**Anoplopoma fimbria isolate bacA mitochondrion, complete genome**

GenBank: KP777542.1

[FASTA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?report=fasta) [Graphics](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?report=graph)

[Go to:](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1" \l "goto808781711_0)

LOCUS KP777542 16507 bp DNA circular VRT 24-JUN-2015

DEFINITION Anoplopoma fimbria isolate bacA mitochondrion, complete genome.

ACCESSION KP777542

VERSION KP777542.1

KEYWORDS .

SOURCE mitochondrion Anoplopoma fimbria (sablefish)

ORGANISM [Anoplopoma fimbria](https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=229290)

Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;

Actinopterygii; Neopterygii; Teleostei; Neoteleostei;

Acanthomorphata; Eupercaria; Perciformes; Cottioidei;

Anoplopomatales; Anoplopomatidae; Anoplopoma.

REFERENCE 1 (bases 1 to 16507)

AUTHORS Galvan-Tirado,C., Del Rio-Portilla,M.A., Delgado-Vega,R. and

Garcia-De Leon,F.J.

TITLE Genetic variability between complete mitochondrion genomes of the

sablefish, Anoplopoma fimbria (Pallas, 1814)

JOURNAL Mitochondrial DNA, 1-2 (2015) In press

PUBMED [26065847](https://www.ncbi.nlm.nih.gov/pubmed/26065847)

REMARK Publication Status: Available-Online prior to print

REFERENCE 2 (bases 1 to 16507)

AUTHORS Galvan-Tirado,C., Del Rio-Portilla,M.A., Delgado Vega,R. and

Garcia-De-Leon,F.J.

TITLE Direct Submission

JOURNAL Submitted (12-FEB-2015) Genetica para la Conservacion, Centro de

Investigaciones Biologicas del Noroeste, Instituto Politecnico

Nacional 195, Colonia Playa Palo de Santa Rita Sur, La Paz, Baja

California Sur 23096, Mexico

COMMENT ##Assembly-Data-START##

Assembly Method :: CLC Genomics WorkBench v. 6.5

Sequencing Technology :: Illumina

##Assembly-Data-END##

FEATURES Location/Qualifiers

source 1..16507

/organism="Anoplopoma fimbria"

/organelle="mitochondrion"

/mol\_type="genomic DNA"

/isolate="bacA"

/db\_xref="taxon:[229290](https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=229290)"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=1&to=68) 1..68

/gene="trnF-gaa"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=1&to=68) 1..68

/gene="trnF-gaa"

/product="tRNA-Phe"

/note="anticodon:gaa"

[rRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=69&to=1013) 69..1013

/product="12S ribosomal RNA"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=1014&to=1085) 1014..1085

/gene="trnV-uac"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=1014&to=1085) 1014..1085

/gene="trnV-uac"

/product="tRNA-Val"

/note="anticodon:uac"

[rRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=1086&to=2779) 1086..2779

/product="16S ribosomal RNA"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=2780&to=2853) 2780..2853

/gene="trnL-uaa"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=2780&to=2853) 2780..2853

/gene="trnL-uaa"

/product="tRNA-Leu"

/note="anticodon:uaa"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=2854&to=3828) 2854..3828

/gene="ND1"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=2854&to=3828) 2854..3828

/gene="ND1"

/codon\_start=1

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="NADH dehydrogenase subunit 1"

/protein\_id="[AKE07108.1](https://www.ncbi.nlm.nih.gov/protein/808781712)"

/translation="MMSALITHLINPLAFIVPVLLAVAFLTLLERKVLGYMQLRKGPN

IVGPYGLLQPIADGLKLFIKEPIRPSTASPLLFLLTPMLALTLALTLWAPMPLPYPVV

DLNLGILFILALSSLAVYSILGSGWASNSKYALIGALRAVAQTISYEVSLGLILLSII

IFTGGFTLQTFNIAQESVWLILPAWPLAAMWYISTLAETNRAPFDLTEGESELVSGFN

VEYAGGPFALFFLAEYANILLMNTLSATLFLGASHIPAFPELTAVNLMTKAALLSVVF

LWVRASYPRFRYDQLMHLIWKNFLPLTLSLVIWHLALPIAFAGLPPQL"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=3833&to=3902) 3833..3902

/gene="trnI-gau"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=3833&to=3902) 3833..3902

/gene="trnI-gau"

/product="tRNA-Ile"

/note="anticodon:gau"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=3902&to=3972) complement(3902..3972)

/gene="trnQ-uug"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=3902&to=3972) complement(3902..3972)

/gene="trnQ-uug"

/product="tRNA-Gln"

/note="anticodon:uug"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=3972&to=4040) 3972..4040

/gene="trnM-cau"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=3972&to=4040) 3972..4040

/gene="trnM-cau"

/product="tRNA-Met"

/note="anticodon:cau; tRNA-Met2"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=4041&to=5086) 4041..5086

/gene="ND2"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=4041&to=5086) 4041..5086

/gene="ND2"

/note="TAA stop codon is completed by the addition of 3' A

residues to the mRNA"

/codon\_start=1

/transl\_except=(pos:5085..5086,aa:TERM)

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="NADH dehydrogenase subunit 2"

/protein\_id="[AKE07109.1](https://www.ncbi.nlm.nih.gov/protein/808781713)"

/translation="MNPYILATLIFGLGLGTTLTFASSHWLLAWMGLEMNTLAIIPLM

AQHHHPRAVEASTKYFLTQATGAAMLLFASTTNAWLTGQWDIQQMSHPLPITLITLAL

ALKVGLAPVHSWLPEVLQGLDLTTGLILSTWQKLAPFALLVQIHSHNPTLLIVLGLAS

TLVGGWGGLNQTQLRKILAYSSIAHLGWMVLVLQFSFSLTLLTLITYFIMTFSTFLVF

KLNGSTNVNALATSWAKAPALTALVPLVLLSLGGLPPLTGFMPKWLILQELANQDLAT

TATLAALSALLSLYFYLRLSYAMTLTMSPNNTTGTTPWRLHSSQSSLPVAISTTATLL

LLPLAPAAITLLAP"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5087&to=5157) 5087..5157

/gene="trnW-uca"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5087&to=5157) 5087..5157

/gene="trnW-uca"

/product="tRNA-Trp"

/note="anticodon:uca"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5159&to=5227) complement(5159..5227)

/gene="trnA-ugc"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5159&to=5227) complement(5159..5227)

/gene="trnA-ugc"

/product="tRNA-Ala"

/note="anticodon:ugc"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5229&to=5301) complement(5229..5301)

/gene="trnN-guu"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5229&to=5301) complement(5229..5301)

/gene="trnN-guu"

/product="tRNA-Asn"

/note="anticodon:guu"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5341&to=5406) complement(5341..5406)

/gene="trnC-gca"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5341&to=5406) complement(5341..5406)

/gene="trnC-gca"

/product="tRNA-Cys"

/note="anticodon:gca"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5412&to=5481) complement(5412..5481)

/gene="trnY-gua"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5412&to=5481) complement(5412..5481)

/gene="trnY-gua"

/product="tRNA-Tyr"

/note="anticodon:gua"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5483&to=7033) 5483..7033

/gene="COX1"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=5483&to=7033) 5483..7033

/gene="COX1"

/codon\_start=1

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="cytochrome c oxidase subunit I"

/protein\_id="[AKE07110.1](https://www.ncbi.nlm.nih.gov/protein/808781714)"

/translation="MATTRWFFSTNHKDIGTLYLVFGAWAGMVGTALSLLIRAELSQP

GALLGDDQIYNVIVTAHAFVMIFFMVMPIMIGGFGNWLIPLMIGAPDMAFPRMNNMSF

WLLPPSFLLLLASSGVEAGAGTGWTVYPPLASNLAHAGASVDLTIFSLHLAGISSILG

AINFITTIINMKPPAISQYQTPLFVWAVLITAVLLLLSLPVLAAGITMLLTDRNLNTT

FFDPAGGGDPILYQHLFWFFGHPEVYILILPGFGMISHIVAYYSGKKEPFGYMGMVWA

MMAIGLLGFIVWAHHMFTVGMDVDTRAYFTSATMIIAIPTGVKVFSWLATLHGGSIKW

EAPLLWALGFIFLFTVGGLTGIILANSSLDIVLHDTYYVVAHFHYVLSMGAVFAIVGG

FVHWFPLFSGYTLHGTWTKIHFAIMFAGVNLTFFPQHFLGLAGMPRRYSDYPDAYTLW

NTVSSIGSLVSLVAVVLFLFIIWEAFAAKREVLAVELTATNVEWLHGCPPPYHTFEEP

AFVQVQPN"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=7034&to=7104) complement(7034..7104)

/gene="trnS-uga"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=7034&to=7104) complement(7034..7104)

/gene="trnS-uga"

/product="tRNA-Ser"

/note="anticodon:uga"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=7108&to=7180) 7108..7180

/gene="trnD-guc"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=7108&to=7180) 7108..7180

/gene="trnD-guc"

/product="tRNA-Asp"

/note="anticodon:guc"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=7188&to=7878) 7188..7878

/gene="COX2"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=7188&to=7878) 7188..7878

/gene="COX2"

/note="TAA stop codon is completed by the addition of 3' A

residues to the mRNA"

/codon\_start=1

/transl\_except=(pos:7878,aa:TERM)

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="cytochrome c oxidase subunit II"

/protein\_id="[AKE07111.1](https://www.ncbi.nlm.nih.gov/protein/808781715)"

/translation="MAHPSQLGFQDAASPVMEELLHFHDHALMVVLLISAFVLYIIVA

MISTKLTNKYVLDSQEIEIIWTVLPAVILILIALPSLRILYLMDEINSPLLTIKAVGH

QWYWSYEYTDYEDLGFDSYMIPTQDLLPGQFRLLEADHRMVIPVEAPIRVLVSADDVL

HSWAVPSLGIKMDAVPGRLNQTAFIATRPGIFYGQCSEICGANHSFMPIVVEAVPLEH

FENWSSRMLEDA"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=7879&to=7952) 7879..7952

/gene="trnK-agc"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=7879&to=7952) 7879..7952

/gene="trnK-agc"

/product="tRNA-Lys"

/note="anticodon:agc"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=7954&to=8121) 7954..8121

/gene="ATP8"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=7954&to=8121) 7954..8121

/gene="ATP8"

/codon\_start=1

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="ATP synthase F0 subunit 8"

/protein\_id="[AKE07112.1](https://www.ncbi.nlm.nih.gov/protein/808781716)"

/translation="MPQLNPAPWLAILVFSWLVFLVVIPPKVIAHTFPNEPTLQSAEK

PKADSWTWPWH"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=8112&to=8795) 8112..8795

/gene="ATP6"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=8112&to=8795) 8112..8795

/gene="ATP6"

/codon\_start=1

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="ATP synthase F0 subunit 6"

/protein\_id="[AKE07113.1](https://www.ncbi.nlm.nih.gov/protein/808781717)"

/translation="MTLSFFDQFMSPTLLGIPLIAIALTIPWILFPTPTTRWLNNRFL

SLQGWFINRFTLQLLLPLNLGGHKWAALFASLMIYLISLNMLGLLPYTFTPTTQLSLN

LGLATPLWLATVIIGMRNQPTHALGHLLPEGTPGPLIPILIIIETISLFIRPLALGVR

LTANLTAGHLLMQLIATAAFTLAPSMPTVAIVTSAVLVLLTLLEIAVAMIQAYVFVLL

LSLYLQENV"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=8795&to=9579) 8795..9579

/gene="COX3"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=8795&to=9579) 8795..9579

/gene="COX3"

/note="TAA stop codon is completed by the addition of 3' A

residues to the mRNA"

/codon\_start=1

/transl\_except=(pos:9578..9579,aa:TERM)

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="cytochrome c oxidase subunit III"

/protein\_id="[AKE07114.1](https://www.ncbi.nlm.nih.gov/protein/808781718)"

/translation="MAHQAHPYHMVDPSPWPLTGAIAALLMTSGLATWFHFQSTVLMT

LGTALLLLTMYQWWRDIIREGTFQGHHTPPVQKGLRFGMILFITSEVFFFLGFFWAFY

HASLAPTPELGGCWPPTGVSTLDPFEVPLLNTAVLLASGVTVTWAHHSIMEGERKQAV

HSLGLTILLGFYFTFLQGLEYYEAPFTIADGVYGSTFFVATGFHGLHVIIGSTFLAVC

LYRQVRYHFTSEHHFGFEAAAWYWHFVDVVWLFLYISIYWWGS"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=9580&to=9651) 9580..9651

/gene="trnG-ucc"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=9580&to=9651) 9580..9651

/gene="trnG-ucc"

/product="tRNA-Gly"

/note="anticodon:ucc"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=9652&to=10000) 9652..10000

/gene="ND3"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=9652&to=10000) 9652..10000

/gene="ND3"

/note="TAA stop codon is completed by the addition of 3' A

residues to the mRNA"

/codon\_start=1

/transl\_except=(pos:10000,aa:TERM)

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="NADH dehydrogenase subunit 3"

/protein\_id="[AKE07115.1](https://www.ncbi.nlm.nih.gov/protein/808781719)"

/translation="MNLVTTVIAITTTLSIILALVSFWLPQMTPDHEKLSPYECGFDP

LGSARLPFSLRFFLVAILFLLFDLEIALLLPLPWGDQLASPLLTFAWATAVLALLTLG

LIYEWLQGGLEWAE"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=10001&to=10069) 10001..10069

/gene="trnR-ucg"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=10001&to=10069) 10001..10069

/gene="trnR-ucg"

/product="tRNA-Arg"

/note="anticodon:ucg"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=10070&to=10366) 10070..10366

/gene="ND4L"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=10070&to=10366) 10070..10366

/gene="ND4L"

/codon\_start=1

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="NADH dehydrogenase subunit 4L"

/protein\_id="[AKE07116.1](https://www.ncbi.nlm.nih.gov/protein/808781720)"

/translation="MTPVHFAFSSAFMLGLAGLAFHRTHLLSALLCLEGMMLSLFIAL

SLWTLQLGSTSFSAAPMLLLAFSACEASAGLALLVATARTHGTDRLQSLNLLQC"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=10360&to=11740) 10360..11740

/gene="ND4"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=10360&to=11740) 10360..11740

/gene="ND4"

/note="TAA stop codon is completed by the addition of 3' A

residues to the mRNA"

/codon\_start=1

/transl\_except=(pos:11740,aa:TERM)

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="NADH dehydrogenase subunit 4"

/protein\_id="[AKE07117.1](https://www.ncbi.nlm.nih.gov/protein/808781721)"

/translation="MLKVLIPTLMLIPTTWATKPKWLWPTTLAHSLIIAVLSLSWLVN

MSETGWSNLSPYLATDALSTPLLVLTCWLLPLMILASQRHTATEPVNRQRMYITLLTS

LQVFLILAFGATEVIMFYVMFEATLIPTLIIITRWGNQTERLNAGVYFLFYTLAGSLP

LLVALLLLQGSVGTLSILTLPYADPLQLVSCGDKLWWAGCLLAFLVKMPLYGVHLWLP

KAHVEAPVAGSMILAAVLLKLGGYGMMRIVVVLDPLTKELSYPFIVFALWGVIMTGSI

CLRQTDLKSLIAYSSVSHMGLVVGGILTQTPWGFTGALILMIAHGLTSSALFCLANTN

YERTHSRTMLLARGLQMALPLMTTWWFIASLANLALPPLPNLMGELMIITSLFNWSWW

TLLLTGVGTLITASYSLYMFLMTQRGPIPAHVLALDPSHTREHLLMALHLLPLLLLVL

KPELIWGWTS"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=11741&to=11809) 11741..11809

/gene="trnH-gug"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=11741&to=11809) 11741..11809

/gene="trnH-gug"

/product="tRNA-His"

/note="anticodon:gug"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=11810&to=11876) 11810..11876

/gene="trnS-gcu"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=11810&to=11876) 11810..11876

/gene="trnS-gcu"

/product="tRNA-Ser"

/note="anticodon:gcu"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=11881&to=11953) 11881..11953

/gene="trnL-uag"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=11881&to=11953) 11881..11953

/gene="trnL-uag"

/product="tRNA-Leu"

/note="anticodon:uag"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=11954&to=13792) 11954..13792

/gene="ND5"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=11954&to=13792) 11954..13792

/gene="ND5"

/codon\_start=1

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="NADH dehydrogenase subunit 5"

/protein\_id="[AKE07118.1](https://www.ncbi.nlm.nih.gov/protein/808781722)"

/translation="MHPPSLMMTTSLIIILALLAYPVLSTLTPHPQPASWAASHVKTG

VKLAFFVSLFPLFLFFNEGAETIVTSWTWMNTYCFDVNISFKFDYYSVIFTPIALYVT

WSILEFATWYMHADPNMNRFFKYLLIFLIAMVVLVTANNLFQLFIGWEGVGIMSFLLI

GWWYGRADANTAALQAVVYNRVGDIGLILAMAWMAMNFNSWEMQQVFSASKDFDLTLP

LLGLILAATGKSAQFGLHPWLPSAMEGPTPVSALLHSSTMVVAGIFLLIRMSPLLEGN

QTALTTCLCLGALTTLFTATCALTQNDIKKIVAFSTSSQLGLMMVTIGLNQPQLAFLH

ICTHAFFKAMLFLCSGSVIHSLNDEQDIRKMGGMHHLTPFTSSCLTIGSLALTGTPFL

AGFFSKDAIIEALNTSHLNAWALTLTLLATSFTAIYSLRVVFFVSMGHPRFNSLSPIN

ENNPAVINPIKRLAWGSIVAGLLITSSILPLKTPVMTMPPLLKLAALVVTITGLLLAL

ELASLTSKQHRTTPLLTTHHFSNMLGFFPAIVHRLTPKLGLILGQTVASQMVDQTWLE

KTGPKAVASSNIPLITTTSNTQQGLIKTYLSLFLLTLTLSVLLTIY"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=13789&to=14310) complement(13789..14310)

/gene="ND6"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=13789&to=14310) complement(13789..14310)

/gene="ND6"

/codon\_start=1

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="NADH dehydrogenase subunit 6"

/protein\_id="[AKE07119.1](https://www.ncbi.nlm.nih.gov/protein/808781723)"

/translation="MTYIMSLFLLGLVLGLVAVASNPSPYFAALGLVVVAGMGCGVLI

GHGGPFLSLVLFLIYLGGMLVVFAYSAALAAEPFPEGWGSWPVAAYMLMYVLGVGLVS

STLWSGWYESSWVPADELGDFSVFRGDIGGVALMYSSGGGMLVISAWVLLLTLFVVLE

LTRGLSRGALRAV"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=14311&to=14379) complement(14311..14379)

/gene="trnE-uuc"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=14311&to=14379) complement(14311..14379)

/gene="trnE-uuc"

/product="tRNA-Glu"

/note="anticodon:uuc"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=14385&to=15525) 14385..15525

/gene="CYTB"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=14385&to=15525) 14385..15525

/gene="CYTB"

/note="TAA stop codon is completed by the addition of 3' A

residues to the mRNA"

/codon\_start=1

/transl\_except=(pos:15525,aa:TERM)

/transl\_table=[2](https://www.ncbi.nlm.nih.gov/Taxonomy/Utils/wprintgc.cgi?mode=c#SG2)

/product="cytochrome b"

/protein\_id="[AKE07120.1](https://www.ncbi.nlm.nih.gov/protein/808781724)"

/translation="MASLRKSHPLLKIANNALVDLPAPSNISALWNFGSLLSLCLITQ

ILTGLFLAMHYTSDIATAFSSVGHICRDVNYGWLIRNIHANGASFFFICLYMHIGRGL

YYGSYLYKETWNVGVVLLLLVMMTAFVGYVLPWGQMSFWGATVITNLLSAVPYVGNSL

VQWIWGGFSVDNATLTRFFAFHFLFPFLIAGATLLHLLFLHETGSNNPLGLNSDADKI

SFHPYFSYKDLLGFAALLTALASLALFAPNLLGDPDNFTPANPLVTPPHIKPEWYFLF

AYAILRSIPNKLGGVLALLASILVLMIVPILHTSKQRGITFRPLTQFLFWALIADVVI

LTWIGGMPVEHPYIIIGQIASFLYFSLFLVLSPLAGWLENKVLEWN"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=15526&to=15598) 15526..15598

/gene="trnT-ugu"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=15526&to=15598) 15526..15598

/gene="trnT-ugu"

/product="tRNA-Thr"

/note="anticodon:ugu"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=15598&to=15668) complement(15598..15668)

/gene="trnP-ugg"

[tRNA](https://www.ncbi.nlm.nih.gov/nuccore/KP777542.1?from=15598&to=15668) complement(15598..15668)

/gene="trnP-ugg"

/product="tRNA-Pro"

/note="anticodon:ugg"

ORIGIN

1 gctagcgtag cttaactaaa gcataacact gaagatgtta aaatgggccc taggaagctc

61 cgcaagcaca aaggcttggt cctgacttta ctatcaactt tagccaaact tacacatgca

121 agtatccgcc cccctgtgag aatgccctac agttccccgc ccgggaacaa ggagctggta

181 tcaggcacac cccattaagc ccatgacgcc ttgcttagcc acaccctcaa gggaactcag

241 cagtgataaa cattaagcca taagtgaaaa cttgacttag tcaaagctaa gagggccggt

301 aaaactcgtg ccagccaccg cggttatacg agaggcccaa gttgaaagac atcggcgtaa

361 agagtggtta agtaaaaact aaactaaagt cgaacatctt caaggctgtt atacgcatcc

421 gaagacaaga agttcaacca cgaaggtgac tttattcgta ctgaacccac gaaagctagg

481 acacaaactg ggattagata ccccactatg cctagcccta aaccttgata gtgacctacg

541 cccactatcc gcctgggaac tacgagcatc agcttgaaac ccaaaggact tggcggtgct

601 ttagatccac ctagaggagc ctgttctaga accgataacc cccgttcaac ctcacctttc

661 cttgttttcc ccgcctatat accgccgtcg tcagcttacc ctgtgaaggt ctaatagtaa

721 gcaaaactgg catagcccta aacgtcaggt cgaggtgtag cgcatgggaa gggaagaaat

781 gggctacatt tgctatgata gcaaatacgg atggtgttct gaaatataca cctgaaggag

841 gatttagcag taagcggaaa atagagtgtt ccgctgaaat tggccctgaa gcgcgcacac

901 accgcccgtc actctcccca agcctgctaa ttcaattaac taaaccctaa aaagggcaaa

961 ggggaggcaa gtcgtaacat ggtaagtgta ccggaaggtg cgcttggaaa aatcagagcg

1021 tagctaagct agaaaagcat ctcccttaca ctgagaagtc atccgtgcaa gtcggatcac

1081 cctgacgcct aacagctagc ccacccacac aaccccaaca aaccaccatt aataccccct

1141 aagtacacta gagtttattt aaacaaacca tttttccccc taagtatagg cgatagaaaa

1201 gggcttacgg cgcaatagag aaagtaccgc aagggaaagc tgaaaaagaa gtgaaagaaa

1261 tcagtaaagc ctagagaagc agagattaaa gctcgtacct tttgcatcat gatttagtga

1321 gtgtatacca agcaaagagt actttagttt gacgccccga aactaagtga gctactccaa

1381 gacagcctat taatagggca cacccgtctc tgtggcaaaa gagtgggacg agctttgagt

1441 agaggtgaca gacctaccga acttagttat agctggttgt tcaagaaatg aatagaagtt

1501 cagccttatg gcttctcact tcaccttagt tttaccccta ctgatgcata gagaaaccac

1561 aagagttagt caaagggggt acagcccctt tgaaccaaga cacaactttc ccaggagggt

1621 aaagatcata ataaaccaaa ggcaaatatt ttggtgggcc taaaagcagc catccccata

1681 gaaagcgtta aagctcagat ataaacccta cccttcttat cctgatcaac taatcttatc

1741 cccctataca tactgaaccg ccccatgcct acatgggggt gactatgcta atatgagtaa

1801 caagagagcc tcagactctc tccttgcaca tgtgtacgtc ggaacggaca ccccgccgac

1861 ccttaacgac cccaaacaaa gagggccctg aataatagac caaacaacta gaagaacatt

1921 caagaaaaaa tcgttaaccc cacacaggtg tgccaataag gaaagactaa aagaaagaga

1981 aggaactcgg caaacatatg aagcctcgcc tgtttaccaa aaacatcgcc tcttgcaaac

2041 ttaagaaata agaggtcctg cctgccctgt gaccatgagt ttaacggccg cggtattttg

2101 accgtgcgaa ggtagcgcaa tcacttgtct tttaaatgaa gacctgtatg aatggcaaaa

2161 cgagggctta actgtctcct ctctccagtc agtgaaattg atcttcccgt gcagaagcgg

2221 gaatacacac ataagacgag aagaccctat ggagctttag acaccaaagc agatcacgtt

2281 aacaccccct gaatacagga ttaaactaaa tgaagcctgc ccgaatgtct ttggttgggg

2341 cgaccgcggg gcattgaaaa acccccacgt ggaatgggag caccaccctc ctacagccaa

2401 gagccacagc tctaggcaac agaacatctg accagcaaga tccggcaatg ccgatcaacg

2461 gaccgagtta ccctagggat aacagcgcaa tcctctttta gagcccatat cgacaagggg

2521 gtttacgacc tcgatgttgg atcaggacat cctaatggtg cagccgctat taagggttcg

2581 tttgttcaac gattaaagtc ctacgtgatc tgagttcaga ccggagtaat ccaggtcagt

2641 ttctatctat gctatgctct tttctagtac gaaaggaccg aaaaggagag gcccatgctg

2701 caagtacgcc tcaccctcac ctgttgaaat caactaaaac aggtaagagg gcatacaacc

2761 cagcctgaga aaacggcatg ttaaggtggc agagcccggt aattgcaaaa gacctaagcc

2821 ctttccacag aggttcaagt cctctcctta gctatgatat ctgcacttat tacacatcta

2881 atcaaccccc tcgccttcat tgtacccgtc ctcctggccg tcgcttttct tacacttcta

2941 gaacggaaag tgcttgggta catacaacta cgaaaaggcc ccaacattgt agggccttac

3001 ggactcttac aacccatcgc agatgggcta aaactattta ttaaagaacc cattcgcccg

3061 tctaccgcct cccccctctt atttctcctc acccctatac tagcccttac ccttgcactc

3121 accctctggg cccccatacc cctaccatac ccagttgttg atcttaacct ggggatcctg

3181 tttattcttg ccttgtctag tctggccgtt tattcgattc taggctcagg gtgagcatct

3241 aattcaaaat atgcccttat tggggccctt cgggcggtag ctcagactat ttcatatgaa

3301 gtcagcctgg gcctaatcct tctaagcatt attattttca ctggcggctt cacgctccag

3361 accttcaaca ttgcccaaga aagcgtctga ctaattctgc ctgcctgacc tctggcggcc

3421 atgtgataca tttctactct agctgaaacc aatcgtgcac cctttgacct tactgagggg

3481 gagtcagagt tggtttcggg ctttaatgta gaatacgcag ggggtccctt cgcactattc

3541 tttctagcag agtacgccaa cattttgctt ataaacacac tttccgccac gctcttcctg

3601 ggcgcctccc acattcccgc ctttccagag ctaaccgccg tgaacttgat gaccaaagcg

3661 gcccttctct ccgttgtttt cctctgagtc cgagcttcct accctcgttt ccgatacgac

3721 caactcatgc atctaatctg gaaaaatttt ctccctctga cattatccct ggtcatctga

3781 caccttgccc tccctattgc ctttgctggt cttcctcccc aactataacg acggagctgt

3841 gcctgaagca tagggccact ttgatagagt gaaccatggg ggttaaagtc cccccaactc

3901 cttagaaaga aggggttcga accctacctg aagagatcaa aactcttagt gcttccacta

3961 caccacttcc tagtaaagta agctaaataa gcttttgggc ccatacccca aatatgttgg

4021 ttaaacccct tccttcacta atgaacccct acattttagc caccctcatt tttggtcttg

4081 gcctagggac caccctaaca ttcgccagct ctcactgact actcgcatga atgggcctcg

4141 aaatgaacac gcttgctatt atccccttaa tagcacagca ccaccaccca cgagcagttg

4201 aagcctccac caagtacttc ctcacacaag ccacaggagc agcaatactt ctctttgcca

4261 gcactactaa tgcgtgacta acaggacaat gagacatcca acagatgtcc cacccactcc

4321 ccatcacctt aatcaccttg gctctagcat taaaagtggg acttgccccc gttcactcat

4381 gactccccga agtactccaa ggccttgatt taaccacagg gcttattctc tccacttgac

4441 aaaaactggc cccctttgca ctgctcgtac aaattcactc tcataacccg acccttctaa

4501 ttgtcctcgg ccttgcatct acacttgtag gaggttgagg cgggctgaat caaacacaac

4561 tgcggaagat ccttgcctac tcctccattg cccatcttgg ctgaatagtc ttggtacttc

4621 agttctcctt ctctttaacc ctcctcaccc ttattaccta ttttatcatg accttttcaa

4681 ctttccttgt atttaaactg aacggctcaa ctaacgtcaa cgcactcgct acgtcttgag

4741 caaaagcacc tgcccttaca gcccttgtgc cccttgttct actatcccta ggaggacttc

4801 cgcctcttac aggctttata ccaaaatggc taatcttaca agagcttgcc aaccaagacc

4861 ttgcaaccac cgctaccctg gctgccctca gcgcactctt aagtctctac ttctacctgc

4921 gtttgtccta cgccataacc cttactatat caccaaataa tacgacgggc actaccccct

4981 gacgcctcca ttcctctcaa tcctcgttac ccgtagccat ttcaaccact gcaacattat

5041 tgctactccc tttagccccg gccgcgatca cactactagc cccctaaggg gcttaggcta

5101 acacaagacc gagggccttc aaagccctaa gcgggagtga aaatctccca gcccctgata

5161 agacttgcgg gacactaacc aacatcttct gcatgcaaca cagacacttt aattaagcta

5221 aagccttcct aggtgggcag gcctcgatcc tgcaaattct tagttaacag ctaagcgctt

5281 aagccagcga gcatccgcct acctttcccc cgcctgtttc aacggtttag aggcggggga

5341 aagccccggc aggtgtctag cctgcttctt aagatttgca atctcacatg ataacacctc

5401 agggcttggg ttggtaagaa gagggattga acctctgtct atggggttac aatccaccgc

5461 ttaaaactca gccatcctac ctgtggccac cacacgctga tttttctcaa ctaatcacaa

5521 agacatcggc accctttatc tagtatttgg tgcatgagcc ggaatagtag gcacagcatt

5581 aagccttctc atccgagcag agttaagcca acctggcgcc ctcttgggcg acgaccaaat

5641 ctataacgta attgttactg cacatgcttt cgtaataatt ttctttatag taatgccaat

5701 tatgatcggc gggtttggaa actgactcat cccactaatg atcggagctc ccgatatagc

5761 attccctcga ataaacaaca taagcttttg attactcccc ccttctttcc tgcttcttct

5821 cgcctcttct ggtgtagaag ccggggcagg gacagggtga acagtatacc cccctctcgc

5881 cagtaacttg gcccatgccg gagcatccgt tgatctaacc atcttctccc tccacttagc

5941 aggtatctcc tcaattctcg gggcaattaa ctttattaca accattatta acatgaaacc

6001 tcctgctatc tctcagtatc agacgcccct tttcgtatgg gccgttctca tcactgcagt

6061 ccttctcctt ctctcccttc cagttctagc tgctggcatt acaatgctcc taacagaccg

6121 aaatttaaac accaccttct tcgacccagc aggcgggggt gaccccattc tttatcaaca

6181 cctattctgg ttcttcggcc accccgaagt atacattcta attcttcctg gctttgggat

6241 gatttcccat attgttgcgt actactctgg taagaaagaa cctttcggct atatgggcat

6301 ggtctgagct atgatggcca ttggccttct agggtttatt gtatgagcac atcatatgtt

6361 tacagttggg atggacgtag acacccgcgc atacttcacc tctgctacca tgattatcgc

6421 cattcccaca ggtgtaaaag tctttagctg acttgcaacc cttcacgggg ggtctatcaa

6481 atgagaagcc ccccttctgt gagcccttgg gtttatcttc cttttcactg tagggggcct

6541 aacaggaatt attcttgcaa actcatccct tgatatcgtt ctacatgata cgtactacgt

6601 agtagcccac ttccactacg tactatctat gggagcagta tttgccatcg tagggggctt

6661 tgtacactga ttccccctct tttcaggata cacactccac ggcacctgaa caaaaatcca

6721 ctttgccatc atgtttgcag gtgttaattt aacattcttc ccccaacact tcctaggcct

6781 ggccggaatg ccccgacgat actcagacta cccagatgcc tacactctct gaaacaccgt

6841 ctcctcaatc ggatccctag tatccctggt agcagtagta ctgttcctgt tcattatttg

6901 agaagccttt gcagctaaac gtgaagtcct agccgtcgaa ctcacagcaa caaatgttga

6961 gtgactacac ggttgccctc caccctatca cacattcgaa gaacctgcat ttgttcaagt

7021 tcaacccaac taacgagaaa gggaggagtc gaacccccat gggttggttt caagccaacc

7081 acataaccgc tctgtcactt tctttataag acactagtaa aactagttat tacgccgcct

7141 tgtcgaggcg aagttgtggg ttaaaccccc gcgtgtcttg ccctttaatg gcacatccct

7201 cacagctagg ctttcaagat gcagcttcac ctgtaataga agaactcctt cactttcacg

7261 accacgcctt aatagtagtc ctcctaatca gcgccttcgt actttacatt attgtcgcta

7321 tgatttccac gaaattgaca aacaaatatg tactagactc ccaagaaatc gaaattatct

7381 gaactgtcct cccggcagtt attctgatcc ttattgccct tccctctctt cgtattctct

7441 accttataga tgaaatcaac agccccctgt tgaccattaa agccgtagga caccagtggt

7501 actgaagcta tgaatacaca gactacgaag acctcgggtt tgattcgtac ataatcccaa

7561 cacaagacct actacccggc caattccgcc tcctagaagc agatcatcgc atggttattc

7621 ccgtagaagc ccctattcgt gtcctggtct ccgccgatga tgtcctccac tcatgagcag

7681 ttccctccct cggcattaaa atagacgcag tcccaggccg tcttaaccaa acagccttta

7741 ttgcaacacg ccctggaatc ttttatggac aatgctcaga gatttgtgga gcaaatcaca

7801 gttttatgcc cattgtagtt gaagcagtcc ctctagaaca ctttgaaaac tggtcatccc

7861 gaatactcga agacgcctcg ctaagaagct aaattcggta tagcgttagc cttttaagct

7921 aaagattggt gactccgaac cacccctagc gacatgccac agctcaaccc cgccccctga

7981 ctagctattc tagttttttc gtgactggtt tttttagttg taattccccc caaagtaatt

8041 gcacatacct tccccaacga acctacactt caaagcgccg agaagcccaa agcagactct

8101 tgaacctgac catgacatta agcttcttcg accagtttat gagccccacg cttctgggta

8161 tccccctaat tgccattgcc ctcactatcc cctgaattct attccccacc cccaccacac

8221 gctgacttaa caaccgcttc ctaagcctcc agggttgatt tatcaatcgc ttcaccctac

8281 aacttctcct ccccctaaac cttggcggac acaaatgggc cgcccttttc gcctccttga

8341 taatctacct tatctctcta aatatgctag gccttcttcc ctatacattc acccccacaa

8401 cacaactctc actaaacctg ggacttgcca cccctctgtg actcgcaaca gtaattatcg

8461 ggatgcgaaa ccagccaacc catgcactgg gccatcttct gccagaagga acccccggac

8521 ccctaatccc cattttaatt attatcgaaa caattagtct attcattcgt cccctagcac

8581 tgggggtccg actaacagcc aacctaacag ccggacatct tttaatgcaa ttaattgcca

8641 ccgctgcctt caccctcgca ccttctatgc caacagtagc aatcgtgaca tccgctgttc

8701 ttgtccttct aacccttctg gagattgctg tagcaatgat tcaagcctac gtatttgtac

8761 tactcctatc cctttatctt caagagaatg tctaatggcc catcaagcac acccctacca

8821 catagtcgac cccagccctt ggcctcttac gggggcaatt gccgccctac taatgacatc

8881 aggtcttgcg acctggttcc acttccagtc aacagtctta ataacacttg ggactgccct

8941 tctcctactt acaatatacc aatgatgacg agacatcatt cgggaaggaa catttcaagg

9001 acaccacacg ccccctgtac aaaaaggact tcgattcggt ataattctgt tcattacctc

9061 tgaagtattc ttcttcctgg gcttcttctg agctttttat cacgcaagtc tcgcacccac

9121 ccctgaatta gggggctgct gacccccaac aggagtaagc acccttgatc cttttgaagt

9181 ccctctactt aacacagctg tactacttgc ctccggagtt acagtaacct gggcacatca

9241 cagtattatg gaaggtgaac gaaaacaggc cgtccactcc ctcggactca ccattcttct

9301 tggcttttat ttcaccttcc tacaaggctt agagtactac gaagcccctt tcacaattgc

9361 agacggtgtt tatggatcca ccttttttgt agcaactggc ttccatggcc tacacgtgat

9421 cattggctca accttccttg ccgtttgctt gtatcgccag gtccggtacc attttacatc

9481 cgagcaccat ttcgggttcg aggcagctgc ctgatactga cacttcgtag acgtcgtctg

9541 actgttccta tatatctcca tctattgatg aggatcttaa tctttctagt actaacgtta

9601 gtataagtga cttccaatca cccggtcttg gttaaagccc aaggaaagat aatgaaccta

9661 gttacaactg taattgccat caccaccaca ctttcaatta tcctggccct tgtctctttc

9721 tgactccctc aaatgacccc cgatcacgaa aagctctcgc cttatgagtg cggatttgac

9781 cctcttggct ccgcccgtct gcccttttcc ctgcgatttt tcctcgttgc catcctcttc

9841 ttgcttttcg acctggaaat tgcccttctg ctccccctgc cgtgagggga tcaattagcg

9901 tcccccttac taaccttcgc ctgagccaca gccgtgctcg ccctacttac cttgggccta

9961 atttacgagt gacttcaagg cggcctggaa tgagccgaat aggcaattag tttaagaaaa

10021 acctttgatt tcggctcaaa aacttgtggt taaagtccat aattacctaa tgacccctgt

10081 ccactttgcc ttctcatcgg ccttcatact aggactagct ggtctagcct ttcaccgaac

10141 acatctcctc tccgcccttt tatgcctaga aggaatgata ctctctttgt ttatcgccct

10201 ttccctgtga accttacaac ttggttccac tagtttctct gcggccccca tgctcctcct

10261 agcattttcg gcctgtgaag caagcgcagg tctcgcctta ttagtagcca ctgcacggac

10321 ccatggaacc gatcgcctac aaagcctgaa cctcttacaa tgctaaaagt tctaatcccc

10381 accctgatgc ttatccccac aacctgggca accaagccaa agtggctctg acccacaacc

10441 ctcgcccaca gccttatcat tgctgtactc agcctttcat gattagtaaa tatgtcggaa

10501 accggatgat caaacctcag cccgtacctg gcaacagacg ccctctccac cccccttcta

10561 gtactcactt gttggcttct gcccctaata atccttgcga gccagcgcca tacggcaact

10621 gagcctgtaa atcgccaacg gatatacatc accctcctaa catcccttca ggtcttcctg

10681 atcctggcct ttggggcaac cgaagttatt atgttctacg taatgtttga agccaccctc

10741 attccaacat taatcattat cacccgatgg ggtaaccaaa ccgaacgact aaacgcagga

10801 gtgtacttcc tcttctatac tctagccggc tctctcccac tactcgttgc cctcctactc

10861 cttcaaggaa gtgtcggcac tctttccatc ctgaccctcc catatgcaga ccctttgcaa

10921 ctggtatctt gcggggataa actttgatgg gccggctgcc tccttgcatt cttagtaaaa

10981 atacccctct atggagtcca tctttgactc cctaaagccc atgtagaggc cccagtagcg

11041 ggctctatga tcctagccgc cgttcttcta aaactcgggg gctacggcat gatacgaatc

11101 gtagtcgtac tagaccccct cactaaagaa ctcagctacc cctttattgt ttttgcatta

11161 tggggggtta tcataacagg ctcaatctgt ctccgccaga cggacttaaa gtccctgatt

11221 gcttactctt ctgtgagtca catgggcctg gttgtaggcg gcattcttac ccagacaccc

11281 tggggcttca ctggagcact aattctcata atcgcacacg gtctcacatc gtcagccctc

11341 ttctgcctcg ccaacacaaa ttatgagcga acccacagcc gaaccatgct gcttgcccga

11401 ggcctacaga tggccctccc tcttataacg acctgatgat tcatcgccag ccttgccaac

11461 ctcgcacttc cccctctccc caatctcatg ggggaactca taattatcac ctccctgttc

11521 aactggtcct gatgaaccct tctactgact ggggtcggaa ccctcatcac agccagctat

11581 tccctgtaca tattcctaat aacccaacga gggcccatcc ccgcacatgt cctcgccctt

11641 gacccctccc acacccgtga acacctctta atagccctcc acctcctccc ccttttactt

11701 cttgttctta aacctgagct aatctgaggc tgaacctcat gtagatatag tttaacaaaa

11761 acgttagatt gtgattctag aaacaggggt taaatccccc ttatccaccg agagaggctc

11821 gcagcagcga agactgctaa tctccgcatc tttggttgga ccccaaagct cactcgaaat

11881 gcttctaaag gataacagct catccgttgg tcttaggaac caaaaactct tggtgcaaat

11941 ccaagtagta gctatgcacc ccccttccct aataataacg accagcttaa ttatcatcct

12001 agcattatta gcctaccccg tcctttcaac actaaccccc cacccccagc cagcttcttg

12061 ggccgcctcg catgttaaaa ccggggttaa acttgctttt tttgtcagtc tctttccact

12121 atttctattt tttaacgagg gggcagaaac aatcgttacc tcctgaacct ggatgaatac

12181 ctactgcttt gacgtaaaca tcagctttaa atttgactac tactctgtta ttttcacacc

12241 aattgccctt tatgtgacat gatcaattct cgaatttgca acatgatata tgcacgcaga

12301 ccctaacata aatcgattct ttaaatacct gctaatcttc ctcatcgcta tggtcgtcct

12361 ggttactgcg aacaatctat ttcaactctt tattggctgg gaaggagtcg gtattatgtc

12421 tttccttctc atcgggtgat gatacggacg agcagatgct aacaccgctg cccttcaggc

12481 ggttgtgtac aaccgcgtag gtgatattgg actaattctt gccatggcat gaatggccat

12541 gaactttaac tcctgagaaa tgcaacaagt cttttcagcc tctaaagact ttgacctcac

12601 actaccattg cttgggctga ttcttgccgc aaccggtaag tcagcccaat tcgggctcca

12661 cccgtgactg ccctctgcaa tagagggccc tacaccggta tctgccctcc tacattcaag

12721 cactatggtt gttgccggta tttttctact catccggatg agccccctat tagaggggaa

12781 tcagactgct ttaaccacct gcctttgtct cggggcccta accacacttt ttactgccac

12841 ctgtgcactc acccaaaatg acatcaaaaa aattgttgca ttttcaacat ccagccaact

12901 gggccttatg atggttacta tcggcctcaa ccaaccccaa cttgccttcc tgcacatttg

12961 cacacacgct ttctttaaag ccatactttt cctgtgttca ggctcggtta ttcacagcct

13021 aaatgatgag caagacatcc gcaaaatggg aggtatgcac catctcaccc cctttacatc

13081 ttcatgctta acgatcggga gccttgctct aacgggcact ccctttttag caggcttctt

13141 ctcaaaagac gccattattg aagccctaaa cacatctcac ctaaacgcct gggccctaac

13201 tctcaccctc ctggccacct ccttcacagc catctacagc ctccgtgtag tcttcttcgt

13261 ctccatgggc caccctcgat ttaactcatt atccccaatt aacgaaaaca accccgccgt

13321 tatcaacccc atcaaacgcc tggcatgagg cagcattgtt gctggccttc taattacttc

13381 aagcattctt ccccttaaaa cccccgtcat gaccataccc ccactgctta aactagcagc

13441 cctggttgta accatcacgg gcctcctctt agccttggaa ctagcctccc tcacaagcaa

13501 acagcaccga acaacccccc ttcttaccac tcaccatttt tccaacatgc ttggcttttt

13561 cccagctatc gtccaccgac tcacccccaa gcttggctta atccttggtc aaacagttgc

13621 aagccaaata gtggatcaaa cctgactcga aaaaacgggc cctaaagccg tagcttcctc

13681 caacatcccc ctgatcacaa caactagcaa cacccaacaa ggcctgatta aaacctacct

13741 ttctctcttt ctcctcaccc ttacactctc tgtcctactc acaatttatt aaacagcccg

13801 aagtgcccct cgacttaacc cccgcgttaa ttctaacaca acaaagagtg taagaagaag

13861 aactcacgca ctaatcacta acatcccccc tcccgaggag tacataaggg ccacccctcc

13921 aatgtccccc cgaaatacag agaagtcccc gagctcatca gccggcaccc aggaggactc

13981 ataccaacca cttcaaaggg tgctagacac tagcccaacc cccagcacgt acattaacat

14041 gtatgccgca acaggccagc ttccccaccc ctcagggaag ggctcagcag caagagctgc

14101 tgagtacgca aatactacca gcataccccc tagatagatg agaaacaaaa ccaaagataa

14161 aaagggccca ccatggccaa tgagaacccc acaccccatg cccgccacca ccaccaaacc

14221 caaggcagca aaatacgggg aagggttaga agcaacagct actagcccta acactaaccc

14281 caataagaat aaagacataa tataggtcat aattcctgcc aggactctaa ccaggactaa

14341 tggcttgaaa aaccaccgtt gttattcaac tacaagaacc tctaatggca agcctgcgaa

14401 aatcacaccc cctactaaaa attgcaaaca acgcactagt tgacctccct gccccctcta

14461 atatttcggc gttatgaaac tttggctccc tcctaagcct ctgcttaatt acccaaatcc

14521 ttacgggact tttcctcgct atacattata cctctgatat tgcgaccgcc ttctcttccg

14581 tcggacatat ctgccgggat gtaaactacg gctgattaat ccgaaacatt cacgctaacg

14641 gtgcatcttt ctttttcatt tgcctctata tgcacatcgg ccgaggtctt tactacggct

14701 catatctcta caaagaaacc tgaaacgtcg gtgtagttct cctcctcctt gttataataa

14761 ccgcctttgt aggttacgtc ctgccctgag ggcagatgtc attttgaggg gccacggtca

14821 ttaccaacct cctatctgca gtcccctatg tgggtaactc ccttgtccag tggatctgag

14881 ggggcttctc agtagataat gcaaccctca cccggttttt tgctttccac ttcctcttcc

14941 ccttcctaat tgccggtgcc accctcctcc accttctttt cctccacgaa acgggctcga

15001 acaaccctct cggcctgaat tcagacgcgg ataaaatttc attccaccca tacttctcct

15061 acaaagacct cctgggcttt gcagcactcc tcactgcact cgcatccctt gcactcttcg

15121 caccaaacct cttaggagac ccagacaatt tcactcctgc caaccccctg gtcacgccac

15181 cccacatcaa gcctgagtga tacttcttgt ttgcgtatgc tatcctacgc tcgatcccca

15241 acaaactagg aggcgtactc gccctccttg cgtcaatcct tgtactgata attgttccca

15301 tcctccacac ctcgaaacaa cgagggatca ccttccggcc cctcactcaa tttctattct

15361 gagctctcat tgcagacgtc gttattctca cgtgaattgg aggcatgccc gtagaacacc

15421 cgtacattat tatcggacaa attgcgtcat tcttatattt ttccctgttt ctagtgctct

15481 ccccactagc cggctgatta gaaaacaagg ttctggaatg aaactgcaac agtagctcag

15541 atgtgagagc gtcggtcttg taagccgaag gtcggaggtt agattcttcc ctgttgctca

15601 aagaagggag attttaactc ccgcccctag ctcccaaagc taggattctt acgctaaact

15661 attccttggt ggcatacata tatgtacgtt tgtacatata tgtattaaca ccatacatct

15721 atattaacca tttcaatagc attcaagtac atatatgttt aatcaacaca actaggtgtt

15781 acccattcat acaacagcat gaaactaagt aatccataaa gcatgtaaag acttaactaa

15841 catcacactc ataaaagaca ggcgacattt aagatcgaac cgattgactc ataaggtaaa

15901 gttatacctt taccttacat ctctcctaac taacctagcg atgtagtaag aaccgaccat

15961 cagttgattt cttaatgcca acggttattg aaggtgaggg acaagtattc gtgggggttt

16021 cacacagtga attattcctg gcatttggtt cctacttcag ggccataagt tgatattact

16081 cctcccactt ccattaacgc ttacataagt taatggtgga gtacatctcc gagagacccc

16141 ccatgccgag cactcactcc atcgggcatt tggttctttt tttctctttt cctttcagtg

16201 aacatttcac agtgcacgtg gcgatagtaa acaaggtgga acattctgtt tgcagaccaa

16261 ggaaatagta tgaatggtga aaagacttta ctaaagaacc acataattga tatcatgagc

16321 ataaatagtg atatttactc gaaagatatc taatatcgac ccggggtttt tgcgggtaaa

16381 acccccctac ccccctaaac tcgtgggatc actaagactc ctgaaaaccc cccggaaaca

16441 ggaaaatccc tagtagttta atttgggcct aaaatacgct tatttacact attaaaataa

16501 tgcgcat