

APPENDIX-1**16S rRNA Sequences deposited with GenBank**

LOCUS KC291496 1475 bp DNA linear BCT 31-DEC-2012
DEFINITION *Vibrio harveyi* strain MCCB 170 16S ribosomal RNA gene, partial sequence.

ACCESSION KC291496

ORGANISM *Vibrio harveyi* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
 Cochin University of Science and Technology, Fine Arts Avenue,
 Cochin, Kerala 682016, India

ORIGIN

1 gcctaacaca tgcaagtcca gcggaacga gttatctgaa ccttcgggga acgataacgg
 61 cgtcgagcgg cggacgggtg agtaatgctt aggaaattgc cctgatgtgg gggataacca
 121 ttgaaacga tggctaatac cgcataatgc ctacgggcca aagaggggga ccttcgggga
 181 tctcgcgtca ggatagcctt aggtgggatt agctagttgg tgagtaagg gctcaccaag
 241 gcgacgatcc ctactgtgct tgagaggatg atcagccaca ctggaactga gacacggctc
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 781 acgatgtcta cttggagggt gtggccttga gccgtggcct tcggagctaa cgcgttaagt
 841 agaccgcctg gggagtacgg tcgcaagatt aaaactcaaa tgaattgacg ggggccccgc
 901 acaagcgggt gagcatgtgg ttaattcga tgcaacgcga agaacttac ctactcttg
 961 acatccagag aactttccag agatggattg gtgcttccgg gaactctgag acaggtgctg
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 1321 gggcctagta caccgccc gtcacacat cggagtgggc tgcaactcga gtaagtagc
 1381 ctcaagtcgt gacaaggcag ccgtacgca atcaggcata gtaatcgtgg atcagaatgc
 1441 cacgggtcac accatgggag tgggctgcaa aagaa

LOCUS KC291497 1451 bp DNA linear BCT 31-DEC-2012

DEFINITION *Vibrio harveyi* strain MCCB 171 16S ribosomal RNA gene, partial sequence.

ACCESSION KC291497

Appendix

ORGANISM *Vibrio harveyi* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

```
1 gcctaacacg ctaatgcaag tcgagcggaa acgagttatc tgaaccttcg gggaacgata
61 acggcgtcga gcggcggacg ggtgagtaat gcctaggaaa ttgcctgat gtgggggata
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181 ggctctcgc gtcaggatat gcctaggtgg gattagctag ttggtgaggt aagggtcacc
241 caaggcgacg atccctagct ggtctgagag gatgatcagc cacactggaa ctgagacacg
301 gtccagactc ctacgggcag gcagcagtgg ggaatattgc acaatgggcg caagcctgat
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781 ccgtaaacga tgttacttg gaggtgtgg cctgagccg tggcttcgg agctaaccg
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1021 tctgcatg ctgctcag ctcgtgtgt gaaatgttg gtaagtccc gcaacgagcg
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1141 aaaccggagg aaggtgggga cgactcaag tcatcatggccttacgaagtagggctaca
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1441 taccacttcc a
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LOCUS KC291498 1478 bp DNA linear BCT 31-DEC-2012

DEFINITION *Vibrio harveyi* strain MCCB 172 16S ribosomal RNA gene, partial sequence.

ACCESSION KC291498

ORGANISM *Vibrio harveyi* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

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ORIGIN

1 acatgcaaag tcgagcggaa cgagttatct gaaccttcgg ggaacgataa cggcgtcgag
 61 cggcggacgg gtgagtaatg cctaggaaat tgcctgatg tgggggataa ccattggaaa
 121 cgatggctaa taccgataa tacctcgggt caaagagggg gaccttcggg cctctcgt
 181 caggatatgc ctaggaggga ttgctagtt ggtgaggtaa gggctacca aggcgacgat
 241 ccctagctgg tctgagagga tgatcagcca cactggaatc tgagacacgg tccagactcc
 301 tacgggaggg agcagtgggg aatattgcac aatgggcgca agcctgatgc gccatgccg
 361 cgtgtgtgaa gaaggcctc ggggtgtaa gcaacttcag tcgtgaggaa ggtagtgtag
 421 ttaatagctg cattattga cgttagcgac agaagaagca cggctaact ccgtgccagc
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 1261 aaaaagtgcg tcgtagtcg gatcggagtc tgcaactcga ctccgtgaag tcggaatcgc
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 1381 gtcacacat gggagtgggc tgcaaaagaa gtgaggtagt ttaacctcgc ggaggacgt
 1441 tacccttgt ggttcacgac tgggggaagt cgtaaca

LOCUS KC291499 1464 bp DNA linear BCT 31-DEC-2012

DEFINITION *Vibrio harveyi* strain MCCB 173 16S ribosomal RNA gene, partial sequence.

ACCESSION KC291499

ORGANISM *Vibrio harveyi* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

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ORIGIN

1 acatgcaaag tcgagcggaa acgagttatc tgaaccttcg gggaacgata acggcgtcga
 61 gcggcggacg ggtgagtaat gcctaggaaa ttgcctgat tggggggata accattggaa
 121 acgatggcta ataccgata atacctacgg gtcaaagagg gggaccttcg ggcctctcgc
 181 gtcaggatat gcctaggtgg gattagctag ttggtgaggt aagggtcac caagcgcagc
 241 atccctagct ggtctgagag gatgatcagc cactcggaa tctgagacac ggtccagact
 301 cctacgggag gcagcagtgg ggaatattgc acaatggcg caagcctgatgcagccatgc

Appendix

361 cgcgtgtgtg aagaaggcct tcgggttgta aagcacttc agtcgtgagg aaggtagtgt
421 agttaatagc gcattattt gacgttagcg acagaagaag caccggctaa ctccgtgcca
481 gcagccgcgg taatacggag ggtgcgagcg ttaatcggaa ttactgggca gtaaagcgca
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1141 ccggtgataa accggaggaa ggtggggacg acgtcaagtc atcatggccc tacgagtag
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1441 gcttaccact tgtggcgcac acag

LOCUS KC291500 1442 bp DNA linear BCT 31-DEC-2012

DEFINITION *Vibrio harveyi* strain MCCB 174 16S ribosomal RNA gene, partial sequence.

ACCESSION KC291500

ORGANISM *Vibrio harveyi* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

1 aacgataac gcgtcgagcg gcggacgggt gagtaatgcc taggaaattg ccctgatgtg
61 ggggataacc attgaaacg atggctaata ccgcataata cctacgggtc aaagaggggg
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301 atgggcgcaa gcctgatgca gccatgccgc gtgtgtggaa gaaggccttc gggttgtaa
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Appendix

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1441 at

LOCUS KC291501 1465 bp DNA linear BCT 31-DEC-2012

DEFINITION *Vibrio alginolyticus* strain MCCB 169 16S ribosomal RNA gene, partial sequence.

ACCESSION KC291501

ORGANISM *Vibrio alginolyticus* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

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Cochin, Kerala 682016, India

ORIGIN

1 acgtggcgg caggcctaac acatgcaagt cgagcggaaa cgagttatct gaaccttcgg
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421 tcgtgaggaa gtagttag ttaatagctg cattattga cgttagcgac agaagaagca
481 ccggctaact ccgtgccagc agccgcggtg atacggaggg tgcgagcgtt aatcggaatt
541 actgggcgta aagcgcagtc aggtggttg ttaagtcaga tgtgaaagcc cggggctcaa
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661 gtgtagcggg gaaatgcgta gagatctgaa ggaataccgg tggcgaaggcggccccctgg
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781 gtccacgccg taaacgatgt ctactggag gttgtggcct tgagccgtgg ctttcggagc
841 taacgcgta agtagaccg ctggggagta cggtcgcaag attaaaactc aatgaattg
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961 acctactct gacatccaga gaacttcca gagatggatt ggtgccttcg ggaactctga
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Appendix

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1321 cgctagtaat cgtggatcag aatgcaacgg tgaatacgtt cccgggcctt gtacacaccg
1381 cccgtcacac catgggagtg ggctgcaaaa gaagtaggta gttaagccttcggggggacg
1441 cttaccactt tgtggttcat gactg

LOCUS KC291502 1486 bp DNA linear BCT 31-DEC-2012
DEFINITION *Vibrio cholerae* strain MCCB 162 16S ribosomal RNA gene,
partial sequence.

ACCESSION KC291502

ORGANISM *Vibrio cholerae* Bacteria; Proteobacteria; Gammaproteobacteria;
Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from
shrimp hatcheries along the Indian coast

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Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

1 tggcggacag gcctaacaca tgtcaagtcc tgaggcgagc agattccaca gcaggacact
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121 agagggggat aaccattgga aacgatggct aataccgcat aacctgcaa gagcaaagca
181 ggggaccttc tggagcctat gcagactaac cggatatgcc caggtgtgga ttacgacgta
241 cgttggtgag gtaagggctc caccaaggcg acgtatccct agctggtctg agaggatgat
301 cagccacact ggaactgaga cacgtgtcca gactcctacg ggaggcagcc gtggggaat
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481 gttacctaca gaagaagcac cggctaacte cgtgccagca gccgcggtaa tacggagggt
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1141 gaactccagt gagactcggg gtgataaacc ggaggaaggt ggggacgacgcaagtcac
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1261 tccgcgaggt ggagcgaate tcacaagaga tacgtcgtga gtccggattg gagtctgcaa
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1381 gtcccgggc cttgtacaca ccgccctca caccatggga gtgggctgca aagaagcag
1441 gtagtttaac cttcgggagg acgcttgcca ctttgtggt ccatga

LOCUS KC291503 1443 bp DNA linear BCT 31-DEC-2012
DEFINITION *Vibrio fluvialis* strain MCCB 130 16S ribosomal RNA gene, partial sequence.

ACCESSION KC291503

ORGANISM *Vibrio fluvialis* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

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ORIGIN

```

1 gcagctgaga agctgtacgt agagtgaag tctgagcgcg cagcgacaac attgaacctt
61 cgggggattt gttgggcggc gagcggcggg cgggtgagta atgcctggga aattgcctg
121 atgtggggga taaccattgg aaacgatggc taataccgca tgatagcttc ggctcaaaga
181 gggggacctt cgggcctctc gcgtcaggat atgcccaggt gggattagct agttggtgag
241 gtaagggctc accaaggcga cgatccctag ctggtctgag aggatgatca gccacactgg
301 aactgagaca cgtccagac tctacggga ggcagcagtg gggaaattg acaatgggc
361 gcaagcctga tgcagccatg ccgcgtgtat gaagaaggcc ttcgggtgtt aaagtacttt
421 cagcagtgag gaaggagta tcgttaatag cggtatcttt tgacgttagc tgcagaagaa
481 gcaccggcta actccgtgcc agcagccgcg gtaatacggg ggggtgcgagc ttaatcgga
541 attactgggc gtaaagcga tgcaggtggt ttgttaagtc agatgtgaaa gcccggggct
601 caacctcgga attgcattg aaactggcag gctagagtac tgtagagggg ggtagaattt
661 caggtgtagc ggtgaaatgc gtagagatct gaaggaatac cgggtggcgaa gcgccccc
721 tggacagata ctgacactca gatgcgaaag cgtgggggagc aaacaggatt agataacctg
781 gtagtccacg ccgtaaacga tgtctacttg gaggttgtgg ccttgagccg tggcttccg
841 agtaacgcg ttaagtagac gcctggggga gtacggtcgc aagattaaaa ctcaaatgaa
901 ttgacggggg cccgcacaag cggtgagca tgtggtttaa ttcgatgcaa ccgcaagaa
961 ccttacctac tcttgacatc cagagaactt agcagagatg ctttgggtcc ttcgggaact
1021 ctgagaacag gtgctgcatg gctgtcgtca gctcgtgttg ggaaatgttg ggtaagtcc
1081 cgcaacgagc gcaaccttat ccttgtttgc cagcgagtaa tgcgggaac tccagggaga
1141 cgtgccgggtg ataaaccgga ggaagtgagg gacgacgtca agtcatcatg cccttacga
1201 gtagggtctac acacgtgcta tcaatggcgc atacagaggg cggccaagtt tgcgaaagtt
1261 gagcgaatcc caaaaagtgc gtcgtagtcc ggattggagt ctgcaactcg actccatgaa
1321 gtcggaatcg ctagtaatcg tgaatcagaa tgcacgggtg aatacgttcc cgggccttgt
1381 acacaccgcc cgtcacacca tgggagtggg ctgcaaaaaa agcaggtagt ttaaccttcg
1441 gga
  
```

LOCUS KC291504 1480 bp DNA linear BCT 31-DEC-2012
DEFINITION *Vibrio nereis* strain MCCB 132 16S ribosomal RNA gene, partial sequence.

ACCESSION KC291504

ORGANISM *Vibrio nereis* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

Appendix

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

```
1 tgaacgctgg cggcaggcct aacacatgct tgaagtcgag cggaaacgag gtatctgaac
61 cttcggggta acgataacgg cgctgagcgg cggacgggtg agtaatgcct gggaaactgc
121 cctgatgtgg gggataacca ttgaaacga tggctaatac cgcataatag cttcggctca
181 aagaggggga ccttcgggcc tctcgcgca ggatatgcc agtggggatt agctagtgg
241 tgaggtaaaa ggctaccaa ggcaacgac cctagctggt ctgagatcag ccgtctcact
301 ggaactgaga ggatgatcag ccacactgga actgagacac ggtccagact ctacgggag
361 gcagcagtgg ggaatattgc acaatggcg caagcctgat gcagccatgc cgcgtgatg
421 aagaaggcct tcgggttga aagtactttc agcagtgagg aagggtgtg cgtaatagc
481 ggtattaatt tgacgttagc tgcagaagaa gcaccggcta actccgtgcc agcagccgcg
541 gtaatacga ggggtcgcgac gtaaatcga attactgggc gtaaagcgca tgcaggtgtg
601 gtgttaagtc agatgtgaaa gcccgggct caacctcggg aagtagacat ttgaaactgg
661 cacactagag tactttaga gggggtaga attcaggtg tagcgtgaa atgcgtagag
721 atctgaagga ataccagtgg cgaaggcggc ccctggaca gatactgaca ctcatgacg
781 aaagcgtggg gagcaaacag gattagatac cctggtatc cacgccgtaa acgatgtcta
841 cttggaggtt gtgggctga gccgtggctt tcggagctaa cgcgttaagt agaccgctg
901 ggggagtacg gtcgcaagat taaaactcaa atgaattgac gggggcccgc caagcggtg
961 gagcatgtgg ttaattcga tgcaacgca agaacctac ctaccttg acatccagag
1021 aatctttcca gagatggatt ggtgcctcg ggaactctga gacaggtgct gcatggctg
1081 cgctacgctg tgtgtgaaa tgttgggta agtcccgcaa cgagcgcaac ccttaccct
1141 gttgccagc gagtaatcgt gggaaactcca gggagactgc cgtgataaa cggaggaag
1201 gtggggacga cgtcaagtc atcatggccc ttacgagtag ggctacacac gtgtacaat
1261 ggcgcataca gaggcgcggc caacctgcg aaagtgagcg aatccccaaaagtgcgctg
1321 tgagtccgga ttgagtctg caactcgact ccatgaagtc ggaatcgcta gtaatcgtg
1381 atctgaatgc cacggtgta aggttgcgtt cccgggctt gtacacaccg cccgtcgac
1441 catgggagtg ggctacgag agcatcttc gcaactctg
```

LOCUS **KC291505** 1487 bp DNA linear BCT 31-DEC-2012

DEFINITION *Vibrio nereis* strain MCCB 165 16S ribosomal RNA gene, partial sequence.

ACCESSION KC291505

ORGANISM *Vibrio nereis* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; *Vibrio*.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

```
1 tcatggctca gattgaacgc tggcggcagg ctaacacat gcaagtcgag cggaaacgag
61 ttatctgaac cttcgggtga aacgataacg gcgtcgagcg cggacgggt gagtaatgcc
```


Appendix

121 tgggaaattg ccctgatgtg ggggataacc attggaacg atggctaata ccgcataata
181 gcttcggctc aaagaggggg accttcgggc ctctcgcgct caggatatgc ccaggtggga
241 tttagctagt ggtgaggtaa aggctcacca aggcaacgat ccctagctgg tctgagagga
301 tgatcagcca cactggaact gagacacggt ccagactcct acgggaggcagcagtgggga
361 atattgcaca atgggcgcaa gcctgatgca gccatgccgc gtgtatgaag aaggccttcg
421 ggttgtaaag tactttcagc agtgaggaag gtggtgtcgc ttaatagcgg tattaattg
481 acgttagctg cagaagaagc accgggtaac tccgtgccag cagccgcgtaatacggagg
541 gtgcgagcgt taatcggaat tactgggcgt aaagcgcag caggtggtgt gtaagtacg
601 atgtgaaagc cggggctca acctcggaat agcatttgaa actggcacac tagagtact
661 gtagaggggg gtagaattc aggtgtagcg gtgaaatgcg tagagatctg aaggaatacc
721 agtggcgaag gcggccccct ggacagatac tgacactcag atgcgaaagc tggggagca
781 aacaggatta gatacctgg tagtccacgc cgtaacgat gtctacttgg aggtgtggc
841 cttgagccgt ggcttcgga gctaaccgct taagtagacc gcctggggag tacggtcgca
901 agattaaaac tcaaatgaat tgacggggcc cgcacaagcg gtggagcatg tggtttaatt
961 cgatgcaacc gcgaagaacc ttactactc ttgacatcca agagaacttt ccagagatgg
1021 attgagtccc ttcgggaact ctgagacaag gtgctgcatg gctgtcgtcc agctcgggt
1081 tgtgaaatgt tgggttaagt cccgcaacga gcgcaacct tacccttgtt tgccagcgag
1141 taatggtggg aactccaggg agactgccgg tgataaacg aggaaggtggggacgacgt
1201 caagtcatca tgcccttac gtagtaggct cacacacgtg ctacaatggc gcatacagag
1261 ggcgccaga cttgcgaaag tggagcgaat cccaaaaagt gcgtcgtagtcggattgga
1321 gtctgcaact cgactccatg aagtcggaat tcgctagtaa tcgtggatca gaatgccagc
1381 gtgaatacgt tcccggcct gtacacacc gcccgctca ccatgggagt gggctgaacg
1441 tgaacaacc acctcaagtc gtaacaaggt agccgtacgc tagcatc

LOCUS **KC291506** 1477 bp DNA linear BCT 31-DEC-2012
DEFINITION *Vibrio proteolyticus* strain MCCB 134 16S ribosomal RNA
gene, partial sequence.

ACCESSION KC291506

ORGANISM *Vibrio proteolyticus* Bacteria; Proteobacteria; Gammaproteobacteria;
Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from
shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

1 attgaacgct ggcggcaggc ctaacacatg caagtcgagc ggaaacgaga tatctgaacc
61 ttcggggaac gatatcggcg tcgagcggcg gacgggtgag taatgcttgg gaaattgccc
121 tgatgtgggg gataaccatt gaaacgatg gtaataaccg cataatagct tcggctcaaa
181 gagggggacc ttcgggcct ctgcgctcag gatatgcca ggtgggatta gcttagttgg
241 tgaggttaag gtcaccaag gcgacgatcc ctactggtc tgagaggatg atcagccaca
301 ctggaactga gacacggtcc agactcctac gggaggcagc atggggaata ttgcacaatg
361 ggcgcaagcc tgatgcagcc atcccgctg tgtgtgaaga aggcctcggg ttgtaaagca
421 ctttcagtcg tgaggaaggt agtgtattta atagatgcat tatttgactg tagcgacaga
481 agaagcaccg gcttccgtgc cagtgcagcc gcgtaatac ggagggtgcc gacgcttaat

Appendix

541 cgggaattact gggcgtaaag cgcatgcagg tgggtgtgta agtcagatgt gaaagcccgg
601 ggetcaacct cggaaatagca tttgaaactg gcagactaga gtactgtaga ggggggggta
661 gaatttcagg ttagcgggtg aaatgcctag agatctgaag aataccgggtg gcgaagggcg
721 cccctggac agatactgac actcagatgc gaaagcgtgg ggagcaaaca ggattagata
781 ccttggtagt ccacgccgta aacgatgtct acttgagggt tgtggccttg agccgtggct
841 ttcggagcta acgcgtaag tagaccgcct ggggagtacg gtcgcaagat taaaactcaa
901 atgagggggc ccgcacaagc ggtggagcat gtggtttaat tcgatgcaac gcgaacctta
961 cctactcttg acatccagag aactttccag agatggattg gtgccttcgg gaactctgag
1021 acaggtgctg catggctgtc gtcagctcgt gttgtgaaat gttgggtaa gtcgccaac
1081 gagcgcaacc cttatccttg tttgccagca cgtaatgggtg ggaactccag ggagactgcc
1141 ggtgataaac cggaggaagg tggggacgac gtcaagtcac catggcctt cgagtaggg
1201 ctacacacgt gctacaatgg cgcatacaga gggcgccaa cttgcgaaag gagcgaatc
1261 ccaaaagtgc gtcgtagtcc ggattggagt ctgcaactcg actccatgaa gtcggaatcg
1321 ctagtaatcg tggatcagaa tggcacgggtg aatacgttcc cgggccttgt acacaccgcc
1381 cgtcacacca tgggagtggg ctgcaaatag aattgggcta gtttaacctt cgggaagtcg
1441 aacaagcact ttgtggttca tgactggcga gcaggca

LOCUS **KC291507** 1332 bp DNA linear BCT 31-DEC-2012
DEFINITION *Vibrio splendidus* strain MCCB 135 16S ribosomal RNA
gene, partial sequence.

ACCESSION KC291507

ORGANISM *Vibrio splendidus* Bacteria; Proteobacteria; Gammaproteobacteria;
Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from
shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

1 ggccggacggg tgagtaatgc ctaggaaatt gccttgatgt gggggataac cattggaac
61 gatggctaata accgcataat gcctacgggc caaagagggg gaccttcggg cctctcgcgt
121 caagatatgc ctagggtgga ttagctagtt ggtgaggtaa tggctacca aggcgacgat
181 ccctagctgg tctgagagga tgatcagcca cactggaact gagacacggt ccagactcct
241 acgggaggca gcagtgggga atattgcaca atgggcgaaa gcctgatgca ccatgccgc
301 gtgtatgaag aaggccttcg ggtgtaaag tactttcagt tgtgaggaag ggggtgtcgt
361 taatagcggc atctcttgac gttagcaaca gaagaagcac cggctaactc cgtgccagca
421 gccgcggtaa tacggagggt gtcgagcgtt aatcggaatt tactgggcgt aaagcggcat
481 gcaggtggtt agattaagtc cgatgtgaaa gccccgggct caacctggga atggcattt
541 aaacttggtc agactagagt actgtagagg gggggtagaa ttcaggtgt aagcggtgaa
601 atgcgtagag atctgaagga ataccggtgg cgaaggcggc cccctggaca atactgaca
661 ctcagatgcg aaaggcgtgg ggagcaaaca ggattagata ccttggtagt ccacgccgta
721 aacgatgtct acttgagggt tgtggccttg agccgtggct ttcgggagct aacgcgtaa
781 gtagaccgcc tggggagtac ggtcgaaga taaaactca aatgaattga cgggggcccc
841 cacaagcggg ggagcatgtg gtttaattcg atgcaacgcg aagaacctta cctactcttg
901 acatccagag aagccagcag gagacgcagg tgtgccttcg ggagctctga acaggtgct

Appendix

961 gcatggctgt cgtcagctcg tgttgtaaa tgtgggta agtcccga c gagcgaac
1021 cttatcctt gttgccagc gagtaatgc gggaactcca gggagactgc cgtgataaa
1081 ccggaggaag gtggggacga cgtcaagtca tcatggcct tacgagtagg ctacacacg
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1201 gcgtcgtagt ccggattgga gtctgcaact cgactccatg aagtcggaat cgctagtaat
1261 cgtagatcag aatgctacgg tgaatacgtt cccggcctt gtacacaccg cccgtcacac
1321 catgggagtg gg

LOCUS KC291508 1420 bp DNA linear BCT 31-DEC-2012

DEFINITION *Vibrio vulnificus* strain MCCB 163 16S ribosomal RNA gene, partial sequence.

ACCESSION KC291508

ORGANISM *Vibrio vulnificus* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

1 gaaaaacttg tttcatcggg tggcgagcgg cggacgggtg agtaatgcct gggaaattgc
61 cctgatgtgg gggataacca ttgaaacga tggctaatac cgcgatgc ctacgggcca
121 aagaggggga cttcgggccc tctcgcgca ggatatccc aggtgggatt agctagttgg
181 tgaggaagg gtcaccaag gcgacgatcc ctactggtc tgagaggatg atcagccaca
241 ctggaactga gacacgggcc agactcctac gggagggcagc agtggggaat attgcacaat
301 gggcgcaagc ctgatgcagc catgccgct gtgtgaagaa ggccttcggg ttgaaagca
361 cttcagttg tgaggaagg ggtgtcgtta atagcggcat catttgacgt tagcaacaga
421 agaagcaccg gctaactccg tgccagcagc cgcggaata cggagggtgc agcgttaat
481 cggaaacttg gggcgtaaag cgcgatgcagg tggttgtta agtcagatgt gaaagcccgg
541 ggctcaacct cggaaactgca ttgaaactg gcagactaga gtactgtaga ggggggtaga
601 attcaggtg tagcgggtaa atgcgtagag atctgaagga ataccggtgg cgaagggcgc
661 ccctggaca gatactgaca ctcatgagc aaagcgtggg gagcaaacag gattagatac
721 cctgtagtc cacgctgtaa acgatgtcta ctggagggt tggccttga gccgtggctt
781 tcggagctaa cgcgttaagt agaccgctg gggagtacgg tcgcaagatt aaaactcaaa
841 tgaattgacg ggggcccga caagcgggtg agcatgtgt ttaattcgat gcaacggcgg
901 aagaatcctt acctactctt tgacatccag agaatgcta gcggagaacg caggtagtgc
961 ctcgggaac tcttgagaac aggtgctgca tggctgtcg gtcagctcgt gtttgtaaa
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1201 acttgcgaaa gtgagcgaat ccaaaaagt gcgtcgtagt ccggattgga gtctgcaact
1261 cgactccatg aagtcggaat cgctagtaat cgtggatcag aatgccaggt gaatacgttc
1321 cggggccttg tacacaccg cgtcacacca tgggagtggg ctgcaaaaga gtgggtagt
1381 ttaacctcg ggaggacgct caccactttg tggttcatga

Appendix

LOCUS KC747734 1477 bp DNA linear BCT 07-MAR-2013
DEFINITION *Vibrio harveyi* strain MCCB 176 16S ribosomal RNA gene, partial
sequence.

ACCESSION KC747734

ORGANISM *Vibrio harveyi* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales;
Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from
shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

```
1 ctgctcaga ttgaacgctg gcggcagcc taacacatgc aagtcgagcg gaaacgagtt
61 atctgaacct tcggggaacg ataacggcgt cgagcggcgg acgggtgagt aatgcctagg
121 aaattgccct gatgtggggg ataaccattg gaaacgatgg ctaataccgc ataacgcta
181 cgggccaag agggggacct tcgggcctct cgcgtcagga tatgcctagg tgggattagc
241 tagttggtga ggtaagggct caccaaggcg acgatcccta gctggtctga gaggatgatc
301 agccacactg gaactgagac acggtccaga ctctacggg aggcagcagt ggggaatatt
361 gcacaatggg cgcaagcctg atgcagccat gccgcgtgtg tgaagaaggc cttcgggttg
421 taaagcactt tcagtcgtga ggaaggtagt gtagttaata gctgcattat ttgacgttag
481 cgacagaaga agcaccggct aactccgtgc cagcagccgc ggtaatacgg agggtcgag
541 cgtaaatcgg aattactggg cgtaaacgcg atgcaggtgg tttgttaagt cagatgtgaa
601 agccccgggc tcaacctcgg aattgcattt gaaactggca gactagagta ctgtagaggg
661 gggtagaatt tcagggttag cggtgaaatg cgtagagatc tgaaggaata cgggtggaga
721 aggcggcccc ctggacagat actgacactc agatcggaaa gcgtgggagc aaacaggatt
781 agataccctg gtagtccacg ccgtaaacga tgttacttgc gaggttggcg ccttgagccg
841 tggcttccgg agccaacgcg ttaagtagac cgctgggga gtacggtcgc aagattaana
901 ctcaaatgaa ttgacggggg cccgcacaag cggtgagca tgggtttaa ttcgatgcaa
961 cgcgaagaac ctactact cttgacatcc agagaacttt ccagagatgg attggtgctt
1021 tcgggaactc tgagacaggt gctgcacggc tctcgtcagc tcgtgtgtg aaatgttggg
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1141 ccaggggagc tccgggtgat aaaccggagg aagggtggga cgacgtcaag ccatcatggc
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1261 agagtgagcg aatccaaaa agtgcgtcgt agtccggacc ggagtctgca actcgactcc
1321 gtgaagtcgg aatcgctagt aatcgatgat cagaatgcca cggtgatac gttcccgggc
1381 cttgtacaca ccgccgtca caccatggga gtgggctgca aaagaagtag gtagttaac
1441 cttegggagg acgcttacca cttgtggtt catgact
```

LOCUS KC747735 1467 bp DNA linear BCT 07-MAR-2013
DEFINITION *Vibrio harveyi* strain MCCB 175 16S ribosomal RNA gene, partial
sequence.

ACCESSION KC747735

ORGANISM *Vibrio harveyi* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales;
Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from
shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

Appendix

1 gcctaacaca tgcaagtcga gcggaaacga gttatctgaa ccttcgggga acgataacgg
61 cgtcgagcgg cggacgggtg agtaatgcct aggaaattgc cctgatgtgg gggataacca
121 ttggaaacga tggctaatac cgcataatac ctwcgggtca aagaggggga cgcctacggg
181 ccaaaagagg gggaccttcg ggcctctcgc gtactcagga tatgcctagg tgggattagc
241 ctagtgggtg aggtaatggc tcaccaaggc gacagatccc tagctggtct cgagaggatg
301 atcacgccac actggaactg agacacggc cagactccta cgggaggcag cagtggggaa
361 tattcaciaa tgggcgcgca agcctgatgc acgcatgcc ggcgctgtgt ggaaggaaga
421 aggcctcgg gttgtaaagc acttcaggt cgtgaggaag gtatgtagt taatagcctg
481 ccattattg acgtatgca cagaagaagc accggctaac tccgtgccag cagccgcggt
541 aatacggagg ggtggcagc gttaatcggg attactgggc gtaaagcga tcaggtggt
601 ttgtaagtc agatgtaaa gcccggggct caacctcggg atgcatttg aaaactggca
661 gactaggagt actgtagagg ggggtagaat ttcaggtgt agcggtgaaa tgcgtagaga
721 tctgaaggaa taccggtggc gaaggcggcc ccctggaca gatactgaca ctcatgctg
781 aaaagcgtgg ggagcaaaac ggattagata ccctgtagt ccacgccgta aaacgatgtc
841 tacttggagg ttgtggcctt gagccgtggc ttcgggagc taacgcgta agtagaccg
901 ctggggagta cgtgcgcaag attaaaact aatgaattg acgggggccc gcacaagcgg
961 tggagcatgt ggtttaatt cgtgcaacg cgaagaacct tacactct tgacatccag
1021 agaacttcc agagatggat tggtccttc gggaactctg agacaggtc tcatggctg
1081 tctcagctc gtgtgtgaa atgtgggtt aagtcgccca acgagcga ccctatct
1141 tgttccag cgagtaatg cgggaaact caggagact gccggtgata aaccggagga
1201 aggtggggac gacgtcaagt catcatggc ctacagta gggctacaca cgtgtacaa
1261 tggcgatc agaggcggc caactgcga ggtgagcga atcccaaaa gtgcgtcga
1321 gtccgcatc gaggctgca actgactcc tgaagtcgg aatcgtagt aatcgtgat
1381 cagaatgcca cgggtaaac gttccgggc ctgtacatc accgccgc acaccatggg
1441 agtgggctgc aaaagaagta ggtagtt

LOCUS KC747736 1398 bp DNA linear BCT 07-MAR-2013
DEFINITION *Vibrio harveyi* strain MCCB 177 16S ribosomal RNA gene, partial
sequence.

ACCESSION KC747736 ORGANISM *Vibrio harveyi* Bacteria; Proteobacteria;
Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from
shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

1 gaggttatctg aaccttcggg gaacgataac ggcgtcgagc ggcggacggg tgagtaatgc
61 ctaggaaatt gccctgatgt gggggataac cattggaac gatggctaac accgataat
121 gcctacgggc caaagagggg gaccttcggg cctctcgt caggatagc ctagggtgga
181 ttagctagtt ggtgaggtaa ggcctacca aggcgacgat cctagctgg tctgagagga
241 tgatcagcca cactggaact gagacacggt ccagactcct acgggcaggc agcagtggg
301 aatattgcac aatgggcgca agcctgatgc agccatgccg cgtgtgtgaa gaaggccttc
361 ggggtgtaaa gcacttcag tctgagga ggtaggttag ttaatagctg cattattga
421 cgttagcggg cagaagaagc accggctaac tccgtgccag cagccgcggt aatacggagg
481 gtgcgagcgt taatcgaat tactggcgt aaagcgcag cagggtggtt gftaagtcag
541 atgtgaaagc cggggctca acctcggat tgcattgaa actggcagac tagagtactg
601 tagagggggg tagaattca ggtgtagcgg tgaatcgt agagatctga aggaataccg
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721 acaggattag atacctgtg atccacgcc gtaaacgat tctacttga ggtgtggcc
781 ttgagccgtg gcttccggag ctaacgcgtt aagtagaccg cctggggagt acggtcgcaa
841 gattaaact caaatgaaat tgacgggggc ccgcacaagc ggtggagcat gtggttaat

Appendix

901 tcgatgcaac gcgaagaacc ttacctactc ttgacatcca gagaacttfc cagagatgga
961 ttggtgcctt cgggaactct gagacagggtg ctgcatggct gtcgtcagct cgtgttgga
1021 aatgttgggt taagtcccg c aacgagcgca acccttatcc ttgttgcca gcgagtaatg
1081 tgggactcc agggagactg cgggtgataa accggaggaa ggtggggacg acgtcaagtc
1141 atcatggccc ttacgaagta gggctacaca cgtgctacaa tggcgatac agaggcgcg
1201 caactgcca gagtgagcga attccaaaa agtgcgtcgt agtccgatac ggagtctgca
1261 aactcgactc cgtgaagtcg gaatcgctag taatcgtgga tcagaatgcc acggtgaata
1321 cgtcccggg ccttgatac caccgccctg cacaccatgg gagtgggctg aaaagaagt
1381 aggtagttt aactctc

LOCUS KC747737 1400 bp DNA linear BCT 07-MAR-2013
DEFINITION *Vibrio harveyi* strain MCCB 178 16S ribosomal RNA gene, partial
sequence.

ACCESSION KC747737

ORGANISM *Vibrio harveyi* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales;
Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from
shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

1 aaattggcca atgaagtga aaaagcgtgg gggacaaacc gggtttattt ccctggta
61 ttccacccc ttaaaggaat tttctgtgg aggtggggc cttgaacct gggtttggg
121 gtaacggcg taaatagac gccctggggg agtacgtgg aagataaaa ctaaatgat
181 gtcggggccc gcacaagcgg tggagcattt gttaattgg atcaacgggg aagaacatta
241 ctattttga tcccagaga actccagag atggattgg gcctcggga actctgagac
301 aggtgctgca tggctgctg cagctcgtg tgtgaaatgt tgggttaagt cccgcaacga
361 gcgcaacct taccctgtt tggcagcag taatgtcggg aactccaggg agactgccg
421 tgataaccg gaggaagtg gggacgacgt caagtcata tggcccttac gtaggggt
481 acacagctg tacaatggc cacaagagg gcggccaact tgcgagagt agcgaatccc
541 aaaaagtgcg tctagtccg gatcggagc tcaactcga ctccgtgag tggaaatcg
601 tagtaatcgt ggcagagaat gccacgggta atacgtccc gggccttga cacaccgcc
661 gtcacacat gggagtggg tcaaataga agtaggcaac gataacggcg tggagcgcg
721 gacgggtgag taatgcctag gaaattgcc tgaatgggg gataaccatt ggaacgat
781 gtaataacc cataatgct acgggcaaaa gagggggacc ttcgggctc tgcgtcagg
841 atatgcctag tgggattag ctagtgtg aggtaaggc tcaccaaggc gacgatcc
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961 gaggcagcag tggggaatat tgcacaatgg gcgcaagcct gatgcagca tcccgctgt
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1141 cgtaatacg gaggtgcca gcgttaatc gaattactg gcgtaaacg catgcaggtg
1201 gttgttaag tcagatgga aagccgggg ctcaacctc gaattgcatt tgaactggc
1261 agactagat actgtagag ggggtagaat ttcaggtgta gcggtgaaat gcgtagat
1321 ctgaaggaat accggtgac gaagcggcc cctggagac atactgacac tcagatgca
1381 aagcgtggg agcaaacag

LOCUS KC747738 1419 bp DNA linear BCT 07-MAR-2013
DEFINITION *Vibrio harveyi* strain MCCB 179 16S ribosomal RNA gene, partial
sequence.

ACCESSION KC747738

Appendix

ORGANISM *Vibrio harveyi* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

```
1 gcctaacacg ctaatgcaag tcgagcggaa acgagttatc tgaaccttcg gggaaacgata
61 acggcgtcga gcggcgggacg ggtgagtaat gcctaggaaa ttccctgat gtgggggata
121 accattgga acgatggta ataccgcata atgcctacgg gccaaagagg gggaccttcg
181 ggctctcgc gtcaggatat gcctaggtgg gattagctag ttggtgaggt aagggtcac
241 caaggcgacg atccctagct ggtctgagag gatgatcagc cacactggaa ctgagacacg
301 gtccagactc ctacgggacg gcagcagtg ggaatattgc acaatggcg caagcctgat
361 gcagccatgc cgcgtgtgtg aagaaggcct tcgggttga aagcacttc agtcgtgagg
421 aaggtagtgt agttaatagc tcattattt gacgttagcg gacagaagaa gcaccggcta
481 actccgtgcc agcagccgcg gtaatacggg ggggtcgcgac gtaatcgga attactgggc
541 gtaagcgca tgcaggtggt ttgtaagtc agatgtgaaa gcccggggct caacctcgga
601 attgatttg aaactggcag actagagtac ttagaggggg ggtagaattt caggtgtagc
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721 ctgacactca gatcgaaaag cgtggggagc aaacaggatt agataacctg gtatccacg
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901 gcccgacaa cgggtggagc atgtggtta attcagatca acgcaagaa cttacctac
961 tctgacatc cagagaactt tccagagatg gattggtgcc ttcgggaact ctgagacagg
1021 tgctcatgg ctgtctcag ctcgtgtgt gaaatgttg gtaagtccc gcaacgagcg
1081 caacccttat cttgtttgc cagcgagtaa tctcgggact ccagggagac tccgggtgat
1141 aaaccggagg aagggtggga cgacgtcaag tcatcatggc cttacgaag tagggctaca
1201 cacgtgctac aatggcgcat acagagggcg gccaaactgc gagagtgagc gaattccaa
1261 aaagtgcgc gtatccgga tcggagtctg caaactcgac tccgtgaagt cggatcgtc
1321 agtaatcgtg gatcagaatg ccacggtgaa tacgtcccg ggctttgta cacaccgcc
1381 gtcacacat gggagtgggc tgaagaaaa gtaggtag
```

LOCUS **KC747739** 1382 bp DNA linear BCT 07-MAR-2013

DEFINITION *Vibrio cholerae* strain MCCB 129 16S ribosomal RNA gene, partial sequence.

ACCESSION KC747739

ORGANISM *Vibrio cholerae* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

```
1 gacgggtgag taatgcctgg gaaattgcc gtagagggg gataaccatt ggaacgatg
61 gctaataccg cataacctg caagagcaaa gcaggggacc ttcgggctt gcgctaccg
121 atatgccag gtgggattag ctagtgtg aggtaagggc tcaccaaggc gacgatcct
181 agctgctg agagatgat cagccact ggaactgaga cacgtccag actcctacg
```

Appendix

241 gaggcagcag tggggaatat tgcacaatgg gcgcaagcct gatgcagcca tggcgcgtgt
301 atgaagaagg ccttcgggtt gtaaagtact ttcagtaggg aggaaggtgg ttaagcfaat
361 acctaatca tttgacgtta cctacagaag aagcaccggc taactccgtg ccagcagccg
421 cggtaatcag gaggggtcaa gcgttaatcg gaattactgg gcgtaaacgc catgcaggtg
481 gttgttaag tcagatgtga aagccctggg ctcaacctag gaatcgatt tgaactgac
541 aagctagagt actgtagagg ggggtagaat ttcaggtgta gcggtgaaat gcgtagagat
601 ctgaaggaat accggtggcg aaggcggccc cctggacaga tactgacct cagatgcgaa
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841 tgtggttaa ttcgatgcaa cgcaagaac cttacctact ctgacatcc agagaatca
901 gcggagaccg ctggagtgc tccgggagct tctgagaaag gtgctgcatg gcttctgccc
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1321 ctgtggactg ctaacctac acacatagct tccacctcg ggactaacg gtgaggcga
1381 at

LOCUS **KC747740** 1441 bp DNA linear BCT 07-MAR-2013

DEFINITION *Vibrio parahaemolyticus* strain MCCB 133 16S ribosomal RNA gene, partial sequence.

ACCESSION KC747740

ORGANISM *Vibrio parahaemolyticus* Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales; Vibrionaceae; Vibrio.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.

TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from shrimp hatcheries along the Indian coast

Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

1 acgataacgg cgtcgagcgg ccgtggacgg ggtgagtaat gcctaggaaa tggcctgat
61 gtgggggata accattggaa acgatggcta ataccgatg atgcctacgg gccaaagagg
121 gggaccttcg ggctctcgc gtcaggatat gcctaggtgg gattagctag ttggtgaggt
181 aagggtcac caaggcagc atccctagct ggtctgagag gatgatcagc cacttgaa
241 ctgagacacg gtcagactc ctacgggagg cagcagtggg gaatattgca caatgggccc
301 aagcctgatg cagccatgcc gcgtgtgta agaagccctt cgggtgtaa agcacttca
361 gtcgtgagg aagcagtgta gtaataagct gcattagtt gacgttagcg acagaagaag
421 caccggctaa ctccgtgcca gcagccgagg taatacggga ggggagcagc gtaatcggg
481 attactgggc gtaaagcga tgcaggtggt ttgtaagtc agatgtgaaa gcccgggct
541 caactcggg attgcattg aaactggcag actagatgac ttagaggggg ggtagaattt
601 caggtgtagc ggtgaaatgc gtagagatct gaaggaaatc cgggtggcga ggcggcccc
661 tggacagata ctgacactca gatgcgaaa cgggtgggag caaacaggga ttagataccc
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901 acctaccta ctcttgact tccagagaac ttccagaga atgattggtg ccttcgggaa
961 ctctgagaca ggtgctgcat gcctgccgc agctcgatt gtgaaatgt tgggctaggt
1021 cccgcaacga gggcaaccct tatcctgtt tccagcagc tattgccggg aactctaggg
1081 aaactgcctg gtagataacc atggaggaag gtgggtacg ccatgcagtc actatggccc

Appendix

1141 ttacgagtag ggctacacac gtgctacaat ggcgcataca gaggcgcgca aacttgcgaa
1201 aatgagcgaa atcccaaaag tgcgtcgtag tccggattgg agtttgcaac tgcactcca
1261 tgaagtcgaa tcgctagtaa tcgtggatca gaatgccacg gtgaatacgt tcccgggcct
1321 tgtgacacac cgtcagtcac accatgggag tgggctgcaa aagaagtagg tagtttaacc
1381 ttcacctac cactgcccac tttgtggtc atgactgggt agaagtcgta acaaggtaac
1441 c

LOCUS KC747741 1381 bp DNA linear BCT 07-MAR-2013
DEFINITION *Vibrio vulnificus* strain MCCB 136 16S ribosomal RNA gene, partial
sequence.
ACCESSION KC747741
ORGANISM *Vibrio vulnificus* Bacteria; Proteobacteria; Gammaproteobacteria;
Vibrionales; Vibrionaceae; Vibrio.
REFERENCE 1 (bases 1 to 1477)
AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.
TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from
shrimp hatcheries along the Indian coast
Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

1 gagcggcgga cgggtgagta atgcctggga aattgcctg atgtggggga taaccattgg
61 aaacgatggc taataccgca tgatgcctac gggccaaaga gggggacctt cgggcctctc
121 gcgtcaggat atgccaggt gggattagct agttggtgag gtaagggctc accaaggcga
181 cgatccctag ctggtctgag aggatgatca gccacactgg aactgagaca cggtcagac
241 tctacggga ggcagcagtg gggaaatattg cacaatgggc gcaagcctga tgcagccatg
301 ccgctgtgtg gaagaaggcc ttcgggttgt aaagcacttt cagttgtgag gaaggtgggtg
361 tcgttaatag cggcatcatt tgacgttagc aacagaagaa gcaccggcta actccgtgcc
421 agcagccgcg gtaatacgga ggggtcgcgag gtaaatcgga attactgggc gtaaagcgca
481 tgcaggtggt ttgtaagtc agatgtgaaa gcccggggct caacctcgga actgcatttg
541 aaactggcag actagagtac tctagagggg ggtagaattt caggtgtagc ggtgaaatgc
601 gttagatct gaaggaatac cgggtggcgaa ggcggccccc tggacagata ctgacactca
661 gatcgaaaag cgtggggagc aaacaggatt agatacctg gtatgccacg ctgtaaacga
721 tcttacttg gaggtgtgg ccttgagccg tggcttccg agctaacgcg ttaagtagac
781 cgcctgggga gtacggctgc aagattaaaa ctcaaatgaa ttgacggggg cccgcacaag
841 cggtgagca tgtggttaa ttcgatgcaa cggcgggaaga atccttacct actcttgac
901 atccagagaa tgcttagcgg agaaccgagg tagtgcttc gggaaacttt gagaacaggt
961 gctgcatggc ttgctggta gctcgtgtt gtgaaatgtt gggtaagtc cgcacaacgag
1021 cgcaaccctt atcctgttt gccagcaggt aatgtcggga actccagggg gactgcccgt
1081 gataaaccgg aggaaggtgg ggacgacgtc aagtcacat gcccttacg agtagggcta
1141 cacacgtgct acaatggcgc atacagaggg cggccaactt gcgaaagtga gcgaatccca
1201 aaaagtgcgt cgtagtccgg attgagctc gcaactcgac tccatgaagt cggaaatcgt
1261 agtaatcgtg gatcagaatg ccaggtgaat acgttcccgg gccttgata caccgcccgc
1321 acaccatggg agtgggctgc aaaagaagtg ggtagttaa ccttcgggag gacgctcacc
1381 a

LOCUS KC747742 1410 bp DNA linear BCT 07-MAR-2013
DEFINITION *Vibrio mediterranei* strain MCCB 131 16S ribosomal RNA gene, partial
sequence.
ACCESSION KC747742
ORGANISM *Vibrio mediterranei* Bacteria; Proteobacteria; Gammaproteobacteria;
Vibrionales; Vibrionaceae; Vibrio.
REFERENCE 1 (bases 1 to 1477)

Appendix

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.
TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from
shrimp hatcheries along the Indian coast
Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

```
1 tgaagagttt gatcatagct cagattgaac gatggcctca ggcctaactg atgcaagtgc
61 agcggaaact tgtaactca ccctcgggt aacgftaacg gcctcgagcg gcgtacgggt
121 gagtaatgcc tgggaaattg ccctgatgtg ggggataacc attgaaacg atggctaata
181 ccgcatgatg cctacgggcc aaagaggggg acctcgggc ctctcgctc aggatatgcc
241 cagggtggat tagctagtgt gtgaggtaa ggcctaccaa ggcgacgac ctagctgtgt
301 ctgagaggat gatcagccac actggaactg agacacggtc cagactccta cgggaggcag
361 cagtggggaa tattgacaa tgggcgcaag cctgatgag ccatgccgcg tgtgtgaaga
421 aggccttcgg gttgaaagc actttcagtt gtgaggaagg tgggtacgtt aatagcggca
481 tcatttgacg ttagcaacag aagaagcacc ggctaactcc gtgccagcag ccgcgtaat
541 acggaggggt cgagcgttaa tcggaattac tgggcgtaaa gcgcatgag gtggtttgtt
601 aagtcagatg tgaagcccc gggctcaacc tcggaactgc attgaaact ggcagactag
661 agtactgtag aggggggtag aatttcaggt gtacggtga aatgcgtaga gatctgaagg
721 aataccggtg gcgaaggcgg cccctggac agatactgac actcagatgc gaaagcgtgg
781 ggagcaaaca ggattagata ccttgtagt ccacgctga aacgatgtct acttggaggt
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901 gtcgcaagat taaaactcaa atgaattgac gggggcccg cacaagcgtg gagcatgtgg
961 ttaattcga tgaacgcga agaacctac ttactttga catccagaga agctagcggg
1021 gacgctgta gtgccttcgg gacctgag acaggtgctg catggctgtc gtcagctctg
1081 gttgtgaaat gttgggttaa gtcccgaac gagcgcacc cttatctttg ttgccagcg
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1261 gggccgcat cttcgaagg tgagcgaatc ccaataagt cgtcgtatc cggattggag
1321 tctgcaactc gactccatga agtcggaatc gctagtaac gtagatcaga atgctacggt
1381 gaatacgttc ccggccttg tacacaccg
```

LOCUS **KC747743** 1397 bp DNA linear BCT 07-MAR-2013
DEFINITION *Vibrio mediterranei* strain MCCB 164 16S ribosomal RNA gene, partial
sequence.

ACCESSION KC747743

ORGANISM *Vibrio mediterranei* Bacteria; Proteobacteria; Gammaproteobacteria;
Vibrionales; Vibrionaceae; *Vibrio*.

REFERENCE 1 (bases 1 to 1477)

AUTHORS Sreelakshmi,N.B., Pai,S.S. and Bright Singh,I.S.
TITLE Phenotypic and genotypic characterization of *Vibrio* isolated from
shrimp hatcheries along the Indian coast
Submitted (22-FEB-2013) National Centre for Aquatic Animal Health,
Cochin University of Science and Technology, Fine Arts Avenue,
Cochin, Kerala 682016, India

ORIGIN

```
1 agtagctcag attgaacgat ggctcagcg ctaacgtatg caagtcgagc ggaaactgtg
61 taactcacc ttcgggtaac gtaacggcg tcgagcggcg tacgggtgag taatgctggt
121 gaaattgcc tgatgtggg gataaccatt ggaacgatg gctaataccg catgatgcct
181 acgggcaaaa gagggggacc ttcggcctc tcgctcagg atatgccag gtgggattag
241 ctagtgtgtg aggtaaggc tcaccaaggc gacgatccct agctggtctg agaggatgat
301 cagccacact ggaactgaga cacggtccag actcctacgg gaggcagcag tggggaatat
```

Appendix

361 tgcacaatgg ggcgaagcct gatgcagcca tgccgcgtgt gtgaagaagg ccttcgggtt
421 gtaaagcact ttcagttgtg aggaaggtgg gtacgttaat agcggcatca tttgacgtta
481 gcaacagaag aagcaccggc taactccgtg ccagcagccg cggtaatacg gaggggtcga
541 gcgttaatcg gaattactgg gcgtaaagcg catgcaggtg gtttgtaag tcagatgtga
601 aagccccggg ctcaacctcg gaactgcatt taaaactggc agactagagt actgtagagg
661 ggggtagaat ttcaggtgta gcggtgaaat gcgtagagat ctgaaggaat accggtggcg
721 aaggcggccc cctggacaga tactgacact cagatgcgaa agcgtgggga gcaaacagga
781 ttagataccc tggtagtcca cgctgtaaac gatgtctact tggaggttgt ggccttgagc
841 cgtggcttfc ggagctaacc cgftaagtag accgcctggg gagtacggtc gcaagattaa
901 aactcaaatg aattgacggg gccccacaca agcgtgggag catgtggtt aattcgtgc
961 aacgcgaaga acctactta ctttgacat ccagagaagc tagcggagac gctggtgtgc
1021 ctcgggacc tctgagacag gtgctgcatg gctgtcgtca gctcgtgtg tgaatgttg
1081 ggtaagtcc cgcaacgagc gccaccctta icttggttg ccagcgagta atgtcgtgaa
1141 ctccagggag tctgccggtg ataaaccgga ggaaggtggg gacgacctca agtcatcatg
1201 gcacttacga gttaggttac acacgtgtgt tcaatggtc atactggggg ccgcatctt
1261 gcgaaggtga gcgaatcca ataatgctg cgtagtcggg attggagtct gcaactcgac
1321 tccatgaagt cggaatcgt agtaatcgta gatcagaatg ctacggtgaa tacgttccc
1381 ggcctgtac acaccg

APPENDIX-2

Nucleotide and Protein sequence obtained of the isolate of *V.harveyi* (V3) with the 15 primers

1. LuxN (NP 170F/R) 1710bps

cagcagctaattgctagtagtggacccccctcatgctaggtcgcgatcgaacaagcattagtaagctgag
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catcgg

QQLIASTGPPLMLGRDANKH**AESN*DQLLIAGILLFMLSTAIFGDA*HSL
WEISR*LGYHQPCRLVKCSLLVMHC*PPASTA*STLLTSLLSRCRSEPFSCFL
*APYLSHLRTGIGGLKPPLSAPLLVLLAHLLYNKGADMHRA**WRRFLVST
ANPVP*RGFSAFFXXRKKVVVWVSCCKFPMTNYAS*PVTTTKPFTKSTFHQT
ARC*CLMNSLRARIHVSAKRS*SAV*QMSSTHRFGYAAVWAR*SVRTYWF
SPQSTPNVSTRNLAVNPATRVQVPLSGSPYRQVECVTLLLKFSCCLKH*NSI
LRTMRR*SDQTRYENKPKQFS AVANSSISFARSE*QLARARTYRYDLDS*SR
RPSQCPLRF*K*ENHRKDSSATAH*FCGKTQ*DLI*LCHFQSDS*RNLLFVY*
IADRQTEISTKTGPYENTLILXDTGPGIDETISHKIFDDFFSYQKSGGSG*VW
GTASV*CVLFRQN*V*VLTW*IHRISVVLPCPECTKSSHITHALLQRLEAK*
TK**T*GRVQRTNE*PSTISAHRRX*RGATCTGSDVCEPTWR*QLTGKHR

2. LuxO (NP275F/R) 1940bps

aaaccgaatggcagaagacttaaccgaatacctgcacgacgatgtgaaagttcgttacctcactcagactttgac
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gatattatgccgctttgatgacag

KPNGRRLNRIPARARCESSLPSLRL*HG*ACRNHSRPSFG*I*CVGWDQLIAR
RSRYAGGVAGGNLGR*RLLAFRAFIDSDHWSCGS*HQR*SDSLRRFDH*
VDEESDGRN*SSSREAKSV*RRDGY*ASSLEAKY*RHYGVGGYHQIEASA*
Y*ASAAIESGRAFSDLRGHVSTTAGEGDQSFSGDVPTRSRS*I*IGGPET*R
D*KAARSVYREQLILL*A*FHCHI*CPSDYVYDHSSGMSRAHICRQKRSQ*A
VGSIGSFCEHVH*QRQLAR*PEGVKKYTAWFVP*FNLLISVYFV*NTHSLT
MIICKCKA*CDYYLKHNELRLTYPNHVS RPFTCHGG*CDPQSNQIKE*S*QP
W*PKLPRLRHQ*PNDAAGLPHH*LGSEQ*SEYFHHG*KWYG*RSVCRSDSR
SK*TW**AVYRHQLCGNPERPY*K*AVWSRKRCVYWCCE*PTRCGRAC*W
RHVVP**AL*NGSGSSN*AIALYPNGDIPKSRFF*NEERRCALVCN*PRPLE
RSARRPFP*RLVLPFVRDSFAPSTAA*AW*RRY*NCILAAWLYVA*GRQEFR
PFRTRRD*KIQQLRMAG*RSPVAKRIA*YRGTEQWQRDHAGYVTATTESA
CCAPIGSKIY*T*HYDGVRYAALDD

3. Clp SP (NP 175F/R) 865bps

ccttgcctgacacgctagcgcagtgattggttccaactcccgcggcgaacgctcttacgacatttactcagctctgctt
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PCLTR*RSDWLPTSRGERSYDIYSRLLKERVIFLTGQVEDHMANLVVAQLL
FLESENPKDIFLYINSPGGSVTAGMSIYDTMQFIKPNVSTVCMGQACSMG
AFLLAGGAPGKRYVLPNSRVMIHQPLGGFQGQASDIQIHAQEILTIKQKLN
NLLAEHTGQPLEVIERDTRDNFMSADQAVEYGIVDAVLSHHTVFPPAGP
ADMKFSIVWAHHFRGGRKFRLLISCFSSAWTAGISGPGN*ISKPGPGTP*GLG
GSILGIFSRNIYSASARASLGDGRLYQEKNAMS

4. Zn MP (NP 179F/R) 1120bps

cgcaagtattgacgcgctagtgccatggtggtgacaaactcccggcggaacgctcttacgacattactcactct
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LRHEVVRSYG*SFRGWQ*FRDRCLLCMVRRISEHEVEYKLTWSPWCLVYV
HVNSQVAYGRRHTGGVAPTVSFCGGKSDGTKGKHTATPPVEEIPTEKFTFV
LIPPRVRPPRGGFQNIIRFLILKILPRDTRGFNPVNHFWPTLRPASESIWRN
FFFHTLF*LPRKKNV

5. Cysteine Protease (NP 176F/R) 980bps

gggttcagtagcgtcagctagtagcgcgccgtgtacgtgaaatcggtgttactgtgaactgtggagctgggacgttga
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GFQYQQLVARRVREIGVYCELSWSDVEEADIREFNPDGILSGGPESVTD
NSPRAPQYVFDSDGVPVLGVCYGMQTMAEQLGGKVAGSTEREFGYAQVKV
SGESALFKDLELTQDVWMSHGDKVVEIPADFKVGETDTCPYAAMANEE
KKYYGVQFHPEVTHTKGGLQMLENFVLGVCGERLWTSESIIEDAVARIK
EQVGDDEVLGLSGGVDSVVAMLVHRAIGDKLTCVFDNGLLRNNEGQQ
VMDMFGDKFGLNIIKVDAEDRFLKALEGKSDPEEKRTIGHVFVDVFDEES
KKLKNAKWLAQGTIYPDVIESAASKT

6. VopD (NP 283F/R) 951bps

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NLK*CKHLRRRNVD*NRSCCYPYQQ**CSNGCEELPIRWAKSACDWRSSA
CGRKADERVGSNRKSINANHRKSTEW*ASG*VTIGYHFAITVSDYSALPSV*
AKP*ATGPAT*NCR*SKRCKHQEPSGRVEQLC*SDDRDRGGSIRRIWDCDY
YRCRGGFFQSG*RNQGRSRGQQCIEDAKSRL*SG*RVNGQY*LVENSARSSE
TCSCVRKR*HY*HDKYFG*WWPQVRQDDGRKPIEERGTAAGTWPNGEFSCK
CRANESSSSKQRG*GISNSCSSRQTESR*KHWLPRKFAKRAA*AFPLYR**S
KPSMACPFTV

7. VopN (NP 284F/R) 876bps

ttcgaagtaccttgagtcttcccgcacgggagcctcggtaaatggtaattatcgaggtgaaactgtccgcgtacacaatgcaactcagctgtgttgatgcgatggaagagctgacggcgttaggttcagaaaaagcagaaaaagacctcacgaaacgcaaaagtgaagacggcagcattcgcgtgaatgaagcgcgatgagctggtttctgattacctaaagaaagtgctgatctgagaaaaacaaaagatcaaaagacctcgtaccaaaatggcaagcggcaacttatcaacgattgctcagttacagcgtacctcaacggattctctgaagagaagagccatcagctcgcgtgcaagcagtgaaaaagttccttggcgccaatccagaaagtaagaactattggcgtgatagaccaagcattctgaccttgagcagagcccggactcttgggctcagattgatactgaaattcgtgttcaagcttcgcggatgaatacagccaagagcaaggtttgacagtttgaccaattgcgtgtttctatcgcgacaggtacatagctaccaaggttagctcagcatacaaggatgtggttgagcgttttgggtgcaaaaaggtctccacggcggcgtgattttatgttcagggcagcgcagatttgaggttcaaggtagcaatattgactccgtt

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ETQSERRQHSRE*SA*AGF*LPKKSA*S*EKPKDQRPRYQNGKRQLINDCSV
TGVPRIL*REEPSVPRAASSEKVPWRQSRK*ELIGADRP SHSDL*AEPGLLG
SD*Y*NSCFKLRG*IQPRARL*QFAPIAWFLSRHGT*LPRFRLSIQCGC*AFW
CKRGLHGGRFVYVAGHERRFECSR*QY*LR*ASASDVRYAKT*DVEYASRPS
*PLPDVQTSAGKLWLSKNTKF*RATNLTRQF

8. VcrR (NP 285F/R) 412bps

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ggcggtaa

SCAAQSTFFLFIMARAAGS*VELC*SLAAHVATSQYINVATNSPVERVQTD
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GAFLPKVGRHFDA*RH*RLSEKAFQLLFLFKWAV

9. VscN (NP 286F/R) 484bps

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EWRSANTTRLSAF*RTTKADGTCRSIRQLHHRAVYRTCRR*RYD*AGG
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PLVLAGP

10. HlyA (NP 562F/R) 358bps

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VSPGLRLLVDALSFKNMFYNTS*QSVIKQRCEQTLDLANENADITYFAAD
NRWSYNHSIWSNDPVMQPDQINKVVALGDSLSDTGNIFNASQWRFPNPN
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11. VhhP2 (NP 288F/R) 272bps

tttctgacctggccccccggcaccgaatggagtgattggtaaccctacaacatagggcaagggaattcggggtgat
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ctfttagaacaaaacaaaggcaaccgaaatggagtgattggtaaccctacaacatagggcaagggaattcggggtgta
tgccgtatgcttgcctaaagccgtgtatact

FPDLAPRHRME*LVTPTT*GKGIRVVLPGKPYLVTNIPYQIIVTIGCK*VWL
PFRNKQRQPKWSDW*PLQHRAREFGLYAVCLP*SRVI

12. toxR (NP 162F/R) 850bps

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aggtagtcataaatttccacttcccagtaaaaag

CC*SFLNLAKWNTSLAKLVVGNVFF*NLETK*IFVPIHQSRGGRVITVIYLQ
HLGFIKPNGTPIFGSNLVHEGVWAWGGAPG*H*LLANFLGRKTYL*GALM
VSFRIQFIVFESLPSLGLLTY*PITGQPVSMVEPV*QRTISVGRXARK*SLGMS
W*SPEYRILLPDLPT*SCHDPYRAQSLQEAGQYVLLIGCLASA*WSGFLSMN
LNIKA*PWKX*WLVDDHREISEVTLTGAHVQGNNTKEADASKRGIYIHKPL
FVSRI*KCSLERQGSFKFSTSQ*K

13. toxS (NP 272F/R) 645bps

cacggatagcgatcattcatacagagaatgtcacgctgcgtatttctgctggtcgtaatgaccaaccgacatctgcaact
aaggaggctgaaatgaagattaaaatagcatctgcggtttggccgtatccatcttttagtggtggctatattgggg
cagtgacctaaaagtggaacaggttctgacttcaaacgaatggcagtcacacatggtgacctcatcaccgatactctg
ccagacgatacagttggccactacgcaaagttaattgtgagtcgaatgtgagacttaccaacggtgactacattcgt
gtcgcgaacattcgattgttctcaaggctcaaaactgaatcaacatcaatatctctgagaaaggtcgttgggaagta
agtgataactacttgcgttctccttgaattcaaagatatctcagcatcgaatcaaaagacttctctgagtcacagct
tcgtctcatcacaaaatcttaagttggatgcagaacaaagtcgccgtattgatgtagtaacgaaaaaacactactact
gactagcttgaatcacgggtcaggggtcctgtaataataactggcgggaaaaataaccagctgattctgaactatatac

HG*RSFIRECHAAFRWS**PNRHLQLREAEMKIKIASAVLAVSILFSGWLY
WGSCLKVEQVLTSTNEWQSTMVTLITDPLDDTVGPLRKNVSNVVKYLPN
GDYIRVANIRLFAQGSNTTESTINISEKGRWEVSDNYLLVSPSEFKDISASQSK
DFSESQRLRITQIFKLDAAEQSRRIDVVNEKTLTSLNHGSRGPGNITGGKN
NQLILNYI

14. OmpK (NP 287F/R) 807bps

ataggctaatagctacctcgtgctatgttgctgatctctcagacggcgacatccacaagaacgatatacaagtggatg
caattcaacctaattgggtgcaattgacgaactccaggtgagcttcacacgactacctaataatggaattcggcggccg
ctctggatcttcgatctttacggttacggtgacgtattcaacctagcgacagataaaggtagcgacaaagctggcgac
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tctaggttctgacgtaatggtccatggtgggcaaaatcggcctaaacctatacggfacttaccaggttaacaacaag
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acatcgattaccaattcggatgaaagatgagtactctactgtagcagcgggtgcaatgtcaacggatctactggc
actctgaccgcttcagttggttacggcctgaaaggttacaaagacgtttacggatcaaaagatactgacggttcaaa
tctactggcttcggtcactacatcgagtaactaaacaagttttatagtgctaaaattccttttagctcttagcctt

IGLVVYLVLCLLISQTATSTRTIYKWMQFNLMGAFDELPGESSHDYLEMEFG
GRSGIFDLGYVDVFNLATDKGSDKAGAPKIFMKFAPRMSLDGLTGKDLS
FGPVQELYVATLFEWDGTDYKTNPFSVNNQKVGLGSDVMVPWLKIGLN
LYGTYYQGNKDWNGFQISTNWFKPFYFFENGFSISYQGYIDYQFGMKDEY
STASSGGAMFNGIYWHSRFAVGYGLKGYKDVYGIKDTDGFKSTGFGHYI
AVTKQVL*CVKFLALSL

15. Type two Secretion (NP 177F/R) 870bps

aattttcggtttgattggtggtagtttcccaacgtggttattaccgtttaccaagatcatggaactagaatggcgacgtg
agtgcgctgaatcctccctgaatacaaaatcgaaccacaaaagaaaactgacattaagcgtaccacggcatcttctg
cagcaatgtggcagcgaattcgtattcgtacaatatccagtgattagttggctgcttctgcgcggtaaatgccacaa
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gctatggtgactttaaactccttgcgcattggcgcttggctgggtggcaatctctaccgatgatcatttctctcttgc
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ttgcgattgctggtgggtgagcttaattggggccatcaaatcctcaactggtactttacgtcgattctaaggagtggttgg
aagtattccagtactaccatggctattcgttggcttgcac

NFSV*LWVVSSTWLFTVYPRSWN*NGDVSALNPSLNTKSNHQKKN*H*AY
HGHLVSNVARKFVFTISQ*LVGCFCAVNATTANLLSAYATLLSNCLLPV
RVLSLFTSVLATSLSRWFSLPLY*LLPRLSTSILCCCQTN*LYH*CGQVSHLL
LLVSVLSAYKILSLVQWRATCVFGVFTGCLNF*QAKKAWAMVTLNSLRH
WALGWVGNLYR*SFCSLRWSASSLVLSNCACKNKVSRKPFLSALTLRLLV
G*V*FGAIKSSTGTLRRF*GVFGSIPVLPMAIRC VCH