

LOCUS AY297781 71383 bp DNA linear BCT 01-MAR-2004

DEFINITION *Alcaligenes faecalis* strain NCIB 8687 arsenite oxidation genes, partial sequence.

ACCESSION AY297781

VERSION AY297781 GI:42741691

KEYWORDS .

SOURCE *Alcaligenes faecalis*

ORGANISM *Alcaligenes faecalis*

Bacteria; Proteobacteria; Betaproteobacteria; Burkholderiales; Alcaligenaceae; *Alcaligenes*.

REFERENCE 1 (bases 1 to 71383)

AUTHORS Silver,S., Phung,L.T. and Malo,B.J.

TITLE Genes for Arsenite Oxidation from *Alcaligenes faecalis*

JOURNAL Unpublished

REFERENCE 2 (bases 1 to 71383)

AUTHORS Silver,S., Phung,L.T. and Malo,B.J.

TITLE Direct Submission

JOURNAL Submitted (21-APR-2003) Microbiology and Immunology, University of Illinois at Chicago, 835 South Wolcott Ave., MC/790, Chicago, IL 60612, USA

FEATURES Location/Qualifiers

source 1..71383

/organism="*Alcaligenes faecalis*"

/mol\_type="genomic DNA"

/strain="NCIB 8687"

/db\_xref="taxon:511"

/note="derived from two overlapping cosmids"

CDS complement(<1..231)

/note="orf77"

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/db\_xref="GI:42741692"

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PAAEAVAVKEGRILDVGTQLQAMQAYKGPNTSVI"

RBS complement(240..244)

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CDS complement(398..1771)

/note="orf457"

/codon\_start=1

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/product="putative amino acid permease"

/protein\_id="AAQ19810"

/db\_xref="GI:33469569"

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GFAGPGVVLVS YVIGGFIALVLMGCLAEMTVEHPTSGSFGAYA E FYIHPLAGFLVRYSY  
WACIVLAVGTEVTAVADYMKFWFPEVSPWIWIVFFSAVLIAVNAYSVKAFGSVEYWFA  
LIKVFAIIAFIVLAIGMLTGYYPQAQVQENLLGQGGFMPNGWYGVVWVGVIIISIFS YLS  
IEMIAVAAGEAENPEQAVRQAFKATIWRLLIFYLLSLSLIVMLVPWQVLIADGTSSPF  
ITVMQSVGIPYADSILNFIVIIAALSAMNSMLYISTRMMFSLSRAGDAPLVLGKVARN  
GVPLNALALSASGVGVA AVVYAYNPETA FPVMIALSMFGALFTWGMIFLTHLFFRRRV  
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RBS complement(1777..1781)

/note="for gene encoding putative amino acid permease"

CDS complement(1808..3058)

/note="orf416"

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/transl\_table=11

/product="putative L-kynurenine hydrolase"

/protein\_id="AAQ19811"

/db\_xref="GI:33469570"

/translation="MITLQQCEQWDQADELAGFKARFDLPPNTIYLDGNSLGAMPRHA  
MERAQQVIAQEWRDLDLINSWNKAGWWTLPVRLGDQMSSLIGAGQGETIVSDSTSVNLF  
KVLAAAVNLQKERHPQKKVILAERDSFPTDLYIIEGFNAFFGKDYRLELIDEPADLKT  
AINDETAVVVL SHVNYRTGYLHDMQATNRLAHEHHALVIWDLCHSAGALPIELKASGS  
DFAIGCTYKYL NAGPGAPALLWVNPELLDKISQPLSGWWGHKHPFAMSPSYEAASGIE  
RFLCGTQPIVSLSLVACGVDFLQTDLQAVRRKSLALTDL FIRLVEQECAEFLRLIT  
PRDHHFRGSHVSFAHEQGYAVVQALIARGVIGDYREPEVMRFGITPLYLSFVDIWQAV  
QHLKAVLTDREWDKPAYKTRSKVT"

RBS complement(3066..3070)

/note="for gene encoding putative L-kynurenine hydrolase"

CDS 3202..3663

/note="orf153"

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/transl\_table=11

/product="putative transcriptional regulator"

/protein\_id="AAQ19812"

/db\_xref="GI:33469571"

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QEGLIENYSANLSASKLGFAIEAFVEVNIAQLNESEHQYLSKALATMDEV LHAYIVTG  
QANYMLHIRTRNFETFSNFVVKLNTLRGVTKIHSQIVLSCIKAKGQRLPV"

gene complement(3706..4424)

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CDS complement(3706..4410)

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TVRQGLAILTRNGLIERFPSRGSFVLERKNTGSWELNSLNDLVQLGKDTSTKVARWEL  
VAPPAEIAEFFASDEPVYKLQAVRYKSAVPLYFAENYVLSIGERLGQQDLETRTMVE  
MLTSVLNVPIKHAQEEISMADASAEMAKQLWIKESQAVIVQRIDLFDVDDKPVQSGKG  
WWRSEHFKRRFTLNYL"  
RBS complement(4420..4424)  
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CDS 4432..4956  
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GFVDATDLLPGGIALRGQAPGEQAHYTFIRPQLEHLAGNDTRHIAKLRHLFAGPHVVI  
HLQTRCIHIQTHIGFLTAKDRGSLEQAWFH FATVRTAPSPLTLQEAIGHDFKSDLCRA  
LHQDAAGMTMWVFH"  
gene 5409..7090  
/gene="lctP"  
RBS 5409..5413  
/gene="lctP"  
CDS 5423..7090  
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IIRASILSITPDQRLQLILVGF CFGAFLEGAAGFGAPVAITA ALLAGLGRPLYAAGL  
CLIAN TAPVAFGAMGIPIIVAGQVSGIDPFHIGQMAGRQLPFMTIIVLFWLMAIMDGW  
RGIKETWPAVLVGGGSFALVQFLTANYIGPELPDITSALVSLVALTLFLKVVWQPKRIF  
RFDEQEATPVQSDVAQQATLPLTTGRIIKA WSPFIILTVMVTIWSVQPFKVLFAANGP  
LASTIVNIPVPFLHNLVEKAPPVVASATPYGAVYAFNWLSATGTAILIAALLTILFLR  
MKPAKAVETLGETFKELAVPIYSIGMVLAFAFIANYSGLSATLALALAHTGKAFTFFS  
PFLGWIGVFLTGS DTSANALFGALQATTAQQLGLPEVLMVAANTTGGVTGKMISPQSI  
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gene 7124..7947  
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RBS 7124..7126  
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CDS 7135..7947

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AQLNVSRAASLREAIQQLTSQGILRSQVGSQTYLTSQTPQWTQRSVDPLAALMLSDPQY  
RYDVLEARIALESSTTWHAAALRASPEDKSKILQCFEQMIRYQQSGDSDLARADAQFH  
LAVAEASHNLVLVQVMRGLFDLVLSSVTQNRDIIMFVHDSPETLTHLTAQHEALVKAI  
IDGDAAHARHVVNEHLGYVRNTLLQADEDLARRERAARLQTSVLPDPILP"  
CDS 7944..9083  
/note="orf379"  
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VALRQRVLKDMSQLDTSIDLFGEKLSMPVALSPVGLTGMYARRGEVQAARAADARGIP  
FTMSSVSVCPIEEVAPRLSRPMWFQLYVLKDRGFMRNALERAQAAGCSTLVFTVDMPV  
PGARYRDAHSGMSGPNAALRRYAQAVMHPRWAWDVGLLGRPHDLGNISRYLGKPTGLE  
DYMGYLGANFDPSISWKDLEWIREFWKGPMLIKGILDPDDARDAVRFGADGHIIVSNHG  
GRQLDGVLSSARALPAIADAVKGGQIKILADSGIRSGLDVVRMIALGADAAMLGRAYIY  
ALAAAGQSGVDHLLGLIEKEIRVAMTLTSVSSISQITSELLVREP"  
RBS 9073..9077  
/note="for gene encoding putative D-lactate dehydrogenase"  
CDS 9086..10807  
/note="orf573"  
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/transl\_table=11  
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LAVVRPGTLLEQWRSLQAAVAADCIVIMQAANTGLTGGSTPDGDDYDRDIVLMNTMRL  
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LVRRGPAYTELTYAQVRDDGSLQLVNHLLGIHLGDTPEEILSRLEQGNRYAADILNDP  
QRKASDPYADDVRDVAQTPARFNADPSRLYEASGSAGKLCIFAVRLDTFPKESSTV  
FYIGTNEPDELTAVRRHLLTQLPRLPIAGEYIHRTAYDIGEQYGKDTFLLIDRFGTAK  
VPSAFAMKSRIDGFFERFGWRGVTDRIQAVMNRLP SHLPARMRQWRDRFEHLLLRV  
SNDTAQATR DYLQQQFGDSTQGA YFECD AEEGRKAFLHRFAIAGAAIRYRESHPN SVE  
DIVALDIALRRNDREWVEQLPDDMEKDIVHKLYYGHFLCHVFHQDYIIKKGVAPLEME  
HRMWKLLDERQAEYPAEHNVGHLYVAKPALAGFYRELDPTNTFNPGIGHTSRRKWWSA  
CCAGKHD"  
CDS complement(10943..11494)

/note="orf183"  
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/translation="MSFVLAGLTLRPLSETELNWWWSIDRSEQIEALYEWREGVLHKQ  
EVAIDLRGWLEGDPEKYHPEHEEAFHRGAWFMGVFKDDRLVAAVGLDRLPLGPQGDWR  
QLFFLHVSQALRGQGMGACLLDQAKKQAILWGAKAVYVSATPSVNTVDFYRAQGFVIA  
PEPDPRLFALDPEDIHLLCHLAT"  
CDS complement(11616..12617)  
/note="orf333"  
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/transl\_table=11  
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ferredoxin-NAD(+) reductase"  
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/db\_xref="GI:33469579"  
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GCKTRLVQGQVDLLDYSRFALTEAQSARGLILACRAIPRSDVTLDWIGTDDVVRGRVPL  
RQVEGTVVTLEALTHDIRRVRIRLADEQPLMFFAGQYADIKFGQAPARSYCMANRPGE  
AELEFHIRRVPGGVASAYVHTVLEPGERVTLELPKGTSYLREGHGGPMLCIAGGAGLA  
PIKSIVETALASGMSQAIHVYFGVREGRDLYGLEEFRALARDYPTLLFTPVVSGIPVA  
HCSRGLVTDIAGSEQADLRGWKVYVAGSPTLVDA TIGMALKRGLKIQDLHAQIYVTP"  
RBS complement(12625..12629)  
/note="for gene encoding putative naphthalene  
1,2-dioxygenase system ferredoxin-NAD(+) reductase"  
CDS complement(12970..13254)  
/note="orf94"  
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DRTPSKTGDQKATQFDGSPKPKPDSPNWFKPKDDTPAILPKRHGPKNPD"  
RBS complement(13260..13264)  
/note="for gene encoding orf94"  
gene complement(13377..13908)  
/gene="yciE"  
CDS complement(13377..13898)  
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/codon\_start=1  
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QRIQQHIEETRTQQGLVRQCIERRGGDPSLLKDLGGKVMATFQGFSGMFASDEVVKGC  
MFSFAFESLEIAAAYSQIKEAADYLGDVETAAVCQQILEQERAMAHWLEVHSPELVRVF  
LARADEGHPQAKR"  
RBS complement(13904..13908)  
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gene complement(14088..15323)  
/gene="chrA"  
CDS complement(14088..15314)  
/gene="chrA"  
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/db\_xref="GI:33469581"  
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RAEFVERRRWLDDRSYSDLVALCQFLPGPASSQVGMALGLGRAGWMGLLAAWTGFTLP  
SAIALILFALGLAGQQGIAQSPWVHGLKIVAVIVAQA VLGMARSLCPDRGRAALAIL  
AALLSLLPSAFGQVLAIAVTGLLAWWRLDSVQAGAMQAHSYPVSRTVGTAAALVLFAG  
LLMVLPVWAAVSASSTAQLLEGVYRSGALVFGGGHVVLPLLQAAVPSGLVSNADLMV  
GYGAAQAVPGPLFTFAAYIGAMAQGPLHGWLGGVLVLLGVIFVPALLILIGVLPFWQGL  
RHRAGIRTAMAGVNAGVVGILGVALYDPVWWSAIHTRADFGLALLLFGLLTVGRVPPA  
LVVLLAGLGASLLAVF"  
RBS complement(15320..15323)  
/gene="chrA"  
CDS complement(15931..17091)  
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RNKGWNVISNKYYVDDNETTVREIDLIA YKATQVQQFSVYTA LIISCKKNESNVWALL  
SRPLQKNDPNRNWHPVHA WTNDKSLNFQISKPEFGTDYHARMGKKALSALEDPSVDIF  
SFQEMNRQSGSPKNDK AIFDSITSLMKAQAYEVRALPTRKTAPSVYHFSLISVVDTEV  
INLLFSEGKIEASEIESEQYLANYIINKKQDISRIRFIRASAFNKIISDYDKLHRFNC  
RVFSEYCDEFYDGALEDNRNRTKVFIEEFRKIVWWKLHWTLHKNLGRDLKREDIDLSWN  
SINKYVEVNVVPGGDDLEFLNKDEESNKA IKKALSEVYRYHGPFHFSEDIPF"  
CDS complement(17054..18490)  
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RSYSGTGRNRQTTRLVELFTNYEAI PADLSPISATGTSMKLVDKGAEFLAPYWADFES  
YSEFQVLLTVPTNSACL TTRTGAKTVGAIFRSSVSPGTMLLLPDIDFYDEQFLSEEGE  
ETQWNDVAEKFSRKL VSSI VALDKALRSSSEVTPEPAWATTPEYSLSAEEDLRRKLE  
AENNERAQRKEELINEL TTTGQLRGLLYEKGKPLENAIKSLHILGFTAEPFKNAN  
SEFDVVFECKEGRFIGEAEKDKTKAINIDKLRQLSMNIHEDLQREEVTTPAKPVLFGR  
AFRLRPVSERPDPFTEKCHSATSSSTALVHTPDLFNVVKYLLDCPDDGYAQACRNAI  
FNSNGRVSFVPPPEAAAFAPSAEHTNPID"

RBS complement(17098..17102)  
/note="for gene encoding orf386"  
RBS complement(18495..18497)  
/note="for gene encoding orf478"  
CDS complement(18967..19458)  
/note="orf163"

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ARHPHPFPTLCFRLRPPVQPLTPLSARITTRMPNCVIESADDEARVLGRPAALRARTR  
PLDASGVPTRYARGKV FRAIGPQLPPRSRRRGWRVQRGKASLGSVHHGWQPILPSIG  
KTY"

RBS complement(19471..19475)  
/note="for gene encoding orf163"  
CDS complement(19507..21699)  
/note="orf730"

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RAYVGETTDTITRLGTHLKHPQKQSLTTVHLVSSERFNKSATLDISSLIKYMSADGR  
FNLLNGNLGLSDHNY YQRNELYSKIFREIWDRLRRHGVAQKSIEVIDNSDVF KYSPYK  
SLSADQQQLIQIMLSL VDPGLKNII VQGGAGTGKSVLAIFLFLIHS DLEELDREF  
SDEEKELRDLLRQLKQRLPSRMALV VPMNSFRRTLK KAFENVVGLHPKMVISPELA

RRSYDIVLVDESHRLRKRVNLGAYYGAFDKACAALGLDKSTCSEVDWVIRQSDKAVFF  
YDPNQSIKPSDANASDFDDIKSSLDSKIMTLVSQFRVRAGLHYVQFVDDLLNMRLPVG  
KKFSSSKYEFLVFDELSDMVREIKHRNNSYGLARLVAGYSWSWVSRTPDLYDIEIGD  
VQLRWNSTNEDWINAKGAEDEVEGCIHTTQGYDLNYTGVIFGHEIRYDERLDQIVIDKD  
NYHDRNGKQTIKDPDELKQYILNIYRTIMLRGIRGTFVYACDDGLRSYLKRHVESYKS  
NVIAFPEAAKPLEPYINAVPLYDLRAAAGGFSAHQHVEHENWVLVPEGMPVGKNIFAC  
HVLGESMNKVIPNGAVCLFRLNPGGSRNGKIVLVECADVQDGDAGSRYTVKEYQSFKA  
RTEDGTENLQILLKPRSTNRELTTIELSNDDDMHRYQVVGEFLGVISP"

CDS complement(21696..22010)

/note="orf104"

/codon\_start=1

/evidence=not\_experimental

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/protein\_id="AAQ19827"

/db\_xref="GI:33469586"

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EL"

RBS complement(22017..22025)

/note="for gene encoding orf104"

gene complement(22451..22794)

/gene="yafQ"

CDS complement(22451..22780)

/gene="yafQ"

/note="YafQ"

/codon\_start=1

/transl\_table=11

/product="damage-inducible protein"

/protein\_id="AAQ19828"

/db\_xref="GI:33469587"

/translation="MTSKKPAASKRTSLPSASDYTKEFLLKDWKRLSHSGRYDMNRLKE

VMGLLTANNGLPPEWLDHALTGDWAGYRECHVGGDFLLIYSLDDTGKHGLVVFVRSG

THSELF"

CDS complement(22752..23063)

/note="orf103"

/codon\_start=1

/transl\_table=11

/product="DNA damage-inducible protein"

/protein\_id="AAS45093"

/db\_xref="GI:42741695"

/translation="MYLNNTQLETLMATTTMVHVRVDEKIKAQATETLASMGLTVSDA

VRVFLTRVADNELPFAVKAPNARTRAAMAEAREIKNRRARFNNSESLIDDLEKASR

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RBS complement(22791..22794)

/gene="yafQ"

CDS complement(23217..23522)

/note="orf101"

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/evidence=not\_experimental

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/product="hypothetical protein"

/protein\_id="AAQ19829"

/db\_xref="GI:33469588"

/translation="MTTVAPELNYS ELARQIAARMSPEALLSAEDVGAMLGYPARYIR  
ETIALAPGFPVAIRLRLNDDGKRSNPRWRRTDVEEWVTTHLAQRRARSGRPRNQAVM"

CDS 23526..23897

/note="orf123"

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/evidence=not\_experimental

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/protein\_id="AAQ19830"

/db\_xref="GI:33469589"

/translation="MHL LCGGLCSQWRQGTAA SWSVRTAGQAQEGAAPGCKAVCGLLP  
LSSARLRRHRLITGAAL IPECRPPG SFPYSTSRKRSVLSLWISPVLLLPRCRAGSHAV  
ACRRRQGVIFIDCLLLKSVNE"

RBS complement(23531..23538)

/note="for gene encoding orf101"

CDS complement(24041..24475)

/note="orf144"

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/evidence=not\_experimental

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/translation="MNEAHIAQQRRELLSKAIDHLTHGDRSAFGRRLGFKDGAFIRQM  
LNGSRAVSEKTIRHIESIPGMRGWFTQAEGNDPPALTPVHVADASPDDIAARYHASSI  
PVQRLVELVLRQPSEPVPEWATPALLSVVTAGLVLAQELDTK"

gene complement(24623..25045)

/gene="arsC2"

CDS complement(24623..25036)

/gene="arsC2"

/codon\_start=1

/transl\_table=11

/product="arsenate reductase"

/protein\_id="AAQ19832"

/db\_xref="GI:33469591"

/translation="MKPVIIYHNPECGTSRNTLEMIKASGEEPEVIEYLVNPPSRERLL  
ELIDLMGISPRELLRRKGT PYDELNLDDPGLTDAQIIDAMMSHPILINRPIVVTEKGV  
KLCRPESELVLELLEHPATTFKKEDGETVNFP AKHM"

RBS complement(25041..25045)

/gene="arsC2"

gene complement(25056..25873)

/gene="phnE1"

CDS complement(25056..25865)

/gene="phnE1"

/note="PhnE1"

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/transl\_table=11

/product="oxyanion permease"

/protein\_id="AAQ19833"

/db\_xref="GI:33469592"

/translation="MDTQTDSLWKRSTRADLLNFVAWVLALALVSWAFQVMTQDTI  
WSFVTDAPTQAVDIGARMMPPDWPYVRELLWPLWETLNMATLGTLLGTLIATPIAFLA  
AYNTTPSKLFIRPVALFIIVASRSINSLIWALLLVAILGPGVLAGTIAIALRSIGFIG  
KLLYEAIIEIDERQVEAISSTGASKPQVMAWGVYPQVAPTLVGITVFRWDINIRESTV  
LGLVGAGGIGVKLESSLGTAWPKVSVLLLAIFATVIVSEWLAACKVRQALI"

gene complement(25841..26653)

/gene="phnE2"

CDS complement(25841..26653)

/gene="phnE2"

/note="PhnE2"

/codon\_start=1

/transl\_table=11

/product="oxyanion permease"

/protein\_id="AAQ19834"

/db\_xref="GI:33469593"

/translation="MQSPSSEHSSSHWRKPPFIERAWLRRSLYAAALLYLLLALSSLE  
VNWSRVAEGLSRGLAFVSAFLQPDFTSRNTDIIQGFIESLTMTLTSTALGTALAI  
LGAASNLAAPRGIYFFCRGFIAVSRTLNEIIVAILLVAMFGFGPFAGFLTLTFASIGFM  
AKLLAEDIEEIQTQQLEALRSTGASTAQVLDFAVLSQIMPRLVGLSLYRLDINFRESS  
VIGIVGAGGIGATLNTAMDRYEFDTAAAILIVIIAIVMLAEYGSGWIRKRIL"

RBS complement(25871..25873)

/gene="phnE1"

gene complement(26667..27497)

/gene="phnC"

CDS complement(26667..27497)

/gene="phnC"

/note="PhnC"

/codon\_start=1

/transl\_table=11

/product="oxyanion transport ATP-binding protein"

/protein\_id="AAQ19835"

/db\_xref="GI:33469594"

/translation="MLEIHNLQKSYSTGDKALKGVNLSVQPGELLGLIGPSGAGKSTL  
IRCVNRLVEPSEGRVLLNGKDLANLGRHDLRMARRRIGMIFQEYALVERLTVMENLLS"

GRLGYSGFWPSWFRFRSPEDIRLAYALLERVGLDGMHNKRADALSGGQRQRVGIARAL  
MQKPDLLLVDDEPTASLDPKTSRQVMRLVLELCREHGLSAIINIHDVVLATEYLPRIVG  
LRAGAVVYDGPASAIIDTHVLTRIYGAEDWSSITDRMTGTTVPGDEQAARVATIAIAAE  
"

gene complement(27509..28522)

/gene="phnD"

CDS complement(27509..28510)

/gene="phnD"

/note="PhnD"

/codon\_start=1

/transl\_table=11

/product="oxyanion binding protein"

/protein\_id="AAQ19836"

/db\_xref="GI:33469595"

/translation="MTATLTPHTNATSFPPKRGKAFSAAIATALALLAGTAHAMDARY  
QDANNDLVADAPTPDKDWIDPSTLVFAYTPVEDPSVYAKVWEGFITHLSQVTGKKVQF  
FPVQSNAAQLEAMRAGRLHVAGFNTGSNPLAVNCAGFVFPFAMMVSKDNQFGYEMEIIT  
YPGSGIEKVEDIRGKQMAFTAETSNSGYKAPSALLRDQFKMEAGKDYTPVFSGKHDNS  
ILGVANKDYLAADVANSVKVRMEGRGVVKEQFTVLYKSQTFPTTGYGHVYNLKPELA  
EKVKEAFFTFNWESELAKEFNKAQPAQEKFMPITYKEYWQVVRDIDRAMGVEYTCK"

RBS complement(28517..28522)

/gene="phnD"

gene complement(28595..29698)

/gene="moaA"

CDS complement(28595..29689)

/gene="moaA"

/codon\_start=1

/transl\_table=11

/product="molybdenum cofactor biosynthesis protein A"

/protein\_id="AAQ19837"

/db\_xref="GI:33469596"

/translation="MRISVLNDRPLTLLSLSEGPVSPPTGPLTDQHGRPVRDLRISV  
TDRCNFRCTYCMPREVFDDRFVFLPRQDMLSFEEIERLARIFVGLGVRKLRLSGGEPL  
MRKDLQDLVAKLAQLHTPDEAMPEIALTTNASLLSRKAAVLRAGLARVNVSLDAIDS  
AVFQRMDSAVLVDDVLNGIDAAQKAGLGPIKVNMMVRRGMNEDQILPMVRHFRGSGH  
VLRFIEFMDVGNVSNKQQNDVFTAAEILSTIQSEHPLVAIQAHNRSDVARRWKYADGQ  
GEIGIIASVTQPFCDCTRARLSADGKLYLCLFAQRGIDLRAPLRSGATNVELEKIIR  
AAWSARTDRYSEQRGLSNGRPKIEMSYIGG"

RBS complement(29693..29698)

/gene="moaA"

gene complement(29702..32193)

/gene="asoA"

CDS complement(29702..32182)

/gene="asoA"

/codon\_start=1

/transl\_table=11

/product="arsenite oxidase Mo-pterin subunit"  
/protein\_id="AAQ19838"  
/db\_xref="GI:33469597"  
/translation="MSRPNDRITLPPANAQRNMTCHFCIVGCGYHVYKWPELQEGGR  
APEQNALGLDFRKQLPPLAVTLTPAMTNVVTEHNGRRYNIMVVPDKACVVNSGLSSTR  
GGKMASYMYTPTGDGKQRLKAPRLYAADQWVDTTWDHAMALYAGLIKKTLDKDGPQGV  
FFSCFDHGGAGGGFENTWGTGKLMFSAIQTPMVRIHNRPAYNSECHATREMGIGELNN  
AYEDAQLADVIWSIGNNPYESQTNYFLNHWLPNLQGATTSSKKKERFPNENFPQARIIF  
VDPRETPSVAIARHVAGNDRVLHLAIEPGTDTALFNGLFTYVVEQGWIDKPFIEAHTK  
GFDDAVKTNRLSLDECSNITGVPVDMMLKRAAEWSYKPKASGQAPRTMHAYEKGIWGN  
DNYVIQSALLDLVIATHNVGRRGTGCVRMGGHQEGYTRPPYPGDKKIYIDQELIKGKG  
RIMTWWGCNNFQTSNNAQALREAILQRSIVKQAMQKARGATTEEMVDVIYEATQNGG  
LFVTSINLYPTKLAEAAHMLPAAHPGEMNLTSMNGERRIRLSEKFMPPGTAMADCL  
IAARIANALRDMYQKDGKAEMAAQFEGFDWKTEEDAFNDGFRRAGQPGAPAIDSQGGG  
TGHLVTYDRLRKSNGVQLPVVSWDESKGLVGTEMLYTEGKFDTDGKAHFKPAPWN  
GLPATVQQQKDKYRFWLNNGRNNEVWQTAYHDQYNSLMQERYPMAIEMNPDDCKQLD  
VTGGDIVEVYNDFGSTFAMVYPVAEIKRGQTFMLFGYVNGIQGDVTTDWTDRNIIPYY  
KGTWGDIRKVGSMEEFKRTVSFKSRRFA"

RBS complement(32188..32193)

/gene="asoA"

gene complement(32195..32736)

/gene="asoB"

CDS complement(32195..32722)

/gene="asoB"

/codon\_start=1

/transl\_table=11

/product="arsenite oxidase Rieske subunit"

/protein\_id="AAQ19839"

/db\_xref="GI:33469598"

/translation="MSDTINLTRRGFLKVS GSGVAVAATLSPIASANAQKAPADAGRT  
TLQYPATQVSVAKNLKANEPVSFTYPTDSSPCVAVKLGSPVPGGVGPNNDIVAYSVLC  
THMGCPSTYDKSSKTFKCPCHFTEFDAEKAGQMICGQATENLPRVLLRYDEASDALTA  
VGVDGLIYGRQANVI"

RBS complement(32730..32736)

/gene="asoB"

gene 32740..33806

/gene="oxyX"

RBS 32740..32743

/gene="oxyX"

CDS 32748..33806

/gene="oxyX"

/codon\_start=1

/transl\_table=11

/product="oxyanion binding protein"

/protein\_id="AAQ19840"

/db\_xref="GI:33469599"

/translation="MNGYRPQAKAKSMPPRSNRRTPVRRQAVKTHTGQNGNGLACQRL  
AVLPNGNVNSVRRRLLAGSVGGVVSSCFPGTVSAASLSRKPLRIGTTAVFLNEQLQLL  
DVWRQDLRDILGFDVQFVQRRSYGEIVELLNRQLDAAWICGFPYVQHADSFRL LAVP  
VYQGQPLYRSYLIVQEENRQARGIADLYGCVFAYS DPLSNSGFLVPMAQMASVSLDPS  
RFFRKAMFTFAHRKV VQAVASGLADAGAVDGYVWDTIAEQFPEWTNGARVAWRSEYYG  
FPPIVARHDLEVDQFHGLQHALLSMTQRPRGRLILSRLCLDRFSVKDPGIYDDIRSL  
QSVNPAHL SRANATAPAV"

gene 33809..35284

/gene="oxyS"

CDS 33809..35284

/gene="oxyS"

/note="two-component histidine kinase sensor"

/codon\_start=1

/transl\_table=11

/product="signal transduction protein"

/protein\_id="AAQ19841"

/db\_xref="GI:33469600"

/translation="MPVRTPNCF S RLSFRYKVPLALAAAIVVTEVVVGSTLVHMSYSG  
MVRDMQASAADLSRVLALSIREPLIRDDVWRVYEALRMPIDAREADSG LQDVIVLDRE  
GSVFAASDPRRFPVLDPLQHMPANVRHAISQLNHVSGSLYDFPGLFSELP AVVATTV  
RSEDSGVAGYVVATYDSEFLRARIIDL VLRVV LISVPGL LLLLVLGWVFGDRIARPLS  
QLELAMQKVG HEDLAAIRASLTVRGLDETARLSRQFDDMLS QLQAKQNLERQMLVTQR  
LAAVGRVAAGVAHEINNPLGGMLNALDTLEKHGSPDPLTQKT VGLVSRGLS QIRATVS  
ALLVEARLDSPLMTLGDWEDLRTLIEPQLEQRQVHLVWDVPDLPTLDLPAHLIRQLTL  
NLLNARNAVDSGGTVACVAVVERSALSIQVSNTGQH IPELLPNLFEPYQLHPNARN  
SHSYGLGLWVTYQIVNQLRGSIQVVSQPGYTSFVVGLPLNL"

gene 35290..36648

/gene="oxyR"

CDS 35290..36648

/gene="oxyR"

/codon\_start=1

/transl\_table=11

/product="two-component aspartyl-phosphate response  
regulator"

/protein\_id="AAQ19842"

/db\_xref="GI:33469601"

/translation="MSHIMKPIVCLIEDDVVMGESLLQRFEIEGFNVDWHVLGESA AV  
ALTSRRYDVVVS DIRLPDIDGGELFHRLVRQGVALPPFILITAYATVERAVSLMKSGI  
ADYITKPFDL SGLVEKVRAAAQASPSLPKELSEQMLGVSEAARDLARRVPRIAGRASS  
ILITGESGVGKEMLARMLHQHAVREEQNTPFVTVNCGAVAPNLLEAEFFGFERGAFTG  
ADRTRRGFLEQA HGGTLLLDEVGELSLPMQAALLRALQEK RIRRVGAETDLPVQFDLI  
CATNRDLEKMKERQFREDLYRINVVSLHVSPLRDRPDDVMWFAERFMEAMASRLNE  
PLKTLHPMARLRLLEHNWPGNVRELHNRIEHA CLMSTGSM LMPADIFPSDVSHPEGLL  
VSAKDTSLGSYKDACERIIKETLRHHGGRVEETAKALRISRKSLWEKLRHRIDRF  
VG"

RBS 36723..36726

/note="for gene encoding putative transcriptional regulator"

CDS 36736..37089

/note="putative regulator of arsR family; similar to ArsR; arsR-like1"

/codon\_start=1

/transl\_table=11

/product="putative transcriptional regulator"

/protein\_id="AAQ19843"

/db\_xref="GI:33469602"

/translation="MTTESHPRHQSFLSSSAPERLDEAKVLTMLRALAQPARELFRA  
IHESGDKGVELAELHRRYGRPRSSISLHLAILTKAGLIQMAPCDPNVRYVSDNQTFRF  
AMNYLDKSVAIDVGV"

gene 37199..38203

/gene="pstS"

RBS 37199..37203

/gene="pstS"

CDS 37210..38202

/gene="pstS"

/codon\_start=1

/transl\_table=11

/product="phosphate-binding protein"

/protein\_id="AAQ19844"

/db\_xref="GI:33469603"

/translation="MKLTKLASAVAILAAAGSMSAASAQEVPTVLIDGSSTVFPISA  
VAEEFQNAQKKGKTRVTVGVSGTGGGFKKFCRGELDITGASRPIKKEEMELCKQNGVEF  
IEMPIVIDALATIINPQNNWAECLSV AELKKMWEPEAQGKITNWNQINSKFPDAPLVL  
FGAGTDSGTYYTFAIVGKEHSSRGDFTATEDDNVSVQGVARDKNAIGFLGLAYYDH  
NKDKIKPVAIRQADGSCVLPSVETAVDGTYQPLTRPIFYVVDKSKADKKHVADFIHFA  
FDPKNQQELISEVGYVSLPAEIANAATKKFDSRKTGSHFDGGSKVGVKMADLVN"

gene 38309..39256

/gene="pstC"

RBS 38309..38311

/gene="pstC"

CDS 38318..39256

/gene="pstC"

/codon\_start=1

/transl\_table=11

/product="phosphate permease"

/protein\_id="AAQ19845"

/db\_xref="GI:42741693"

/translation="MTLVSGEKNIQRFMPSAAYLARRRFIDKLSRFALMAAAAALSVFI  
TLGIVYVLVSESWGFFEKVS LWTFLTDTQWTPMFENPQFGVWPLL TATLWAAGIALII  
AIPLGTVLAVYLSEFARPAVRESIKPCLELLEAVPTIVYGYFALLLLTPFMQNFVPGL  
GGFNLLVPGIVL GIMILPYIVSVSEDAMRAVPGSLREGAYALGMSRIQTAVRVIIPGA  
FSGITAAAYVLGMSRAVGETMVLAVAAGQNPNTMDPREGAATITAYIVQMSMGDLPHG"

SLAYQSIFAVGLVLFLITLAFNVIGYQMRKRYREVY"

gene 39245..40217

/gene="pstA"

RBS 39245..39248

/gene="pstA"

CDS 39258..40217

/gene="pstA"

/codon\_start=1

/transl\_table=11

/product="phosphate permease"

/protein\_id="AAS45094"

/db\_xref="GI:42741696"

/translation="MATNSRKKDYSAINIDETKSIQLVRYAKRSDIVFSIAGVFLV  
SMGLLVTVLLDLALDGAARISDFDLTSFPSRKPEAAGILSAWVGTTLMIVTAFLAIP  
LGVLAGLYLEEYAPKNWFTTLLIEVNISNLAGVPSIIYGLLALGLFVYMFDLGQTVFVA  
GAVLALLILPVIIVSTREAVRSIPQVIKEGAYGMGADKWQTMGTGYILPAARPGILTGA  
IVGLSRAIGETAPVITIGALTYIAFLPTFPFQGDFPYLNFDWLNPFVMPIQMFNWL  
SRPQTEFHVNAATGLILIGMTVVMNLIAIVIRFKLRRRNVAN"

gene 40256..41141

/gene="pstB"

RBS 40256..40259

/gene="pstB"

CDS 40266..41141

/gene="pstB"

/codon\_start=1

/transl\_table=11

/product="ATPase"

/protein\_id="AAS45095"

/db\_xref="GI:42741697"

/translation="MSDTTKPPMARKMGLTAERVHGERRVEDPSRSVMTTPPKEELRAN  
VKDLSFWYGEFQALHAVNLPIARNKVTALIGASGCGKSTLLRCFNRMHDLYPGNRYGG  
EIDLQPEGQNIAPGIDPILIRLRIGMVFQKPNPFPKTIYENVASGLRIRGIRSRAVL  
DERVEVSLRQAALWDEVKDRHLHQSAYGLSGGQQQLCIARTLAPNPEILFDEPTSAL  
DPIATAKIEDLFTDLRDDYTIVIVTHNMQQAARISDYLAFMHLGKMIEFGPTDECFAK  
PKHAMTEEYITGRFG"

gene 41140..41814

/gene="phoU"

RBS 41140..41144

/gene="phoU"

CDS 41152..41814

/gene="phoU"

/codon\_start=1

/transl\_table=11

/product="phosphate regulator"

/protein\_id="AAS45096"

/db\_xref="GI:42741698"

/translation="MSDKAHIVREYDKELTHLGELLDDEMTVAAQEILACAEFKVLGTG  
AGNCGTTGALSHLNGLYDTVNHRTMLILTKRQPMSEDLRQVMGVVHIASELQRLGALA  
NSICERGQSIDNQLLVADV NKGLATLFR LVRGFFSDAMSGYRSADSQRLLAMVDADNA  
VDEAYHRLVADIVTMFSQHTSYALDLTQLLFCAKGLERIGDHVAHIVHAGYVAHTGEL  
PG"

gene complement(41872..42791)

/gene="czcD"

CDS complement(41872..42783)

/gene="czcD"

/codon\_start=1

/transl\_table=11

/product="efflux protein"

/protein\_id="AAS45097"

/db\_xref="GI:42741699"

/translation="MLQMAHTHDHSHEPNSYGFAGFGILLNLA FVAIEGFYGWRANS  
LALLADAGHNLSVGGVLVLA WVAYGA AKMRPNQRHTY GWRKASILASFVNAVILLVAM  
GSLASEAISRLGDPGTPNAQTIIIVAGVGV LINAVTAWLFMAGSRNDLNIRGAFLHMA  
ADAAVSLGVVASGCLALWQSWVKLDPV VSLVIAVIII FATLSL FKRS LHMLFDGVPDD  
IDLNAVRSV LLEIPGLKSLHDLHIWNLS TTETALT VHLVLDENIDVDAALRGATNILI  
ERFSIHHSTIQCESPRFATDCTLNVRH"

CDS complement(42758..43420)

/note="orf220"

/codon\_start=1

/transl\_table=11

/product="monooxygenase"

/protein\_id="AAS45098"

/db\_xref="GI:42741700"

/translation="MAPFSQEMKPPQNSVRFTTPYQNQRVAIVGGGNSGAQILAEVSR  
VAQTFWITPTPPVFLPDEVDGRV LFERATQRWLAQKEGRTVDVPVGG LGDIVMVPSVR  
EARARGVLVADRPFTRFSETGIEWDDGRKQPIDAVI WCTGFRPALKHLSSLGVVGS DG  
KVEVNQSR SVTEPRLWL VGYGDWTGPASATLAGVMRAARDAVAEIAEELLGEDASNGT  
HS"

RBS complement(42789..42791)

/gene="czcD"

RBS 43406..43410

/note="for gene encoding transposase"

CDS 43419..43742

/note="orf107"

/codon\_start=1

/transl\_table=11

/product="transposase"

/protein\_id="AAS45099"

/db\_xref="GI:42741701"

/translation="MSKNNKFSPEVRERAVRLVQGHRDEYRSLWAAVESIAPKIGCTP  
TTL LDWIKRSEVNNGIRPGVTTEERERL KALEKENRELRRANEILKSASAFFAQAALD  
RELKK"

gene 43796..44653

/gene="int"

/note="integrase; start codon not determined"

CDS complement(44544..45188)

/note="orf214"

/codon\_start=1

/transl\_table=11

/product="monooxygenase"

/protein\_id="AAS45100"

/db\_xref="GI:42741702"

/translation="MSPTTWNPEPRTL DVVVIGAGQAGLATAYFLRRTGLSFALLDNQ  
PRSGGAWLHGWKSRLFPSTWSSLPGRMPASESGLYPSRDEVLDYFAHYEARQFP  
IERPVCVQVTRSGTHMLTHADSRMWQSRAVVSATGNWSNPYIPDYPGIKEFKGTQRH  
SALYVDAMNHTGNRGGCLVKVKQVPQLVLQVVDSNALRLRLAGCRRSIPAGAGG"

CDS complement(45204..45440)

/note="orf78"

/codon\_start=1

/transl\_table=11

/product="thioredoxin"

/protein\_id="AAS45101"

/db\_xref="GI:42741703"

/translation="MKTIEVLGTGCSKCITTAKTIEQVA AELGQHVSVEKVTDLERIM  
AYKVMATPAVAIDGKLVHTGSIPDREKISNWLQG"

RBS complement(45449..45454)

/note="for gene encoding thioredoxin"

CDS complement(45469..46494)

/note="orf341"

/codon\_start=1

/transl\_table=11

/product="permease"

/protein\_id="AAS45102"

/db\_xref="GI:42741704"

/translation="MFALFTDLASWLTYDLLGLSPETKLGSSVHFFIEDTTKILFLLL  
VMIYIIALMRASLNVERVRAYIQQKNRFLGYLFGSGFGAITPFCSCSSIPLFLGFTSA  
GIPLGITMAFLTSPINEVAVIMLWSLLGWKFTLAYVVIGMAVGIVGGMIIDSMRAE  
RWLQDFAAKAYKQAAQAPGASNEADRQLLDTRGMTIRQRHDFAKHEVREIVGRIWIWV  
LVGVGLGAALHGFVPDGWFASNLGAGQWWSVPVAVLAGLPLYSNATGVIPVMESLIAK  
GLPIGTTLAFCMSTVAASFPEFIMLKQVMTRLLALIFLTLLANFMIVGWLINSIGPW  
LFTGLGS"

RBS complement(46500..46504)

/note="for gene encoding permease"

RBS 46669..46673

/note="for gene encoding ECF sigma factor-z"

CDS 46681..47220

/note="orf179"

/codon\_start=1

/transl\_table=11  
/product="ECF sigma factor-z"  
/protein\_id="AAS45103"  
/db\_xref="GI:42741705"  
/translation="MAFECVTKAWQSYHSELRRFLVARLGDEAASDDVLQDVFFRAMR  
SGSQFCELNNSRAWLYEVTRNAVIDRHRMAKVWVPASDELIADSDDETQDDPVVLESC  
LINALGRLAPDDRILEQCDLAGDTQAAAYAKRRGLSLPAVKARIRRARERLRDDLVRH  
CDVQWDSANKVCCHRAFGG"  
gene complement(47266..48235)  
/gene="soxH"  
CDS complement(47266..48225)  
/gene="soxH"  
/codon\_start=1  
/transl\_table=11  
/product="hydrolase"  
/protein\_id="AAS45104"  
/db\_xref="GI:42741706"  
/translation="MTAFKKSLLNLIFAFAFFGLMATLPTTAAPPTFEPVAQQVVDNV  
YAIVGPLGQRSEKNAGLNANYGFIVANTGVILIDSGPSEVGAIIIEKTINAVTPKPIL  
WVLNTGSQDHRWLGNQYFSRKGAEIHAMRGTTANTQEKFSQQQLTNLEKFLGDQLIGTE  
PEYASVLHDSPATELSIDGIDIQWIETNAHYPADTMIFLPKHSVVFTGDLVYVDRLLG  
ILPQSNIRNADAAFKQLVSMKPTHVVPGHGRVTDIAQAQKETGDYYTFMITNIGAAAR  
EMEPMTETLNQFANPAQFKHLANFEELHRLNMNRVYLDVESNP"  
RBS complement(48231..48235)  
/gene="soxH"  
RBS 48450..48455  
/note="for gene encoding putative transcriptional  
regulator"  
CDS 48461..48790  
/note="putative regulator of arsR family; similar to ArsR;  
arsR-like2"  
/codon\_start=1  
/transl\_table=11  
/product="putative transcriptional regulator"  
/protein\_id="AAS45105"  
/db\_xref="GI:42741707"  
/translation="MKPIESCEAASCASDLPLSESLDAEELAVLLKALAHPARIRLLQ  
YLARQGSCYFGNLAQVVNLAPSTVSQHVVQILKAAGLLLGSAQEQRTCYCVNPDRLAVL  
KRLVEAL"  
RBS 48838..48841  
/note="for gene encoding secreted protein"  
CDS 48852..50279  
/note="orf475"  
/codon\_start=1  
/transl\_table=11  
/product="secreted protein"

/protein\_id="AAS45106"  
/db\_xref="GI:42741708"  
/translation="MNVQSTSPVAIIGAGPVGLAAAHLAQRSIPFKVFEAGAQVGAN  
LRSYRQVRLFSPWRYNVDRARELLGAAGWQAPDEDLLPTAGELVDSYLEPLAGSHAL  
APYIQYATRVIASREGFDKTKTAGRDCADFVLQLQSGEGLREQRARAVIDASGTWLQ  
PNPLGNHGLPAIGEVEARARIAYGMPDILGADRARYAGRKVLVVGSGHSAAGNLLALS  
KLAQQVPGTRLAWAVRGKDLRRLFGGGENDGLPARGELGLLLRQLVERDQLEMHLGFG  
IHEIVCATEGLRILAESAQLPAIEGVEQIVAATGSRPDLLMTRELRLRLDPWLESTDA  
LAPLIDPNVHSCGTVRPHGHRELAHPEPNFYAIGAKSYGRAPNFLMATGYEQARSVVA  
ALAGDMSAADDVRELPETGVCASDFGAVGVAVEGACCGGSVTTAVGVSGLVAKPREA  
QERAACCGTPAQPIKAAATRSACCG"  
RBS 50472..50476  
/note="for gene encoding orf91"  
CDS 50483..50758  
/note="orf91"  
/codon\_start=1  
/evidence=not\_experimental  
/transl\_table=11  
/product="hypothetical protein"  
/protein\_id="AAS45107"  
/db\_xref="GI:42741709"  
/translation="MRVNIPFSPILPFLSADAPDAFDSGIGVCHLAITHSPEKTKSDR  
PTGDSGARRAAGGRSQVLVGLVCVAMSTPPKPPTVLQSIPAALAFAA"  
gene 50979..51523  
/gene="radC"  
RBS 50979..50983  
/gene="radC"  
CDS 50993..51523  
/gene="radC"  
/codon\_start=1  
/transl\_table=11  
/product="DNA repair protein"  
/protein\_id="AAS45108"  
/db\_xref="GI:42741710"  
/translation="MKEYQSLALALDNMNSLPLYVKSPRGRYQPARDDQILAAARQA  
ADSLISKEQALNQPPVVEAFFKAKLAGLGHECAAVA YLDHQFRLIRYMEISQGTISQA  
SVYPREVVKTGLRLNASAVIMAHNHPSGSPGPSQADITLTTHLRKALALIDLRLLDHI  
IVTGKGTSSMASMGLI"  
RBS 51645..51651  
/note="for gene encoding orf135"  
CDS 51658..52065  
/note="orf135"  
/codon\_start=1  
/evidence=not\_experimental  
/transl\_table=11  
/product="hypothetical protein"

/protein\_id="AAS45109"  
/db\_xref="GI:42741711"  
/translation="MEFFAIEDHLVHCYTRGQAMADGMLVDISEAAVEAGFRAPVAMT  
RTAWADCVEWSQATADRKAILQDEEGRLWDVVYMMAMLAARRSEGMSRTVFDVYRVPTT  
GKGVKPRRTTLVMQIGPGDTGEPVITISLPGED"  
CDS 52757..53779  
/note="orf340"  
/codon\_start=1  
/evidence=not\_experimental  
/transl\_table=11  
/product="hypothetical protein"  
/protein\_id="AAS45110"  
/db\_xref="GI:42741712"  
/translation="MLVSLTVHVRGLLTVAGDELKRDGGNEANRVPRADCTEQLKSRA  
PNLGIRCAVNSQPFFYVRRITMLVSRFAFRSPVLRSEPLSDDQIRAVVPSIFADAPHE  
SRSDRYTYIPTVAVLTELKKEGFQPFMVTQTRVRNTERRDFTKHMIRLRHAGQINTRG  
EANEIILLNSHDGSSSYQMLAGMFRFVCSNGLVCGETVADVRVPHKGDVAGLVVEGAY  
RVLGGFDRARESRELMRDITLEAGETEVEFARAALSLKYDDPDKPAPVTETQILLPRA  
EDRRSDLWSVFNRQTQENLTGGLSGRSANGSRQKTRPVQGIDQNIKLNRLWLLADGM  
RQLKAG"  
gene complement(53853..54305)  
/gene="pbrR"  
CDS complement(53853..54293)  
/gene="pbrR"  
/codon\_start=1  
/evidence=not\_experimental  
/transl\_table=11  
/product="hypothetical protein"  
/protein\_id="AAS45111"  
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CDS 56781..57860

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Secure mode active.