

SlA. Multiple alignment of amino acid of the known piscine Ddx4 protein homologs and location of degenerate primer design. *C. carpio*, AF479820.2; *L. japonicus*, JQ756458.1; *E. fuscoguttatus*, KU695222.1; *D. labrax*, GU987023.1; *T. orientalis*, ABY77970.1; *T. maccoyii*, KP171241.1; *O. qoramy*, GQ422440.1; *L. calcarifer*, XM 018704462.1

<i>C. carpio</i>	LMACAQTGSGKTA AFLLPILQRFMTDGVAA SKFSEIQEPEAII VAPTRELINQIYLEARK	352
<i>D. labrax</i>	LMACAQTGSGKTA AFLLPILQQLMADGVAASS FSELQEPEAVIVAPTRELINQIYLEARK	299
<i>E. fuscoguttatus</i>	LMACAQTGSGKTA AFLLPILQQLMADGVAASS FSELQEPETIIVAPTRELINQIFLEARK	306
<i>T. orientalis</i>	LMACAQTGSGKTA AFLLPILQQLMADGVAAS RFSELQEPEAII VAPTRELINQIYLEARK	307
<i>T. maccoyii</i>	LMACAQTGSGKTA AFLLPILQQLMADGVAAS RFSELQEPEAII VAPTRELINQIYLEARK	306
<i>O. goramy</i>	LMACAQTGSGKTA AFLLPILQQLMADGVAAS RFSELQEPEALIVAPTRELINQIYLEARK	317
<i>L. japonicus</i>	LMACAQTGSGKTA AFLLPILQQLMADGVAAS RFSELQEPEAII VAPTRELINQIYLEARK	296
<i>L. calcarifer</i>	LMACAQTGSGKTA AFLLPILQQLMADGVAAS RFSELQEPEAII VAPTRELINQIYLEARK	310
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<i>C. carpio</i>	FAYGTCVRPVVYGGINTGYTIREVLKGCNVLCATPGRLHDLIGRGKIGLSKVRYLVLDE	412
<i>D. labrax</i>	FAFGTCVRPVVYGGVSTGHQIREISRGCNVLCGTPGRLLDVIGRGKVGLSKVRVFLDE	359
<i>E. fuscoguttatus</i>	FAFGTCVRPVVYGGVSTGHQIREICRGCNVVCCTPGRLLDVIGRGKIGLSKLRYLVLDE	366
<i>T. orientalis</i>	FAFGTCVRPVVYGGVSTGHQIREIERGCNVVCGTPGRLLDMIGRGKVGLSKLRYLVLDE	367
<i>T. maccoyii</i>	FAFGTCVRPVVYGGVSTGHQIREIERGCNVVCGTPGRLLDMIGRGKVGLSKLRYLVLDE	366
<i>O. goramy</i>	FSFGTCVRPVVYGGVSTAHQIREISRGCNVLCGTPGRLLDVIGRGKVGLSKLRYLVLDE	377
<i>L. japonicus</i>	FAFGTCVCPVVYGGASTGHQIREISRGCNVLCGTPGRLLDMIGRGKVGLSKLRYFLVDE	356
<i>L. calcarifer</i>	FAFGTCVRPVVYGGVSTGYQIREISRGCNVLCGTPGRLLDMIGRGKVGLQKLRYLVLDE	370

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<i>C. carpio</i>	ADRMLDMDMGFEPMRKLVGSPGMPSKEDRQTLMFSAATYPEDIQRMAADFLKVDYIFLAV	472
<i>D. labrax</i>	ADRMLD--MGFEPMRRLVGSPGMPSKENRQTLMFSAATYPEDIQRMAADFLKTDYFLAV	417
<i>E. fuscoguttatus</i>	ADRMLD--MGFEPMRRLVGSPGMPPKESRQTLMFSAATYPEDIQRMAADFLKTDYFLAV	424
<i>T. orientalis</i>	ADRMLD--MGFEPMRRLVGSPGMPSKENRQTLMFSAATYPEDIQRMAADFLKTDYFLAV	425
<i>T. maccoyii</i>	ADRMLD--MGFEPMRRLVGSPGMPSKENRQTLMFSAATYPEDIQRMAADFLKTDYFLAV	424
<i>O. goramy</i>	ADRMLD--MGFEPMRRLVGSPGMPSKENRQTLMFSAATYPEDIQRMAADFLKTDYFLAV	435
<i>L. japonicus</i>	ADRMLD--MGFEPMRRLVGSPGMPSKENRQTLMFSAATYPEDIQRMAADFLKTDYFLAV	414
<i>L. calcarifer</i>	ADRMLD--MGFEPMRRLVGSPGMPSKEDRQTLMFSAATYPEDIQRMAADFLKTDYFLAV	428

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<i>C. carpio</i>	GVVGGACSDVEQTIVQVTS--TKRDQLELLLRSTGNERTMVFVETKRSADFIATFLCQEK	531
<i>D. labrax</i>	GVVGGACSDVEQTFVQVTKFSKREQLLDLLKTTGMERTMVFVETKRQADFIATYLCQEK	477
<i>E. fuscoguttatus</i>	GIVGGACSDVEQSFVQVTKFSKREQLLDLLKTTGTERTMVFVETKRQADFIATYLCQEK	484
<i>T. orientalis</i>	GVVGGACSDVEQTFIQVTKFSKREQLLDLLKTTGTERTMVFVETKRQADFIATFLCQEK	485
<i>T. maccoyii</i>	GVVGGACSDVEQTFIQVTKFSKREQLLDLLKTTGTERTMVFVETKRQADFIATFLCQEK	484
<i>O. goramy</i>	GVVGGACSDVEQTFVQVTKFSKREQLLDLLKTTGTERTMVFVETKRQADFIATFLCQEK	495
<i>L. japonicus</i>	GVVGGACSDVEQTFVQVTKFSKREQLLDLLKTTGTERTMVFVETKRQADFIATYLCQEK	474
<i>L. calcarifer</i>	GVVGGACSDVEQTFIEVTKFSKREQLLDLLKTTGTERTMVFVETKRQADFIATFLCQEK	488

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<i>C. carpio</i>	STTSIHGDREQREREKALSDFRTGQCPVLVATSVAAAGLDIEQVQHVNFDPSSIDEYV	591
<i>D. labrax</i>	PTTSIHGDREQREREQALADFRSGKCPVLVATSVAAAGLDIPDVQHVNFDPNNIDEYV	537
<i>E. fuscoguttatus</i>	PTTSIHGDREQREREQALADFRSGKCPVLVATSVAAAGLDIPDVQHVNFDPNNIDEYV	544
<i>T. orientalis</i>	PTTSIHGDREQREREQALADFRSGKCPVLVATSVAAAGLDIPDVQHVNFDPNNIDEYV	545
<i>T. maccoyii</i>	PTTSIHGDREQREREQALADFRSGKCPVLVATSVAAAGLDIPDVQHVNFDPNNIDEYV	544
<i>O. goramy</i>	PTTSIHGDREQREREQALADFRSGKCPVLVATSVAAAGLDIPDVQHVNFDPNNIDEYV	555
<i>L. japonicus</i>	PTTSIHGDREQREREQALADFRSGKCPVLVATSVAAAGLDIPDVQHVNFDPNNIDEYV	534
<i>L. calcarifer</i>	PTTSIHGDREQREREQALADFRSGKCPVLVATSVAAAGLDIPDVQHVNFDPNNIDEYV	548

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Tpe-ddx4R2

Tpe-ddx4R1

<i>C. carpio</i>	HRIGRTGRCGNIGRAVSFFNPESDTPLARSLVKVLSGAQQEVPKWLEEIAFSAHG-TTGF	650
<i>D. labrax</i>	HRIGRTGRCGNTGRAVSFFDPDSDQLARSLVTILSKAQEVPSWLEDSAFSGPGSM--G	595
<i>E. fuscoguttatus</i>	HRIGRTGRCGNTGRAVSFYDPDNDQLARSLVTILSKAQEVPAWLEESAFSGGGGSGF	604
<i>T. orientalis</i>	HRIGRTGRCGNTGRAVSFYDPDADGQLARSLVTVLSKAQQEVPSWLEESAFSGP-ATTGF	604
<i>T. maccoyii</i>	HRIGRTGRCGNTGRAVSFYDPDADGQLARSLVTVLSKAQQEVPSWLEESAFSGP-ATTGF	603
<i>O. goramy</i>	HRIGRTGRCGNTGRAVSFYDPEADGHLARSLVGVLSKAQQEVPSWLEEAFAFGP-SSTGF	614
<i>L. japonicus</i>	HRIGRTGRCGNTGRAVSFYDPDADGQLARSLVTVLSKAQQEVPSWLEEFASFSGP-ATTGF	593
<i>L. calcarifer</i>	HRIGRTGRCGNVGRAVSFYDPDADVQLARSLVTVLSKAQQVPSWLEEHAFSGL--STGF	606

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<i>C. carpio</i>	NPRGKVFASTDRKG---GSFKTDEPPQASAPSPAAAADDEEWE	691
<i>D. labrax</i>	VAPRKTFASSDSRKGPQGGSVQDSDV-QSQSAAQTAH-DEEWD	637
<i>E. fuscoguttatus</i>	NAPRKSFASDTSRK---GGSSQDNSV-KSPPAQSAN-DEEWE	643
<i>T. orientalis</i>	NPPRKNFASTDSRK---RGSFQDNSV-KSQPAVQTAADDDEEWE	644
<i>T. maccoyii</i>	NPPRKNFASTDSRK---RGSFQDNSV-KSQPAVQTAADDDEEWE	643
<i>O. goramy</i>	NPPRKNFASTDRQ---RGLLQDTSV-MSQPAAPQAA-DEEWE	653
<i>L. japonicus</i>	NPPRKNFASTDSRK---GGSFQDNMG-ESLPAAQAAA-DEEWE	632
<i>L. calcarifer</i>	NPPRKNFASTDSRK---GGSFQDNMM-KSQPAALAAA-DEEWE	645

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S1B. Nucleotide alignment of the known piscine ddx4 homologs degenerate oligonucleotide primer design for cloning of *ddx4*. *C. carpio*, AF479820.2; *L. japonicus*, JQ756458.1; *E. fuscoguttatus*, KU695222.1; *D. labrax*, GU987023.1; *T. orientalis*, ABY77970.1; *T. maccoyii*, KP171241.1; *O. goramy*, GQ422440.1; *L. calcarifer*, XM_018704462.1

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D.labrax      -----
L.japonicus   -----
T.orientalis  -----
T.maccoyii    -----
O.goramy      -----
L.calcarifer  -----
E.fuscoguttatus -----
C.carpio      ATGGATGACTGGGAGGAAGATCAGGGCCCTGTTGTATCCTGCAGTTCAGGTTTTGGTCTG

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D.labrax      ----ATGGATGAGTGGGAAGAAGAGGGAACACTATTACTAGCACTACCACACTAACCAC
L.japonicus   ----ATGGACGAATGGGAAGAAGAAGGAACCTCC---TACAAGTACTATAACACTAACCAG
T.orientalis  ----ATGGATGAGTGGGAAGAAGAGGGAAATACT-----AGCACTATTACACTAACCAG
T.maccoyii    ----ATGGATGAGTGGGAAGAAGAGGGAAATACT-----AGCACTATTACACTAACCAG
O.goramy      ----ATGGATGAGTGGGAAGAAGAGGAAACTACTACTATTAGTACTATCGCACTAACCAG
L.calcarifer  ----ATGGATGATTGGGATGAAGAGGCAACTGCT---ACCAGTGCTATTACACTAACCAG
E.fuscoguttatus ----ATGGACGAGTGGGAAGAAGAGGGAACCTACC---ACTAGTACTATTGCACCAACCAG
C.carpio      AGCTCTAGAGGTGCAGACGGAGGATTCAAGAGCTTTTA-TACAGGAAGTACAGGAAACGG
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D.labrax      CACT-----AGTGAAGGCAGACAAGAAGGGTCTTGAATAC---TGCCAATGGTGAATC
L.japonicus   CCAC-----ACCT---CAAGTGAAGGTTGTGGTGAAGAG----GCAGACGAGGAGGA
T.orientalis  CCGCACCTCAAGTGAAGGCACACAAGGAGACTTCTGGAACAC---CAATGGTGGTGAATT
T.maccoyii    CCACACCTCAAGTGAAGGCACACAAGGAGACTTCTGGAACAC---CAATGGTGGTGAATT
O.goramy      TCAAAGCACAAATGAAGGCACTCAAGGAGATTCTGGAACAC---AGACAGCGGTGAATC
L.calcarifer  CCACACCTCAAATGAAGTCACACAAGGAGACTCATGGAACGC---TGGTGGTGGTGAATT
E.fuscoguttatus C-----CAAGGAGATACCTGGAACAC---TGGTGGTGGGAGAATT
C.carpio      GAAGGCCAAACAATGAAGATGGTGATGGTGGCTCATGGAAGACGACTGCTGGTGGTGGATT
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D.labrax      T---GGAAGGGGTCGTGGTGGGAAGGGGCAGAGG-----AGGAGGATTTAAAAGCTCATT
L.japonicus   T---TTAAAAGCTTGTTCTCTTCAGG--TGGTG-----ACGAGAATCAGAA-----
T.orientalis  T---GGAAGGGGTCGCGGTGGAAGAGGCAGAGGGAG---AGGAGGATTTAAAAGCTCATA
T.maccoyii    T---GGAAGAGGTCGCGGTGGAAGAGGCAGAGGGAG---AGGAGGATTTAAAAGCTCATA
O.goramy      T---GGAAGGGGTCGTGGAGGTGGAGGCAGAGGAAGACGAGGAGGATTCAAAGCTCATT
L.calcarifer  T---GGAGGGGTCGCGGTGGAAGAGGCAAAGGCAGACGAGGGGGATTTACAAGCTCATT
E.fuscoguttatus T---AGCAGGGGTCGTGGTGGGAAGAGGCAGAGGCAGACACAAGGAGGATTTAAAAGCTCGTT
C.carpio      CAGGGGCAGAGGAGGCAGGGGAGGATCACGAGGAGGAAGAGGAGCTTCAGAAATACCTT
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D.labrax      CTCCTC-----AGATGGCGACAACCTGGAACAGTACAGCTGGAGA
L.japonicus   -----TGATGGGGACAACCTGGAACAATACAGGTGGAGA
T.orientalis  CTCCTCAGGTGGAGATGGGA-----ATGATGAGGACAAATGGAACAATGCAGGAGGAGA
T.maccoyii    CTCCTCAGGTGGAGATGGGA-----ATGATGAGGACAAATGGAACAATGCAGGAGGAGA
O.goramy      CTCCTCAGGAGGTGAGGAGAGAAGGGATGATGGGAACAACCTGGAACAGTACAGCAGCAGA
L.calcarifer  CTC-----AGGTGATGAGA-----ATGGGAATGACAGCTGGAACAATACAGGAGGGGA
E.fuscoguttatus CTCCTCAGGTGGTGGTATGAGAATGGGAACGATCAGGACACTTGAACCATGCAGGAGGAGA
C.carpio      TAAATCAGAAACTGATGAAAATGGCAACGATGAGGGTTGGAAAAATGGTGAAGGCCAAGG
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D.labrax      AAGAGGT-----TTTAGAGGTAGA-----GGAGG---CAGAGGGCGTGGCAGAGG
L.japonicus   AAGAGGT-----GGTTTCAGAGGTAGA-----GGAGG---CAGAGGGCGTGGCAGGGG
T.orientalis  AAGAGGT-----GGTTTCAGAGGTAGA-----GGAGG---CCAAGGGCGCGGCAGAGG
T.maccoyii    AAGAGGT-----GGTTTCAGAGGTAGA-----GGAGG---CCAAGGGCGCGGCAGAGG
O.goramy      AAGAGGT-----GGTTTCAGAGGTAGA-----GGAGG---CCGAGGTGCTGGCAGAGG
L.calcarifer  AAGAGGT-----GGTTTCAGAGATAGA-----GGCGG---TCGAGGGCGTGGCAGAGG
E.fuscoguttatus CAGAGGT-----GGTTTCAGAGGGAGA-----GGAGGACGCAGAGGGCGCGGCAGAGG
C.carpio      AAGAGGTGCTGGTGGTTTTCCGTGGTGGTTTTCCGCGGGGGTTTTCCGCGGTGGTTTTCCGTGA
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<i>D.labrax</i>	ATTCAGCC--GAACGGATCGCAGTGAA----TTCAATGAGGATGACAATCAAGTGTGTGA
<i>L.japonicus</i>	ATTTGACA--GAAGGGATCGCAGTGAA----TTCAATGAAAACATGATGGAGTGTGTGA
<i>T.orientalis</i>	ATTTTGCA--GAATGGATCAAAGTGAA----TTCAATGGAGATGACAATGGAATGCGTGA
<i>T.maccoyii</i>	ATTTTGCA--GAATGGATCAAAGTGAA----TTCAATGGAGATGACAATGGAATGCGTGA
<i>O.goramy</i>	ATTTGGTC--GAATGGATCAGAGTGAA----TTCAACGGTGATGACAGTGGAGTGTGTGA
<i>L.calcarifer</i>	ATTTTGCA--GAACGGATCCGAGTGAA----TTCACTGGAGATGACGATGGAGTGTGTGA
<i>E.fuscoguttatus</i>	ATTTGGCG--GGACGGATGGCAGTGAA----TTCAGTGGAGATGATAATGGAGTGTGTGA
<i>C.carpio</i>	AGGTGGCAATGAAGAGACTGGGAAAAAGGCTTTGGAAGAGAAAATGACGGAAATGGCAC

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<i>D.labrax</i>	AAATGG-----GGGAGGCAGCCAGGCGGCAGAGGAGGCAGAGGAGG-----
<i>L.japonicus</i>	AAATGGCTTTAGGGGAGGAAGCAGAGGAGGAAGAGGTGGCAGAGGAGGA-----GG---
<i>T.orientalis</i>	AAATGGGT---ATAGAGGAGGAAGAGGGGGCAGAGGAAGAGGAGGAGG-----
<i>T.maccoyii</i>	AAATGGGT---ATAGAGGAGGAAGAGGGGGCAGAGGAAGAGGAGGAGG-----
<i>O.goramy</i>	AAGTGGGTTTAGAGGAGGAAGCCGAGGTGGAAGAGGCAGCAGAGGAAGA-----GGAGG
<i>L.calcarifer</i>	AAATGGGTTTAGAGGAGGAAGCCGAGGAGGAAGAGGCAGCAGAGGAGGT-----CGAGG
<i>E.fuscoguttatus</i>	AAATGGGTTTAGAGGAGGAAGCCGAGGAGGAAGAGGCGGCAGAGG-----
<i>C.carpio</i>	AGATGGGGGTTGGAAGGAGGTGAAGGCCGAGGAATAGGTCGTGGAGGCTTCCGTGGGGG

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<i>D.labrax</i>	TTTCAGATCAGGTGGTGAC--CAAGGTTGCAG----AGGAGGATTTGG--AGGAGGCTA
<i>L.japonicus</i>	TTTCAGACAAGGTGGTGAC--CAGGGTGGCAA----AGGAGGCTTTGG--AGGAGGCTA
<i>T.orientalis</i>	TTTCAGCCAAGGTGGCGAC--CAGGGTGGCAG----AGGAGGCTTTGG--AGGAGGTTA
<i>T.maccoyii</i>	TTTCAGCCAAGGTGGCGAC--CAGGGTGGCAG----AGGAGGCTTTGG--AGGAGGTTA
<i>O.goramy</i>	CTTCAGAGAAGCTGGTGAC--CAGGGTGGCAG----AGGAGGCTATGG--AGGAGGCTA
<i>L.calcarifer</i>	TTTCAGACAAGGTGGTGAG--CGGGGTGGCAG----AGGAGGCTTTGG--AGGAGGTTA
<i>E.fuscoguttatus</i>	TTTCAGACAAGGTGGTGAC--CAGGGTGGCAG----AGGAGGCTTTGG--AGGAGGCTA
<i>C.carpio</i>	CTTCCGTGATGGTAGTGGTGATGAGGAGACAGGAAAAAGAGGCTTTGGTAGAGGAGGTTT

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<i>D.labrax</i>	CCGTGGAAGATGAGGAGGTCTTTTCTCAACG---GGAAGATAAAGA-----AAATAA
<i>L.japonicus</i>	CCGTGGAAGATGAGGAGATATTTGCTCAACGTGGGGAAGATAAAGA-----AAAGAA
<i>T.orientalis</i>	TCGTGGAAGATGAGGAGATCTTTACTCGAGG---GGAAGATAAAGA-----TCCAGA
<i>T.maccoyii</i>	TCGTGGAAGATGAGGAGATCTTTACTCGAGG---GGAAGATAAAGA-----TCCAGA
<i>O.goramy</i>	CCGTGGAAGATGAAGAGATCTTTGCTCAAGG---GGAAGATAAAGACCCAGGAAAGAA
<i>L.calcarifer</i>	CAGAGGAAAAGATGAACAGGTCTTTGCTCAAGG---GGAAGATAAAGATCC---AGGGAA
<i>E.fuscoguttatus</i>	CCGTGGGAAAAGATGAGGAGGTCTTTGCTAAAGG---GGATGACAGAGATCC---AGAGAA
<i>C.carpio</i>	CAGAGCCGGAATGAGGAAGTGTTTTC-CAAGGCCTCAACAGCAGACAAGCC--AGATCC

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<i>D.labrax</i>	GGATGCAACCGATGGTGAAAGACCAAGGGTCACATATATTCCCCAACCCCTCCCTGAAGA
<i>L.japonicus</i>	GGATGCAAGTGATGGTGACAGACCGAAGGTCACGTATGTTCCCCAACCCCTCCCTGAAGA
<i>T.orientalis</i>	AAAGAAGGACGATAGTGACAGACCAAAGATCACATATGTTCCCCAACCCCTCCCTGAAGA
<i>T.maccoyii</i>	AAAGAAGGATGATAGTGACAGACCAAAGATCACATATGTTCCCCAACCCCTCCCTGAAGA
<i>O.goramy</i>	GGATGCGATCGATGGTGACAGACCGAAGGTAACATACGTTCCCCAACACTCCCTGAAGA
<i>L.calcarifer</i>	TGATGCAAGTGAGGGTGACAGACCAAAGATCACATACATTCCACCAACCCTACCTGAAGA
<i>E.fuscoguttatus</i>	GGATGCAGGCGATGGTGACAAGCCAAAGGTCACGTATATTCCCCGTCCCTTCCCTGATGA
<i>C.carpio</i>	AGAAGCAGGTGAAAATGCAGGACCAAGGTTGTCTATGTGCCGCCTCCCCCTCCAGAAGA

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Tpe-ddx4F1

5' -GAYGABAT

<i>D.labrax</i>	TGAAGACTCCATTTTTGCCCACTATGAGACGGGCATCAACTTTGACAAGTATGATGACAT
<i>L.japonicus</i>	TGAAGACTCCATTTTTTCCCACTATGAGACGGGCATCAACTTTGACAAGTATGATGACAT
<i>T.orientalis</i>	TGAGGACTCCATTTTTTCCCACTATGAAACAGGGATCAACTTTGACAAGTATGATGACAT
<i>T.maccoyii</i>	TGAGGACTCCATTTTTTCCCACTATGAAACAGGGATCAACTTTGACAAGTATGATGACAT
<i>O.goramy</i>	CGAAGACTCCATTTTTGCACACTACAAGACAGGCATCAACTTTGACAAATATGATGACAT
<i>L.calcarifer</i>	CGAAGACGCCGTGTTTGCCCCACTACGAGACAGGCATTAACTTTGATAAGTATGACGACAT
<i>E.fuscoguttatus</i>	CGAAGACTCCATTTTCGCCCCACTACGAGTCAGGCATCAACTTCGACAAGTATGATGACAT
<i>C.carpio</i>	GGAGAGTTCCATATTTTCCCATATGCCTCAGGCATTAATTTTGACAAATATGATGACAT

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MHTKGTVGAYGTBAGYGG-3'

D. labrax CCTGGTGGATGTCAGTGGAGCCAATCCACCACAGGCTATAATGACTTTTGGATGAGGCAGG
L. japonicus CATGGTGGATGTCAGTGGTACCAACCCACCGCAGGCTATCATGACCTTTGATGAGGCAGC
T. orientalis CATGGTGGATGTTAGTGGAAACCAATCCACCACAAGCTGTCATGACTTTTGGATGAGGCAGC
T. maccoyii CATGGTGGATGTTAGTGGAAACCAATCCACCACAAGCTGTCATGACTTTTGGATGAGGCAGC
O. goramy AATGGTGGATGTCAGCGGAACCAACCCACCACAGGCAATCCTGACCTTTGATGAGGCGGC
L. calcarifer TATGGTTGATGTCAGTGGAAACCAATCCACCAGAGGCACTCATGACTTTTGGATGAGGCAAT
E. fuscoguttatus CATGGTAGACGTCAGTGGAAACCAACCCACCACAGGCCATCATGACTTTTCGACGAGGCAGC
C. carpio CCTTGTGGATGTGAGTGGCAGCAATCCTCCAAAGGCTATTATGACTTTTGGATGAAGCAGG
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Tpe-ddx4F2**5' -AAGCCBACYCCDGT**

D. labrax ATTGTGTGAGTCGCTGAGAAAAACAGTCAGCAAGTCTGGTTATGTGAAGCCGACCCCTGT
L. japonicus ATTGTGCGAGTCCCTGAGAAAAACGTCAGCAAATCTGGTTATGTAAAGCCGACCCCTGT
T. orientalis ATTGTGCGAGTCCCTGAGAAAAACGTCAGCAAGTCTGGTTATGTGAAGCCGACCCCTGT
T. maccoyii ATTGTGCGAGTCCCTGAGAAAAACGTCAGCAAGTCTGGTTATGTGAAGCCGACCCCTGT
O. goramy GTTGTGCGAGACCCCTGAGAAAAACGTCAGCAAGTCTGGCTATGTGAAGCCACCCCTGT
L. calcarifer GTTGTGCGAATCCCTGAGAAAAACGTCAGCAAGTCTGGTTACGTGAAGCCGACCCCTGT
E. fuscoguttatus GTTGTGCGAGTCCCTGAGAAAAACATCAAGAAGTCTGGTTACGTGAAGCCGACCCCTGT
C. carpio ACTTTGTGAATCACTGAGAAAGATGTAACGAAGTCTGGATATGTGAAGCCTACTCCTGT
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VCAGAARYAYGG-3'

D. labrax GCAGAAGCATGGCATTCCAATCATCTCTGCTGGTAGAGATCTTATGGCCTGTGCCAGAC
L. japonicus TCAGAAGCACGGCATCCAATCATCTCTGCTGGCAGAGATCTCATGGCCTGTGCCAAAC
T. orientalis GCAGAAGCACGGCATCCAATCATCTCTGCTGGTAGAGATCTCATGGCCTGTGCCAGAC
T. maccoyii GCAGAAGCACGGCATCCAATCATCTCTGCTGGTAGAGATCTCATGGCCTGTGCCAGAC
O. goramy GCAGAAGCACGGTATTCCAATCATTTCTGCCGGCAGAGATCTCATGGCCTGCGCCAGAC
L. calcarifer GCAGAAGCATGGCATCCCGATCATCTCTGCCGGCAGAGATCTCATGGCCTGTGCCAGAC
E. fuscoguttatus GCAGAAGTACGGCATCCCGATCATCTCTGCCGGCAGAGATCTCATGGCCTGTGCCAGAC
C. carpio CCAGAAACATGGAATCCCATATTCTGCTGGAAGAGATCTAATGGCTTGTGCCAGAC
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D. labrax TGGATCTGGTAAAACGGCTGCTTTCCTGCTCCCTATTCTGCAGCAGCTGATGGCAGACGG
L. japonicus TGGATCTGGTAAAACGGCTGCATTCTGCTCCCTATTCTGCAGCAACTGATGGCAGACGG
T. orientalis TGGATCTGGTAAAACGGCTGCATTCTGCTCCCTATTCTGCAGCAGCTGATGGCAGATGG
T. maccoyii TGGATCTGGTAAAACGGCTGCATTCTGCTCCCTATTCTGCAGCAGCTGATGGCAGATGG
O. goramy TGGATCGGGCAAAAACGGCTGCGTTCTGCTCCCAATTCTGCAGCAGCTGATGGCAGACGG
L. calcarifer TGGATCTGGTAAAACGGCTGCGTTCTTCTCCCAATTCTGCAGCAGCTGATGGCGACGG
E. fuscoguttatus TGGATCTGGTAAAACGGCTGCGTTCTGCTCCCAATTCTGCAGCAGCTGATGGCAGACGG
C. carpio CGGGTCAGGAAAAACGGCGGCTTCTGCTGCCCATCCTACAGCGCTTTATGACTGATGG
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D. labrax TGTGGCAGCCAGTTCCCTCAGTGAGCTGCAGGAGCCTGAAGCCGTCATCGTGGCTCCAAC
L. japonicus TGTGGCAGCCAGTCGTTTTCAGTGAGCTGCAGGAGCCTGAAGCCATCATTGTGGCCCCAAC
T. orientalis TGTGGCAGCAAGTCGCTTCAGCGAGCTGCAGGAGCCTGAAGCAATCATTGTGGCCCCAAC
T. maccoyii TGTGGCAGCAAGTCGCTTCAGCGAGCTGCAGGAGCCTGAAGCAATCATTGTGGCCCCAAC
O. goramy AGTGGCAGCCAGTCGCTTCAGTGAGCTGCAGGAGCCTGAAGCTCTCATTGTGGCCCCGAC
L. calcarifer TGTGGCAGCCAGTCGCTTCAGTGAGCTGCAGGAGCCTGAGGCCATCATTGTGGCCCCAAC
E. fuscoguttatus TGTGGCAGCCAGTAGCTTCAGCGAGCTGCAGGAGCCTGAGACCATCATCGTGGCCCCGAC
C. carpio TGTGGCAGCCAGCAAGTTTCAGTGAGATACAGGAGCCTGAGGCCATAATCGTGGCTCCAC
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D. labrax TAGGGAGCTCATCAACCAGATTTACCTAGAGGCCAGGAAGTTTCGCCTTTGGGACATGTGT
L. japonicus TAGGGAGCTCATCAACCAGATTTACCTGGAAGCCAGGAAGTTTGCCCTTTGGGACATGTGT
T. orientalis CAGGGAGCTCATCAACCAGATTTACCTGGAGGCCAGGAAGTTTGCCCTTTGGGACATGTGT
T. maccoyii CAGGGAGCTCATCAACCAGATTTACCTGGAGGCCAGGAAGTTTGCCCTTTGGGACATGTGT
O. goramy CAGGGAGCTCATCAACCAGATTTACCTGGAGGCCAGGAAGTTTTCATTTGGGACGTGTGT
L. calcarifer CAGGGAGCTCATCAATCAGATTTACCTAGAGGCCAGGAAGTTTGCTTTTCGGGACGTGTGT
E. fuscoguttatus CAGAGAACTCATCAACCAGATCTTCTGAGGCCAGGAAGTTTGCCCTTTGGGACATGTGT
C. carpio CAGAGAACTTATCAATCAGATCTATCTGGAGGCCAGGAAGTTTGATACGGGACCTGTGT
 * * * * *

<i>D. labrax</i>	CGGTCCAGTAGTAGTCTATGGTGGAGTCAGCACTGGACATCAAATAAGAGAAATCTCAAG
<i>L. japonicus</i>	GTGTCCAGTAGTGGTTTATGGTGGAGCCAGCACTGGACACCAAATAAGGGAAATCTCAAG
<i>T. orientalis</i>	CGGTCCAGTGTTGGTTTATGGTGGAGTCAGCACTGGACACCAAATAAGAGAAATCGAAAG
<i>T. maccoyii</i>	CGGTCCAGTGGTGGTTTATGGTGGAGTCAGCACTGGACACCAAATAAGAGAAATCGAAAG
<i>O. goramy</i>	CGGTCTCTGTAGTTGTTTATGGTGGAGTCAGCACTGCACACCAATCAGAGAAATCTCAAG
<i>L. calcarifer</i>	GCGTCCGGTGGTTGTTTATGGTGGAGTCAGCACTGGATACCAAATAAGGGAAATCTCAAG
<i>E. fuscoguttatus</i>	GCGTCCAGTCGTGGTGTATGGTGGAGTCAGCACTGGACACCAGATCAGAGAGATCTGCAG
<i>C. carpio</i>	ACGACCTGTTGTGGTTTATGGAGGTATAAATACCGGATATACTATCCGAGAGGTGTTAAA

<i>D. labrax</i>	GGGATGCAATGTGCTGTGTGGAACACCAGGGAGACTGTTGGATGTGATTGGAAGAGGAAA
<i>L. japonicus</i>	GGGATGCAATGTTCTGTGTGGAACACCAGGGAGACTGTTGGATATGATTGGAAGAGGAAA
<i>T. orientalis</i>	GGGATGCAATGTAGTGTGTGGAACACCAGGGAGGCTATTGGATATGATTGGAAGAGGAAA
<i>T. maccoyii</i>	GGGATGCAATGTAGTGTGTGGAACACCAGGGAGGCTATTGGATATGATTGGAAGAGGAAA
<i>O. goramy</i>	GGGATGCAATGTGCTGTGTGGAACACCAGGGAGACTGTTGGATGTGATCGGAAGAGGAAA
<i>L. calcarifer</i>	GGGCTGCAATGTGCTGTGTGGAACACCAGGGAGACTGTTGGATATGATTGGAAGAGGAAA
<i>E. fuscoguttatus</i>	GGGCTGCAATGTGGTGTGTGGAACACCAGGGAGGCTGTTGGATGTGATCGGACGAGGAAA
<i>C. carpio</i>	GGGCTGCAATGTATTGTGTGCTACTCCTGGAAGATTGCATGACCTCATTGGTCGTGGAAA

<i>D. labrax</i>	GGTTGGGTTGAGTAAGGTGCGGTACTTTGTGCTGGATGAGGCTGACCGGATGTTGGATAT
<i>L. japonicus</i>	GGTTGGGTTGAGTAAGTTGCGCTACTTTGTGCTGGACGAGGCTGACCGGATGTTGGATAT
<i>T. orientalis</i>	GGTTGGGTTGAGTAAGCTGCGGTACTTGGTGCTAGATGAGGCCGACCGGATGTTGGATAT
<i>T. maccoyii</i>	GGTTGGGTTGAGTAAGCTGCGGTACTTGGTGCTAGATGAGGCCGACCGGATGTTGGATAT
<i>O. goramy</i>	GGTTGGGTTGAGTAAGCTGAGGTACCTGGTGCTAGATGAGGCTGACAGGATGTTGGATAT
<i>L. calcarifer</i>	GGTTGGGCTGCAGAAGCTGCGGTACTTGGTGCTGGATGAGGCTGACCGTATGCTGGACAT
<i>E. fuscoguttatus</i>	GATTGGGTTGAGTAAGCTGCGCTACTTGGTGCTGGACGAGGCAGCCGATGCTGGACAT
<i>C. carpio</i>	GATTGGCCTGAGTAAAGTGCGCTATCTAGTTCTGGATGAAGCAGACAGAATGCTGGACAT

<i>D. labrax</i>	GG-----GTTTGTAGCCTGACATGCGTCGCTTGGTGGGCTCCCCGGAATGCCATCAA
<i>L. japonicus</i>	GG-----GTTTGTAGCCTGACATGCGCCGCTTGGTGGGCTCCCTTGAATGCCGTCCAA
<i>T. orientalis</i>	GG-----GATTTGAGCCTGACATGCGCCGCTTGGTGGGCTCACTGGAATGCCATCCAA
<i>T. maccoyii</i>	GG-----GATTTGAGCCTGACATGCGCCGCTTGGTGGGCTCACTGGAATGCCATCCAA
<i>O. goramy</i>	GG-----GTTTTGAGCCTGACATGCGACGCCCTCGTGGGCTCTCTGGAATGCCGTCCAA
<i>L. calcarifer</i>	GG-----GCTTCGAGCCTGACATGCGGCGCCTGGTGGGCTCTCTGGAATGCCATCCAA
<i>E. fuscoguttatus</i>	GG-----GCTTTGAACCTGACATGCGCCGCTTGGTGGGCTCCCTTGAATGCCACCCAA
<i>C. carpio</i>	GGACATGGGCTTCGAGCCAGATATGCGTAAGCTAGTGGGATCTCCGGGCATGCCTTCAA

<i>D. labrax</i>	AGAGAACCGGCAGACGCTGATGTTTCAGTGCCACCTACCCTGAGGACATTTCAGAGGATGGC
<i>L. japonicus</i>	AGAGAACCGTCAGACTCTGATGTTTCAGTGCCACCTACCCTGAGGACATTTCAGAGGATGGC
<i>T. orientalis</i>	AGAGAACCGTCAGACTCTGATGTTTCAGTGCCACATACCCTGAAGACATCCAGAGGATGGC
<i>T. maccoyii</i>	AGAGAACCGTCAGACTCTGATGTTTCAGTGCCACATACCCTGAAGACATCCAGAGGATGGC
<i>O. goramy</i>	AGAGAACCGTCAGACTCTGATGTTTCAGTGCCACCTACCCTGAGGACATCCAGAGGATGGC
<i>L. calcarifer</i>	GGAGGACCGTCAGACTCTGATGTTTCAGTGCCACCTATCCTGAGGACATCCAAAGGATGGC
<i>E. fuscoguttatus</i>	AGAGAGCGCCAGACTCTGATGTTTCAGCGCCACCTACCCCGAGGACATCCAGAGGATGGC
<i>C. carpio</i>	AGAGGATCGACAAACCCTCATGTTTCAGTGCCACCTACCCTGAAGATATTCAAAGGATGGC

<i>D. labrax</i>	AGCAGACTTTCTCAAGACCGACTATTTGTTCTTGGCTGTGGGTGTGGTTGGCGGAGCCTG
<i>L. japonicus</i>	AGCTGACTTCCTCAAGACGGACTATTTATTCTTGGCTGTGGGTGTGGTGGGCGGAGCCTG
<i>T. orientalis</i>	GGCTGACTTCCTCAAGACAGACTATTTGTTCTTGGCTGTGGGTGTGGTGGGTGGAGCCTG
<i>T. maccoyii</i>	TGCTGACTTCCTCAAGACAGACTATTTGTTCTTGGCTGTGGGTGTGGTGGGTGGAGCCTG
<i>O. goramy</i>	GGCTGACTTCCTGAAGACAGACTATTTGTTCTTGGCTGTGGGTGTGGTGGGTGGAGCCTG
<i>L. calcarifer</i>	GGCAGACTTCCTCAAGACTGACTATTTGTTCTTGGCTGTGGGTGTGGTGGGAGGAGCCTG
<i>E. fuscoguttatus</i>	GCCTGACTTCCTCAAGACTGACTATTTGTTCTTGGCTGTGGGTATTTGTGGGCGGAGCCTG
<i>C. carpio</i>	TGCAGATTTTTTGAAAGTGGACTACATTTTCTTGTCTGTTGGTGTGGTTGGTGGAGCATG

<i>D. labrax</i>	CAGTGATGTGGAGCAGACATTTGTCCAGGTCACCAAGTTCTCCAAAAGGGAGCAACTCCT
<i>L. japonicus</i>	CAGTGACGTGGAGCAGACATTTGTCCAAGTCTACTAAGTTCTCCAAGAGGGAGCAGCTCCT
<i>T. orientalis</i>	CAGTGATGTGGAGCAGACATTTATCCAAGTCACAAAGTTCTCCAAGAGAGAGCAGCTCCT
<i>T. maccoyii</i>	CAGTGATGTGGAGCAGACATTTATCCAAGTCACAAAGTTCTCCAAGAGAGAGCAGCTCCT
<i>O. goramy</i>	CAGTGATGTGGAGCAGACATTTGTCCAAGTGACCAAATTTCTCCAAGAGGGAGCAGCTCCT
<i>L. calcarifer</i>	CAGCGATGTGGAGCAGACATTTATTGAAGTTACCAAATTTCTCCAAGAGGGAGCAGCTACT
<i>E. fuscoguttatus</i>	CAGTGACGTGGAGCAGTCATTTGTGCAAGTCACCAAGTTCTCCAAGAGGGAGCAGCTCCT
<i>C. carpio</i>	CAGTGATGTGGAGCAAACATATCGTTCAGGTGACCAG---TACCAAGAGAGACCAGCTGCT

<i>D.labrax</i>	TGACCTCCTCAAGACAACCTGGAATGGAGCGCACTATGGTGTTTGTGGAGACCAAGAGACA
<i>L.japonicus</i>	TGACCTCCTCAAGTCAACTGGAATGGAGCGCACCATGGTGTTTGTAGAGACCAAGAGACA
<i>T.orientalis</i>	TGACCTCCTGAAGACCACTGGAACGGAGCGCACCATGGTGTTTGTAGAGACCAACGACA
<i>T.maccoyii</i>	TGACCTCCTGAAGACCACTGGAACGGAGCGCACCATGGTGTTTGTGGAGACCAACGACA
<i>O.goramy</i>	GGATCTCCTGAAGACCACAGGAACGGAGCGCACCATGGTGTTTGTGGAGACCAAGAGACA
<i>L.calcarifer</i>	TGACCTCCTGAAGACCACAGGAACGGAGCGCACCATGGTGTTTGTGGAAACCAAGAGACA
<i>E.fuscoguttatus</i>	CGACCTCCTCAAGACCACTGGAACGGAGCGCACCATGGTGTTTGTGGAGACCAAGAGACA
<i>C.carpio</i>	TGAACTGCTCAGATCTACAGGAATGAACGCACAATGGTCTTTGTTGAAACCAAAAGAAG
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<i>D.labrax</i>	AGCTGATTTTCATTGCCACTTACTTGTGCCAGGAAAAGGTTCCCTACCACCAGCATTTCATGG
<i>L.japonicus</i>	AGCTGATTTTATTGCCACTTACTTGTGCCAGGAAAAGGTTCCAACTACAAGCATTTCATGG
<i>T.orientalis</i>	AGCTGATTTTATTGCCACGTTCTTGTGCCAAGAGAAAAGTTCCAACTACCAGCATTTCACGG
<i>T.maccoyii</i>	AGCTGATTTTATTGCCACGTTCTTGTGCCAAGAGAAAAGTTCCAACTACCAGCATTTCACGG
<i>O.goramy</i>	AGCTGATTTTATTGCCACATTCTTGTGCCAGGAGAAGGTTCCCAACAACAGCATTTCATGG
<i>L.calcarifer</i>	GGCTGATTTTATTGCCACTTTCCTGTGCCAGGAGAAGGTTCCAACCACCAGCATTTCATGG
<i>E.fuscoguttatus</i>	AGCTGATTTTCATCGCCACTTATTGTGCCAGGAGAAGGTTCCAACTACGAGCATCCACGG
<i>C.carpio</i>	TGCTGATTTTCATTGCAACATTTCTCTGTCAAGAGAAGATGTCTACTACAAGCATCCATGG
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<i>D.labrax</i>	TGACCGAGAGCAGCGGGAGCGAGAGCAGGCTCTGGCAGACTTCCGCTCTGGCAAAATGTCC
<i>L.japonicus</i>	TGACCGTGAGCAGCGGGAGCGAGAGCAGGCTCTGGCCGACTTCCGCTCTGGCAAAATGTCC
<i>T.orientalis</i>	TGACCGAGAGCAGCGGGAGCGAGAGCAGGCTCTGGCAGACTTCCGCTCTGGTAAATGTCC
<i>T.maccoyii</i>	TGACCGAGAGCAGCGGGAGCGAGAGCAGGCTCTGGCAGACTTCCGCTCTGGTAAATGTCC
<i>O.goramy</i>	TGACCGTGAGCAGCGGGAGCGCGAGCAGGCTCTGGCAGACTTCCGCTCTGGTAAATGTCC
<i>L.calcarifer</i>	TGACCGCAGCAGCGTGAGCGAGAGCAGGCCCTGGCAGACTTCCGCTCCGGCAAGTGTCC
<i>E.fuscoguttatus</i>	GGACCGTGAGCAGCGGGAGAGAGAGCAGGCTCTGGCTGACTTCCGCTCCGGCAAAATGTCC
<i>C.carpio</i>	TGATCGGGAGCAACGAGAGCGAGAGAAGGCTCTCAGTGATTTTCGCACAGGCCAGTGTCC
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<i>D.labrax</i>	AGTCCTAGTGGCAACCTCTGTGGCTGCCCGTGGTCTGGACATTCCAGATGTACAGCATGT
<i>L.japonicus</i>	AGTCCTGGTGGCAACCTCGGTAGCTGCCCGTGGTCTGGATATTCCAGATGTACAGCATGT
<i>T.orientalis</i>	AGTCCTAGTAGCAACCTCTGTAGCTGCCCGCGGTCTGGATATTCCAGATGTACAGCATGT
<i>T.maccoyii</i>	AGTCCTAGTAGCAACCTCTGTAGCTGCCCGCGGTCTGGATATTCCAGATGTACAGCATGT
<i>O.goramy</i>	TGTCCTGGTGGCGACGTCTGTAGCTGCCCGCGGTCTGGATATTCCATGTACACATGT
<i>L.calcarifer</i>	GGTCCTGGTGGCCACCTCTGTCCCGCCCCGTGGCTGGATATTCCAGATGTGCAGCATGT
<i>E.fuscoguttatus</i>	CGTCCTGGTGGCAACTTCTGTCTGCTGCCCGCGGTCTGGATATTCCCGATGTACAGCACGT
<i>C.carpio</i>	AGTGCTGGTGGCCACGTACGTCTGCTGCCAGAGGCTGGACATTGAGCAGGTCCAGCACGT
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Tpe-ddx4R2
3' -TYGGVVMGMACHGG

<i>D.labrax</i>	GGTGAACCTTTGACCTCCCCAACAAACATTGACGAATATGTCCACCGTATTGGGAGAACTGG
<i>L.japonicus</i>	GGTGAACCTTTGACCTCCCCAACAAACATTGACGAATATGTCCACCGTATTGGGAAGAACTGG
<i>T.orientalis</i>	GGTTAACTTTGACCTCCCCAACAAACATTGATGAATATGTCCACCGTATTGGGAGGACTGG
<i>T.maccoyii</i>	GGTTAACTTTGACCTCCCCAACAAACATTGATGAATATGTCCACCGTATTGGGAGGACTGG
<i>O.goramy</i>	GGTGAACCTTTGACCTCCCCAGCAACATCGACGAATACGTGCACCGCATTTGGGAGAACTGG
<i>L.calcarifer</i>	GGTGAACCTTTGACCTCCCCAACAAACATTGATGAATATGTCCACCGTATTGGGAGAAACCGG
<i>E.fuscoguttatus</i>	GGTGAACCTTTGACCTCCCCAACAAACATCGACGAGTACGTCCACCGTATTGGGAGAACTGG
<i>C.carpio</i>	TGTGAATTTGACCTGCCAGCAGCATCGACGAATACGTCCATCGCATCGGAAGAACCGG
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HCGMTGYGGDAA-5'

<i>D.labrax</i>	CCGCTGTGGTAACTACTGGAAGGGCGGTGTCTTTCTTTGACCCAGATTCTGATGACCAATT
<i>L.japonicus</i>	CCGCTGTGGAAACTACTGGGAGGGCTGTCTTTCTATGACCCAGATGCTGATGGCCAATT
<i>T.orientalis</i>	CCGCTGCGGTAAACACAGGGAGGGCAGTGTCTTTCTATGACCCGTGATGCTGATGGCCAAT
<i>T.maccoyii</i>	CCGCTGCGGTAAACACAGGGAGGGCAGTGTCTTTCTATGACCCGTGATGCTGATGGCCAAT
<i>O.goramy</i>	CCGCTGTGGGAACTACTGGGAGGGCGGTGTCTTTCTATGACCCAGAAGCTGATGGCCATTT
<i>L.calcarifer</i>	CCGCTGCGGTAAACGTGCGGAGGGCGGTGTCTTTCTACGACCCAGACGCTGACGTCAGCT
<i>E.fuscoguttatus</i>	CCGCTGTGGGAACTACTGGGAGGGCGGTGTCTTTCTACGACCCAGATAATGATAACCAAGTT
<i>C.carpio</i>	ACGCTGTGGGAAACATCGGGCGGGCCGTGTCTTTTAAACCCAGAGTCTGACACTCCATT
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Tpe-ddx4R1

3' -CCYCARCAGGARGTKCCBWMVTGG-5

<i>D.labrax</i>	GGCTCGCTCCCTAGTCACAATCCTGTCCAAGGCTCAGCAGGAAGTGCCTTCATGGTTGGA
<i>L.japonicus</i>	GGCTCGCTCCCTGGTCACAGTCCTGTCCAAGGCCAGCAGGAAGTGCCTTCATGGTTAGA
<i>T.orientalis</i>	GGCTCGCTCCCTGGTCACAGTCCTGTCCAAGGCCAGCAGGAAGTGCCTTCATGGTTAGA
<i>T.maccoyii</i>	GGCTCGCTCCCTGGTCACAGTCCTGTCCAAGGCCAGCAGGAAGTGCCTTCATGGTTAGA
<i>O.goramy</i>	GGCTCGTTCCTTGGTCGGTGTCTGTCCAAGGCCAGCAGGAGGTGCCTTCATGGTTAGA
<i>L.calcarifer</i>	GGCTCGATCCTTGGTCACAGTCCTGTCCAAGGCTCAGCAGGTAGTGCCTTCATGGTTAGA
<i>E.fuscoguttatus</i>	GGCCCGCTCTCTGGTCACGATCCTGTCCAAGGCTCAACAGGAAGTGCCTCGCTGGTTAGA
<i>C.carpio</i>	AGCTCGCTCTCTGGTCAAAGTTCTGTCTGGGCCCCAACAGGAAGTTCCCAATGGCTGGA
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<i>D.labrax</i>	GGATTCTGCATTCACTGGCCCC---TGGTAGCATGGGCGTCG---CCCCCAGAAAGACATT
<i>L.japonicus</i>	GGAGTTTGCCTTCAGCGGCC---TGCAACCACAGGCTTCAATCCTCCAGGAAGAACTT
<i>T.orientalis</i>	AGAGTCTGCGTTCAGCGGACC---TGCTACCACTGGCTTTAACCCACCTAGGAAGAACTT
<i>T.maccoyii</i>	AGAGTCTGCGTTCAGCGGACC---TGCTACCACTGGCTTTAACCCACCTAGGAAGAACTT
<i>O.goramy</i>	GGAGGCTGCGTTCAGTGGCCCC---CAGTTCCACAGGCTTCAACCCACCCAGGAAGAACTT
<i>L.calcarifer</i>	GGAGCACGCATTCTCTGGCCT---CAGT---ACAGGCTTCAACCCCCCAGGAAGAACTT
<i>E.fuscoguttatus</i>	GGAGTCGGCGTTCAGCGGCGGGGCGGAGGCTCAGGCTTCAACGCCCCCAGGAAAGCTT
<i>C.carpio</i>	GGAAATTGCTTTCAGTGCTCA---TGGAACAACAGGTTTTTAACCCCTCGTGGAAGTGT
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<i>D.labrax</i>	TGCCTCCTCAGACTCCAGAAAGGGCCCCACAGGGAGGATCTGTCCAAGAC-----GACAGC
<i>L.japonicus</i>	TGCCTCCTCAGACTCCAGGAAGGG-----AGGATCTTTCCAAGAC-----AATGGT
<i>T.orientalis</i>	TGCCTCCACAGACTCCAGGAAGAG-----AGGATCTTTCCAAGAC-----AACAGT
<i>T.maccoyii</i>	TGCCTCCACAGACTCCAGGAAGAG-----AGGATCTTTCCAAGAC-----AACAGT
<i>O.goramy</i>	TGCCTCCACAGACACCAGACAGAG-----AGGATTGTTGCAAGAC-----ACCAGT
<i>L.calcarifer</i>	TGCCTCCACAGACTCCAGGAAGGG-----AGGATCCTTTCCAGGAC-----AACATG
<i>E.fuscoguttatus</i>	TGCCTCCACAGACTCCAGGAAGGG-----AGGATCTTCCAGGAC-----AACAGT
<i>C.carpio</i>	TGCGTCTACAGACACCCGGAAGGG-----AGGGTCCTT-CAAGACGGATGAGCCGC
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<i>D.labrax</i>	GTGCAGAGCCAGTCGGCTGCTCAGACTGCAC---ATGATGAAGAAGAATGGGAT TAG
<i>L.japonicus</i>	ATGGAGAGCTTGCCGGCTGCTCAGGCTGCAG---CTGATGATGAAGAATGGGAG TAG
<i>T.orientalis</i>	GTGAAGAGCCAGCCGGCTGTTTCACTGCAGCGGATGATGATGAGGAATGGGA TAG
<i>T.maccoyii</i>	GTGAAGAGCCAGCCGGCTGTTTCACTGCAGCTGATGATGATGAGGAATGGGA TAG
<i>O.goramy</i>	GTGATGAGCCAGCCGGCTGCTCAGCCTGCAG---CTGATGAAGAAGAGTGGGAG TAG
<i>L.calcarifer</i>	ATGAAGAGCCAGCCGGCTGCTTGGCTGCAG---CTGACGAGGAAGAATGGGA TAG
<i>E.fuscoguttatus</i>	GTGAAGAGTCTCCAGCTGCTCAGTCAGCTA---ACGATGATGAAGAGTGGGA TAG
<i>C.carpio</i>	CTCAAGCATCCGCCCCAAGCCAG-CAGCTGCTGCAGATGATGAAGAATGGGA TAA
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S2A.Multiple alignment of amino acid of the known piscine Dnd protein homologs and location of degenerate primer design. *M. anguillicaudatus*, BAJ19134.1; *D. rerio*, NP_997960.1; *C. gibelio*, AKL72310.1; *G. rarus*, AIF74583.1; *O. mykiss*, NP_001118133.1; *S. salar*, NP_001266060.1; *O. latipes*, NP_001157988.1; *O. mossambicus*, ALM89050.1; *P. olivaceus*, AKD44207.1

Tpe-dndF1

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M.anguillicaudatus -----MEGADLLQLFNPQALKALKEWMQKSSTTLTQVNGQRKYGGP 41
D.rerio -----MVGDMDAQQQLQQLNPQKLKSLQEWQMQRNSITLTQVNGQRKYGGP 47
C.gibelio -----MEGQQLQQLNPQRLKSLQEWQMKSITLTQVNGQRKYGGP 41
G.rarus -----MDG-QQQQVLNPQRLKSLKEWQKSSITLTQVNGQRKYGGP 40
O.mykiss -----MEERSQVLNPERLKALEMWLQETDVKLTQVNGQRKYGGP 40
S.salar -----MEERSQVLNPERLKALEMWLQETDVKLTQVNGQRKYGGP 40
O.latipes -----MDNQSKVNLERVQALQAWVKSTNTKLTQVNGQRKYGGP 39
O.mossambicus -----MENTQSQVLNLERVQALEIWLKATNTKLTQVNGQRKYGGP 40
P.olivaceus MQPRGDREASQNPAMEEE-VMEEAQSVLNFEPVPALETWLKTTNTQLIQVNGQRKYGGP 59
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Tpe-dndR1

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M.anguillicaudatus PPGWHGPAPGPGCEVFISHIPRNVFEDTLIPLFQRVGTLYEFRLMMNFSGQNRGFAYAKY 101
D.rerio PPGWQGPAPGSGCEVFISQIPNDVYEDRLIPLFQSIGTIYEFRLMMNFSGQTRGFAYAKY 107
C.gibelio PPGWRGPVPGPGCEVFISQIPRDVYEDRLIPLFQSIGTIYEFRLMMNFSGQNRGFAYAKY 101
G.rarus PPGWQGPAPGPGCEVFISQIPRDVYEDRLIPLFQSVGTLYEFRLMMNFSGQNRGFAYAKY 100
O.mykiss PDDWLGAAPPGPGCEVFISQIPRDVFEDQLIPLFRAVGPLWEFRLMMNFSGQNRGFAYAKY 100
S.salar PDDWLGAAPPGPGCEVFISQIPRDVFEDQLIPLFRAVGPLWEFRLMMNFSGQNRGFAYAKY 100
O.latipes PDVWDGPPPGARCEVFISQIPRDVYEDLLIPLFSSVGALWEFRLMMNFSGQNRGFAYAKY 99
O.mossambicus PEVWEGPTPGPRCEVFISQIPRDAYEDILIPLFSSIGPLWEFRLMMNFSGQNRGFAYAKY 100
P.olivaceus PEVWNGPIPGAHCCEVFISQIPRDAYEDLLIPLFSSVGPLWEFRLMMNFSGQNRGFAYAKY 119
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M.anguillicaudatus GDQVTAITAVKTLNQHRIADGVRLMVRRSMEKRQLWIE---DLPPDVSQDELLMMLRQIS 158
D.rerio GDPLTASAAVTTLHQYRLPEGGLTVRRSTEKRLRLG---DLPVSMNESKLLMVLQMLS 164
C.gibelio GDPLTASTAVTLHGHYRLPEGGLTVRRSTEKRLRLG---DLPTSINQVELLRMLRMS 158
G.rarus GDPFTASTAVMTLHQYPLQEGVCLTVRRSTEKRLRLG---DLPTNVNQTEMLMVLQMS 157
O.mykiss DSPASAAAIRSLHGRALESGARLSVRRSTEKRLCLG---ELPTSTRREQLLQVLLDFS 157
S.salar DSPASAAAIRSLHGRALESGARLGVRSTEKRLCLG---ELPTSTRREQLLQVLLDFS 157
O.latipes GTAAIANDAIHLLHGYPLGPGARLSVRCSEKRQLCIQ---NLPASTRQEELLQVLRLLS 156
O.mossambicus GSAAIAVEAIRQLHGHMVEPGYRISVRRSTEKRLHCIGGIGGLPASTRQEGILQVLRMLV 160
P.olivaceus SSSGLAAEAICLLDGYMVEQGSCIKVRLSIEKRHLICIE---DLPATTRQEELLEVLRLVLT 176
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M.anguillicaudatus EGVEDVTLKFSGPKGGDVAHVSYFTHIAASMANKVLVEAFKKQYGMSTVVRWMTFTAKS 218
D.rerio DGVEDVLLKPPGPKGKEVALVNYTSHYAASMAKKVLVEAFNRNRYGISITVRWTSFS-KS 223
C.gibelio EGVEEVLLKMAGPKGREFVALVNYSSHYAASMAKKVLVQAFKQYGISITVKWMSFS-KS 217
G.rarus EGVENVLLKLAGPKGREVALVNYSSHYAASMAKKVLVEAFKKQCGISITVSWTSFS-KS 216
O.mykiss EGVEGVSLR-AGPREQGLSAVVVYASHHAASMAKKVLIEAFKKRFGLAITLKWQSSSRPK 216
S.salar EGVEGVSLR-AGPGEQGMSAVVVYASHHAASMAKKVLIEAFKKRFGLAITLKWQSSSRPK 216
O.latipes AGVESVALK-AGPGIEGSAVVAFFSSHHAASMAKKALGEEFKQFCLDISIKWLSAEKPN 215
O.mossambicus EGVERVSLK-AGPGIEGVSATVAFSSHHAASMAKKVLVEAFKKQFTMCVSVKWPTEKPN 219
P.olivaceus EGVQKVSILT-AGPGIEGSAIVAFLSHYTASMAKKMLVEVFKQFALNISIVWHPDESLS 235
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M.anguillicaudatus KHVEKTKQDNGPPAPPSPKPLSKPF---SHLHTQPS-----HHIIPHTHTTPQPFTRAVGA 270
D.rerio KRVEDTPQEDSCVTPLVLKPLSKPS-----LL-----HYDVPAPHQSLPLFRAVGG 269
C.gibelio KHVDETGED-DRFTPPVLNPLPKPSITPPHLHPQPL-----LHDVPPHPLIQPFRAAGG 271
G.rarus KRVKEMGQEDDFTTTPGLKPLTKPSLSPCLYPQLS-----HHDVPAHPTLQPFRAVGG 271
O.mykiss HEPPRPS-----KTPPS-----PKPP--HCSLLDSPRPPL-----RLAQRQLPAFSRAVRA 261
S.salar HEPPRPS-----KTPPSP--PKPP--RCSLLDSPRPPL-----HLAQRQLPAFSRAVRA 263
O.latipes PDKPPP-Q---RAPKGLLPSPLKH--L---GQTSRPLPRL--ASPAVPTAFCKAVGG 262
O.mossambicus PDEPRCPQ---KRAKSLPLSHLGP--L--HHSSPQPSGPPSFLTLPASIPAGFCRAVGG 271
P.olivaceus PNKPPKS-----PLASPLKP--PCHILKSPQPSVPPHLAHHSPTPPSFCRAVGG 283
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<i>M. anguillicaudatus</i>	PVTQPRNEP-----ISQSRDAASQL	290
<i>D. rerio</i>	PTTSEQRDEMIPQPTIMSRNELIPQSSIRQRDEMVPQLPIRPRDGMAPQSPISLDAVSHL	329
<i>C. gibelio</i>	PAGLRDETM-----PRAPVNQDAVSQ	293
<i>G. rarus</i>	PTAPPRDEMMA-----NPNPNVRDTSVQL	296
<i>O. mykiss</i>	PPPMVHAA-----PESLREV-----TVVPEVDAAALL	288
<i>S. salar</i>	PSPMVHAA-----PESPRGA-----TMVPPVDAAALL	290
<i>O. latipes</i>	PPTQHDTHVKGT--SPPPRG-----QVMFSVSPVLLL	292
<i>O. mossambicus</i>	PTAPQLSHPTCSFPDSSTQG-----HLVFAASPVMFL	303
<i>P. olivaceus</i>	PTAFSHPHCPHHFTFSSSQG-----DRVPESPVMLL	315
	* . . *	
<i>M. anguillicaudatus</i>	KWLCEVNKLGTPRYEARYNHIGPDGFL-YFTYKVMIPALSFPLYGQSVQILPGTSARAMKG	349
<i>D. rerio</i>	QWMCEVNRLGSPQYEVHFHHAAPDGFL-YFAFKVLIPGLPLPLYGFVQILPGTSARAMKS	388
<i>C. gibelio</i>	QWICELHRLGTPQYEVRFHRTSSDGFL-YFNFKVLVPGLLPLFNGVIQILPGTSIQAMKA	352
<i>G. rarus</i>	QSMCEANRLGAPQYEVRYHHTGPDGLSSTFAFKVLIPGLLLPLFGAVQILPGTSAQAMKG	356
<i>O. mykiss</i>	QGVCEVYQGKPLYDLQYRHMGPDGFL-CFSYRVYVPGLATPFTGMVQTLPGPTPGAIQE	347
<i>S. salar</i>	QGVCEVYQGKPLYDLQYRHMGPDGFL-CFSYRVYVPGLATPFTGMVQTLPGPTPGAIQE	349
<i>O. latipes</i>	RKLSEASGWGDPHYEMLFHSHAGPDGFL-YFTYKVHVPGAPTFRGFVMILPGHCTSTMLE	351
<i>O. mossambicus</i>	SKLCETAGVGQPFYEVQYSHAGPDGFL-YFSYKVQIRGITAAFKGLVMILPGPNVSTMLE	362
<i>P. olivaceus</i>	SKVCEVTGVGQPRYEMSYSHTGRNGFL-YFDYTVCIPIRITPFFKGLVMTLPGPTASTVQE	374
	: . * * * * : : . : * : * : : * : * * : :	
<i>M. anguillicaudatus</i>	EVHRATAEQVIQTIYTAARWQPF-----	372
<i>D. rerio</i>	EVYRAAAEQVIQTLCRVSNLRPF-----	411
<i>C. gibelio</i>	EVYRAAAEQVIQTMCKVSNLRPF-----	375
<i>G. rarus</i>	EVCRAAAEQVIQTMCKGLKFATFLKFELFLLM	388
<i>O. mykiss</i>	EARRATAQQVLSALYRA-----	364
<i>S. salar</i>	EARRATAQQVLSALYRA-----	366
<i>O. latipes</i>	EARRAAAQQVLQKLCSSGLSA-----	372
<i>O. mossambicus</i>	EAQKAVAQQVLQKMYNTGLTH-----	383
<i>P. olivaceus</i>	EAGQAAAQQVLKRIYNNQ-----	392
	* . : * . * : * : . :	

S2B. Nucleotide alignment of the known piscine deadend homologs and degenerate oligonucleotide primer design for cloning of *dnd1*. *M. anguillicaudatus*, BAJ19134.1; *D. rerio*, NP_997960.1; *C. gibelio*, AKL72310.1; *G. rarus*, AIF74583.1; *O. mykiss*, NP_001118133.1; *S. salar*, NP_001266060.1; *O. latipes*, NP_001157988.1; *O. mossambicus*, ALM89050.1; *P. olivaceus*, AKD44207.1

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O.mykiss      -----ATG
S.salar       -----ATG
C.gibelio     -----ATGGAG
D.rerio       -----ATGGTCGGAGACATGGATGCCCAG
G.rarus       -----ATGGAT
M.anguillicaudatus -----ATGGAA
O.latipes     -----
P.olivaceus   ATGCAGCCGCGGGGCGACAGAGAGGCGTCACAGAACCCAGCGATGGAGGAGGAGGTGATG
O.mossambicus -----ATG

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O.mykiss      GAGGAGCGTTCAAGTCAGGTGTTGAACCCGAGCGACTGAAGGCGCTGGAGATGTGGCTG
S.salar       GAGGAGCGTTCAAGTCAGGTGTTGAACCCGAGCGACTGAAGGCGCTGGAGATGTGGCTG
C.gibelio     GGACAGCAGCTACAGCAGCTTTTGAACCCGAGAGACTGAAGTCACTTCAAGAATGGATG
D.rerio       CAGCAGGAGCTTCAGCAGATTCTGAACCCGAGAACTCAAGTCTCTGCAGGAATGGATG
G.rarus       GGACAGCAGC---AGCAGGTTTGAACCCGAGAGACTGAAGTCACTAAAAGAATGGGTG
M.anguillicaudatus GGAGCAGATCTGCTACAGCTTTTCAACCCGAGGCACTGAAGGCACTGAAGGAGTGGATG
O.latipes     ATGGACAATCAGAGCAAGGTGGTGAACCTTGAGCGGGTCCAGGCACTTCAGGCCCTGGGTC
P.olivaceus   GAGGCCGCGCAGAGCCAGGTCTGAACTTTGAGCCGGTGCCAGCGCTGGAAACCTGGCTG
O.mossambicus GAAAACACGCAAAGCCAGGTGCTGAACCTTGAACGGGTGCAGGCCCTGGAAATCTGGTTG
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Tpe-dndF1

5' -**AA**YGGNCARMGNAARTAYGG-3'

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O.mykiss      CAGGAGACTGACGTCAAACCTGACCCAAAGTCAATGGCCAGAGAAAATATGGAGGTCCACCT
S.salar       CAGGAGACTGACGTCAAACCTGACCCAGGTCAATGGCCAGAGGAAATATGGAGGTCCACCT
C.gibelio     CAGAAAAGCTCAATCACTTTAACACAGGTCAATGGGCAGAGGAAATATGGTGGTCCCTCCT
D.rerio       CAGAGGAACTCCATCACTTTAACCCAAAGTCAATGGGCAGAGGAAATATGGTGGTCCCTCCT
G.rarus       CAGAAAAGCTCCATCACTTTAACACAGGTCAACGGGCAGAGGAAATATGGTGGTCCCTCCT
M.anguillicaudatus CAAAAATCCTCCACCACCTTAACGCAGGTCAACGGTCAGAGGAAATATGGTGGTCCCTCCT
O.latipes     AAGTCCACCAATACCAAACCTGACCCAGGTTAACGGCCAGAGGAAGTATGGAGGGCCACCT
P.olivaceus   AAAACAACCAATACACAACCTGATTCAAGTAAATGGCCAGAGGAAGTATGGAGGACCACCT
O.mossambicus AAAGCAACCAACACAAAGCTGACTCAAGTTAATGGCCAGAGGAAATATGGAGGACCACCT
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O.mykiss      GATGATTGGCTTGGCGCCCCCCTGGGCGGGCTGTGAGGTGTTTCATCAGCCAGATCCCG
S.salar       GATGACTGGCTTGGCGCCCCCCTGGGCGGGCTGTGAGGTGTTTCATCAGCCAGATCCCG
C.gibelio     CCGGGCTGGCGAGGTCTGTTCGGGGCGGGCTGTGAGGTGTTTCATCAGTCAGATCCCG
D.rerio       CCAGGTGGCAGGGTCTGCTCCTGGTTCGGGCTGTGAGGTGTTTCATCAGTCAGATCCCG
G.rarus       CCGGGCTGGCAAGGTCTGCTCCCGGCCAGGCTGTGAGGTGTTTCATCAGTCAGATCCCA
M.anguillicaudatus CCGGGCTGGCACGGTCTGCTCCAGGGCCAGGTTGCGAGGTCTTTATCAGTCATATTCCA
O.latipes     GATGTGTGGGACGGTCCCCACCTGGGGCGCGCTGTGAGGTCTTTATCAGCCAGATCCCA
P.olivaceus   GAGGTGTGGAACGGCCCCATCCCAGGAGCCACTGCGAGGTCTTCATCAGCCAGATCCCA
O.mossambicus GAGGTGTGGGAAGTCCACACCGGACCGCGCTGTGAAGTCTTCATCAGCCAGATCCCA
                * ** * * * *

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O.mykiss      CGGGATGTCTTTGAGGACCAGCTGATTCCGCTGTTCCGTGCGGTGGGCCCTCTCTGGGAG
S.salar       CGGGATGTCTTTGAGGACCAGCTGATTCCGCTGTTCCGTGCGGTGGGCCCTCTCTGGGAG
C.gibelio     CGCGACGTCTACGAGGACCGCTGATCCCTCTTTTCCAGAGCATTGGCACTATTTACGAG
D.rerio       AACGACGTGTACGAGGACCGCTGATCCCTCTCTTCCAGAGCAGCGGCACCATTTACGAG
G.rarus       CGTGATGTCTACGAGGACCGATTGATTCTCTCTTCCAGAGCGTCGGTACACTTTATGAG
M.anguillicaudatus CGTAACGTCTTTGAGGACACCTAATCCCGCTCTTCCAGAGAGTCGGCACTCTATACGAG
O.latipes     CGGGATGTCTACGAGGACCTGCTCATCCCCCTCTTCAGCTCGGTGGGGGCACTTTGGGAA
P.olivaceus   CGGGACGCTACGAGGACCTGCTGATCCCCCTGTTTCAGCTCTGTGGGGCCTCTCTGGGAG
O.mossambicus CGGGACGCTACGAGGACCTGCTTATCCCTGTTTCAGCTCCATTGGGCCACTCTGGGAG
                * * * * *

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Tpe-dndR1

3' -ATGATGAAYTTYWSNGGNCA-5'

<i>O.mykiss</i>	TTCCGCCTCATGATGAACCTTCAGCGGACAGAACCCTGGCTTTGCCTACGCCAAGTACGAC
<i>S.salar</i>	TTCCGCCTCATGATGAACCTTCAGCGGACAGAACCCTGGCTTTGCCTACGCCAAGTACGAC
<i>C.gibelio</i>	TTTCGTCTCATGATGAACCTTCAGCGGGCAGAACCAGAGGCTTCGCCTACGCCAAGTACGGC
<i>D.rerio</i>	TTTCGCCTCATGATGAACCTTCAGCGGGCAGACCCGGGGCTTCGCCTATGCTAAGTACGGT
<i>G.rarus</i>	TTTCGTCTCATGATGAATTTTCAGCGGACAGAACCAGAGGCTTTGCCTATGCAAAGTACGGC
<i>M.anguillicaudatus</i>	TTTCGTCTCATGATGAACCTTCAGTGGGCAGAACCAGGGCTTCGCCTACGCTAAGTACGGT
<i>O.latipes</i>	TTCCGGCTCATGATGAACCTTCAGCGGTCAGAACCAGGGGCTTCGCCTACGCCAAATACGGC
<i>P.olivaceus</i>	TTTAGGCTCATGATGAACCTTCAGCGGGCAGAACCCTGGCTTTGCATATGCTAAATACAGC
<i>O.mossambicus</i>	TTCCGGCTCATGATGAACCTTCAGTGGGCAGAACCAGGGCTTTGCGTATGCCAAATATGGC

** *

<i>O.mykiss</i>	AGCCCTGCCTCGGCCGCTGCCGCCATCCGCTCGTTGCATGGCCGTGCCCTGGAGTCAGGG
<i>S.salar</i>	AGCCCTGCCTCGGCCGCTGCCGCCATCCGCTCGTTGCATGGCCGTGCCCTCGAGTCAGGG
<i>C.gibelio</i>	GACCCCTCACCGCCTCCACCGCCGCTTTGACCCTGCATCACTACCGTCTGCCGGAGGGG
<i>D.rerio</i>	GACCCCTTACAGCCTCGGCTGCCGTCACCACGCTGCATCAGTACCGGCTGCCGGAGGGG
<i>G.rarus</i>	GACCCCTTACCGCATCCACCGGCTCATGACCCTCCATCAGTATCCTCTGCAGGAGGGG
<i>M.anguillicaudatus</i>	GACCAGGTCACGGCCATAACTGCCGTTAAGACCCTCAATCAGCACCAGGATTGCGGATGGG
<i>O.latipes</i>	ACGGCCGCCATCGCCAATGATGCCATCCACCTCCTTCACGGCTACCCGCTGGGGCCTGGG
<i>P.olivaceus</i>	TCCTCGGGTTTGGCTGCTGAAGCAATCTGCCTGCTCGATGGCTACATGGTGGAGCAAGGC
<i>O.mossambicus</i>	TCAGCTGCTATAGCTGTTGAAGCCATACGACAGCTGCACGGTCACATGGTGGAGCCTGGC

* *

<i>O.mykiss</i>	GCACGCCTCAGTGTACGGCGCAGCACAGAGAAACGTCAGCTCTGTCTTGGGGAG-----
<i>S.salar</i>	GCACGCCTCGGTGTACGGCGCAGCACGGAGAAACGTCAGCTCTGTCTTGGGGAG-----
<i>C.gibelio</i>	GGCTGCCTGACAGTGCAGAACAGCACAGAGAACGGCAGCTGCGTCTGGGGGAT-----
<i>D.rerio</i>	GGCTGCCTGACCGTGCAGCAGGAGCACCGAGAAAGCGCCAGCTGCGTTTGGGGGAT-----
<i>G.rarus</i>	GTTTGTCTGACGGTTTCGACAGGAGCACGGAGAAGCGCCAGCTGCGCCTGGGGGAT-----
<i>M.anguillicaudatus</i>	GTTTCGATTGATGGTGCAGGAGCATGGAGAAGAGGCAGCTGTGGATTGAGGAC-----
<i>O.latipes</i>	GCTCGCCTCAGCGTGCGCTGTAGTCATCGAGAAGCGCCAGCTCTGCATCCAGAAC-----
<i>P.olivaceus</i>	TCCTGCATCAAGGTCCGCTGAGTATAGAGAAGAGACACCTCTGCATTGAGGAT-----
<i>O.mossambicus</i>	TACCGCATCAGTGTACGGCGGAGCACAGAGAAGCGACACCTTTGTATTGGAGGTATTGGA

* *

<i>O.mykiss</i>	---CTGCCCACCAGCACAAAGGAGGGAGCAACTGCTGCAGGTGCTGCTGGACTTCTCTGAG
<i>S.salar</i>	---CTGCCCACCAGCACAAAGGAGGGAGCAACTGCTGCAGGTGCTGCTGGACTTCTCTGAG
<i>C.gibelio</i>	---CTTCCGACTAGCATAAATCAGGTGGAGTTGCTGAGGATGCTGCGAATGATGCTGAA
<i>D.rerio</i>	---CTGCCCCTCAGCATGAATGAATCGAAGCTGCTGATGGTGTCTCCAGATGCTCTCTGAC
<i>G.rarus</i>	---CTTCCGACTAACGTGAATCAGACGGAGATGCTGATGGTGTCTCCAAATGATGTCTGAG
<i>M.anguillicaudatus</i>	---CTGCCACCCGACGTGAGCCAGGATGAAGTCTGCTGATGCTTCGACAGATTTTCGGAG
<i>O.latipes</i>	---CTGCCAGCTTCCACCAGGCAGGAGGAGCTGCTGCAGGTGCTGCGTTTGTGTCTGCG
<i>P.olivaceus</i>	---CTGCCGGCCACCACAGGCAAGAGGAGCTGCTGGAGGTTCTGCGTGTGCTGACTGAG
<i>O.mossambicus</i>	GGTCTGCCTGCTTCCATGACACAAGAAGGCATACTGCAGGTGCTGCGTATGCTGGTAGAG

* *

<i>O.mykiss</i>	GGGGTAGAGGGCGTGTCCCTGAG---AGCAGGGCCTCGGGAACAGGGGCTGTCTGCAGTG
<i>S.salar</i>	GGGGTAGAGGGCGTGTCCCTGAG---AGCAGGGCCTCGGGAACAGGGGATGTCTGCAGTG
<i>C.gibelio</i>	GGGGTAGAGGAGGTCTGTGAAGATGGCCGGGCCCAAAGGGAGAGAGTTTGTGGCCCTA
<i>D.rerio</i>	GGTGTAGAGGACGTCTGCTGAAGCCACCGGGGCCCAAAGGGAAAGAGGTTGTGGCTCTA
<i>G.rarus</i>	GGTGTGGAGAATGTCTGCTGAAGTTGGCCGGGCCCAAAGGGAGAGAGGCTGTGGCTCTA
<i>M.anguillicaudatus</i>	GGCGTGGAGGATGTACGCTGAAGTTTAGCGGGCCTAAAGGGGGAGATGTGCGCGCTGTA
<i>O.latipes</i>	GGTGTGGAGAGTGTGCGCTTGAA---GGCTGGCCCTGGCATAGAGGGGTGTGAGCCGTT
<i>P.olivaceus</i>	GGCGTGCAGAAAGTGTCTCTGAC---AGCCGGGCCTGGTATCGAGGGGTGTGCGCCATA
<i>O.mossambicus</i>	GGGGTAGAGAGAGTTTCCCTGAA---GGCCGGACCTGGTATAGAGGGGTATCTGCTACT

* *

<i>O.mykiss</i>	GTGGTCTATGCCTCCCACCATGCAGCTTCCATGGCCAAGAAGGTGCTGATTGAAGCCTTT
<i>S.salar</i>	GTGGTCTATGCCTCCCACCATGCAGCTTCCATGGCCAAGAAGGTGCTGATTGAAGCCTTT
<i>C.gibelio</i>	GTGAATACTCTCTCCACTACGCCGATCCATGGCCAAGAAAGTGTCTGTGCAAGCTTTT
<i>D.rerio</i>	GTCAACTACAGCTCCCATACGCCGATCCATGGCTAAGAAAGTGTCTGTTGAAGCTTTT
<i>G.rarus</i>	GTGAATACTCTCTCCACTACGCCGCGTCCATGGCCAAGAAAGTGTCTGTGGAAGCTTTT
<i>M.anguillicaudatus</i>	GTCAGCTACTTCACGCATATCGCTGCATCTATGGCTAACAAAGTATTGGTCGAAGCATTC
<i>O.latipes</i>	GTGCTTTTCTCTCTCATCATGCAGCCTCCATGGCCAAGAAGGCTCTGGGAGAAGAGTTT
<i>P.olivaceus</i>	GTAGCCTTCTTGTCCACTACACTGCTTCTATGGCCAAGAAGATGCTGGTTGAAGTGTTT
<i>O.mossambicus</i>	GTTGCTTTTCTCATCTACCATGCAGCTTCTATGGCTAAGAAAGTGTCTGGTGAAGCATTT

* *

<i>O.mykiss</i>	AAGAAACGCTTTGGGCTGGCCATCACTTTGAAGTGGCAGTCCTCTTCT---AGGCCCAAG
<i>S.salar</i>	AAAAAACGCTTCGGGCTGGCCATCACTTTGAAGTGGCAGTCCTCTTCT---AGGCCCAAG
<i>C.gibelio</i>	AGGAAGCAGTACGGCATTTCATTACTGTGAAATGGATGTCCTTCTCC---AAGTCCAAG
<i>D.rerio</i>	CGGAACCGGTACGGCATTTCATCACCGTCAGATGGACTTCCTTCTCC---AAGTCCAAG
<i>G.rarus</i>	AAGAAGCAGTGCGGTATTTCATTACTGTGAGTGGACGTCCTTCTCC---AAGTCCAAG
<i>M.anguillicaudatus</i>	AAGAAGCAGTACGGCATGTCCGTCACTGTAAGATGGATGACTTTCACTGCAAAGTCCAAG
<i>O.latipes</i>	AAGAAGCAGTTCTGCTTAGACATCTCTATCAAGTGGCTCTCTGCAGAG---AAGCCCAAC
<i>P.olivaceus</i>	AAGAAGCAGTTTGCACTGAATATCTCAATCGTATGGCATCCAGACGAA---TCGCTGTCT
<i>O.mossambicus</i>	AAGAAGCAGTTTACAATGTGTGTGTGTCAGTCAAGTGGCAGCCAACAGAG---AAGCCAAAC
	*** * *
<i>O.mykiss</i>	CACGAAGAGCCTCCCAGACCTCCAA--AACGCCTCCTTC-----TCCCAAACCTCCCC
<i>S.salar</i>	CACGAAGAGCCTCCCAGACCTCCAA--AACCCCTCCTTCTCTCTCCCAAACCTCCTC
<i>C.gibelio</i>	CATGTCGACGAGACTG---GAGAAGATGACCGCTTTACTCCACCTGTTCTGAATCCCCCTC
<i>D.rerio</i>	CGCGTCGAGGACACTCCCCAGGAAGACAGCTGCGTAACCCCACTTGTTCTGAAGCCGCTT
<i>G.rarus</i>	CGTGTCAGGAGATGGGACAAGAAGATGACTTCTTTACCACACCTGGTCTAAACCCCTC
<i>M.anguillicaudatus</i>	CATGTCGAGAAAAACGAACAAGACAACGGCCCCCTGCCCAACCCAGTCTTAAACCCCTC
<i>O.latipes</i>	CCGGACAAGCCCC-----TCCTCAGAGAGCTCCTAAAGCCCTGCTGCCGTCCCCCTC
<i>P.olivaceus</i>	CCAAACAAGCCTCCGA-AGAGCCCTCTGGCATCTCCCTGAAGCCACCATGCCACATCCT
<i>O.mossambicus</i>	CCTGACGAGCCACG---ATGCCCTCAGAAACGTGCAAAGAGCCTGTTGCCGTACACCT
	* *
<i>O.mykiss</i>	ACTGCTCCCTC-----CTCGACAGCCC-CCGGCCTCCCCTGCGCCTCGC
<i>S.salar</i>	GCTGCTCCCTC-----CTGGACAGCCC-CCGGCCTCCCCTGCACCTCGC
<i>C.gibelio</i>	CCCAAACCTC-----CATCACCCCTCCCCACCTG--CACCTCAGC--CCTTGCTT
<i>D.rerio</i>	TCTAAACCATCACTCTG-CATTATGACGTCCCAGCTCACCAGTCTCTGCTTCTCTCTT
<i>G.rarus</i>	ACTAAACCGTC-----CCTCTCCCCTCCATGCCTG--TATCCTCAGC--TCTCTCAT
<i>M.anguillicaudatus</i>	TCCAAACCTT-----TCCCATCTG--CACACTCAGC--CATCCCAT
<i>O.latipes</i>	GAAGCACCTAGGCCA-----AACCTCCCCTCGGCTGCCCCACGATTGGCTTCT
<i>P.olivaceus</i>	GAAGTCTCCAC-----AGCCCTCAGTC--CCGCCTCCACATCTCGCCCAT
<i>O.mossambicus</i>	AGGGCCCTGTCACACAGTTCTCCACAACCTCAGGC--CCGCCTTATCTCTGACCCTC
	* *
<i>O.mykiss</i>	CCAGC-----GTCAGCTCCCTGCCTTC
<i>S.salar</i>	CCAGC-----GTCAGCTCCCTGCCTTC
<i>C.gibelio</i>	C-----ATGATGTCCCAACCCAC
<i>D.rerio</i>	CCGGGCTGTTGGGGGTCCGACCACAGTGAGCAGAGAGATGAGATGATTCTCAACCCAC
<i>G.rarus</i>	C-----ATGATGTCCCGGCACAC
<i>M.anguillicaudatus</i>	C-----ACATCATTCGACCCAC
<i>O.latipes</i>	CCCGCA-----GTCCCCACAGCCTTC
<i>P.olivaceus</i>	CATTAC-----CCACCCCCCAAGTTTC
<i>O.mossambicus</i>	CCTGCAT-----CCATACCCCGAGGTTTC
	* *
<i>O.mykiss</i>	TCCC-----GGGCTGTGAGGGCACCCCTCCC-----ATGGT
<i>S.salar</i>	TCCC-----GGGCTGTGAGGGCGCCCTCTCCC-----ATGGT
<i>C.gibelio</i>	CC-----ACTAATCCAGCCCTTCTCCG-----GGC
<i>D.rerio</i>	CATAATGTCAAGAAATGAGCTGATTCTCAATCGTCCATAAGGCAGAGAGATGAGATGGT
<i>G.rarus</i>	CC-----CACTCTCCAGCCCTTCTCCG-----GGC
<i>M.anguillicaudatus</i>	AC-----CACCCCCAGCCCTTCACCCG-----AGC
<i>O.latipes</i>	TGTAA-----AGCTGTGGGTGGGCC-----CCCCACACAG-----CATGATACT
<i>P.olivaceus</i>	TGCAG-----AGCAGTGGGCGGACCTACGGCCTTTTCACAC-----CCTCACTGT
<i>O.mossambicus</i>	TGCAG-----AGCAGTGGGAGGGCCACTGCTCCTCAGCTC-----TCTCACCT
<i>O.mykiss</i>	GCACGCTGCTCCTGAATCCCTC---AGGGAGGTGACCGTG-----GTGCC-----
<i>S.salar</i>	GCACGCTGCTCCTGAATCCCC---AGGGGGGCGACCATG-----GTGCC-----
<i>C.gibelio</i>	TGCTGGAGGTCCGGCTGGCTG---AGAGATGAGACGATG---CCTCGAGCC---CCTGT
<i>D.rerio</i>	TCCTCAGCTCCCCATAAGGCCG---AGAGATGGGATGGCT---CCCCAATCC---CCCAT
<i>G.rarus</i>	AGTTGGGGGTCCAACCGCCCCGCCAAGAGATGAGATGATGGCTCCTAACCCTAACCCCTGT
<i>M.anguillicaudatus</i>	GGTCGGTGCTCCCGTCACCCAGCCGAGGAACGAGCCGATA-----AGTCA-----
<i>O.latipes</i>	CATGTTAAAGGCACCTCTCTCCCCCAGGGGACAAGTCA-----TGTT-----
<i>P.olivaceus</i>	CCCCACCACTTCACTTTTTCTCTTCGACGGGGGACCGAG-----TGCC-----
<i>O.mossambicus</i>	ACATGCTCTTTTCCCGATTCTCCACCCAAGGCCATCTTG-----TATT-----
	* *

<i>O.mykiss</i>	TCCTGTGGATGCAGCAGCCCTGCTCCAGGGTGTGTGTGAGGTGTACGGGCAGGGGAAGCC
<i>S.salar</i>	TCCTGTGGATGCAGCAGCCCTGCTCCAGGGTGTGTGTGAGGTGTACGGGCAGGGGAAGCC
<i>C.gibelio</i>	GAATCAGGATGCCGTGTCTCAGCTGCAGTGGATATGTGAGCTGCACAGACTCGGCACTCC
<i>D.rerio</i>	TAGTCTCGACGCCGTGTCTCATCTGCAGTGGATGTGCGAGGTCAACAGACTCGGCTCTCC
<i>G.rarus</i>	GAACCGTGACACCGTATCTCAGCTGCAGAGTATGTGCGAGGCAAAACAGACTCGGTGCGCC
<i>M.anguillicaudatus</i>	AAGCCGTGACGCTGCGTCTCAGCTGAAGTGGCTCTGCGAGGTGAACAACTCGGAACGCC
<i>O.latipes</i>	TTCTGTGTCCCCGGTGTGTGTGCTGCGGAAGCTGAGTGAGGCGAGTGGGTGGGGGATCC
<i>P.olivaceus</i>	TGTTGAATCCCCAGTGATGCTCCTGAGTAAGGTGTGTGAGGTGACGGGGGTGGTTCAGCC
<i>O.mossambicus</i>	TGCAGCATCCCCAGTGATGTTTCTCAGTAAGCTGTGTGAGACAGCAGGTGTTGGCCAGCC
	* * ** * * * * ** **
<i>O.mykiss</i>	CCTCTATGACCTGCAGTACCGCCACATGGGGCCTGACGGG--TTCCTGTGCTT-CAGCTA
<i>S.salar</i>	CCTCTATGACCTGCAGTACCGCCACATGGGGCCTGACGGG--TTCCTGTGCTT-CAGCTA
<i>C.gibelio</i>	GCAGTATGAAGTCCGTTTCCATCGCACCAGCTCCGACGGC--TTCCTCTACTT-CAACTT
<i>D.rerio</i>	GCAATATGAAGTCCACTTCCATCACGCGGCTCCTGACGGA--TTCCTCTACTT-CGCCTT
<i>G.rarus</i>	ACAGTACGAAGTCCGTTTACCATCACACTGGCCCAGACGGGCTTTCTTCTACTTTTCGCTTT
<i>M.anguillicaudatus</i>	ACGATACGAAGCAGCATACAATCACATCGGTCCCGACGGC--TTTCTCTATTT-CACGTA
<i>O.latipes</i>	AACTATGAGATGCTTTTTAGCCACGCCGCCAGATGGA--TTTCTGTACTT-CACCTA
<i>P.olivaceus</i>	ACGCTATGAGATGTCTACAGCCACACTGGAAGAAATGGA--TTCCTCTACTT-CGACTA
<i>O.mossambicus</i>	GTTTTATGAAGTGCAGTACAGCCACGCTGGGCCTGATGGA--TTCCTCTACTT-CTCCTA
	** ** * * * * * ** * * ** * * * *
<i>O.mykiss</i>	CCGGGTGTATGTGCCGGGGCTGGCCACACCCTTCACTGGGATGGTGCAGACACTGCCCGG
<i>S.salar</i>	CCGGGTGTATGTGCCGGGGCTGGCCACACCCTTCACTGGGATGGTGCAGACTCTGCCCGG
<i>C.gibelio</i>	CAAAGTCCTGGTCCCAGGCCTTCTTTTTCTCTGAACGGGGTTATCCAGATCCTTCCAGG
<i>D.rerio</i>	CAAAGTGCTGATCCCAGGCCTGCCGCTGCCCTGTATGGGTTCGTCCAGATCCTGCCAGG
<i>G.rarus</i>	CAAAGTGCTGATCCCAGGCCTCCTTCTGCCCTGTGTTCCGGGCTGTCCAGATCCTTCCAGG
<i>M.anguillicaudatus</i>	CAAGGTCAATGATCCCAGGCCTTCTTTTTCCCTGTACGGTTCTGTCCAGATCCTGCCAGG
<i>O.latipes</i>	CAAGGTGCACGTCCCCGGAGCCCCACCACCTTCAAGGGCTTCGTCTATGATTTTACCAGG
<i>P.olivaceus</i>	CACAGTGTGATCCCCAGGATAACCCTTCTTCAAAGGGCTGGTTCATGACCTTGCACAGG
<i>O.mossambicus</i>	TAAGGTGCAGATCCCGGGATCACTGCCGCTTTCAAAGGGTTGGTTCATGATCTTACCAGG
	** * * * * * ** * ** * * * * *
<i>O.mykiss</i>	CCCCACCCTGGAGCCATACAGGAAGAGGCTCGCAGAGCTACAGCCCAGCAGGTCTCTCAG
<i>S.salar</i>	CCCCACCCTGGAGCCATACAGGAAGAGGCTCGCAGAGCTACAGCCCAGCAGGTCTCTCAG
<i>C.gibelio</i>	CACCAGCATTCAGCCATGAAGGCAGAGTTTATCGAGCCGCTGCCGAGCAGGTGATCCA
<i>D.rerio</i>	CACCAGCGCAGAGCCATGAAGAGTGAAGTTTACCGGGCCGCCGCTGAGCAGGTGATCCA
<i>G.rarus</i>	CACCAGCGCTCAAGCCATGAAGGGGGAAGTTGTGCGAGCCGCCGCCGAGCAGGTGATCCA
<i>M.anguillicaudatus</i>	TACGAGCGCTCGGGCCATGAAGGGGGAAGTTTCATCGAGCCACTGCTGAGCAAGTATCCA
<i>O.latipes</i>	ACACTGCACGTCCACCATGCTGGAGGAGGCCAGGAGGGCTGCTGCCAGCAGGTCTTGCA
<i>P.olivaceus</i>	ACCCACTGCCAGCACCGTGCAGGAGGAAGCTGGGCAGGCTGCAGCCCAACAGGTCTTGAA
<i>O.mossambicus</i>	TCCTAATGTCAGCACCATGCTAGAGGAGGCTCAGAAGGCTGTAGCCCAGCAGGTCTTGCA
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<i>O.mykiss</i>	CGCTCTGTACAGGG-CCTGA-----
<i>S.salar</i>	CGCTCTGTACAGGG-CCTGA-----
<i>C.gibelio</i>	AACCATGTGTAAAG-TCTCAAACCTTGCGACCTTTCTAA-----
<i>D.rerio</i>	AACCTTGTGCCGAG-TCTCAAATTTACGGCCTTTCTAA-----
<i>G.rarus</i>	AACCATGTGCAAAGGTCTCAAATTTGCGACCTTTCTAAATTTGAGCTGTTTTGCTAAT
<i>M.anguillicaudatus</i>	AACCATATACAGG-CTGCGCGTTGGCAACCTTTCTAA-----
<i>O.latipes</i>	GAAGTTGTGCAGCA---GCGGTTTGAGCGCCTGA-----
<i>P.olivaceus</i>	GAGAATTTACAACA---ACCAGTGA-----
<i>O.mossambicus</i>	GAAGATGTACAACA---CTGGTCTCACACACTAA-----
	* *
<i>O.mykiss</i>	----
<i>S.salar</i>	----
<i>C.gibelio</i>	----
<i>D.rerio</i>	----
<i>G.rarus</i>	GTAA
<i>M.anguillicaudatus</i>	----
<i>O.latipes</i>	----
<i>P.olivaceus</i>	----
<i>O.mossambicus</i>	----