	-----	CTATCCGCCGATT	-----	TCCGCCCCCTTTC	-----	GGGCCC
Ptti	GATG	--GAAAGGGGCGGA	-----	TTATCTGTCTGATT	-----	ATCCGCCCCCTTTC	-----	GGGCCC
Losu	ATAT	--GAAGGGGCGGATA	-----	TGCTTTTTTT	-----	TATCCGCCCTT	-----	CGGGCCC
Geoy	ATTG	--GAAGGGGCGGA	-----	CTTCCGCTCGTT	-----	TCCGCCCCCTTC	-----	GGGCCC
Dipi	GATG	--GAAAGGGGCGGA	-----	TCGTCTCTGTTTT	-----	TCCGCCCCCTTTC	-----	GGGCCA
Pama	ATGG	--GGAGGGGCGGGTA	-----	TAACCCCTCCT	-----	TACCCGCCCCCTTC	-----	GGGCCG
Leob	GATG	--GAAAGGGGCGGA	-----	CTATTTAGGCGGT	-----	TCCGCCCCCTTTC	-----	GGTCCG
Neba	AAAG	--GAAAGGGGCGGG	-----	CGTCTCGCCCT	-----	CCCGGCCCTTTC	-----	GGGCCG
Pdpl	GGTA	--GATGAAAGCGGGC	-----	CAGAGAAGAGTTTT	-----	GCCCGCTTTATATT	-----	CGGTCCG
Nimi	AATG	--GAAAGGGGCGGG	-----	CTTTGCCCCGCT	-----	CCCGGCCCTTTC	-----	GGGCCG
Uptr	GATG	--GAAAGGGGCGGGG	-----	CAT	-----	TTTTCCGCCCTTTC	-----	GGGCCG

Pesc	GATG--GAAAGGGGCGGGAG-----CCG-----CTTTCGCCCTTTC-----GGGCCC
Baar	GATG--GAAAGGGGCGGAT-----TTTTCCGGT-----ATCCGCCCTTTC-----GGGCCA
Moar	GATG--GAAAGGGGCGGAT-----TTATTTTTGATT-----ATCCGCCCTTTC-----GGGCCC
Toja	GATG--GAAAGGGGCGGAT-----TTATCTGTTGATC-----ATCCGCCCTTTC-----GGGCCC
Chau	GATT--GAAAGGGGCGGA-----CTGGCCGCTTTT-----TCCGCCCTTTC-----GGGCCC
Chse	GATG--GAAAGGGGCGGA-----TGAATCTGTTGATT-----TCCGCCCTTTC-----GGGCCC
Enar	GATG--GAAAGGGGCGGA-----AAATTGTTCCGATC-----TCCGCCCTTTC-----GGGCCA
Hpty	GATG--GAAAGGGGCGGA-----CTTTTTGGT-----TCCGCCCTTTC-----GGGCCC
Nana	GATG--GAAAGGGGCGGG-----CGGTCGCGATT-----CCCGCCCCTTTC-----GGGCCC
Mcst	GATG--GAAAGGGGCGGA-----CGCCCCCGCT-----TCCGCCCTTTC-----GGGCCC
Rhox	GATG--GAAAGGGGCGGA-----CCCTAAAGGGTTTA-----TCCGCCCTTTC-----AGGCCC
Opfa	TTGG--GAAAGGGGCGGA-----TAGGTCGCCCGGT-----TCCGCCCTTTC-----GGGCCC
Paar	GATG--GAAAGGGGCGGAA-----AAGCCGATCC-----TTCCGCCCTTTC-----GGGCCA
Gozo	AGAT--GAAAGGGGCGG-----CGCCCCTTTTCGCCCCTTT-----CGCCCCTTTC-----GAGGCCA
Ackr	not found
Elev	AGAT--GAAAGGGGCGGA-----CTCCCCCCTT-----TCCGCCCTTTC-----GGAGCCC
Trdu	ATTG--GAAAGGGGCGGG-----CGGAGATTTT-----CCCGCCCCTTTC-----GGGCCC
Amoc	GATG--GAAAGGGGCGGA-----CGGTTTTTT-----TCCGCCCTTTC-----GGGCCA
Hame	GATG--AGGAATGGGGCGGAA-----CCGCCGTT-----TTCCGCCCATTCCT-----TTCGGGCCC
Chso	GATG--GAAAGGGGCGGG-----CAATCATTGGCCCGTT-----GCCCGCCCCTTTC-----GGGCCC
Lyto	GGAT--GAGGGGGGCGGA-----ACAGTCGGAATC-----TCCGCCCCCTTC-----GGATCC
Encr	GGAT--GAAAGGGGCGGAA-----CAGTTCGTAATC-----TTCCGCCCTTTC-----GGATCC
Bvar	GATT--GGGGGGGGGAA-----AAAACCCCC-----TTTCCCCCCCCT-----CCTGGCCC
Noco	ATGG--AAAGGGGCGGA-----CAACCCGCCCT-----TCCGCCCTTT-----GGGCCA
Chsp	AGAT--AAAAGGGGCGGAG-----ATCGG-----TTTCCGCCCTTT-----GGGCCA
Arja	GATG--GAAAGGGGCGGA-----CAGCTTGGCCATC-----TCCGCCCTTTC-----GGGTCC
Pase	ATGG--GGGGCGGAA-----TTATT-----TTTCGCCCC-----AAAAAATTCGGGCCC
Trel	AAGC--CGGGGGGGGGA-----CCCCCCTT-----TCCCCCCCCCG-----ATCTGCCCG
Lifa	TGAA--AGGGGCGGGGAA-----CGCCGCCCTTT-----TTCCCGCCCTTT-----CAGAACC
Acur	ATCG--AAGTGGGGGGGGGG-----CCCCCCCCACC-----CCCCACCCCCCATT-----CGAGCCT
Ampe	AGAT--GAAAGGGGCGGA-----TTTTCCCCGGT-----TCCGCCCTTTC-----GGGCCA
Urja	not found
Enet	GTGT--GAAAGGAGGCGGA-----CGCGGAATTT-----TCCGCTCCCTTTC-----GGGCCC
Ptbr	GATT--GAAAGAGGCGGG-----CGGACT-----TTCCGCCCTTTC-----GGGCCC
Safa	GATG--GAAAGGGGCGGG-----CCGGATTT-----TCCGCCCTTTC-----GGGCCC
Icae	ATGG--GAAAGGGGCGGA-----AAAGCCTTTTTCC-----TCCGCCCTTTC-----GGGCCA
Asmi	TAGA--TGAAAAGGGGGGGGG-----CCCCCCTT-----TCCCCCCTTTTCCA-----GAACC
Foal	AGAT--TGAAAGGCGGA-----CAGTCCCCCT-----TCCGCCTTTCA-----GGCCC
Drze	ATGT--GAAAGGGGCGGG-----AAGGTACCGCCTCC-----CCCGCCCCTTTC-----GGGCCC
Rhas	TGGA--AAAGGGGCGGAG-----AATCTCTCGA-----TTCTCGCCCCCTT-----CGGGCCA
Elac	GATA--GAAAGGGGCGGA-----CGGCCGATT-----TCCGCCCTTTC-----GGGCCC
Kugu	GATG--GAAAGGGGCGG-----CCTTTTTTT-----CCGCCCTTTC-----GGGCCC
Plor	GATT--GAAAGGGGCGGA-----CAGTTTGTCTGTT-----TCCGCCCTTTC-----GGGCCC
Sgun	GATG--GAAAGGGGCGGA-----CTATCCGCGCGT-----TCCGCCCTTTC-----GGGCCC
Zaco	GATG--GAAAGGGGCGGG-----TCATATTCTGATT-----CCCGCCCCTTTC-----GGGCCC
Zbfl	AGAT--GAAAGGGGCGGAC-----ATATTTTTGGTC-----GTCCGCCCTTTC-----GGTCCA
Spba	GATG--GAAAGGGGCGGA-----TTATTTATGATTT-----TCCGCCCTTTC-----GGGCCC
Game	ATGG--GAAAGGGGCGGA-----AATTTGCCCC-----TCCGCCCTTTC-----GGGCCC
Thth	ATTG--GAAAGGGGCGGAA-----AAGTTTTTCC-----TTCCGCCCTTTC-----GGGCCC
Xigl	GATG--GAAAGGCGGAC-----AATTATATTGCC-----GTCCGCCCTTTC-----GGGCCC
Hyja	GATG--GAAAGGGGCGGA-----AAATTTTTTCC-----TCCGCCCTTTC-----GGTCCC
Psan	GATG--GAAGAAGGCGGAAA-----TCTTTTT-----TTTCCGCCCTTTC-----GGCCCC
Cupa	GATG--GAAAGGGGCGGAA-----AAGTTTTTCC-----TTCCGCCCTTTC-----GGGCCC
Mpch	AGAT--CGAAAGGGGCGGA-----CGGAAATTT-----TCCGCCCTTTC-----GGCCC
Char	GATG--GAAAGGGGCGGAT-----CGGCTTTTTTT-----ATCCGCCCTTTC-----GGGCCC
Pser	ATAG--GAAGGGGCGGG-----CAGCCCCCTCC-----CCCTCGCCCCCTTC-----GGGCCC
Prol	AGAT--GAAAGGGGCGGAT-----TGACCCGTCGATT-----ATCCGCCCTTTC-----GGGCCA
Plbi	AGAT--GAAAAGGGGCGGAA-----CAAATCATTGATT-----TTCCGCCCTTTC-----GGGCCC
Calu	GATG--AAGGGGCGGA-----CAGGCCCTCC-----TCCGCCCTT-----GGGGG
Papa	not found
Sufr	GATT--GAAAGGGGCGGATCAA-----TTTTGTT-----TTATCCGCCCTTTC-----GGGCCC
Stci	AGAT--GAAAGGGGCGGCC-----CCCCCCCCACT-----GGCGCCCCTTTC-----GGGCCC
Taru	GATT--GAAAGGGGCGGA-----TCGTTTTGTT-----TCCGCCCTTTC-----GGGCCC
Rala	GATG--GAAAGGGGCGGA-----TTTGATTCTGATC-----TCCGCCCTTTC-----GGGCCC