

Isolation and characterization of *Pseudomonas chlororaphis* strain ST9; rhizomicrobiota and *in planta* studies

Iris Bertani^{1§}, Elisa Zampieri^{2,3§}, Cristina Bez¹, Andrea Volante^{2,4}, Vittorio Venturi^{1*} and Stefano Monaco^{2*}

¹ International Centre for Genetic Engineering and Biotechnology, 34149 Trieste, Italy; bertani@icgeb.org (I.B.); bez@icgeb.org (C.B.)

² Council for Agricultural Research and Economics-Research Centre for Cereal and Industrial Crops, s.s. 11 to Torino, km 2.5, 13100 Vercelli, Italy; elisa.zampieri@ipsp.cnr.it (E.Z.); andrea.volante@crea.gov.it (A.V.)

³ Institute for Sustainable Plant Protection, National Research Council, Strada delle Cacce 73, 10135 Turin, Italy

⁴ Council for Agricultural Research and Economics-Research Centre for Vegetable and Ornamental Crops, Corso Inglese 508, 18038 Sanremo, Italy (present address)

* Correspondence: venturi@icgeb.org (V.V.); stefano.monaco@crea.gov.it (S.M.)

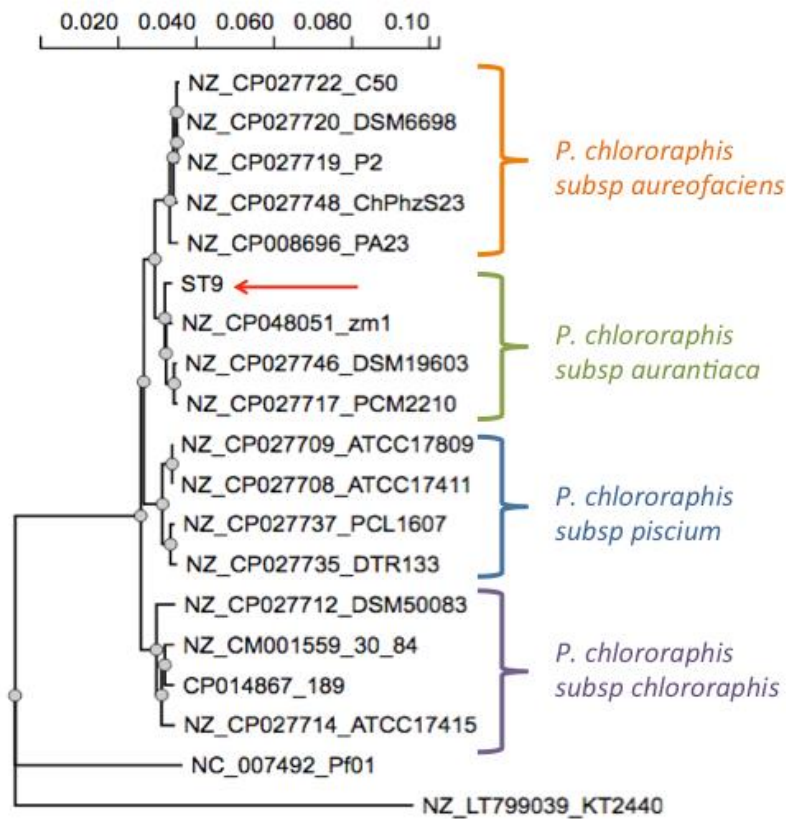
§ Equal Contribution

Keywords: rice, plant growth promoting bacteria, qPCR, microbiome, inoculum persistence, genome analysis

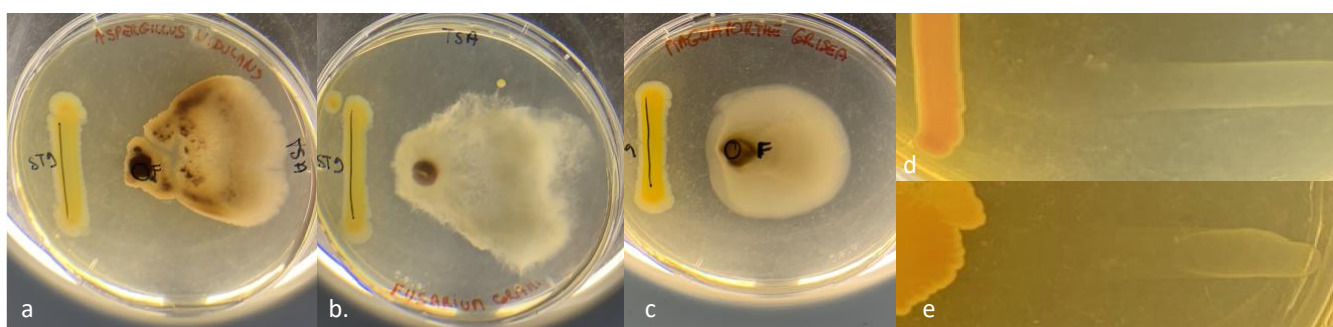
This PDF file includes:

- Supplementary Figures S1-S5
- Supplementary Tables S1 and S2
- Supplementary Material S1
- Reference

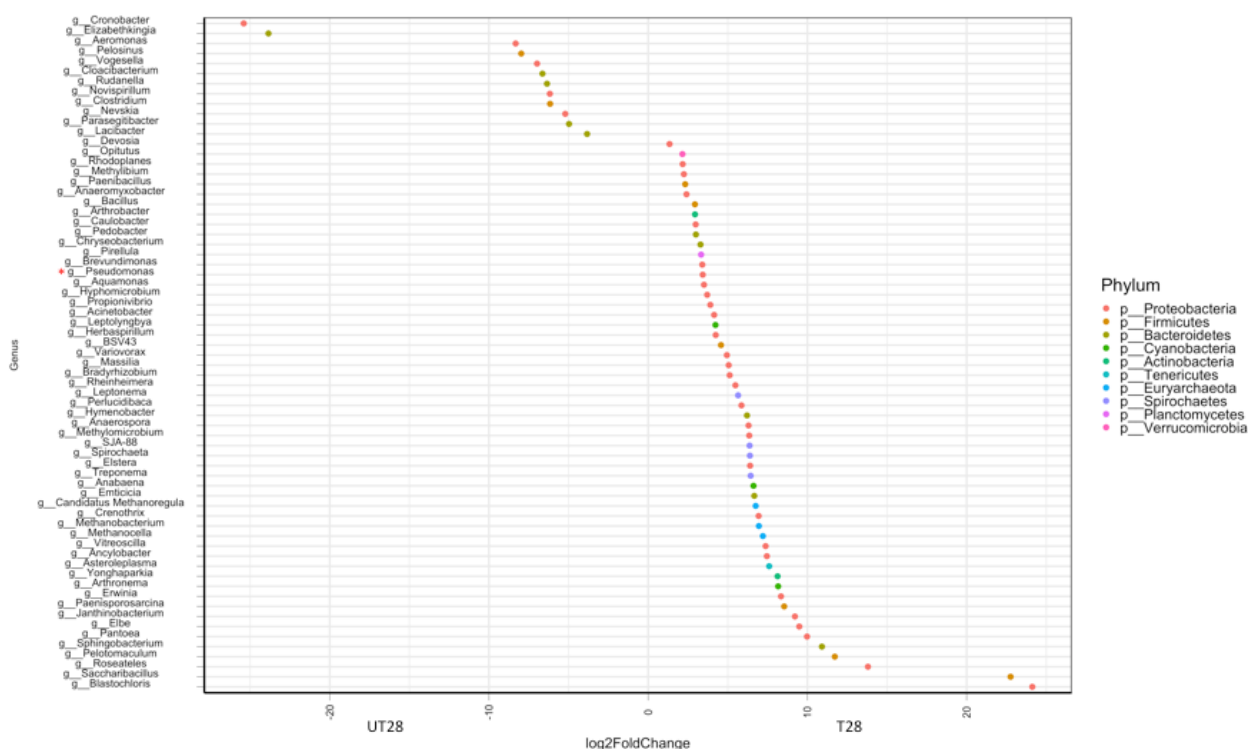
Supplementary Figures



Supplementary Figure S1. Phylogenetic tree reconstructed by the MSLA method based on six concatenated gene sequences (16S rRNA, *recA*, *gyrB*, *rpoD*, *carA*, *atpD* – 9371 nt-) of 17 *Pseudomonas chlororaphis* strains. The strains *P. putida* KT2440 and *P. fluorescens* Pf01 served as outgroups. The 4 subspecies of *P. chlororaphis* cluster separately and ST9 is part of the *aurantiaca* subspecies. The phylogenetic analysis was performed using the NGPhylogeny.fr public platform.

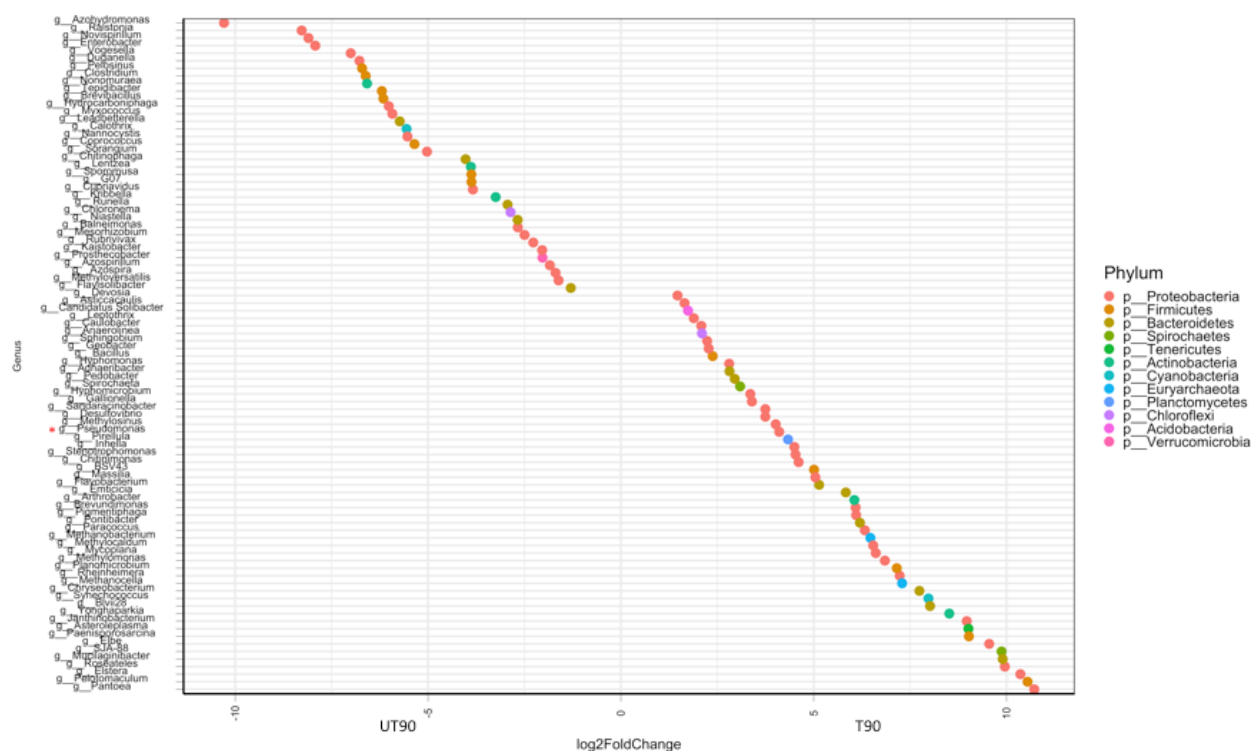


Supplementary Figure S2. *In vitro* antimicrobial activity of *P. chlororaphis* ST9. The antifungal activity was tested against a. *Aspergillus nidulans*, b. *Fusarium graminearum* and c. *Magnaporthe oryzae*. The antibacterial activity was verified against d. *Dickeya zeae* and e. *Pseudomonas fuscovaginae*.

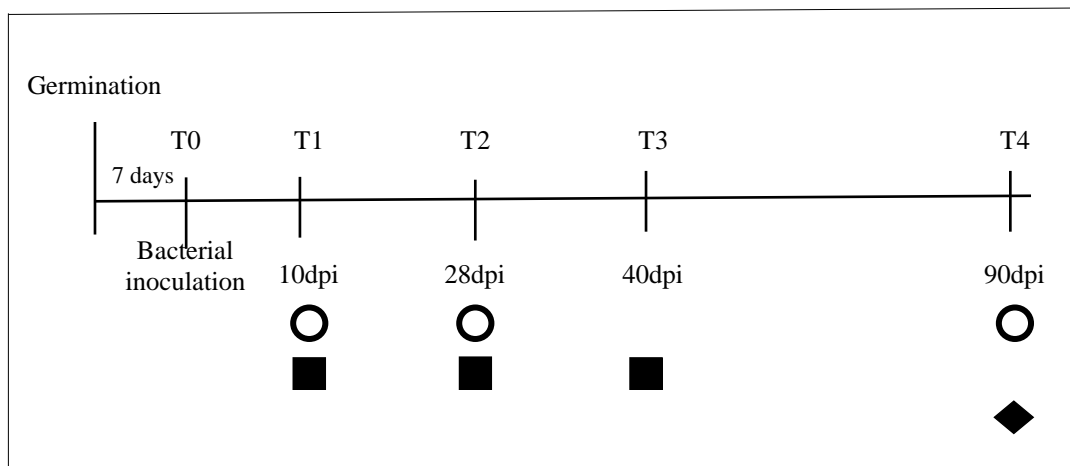


Supplementary Figure S3. Differential representation of OTUs between ST9 inoculated and control samples at 28 days post inoculation.

Differential abundance of OTUs between the two groups of tested samples was assessed by fitting a local regression model with a negative binomial distribution to the data and testing for differential abundance with a likelihood ratio test as implemented in the R package DESeq2 [1] in conjunction with the phyloseq package. Taxa are represented as dots in the graph of fold change. A negative log2Foldchange indicates taxa more abundant in untreated samples, while a positive log2Foldchange indicates taxa more abundant in treated samples. Samples with a p -value less than 0.0001 and mean representation over all samples higher than 1 are shown. UT28: untreated samples at 28 dpi; T28: ST9 treated samples at 28 dpi.



Supplementary Figure S4. Differential representation of OTUs between ST9 inoculated and control samples at 90 days post inoculation. Differential abundance of OTUs between the two groups of tested samples was assessed by fitting a local regression model with a negative binomial distribution to the data and testing for differential abundance with a likelihood ratio test as implemented in the R package DESeq2 [1] in conjunction with the phyloseq package. Taxa are represented as dots in the graph of fold change. A negative log2Foldchange indicates taxa more abundant in untreated samples, while a positive log2Foldchange indicates taxa more abundant in treated samples. Samples with a p -value less than 0.0001 and mean representation over all samples higher than 1 are shown. UT90: untreated samples at 90 dpi; T90: ST9 treated samples at 90 dpi.



Supplementary Figure S5. Time line of the sampling and use of the samples: ○ bacterial counting and microbiome analysis, ■ plant gene expression analysis, ◆ plant physiological and morphological evaluations.

Supplementary Tables

Table S1: List of the primers used in this study

Primer name	Primer sequence (5'-3')	Gene name	Putative function	Reference
fD1	AGAGTTTGATCCTGGCTCAG	<i>16SrRNA</i>	16S rRNA amplification	[2]
rP2	ACGGCTACCTTGTTACGACTT			
518F	CCAGCAGCCGCGGTAATACG	<i>16SrRNA</i>	16S rRNA sequencing	[2]
800R	TACCAGGGTATCTAATCC			
OsERS1f	GAAAGGTCAGGCTTCTCTGAAATC	<i>OsERS1</i>	Ethylene response sensor 1	[3]
OsERS1r	ATGCCGTCGATCAATTTACAGTAG			
OsERS2f	CCTCGGGTTCGCTACCAAT	<i>OsERS2</i>	Ethylene response sensor 2	[3]
OsERS2r	GCATGGCGATGGCATCAT			
OsETR2f	CTTTAGCAGCACTGGGAGATGA	<i>OsETR2</i>	Ethylene responsive 2	[3]
OsETR2r	TGAGAACCATGAGGCTCTTTCA			
OsETR3f	CGAGCTGGCGCGAATT	<i>OsETR3</i>	Ethylene responsive 3	[3]
OsETR3r	TTAGACAAACAGACCTCCAGCAAA			
OsIAA1f	ACCAAGAGCCGCTCAATGAG	<i>OsIAA1</i>	auxin-responsive protein IAA1-like	[4]
OsIAA1r	ATCACACGTGGGCGAACATC			
OsIAA4f	GCTCTTGCTGGATGGGTATGA	<i>OsIAA4</i>	auxin-responsive protein IAA4	[4]
OsIAA4r	AGGTGATGGGCGTCTTGAAC			
OsIAA11f	AGTTGTCCATGGCGTTCCA	<i>OsIAA11</i>	auxin-responsive protein IAA11	[4]
OsIAA11r	TGCTCTCCTTCAGCTGCTGAT			
OsIAA13f	CAAGGATGGTGACTGGATGCT	<i>OsIAA13</i>	auxin-responsive protein IAA13-like	[4]
OsIAA13r	GATCCTCAAGCGTTTGCATGA			
OsIAA14f	CCGTCGCCTATGAGGACAA	<i>OsIAA14</i>	auxin-responsive protein IAA14-like	[4]
OsIAA14r	TTATCCGCAGCTTCTTGCAA			

OsACT1f	GTATCCATGAGACTACATACAACT	<i>OsACT1</i>	Actin 1	[5]
OsACT1r	TACTCAGCCTTGGCAATCCACA			
ARF2-like f	GGCCTGAATCAAGTTGGAGATC	<i>OsARF2</i>	Similar to auxin response factor 2	[6]
ARF2-like r	CTATCTGGCCGCGGAATAGTT			
ERF2-like f	CCGGCAAGGGTAGAGATGGT	<i>OsERF2</i>	Similar to ethylene response factor 2	[6]
ERF2-like r	TCAACATCGAAATCCCAAGAACT			
ERF3-like f	TGCAGCAGCCTATGCAGATC	<i>OsERF3</i>	Similar to ethylene response binding factor 3	[6]
ERF3-like r	CGCGAGGACACTGCTTGAT			
OsISAP1 f	GCAATCCTCATCACACAGCAA	<i>OsISAP1</i>	Multiple stress-responsive zinc-finger protein	[6]
OsISAP1 r	CCCTCTTGGTCTCAGGCTCTCT			
Metallothionein f	CAAAC TGCTCCTGCGGAAAG	<i>Osmetallothionein</i>	metallothionein-like protein type 1	[6]
Metallothionein r	ACGACGGTGGCCTTG GT			

Table S2: Fold change at each time point

Gene	Time		
	T1	T2	T3
<i>OsERF2</i>	0.22	0.02*	0.02*
<i>OsMetallothionein</i>	0.11*	0.01*	0.01*
<i>OsIAA1</i>	0.22	0.002*	0.01*
<i>OsIAA11</i>	0.21	0.05	0.43
<i>OsIAA13</i>	2.54	2.81*	0.3
<i>OsIAA14</i>	1.8	10.54*	4.4*
<i>OsISAP1</i>	1.16	3.02*	0.62
<i>OsETR3</i>	1.72	41.8*	1.88
<i>OsARF2</i>	0,69	19,35*	1,16
ERS1	0,3	8,54*	2,04
<i>OsERS2</i>	0,87	22,09*	2,46
<i>OsERF3</i>	0,81	5,68*	0,56*
<i>OsIAA4</i>	0,37	3,22	6,3
<i>OsETR2</i>	0,73	19,27*	2,19

*: statistically significant different (P< 0.05)

Supplementary Materials (SM)

Supplementary Material 1

Sequences used for the taxonomic analysis of *P. chlororaphys* ST9.

NCBI Reference Sequence: NZ_CP014867.1

Strain: 189

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP014867.1_189

GAAGTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGAAGCTTGCTTCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTCCGGAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTGCCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTAAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTTCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTGTCGTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCCTTGTCCTTAGTTACCAGCACGTAATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG
GCTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCACAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTAC
ACACCGCCCGTCACACCATGGGAGTGGGTTGCACCAGAAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCG
TAGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTT
GGCTGCGGCCCTGGGTGAGATCGAACGTCAATTCGGCAAGGGTGCCGTAATGCGTATG
GGCGATCACGACCGCCAGGCGATCCCGGCCATTTCCTACTGGCTCTCTGGGTCTGGACAT
CGCACTCGGCATCGGCGGCCTGCCAAAGGGTTCGTATTGTTGAAATCTACGGTCCGGAA
TCGTCCGGTAAACACACCTGACCCTGTCCGTGATTGCCAGGCACAGAAGATGGGCG
CCACTTGCGCCTTCGTGACGCCGAGCATGCACTGGACCCGGAATACGCCGGCAAGCT
GGGGGTCAACGTTGACGACCTGCTGGTTTCCAGCCGGACACCGGTGAACAGGCACTG
GAAATCACCGATATGCTGGTGCCTCCAATGCCATCGACGTGATCGTGATCGACTCCGT
GGCGGCACTGGTGCCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGGG
CCTGCAGGCCCGCTGATGTCCCAGGCGCTACGCAAGATCACCGGCAACATCAAGAAC
GCCAACTGCCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTCCG
CAGCCCGGAAACCACACCGGTGGTAACGCGCTGAAGTTCTACGCTTCGGTTCGTCTG
GATATCCGTCGTACTGGCGCGGTGAAGGAAGGTGACGAAGTCGTGCGGTAGCGAAACCC
GGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCGTTCCGCCAGGCTGAATTCCAGAT

CCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGCAT
GGTTTCCTCGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTCAGG
GCAAGGCCAACTCGGCCAAGTTCCTGCAGGACAACCCGGAAATCGGTAATGCCCTCGA
GAAGCAGATTCGCGACAAGCTGCTGGCTCCGACCGCTGATGTCAAAGCTTCGCCGGTC
AACGAGACCATCGATGACATGGCCGACGCGGATATCTGAATGAGCGAAGAAAAACAG
TACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCCCG
GTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTCGAGGT
GGTCGATAACTCGATCGACGAAGCTCTGGCCGGCCATTGCGACGACATCAGCATCATC
ATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGACG
TGCATAAAGAAGAAGGGCGTTTCCGCAGCCGAGGTCATCATGACTGTGCTGCACGCCGG
CGGTAAGTTCGACGATAACTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGTGTG
TCGGTAGTGAACGCCCTGTCCGAAGAGCTGGTCCTGACCGTTTCGCCGCAGTGGCAAGA
TCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCGGTGA
CAGCGAAACCACCGGTACCCAGATTCACTTCAAGGCTTCCAGCGAGACCTTCAAGAAC
ATCCACTTCAGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTCTCAACTC
CGGTGTCCGGTATCGTTCTGAAGGACGAGCGCAGCGGCAAGGAAGAGCTGTTCAAGTAC
GAAGGCGGCTTGCGTGCGTTCGTTGAATACCTGAACACCAACAAGACTGCGGTCAACC
AGGTGTTCCACTTCAACGTGCAGCGTGAAGATGGCATCGGCGTGGAATCGCCCTGCA
GTGGAACGACAGCTTCAACGAGAACCTGCAGTGCTTCACCAACAACATTCCGCAGCGC
GACGGCGGCACCCACCTGGTGGGCTTCCGTTCCGGCGCTGACGCGTAACCTGAACAAC
ACATCGAGCAGGAAGGCCTGGCGAAGAAGCACAAAGGTCGCCACCACCGGTGACGATG
CCCGCGAAGGCCTGACCGCGATCATTTCCGGTCAAGGTGCCGGATCCGAAGTTCAGCTC
CCAGACCAAGACAAGCTGGTGTCTTCCGAAGTGAAGACCGCGGTGGAACAGGAAAT
GGGTAAGTACTTCTCCGACTTCCTGCTGGAAAACCCGAACGAAGCCAACTGGTGGTC
GGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAAGCCCGTGAGATGA
CCCGTCGTAAAGGCGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCCA
GGAAAAAGACCCTGCCCTTTCCGAACCTCTACCTGGTGGAAAGGTGACTCTGCTGGCGGC
TCCGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATCCTGCCGCTCAAGGGCAAG
ATCCTCAACGTCGAGAAAGCGCGCTTCGACAAGATGATTTCTCTCGCAAGAGGTGCGCA
CCTTGATCACTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGCT
GCGTTATCACAACATCATCATCATGACCGACGCCGACGTCGACGGTTCGCACATCCGT
ACCCTACTCCTGACCTTCTTCTTCCGTCAGTTGCCGGAGCTGATCGAGCGTGGCTACAT
CTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATC
AAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGC
CTGCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGA
ACGACTTCCGCATGGTCATGAAGACCCTCAAGCGTCTGTGCGGCCTCTACCCTCAAGAG
CTGACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAACTCTCCGATCACGC
GGCGATGCAGGATTGGCTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGTCC
GGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTGTGGCTGCCAG
AGGTGCAACTGATCTCCCACGGCCTGTGCAACTACGTCACCTTCAACCGCGACTTCTTC
GGCAGCAATGACTACAAGACCGTCGTCACCCTCGGCGCTCAACTGAGCTCCCTGCTGG
ACGAAGGTGCTTATATTTCAGCGCGGCGAGCGCAAGAAGGCGGTGACCGAGTTCAAGG
AAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCATACCATCCAGCGATACAA
AGGTCTGGGTGAGATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAGCGTG
CGCCGATGCTCAAGGTCACTATCGAAGACGCCATCGGCGCCGACCAGATCTTCAACA
CCCTGATGGGTGATGCGGTCGAGCCTCGTCGTGACTTCATCGAAAGCAACGCCCTGGC
GGTATCCAACCTGGACTTCTGAATGTCCGGAAAAGCGCAACAGCAGTCTCGCCTCAAA
GAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACGACC
ACCTGCCGGAGGATATTTTCAGATCCGGAACAGGTGGAAGACATCATCCGCATGATCAA
CGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTTGGCC
GAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCTTGGCGGCTGTG

GAAACCGACATTGGTCGCACTACCGACCCAGTGCGTATGTACATGCGCGAAATGGGTA
CGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAGAGG
GCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACATCCT
CTCCGAATACACTCGCGTCACCACCGAAGGTGGTCGCCTGTCCGACGTCCTGAGCGGTT
ACATCGACCCGGACGACGGCATCGCGCCGCCTGCCGCCGAAGTACCACCGCCTGTCGA
TGCCAAGGCCGCGAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCAGTGA
CGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCTTTGGC
GCCGTTGCCGACCAGATGGAAATCACTCGCAAGGCGCTGAAAAAGCACGGTCGTGAAC
ACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCGATCAAAC
GGTTCCGAAGCAATTCGAAGGCCTGGTTGAACGCGTTTCGTAGCGCCCTGGATCGCCTG
CGTCAGCAAGAGCGCGCGATCATGCAACTCTGTGTTTCGTGATGCTCGCATGCCACGCG
CCGACTTCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGATGCACT
GGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGTCGCCTGCAACCGGACATCATC
CGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATCGCCGAGA
TCAAGGACATCAACCGTCGCATGTCGATCGGCGAGGCCAAGGCCCGTCGCGCGAAGAA
AGAGATGGTCGAAGCCAACTTGCGCCTGGTGATCTCCATCGCCAAGAAGTACACCAAC
CGTGGCCTGCAGTTCCTGGACCTGATCCAGGAAGGCAACATCGGCTTGATGAAAGCGG
TAGACAAGTTCGAATACCGTCGCGGCTACAAGTTCTCGACTTATGCCACCTGGTGGATC
CGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTCCGGTGC
ACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGCTGCAGGAAAT
GGGTGCGGAACCGACCCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGAGGACAA
GATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCGATCGGT
GATGACGAAGACTCCCATCTGGGCGACTTCATCGAAGACTCGACCATGCAGTCGCCAA
TCGATGTGCGCACCGTTGAGAGCCTCAAGGAAGCGACTCGCGAAGTTCTCTCCGGCCT
CACTGCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAATACCGAC
CACACCCTCGAGGAAGTCGGTAAGCAGTTCGACGTTACCCGTGAGCGGATTCGCCAGA
TCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGAGAAGCGAGCACCTGCGCTC
CTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCAGCATTT
TTCGCGGCGAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGTTTAACAC
CGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCCAACAGATCGTTA
CCCTGACTTACCCGCATATCGGCAATACCGGCACCACGCCGGAAGACGCCGAGTCCGA
TCGTGTCTGGTCGGCCGGTCTGGTGATTGCGGACCTGCCACTGGTTGCGAGCAACTGGC
GTAACACCCTGTCCCTGTCCGATTACCTGAAAGCCAACAACGTTGTGGCGATCGCCGGT
ATCGACACCCGTGCTGACGCGCATCCTGCGCGAGAAAGGCGCGCAGAACGGCTGCA
TCATAGCCGGCGACAACATTTCCGACGAAGCGGCGATTGCCGCAGCGCGCGGCTTCCC
TGGCCTGAAAGGCATGGATTTGGCGAAGGTGCTCAGCACCAAGGAAAGCTACGAGTG
GCGCTCCAGCGTCTGGAGCCTGAAGACCGACAGTCATCCGACTATCGAGGCTTCCGAG
CTGCCGTACCACGTGGTCGCCTACGACTACGGCGTCAAGCTGAACATCCTGCGCATGCT
GGTCGAGCGCGGTTGCCGCGTGACCGTAGTGCTGCGCAAACCTTCGGCCAGCGACGTC
CTGGCACTCAAGCCTGACGGTGTGTTCCCTGTCCAACGGCCCTGGCGACCCCGAGCCTTG
CGATTACGCCATCCAGGCGATCAAGGATGTGCTGGAAACCGAGATCCCGGTCTTCGGT
ATCTGCCTGGGCCACCAACTGCTGGCACTGGCCTCCGGCGCCAAGACGGTGAAGATGG
GCCACGGCCACCACGGTGCCAACCACCCGGTCCAGGACCTGGACAGCGGTGTAGTGAT
GATCACCAGCCAGAACCACGGTTTTTGCGGTGGACGAAGCCACCCTGCCAGGCAACGTG
CGGGCGATCCACAAATCGCTGTTTCGACGGCACCCCTGCAAGGCATCGAACGTACCGACA
AGAGCGCATTTCAGTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAACGATGTGGC
GCCGCTGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATGAGTAGCGGA
CGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGACAGCGTACC
GAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGAAGTTCAGCAG
CAGCTGGGCGACGGCGTGGTACGTACCATTTGCGATGGGCTCCACCGAGGGCTTGAAGC
GCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTTCGGTAAAGCGAC

CCTGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGGTCCGATCGGC
GAAGAAGAGCGTTGGGGCATTACCGTCTGCGCCGTCCTTCGCTGAACAAGCTGGCG
GCAACGACCTCCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCCCGTTTCGCCAA
GGGCGGTAAAGTCGGTCTGTTTGGTGGTGCCGGTGTGGGCAAAACCGTAAACATGATG
GAACTGATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTCGCCGGTGTGG
GTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTCCAACGTTCT
GGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAACCGTCTGCG
CGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGGTAACGACGTT
CTGCTGTTTCGTGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGTATCCGCACT
GCTGGGCCGTATGCCTTCCGCAGTAGGTTACCAGCCGACCCTGGCTGAAGAGATGGGC
GTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGATCCAAGCGG
TATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACCTTCGCCCCTTG
GACGCCACCGTCGTACTGTCCCGTGACATCGCTTCCCTGGGTATCTACCCAGCGGTAGA
TCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAACGAGCACTAT
GAAACCGCTCGCGGCGTTTCAGTACGTGCTGCAGCGCTACAAAGAGCTGAAGGACATCA
TTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGGTATCCCGCGC
TCGTAAGATCCAGCGCTTCCTGTGCGAGCCGTTCTTCGTGGCTGAAGTCTTCACTGGTT
CTCCAGGCAAATACGTTTCCCTGAAAGATACCATCGCTGGCTTCAAAGGCATCCTCAAC
GGTGACTACGACCACCTGCCAGAACAAGCGTTCTACATGGTCGGCGGCATCGAAGAAG
CGATCGAGAAAGCCAAGAACTGTAA

NCBI Reference Sequence: NZ_ CP027714.1

Strain: ATCC17415

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP027714_ATCC17415

GAACTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGAAGCTTGCTTCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGCGGGGATAACGTCCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAATTTCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAACTCAAATGAATTGACGGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTGGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCCTTGTCCTTAGTTACCAGCACATAATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG
GCTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCACAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTTAC
ACACCGCCCGTCACACCATGGGAGTGGGTTGCACCAGAAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCG

TAGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTT
GGCTGCGGCCCTGGGTGAGATCGAACGTCAATTTCGGCAAGGGTGCCGTAATGCGTATG
GGCGATCACGACCGCCAGGCGATCCCGGCCATTTCCTACTGGCTCTCTGGGTCTGGACAT
CGCACTCGGCATCGGCGGCCTGCCAAAGGGCCGTATTGTTGAAATCTACGGTCCGGAA
TCGTCCGGTAAAACCACCCTGACCCTGTCCGTGATTGCCCAGGCACAGAAGATGGGCG
CCACTTGCGCCTTCGTGACGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAGCT
GGGGGTCAATGTTGACGACCTGCTGGTTTCCCAGCCGGACACCGGTGAACAGGCACTG
GAAATCACCGACATGCTGGTGCGCTCCAATGCCATCGACGTGATCGTGATCGACTCCG
TGCGGGCACTGGTGCCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGG
GCCTGCAGGCCCCGCTGATGTCCCAGGCGCTGCGCAAGATCACCGGCAACATCAAGAA
CGCCAACTGCCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTTCG
GCAGCCCGGAAACCACCACCGGTGGTAACGCGCTGAAGTTCTACGCTTCGGTTCGTCT
GGATATCCGTCGTA CTGGCGCGGTGAAGGAAGGTGACGAAGTCGTGCGGTAGCGAAACC
CGGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCGTTCCGCCAGGCTGAATTCCAGA
TCCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGCA
CGGTTTCCTCGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTGAG
GGCAAGGCCAACTCGGCCAAGTTCCTGCAGGACAACCCGGAAATCGGTAACGCCCTCG
AGAAGCAGATTCGCGACAAGCTGCTGGCTCCGACCGCTGATGTCAAAGCTTCGCCGGT
CAACGAGACCATCGATGACATGGCCGACGCGGATATCTGAATGAGCGAAGAAAACAC
GTACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCCC
GGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTTCGAGG
TGGTTCGATAACTCGATCGACGAAGCTCTGGCCGGCCATTGCGACGACATCAGCATCAT
CATCCACCCGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGAC
GTGCATAAAGAAGAAGGCGTTTCCGCAGCCGAGGTCATCATGACCGTACTGCACGCCG
GCGGTAAGTTCGACGATAACTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGTGT
GTCGGTAGTGAACGCCCTGTCCGAAGAAGTGGTCTGACCGTTCGCCGCAGTGGCAAG
ATCTGGGAACAGACCTACGTTTCATGGTGTCCTCAGGCACCTATGGCGATCGTCGGTG
ACAGCGAAACCACTGGTACCCAGATTCACTTCAAGGCTTCCAGCGAGACCTTCAAGAA
CATCCACTTCAGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTTCCTCAACT
CCGGTGTGCGGTATCGTTCTGAAGGACGAGCGCAGCGGCAAGGAAGAGCTGTTCAAGTA
CGAAGGCGGCTTGCGTGCGTTCGTTGAATACCTGAACACCAACAAGACTGCGGTCAAC
CAGGTGTTCCACTTCAATGTGCAGCGTGAAGACGGCATCGGCGTGGAATCGCCCTGC
AGTGGAACGACAGCTTCAACGAGAACCTGCAGTGCTTTACCAACAACATTCCGCAGCG
CGACGGCGGCACCCACCTGGTGGGCTTCCGTTTCGGCGCTTACGCGTAACCTGAACAAC
TACATCGAGCAGGAAGGCCTGGCGAAGAAGCACAAAGGTGCGCCACCACCGGTGACGAT
GCCCCGCAAGGCCTGACCGCGATCATTTCCGGTCAAGGTGCCGGATCCGAAGTTCAGCT
CCCAGACCAAAGACAAGCTGGTTTCTTCCGAAGTGAAGACCGCAGTCGAACAGGAAAT
GGGCAAGTACTTCTCCGACTTCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGTC
GGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAAGCCCGTGAGATGA
CCCGTCGTAAAGGCGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCCA
GGAAAAAGACCCTGCCCTTTCCGAACCTCTACCTGGTGGAAGGTGACTCTGCTGGCGGC
TCCGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATCCTGCCGCTCAAGGGCAAG
ATCCTCAACGTCGAGAAAGCGCGCTTCGACAAGATGATTTCTCCTCGCAAGAGGTGCGCA
CCTTGATCACTGCACTCGGTTGCGGCATCGGTGCGGAAGAGTACAACATCGACAAGCT
GCGTTATCACAACATCATCATGACCGACGCCGACGTGACGGTTCGCACATCCGC
ACCCTGCTGCTGACCTTCTTCTTCCGTCAGTTGCCGGAGCTGATCGAGCGTGGCTACAT
CTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATC
AAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGC
CTGCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGA
ACGACTTCCGCATGGTCATGAAGACCTCAAGCGTCTGTGCGCGCCTCTACCTCAAGAG
CTGACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAACTCTCCGATCACGC

GGCGATGCAGGATTGGCTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGTCC
GGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTGTGGCTGCCAG
AGGTGCGAACTGATCTCCCACGGTCTGTGCGAACTACGTACCTTCAACCGCGACTTCTTC
GGCAGCAATGACTACAAGACCGTCGTCACCCTCGGCGCTCAACTGAGCTCCCTGCTGG
ACGAAGGCGCTTATATTCAGCGCGGGCGAGCGCAAGAAGGCGGTGACCGAGTTCAAGG
AAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATACAA
AGGTCTGGGCGAGATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAGCGT
GCGCCGCATGCTCAAGGTCACCATCGAAGACGCCATCGGCGCCGACCAGATCTTCAAC
ACCCTGATGGGTGATGCGGTGAGCCTCGTCGTGACTTCATCGAAAGCAACGCTCTGG
CGGTATCCAACCTGGACTTCTGAATGTCCGGAAAAGCGCAACAGCAGTCTCGCCTCAA
AGAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACGAC
CACCTGCCGGAGGATATTTTCAGATCCGGAACAGGTGGAAGACATCATCCGCATGATCA
ACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTGGC
CGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCGTTGGCGGCTGT
GGAAACCGACATTGGGCGCACTACCGACCCAGTGCGTATGTACATGCGCGAAATGGGT
ACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAGAG
GGTATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACATCC
TCTCCGAATACACTCGCGTCACCACCGAAGGTGGTCGCCTGTCCGACGTCCTGAGCGGT
TACATCGACCCGGACGACGGCATCGCGCCGCCTGCCGCCGAAGTACCACCGCCTGTGC
ATGCCAAGGCCGCGAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCAGTG
ACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATTGCAGCCCAGCGCTTTGG
CGCCGTTGCCGACCAGATGGAAATCACTCGCAAGGCGCTGAAAAAGCACGGTCGTGAA
CACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCGATCAAAC
TGGTTCCGAAGCAATTCGAAGGCCTGGTTGAACGCGTTCGTAGCGCCCTGGATCGCCT
GCGTCAGCAAGAGCGCGCGATCATGCAACTCTGTGTTTCGTGATGCTCGCATGCCACGC
GCCGACTTCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGACGCAC
TGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGTTCGCCTGCAGCCGGACATCAT
CCGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATCGCCGAG
ATCAAGGACATCAACCGTCGCATGTCGATCGGCGAGGCCAAGGCCCGTCGCGCGAAGA
AAGAGATGGTCGAAGCCAACCTTGCGTCTGGTGATCTCCATCGCCAAGAAGTACACCAA
CCGTGGCCTGCAGTTCCTCGACCTGATCCAGGAAGGCAACATCGGCTTGATGAAAGCG
GTAGACAAGTTCGAATACCGTCGCGGCTACAAGTTCTCGACTTATGCCACCTGGTGGAT
CCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTCCGGTGC
ACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGCTGCAGGAAAT
GGGTGCGGAACCGACCCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGAGGACAA
GATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCGATCGGT
GATGACGAAGACTCCCATCTGGGCGACTTCATCGAAGACTCGACCATGCAGTCGCCAA
TCGATGTGCGCACCGTTGAGAGCCTCAAGGAAGCGACTCGCGAAGTTCTCTCCGGCCT
CACTGCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAATACCGAC
CACACCCTCGAGGAAGTCGGTAAGCAGTTCGACGTTACCCGTGAGCGGATTCGCCAGA
TCGAAGCCAAGGCGCTGCGCAAGCTACGCCATCCGACGAGAAGCGAGCACCTGCGCTC
CTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCAGCATTT
TTCGCGGCGAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGTTTAACAC
CGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCCAACAGATCGTTA
CCCTGACTTACCCGCATATCGGCAATACCGGCACCACGCCGAAGACGCCGAGTCCGA
TCGTGTCTGGTCGGCCGGTCTGGTGATTGCGGACCTGCCACTGGTTGCGAGCAACTGGC
GTAATACCCTGTCCCTGTCCGACTACCTGAAAGCCAACAACGTTGTGGCGATCGCCGGT
ATCGACACCCGTCGCCTGACGCGCATCCTGCGCGAGAAAGGCGCGCAGAACGGCTGCA
TCATGGCCGGCGACAATATCTCCGACGAAGCGGCGATTGCCGCGAGCGCGCGGCTTCCC
TGGTCTGAAAGGCATGGATCTGGCGAAGGTGCTCAGCACCAAGAAAACCTACGAGTGG
CGCTCCAGCGTCTGGAGCCTGAAGACCGACAGTCATCCGACTATCGAGGCTTCCGAGC

TGCCGTACCACGTGGTCGCCTACGACTACGGCGTCAAGCTGAACATCCTGCGCATGCT
GGTCGAGCGTGGTTGCCGCGTGACCGTAGTGCCTGCGCAAACCTCCGGCCAGCGACGTC
CTGGCACTCAAGCCTGACGGTGTGTTCTGTCCAACGGCCCTGGCGACCCCGAGCCTTG
CGATTACGCCATCCAGGCGATTAAGGACGTGCTGGAAACCGAGATCCCGGTCTTCGGT
ATCTGCCTGGGCCACCAACTGCTGGCATTGGCCTCCGGCGCCAAGACGGTGAAGATGG
GCCACGGCCACCACGGTGCCAACCAACCCGGTCCAGGACCTGGACAGCGGTGTAGTGAT
GATCACCAGCCAGAACCACGGTTTTTGCAGGTGGACGAAGCCACCCTGCCAGGCAACGTG
CGGGCGATCCACAAATCGCTGTTTCGACGGCACCCCTGCAAGGCATCGAACGTACCGACA
AGAGCGCATTTCAGCTTCCAGGGGCCACCCTGAAGCGAGCCCGGGCCCGAACGATGTGGC
GCCGCTGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATGAGTAGCGGA
CGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGACAGCGTACC
GAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGAAGTTCAGCAG
CAGCTGGGCGACGGCGTGGTACGTACCATTTGCGATGGGCTCCACCGAGGGCTTGAAGC
GCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTTCGGTAAAGCGAC
CCTGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGGCCCGATCGGC
GAAGAAGAGCGTTGGGGCATTACCGTCTCGCGCCGTCCTTCGCTGAACAAGCTGGCG
GCAACGACCTCCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTTGCCCGTTCGCCAA
GGGCGGTAAAGTCGGTCTGTTCGGTGGTGCCGGTGTGGGCAAAACCGTAAACATGATG
GAACTGATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTCGCCGGTGTGG
GTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTCCAACGTTCT
GGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAACCGTCTGCG
CGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGGTAAACGACGTT
CTGCTGTTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGTATCCGCACT
GCTGGGCCGTATGCCTTCCGCAGTAGGTTACCAGCCGACCCTGGCTGAAGAGATGGGC
GTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGATCCAAGCGG
TATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACTTCGCCCCACTTG
GACGCCACCGTTCGTACTGTCCCGTGACATCGCTTCCCTGGGTATCTACCCAGCGGTAGA
TCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAACGAGCACTAT
GAAACCGCTCGCGGCGTTTCAGTACGTGCTGCAGCGCTACAAAGAGCTGAAGGACATCA
TTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGGTATCCCGCGC
TCGTAAGATCCAGCGCTTCCTGTGCGAGCCGTTCTTCGTGGCTGAAGTCTTCACTGGTT
CTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGGCATCCTCAA
CGGTGACTACGACCACCTGCCAGAACAAGCGTTCTACATGGTTCGGCGGCATCGAAGAA
GCGATCGAGAAAGCCAAGAAACTGTAA

NCBI Reference Sequence: NZ_CP027735.1

Strain: DTR133

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP027735_DTR133

GAACTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGGTGCTTGCACCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTTTCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGGAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGAATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTTCTGTGTAGCGGTGAAATGCGT

AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTGAGCTCGTGTGCTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCCTTGTCCTTAGTTACCAGCACGTAATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG
GCTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTA
ACACCGCCCGTCACACCATGGGAGTGGGTGTCACCAGAAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCG
TAGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTT
GGCTGCGGCCCTGGGTGAGATCGAACGTCAATTTCGGCAAGGGTGCCGTAATGCGTATG
GGCGATCACGATCGCCAGGCGATCCCGGCCATTTCCACTGGCTCTCTGGGTCTGGACAT
CGCACTCGGCATCGGCGGCCTGCCAAAAGGCCGTATTGTTGAAATCTACGGTCCGGAA
TCGTCCGGTAAAACCACCCTGACCCTGTCGGTGATTGCCCAGGCACAGAAGATGGGCG
CCACCTGCGCCTTCGTGACGCCGAGCACGCACTGGACCCGGAGTACGCCGGCAAACCT
GGGGGTCAACGTTGACGACCTGCTGGTTTCCAGCCGGACACCGGCGAACAGGCGCTG
GAAATCACCGACATGCTGGTGCGCTCCAATGCCATCGACGTGATCGTGATCGACTCCG
TGGCGGCGCTGGTACCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGG
GCCTGCAGGCTCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGTAACATCAAGAA
CGCCAACTGCCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTTCG
GCAGCCCGGAAACCACCACCGGTGGTAACGCGCTGAAGTTCTACGCTTCGGTTCGTCT
GGATATCCGTCGTA CTGGCGCGGTGAAGGAAGGTGACGAAGTCGTGCGGTAGCGAAACC
CGGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCCTTCCGTCAAGCTGAGTTCCAGA
TCCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGCA
CGGTTTCCTAGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTCAG
GGCAAGGCCAACTCGGCCAAGTTCCTGCAGGACAATCCGGAAATCGGTAATGCCCTCG
AGAAGCAGATTTCGCGACAAGCTGCTGGCTCCGAGCGGAGATACCAAGGCTCTGCCCGT
CAACGAGACCATCGATGACATGGCCGACGCGGATATCTGAATGAGCGAAGAAAACAC
GTACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCCC
GGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTCGAGG
TGGTCGACAACTCGATCGACGAAGCTCTGGCCGGCCACTGCGACGACATCAGCATCAT
CATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCCGCGCATCCCGGTAGAC
GTGCATAAAGAAGAAGGCGTTTCCGCGAGCCGAGGTCATCATGACCGTGCTGCACGCCG
GCGGTAAGTTCGACGACAACTCCTACAAGGTATCCGGCGGTCTGCACGGTGTGGGTGT
GTCGGTAGTGAATGCCCTGTCCGAAGAACTGGTGCTGACCGTTCGCCGCAGTGGCAAG
ATCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCGGTG
ACAGCGAGACCACTGGTACCCAGATTCACTTCAAGGCTTCCAGCGAGACCTTCAAGAA
CATCCATTTACAGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTTCCTCAACT
CCGGTGTCCGTATCGTTCTGAAGGACGAGCGCAGCGGCAAGGAAGAACTGTTCAAATA
CGAAGGCGGCCTGCGCGCGTTCGTGCAATACCTGAACACCAACAAGACTGCGGTCAAC
CAGGTGTTCCACTTCAACGTGCAGCGTGAAGACGGCATCGGCGTGGAATCGCCCTGC
AGTGGAACGACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCAGCG
CGACGGCGGTACTCACCTGGTGGGCTTCCGCTCGGCACTGACGCGTAACCTGAACAAC
TACATCGAGCAGGAAGGTCTGGCGAAGAAGCACAAAGGTGCCACCACCGGTGACGAT
GCCCCGCAAGGCCTGACCGCGATCATTTCCGGTCAAGGTGCCCGGATCCGAAGTTCAGCT
CCCAGACCAAAGACAAGCTGGTGTCTTCCGAAGTAAAGACCGCGGTGCAACAGGAAA

TGGGCAAGTACTTCTCCGACTTCCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGT
CGGCAAGATGCTCGACGCCGCCCGCGCCCGTGAAGCGGCGCGTAAGGCCCGTGAGATG
ACCCGCCGTAAAGGTGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCC
AGGAAAAGGACCCTGCCCTTCCGAACCTACCTGGTGGAAGGTGACTCTGCTGGCGG
CTCCGCCAAGCAGGGACGCAACCGCAAGACCCAGGCGATTCTGCCGCTCAAGGGCAA
GATTCTTAACGTCGAGAAAGCGCGCTTCGACAAGATGATTTCCCTCGCAAGAGGTGCGC
ACCTTGATCACTGCACTCGGCTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGC
TGCGTTATCACAACATCATCATCATGACCGACGCCGACGTCGACGGTTCGCACATCCGC
ACCCTGCTGCTGACTTTCTTCTTCCGTCAGCTGCCGGAGCTGATCGAGCGTGGCTACAT
CTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATC
AAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGC
CTGCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGA
ACGACTTCCGCATGGTCATGAAAACCTCAAGCGTCTGTGCGGCCTGTACCCTCAGGA
GCTGACCGAACACTTCATCTACCTGCCAGCCGTGAGCCTGGAGCAACTCTCCGATCAC
GCAGCGATGCAGGATTGGTTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGT
CCGGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCC
AGAGGTCGAACTGATCTCCACGGCCTGTCGAACTACGTCACCTTCAACCGCGACTTCT
TCGGCAGCAATGACTACAAGACCGTCGTCACCCTCGGCGCTCAACTGAGCTCCCTGCT
GGACGAAGGCGCTTATATTACAGCGCGGCGAACGCAAGAAGGCGGTGACCGAGTTCAA
GGAAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATAC
AAAGGTCTGGGCGAGATGAACCCGGACCAGCTGTGGGAAACCACCATGGACCCAAGC
GTGCGCCGCATGCTCAAGGTCACCATCGAAGACGCCATCGGCGCCGACCAGATCTTCA
ACACCCTGATGGGTGATGCGGTGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCT
GGCGGTATCCAACCTGGACTTCTGAATGTCCGAAAAGCGCAACAGCAGTCTCGCCTC
AAAGAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACG
ACCACCTGCCGGAGGATATTTACAGATCCGGAACAGGTGGAAGACATCATCCGCATGAT
CAACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTG
GCCGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCTTGGCGGCT
GTGGAAACCGACATTGGTCGCACTACCGACCCAGTGCGTATGTACATGCGCGAAATGG
GCACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAG
AGGGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACAT
CCTCTCCGAATACACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCCTGAGC
GGTTACATCGACCCGGATGACGGCATTGCGCCGCCTGCCGCCGAAGTACCACCGCCTG
TCGATGCCAAGGCCGCGAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCA
GTGACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCT
TTGGCGCCGTTGCCGACCAGATGGAAATCACCCGCAAGGCGCTGAAAAAGCACGGTCG
TGAACACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCAATC
AACTGGTTCCGAAGCAATTGGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATC
GCCTGCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCGCATGCC
ACGCGCCGACTTCCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGAC
GCGCTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGCCGCCTGCAGCCGGAC
ATCATCCGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATTG
CCGAGATCAAGGACATCAACCGTCGCATGTGATCGGCGAGGCCAAGGCCCGTCGCGC
GAAGAAAGAGATGGTTCGAAGCCAACCTTGC GCCTGGTGATCTCCATCGCCAAGAAGTAC
ACCAACCGTGGCCTGCAGTTCCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGA
AAGCGGTAGACAAGTTCGAATACCGTCGCGGCTACAAGTTCTCGACTTATGCCACCTG
GTGGATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTC
CGGTGCACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCA
GGAAATGGGTGCGCAACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGA
GGACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCG
ATCGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGT

CGCCAATCGATGTCGCCACCGTTGAGAGCCTCAAGGAAGCGACTCGCGAAGTCCTCTC
CGGCTCACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAAT
ACCGATCACACCCTTGAGGAAGTCGGTAAGCAGTTCGACGTTACCCGTGAGCGGATTC
GTCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGAGAAGCGAGCATC
TGCGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGC
AGCATTTTTTCGCGGGCAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGT
TTAACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCCAACAG
ATCGTTACCCTGACTTACCCGCACATCGGCAACACTGGCACCACGCCGGAAGACGCCG
AGTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTGCGGACCTGCCACTGGTTGCGAGC
AACTGGCGTAACACCCTGTCCCTGTCCGACTACCTGAAAGCCAACAATGTCGTGGCGA
TCGCCGGTATCGACACCCGTGCGCTGACGCGCATCCTGCGTGAAAAAGGCGCGCAGAA
CGGCTGCATCATGGCCGGCGACAATATCTCCGACGAAGCAGCGATTGCCGCAGCGCGC
GGCTTCCCTGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTCAGCACCAAGGAAAGCT
ACGAGTGGCGCTCCAGCGTCTGGAGCCTGAAGACCGACAGTCATCCGACTATCGAAGC
TTCCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGC
GCATGTTGGTCGAGCGCGGCTGCCGCGTGACCGTAGTGCTGCGCAAACCTCCGGCCAG
CGACGTCCTGGCACTCAAGCCTGACGGTGTGTTCTGTCCAACGGTCCTGGCGACCCCCG
AGCCTTGTGATTACGCCATCCAGGCGATCAAGGACGTGCTGGAAACCGAGATCCCGGT
CTTCGGTATCTGTCTGGGTACCAATTGCTGGCTCTGGCCTCCGGTGCCAAGACAGTGA
AGATGGGCCACGGCCACCATGGCGCCAACCACCCGGTCCAGGACCTGGACAGCGGTGT
AGTGATGATCACCAGCCAAAACCACGGTTTTTGCGGTGGACGAAACTACCCTGCCAGGC
AACGTGCGGGCGATCCACAAGTCGCTGTTTCGATGGCACCTTGCAAGGCATCGAGCGTA
CCGACAAGAGCGCATTACAGCTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAACGA
TGTGGCGCCGCTGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATGAGT
AGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGACA
GCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGAAGT
TCAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTCGATGGGCTCCACCGAGGGC
TTGAAGCGCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTGCGTA
AAGCGACCCTGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGGCCC
GATCGGCGAAGAAGAGCGTTGGGGCATTACCGTCCTGCGCCGACCTTCGCTGAACAA
GCTGGCGGCAACGACCTCCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCCCGT
TCGCCAAGGGCGGTAAAGTCGGTCTGTTTCGGTGGTGCCGGTGTGGGCAAAACCGTAAA
CATGATGGAAGTATCCGTAACATCGCCATCGAGCACAGCGGTTATTCGTGTTTCGCCG
GTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTCCAA
CGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAACCGT
CTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGGTAACG
ACGTTCTGCTGTTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGTATCC
GCACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAAGAGA
TGGGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGATCCA
AGCGGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACACCTTCGCC
CACTTGACGCCACCGTCGTACTGTCCCGTGACATCGCTTCCCTGGGTATCTACCCAGC
GGTAGACCCACTGGATTTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAACGAG
CACTACGAAACCGCTCGCGGGCGTTACGTACGTGCTGCAGCGCTACAAAGAGCTGAAGG
ACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGGTATC
CCGCGCTCGTAAGATCCAGCGCTTCCTGTGCGAGCCGTTCTTCGTGGCTGAAGTCTTCA
CTGGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGGCATC
CTCAACGGTGACTACGACCACCTGCCAGAACAAAGCGTTCTACATGGTCGGCGGCATCG
AAGAAGCGATCGAGAAAGCCAAGAAACTGTAA

NCBI Reference Sequence: NZ_CP027748.1
Strain: ChPhzS23

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP027748_ChPhzS23

GAAGTGAAGAGTTTGGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGAAGCTTGCTTCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTTTCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGGAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTTCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAACTCAAATGAATTGACGGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTGTCGTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCTTTGTCCTTAGTTACCAGCACGTCATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG
GCTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTGCGCGGTGAATACGTTCCCGGGCCTTGTA
ACACCGCCCGTCACACCATGGGAGTGGGTGACACAGAAAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCG
TAGGGGAACCTGCGGCTGGATCACCTCCTTAATATGGACGACAACAAGAAGAAAGCCT
TGGCTGCGGCCCTGGGTGAGATCGAACGTCAATTCGGCAAGGGTGCCGTAATGCGTAT
GGGCGATCACGACCGCCAGGCGATCCCGGCCATTTCCACTGGCTCTCTGGGTCTGGAC
ATCGCACTCGGCATCGGCGGCCTGCCAAAAGGTTCGTATTGTTGAAATCTACGGTCCGG
AATCGTCCGGTAAAACCAACCTGACCCTGTCCGTGATTGCCAGGCACAGAAGATGGG
CGCCACCTGCGCCTTCGTCGACGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAA
CTGGGGGTCAACGTTGACGACCTGCTGGTTTCCAGCCGGACACCGGCGAACAGGCGC
TGGAATACACCGACATGCTGGTGCCTCCAATGCCATCGACGTGATCGTGATCGACTC
CGTGGCGGCACTGGTACCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGT
GGGCTGACAGGCCCGCCTGATGTCCAGGCGCTGCGCAAGATCACCGGTAACATCAAG
AACGCCAACTGCCTGGTGTCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTT
CGGCAGCCCGGAAACCACCGGCGGTAACGCGCTGAAGTTCTACGCTTCGGTTTCGT
CTGGACATCCGTCGTACTGGCGCGGTGAAGGAAGGCGACGAAGTCGTCGGTAGCGAA
ACCCGGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCGTTCCGCCAGGCTGAATTCC
AGATCCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCT
GCACGGTTTCCTCGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGT
CAGGGCAAGGCCAACTCGGCCAAGTTCCTGCAGGACAATCCGGAAATCGGCAATGCCC
TCGAGAAGCAGATTCGCGACAAGCTGCTGGCTCCAAGCGCTGATGTCAAAGCTTCGCC
GGTCAACGAGACCATCGATGACATGGCTGACGCGGATATCTGAATGAGCGAAGAAAA
CACGTACGACTCGAGCAGCATTAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGT
CCCGGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTCG
AGGTGGTTCGATAACTCGATCGACGAAGCTCTGGCCGGCCATTGCGACGACATCAGCAT
CATCATCCACCCGACGAATCCATTACCGTGCGTGACAACGGTTCGCGGCATCCCGGTA

GACGTGCATAAAGAAGAAGGCGTTTCCGCGGCCGAGGTCATCATGACCGTACTGCACG
CCGGCGGTAAGTTCGACGATAACTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGG
TGTGTCGGTAGTGAACGCCCTGTCCGAAGAACTGGTCCTGACCGTTCGCCGCAGCGGA
AAGATCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCG
GTGACAGCGAAACCAACCGGTACCCAGATTCACTTCAAGGCGTCCAGCGAGACCTTCAA
GAACATCCATTTCAGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTCCTCA
ACTCCGGTGTTCGGTATCGTTCTGAAGGACGAACGCAGTGGCAAGGAAGAGCTGTTCAA
GTACGAAGGCGGCCTGCGTGCGTTTCGTTGAATACCTGAACACCAACAAGACCGCGGTC
AACCAGGTGTTCCACTTCAATGTGCAGCGTGAAGATGGCATCGGCGTGGAATCGCCC
TGCAGTGGAACGACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCA
GCGCGATGGCGGCACCCACTTGGTGGGCTTCCGTTTCGGCACTGACGCGTAACCTGAAC
AACTACATCGAACAGGAAGGTCTGGCGAAGAAGCACAAAGGTCGCCACCACCGGTGAC
GATGCCCCGCGAAGGCCTGACCGCGATCATTTCCGGTCAAGGTGCCGGATCCGAAGTTCA
GCTCCCAGACCAAAGACAAGCTGGTGTCTTCCGAAGTGAAGACCGCGGTTGAACAGGA
AATGGGCAAGTACTTCTCCGACTTCCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTG
GTCGGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAGGCTCGTGAGA
TGACCCGCCGTAAAGGCGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTG
CCAGGAAAAAGACCCTGCCCTTTCCGAACCTCTACTTGGTGGAAAGGTGACTCTGCTGGC
GGCTCCGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATTCTGCCGCTCAAGGGCA
AGATCCTTAACGTTCGAGAAAGCGCGCTTCGACAAGATGATTTCTCGCAAGAGGTCCG
CACCTTGATCACTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAG
CTGCGTTATCACAAACATCATCATGACCGACGCTGACGTCGACGGTTCGCACATCCG
TACCCTGCTGCTGACCTTCTTCTTCCGTCAGCTGCCGGAGCTGATCGAGCGTGGCTACA
TCTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACAT
CAAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAG
CCTGCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTG
AACGACTTCCGCATGGTCATGAAAACCCCTCAAGCGTCTGTTCGCGCCTGTACCCTCAGG
AGCTGACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAACTCTCCGATCA
CGCGGCCATGCAGGATTGGCTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAG
TCCGGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGC
CAGAGGTCGAACTGATCTCCACGGCCTGTGCGAACTACGTCACCTTCAACCGCGACTTC
TTCGGTAGCAATGACTACAAGACCGTCGTTACCCTCGGCGCTCAACTGAGCTCCCTGCT
GGACGAAGGCGCTTATATTACAGCGTGGCGAACGCAAGAAGGCGGTGACCGAGTTCAA
GGAAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATAC
AAAGGTCTGGGCGAGATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAGC
GTGCGCCGTATGCTCAAGGTCACGATTGAAGATGCCATCGGCGCCGACCAGATCTTCA
ACACCCTGATGGGGGATGCGGTTCGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCT
GGCGGTATCCAATCTGGACTTCTGAATGTCCGGAAAAGCGCAACAGCAGTCTCGCCTC
AAAGAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACG
ACCACCTGCCGGAGGATATTTACAGATCCGGAACAGGTGGAAGACATCATCCGCATGAT
CAACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTG
GCCGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCTTGGCGGCC
GTGGAACCCGACATTGGTCGCACTACCGACCCCGTGCGTATGTACATGCGCGAAATGG
GAACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAG
AGGGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACAT
CCTCTCCGAATACACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCCTGAGC
GGTTACATCGACCCGGACGACGGCATCGCGCCGCCTGCCGCCGAAGTACCACCGCCTG
TCGATGCCAAGGCCGCAAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCA
GTGACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCT
TTGGCGCCGTTGCCGACCAGATGGAAATCACCCGCAAGGCGCTGAAGAAGCACGGTCG
CGAACACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCGATC

AAACTGGTTCCGAAGCAATTCGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATC
GCCTGCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCCGATGCC
ACGCGCCGACTTCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGAC
GCGCTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGCCGCCTGCAGCCGGAC
ATTATCCGTTGCCAGCAGAAGCTGACCGCGCTTGAGACCGAGACCGGCCTGACGATCG
CCGAGATCAAGGACATCAACCGTCGCATGTTCGATCGGCGAGGCCAAGGCCCGTCGCGC
GAAGAAAGAGATGGTTCGAAGCCAACCTGCGTCTGGTGTCTCCATCGCCAAGAAGTAC
ACCAACCGTGGCTTGCAATTCCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGA
AAGCGGTAGACAAGTTCGAATACCGTCGCGGCTACAAATTCTCGACTTATGCCACCTG
GTGGATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTC
CGGTGCACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCA
GGAAATGGGTTCGCGAACCAGCTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGA
GGACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCG
ATCGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGT
CGCCAATCGATGTCGCCACCGTCGAGAGTCTTAAAGAAGCGACTCGCGAAGTACTCTC
CGGCCTCACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAAT
ACCGACCACACCCTCGAGGAAGTCGGTAAGCAGTTTGACGTTACCCGTGAGCGGATTC
GTCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGCGAAGCGAGCACC
TGCGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGC
AGCATTTTTTCGCGGGCGAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGT
TTAACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCCAACAG
ATCGTTACCCTGACTTACCCGCATATCGGCAATACCGGCACCACGCCGGAAGACGCCG
AGTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCTCTGGTTGCGAGC
AACTGGCGTAACACCCTGTCCCTGTCCGACTACCTGAAAGCCAACAATGTCGTGGCAA
TCGCCGGTATCGACACCCGTGCGCTGACGCGCATCCTGCGCGAGAAAGGTGCGCAGAA
CGGCTGCATCATGGCCGGCGACAATATCTCCGACGAAGCGGGCGATTGCCGCTGCACGC
GGCTTCCCGGGCCTGAAAGGCATGGATCTGGCGAAGGTCTGTCAGCACCAAGGAAAGCT
ACGAGTGGCGCTCCAGTGTCTGGAACCTGAAGACCGACAGTCATCCGACCATCGAAGC
TTCCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGC
GCATGCTGGTTCGAACGCGGTTGCCGCGTGACCGTGGTGCTGCGCAAACCCCGGCCAG
CGAAGCGCTGGCGCTCAAGCCTGACGGTGTGTTCTGTCCAACGGCCCTGGCGACCCC
GAGCCTTGCGATTACGCCATCCAGGCGATCAAGGACGTGCTGGAGACCGAGATTCCGG
TCTTCGGTATCTGTCTGGGCCACCAACTGCTGGCACTGGCCGCCGGCGCCAAGACAGT
GAAGATGGGCCACGGCCACCACGGCGCCAACCACCCGGTCCAGGACCTGGACAGCGG
TGTGGTGATGATCACCAGCCAGAACCACGGTTTTTTCGGTGGACGAAGCCACCCTGCCG
GGCAACGTGCGGGCGATCCACAAGTCGCTGTTTCGACGGCACCCCTGCAAGGCATCGAGC
TGATCGACAAGAGCGCATTCAGCTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAA
CGATGTGGCGCCGCTGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATG
AGTAGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCG
ACAGCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGA
AGTTCAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTCGATGGGCTCCACCGAG
GGCTTGAAGCGCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTGCG
GTAAAGCGACCCTGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGG
CCCGATCGGCGAAGAAGAGCGTTGGGGCATTACCGTCCTGCGCCGACCTTCGCTGAA
CAAGCTGGCGGCAACGACCTGCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCC
CGTTCGCCAAGGGCGGTAAAGTCGGTCTGTTTCGGTGGTGCCGGTGTGGGGCAAAACCGT
AAACATGATGGAACCTGATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTC
GCCGGTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGACT
CCAACGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAA
ACCGTCTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGG
TAACGACGTTCTGCTGTTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAG

TATCCGCACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAA
GAAATGGGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGA
TCCAAGCGGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACCTT
CGCCCACTTGGACGCCACCGTCGTTCTGTCCCGTGACATCGCTTCCCTGGGTATCTACC
CAGCGGTAGACCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAC
CGAGCACTACGAAACCGCTCGTGGCGTTTACGTACGTGCTGCAGCGCTACAAAGAGCTG
AAGGACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGG
TATCCCGCGCTCGTAAGATCCAGCGCTTCTGTGCGAGCCGTTCTTCGTGGCTGAAGTC
TTCCTGGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGG
CATCTCAACGGTGACTACGACCATCTGCCAGAACAAGCGTTCTACATGGTTGGTGGC
ATCGAAGAAGCGATCGAGAAAGCCAAGAACTGTAA

NCBI Reference Sequence: NZ_CP027720.1

Strain: DSM6698

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP027720_DSM6698

GAAGTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGAAGCTTGCTTCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTTTCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAATTTCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTGTCGTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCTTGTCTTAGTTACCAGCACGTCATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG
GCTACACACGTGCTACAATGGTTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTAC
ACACCGCCCGTCACACCATGGGAGTGGGTGACCAGAAAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCG
TAGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTT
GGCTGCGGCCCTGGGTCAGATCGAACGTCAATTTCGGCAAGGGTGCCGTAATGCGTATG
GGCGATCACGACCGCCAGGCGATCCCGGCCATTTCCTACTGGCTCTCTGGGTCTGGACAT
CGCACTCGGCATCGGCGGCCTGCCAAAAGGTCGTATTGTTGAAATCTACGGTCCGGAA
TCGTCCGGTAAAACCACCTGACCCTGTCCGTGATTGCCAGGCACAGAAGATGGGCG
CCACCTGCGCCTTCGTGACGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAACCT
GGGGGTCAACGTTGACGACCTGCTGGTTTCCAGCCGGACACCGGCGAACAGGCGCTG
GAAATCACCGACATGCTGGTGCGCTCCAATGCCATCGACGTGATCGTGATCGACTCCG
TGGCGGCACTGGTACCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGG

GCCTGCAGGCCCGCCTGATGTCCCAGGCACTGCGCAAGATCACCGGTAACATCAAGAA
CGCCAACTGCCTGGTGTCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTTCG
GCAGCCCGGAAACCACCACCGGCGGTAACGCGCTGAAGTTCTACGCTTCGGTTCGTCT
GGACATCCGTCGTACTGGCGCGGTGAAGGAAGGCGACGAAGTCGTCCGTAGCGAAAC
CCGGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCGTTCCGCCAGGCTGAATTCCAG
ATCCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGC
ACGGTTTCCTCGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTCA
GGGCAAGGCCAACTCGGCCAAGTTCCTGCAGGACAATCCGGAAATCGGCAATGCCCTC
GAGAAGCAGATTCGCGACAAGCTGCTGGCTCCAACCGCTGATGTCAAAGCTTCGCCGG
TCAACGAGACCATCGATGACATGGCTGACGCGGATATCTGAATGAGCGAAGAAAACA
CGTACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCC
CGGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTTCGAG
GTGGTCGATAACTCGATCGACGAAGCTCTGGCCGGCCATTGCGACGACATCAGCATCA
TCATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGA
CGTGCATAAAGAAGAAGGCGTTTCCGCGGCCGAGGTCATCATGACCGTACTGCACGCC
GGCGGTAAGTTCGACGATAACTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGTG
TGTCGGTAGTGAACGCCCTGTCCGAAGAACTGGTCCTGACCGTTCGCCGCAGCGGAAA
GATCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCGGT
GACAGCGAAACCACCGGTACCCAGATTCACTTCAAGGCGTCCAGCGAGACCTTCAAGA
ACATCCATTTAGCTGGGACATCCTGGCCAAGCGGATTTCGTGAACGTGCCTTCCTCAAC
TCCGGTGTCCGTATCGTTCTGAAGGACGAACGCAGTGGCAAGGAAGAGCTGTTCAAGT
ACGAAGGCGGCCCTGCGTGCGTTCTGTTGAATACCTGAACACCAACAAGACCGCGGTCAA
CCAGGTGTTCCACTTCAATGTGCAGCGTGAAGATGGCATCGGCGTGGAATCGCCCTG
CAGTGGAACGACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCAGC
GCGATGGCGGCACCCACTTGGTGGGCTTCCGTTCCGCACTGACGCGTAACCTGAACAA
CTACATCGAACAGGAAGGTCTGGCGAAGAAGCACAAAGGTCGCCACCACCGGTGACGA
TGCCCGCGAAGGCCTGACCGCGATCATTTCCGGTCAAGGTGCCGGATCCGAAGTTCAGC
TCCCAGACCAAAGACAAGCTGGTGTCTTCCGAAGTGAAGACCGCGGTTGAACAGGAAA
TGGGCAAGTACTTCTCCGACTTCTGCTGGA AAAACCCGAACGAAGCCAAGCTGGTGGT
CGGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAGGCTCGTGAGATG
ACCCGCCGTAAAGGCGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCC
AGGAAAAAGACCCTGCCCTTCCGAACCTACCTGGTGGAAGGTGACTCTGCTGGCGG
CTCCGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATTCTGCCGCTCAAGGGCAAG
ATCCTTAACGTCGAGAAAGCGCGCTTCGACAAGATGATTTCTTCGCAAGAGGTCGGCA
CCTTGATCACTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGCT
GCGTTATCACAACATCATCATCATGACCGACGCTGACGTCGACGGTTCGCACATCCGTA
CCCTGCTGCTGACCTTCTTCTTCCGTCAGCTGCCGGAGCTGATCGAGCGTGGCTACATC
TACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATCA
AAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGCC
TGCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGAA
CGACTTCCGCATGGTCATGAAAACCTCAAGCGTCTGTGCGCCTGTACCCTCAGGAGC
TGACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAACTCTCCGATCACGC
GGCCATGCAGGATTGGCTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGTCC
GGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCCAG
AGGTCGAACTGATCTCCACGGCCTGTCGAACTACGTACCTTCAACCGCGACTTCTTC
GGTAGCAATGACTACAAGACCGTCGTTACCCTCGGCGCTCAACTGAGCTCCCTGCTGG
ACGAAGGCGCTTATATTAGCGTGGCGAACGCAAGAAGGCGGTGACCGAGTTCAAGG
AAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATACAA
AGGTCTGGGCGAGATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAGCGT
GCGCCGTATGCTCAAGGTCACGATTGAAGATGCCATCGGCGCCGACCAGATCTTCAAC
ACCCTGATGGGGGATGCGGTTCGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCTGG

CGGTATCCAATCTGGACTTCTGAATGTCCGGAAAAGCGCAACAGCAGTCTCGCCTCAA
AGAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACGAC
CACCTGCCGGAGGATATTTTCAGATCCGGAACAGGTGGAAGACATCATCCGCATGATCA
ACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTGTC
CGAAGCCGATAACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCGTTGGCGGCTGT
GGAAACCGACATTGGTCGCACTACCGACCCCGTGCGTATGTACATGCGCGAAATGGGA
ACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAGAG
GGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACATCC
TCTCCGAATACTCGCGTCACCAACGAAGGTGGCCGCCTGTCCGACGTCCTGAGCGG
TTACATCGACCCGGACGACGGCATTGCGCCGCCTGCCGCCGAAGTACCACCGCCTGTC
GATGCCAAGGCTGCAAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCAGT
GACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCTTT
GGCGCCGTTGCCGACCAGATGGAAATCACCCGCAAGGCGCTGAAGAAGCACGGTCGC
GAACACAAGCAAGCCCTGGCCGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCGATCA
AACTGGTTCCGAAGCAATTCGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATCG
CCTGCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCGCATGCCA
CGCGCCGACTTCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGACG
CGCTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGCCGCCTGCAGCCGGACA
TCATCCGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATCGC
CGAGATCAAGGACATCAACCGTCGCATGTCGATCGGCGAGGCCAAGGCCCGTCGCGCG
AAGAAAGAGATGGTCGAAGCCAACCTGCGTCTGGTGATCTCCATCGCCAAGAAGTACA
CCAACCGTGGCTTGCAATTCCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGAA
AGCGGTAGACAAGTTCGAATACCGTCGCGGGCTACAAATTCTCGACTTATGCCACCTGG
TGGATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTCC
GGTGACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCAG
GAAATGGGTCGCGAACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGAG
GACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCGA
TCGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGTC
GCCAATCGATGTCGCCACCGTTGAGAGCCTTAAAGAAGCGACTCGCGAAGTACTCTCC
GGCCTCACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAATA
CCGACCACACCCTCGAGGAAGTCGGTAAGCAGTTCGACGTTACCCGTGAGCGGATTCC
TCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGCGAAGCGAGCACCT
GCGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCA
GCATTTTTTCGCGGCGAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGTT
TAACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCAACAG
ATCGTTACCCCTGACTTACCCGCATATCGGCAATACCGGCACCACGCCGGAAGACGCCG
AGTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCTCTGGTTGCGAGC
AACTGGCGTAACACCCTGTCCCTGTCCGACTACCTGAAAGCCAACAATGTCGTGGCGA
TCGCCGGTATCGACACCCGTGCGCTGACGCGCATCTGCGCGAGAAAGGTGCGCAGAA
CGGCTGCATCATGGCCGGCGACAATATCTCCGACGAAGCGGGCGATTGCCGCTGCACGC
GGCTTCCCGGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTCAGTACCAAGGAAAGCT
ACGAGTGGCGCTCCAGTGTCTGGAACCTGAAGACCGACAGTCATCCGACCATCGAAGC
TTCCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGC
GCATGCTGGTCGAACGCGGTTGCCGCGTGACCGTGGTGCTGCGCAAACCCCGGCCAG
CGAAGCTCTGGCGCTCAAGCCTGACGGTGTGTTCTGTCCAACGGCCCTGGCGACCCC
GAGCCTTGCGATTACGCCATCCAGGCGATCAAGGACGTGCTGGAGACCGAGATTCCGG
TCTTCGGTATCTGTCTGGGCCACCAACTGCTGGCACTGGCCGCCGGCGCCAAGACAGT
GAAGATGGGCCACGGCCACCACGGCGCCAACCACCCGGTCCAGGACCTGGACAGCGG
TGTGGTGATGATCACCAGCCAGAACCACGGTTTTTTCGGTGAGCGAAGCCACCCTGCCG
GGCAACGTGCGGGCGATCCACAAGTCGCTGTTCGACGGCACCCCTGCAAGGCATCGAGC
TGACCGACAAGAGCGCATTTCAGCTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAA

CGATGTGGCGCCGCTGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATG
AGTAGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCG
ACAGCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGA
AGTTCAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTGCGATGGGCTCCACCGAG
GGCTTGAAGCGCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTCTG
GTAAAGCGACCCTGGGCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGG
CCCGATCGGTGAAGAAGAGCGTTGGGGCATTACCGTCTGCGCCGACCTTCGCTGAA
CAAGCTGGCGGCAACGACCTGCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCC
CGTTCGCCAAGGGCGGTAAAGTCGGTCTGTTCCGGTGGTGCCGGTGTGGGCAAAACCGT
AAACATGATGGAACCTGATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTC
GCCGGTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATT
CCAACGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAA
ACCGTCTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCGTGACGAAGG
TAACGACGTTCTGCTGTTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAG
TATCCGCACTGCTGGGCGGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAA
GAGATGGGCGTTCGTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGA
TCCAAGCGGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACTT
CGCCCACTTGGACGCCACCGTCGTTCTGTCCCGTGACATCGCTTCCCTGGGTATCTACC
CAGCGGTAGACCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAC
CGAGCACTACGAAACCGCTCGTGGCGTTCAGTACGTGCTGCAGCGCTACAAAGAGCTG
AAGGACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGG
TATCCCGCGCTCGTAAGATCCAGCGCTTCTGTGCGAGCCGTTCTTCGTGGCTGAAGTC
TTCCTGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGG
CATCCTCAACGGTGACTACGACCATCTGCCAGAACAAAGCGTTCTACATGGTTGGTGGC
ATCGAAGAAGCGATCGAGAAAGCCAAGAAACTGTAA

NCBI Reference Sequence: NZ_CP027737.1

Strain: PCL1607

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP027737_PCL1607

GAAGTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGGTGCTTGACCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTTTCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAACCTGAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGAATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTCCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCTGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTGCTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCTTGTCTTAGTTACCAGCACGTAATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG

GCTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTAC
ACACCGCCCGTCACACCATGGGAGTGGGTGTCACCAGAAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCG
TAGGGGAACCTGCGGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTT
GGCTGCGGGCCCTGGGTGAGATCGAACGTCAATTTCGGCAAGGGTGCCGTAATGCGTATG
GGCGATCACGATCGCCAGGCGATCCCGGCCATTTCCACTGGCTCTCTGGGTCTGGACAT
CGCACTCGGCATCGGCGGCCTGCCAAAAGGCCGTATTGTTGAAATCTACGGTCCGGAA
TCGTCCGGTAAAACCACCCTGACCCTGTCGGTGATTGCCCAGGCACAGAAGATGGGCG
CCACCTGCGCCTTCGTGACGCCGAGCACGCACTGGACCCGGAGTACGCCGGCAAACCT
GGGGGTCAACGTTGACGACCTGCTGGTTTTCCAGCCGGACACCGGCGAACAGGCGCTG
GAAATCACCGACATGCTGGTGCGCTCCAATGCCATCGACGTGATCGTGATCGACTCCG
TGGCGGCGCTGGTACCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGG
GCCTGCAGGCTCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGTAACATCAAGAA
CGCCAACCTGCCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTTCG
GCAGCCCGGAAACCACCACCGGTGGTAACGCGCTGAAGTTCTACGCTTCGGTTCGTCT
GGATATCCGTCGTA CTGGCGCGGTGAAGGAAGGTGACGAAGTCGTCGGTAGCGAAACC
CGGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCCTTCCGTCAAGCTGAGTTCCAGA
TCCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGCA
CGGTTTCCTAGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTGAG
GGCAAGGCCAACTCGGCCAAGTTCTGTCAGGACAATCCGGAAATCGGTAATGCCCTCG
AGAAGCAGATTTCGCGACAAGCTGCTGGCTCCGAGCGGAGATACCAAGGCTCTGCCCCGT
CAACGAGACCATCGATGACATGGCCGACGCGGATATCTGAATGAGCGAAGAAAACAC
GTACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCCC
GGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTTCGAGG
TGGTCGACAACTCGATCGACGAAGCTCTGGCCGGCCACTGCGACGACATCAGCATCAT
CATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGAC
GTGCATAAAGAAGAAGGCGTTTCCGCGAGCCGAGGTCATCATGACCGTGCTGCACGCCG
GCGGTAAGTTTCGACGACAACTCCTACAAGGTATCCGGCGGTCTGCACGGTGTGGGTGT
GTCGGTAGTGAATGCCCTGTCCGAAGAACTGGTGCTGACCGTTCGCCGCAGTGGCAAG
ATCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCGGTG
ACAGCGAGACCACTGGTACCCAGATTCACTTCAAGGCTTCCAGCGAGACCTTCAAGAA
CATCCATTTACAGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTCTCAACT
CCGGTGTGCGGTATCGTTCTGAAGGACGAGCGCAGCGGCAAGGAAGAACTGTTCAAATA
CGAAGGCGGCCTGCGCGCGTTTCGTGCAATACCTGAACACCAACAAGACTGCGGTCAAC
CAGGTGTTCCACTTCAACGTGCAGCGTGAAGACGGCATCGGCGTGGAATCGCCCTGC
AGTGGAACGACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCAGCG
CGACGGCGGTACTCACCTGGTGGGCTTCCGCTCGGCACTGACGCGTAACCTGAACAAC
TACATCGAGCAGGAAGGTCTGGCGAAGAAGCACAAAGGTGCGCCACCACCGGTGACGAT
GCCCCGCAAGGCCTGACCGCGATCATTTCCGTCAAGGTGCCGGATCCGAAGTTCAGCT
CCCAGACCAAAGACAAGCTGGTGTCTTCCGAAGTAAAGACCGCGGTTCGAACAGGAAA
TGGGCAAGTACTTCTCCGACTTCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGT
CGGCAAGATGCTCGACGCCGCCCGCGCCCGTGAAGCGGCGCGTAAGGCCCGTGAGATG
ACCCGCCGTAAAGGTGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCC
AGGAAAAGGACCCTGCCCTTCCGAACCTCTACCTGGTGGAAGGTGACTCTGCTGGCGG
CTCCGCCAAGCAGGGACGCAACCGCAAGACCCAGGCGATTCTGCCGCTCAAGGGCAA
GATTCTTAACGTGAGAAAGCGCGCTTCGACAAGATGATTTCTCTCGCAAGAGGTGCGC
ACCTTGATCACTGCACTCGGCTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGC
TGCGTTATCACAACATCATCATCATGACCGACGCCGACGTCGACGGTTTCGCACATCCGC
ACCCTGCTGCTGACTTTCTTCTTCCGTCAGCTGCCGGAGCTGATCGAGCGTGGCTACAT

CTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATC
AAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGC
CTGCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGGCGCTGGAGCGCCTGGTGA
ACGACTTCCGCATGGTCATGAAAACCTCAAGCGTCTGTGCGCCTGTACCCTCAGGA
GCTGACCGAACACTTCATCTACCTGCCAGCCGTGAGCCTGGAGCAACTCTCCGATCAC
GCAGCGATGCAGGATTGGTTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGT
CCGGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCC
AGAGGTCGAACTGATCTCCACGGCCTGTCGAACTACGTCACCTTCAACCGCGACTTCT
TCGGCAGCAATGACTACAAGACCGTCGTCACCCTCGGGCGCTCAACTGAGCTCCCTGCT
GGACGAAGGCGCTTATATTACAGCGCGGCGAACGCAAGAAGGCGGTGACCGAGTTCAA
GGAAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATAC
AAAGGTCTGGGCGAGATGAACCCGGACCAGCTGTGGGAAACCACCATGGACCCAAGC
GTGCGCCGCATGCTCAAGGTCACCATCGAAGACGCCATCGGGCGCCGACCAGATCTTCA
ACACCCTGATGGGTGATGCGGTCGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCT
GGCGGTATCCAACCTGGACTTCTGAATGTCCGGAAGAGCGCAACAGCAGTCTCGCCTC
AAAGAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACG
ACCACCTGCCGGAGGATATTTACAGATCCGGAACAGGTGGAAGACATCATCCGCATGAT
CAACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTG
GCCGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCGTTGGCGGCT
GTGGAACCGACATTGGTCGCACTACCGACCCAGTGCGTATGTACATGCGCGAAATGG
GCACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAG
AGGGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACAT
CCTCTCCGAATACACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCCTGAGC
GGTTACATCGACCCGGATGACGGCATTGCGCCGCCTGCCGCCGAAGTACCACCGCCTG
TCGATGCCAAGGCCGCGAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCA
GTGACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCT
TTGGCGCCGTTGCCGACCAGATGGAAATCACCCGCAAGGCGCTGAAAAAGCACGGTCG
TGAACACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCAATC
AAACTGGTTCCGAAGCAATTTCGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATC
GCCTGCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCGCATGCC
ACGCGCCGACTTCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGAC
GCGCTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGCCGCCTGCAGCCGGAC
ATCATCCGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATTG
CCGAGATCAAGGACATCAACCGTCGCATGTTCGATCGGCGAGGCCAAGGCCCGTCGCGC
GAAGAAAGAGATGGTTCGAAGCCAACTTGCGCCTGGTGATCTCCATCGCCAAGAAGTAC
ACCAACCGTGGCCTGCAGTTCCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGA
AAGCGGTAGACAAGTTCGAATACCGTCGCGGCTACAAGTTCTCGACTTATGCCACCTG
GTGGATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTC
CGGTGCACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCA
GGAAATGGGTCGCGAACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGA
GGACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCG
ATCGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGT
CGCCAATCGATGTCGCCACCGTTGAGAGCCTCAAGGAAGCGACTCGCGAAGTCCTCTC
CGGCCTCACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAAT
ACCGATCACACCCTTGAGGAAGTCGGTAAGCAGTTCGACGTTACCCGTGAGCGGATTC
GTCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGAGAAGCGAGCATC
TGCGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGC
AGCATTTTTTCGCGGCGAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGT
TTAACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCCAACAG
ATCGTTACCCTGACTTACCCGCACATCGGCAACACTGGCACCAACGCCGGAAGACGCCG
AGTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTGCGACCTGCCACTGGTTGCGAGC

AACTGGCGTAACACCCTGTCCCTGTCCGACTACCTGAAAGCCAACAATGTCGTGGCGA
TCGCCGGTATCGACACCCGTCGCCTGACGCGCATCCTGCGTGAAAAAGGCGCGCAGAA
CGGCTGCATCATGGCCGGCGACAATATCTCCGACGAAGCAGCGATTGCCGCAGCGCGC
GGCTTCCCTGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTCAGCACCAAGGAAAGCT
ACGAGTGGCGCTCCAGCGTCTGGAGCCTGAAGACCGACAGTCATCCGACTATCGAGGC
TTCCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGC
GCATGCTGGTTCGAGCGCGGTTGCCGCGTGACCGTAGTGCCTGCGCAAACCCCGGCCAG
CGACGTCCTGGCACTCAAGCCTGACGGTGTGTTCTGTCCAACGGTCCTGGTGACCCCG
AGCCTTGCATTACGCCATCCAGGCGATCAAGGACGTGCTGGAAACCGAGATTCCGGT
CTTCGGTATCTGCCTGGGCCACCAACTGCTGGCACTGGCCTCCGGCGCCAAGACGGTG
AAGATGGGCCACGGTCACCACGGTGCCAACCACCCGGTCCAGGACCTGGACAGCGGTG
TAGTGATGATCACTAGCCAGAACCACGGTTTTGCGGTGGACGAAGCCACCCTGCCGGG
CAACGTGCGGGCGATCCACAAGTCGCTGTTTCGACGGCACCCCTGCAAGGCATCGAGCGT
ACCGACAAGAGTGCATTTCAGCTTCCAGGGGCCACCCTGAAGCGAGCCCGGGCCCGAACG
ATGTGGCGCCGCTGTTTCGATCGTTTCATCAACGAGATGGTCAAGCGACGCTGAATGAG
TAGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGAC
AGCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGAAG
TTCAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTGCGATGGGCTCCACCGAGGG
CTTGAAGCGCGGTCTGGACGTCAACAACACTGGGCGCAGCCATCTCCGTACCGGTCTGGT
AAAGCGACCCTGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGGCC
CGATCGGCGAAGAAGAGCGTTGGGGCATTACCGTCTGCGCCGACCTTCGCTGAACA
AGCTGGCGGCAACGACCTCCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCCCG
TTCGCCAAGGGCGGTAAAGTCGGTCTGTTTCGGTGGTGCCGGTGTGGGCAAACCGTAA
ACATGATGGAAGTATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTCGCC
GGTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTCCA
ACGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAACC
GTCTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGGTAA
CGACGTTCTGCTGTTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGTAT
CCGCACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAAGA
GATGGGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGATC
CAAGCGGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACCTTCG
CCCCTTGGACGCCACCGTCGTAAGTGTCCCGTGACATCGCTTCCCTGGGTATCTACCCA
GCGGTAGACCCACTGGATTTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAACG
AGCACTACGAAACTGCTCGCGGCGTTTCAGTACGTGCTGCAGCGCTACAAAGAGCTGAA
GGACATCATTGCGATCCTGGGTATGGACGAAGTGTCCGAAGCCGACAAGCAACTGGTA
TCCCGCGCTCGTAAGATCCAGCGCTTCCCTGTCGACGCCGTTCTTCGTGGCTGAAGTCTT
CACTGGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGGC
ATCCTCAACGGTGACTACGACCACCTGCCAGAACAGCGTTCTACATGGTCGGCGGCA
TCGAAGAAGCGATCGAGAAAGCCAAGAACTGTAA

RAST server Genome ID: 286.2086

Strain: ST9

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>ID_286.2086_ST9

GAACTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGAAGCTTGCTTCTTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTCCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAAGTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA

AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTAAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAAGTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTTCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTACGCTCGTGTCTGTGAGATGTTGGGTTAAGTCCCGTAACGAG
CGCAACCCTTGTCTTAGTTACCAGCACGTTATGGTGGGCACTCTAAGGAGACTGCCGG
TGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGGG
CTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTAA
TCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCGG
AATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTACA
CACCGCCCGTCACACCATGGGAGTGGGTTGCACCAGAAGTAGCTAGTCTAACCTTCGG
GAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCGT
AGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTTG
GCTGCGGCCCTGGGTCAGATCGAACGTCAATTCGGCAAGGGTGCCGTAATGCGTATGG
GCGATCACGACCGCCAGGCGATCCCGGCCATTTCCACTGGCTCTCTGGGTCTGGACATC
GCACTCGGCATCGGCGGCCTGCCAAAAGGCCGTATTGTTGAAATCTACGGTCCGGAAT
CGTCCGGTAAAACCACCCTGACCCTGTCGGTGATTGCCCAGGCACAGAAGATGGGCGC
CACCTGCGCCTTCGTGACGCGGAGCACGCACTGGACCCGGAATACGCCGGCAAACCTG
GGGGTCAACGTTGACGACCTGCTGGTTTCCAGCCGGACACCGGCGAACAGGCGCTGG
AAATCACCGACATGCTGGTGCGCTCCAATGCCATCGACGTGATCGTGATCGACTCCGT
GGCGGCACTGGTACCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGGG
CCTGCAGGCCCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGTAACATCAAGAAC
GCCAACTGCCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTCCG
CAGCCCGGAAACCACCACCGGTGGTAACGCGCTGAAGTTCTACGCTTCGGTTCGTCTG
GACATCCGTCTGACTGGCGCGGTGAAGGAAGGCGACGAAGTCGTCCGTAGCGAAACC
CGGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCGTTCCGTACAGGCTGAATTCCAGA
TCCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGCA
CGGTTTCCTCGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTACG
GGCAAGGCCAACTCGGCCAAGTTCTGCAGGACAATCCGGAAATCGGCAATGCCCTCG
AGAAGCAGATTTCGCGACAAGCTGCTGGCTCCAACCGCTGATGTCAAAGCTTCGCCGGT
CAACGAGACCATCGATGACATGGCTGACGCGGATATCTGAATGAGCGAAGAAAACAC
GTACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCCC
GGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTTCGAGG
TGGTCGATAACTCGATCGACGAAGCTCTGGCCGGCCACTGCGACGACATCAGCATCAT
CATCCACCCAGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGAC
GTGCATAAAGAAGAAGGCGTTTCCGCGGCCGAGGTCATCATGACTGTGCTGCACGCCG
GCGGTAAGTTCGACGACAACCTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGTGT
GTCGGTAGTGAACGCCCTGTCCGAAGAACTGGTCCTGACCGTTCGCCGCAGTGGCAAG
ATCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCGGTG
ACAGTGAAACCACCGGTACCCAGATTCACTTCAAGGCTTCCAGCGAGACCTTCAAGAA
CATCCATTTACAGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTCCTCAACT
CCGGTGTCCGTATCGTTCTGAAGGACGAGCGCAGCGGCAAGGAAGAACTGTTCAAGTA
CGAAGGCGGTCTGCGTGCGTTTCGTTGAATACCTGAACACCAACAAGACCGCGGTCAAC
CAGGTGTTCCACTTCAATGTGCAGCGTGAAGATGGCATCGGCGTGGAATCGCCCTGC

AGTGGAACGACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCAGCG
CGACGGCGGGCACCCTTGGTGGGCTTCCGTTCCGGCACTGACACGTAACCTGAACAAC
TACATCGAACAGGAAGGTCTGGCGAAGAAGCACAAAGGTCGCCACCACCGGTGACGAT
GCCCCGGAAGGCCTGACCGCGATCATTTCCGGTCAAGGTGCCGGATCCGAAGTTCAGCT
CCCAGACCAAAGACAAGCTGGTGTCTTCCGAAGTGAAGACCGCGGTTCGAACAGGAAA
TGGGCAAGTACTTCTCCGACTTCCCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGT
CGGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAGGCTCGCGAGATG
ACCCGCCGTAAAGGTGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCC
AGGAAAAAGACCCTGCCCTTTCGAACTCTACCTGGTGGAAAGGTGACTCTGCTGGCGG
CTCCGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATTCTGCCGCTCAAGGGCAAG
ATCCTTAACGTGAGAAAGCGCGTTTCGACAAGATGATTTCTCGCAAGAGGTCTGGCA
CCTTGATCACTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGCT
GCGTTATCACAACATCATCATGACCGACGCCGACGTCGACGGTTCGCACATCCGT
ACCCTGCTGCTGACCTTCTTCTTCCGTCAGCTGCCGGAGCTGATCGAGCGTGGCTACAT
CTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATC
AAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGC
CTGCACCTGAACGAAGACGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGA
ACGACTTCCGCATGGTCATGAAAACCTCAAGCGTCTGTGCGGCCTGTACCCTCAGGA
GCTGACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAGCTCTCCGATCAC
GCGGCGATGCAGGATTGGCTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGT
CCGGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCC
AGAGGTCGAACTGATCTCCACGGCCTGTCGAACTACGTCACCTTCAACCGCGACTTCT
TCGGCAGCAATGACTACAAGACCGTCGTCACCCTCGGTGCTCAACTGAGCTCCCTGCTG
GACGAAGGCGCTTATATTCAGCGTGGCGAACGCAAGAAGGCAGTGACCGAGTTCAAG
GAAGCCCTGGACTGGCTGATGACCGAAAGTACCAAGCGCCACACCATCCAGCGATACA
AAGGTCTGGGCGAGATGAACCCGGATCAGCTGTGGGAAACCACTATGGACCCAAGCGT
GCGCCGTATGCTCAAGGTCACCATCGAAGACGCCATCGGCCGCCGACCAGATCTTCAAC
ACCCTGATGGGTGATGCGGTGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCTGG
CGGTATCCAACCTGGACTTCTGAATGTCCGGAAAAGCGCAACAGCAGTCTCGCCTCAA
AGAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACGAC
CACCTGCCGGAGGATATTTAGATCCGGAACAGGTGGAAGACATCATCCGCATGATCA
ACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTTGGC
CGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCTTGGCGGCTGT
GGAAACCGACATTGGTCGCACTACCGACCCCGTGCGTATGTACATGCGCGAAATGGGT
ACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAGAG
GGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACATCC
TCTCCGAATACACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCCTGAGCGG
TTACATCGACCCGGACGACGGTATTGCGCCGCCTGCCGCCGAAGTACCACCGCCTGTC
GATGCCAAGGCCGCAAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCAGT
GACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTTCATCGCAGCCCAGCGCTTT
GGCGCCGTTGCCGACCAGATGGAAATTACCCGCAAGGCGCTGAAAAAGCACGGTTCG
GAACACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAGCTGTTTCATGCCGATCA
AACTGGTTCCGAAGCAATTCGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATCG
CCTGCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCCGATGCCA
CGCGCCGACTTCCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGACG
CACTGGCCAAAGGCAAGGCCAAGTACGCCGAATCCATTGGCCGCCTGCAGCCGGATAT
CATCCGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATCGCC
GAGATCAAGGACATCAACCGTCGCATGTCGATCGGCGAGGCCAAGGCCCGTCGCGCGA
AGAAAGAGATGGTCGAAGCCAACTTGCGTCTGGTGATCTCCATCGCCAAGAAGTACAC
CAACCGTGGCCTGCAATTCCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGAAA
GCGGTAGACAAGTTCGAATACCGTCGCGGCTACAAGTTCTCGACTTATGCCACCTGGT

GGATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTCC
GGTGCACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCAG
GAAATGGGTGCGGAACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGAA
GACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCGA
TCGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGTC
GCCAATCGATGTCGCCACCGTTGAGAGCCTTAAAGAAGCGACTCGCGAAGTACTCTCC
GGCCTCACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAATA
CCGACCACACCCTCGAGGAAGTCGGTAAGCAGTTCGACGTTACCCGTGAGCGGATTTCG
TCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGCGAAGCGAGCACCT
GCGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCA
GCATTTTTCGCGGCGAAGCCATTGGAGCCGACGGTCAGACCGTTGGTGAGGTGGTGTT
TAACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCAACAG
ATCGTTACCCCTGACTTACCCGCACATCGGCAATACCGGCACCACGCCGGAAGACGCCG
AGTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCACTGGTTGCGAGC
AACTGGCGTAACACCCTGTCCCTGTCCGACTACCTGAAAGCCAACAACGTTGTGGCGA
TCGCCGGTATCGACACCCGTGCGCTGACGCGCATCCTGCGCGAGAAAGGCGCGCAGAA
CGGCTGCATCATGGCCGGCGACAATATCTCCGACGAAGCGGCGATTGCCGCTGCGCGC
GGCTTCCCTGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTCAGCACCAAGGAAAGCT
ACGAATGGCGTTCCAGCGTCTGGAGCCTGAAGACCGACAGTCATCCGACCATCGAGGC
TTCCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGC
GCATGCTGGTCGAGCGCGGTTGCCGCGTGACCGTGGTACCTGCGCAAACCCCGGCCAG
CGACGTCTGGCGCTCAAGCCTGACGGTGTGTTTCTGTCCAACGGTCTTGCGACCCCG
AGCCTTGCGATTACGCGATCCAGGCGATCAAGGACGTGCTGGAGACCGAGATCCCGGT
CTTCGGTATCTGCCTGGGCCACCAACTGCTGGCGCTGGCCGCCGGCGCCAAGACAGTG
AAGATGGGCCACGGCCACCACGGTGCCAACCACCCGGTCCAGGACCTGGACAGCGGT
GTAGTGATGATCACCAGCCAGAACCACGGTTTTTGCGGTGGACGAAACCACCCTGCCGG
GCAACGTGCGGGCGATCCACAAGTCGCTGTTCGACGGCACCCCTGCAAGGCATCGAGTT
GACCGACAAGAGCGCATTCAGCTTCCAGGGGCACCCTGAAGCGAGCCCGGGCCCGAA
CGATGTGGCGCCGCTGTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATG
AGTAGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCG
ACAGCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGA
AGTTCAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTGCGATGGGCTCCACCGAG
GGCTTGAAGCGCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTCC
GTAAAGCGACCCTGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGG
CCCGATCGGCGAAGAAGAGCGTTGGGGCATTACCGTCTGCGCCGACCTTCGCTGAA
CAAGCTGGCGGCAACGACCTGCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCC
CGTTCGCCAAGGGCGGTAAAGTCGGTCTGTTCGGTGGTGCCGGTGTGGGGCAAAACCGT
AAACATGATGGAACCTGATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTT
GCCGGTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATT
CCAACGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAA
ACCGTCTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGG
TAACGACGTTCTGCTGTTCTGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAG
TATCCGCACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAA
GAGATGGGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGA
TCCAAGCGGTATACGTGCCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACTT
CGCCCACTTGGACGCCACCGTCGTTCTGTCCCGTGACATCGCTTCCCTGGGTATCTACC
CAGCGGTAGACCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAA
CGAGCACTACGAAACCGCTCGCGGCGTTTCAGTACGTGCTGCAGCGCTACAAAGAGCTG
AAGGACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGG
TATCCCGCGCTCGTAAGATCCAGCGCTTCTGTGCGAGCCGTTCTTCGTGGCTGAAGTC
TTCCTGGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGG

CATCCTCAACGGTGACTACGACCATCTGCCAGAACAAGCGTTCTACATGGTTGGTGGC
ATCGAAGAAGCGATCGAGAAAGCCAAGAACTGTAA

NCBI Reference Sequence: NZ_CP027708.1

Strain: ATCC17411

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP027708_ATCC17411

GAAGTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGGTGCTTGACCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTTTCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGAATGTGAAATCCCCGGGCTCAACCTGGGAAGTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTCCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTGTCGTGAGATGTTGGGTTAAGTCCCGTAACGAG
CGCAACCCTTGTCTTAGTTACCAGCACGTAATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG
GCTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTA
ACACCGCCCGTCACACCATGGGAGTGGGTTGCACCAGAAAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCG
TAGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTT
GGCTGCGGCCCTGGGTGAGATCGAACGTCAATTCGGCAAGGGTGCCGTAATGCGTATG
GGCGATCACGATCGCCAGGCGATCCCGGCCATTTCCTACTGGCTCTCTGGGTCTGGACAT
CGCACTCGGCATCGGCGGCCTGCCAAAAGGCCGTATTGTTGAAATCTACGGTCCGGAA
TCGTCCGGTAAAACCAACCTGACCCTGTCGGTGATCGCCAGGCACAGAAGATGGGCG
CCACCTGCGCCTTCGTCGACGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAACCT
GGGGGTCAACGTTGACGACCTGCTGGTTTCCAGCCGGACACCGGCGAACAGGCGCTG
GAAATCACCGACATGCTGGTGCCTCCAATGCCATCGACGTGATCGTGATCGACTCCG
TGGCGGCGCTGGTACCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGG
GCCTGCAGGCTCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGTAACATCAAGAA
CGCCAACTGCCTGGTGTCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTTCG
GCAGCCCGGAAACCAACCGGTGGTAACGCGCTGAAGTTCTACGCTTCGGTTCGTCT
GGACATCCGTCGTAAGTGGCGCGGTGAAGGAAGGTGACGAAGTCGTCGGTAGCGAAAC
CCGGGTCAAGATCGTCAAGAACAAAGGTGGCTCCACCTTTCCGTCAAGCTGAGTTCAG
ATCCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGC
ACGGTTTTCCTCGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTCA
GGGCAAGGCCAACTCGGCCAAGTTTCTGCAAGGACAATCCGGAAATCGGTAAATGCCCTC
GAGAAGCAGATTCGCGACAAGCTGCTGGCTCCGAGCGGAGATACCAAGGCTCTGCCCCG

TCAACGAGACCATCGATGACATGGCCGACGCGGATATCTGAATGAGCGAAGAAAACA
CGTACGACTCGAGCAGCATTAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCC
CGGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTCGAG
GTGGTCGACAACTCGATCGACGAAGCTCTGGCCGGCCACTGCGACGACATCAGCATCA
TCATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGA
CGTGCATAAAGAAGAAGGCGTTTCCGCAGCCGAGGTCATCATGACCGTGCTGCACGCC
GGCGGTAAGTTCGACGACAACTCCTACAAGGTATCCGGCGGTCTGCACGGTGTGGGTG
TGTCGGTAGTGAACGCCCTGTCCGAAGAACTGGTGCTGACCGTTCGCCGCAGTGGCAA
GATCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCAATTGTCGGT
GACAGCGAGACCACCGGTACCCAGATTCACTTCAAGGCTTCCAGCGAGACCTTCAAGA
ACATCCATTTAGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTCCTCAAC
TCCGGTGTCGGTATCGTTCTGAAGGACGAGCGCAGCGGCAAGGAAGAGCTGTTCAAGT
ACGAAGGCGGCCTGCGCGCATTCGTTGAATACCTGAACACCAACAAGACTGCGGTCAA
CCAGGTGTTCCACTTCAACGTGCAGCGTGAAGACGGCATCGGCGTGGAATCGCCCTG
CAGTGGAACGACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCAGC
GCGACGGCGGCACCCACCTGGTGGGCTTCCGCTCGGCACTGACGCGTAACCTGAACAA
CTACATCGAGCAGGAAGGTCTGGCGAAGAAGCACAAGGTGGCCACCACCGGTGACGA
TGCCCGCGAAGGCCTGACCGCGATCATTTCCGGTCAAGGTGCCGGATCCGAAGTTCAGC
TCCCAGACCAAAGATAAGCTGGTGTCTTCCGAAGTGAAGACCGCAGTCGAACAGGAAA
TGGGCAAGTACTTCTCCGACTTCCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGT
CGGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAGGCTCGTGAGATG
ACCCGCCGTAAAGGTGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCC
AGGAAAAGGACCCTGCCCTTCCGAACCTCTACCTGGTGGAAAGGTGACTCTGCTGGCGG
CTCCGCCAAGCAGGGACGCAACCGCAAGACCCAGGCGATTCTGCCGCTCAAGGGCAA
GATTCTTAACGTCGAGAAAGCGCGCTTCGACAAGATGATTTCTCGCAAGAGGTCCGC
ACCTTGATCACTGCACTCGGCTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGC
TGCGTTATCACAAACATCATCATCATGACCGACGCCGACGTCGACGGTTCGCACATCCGC
ACCCTGCTGCTGACTTTCTTCTTCCGTCAGCTGCCGGAGCTGATCGAGCGTGGCTACAT
CTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATC
AAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGC
CTGCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGA
ACGACTTCCGCATGGTCATGAAAACCTCAAGCGCCTGTGCGGCCTGTACCCTCAGGA
GCTGACCGAACACTTCATCTACCTGCCAGCCGTGAGCCTGGAGCAACTCTCCGATCAC
GCAGCGATGCAGGATTGGTTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGT
CCGGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCC
AGAGGTCGAACTGATCTCCACGGCCTGTCGAACTACGTCACCTTCAACCGCGACTTCT
TCGGCAGCAATGACTACAAGACCGTCGTCACCCTCGGCGCTCAACTGAGCTCCCTGCT
GGACGAAGGCGCTTATATTAGCGTGCGCAACGCAAGAAGGCGGTGACCGAGTTCAA
GGAAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATAC
AAAGGTCTGGGCGAGATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAGC
GTGCGCCGATGCTCAAGGTCACCATCGAAGACGCCATCGGCGCCGACCAGATCTTCA
ACACCCTGATGGGTGATGCGGTCGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCT
GGCGGTATCCAACCTGGACTTCTGAATGTCCGGAAGCGCAACAGCAGTCTCGCCTC
AAAGAGTTGATCAGCCGTGGTCTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACG
ACCACCTGCCGGAGGATATTTAGATCCGGAACAGGTGGAAGACATCATCCGCATGAT
CAACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTG
GCCGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCTTGGCGGCT
GTGGAACCGACATTGGTCGCACTACCGACCCAGTGCGTATGTACATGCGCGAAATGG
GCACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAG
AGGGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACAT
CCTCTCCGAATACACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCCTGAGC

GGTTACATCGACCCGGATGACGGCATTGCGCCGCCTGCCGCCGAAGTACCACCGCCTG
TCGATGCCAAGGCCGCGAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCA
GTGACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCT
TTGGCGCCGTTGCCGACCAGATGGAAATCACCCGCAAGGCGCTGAAAAAGCACGGTCG
CGAACACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCGATC
AACTGGTTCCGAAGCAATTTCGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATC
GCCTGCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCGCATGCC
ACGCGCCGACTTCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGAC
GCGCTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGCCGCCTGCAGCCGGAC
ATCATCCGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATTG
CCGAGATCAAGGACATCAACCGTCGCATGTCGATCGGCGAGGCCAAGGCCCGTCGCGC
GAAGAAAGAGATGGTTCGAAGCCAACTTGCGCCTGGTGATCTCCATCGCCAAGAAGTAC
ACCAACCGTGGCCTGCAGTTCCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGA
AAGCGGTAGACAAGTTCGAATACCGTCGCGGCTACAAGTTCTCGACTTATGCCACCTG
GTGGATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTC
CGGTGCACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCA
GGAAATGGGTCGCGAACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGA
GGACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCG
ATCGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGT
CGCCAATCGATGTCGCCACCGTTGAGAGCCTCAAGGAAGCGACTCGCGAAGTCCTCTC
CGGCCTCACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAAT
ACCGACCACACCCTTGAGGAAGTCGGTAAGCAGTTTCGACGTTACCCGTGAGCGGATTC
GTCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGAGAAGCGAGCATC
TGCGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGC
AGCATTTTTTCGCGGCGAAGCCATTGGAGCCGACGGTCAGACCGTTGGTGAGGTGGTGT
TTAACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCCCAACAG
ATCGTTACCCTGACTTACCCGCACATCGGCAACACTGGCACCCACGCCGGAAGACGCCG
AGTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCACTGGTTGCGAGC
AACTGGCGTAACACCCTGTCCCTGTCCGATTACCTGAAAGCCAACAATGTCGTGGCGA
TCGCCGGTATCGACACCCGTGCGCTGACGCGCATCCTGCGCGAGAAAGGCGCACAGAA
CGGCTGCATCATGGCCGGCGACAACATCTCCGACGAAGCGGCGATTGCTGCTGCACGC
GGCTTCCCTGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTCAGCACCAAGGAAAGCT
ACGAGTGGCGCTCCAGCGTCTGGAGCCTGAAGACCGACAGTCATCCGACTATCGAGGC
TTCCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGC
GCATGCTGGTCGAGCGCGGTTGCCGCGTGACCGTAGTGCCTGCGCAAACCCCGGCCAG
CGACGTCTGGCACTCAAGCCTGACGGTGTGTTCTGTCCAACGGTCTGGCGACCCCG
AGCCTTGCGATTACGCCATCCAGGCGATCAAGGACGTGCTGGAAACCGAGATTCCGGT
CTTCGGTATCTGCCTGGGCCACCAACTGCTGGCACTGGCCTCCGGCGCCAAGACGGTG
AAAATGGGCCACGGCCACCACGGCGCCAACCACCCGGTCCAGGACCTGGACAGCGGT
GTGGTGATGATCACCAGCCAGAACCACGGTTTTGCGGTGGACGAAACCACCCTGCCGG
GCAACGTGCGGGCGATCCACAAGTCGCTGTTTCGATGGCACCTGCAAGGCATCGAGCG
TACCGACAAGAGCGCATTTCAGCTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAAC
GATGTGGCGCCGCTGTTTCGATCGTTTTTCATCAACGAGATGGCCAAGCGACGCTGAATGA
GTAGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGA
CAGCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGAA
GTTTCAGCAGCAGCTGGGCGACGGCGTGTTACGTACCATTTGCGATGGGCTCCACCGAGG
GCTTGAAGCGCGGTCTGGACGTCAACAACACTGGCGCCGCCATCTCCGTACCGGTCCG
TAAAGCGACCCTGGGCCGGATCATGGACGTGCTGGGCAACCCGATCGACGAAGCTGGC
CCGATCGGCGAAGAAGAGCGTTGGGGCATTACCCGTCCTGCGCCGACCTTCGCTGAAC
AAGCTGGCGGCAACGACCTCCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCC
GTTCCGCAAGGGCGGTAAAGTCGGTCTGTTCCGTGGTGCCGGTGTGGGCAAAACCGTA

AACATGATGGAAGTATGATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTCG
CTGGTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTC
CAACGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAA
CCGTCTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGGT
AACGACGTTCTGCTGTTCTGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGT
ATCCGCACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAA
GAGATGGGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGA
TCCAAGCGGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACCTT
CGCCCACTTGGACGCCACCGTCGTACTGTCCCGTGACATCGCTTCCCTGGGTATCTACC
CAGCGGTAGACCCACTGGATTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAA
CGAGCACTACGAAACCGCTCGCGGCGTTACGTACGTGCTGCAGCGCTACAAAGAGCTG
AAGGACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGG
TATCCCGCGCTCGTAAGATCCAGCGCTTCCGTGTCGAGCCGTTCTTCGTGGCTGAAGTC
TTCCTGGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGG
CATCCTCAACGGTGACTACGACCACCTGCCAGAACAAGCGTTCTACATGGTCGGCGGC
ATCGAAGAAGCGATCGAGAAAGCCAAGAACTGTAA

NCBI Reference Sequence: NZ_CP027722.1

Strain: C50

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP027722_C50

GAAGTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGAAGCTTGCTTCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTTTCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGTCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAAGTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAAGTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGCGGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTTCCCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCCTTGTCCTTAGTTACCAGCACGTCATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG
GCTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGATC
ACACCGCCCGTCACACCATGGGAGTGGGTTGCACCAGAAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCG
TAGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTT
GGCTGCGGCCCTGGGTGAGATCGAACGTCAATTTCGGCAAGGGTGCCGTAATGCGTATG
GGCGATCACGATCGCCAGGCGATCCCGGCCATTTCCTACTGGCTCTCTGGGTCTGGACAT
CGCGCTCGGCATCGGCGGCCTGCCAAAAGGCCGTATTGTTGAAATCTACGGTCCGGAA

TCGTCCGGTAAAACCACCCTGACCCTGTCCGTGATTGCCCAGGCACAGAAGATGGGCG
CCACCTGCGCCTTCGTGACGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAACCT
GGGGGTCAACGTTGACGACCTGCTGGTTTCCAGCCGGACACCGGCGAACAGGGCGCTG
GAAATCACCGACATGCTGGTGCGCTCCAATGCCATCGACGTGATCGTGATCGACTCCG
TGGCGGCACTGGTACCCAAGGCCGAGATCGAAGGCCGAGATGGGCGACATGCACGTGG
GCCTGCAGGCCCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGTAACATCAAGAA
CGCCAACCTGTCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTTCG
GCAGCCCGGAAACCACCACCGGCGGTAACGCGCTGAAGTTCTACGCCTCGGTTTCGTCT
GGACATCCGTCGTA CTGGCGCGGTGAAGGAAGGCGACGAAGTCGTCGGTAGCGAAAC
CCGGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCGTTCCGTCAGGCTGAATTCCAG
ATCCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGC
ACGGTTTTCCTCGAGAAGTCCGGTGCTGACAGCTACCAGGGCAACAAGATCGGTCA
GGGCAAGGCCAACTCGGCCAAGTTTCTGCAGGACAATCCGGAAATCGGCAATGCCCTC
GAGAAGCAGATTCGCGACAAGCTGCTGGCTCCAACCGCTGATGTCAAAGCTTCGCCGG
TCAACGAGACCATCGATGACATGGCTGACGCGGATATCTGAATGAGCGAAGAAAACA
CGTACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCC
CGGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTTCGAG
GTGGTCGATAACTCGATCGACGAAGCTCTGGCCGGCCATTGCGACGACATCAGCATCA
TCATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGA
CGTGCATAAAGAAGAAGGCGTTTCCGCGGCCGAGGTCATCATGACCGTACTGCACGCC
GGCGGTAAGTTCGACGATAACTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGTG
TGTCGGTAGTGAACGCCCTGTCCGAAGAACTGGTCCTGACCGTTCGCCGCAGCGGAAA
GATCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCGGT
GACAGCGAAACCACCGGTACCCAGATTCACTTCAAGGCGTCCAGCGAGACCTTCAAGA
ACATCCATTTTCAGCTGGGACATCCTGGCCAAGCGGATTCGTGAAGTGTCTTCTCTAAC
TCCGGTGTCGGTATCGTTCTGAAGGACGAACGCAGTGGCAAGGAAGAGCTGTTCAAGT
ACGAAGGCGGCCTGCGTGCGTTTCGTTGAATACCTGAACACCAACAAGACCGCGGTCAA
CCAGGTGTTCCACTTCAATGTGCAGCGTGAAGATGGCATCGGCGTGGAATCGCCCTG
CAGTGGAACGACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCAGC
GCGATGGCGGCACCCACTTGGTGGGCTTCCGTTCCGGCACTGACGCGTAACCTGAACAA
CTACATCGAACAGGAAGGTCTGGCGAAGAAGCACAAGGTCGCCACCACCGGTGACGA
TGCCCGCGAAGGCCTGACCGCGATCATTTCCGGTCAAGGTGCCGGATCCGAAGTTCAGC
TCCCAGACCAAAGACAAGCTGGTGCTTCCGAAGTGAAGACCGCGGTTGAACAGGAAA
TGGGCAAGTACTTCTCCGACTTCCCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGT
CGGCAAGATGCTCGACGCCGCCCGTGGCCGTGAAGCGGCGCGTAAGGCTCGTGAGATG
ACCCGCCGTAAAGGCGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCC
AGGAAAAAGACCCTGCCCTTTCGAACCTCTACCTGGTGGAAGGTGACTCTGCTGGCGG
CTCCGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATTCTGCCGCTCAAGGGCAAG
ATCCTTAACGTCGAGAAAGCGCGCTTCGACAAGATGATTTCTCTCGCAAGAGGTTCGGCA
CCTTGATCACTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGCT
GCGTTATCACAACATCATCATCATGACCGACGCTGACGTCGACGGTTCGCACATCCGTA
CCCTGCTGCTGACCTTCTTCTTCCGTGAGCTGCCGGAGCTGATCGAGCGTGGCTACATC
TACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATCA
AAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGCC
TGCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGAA
CGACTTCCGCATGGTCATGAAAACCCTCAAGCGTCTGTGCGGCCTGTACCCTCAGGAGC
TGACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAACTCTCCGATCACGC
GGCCATGCAGGATTGGCTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGTCC
GGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCCAG
AGGTGCAACTGATCTCCACGGCCTGTCGAACTACGTCACCTTCAACCGCGACTTCTTC
GGTAGCAATGACTACAAGACCGTCGTTACCCTCGGCGCTCAACTGAGCTCCCTGCTGG

ACGAAGGCGCTTATATTCAGCGTGGCGAACGCAAGAAGGCGGTGACCGAGTTCAAGG
AAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATACAA
AGGTCTGGGCGAGATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAGCGT
GCGCCGTATGCTCAAGGTCACGATTGAAGATGCCATCGGCGCCGACCAGATCTTCAAC
ACCCTGATGGGGGATGCGGTCGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCTGG
CGGTATCCAATCTGGACTTCTGAATGTCCGGAAGCGCAACAGCAGTCTCGCCTCAA
AGAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACGAC
CACCTGCCGGAGGATATTTTCAGATCCGGAACAGGTGGAAGACATCATCCGCATGATCA
ACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTGTCG
CGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCGTTGGCGGGCTGT
GGAAACCGACATTGGTCGCACTACCGACCCCGTGCGTATGTACATGCGCGAAATGGGA
ACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAGAG
GGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACATCC
TCTCCGAATACACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCCTGAGCGG
TTACATCGACCCGGACGACGGCATTGCGCCGCCTGCCGCCGAAGTACCACCGCCTGTC
GATGCCAAGGCTGCAAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCAGT
GACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCTTT
GGCGCCGTTGCCGACCAGATGGAAATCACCCGCAAGGCGCTGAAGAAGCACGGTCGC
GAACACAAGCAAGCCCTGGCCGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCGATCA
AACTGGTTCCGAAGCAATTCGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATCG
CCTGCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCGCATGCCA
CGCGCCGACTTCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGACG
CGCTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGCCGCCTGCAGCCGGACA
TCATCCGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATCGC
CGAGATCAAGGACATCAACCGTCGCATGTCGATCGGCGAGGCCAAGGCCCGTCGCGCG
AAGAAAGAGATGGTCGAAGCCAACCTGCGTCTGGTGATCTCCATCGCCAAGAAGTACA
CCAACCGTGGCTTGCAATTCCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGAA
AGCGGTAGACAAGTTTCAATACCGTCGCGGCTACAAATTCTCGACTTATGCCACCTGG
TGGATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTCC
GGTGACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCAG
GAAATGGGTCGCGAACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGAG
GACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCGA
TCGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGTC
GCCAATCGATGTCGCCACCGTTGAGAGCCTTAAAGAAGCGACTCGCGAAGTACTCTCC
GGCCTCACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAATA
CCGACCACACCCTCGAGGAAGTCGGTAAGCAGTTTCGACGTTACCCGTGAGCGGATTCCG
TCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGCGAAGCGAGCACCT
GCGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCA
GCATTTTTCGCGGCGAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGTT
TAACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCTACGCCCAACAG
ATCGTTACCCTGACTTACCCGCATATCGGCAATACCGGCACCACGCCGGAAGACGCCG
AGTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCTCTGGTTGCGAGC
AACTGGCGTAACACCCTGTCCCTGTCCGACTACCTGAAAGCCAACAATGTCGTGGCGA
TCGCCGGTATCGACACCCGTGCGCTGACGCGCATCCTGCGCGAGAAAGGTGCGCAGAA
CGGCTGCATCATGGCCGGCGACAATATCTCCGACGAAGCGGCGATTGCCGCTGCACGC
GGCTTCCCGGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTACGTACCAAGGAAAGCT
ACGAGTGGCGCTCCAGTGTCTGGAACCTGAAGACCGACAGTCATCCGACCATCGAAGC
TTCCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGC
GCATGCTGGTTCGAACGCGGTTGCCGCGTGACCGTGGTGCTGCGCAAACCCCGGCCAG
CGAAGCTCTGGCGCTCAAGCCTGACGGTGTGTTTCTGTCCAACGGCCCTGGCGACCCC
GAGCCTTGCGATTACGCCATCCAGGCGATCAAGGACGTGCTGGAGACCGAGATTCCGG

TCTTCGGTATCTGTCTGGGGCCACCAACTGCTGGCACTGGCCGCCGGGCGCCAAGACAGT
GAAGATGGGGCCACGGCCACCACGGCGCCAACCACCCGGTCCAGGACCTGGACAGCGG
TGTGGTGATGATCACCAGCCAGAACCACGGTTTTTGCGGTGGACGAAGCCACCCTGCCG
GGCAACGTGCGGGCGATCCACAAGTCGCTGTTCGACGGCACCCCTGCAAGGCATCGAGC
TGACCGACAAGAGCGCATTTCAGCTTCCAGGGCCACCCTGAAGCGAGCCCCGGGCCCCGAA
CGATGTGGCGCCCGCTGTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATG
AGTAGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCG
ACAGCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGA
AGTTCAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTTGCGATGGGCTCCACCGAG
GGCTTGAAGCGCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTTCG
GTAAAGCGACCCTGGGCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGG
CCCGATCGGTGAAGAAGAGCGTTGGGGCATTACCGTTCCTGCGCCGACCTTCGCTGAA
CAAGCTGGCGGCAACGACCTGCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCC
CGTTCGCCAAGGGCGGTAAAGTCGGTCTGTTCGGTGGTGCCGGTGTGGGCAAAACCGT
AAACATGATGGAAGTATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTC
GCCGGTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATT
CCAACGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAA
ACCGTCTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAAGTTCCGTGACGAAGG
TAACGACGTTCTGCTGTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAG
TATCCGCACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAA
GAGATGGGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGA
TCCAAGCGGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACTT
CGCCCCTTGGACGCCACCGTCGTTCTGTCCCGTGACATCGCTTCCCTGGGTATCTACC
CAGCGGTAGACCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAC
CGAGCACTACGAAACCGCTCGTGGCGTTTACGTACGTGCTGCAGCGCTACAAAGAGCTG
AAGGACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGG
TATCCCGCGCTCGTAAGATCCAGCGCTTCCGTGTCGAGCCGTTCTTCGTGGCTGAAGTC
TTCCTGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGG
CATCCTCAACGGTGACTACGACCATCTGCCAGAACAAGCGTTCTACATGGTTGGTGGC
ATCGAAGAAGCGATCGAGAAAGCCAAGAACTGTAA

NCBI Reference Sequence: NZ_CM001559.1

Strain: 30-84

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CM001559_30_84

GAAGTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGAAGCTTGCTTCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTCCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTTCCCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAAACTCAAATGAATTGACGGGGGCC

CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTCTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCCTTGTCCTTAGTTACCAGCACGTAATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG
GCTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCACAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTA
ACACCGCCCGTCACACCATGGGAGTGGGTGCAACCAGAAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAAGTAGCCG
TAGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTT
GGCTGCGGCCCTGGGTGAGATCGAACGTCAATTCGGCAAGGGTGCCGTAATGCGTATG
GGCGATCACGACCGCCAGGCGATCCCGGCCATTTCCTACTGGCTCTCTGGGTCTGGACAT
CGCACTCGGCATCGGCGGCCTGCCAAAGGGCCGTATTGTTGAAATCTACGGTCCGGAA
TCGTCCGGTAAAACCAACCTGACCCTGTCCGTGATTGCCAGGCACAGAAGATGGGCG
CCACCTGCGCCTTCGTGACGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAGCT
GGGGGTCAACGTTGACGACCTGCTGGTTTCCCAGCCGGACACCGGTGAACAGGCACTG
GAAATCACCGATATGCTGGTGCCTCCAATGCCATTGACGTGATCGTGATCGACTCCGT
GGCGGCACTGGTGCCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGGG
CCTGCAGGCCCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGCAACATCAAGAAC
GCCAACTGCCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTCCG
CAGCCCGGAAACCACCACCGGTGGTAACGCGCTGAAGTTCTACGCTTCGGTTTCGTCTG
GATATCCGTCTGACTGGCGCGGTGAAGGAAGGTGACGAAGTCGTCCGTAGCGAAACCC
GGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCGTTCGCCAGGCTGAATTCCAGAT
CCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGCAC
GGTTTCCTCGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTCAGG
GCAAGGCCAACTCGGCCAAGTTCCCTGCAGGACAACCCGGAAATCGGTAACGCCCTCGA
GAAGCAGATTTCGCGACAAGCTGCTGGCTCCGACTGCTGATGTCAAAGCTTCGCCGGTC
AACGAGACCATCGATGACATGGCCGACGCGGATATCTGAATGAGCGAAGAAAACACG
TACGACTCGAGCAGCATTAAGTGCTGAAAGGTTTGGATGCCGTACGCCAACGTCCCG
GTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTTCGAGGT
GGTCGATAACTCGATCGACGAAGCTCTGGCCGGCCATTGTGACGACATCAGCATCATC
ATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGACG
TGCATAAAGAAGAAGGCGTTTCCGCAGCCGAGGTCATCATGACTGTGCTGCACGCCGG
CGGTAAGTTCGACGATAACTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGTGTG
TCGGTAGTAAACGCCCTGTCCGAAGAGCTGGTCTTGACCGTTCCGCCGAGTGGAAGA
TCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCCGTGA
CAGCGAAACCACCGGTACCCAGATTCACTTCAAGGCTTCCAGCGAGACCTTCAAGAAC
ATCCACTTCAGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTCTCAACTC
CGGTGTCCGTATCGTTCTGAAGGACGAGCGCAGCGGCAAGGAAGAGCTGTTCAAGTAC
GAAGGCGGCTTGCGTGCGTTTCGTTGAATACCTGAACACCAACAAGACTGCGGTCAACC
AGGTGTTCCACTTCAACGTGCAGCGTGAAGATGGCATCGGCGTGGAATCGCCCTGCA
GTGGAACGACAGCTTCAACGAGAACCTGCAGTGCTTACCAACAACATTCCGCAGCGC
GACGGCGGCACCCACCTGGTGGGCTTCCGTTCCGGCGCTGACGCGTAACCTGAACAAC
ACATCGAGCAGGAAGGCCTGGCGAAGAAGCACAAAGGTCGCCACCACCGGTGACGATG
CCCGCGAAGGCCTGACCGCGATCATTTCCGGTCAAGGTGCCGGATCCGAAGTTCAGCTC
CCAGACCAAGACAAGCTGGTGTCTTCCGAAGTGAAGACCGCGGTGGAACAGGAAAT
GGGTAAAGTACTTCTCCGACTTCTGTGCTGGAAAACCCGAACGAAGCCAAACTGGTGGTC
GGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAAGCCCGTGAGATGA
CCCGTCGTAAAGGCGCGCTGGATATCGCCGGCCTGCCGGGCAAACTGGCGGACTGCCA
GGAAAAAGACCCTGCCCTTCCGAACCTCTACCTGGTGGAAGGTGACTCTGCTGGCGGC

TCCGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATCCTGCCGCTCAAGGGCAAG
ATCCTCAACGTCGAGAAAGCGCGCTTCGACAAGATGATTTCTCTCGCAAGAGGTCGGCA
CCTTGATCACTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGCT
GCGTTATCACAACATCATCATCATGACCGACGCCGACGTCGACGGTTCGCACATCCGT
ACCCTGCTGCTGACCTTCTTCTTCCGTCAGTTGCCGGAGCTGATCGAGCGTGGCTACAT
CTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATC
AAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAGGATGCGAGC
CTGCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGTCTGGTGA
ACGACTTCCGCATGGTCATGAAGACCCTCAAGCGTCTGTGCGGCCTGTACCCTCAAGA
GCTGACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAACTCTCCGATCAC
GCGGCCATGCAGGATTGGCTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGT
CCGGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTGTGGCTGCC
AGAGGTCGAACCTGATCTCCACGGCCTGTCGAACTACGTCACCTTCAACCGCGACTTCT
TCGGCAGCAATGACTACAAGACCGTCGTCACCCTCGGTGCTCAACTGAGCTCCCTGCTG
GACGAAGGCGCTTATATTCAGCGCGGCGAGCGCAAGAAGGCGGTGACCGAGTTCAAG
GAAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATACA
AAGGTCTGGGCGAGATGAACCCGGATCAGTTGTGGGAAACCACCATGGACCCAAGCGT
GCGCCGCATGCTCAAGGTCACCATCGAAGACGCCATCGGCGCCGACCAGATCTTCAAC
ACCCTGATGGGTGATGCGGTGAGCCTCGTCGTGACTTCATCGAAAGCAACGCCCTGG
CGGTATCCAACCTGGACTTCTGAATGTCCGGAAAAGCGCAACAGCAGTCTCGCCTCAA
AGAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACGAC
CACCTGCCGGAGGATATTTTCAGATCCGGAACAGGTGGAAGACATCATCCGCATGATCA
ACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTGGC
CGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCGTTGGCGGCTGT
GGAAACCGACATTGGTCGCACTACCGACCCAGTGCGTATGTACATGCGCGAAATGGGT
ACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAGAG
GGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACATCC
TCTCCGAATACTCGCGTCACCACCGAAGGTGGTCGCCTGTCCGACGTCCTGAGCGGT
TACATCGACCCGGACGACGGCATCGCGCCGCCTGCCGCCGAAGTACCACCGCCTGTGC
ATGCCAAGGCCGCGAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCAGTG
ACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCTTTG
GCGCCGTTGCCGACCAGATGGAAATCACCCGCAAGGCGCTGAAAAAGCACGGTCGTG
AACACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCGATCAA
ACTGGTTCCGAAGCAATTCGAAGGCCTGGTTGAACGCGTTTCGTAGCGCCCTGGATCGC
CTGCGTCAGCAAGAGCGCGCGATCATGCAACTCTGTGTTTCGTGATGCTCGCATGCCAC
GCGCCGACTTCTGCGCCAGTTCCCTGGCAATGAAGTGGAAGCAAGCTGGTCCGACGC
ACTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGTCGCCTGCAACCGGACATC
ATCCGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATCGCCG
AGATCAAGGACATCAACCGTCGCATGTGCATCGGCGAAGCCAAGGCCCGTCGCGCGAA
GAAAGAGATGGTTCGAAGCCAACCTTGCGTCTGGTGATCTCCATCGCCAAGAAGTACACC
AACCGTGGCCTGCAGTTCCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGAAAG
CGGTAGACAAGTTCGAATACCGTCGCGGCTACAAGTTCTCGACTTATGCGACCTGGTG
GATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGTACCATCCGTATTCCGG
TGCACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGCTGCAGGA
AATGGGTGCGGAACCGACCCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGAGGA
CAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCGATC
GGTGATGACGAAGACTCCCATCTGGGCGACTTCATCGAAGACTCGACCATGCAGTCGC
CAATCGATGTGCGCACCGTTGAGAGCCTCAAGGAAGCGACTCGCGAAGTACTCTCCGG
CCTCACTGCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAATACC
GACCACACCCTCGAGGAAGTCGGTAAGCAGTTCGACGTTACCCGTGAGCGGATTCGCC
AGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGAGAAGCGAGCACCTGC

GCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCAGC
ATTTTTTCGCGGGCAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGTTTA
ACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCCAACAGAT
CGTTACCCTGACTTACCCGCATATCGGCAATACCGGCACCACGCCGGAAGACGCCGAG
TCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCACTGTTTGCGAGCAA
CTGGCGTAACACCCTGTCCCTGTCCGATTACCTGAAAGGCCAACAACGTTGTGGCGATCG
CCGGTATCGACACCCGTCGCCTGACGCGCATCCTGCGCGAGAAAGGCGCGCAGAACGG
CTGCATCATGGCCGGCGACAACATTTCCGACGAAGCGGGCGATTGCCGCAGCGCGCGGC
TTCCCTGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTCAGCACCAAGGAAAGCTACG
AGTGGCGCTCCAGCGTCTGGAGCCTGAAGACCGACAGTCATCCGACCATCGAGGCTTC
CGAGCTGCCGTACCACGTGGTCGCCTACGATTACGGCGTCAAGCTGAACATCCTGCGC
ATGCTGGTCGAGCGCGGTTGCCGCGTGACCGTAGTGCCTGCGCAAACCTCCGGCCAGCG
ACGTCCTGGCACTCAAGCCTGACGGTGTGTTCCCTGTCCAACGGCCCTGGCGACCCCGA
GCCTTGCGATTACGCCATCCAGGCGATCAAGGATGTGCTGGAAACCGAGATCCCGGTC
TTCGGTATCTGCCTGGGCCACCAACTGCTGGCACTGGCCTCTGGCGCCAAGACGGTGA
AGATGGGCCACGGCCACCACGGTGCCAACCACCCGGTCCAGGACCTGGACAGCGGTGT
AGTGATGATCACCAGCCAGAACCACGGTTTTGCGGTGGACGAAGCCACCCTGCCAGGC
AACGTGCGGGCGATCCACAAATCGCTGTTTCGACGGCACCCCTGCAAGGCATCGAACGTA
CCGACAAGAGCGCATTCAGCTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAACGA
TGTGGCGCCGCTGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATGAGT
AGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGACA
GCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGAAGT
TCAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTCGCGATGGGCTCCACCGAGGGC
TTGAAGCGCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTCGGTA
AAGCGACCCTGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGGTCC
GATCGGCGAAGAAGAGCGTTGGGGCATTACCGTCCCTGCGCCGACCTTCGCTGAACAA
GCTGGCGGCAACGACCTGCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTTGCCCGT
TCGCCAAGGGCGGTAAAGTCGGTCTGTTCCGTGGTGCCGGTGTGGGCAAAACCGTAAA
CATGATGGAAGTATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTCGCCG
GTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTCCAA
CGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAACCGT
CTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGGTAACG
ACGTTCTGCTGTTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGTATCC
GCACTGCTGGGCCGTATGCCTTCCGCAGTAGGTTACCAGCCGACCCTGGCTGAAGAGA
TGGGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGATCCA
AGCGGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACTTCGCC
CACTTGACGCCACCGTCGTAAGTGTCCCGTGACATCGCTTCCCTGGGTATCTACCCAGC
GGTAGATCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAACGAG
CACTATGAAACCGCTCGCGGCGTTCAGTACGTGCTGCAGCGCTACAAAGAGCTGAAGG
ACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGGTATC
CCGCGCTCGTAAGATCCAGCGCTTCCTGTGCGAGCCGTTCTTCGTGGCTGAAGTCTTCA
CTGGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGGCATC
CTCAACGGTGACTACGACCACCTGCCAGAACAAAGCGTTCTACATGGTCGGCGGCATCG
AAGAAGCGATCGAGAAAGCCAAGAACTGTAA

NCBI Reference Sequence: NZ_CP027712.1

Strain: DSM50083

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP027712_DSM50083

GAAGTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGGTGCTTGACCTCTTGAGAGCGGCGGACGGGTGAGTAATG

CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTTTCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTTCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTAAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTCTGTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCCTTGTCCTTAGTTACCAGCACGTAATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG
GCTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCACAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTA
ACACCGCCCGTCACACCATGGGAGTGGGTGCAACCAGAAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCG
TAGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTT
GGCTGCGGCCCTGGGTGAGATCGAACGTCAATTCGGCAAGGGTGCCGTAATGCGTATG
GGCGATCACGACCGCCAGGCGATCCCGGCCATTTCCACTGGCTCTCTGGGTCTGGACAT
CGCACTCGGCATCGGCGGCCTGCCAAAGGGCCGTATTGTGCGAAATCTACGGTCCGGAA
TCGTCCGGTAAACACCACCTGACCTTGTCCTGATTGCCCAGGCACAGAAGATGGGCG
CCACTTGCGCCTTCGTGACGCGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAGCT
GGGGGTCAACGTTGACGACCTGCTGGTTTCCCAGCCGGACACCGGTGAACAGGCACTG
GAAATCACCGACATGTTGGTGCGCTCCAATGCCATCGACGTGATCGTGATCGACTCCGT
GGCAGCACTGGTGCCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGGG
CCTGCAGGCCCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGCAACATCAAGAAC
GCCAACTGCCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTCCG
CAGCCCGGAAACCACCACCGGTGGTAACGCGCTGAAGTTCTACGCTTCGGTTTCGCTG
GATATCCGTCTGACTGGCGCGGTGAAGGAAGGTGACGAAGTCGTCCGTAGCGAAACCC
GGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCGTTCCGCCAGGCTGAATTCCAGAT
CCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGCAC
GGTTTCCTCGAGAAGTCTGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTCAGG
GCAAGGCCAACTCGGCCAAGTTCTTGCAGGACAACCCGGAAATCGGTAATGCCCTCGA
GAAGCAGATTTCGCGACAAGCTGCTGGCTCCGACCGCTGATGTCAAAGCTTCGCCGGTC
AACGAGACCATCGATGACATGGCCGACGCGGATATCTGAATGAGCGAAGAAAACACG
TACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCCCG
GTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTCGAGGT
GGTCGATAACTCGATCGACGAAGCTCTGGCCGGCCATTGCGACGACATCAGCATCATC
ATCCACCCGGACGAATCCATTACCGTGCGCGACAACGGTCGCGGCATCCCGGTAGACG
TGCATAAAGAAGAAGGCGTTTCCGCAGCCGAGGTCATCATGACCGTGCTGCACGCCGG
CGGTAAGTTCGACGATAACTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGTGTG
TCGGTAGTGAACGCCCTGTCCGAAGAAGTGGTCTTGACCGTTCCGCCGAGTGGCAAGA
TCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCTATCGTCGGTGAC

AGCGAAACCACCGGTACCCAGATTCACTTCAAGGCTTCCAGCGAAACCTTCAAGAACA
TCCACTTCAGCTGGGACATCCTGGCCAAGCGGATTTCGTGAACTGTCCTTCCTCAACTCC
GGTGTGGTATCGTTCTGAAGGACGAGCGCAGCGGCAAGGAAGAACTGTTCAAGTACG
AAGGCGGCTTGCGTGCGTTCGTTGAATACCTGAATACCAACAAGACTGCGGTCAACCA
GGTGTTCACCTTCAATGTGCAGCGTGAAGACGGCATTGGCGTGGAATCGCACTGCAG
TGGAACGACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCAGCGCG
ACGGCGGCACCCACCTGGTGGGCTTCCGTTTCGGCACTGACGCGTAACCTGAACAATA
CATCGAACAGGAAGGCCTGGCGAAGAAGCACAAGGTCGCCACCACCGGTGACGATGC
CCGCGAAGGCCTGACCGCGATCATTTCGGTCAAGGTGCCGGATCCGAAGTTCAGCTCC
CAGACCAAAGACAAGCTGGTGTCTTCCGAAGTGAAGACCGCGGTTCGAACAGGAAATG
GGCAAGTACTTCTCCGACTTCCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGTCG
GCAAGATGCTCGACGCCGCCCCTGCCCCGTGAAGCGGCGCGTAAAGCCCCTGAGATGAC
CCGTGCTAAAGGCGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCCAG
GAAAAAGACCCTGCTCTTTCCGAACCTCTACCTGGTGGAAGGTGACTCTGCTGGCGGCTC
CGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATCCTGCCGCTCAAGGGCAAGAT
CCTCAACGTCGAGAAAGCGCGCTTCGACAAGATGATTTCTCTCGCAAGAGGTTCGGCACC
TTGATCACTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGCTGC
GTTATCACACATCATCATCATGACCGACGCCGACGTCGACGGTTTCGCACATCCGTACC
CTCTGCTGACCTTCTTTTTCCGTCAGTTGCCGGAGCTGATCGAGCGTGGCTACATCTA
CATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATCAA
AGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGCCT
GCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGAAC
GACTTCCGCATGGTCATGAAGACCCTCAAGCGTCTGTGCGCGCCTGTACCCTCAAGAGCT
GACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAACTCTCCGATCACGCG
GCGATGCAGGATTGGCTGGCCAGTATGAAGTCCGCCTGCGCACCGTCGAGAAGTCCG
GCCTGGTCTACAAGGCCAGTCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCCAGA
GGTCGAACTGATCTCCACGGCCTGTGCAACTACGTCACCTTCAACCGCGATTTCTTCG
GCAGTAATGACTACAAGACCGTCGTCACCCTCGGGGCTCAACTGAGCTCCCTGCTGGA
CGAAGGCGCTTATATTTCAGCGCGGCGAGCGCAAGAAGGCAGTGACCGAGTTCAAGGA
AGCCCTGGACTGGCTGATGACCGAAAGCACCAAACGCCACACCATCCAGCGATATAAA
GGTCTGGGTGAGATGAACCCGGACCAGCTGTGGGAAACCACCATGGACCCAAGCGTGC
GCCGCATGCTCAAGGTCACCATCGAAGACGCCATCGGCGCCGACCAGATCTTCAACAC
CCTGATGGGTGATGCGGTGCGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCTGGCG
GTATCCAACCTGGACTTCTGAATGTCCGAAAAGCGCAACAGCAGTCTCGCCTCAAAG
AGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACGACCA
CCTGCCGGAGGATATTTTCAGATCCGGAACAGGTGGAAGACATCATCCGCATGATCAAC
GACATGGGGATCAACGTATTTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTGGCCG
AAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCTTGGCGGCAGTGG
AAACCGACATTGGTCGCACTACCGACCCAGTGCGTATGTACATGCGCGAAATGGGTAC
GGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAGAGGG
CATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACATCCTCT
CCGAATACACTCGCGTCACCACCGAAGGTGGTCGCCTGTCCGACGTCCTGAGCGGTTA
CATCGACCCGGACGACGCGCATCGCGCCGCTGCCGCCGAAGTACCACCGCCTGTGAT
GCCAAGGCCGCGAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCAGTGAC
GACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCTTTGGC
GCCGTTGCCGACCAGATGGAAATCACCCGCAAGGCGCTGAAAAAGCACGGTTCGTGAA
CACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCGATCAAAC
TGGTTCCGAAGCAATTCGAAGGCCTGGTTGAACGCGTTCGTAGCGCCCTGGATCGCCT
GCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCTCGCATGCCACGC
GCCGACTTCCTGCGCCAGTTCCTGGCAATGAAGTGGACGAAAGCTGGTCCGACGCAC
TGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGTTCGCCTGCAGCCGGACATCAT

TCGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATCGCCGAG
ATCAAGGACATCAACCGTCGCATGTCGATCGGCGAGGCCAAGGCCCGTCGCGCGAAGA
AAGAGATGGTCTGAAGCCAACTTTCGTCTGGTGATCTCCATCGCCAAGAAGTACACCAA
CCGTGGCCTGCAGTTCCTCGACCTGATCCAGGAAGGCCAACATCGGCTTGATGAAAGCG
GTAGACAAGTTCGAATACCGTCGCGGCTACAAGTTCTCGACTTATGCCACCTGGTGGAT
CCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTCCGGTGC
ACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGCTGCAGGAAAT
GGGCCGCGAACCGACCCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGAGGACAA
GATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCGATCGGT
GATGACGAAGACTCCCATCTGGGCGACTTCATCGAAGACTCGACCATGCAGTCGCCAA
TCGATGTGCTACCGTTGAGAGCCTCAAGGAAGCGACTCGCGAAGTACTCTCCGGCCT
CACTGCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGTATCGACATGAATACCGAC
CATAACCCTCGAGGAAGTCGGTAAGCAGTTCGACGTTACCCGTGAGCGGATTCGCCAGA
TCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGAGAAGCGAGCACCTGCGCTC
CTTCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCAGCATTT
TTCGCGGCGAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGTTAACAC
CGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCAACAGATCGTTA
CCCTGACTTACCCGCATATCGGCAATACCGGCACCACGCCGAAGACGCCGAGTCCGA
TCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCACTGGTTGCGAGCAACTGGC
GTAACACCCTGTCCCTGTCCGATTACCTGAAAGCCAACAATGTTGTGGCGATCGCCGGT
ATCGACACCCGTGCGCTGACGCGCATCCTGCGCGAGAAAGGCGCGCAGAACGGCTGCA
TCATGGCCGGTGACAATATCTCCGACGAAGCGGCGATTGCCGCAGCGCGCGGCTTCCC
TGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTCAGCACCAAGGAAAGCTACGAGTG
GCGCTCCAGCGTCTGGAGCCTGAAGACCGACAGTCATCCGACCATCGAGGCTTCCGAG
CTGCCGTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGCGCATGCT
GGTCGAGCGCGGTTGCCGCGTGACCGTAGTGCTGCGCAAACCTCCGGCCAGCGACGTC
CTGGCACTCAAGCCTGATGGCGTGTTCCCTGTCCAACGGCCCTGGCGACCCCGAGCCTTG
CGATTACGCCATCCAGGCGATCAAGGACGTGCTGGAAACCGAGATCCCGGTCTTCGGT
ATCTGCCTGGGCCACCAACTGCTGGCACTGGCCTCCGGCGCCAAGACGGTGAAGATGG
GCCACGGCCACCACGGTGCCAACCACCCGGTCCAGGACCTGGACAGCGGTGTAGTGAT
GATCACCAGCCAGAACCACGGTTTTGCGGTGGACGAAGCCACCCTGCCAGGCAACGTG
CGGGCGATCCACAAATCGCTGTTTCGACGGTACCCTGCAAGGCATCGAACGTACCGACA
AGAGCGCATTCAGCTTCCAGGGCCACCCTGAAGCGAGCCCCGGGCCGAACGATGTGGC
GCCGCTGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATGAGTAGCGGA
CGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGACAGCGTACC
GAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGAAGTTCAGCAG
CAGCTGGGCGACGGCGTGGTACGTACCATTTGCGATGGGCTCCACCGAGGGCTTGAAGC
GCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTGGTAAAGCGAC
CCTGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGGCCCGATCGGC
GAAGAAGAGCGTTGGGGCATTACCGTCTGCGCCGTCCTTCGCTGAACAAGCTGGTG
GCAACGACCTCCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCCCGTTTCGCCAA
GGGCGGTAAAGTCGGTCTGTTTCGGTGGTGCCGGTGTGGGCAAGACCGTAAACATGATG
GAACTGATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTCGCCGGTGTGG
GTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTCCAACGTTCT
GGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAACCGTCTGCG
CGTAGCTCTGACCGGCTGACCATGGCCGAGAAGTTCCGTGACGAAGGTAACGACGTT
CTGCTGTTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGTATCCGCACT
GCTGGGCCGTATGCCTTCCGCAGTAGGTTACCAGCCGACCCTGGCTGAAGAGATGGGC
GTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGATCCAAGCGG
TATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACACCTTCGCCCCACTTG
GACGCCACAGTCGTACTGTCCCGTGACATCGCTTCCCTGGGTATCTACCCAGCGGTAGA

TCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAACGAGCACTAC
GAAACCGCTCGCGGCGTTTCAGTACGTGCTGCAGCGCTACAAAGAGCTGAAGGACATCA
TTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGGTATCCCGCGC
TCGTAAGATCCAGCGCTTCCTGTCGCAGCCGTTCTTCGTGGCTGAAGTCTTCACTGGTT
CTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGGCATCCTCAA
CGGTGACTACGACCACCTGCCAGAACAAGCGTTCTACATGGTCGGCGGCATCGAAGAA
GCGATCGAGAAAGCCAAGAACTGTAA

NCBI Reference Sequence: NZ_CP027717.1

Strain: PCM2210

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP027717_PCM2210

GAAGTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGAAGCTTGCTTCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTCCGGAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTAAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAATTTCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTAAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTCTGTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCTTGTCTTAGTTACCAGCACGTTATGGTGGGCACTCTAAGGAGACTGCCGG
TGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGGG
CTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTAA
TCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCGG
AATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTACA
CACCGCCCGTCACACCATGGGAGTGGGTTGCACCAGAAGTAGCTAGTCTAACCTTCGG
GAGGACGGTTACCACGGTGTGATTTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCGT
AGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTTG
GCTGCGGCCCTGGGTCAGATCGAACGTCAATTCGGCAAGGGTGCCGTAATGCGTATGG
GCGATCACGACCGCCAGGCGATCCCGGCCATTTCCACTGGCTCTCTGGGCCTGGACATC
GCGCTCGGCATCGGCGGCCTGCCAAAAGGCCGTATTGTTGAAATCTACGGTCCGGAAT
CGTCCGGTAAAACCAACCTGACCCTGTCGGTGATTGCCAGGCACAGAAGATGGGCGC
CACCTGCGCCTTCGTCGACGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAACCTG
GGGGTCAACGTTGACGACCTGCTGGTTTCCAGCCGGACACCGGCGAACAGGCGCTGG
AAATCACCGACATGCTGGTGCGTTCCAATGCCATCGACGTGATCGTGATCGACTCCGTG
GCGGCACTGGTACCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGGGC
CTGCAGGCCCCGCTGATGTCCAGGCGCTGCGCAAGATCACCGGTAACATCAAGAACG
CCAACCTGCCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTCCGG
AGCCCGGAAACCACCGGCGGTAAACGCGCTGAAGTTCTACGCCTCGGTTCTGTCTGG
ACATCCGTCGTACTGGCGCGGTGAAGGAAGGCGACGAAGTCGTCGGTAGCGAAACCC

GGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCGTTCCGTCAGGCTGAATTCCAGAT
CCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGCAC
GGTTTCCTCGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTCAGG
GCAAGGCCAACTCGGCCAAGTTCCTGCAGGACAATCCGGAAATCGGCAATGCCCTCGA
GAAGCAGATTTCGCGACAAGCTGCTGGCTCCAACCGCTGATGTCAAAGCTTCGCCGGTC
AACGAGACCATCGATGACATGGCTGACGCGGATATCTGAATGAGCGAAGAAAACACG
TACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCCCG
GTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTCGAGGT
GGTCGATAACTCGATCGACGAAGCTCTGGCCGGCCACTGCGACGACATCAGCATCATC
ATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGACG
TGCATAAAGAAGAAGGCGTTTCCGCGGCCGAGGTCATCATGACTGTGCTGCACGCCGG
CGGTAAGTTCGACGACAACCTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGTGTG
TCGGTAGTGAACGCCCTGTCCGAAGAACTGGTCCTGACCGTTCGCCGCAAGTGGCAAGA
TCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCGGTGA
CAGTGAAACCACCGGTACCCAGATTCACTTCAAGGCTTCCAGCGAGACCTTCAAGAAC
ATCCATTTAGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTCTCAACTC
CGGTGTCGGTATCGTTCTGAAGGACGAGCGCAGCGGCAAGGAAGAACTGTTCAAGTAC
GAAGGCGGTCTGCGTGCGTTTCGTTGAATACCTGAACACCAACAAGACCGCGGTCAACC
AGGTGTTCCACTTCAATGTGCAGCGTGAAGATGGCATCGGCGTGGAATCGCCCTGCA
GTGGAACGACAGCTTCAACGAAAACCTGCAGTGCTTACCAACAACATTCCGCAGCGC
GACGGCGGCACCCACCTGGTGGGCTTCCGTTCCGCACTGACGCGTAACCTGAACAAC
ACATCGAACAGGAAGGTCTGGCGAAGAAGCACAAGGTCGCCACCACCGGTGACGATG
CCCGCGAAGGCCTGACCGCAATCATTTCGGTCAAGGTGCCGGATCCGAAGTTCAGCTC
CCAGACCAAGACAAGCTGGTGTCTTCCGAAGTGAAGACCGCGGTGGAACAGGAAAT
GGGCAAGTACTTCTCCGACTTCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGTC
GGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAGGCTCGCGAGATGA
CCCGCCGTAAAGGTGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCCA
GGAAAAAGACCCTGCCCTTTCCGAACCTTACCTGGTGGAAGGTGACTCTGCTGGCGGC
TCCGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATTCTGCCGCTCAAGGGCAAG
ATCCTTAACGTCGAGAAAGCGCGTTTCGACAAGATGATTTCTCGCAAGAGGTTCGGCA
CCTTGATCACTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGCT
GCGTTATCACAACATCATCATGACCGACGCCGACGTCGACGGTTCGCACATCCGT
ACCCTGCTGCTGACCTTCTTCTTCCGTCAGCTGCCGGAGCTGATCGAGCGTGGCTACAT
CTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATC
AAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGC
CTGCACCTGAACGAAGACACACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGA
ACGACTTCCGCATGGTCATGAAAACCTCAAGCGTCTGTGCGGCCTGTACCCTCAGGA
GCTGACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAGCTCTCCGATCAC
GCGGCCATGCAGGATTGGCTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGT
CCGGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCC
AGAGGTCGAACTGATCTCCACGGCCTGTCGAACTACGTCACCTTCAACCGCGACTTCT
TCGGCAGCAATGACTACAAGACCGTCGTCACACTCGGCGCTCAACTGAGCTCCCTGCT
GGACGAAGGCGCTTATATTACAGCGTGGCGAACGCAAGAAGGCAGTGACCGAGTTCAA
GGAAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATAC
AAAGGTCTGGGCGAGATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAGC
GTGCGCCGTATGCTCAAGGTCACCATCGAAGACGCCATCGGCGCCGACCAGATCTTCA
ACACCCTGATGGGTGATGCGGTGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCT
GGCGGTATCCAACCTTGGAATTCTGAATGTCCGGAAAAGCGCAACAGCAGTCTCGCCTC
AAAGAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACG
ACCACCTGCCGGAGGATATTTAGATCCGGAACAGGTGGAAGACATCATCCGCATGAT
CAACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTG

GCCGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCGTTGGCGGCT
GTGGAAACCGACATTGGTCGCACTACCGACCCCGTGCATATGTACATGCGCGAAATGG
GTACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAG
AGGGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACAT
CCTCTCCGAATACACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCCTGAGC
GGTTACATCGACCCGGACGACGGTATTGCGCCGCCTGCCGCCGAAGTACCACCGCCTG
TCGATGCCAAGGCCGCAAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCA
GTGACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCT
TTGGCGCCGTTGCCGACCAGATGGAAATTACCCGCAAGGCGCTGAAAAAGCACGGTGC
CGAACACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAGCTGTTTCATGCCGATC
AAACTGGTTCCGAAGCAATTTCGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATC
GCCTGCGTCAGCAAGAGCGCGCATCATGCAGCTCTGTGTTTCGTGATGCCCGCATGCC
ACGCGCCGACTTCCTGCGCCAGTTCCTGGCAATGAAGTGGACGAAAGCTGGTCCGAC
GCATTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGCCGCCTGCAGCCGGAT
ATCATCCGTTGCCAGCAGAAGCTGACAGCGCTCGAGACCGAGACTGGCCTGACGATCG
CCGAGATCAAGGACATCAACCGTCGCATGTTCGATCGGCGAGGCCAAGGCCCGTCGCGC
GAAGAAAGAGATGGTTCGAAGCCAACCTTGCCTCTGGTGATCTCCATCGCCAAGAAGTAC
ACCAACCGTGGCCTGCAATTCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGA
AAGCGGTAGACAAGTTCGAATACCGTCGCGGCTACAAATTCTCGACTTATGCCACCTG
GTGGATCCGTCAGGCGATCACTCGTTTCGATCGCCGACCAGGCCCGCACCATCCGTATTC
CGGTGCACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCA
GGAAATGGGTTCGCGAACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGA
GGACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCG
ATCGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGT
CGCCAATCGATGTCGCCACCGTTGAGAGCCTTAAAGAAGCGACTCGCGAAGTACTCTC
CGGCTCACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAAT
ACCGACCACACCCTCGAGGAAGTCGGTAAGCAGTTCGACGTTACCCGTGAGCGGATTC
GTCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGCGAAGCGAGCATCT
GCGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCA
GCATTTTTTCGCGGCGAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGTT
TAACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCAACAG
ATCGTTACCTGACTTACCCGCACATCGGCAATACCGGCACCACGCCGGAAGACGCCG
AGTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCACTGGTTGCGAGC
AACTGGCGTAACACCTTGTCCCTGTCCGACTACCTGAAAGCCAACAATGTTGTGGCGAT
CGCCGGTATCGACACCCGTCGTCTGACGCGCATCCTGCGCGAGAAAGGCGCGCAGAAC
GGCTGCATCATGGCCGGCGACAATATCTCCGACGAAGCGGCGATTGCCGCTGCGCGCG
GCTTCCCGGGCCTGAAAGGCATGGATCTGGCGAAGGTTCGTCAGCACCAAGGAAAGCTA
CGAGTGGCGCTCCAGCGTCTGGAGCCTGAAGACCGACAGTCACCCGACCATCGAGGCT
TCCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGCG
CATGCTGGTCGAGCGCGGTTGCCGCGTGACCGTGGTACCTGCGCAAACCCCGGCCAGC
GACGTCCTGGCGCTCAAGCCTGACGGTGTGTTTCTGTCCAACGGTCCTGGCGACCCCGA
GCCTTGCGATTACGCGATCCAGGCGATCAAGGACGTGCTGGAGACCGAGATACCGGTC
TTCGGGATCTGCCTGGGCCACCAACTGCTGGCGCTGGCCGCCGGCGCCAAGACAGTGA
AGATGGGCCACGGCCACCACGGTGCCAACCACCCGGTCCAGGACCTGGACAGCGGTGT
AGTGATGATCACCAGTCAGAACCACGGTTTTGCGGTGGACGAAACCACCTGCCGGGC
AACGTGCGGGCGATCCACAAGTCGTTGTTTCGACGGCACCTGCAAGGCATCGAGCTGA
CCGACAAGAGCGCATTCAGCTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAACGA
TGTGGCGCCGCTGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATGAGT
AGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGACA
GCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACCTCTGGAAGT
TCAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTGCGATGGGCTCCACCGAGGGC

TTGAAGCGCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTCGGTA
AAGCGACCCTGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGGCCC
GATCGGCGAAGAAGAGCGTTGGGGCATTACCGTCCTGCGCCGACCTTCGCTGAACAA
GCTGGTGGCAACGACCTGCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCCCGT
TCGCCAAGGGCGGTAAAGTTGGTCTGTTCCGGTGGTGCCGGTGTGGGCAAAACCGTAAA
CATGATGGAACCTGATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTCGCCG
GTGTGGGCGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTCCAA
CGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAACCGT
CTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGGTAACG
ACGTTCTGCTGTTTCGTGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGTATCC
GCACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAAGAGA
TGGGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGATCCA
AGCGGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACACCTTCGCC
CACTTGACGCCACCGTCGTTCTTTCCCGTGACATCGCTTCCCTGGGTATCTACCCAGC
GGTAGACCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAACGAG
CACTATGAAACCGCTCGCGGCGTTCAGTACGTGCTGCAGCGCTACAAAGAGCTGAAGG
ACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGGTATC
CCGCGCTCGTAAGATCCAGCGCTTCCTGTGCGAGCCGTTCTTCGTGGCTGAAGTCTTCA
CTGGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGGCATC
CTCAACGGTGACTACGACCATCTGCCAGAACAAGCGTTCTACATGGTTGGTGGCATCG
AAGAAGCGATCGAGAA

NCBI Reference Sequence: NZ_CP027746.1

Strain: DSM19603

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD >NZ_CP027746_DSM19603

GAACCTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGAAGCTTGCTTCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTCCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAACCTGAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTCCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTAAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCCTTGTCCTTAGTTACCAGCACGTTATGGTGGGCACTCTAAGGAGACTGCCGG
TGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGGG
CTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTAA
TCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCGG
AATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTACA
CACCGCCCGTACACCATGGGAGTGGGTTGCACCAGAAGTAGCTAGTCTAACCTTCGG
GAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCGT

AGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTTG
GCTGCGGCCCTGGGTCAGATCGAACGTCAATTCGGCAAGGGTGCCGTAATGCGTATGG
GCGATCACGACCGCCAGGCGATCCCGGCCATTTCCACTGGCTCTCTGGGCCTGGACATC
GCGCTCGGCATCGGCGGCCTGCCAAAAGGCCGTATTGTTGAAATCTACGGTCCGGAAT
CGTCCGGTAAAACCACCCTGACCCTGTCGGTGATTGCCCAGGCACAGAAGATGGGCGC
CACCTGCGCCTTCGTCGACGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAACCTG
GGGGTCAACGTTGACGACCTGCTGGTTTCCCAGCCGGACACCGGGCAACAGGCGCTGG
AAATCACCGACATGCTGGTGCGTTCCAATGCCATCGACGTGATCGTGATCGACTCCGTG
GCGGCACTGGTACCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGGGC
CTGCAGGCCCCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGTAACATCAAGAACG
CCAATGCCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTCCGC
AGCCCGGAAACCACCACCGGCGGTAAACGCGCTGAAGTTCTACGCCTCGGTTCTGTCTGG
ACATCCGTCGTACTGGCGCGGTGAAGGAAGGCGACGAAGTCGTCGGTAGCGAAACCC
GGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCGTTCCGTCAGGCTGAATTCCAGAT
CCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGCAC
GGTTTCCTCGAGAAGTCCGGTGCTGTACAGCTACCAGGGCAACAAGATCGGTCAGG
GCAAGGCCAACTCGGCCAAGTTCCTGCAGGACAATCCGGAAATCGGCAATGCCCTCGA
GAAGCAGATTTCGCGACAAGCTGCTGGCTCCAACCGCTGATGTCAAAGCTTCGCCGGTC
AACGAGACCATCGATGACATGGCTGACGCGGATATCTGAATGAGCGAAGAAAACACG
TACGACTCGAGCAGCATTAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCCCG
GTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTTCGAGGT
GGTCGATAACTCGATCGACGAAGCTCTGGCCGGCCACTGCGACGACATCAGCATCATC
ATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGACG
TGCATAAAGAAGAAGGCGTTTCCGCGGCCGAGGTCATCATGACTGTGCTGCACGCCGG
CGGTAAGTTCGACGACAACCTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGTGTG
TCGGTAGTGAACGCCCTGTCCGAAGAACTGGTCCTGACCGTTCCGCCGAGTGGCAAGA
TCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCGGTGA
CAGTGAAACCACCGGTACCCAGATTCACTTCAAGGCTTCCAGCGAGACCTTCAAGAAC
ATCCATTTTCAGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTCTCAACTC
CGGTGTCCGTATCGTTCTGAAGGACGAGCGTAGCGGCAAGGAAGAACTGTTCAAGTAC
GAAGGCGGTCTGCGTGCGTTCGTTGAATACCTGAACACCAACAAGACCGCGGTCAACC
AGGTGTTCCATTTCAATGTGCAGCGTGAAGATGGCATCGGCGTGGAATCGCCCTGCA
GTGGAATGACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCAGCGC
GATGGCGGCACCCACCTGGTGGGCTTCCGTTCCGGCACTGACACGTAACCTGAACAAC
ACATCGAACAGGAAGGTCTGGCGAAGAAGCACAAAGGTCGCCACCACCGGTGACGATG
CCCGCGAAGGCCTGACCGCAATCATTTTCGGTCAAGGTGCCGGATCCGAAGTTCAGCTC
CCAGACCAAAGACAAGCTGGTGTCTTCCGAAGTGAAGACCGCGGTGCAACAGGAAAT
GGGCAAGTACTTCTCCGACTTCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGTC
GGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAGGCTCGTGAGATGA
CCCGCCGTAAAGGTGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCCA
GGAAAAAGACCCTGCCCTTTCCGAACCTCTACCTGGTGGAAGGTGACTCTGCTGGCGGC
TCCGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATTCTGCCGCTCAAGGGCAAG
ATCCTTAACGTCGAGAAAGCGCGTTTCGACAAGATGATTTCTCTCGCAAGAGGTGCGCA
CCTTGATCACTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGCT
GCGTTATCACAACATCATCATGACTGACGCCGACGTCGATGGTTCGCACATCCGTA
CCCTGCTGCTGACCTTCTTCTTCCGTGAGCTGCCGGAGCTGATCGAGCGTGGCTACATC
TACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATCA
AAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGCC
TGCACCTGAACGAAGACGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGAA
CGACTTCCGCATGGTCATGAAAACCCTCAAGCGTCTGTGCGCCTGTACCCTCAGGAGC
TGACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAGCTCTCCGATCACGC

GGCGATGCAGGATTGGCTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGTCC
GGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCCAG
AGGTGCGAACTGATCTCCCACGGCCTGTGCGAACTACGTCACCTTCAACCGCGACTTCTTC
GGCAGCAATGACTACAAGACCGTCGTCACCCTCGGTGCTCAACTGAGCTCCCTGCTGG
ACGAAGGCGCTTATATTCAGCGTGGCGAACGCAAGAAGGCAGTGACCGAGTTCAAGG
AAGCCCTGGACTGGCTGATGACCGAAAGTACCAAGCGCCACACCATCCAGCGATACAA
AGGTCTGGGCGAGATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAGCGT
GCGCCGTATGCTCAAGGTCACCATCGAAGACGCCATCGGCGCCGACCAGATCTTCAAC
ACCCTGATGGGTGATGCGGTGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCTGG
CGGTATCCAACCTTGGACTTCTGAATGTCCGGAAAAGCGCAACAGCAGTCTCGCCTCAA
AGAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACGAC
CACCTGCCGGAGGATATTTTCAGATCCGGAACAGGTGGAAGACATCATCCGCATGATCA
ACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTGTTGGC
CGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCGTTGGCGGCTGT
GGAAACCGACATTGGTCGCACTACCGACCCCGTGCATGTACATGCGCGAAATGGGT
ACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAGAG
GGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACATCC
TCTCCGAATACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCCTGAGCGG
TTACATCGACCCGGACGACGGTATTGCGCCGCCTGCCGCCGAAGTACCACCGCCTGTC
GATGCCAAGGCCGCAAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCAGT
GACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCTTT
GGCGCCGTTGCCGACCAGATGGAAATTACCCGCAAGGCGCTGAAAAAGCACGGTCGC
GAACACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAGCTGTTTCATGCCGATCA
AACTGGTTCCGAAGCAATTCGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATCG
CCTGCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCGCATGCCA
CGCGCCGACTTCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGACG
CATTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGCCGCCTGCAGCCGGATAT
CATCCGTTGCCAGCAGAAGCTGACAGCGCTCGAGACCGAGACTGGCCTGACGATCGCC
GAGATCAAGGACATCAACCGTCGCATGTCGATCGGCGAGGCCAAGGCCCGTCGCGCGA
AGAAAGAGATGGTCGAAGCCAACTTTCGTCTGGTGATCTCCATCGCCAAGAAGTACAC
CAACCGTGGCCTGCAATTCCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGAAA
GCGGTAGACAAGTTTGAATACCGTCGCGGCTACAAATTCTCGACTTATGCCACCTGGT
GGATCCGTCAGGCGATCACTCGTTTCGATCGCCGACCAGGCCCGCACCATCCGTATTCCG
GTGCACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCAGG
AAATGGGTGCGGAACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGAGG
ACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCGAT
CGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGTCG
CCAATCGATGTCGCCACCGTTGAGAGCCTTAAAGAAGCGACTCGCGAAGTACTCTCCG
GCCTCACTGCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAATAC
CGACCACACCCCTCGAGGAAGTCGGTAAGCAGTTTCGACGTTACCCGTGAGCGGATTTCGT
CAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGCGAAGCGAGCATCTG
CGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCAG
CATTTTTTCGCGGCCGAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGT
AACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCCAACAGA
TCGTTACCCTGACTTACCCGCACATCGGCAATACCGGCACCACGCCGAAGACGCCGA
GTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCACTGGTTGCGAGCA
ACTGGCGTAACACCTTGTCCCTGTCCGACTACCTGAAAGCCAACAATGTTGTGGCGATC
GCCGGTATCGACACCCGTGCTCTGACGCGCATCCTGCGCGAGAAAGGCGCGCAGAACG
GCTGCATCATGGCCGGCGACAATATCTCCGACGAAGCGGCGATTGCCGCTGCGCGCGG
CTTCCCGGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTCAGCACCAAGGAAAGCTAC
GAGTGGCGCTCCAGCGTCTGGAGCCTGAAGACCGACAGTCACCCGACCATCGAGGCTT

CCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGCGC
ATGCTGGTCGAGCGCGGTTGCCGCGTGACCGTGGTACCTGCGCAAACCCCGGCCAGCG
ACGTCCTGGCGCTCAAGCCTGACGGTGTGTTCTGTCCAACGGTCCTGGCGACCCCGAG
CCTTGCGATTACGCGATCCAGGCGATCAAGGACGTGCTGGAGACCGAGATAACCGGTCT
TCGGGATCTGCCTGGGCCACCAACTGCTGGCGCTGGCCGCCGGCGCCAAGACAGTGAA
GATGGGCCACGGCCACCACGGTGCCAACCACCCGGTCCAGGACCTGGACAGCGGTGTA
GTGATGATCACCAGTCAGAACCACGGTTTTGCGGTGGACGAAACCACCCTGCCGGGCA
ACGTGCGGGCGATCCACAAGTCGTTGTTTCGACGGCACTCTGCAAGGCATCGAGCTGAC
CGACAAGAGCGCATTCAGCTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAACGAT
GTGGCGCCGCTGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATGAGTA
GCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGACAG
CGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGAAGTT
CAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTGCGATGGGCTCCACCGAGGGCT
TGAAGCGCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTCGGTAA
AGCGACCCTGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGGCCCCG
ATCGGCGAAGAAGAGCGTTGGGGCATTACCCGTCCTGCGCCGACCTTCGCTGAACAAG
CTGGTGGCAACGACCTGCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCCCGTTC
GCCAAGGGCGGTAAAGTTGGTCTGTTTCGGTGGTGCCGGTGTGGGCAAAACCGTAAACA
TGATGGAAGTATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTCGCCGGT
GTGGGCGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTCCAACG
TTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAACCGTCT
GCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGGTAAACGAC
GTTCTGCTGTTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGTATCCGC
ACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAAGAGATG
GGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGATCCAAG
CGGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACACCTTCGCCCA
CTTGGACGCCACCGTCGTTCTTTCCCGTGACATCGCTTCCCTGGGTATCTACCCAGCGG
TAGACCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAACGAGCA
CTATGAAACCGCTCGCGGCGTTTCAGTACGTGCTGCAGCGCTACAAAGAGCTGAAGGAC
ATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGGTATCCC
GCGCTCGTAAGATCCAGCGCTTCCTGTCGCAGCCGTTCTTCGTGGCTGAAGTCTTCACT
GGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGGCATCCT
CAACGGTGACTACGACCATCTGCCAGAACAAGCGTTCTACATGGTTGGTGGCATCGAA
GAAGCGATCGAGAAAGCCAAGAAACTGTAA

NCBI Reference Sequence: NZ_CP027709.1

Strain: ATCC17809

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD >NZ_CP027709_ATCC17809

GAACTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGGTGCTTGCACCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTTCCGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGAATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTTCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACTGGACTGATACTGACACTG

AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTGTCGTGAGATGTTGGGTTAAGTCCCGTAACGAG
CGCAACCCTTGTCCTTAGTTACCAGCACGTAATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG
GCTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTA
ACACCGCCCGTCACACCATGGGAGTGGGTTGCACCAGAAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCG
TAGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTT
GGCTGCGGCCCTGGGTGAGATCGAACGTCAATTTCGGCAAGGGTGCCGTAATGCGTATG
GGCGATCACGATCGCCAGGCGATCCCGGCCATTTCCTACTGGCTCTCTGGGTCTGGACAT
CGCACTCGGCATCGGCGGCCTGCCAAAAGGCCGTATTGTTGAAATCTACGGTCCGGAA
TCGTCCGGTAAAACCACCCTGACCCTGTCGGTGATCGCCAGGCACAGAAGATGGGCG
CCACCTGCGCCTTCGTGACGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAACCT
GGGGGTCAACGTTGACGACCTGCTGGTTTCCAGCCGGACACCGGCGAACAGGCGCTG
GAAATCACCGACATGCTGGTGCGCTCCAATGCCATCGACGTGATCGTGATCGACTCCG
TGGCGGCGCTGGTACCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGG
GCCTGCAGGCTCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGTAACATCAAGAA
CGCCAACTGCCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTTCG
GCAGCCCGGAAACCACCACCGGTGGTAACGCGCTGAAGTTCTACGTTTCGGTTCGTCT
GGACATCCGTCGTAATGGCGCGGTGAAGGAAGGTGACGAAGTCGTGCGTAGCGAAAC
CCGGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCTTTCCGTCAAGCTGAGTTCCAG
ATCCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGC
ACGGTTTTCCTCGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTCA
GGGCAAGGCCAACTCGGCCAAGTTTCTGCAGGACAATCCGGAAATCGGTAAATGCCCTC
GAGAAGCAGATTCGCGACAAGCTGCTGGCTCCGAGCGGAGATACCAAGGCTCTGCCCCG
TCAACGAGACCATCGATGACATGGCCGACGCGGATATCTGAATGAGCGAAGAAAACA
CGTACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCC
CGGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTTCGAG
GTGGTCGACAACTCGATCGACGAAGCTCTGGCCGGCCACTGCGACGACATCAGCATCA
TCATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGA
CGTGCATAAAGAAGAAGGCGTTTCCGCGAGCCGAGGTCATCATGACCGTGCTGCACGCC
GGCGGTAAAGTTCGACGACAACCTCTACAAGGTATCCGGCGGTCTGCACGGTGTGGGTG
TGTCGGTAGTGAACGCCCTGTCCGAAGAACTGGTGCTGACCGTTTCGCCGAGTGCGAA
GATCTGGGAACAGACCTACGTTACCGGTGTGCCTCAGGCGCCTATGGCAATTGTCGGT
GACAGCGAGACCACCGGTACCCAGATTCACTTCAAGGCTTCCAGCGAGACCTTCAAGA
ACATCCATTTAGCTGGGACATCCTGGCCAAGCGGATTCGTGAAGTGTCTTCTCTCAAC
TCCGGTGTCGGTATCGTTCTGAAGGACGAGCGCAGCGGCAAGGAAGAGCTGTTCAAGT
ACGAAGGCGGCCTGCGCGCATTCGTTGAATACCTGAACACCAACAAGACTGCGGTCAA
CCAGGTGTTCACTTCAACGTGCAGCGTGAAGACGGCATCGGCGTGGAATCGCCCTG
CAGTGGAACGACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCAGC
GCGACGGCGGCACCCACCTGGTGGGCTTCCGCTCGGCACTGACGCGTAACCTGAACAA
CTACATCGAGCAGGAAGGTCTGGCGAAGAAGCACAAGGTGGCCACCACCGGTGACGA
TGCCCGCGAAGGCCTGACCGCGATCATTTTCGGTCAAGGTGCCGGATCCGAAGTTCAGC
TCCCAGACCAAAGATAAGCTGGTGCTTCCGAAGTGAAGACCGCAGTCGAACAGGAAA
TGGGCAAGTACTTCTCCGACTTCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGT

CGGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAGGCTCGTGAGATG
ACCCGCCGTAAAGGTGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCC
AGGAAAAGGACCCTGCCCTTTCCGAACCTCTACCTGGTGGAAAGGTGACTCTGCTGGCGG
CTCCGCCAAGCAGGGACGCAACCGCAAGACCCAGGCGATTCTGCCGCTCAAGGGCAA
GATTCTTAACGTCGAGAAAGCGCGCTTCGACAAGATGATTTCCCTCGCAAGAGGTCTGGC
ACCTTGATCACTGCACTCGGCTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGC
TGCGTTATCACAACATCATCATCATGACCGACGCCGACGTCGACGGTTCGCACATCCGC
ACCCTGCTGCTGACTTTCTTTCTTCCGTCAGCTGCCGGAGCTGATCGAGCGTGGCTACAT
CTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATC
AAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGC
CTGCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGA
ACGACTTCCGCATGGTCATGAAAACCTCAAGCGCCTGTGCGGCCTGTACCCTCAGGA
GCTGACCGAACACTTCATCTACCTGCCAGCCGTGAGCCTGGAGCAACTCTCCGATCAC
GCAGCGATGCAGGATTGGTTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGT
CCGGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCC
AGAGGTCGAACCTGATCTCCACGGCCTGTGCAACTACGTCACCTTCAACCGCGACTTCT
TCGGCAGCAATGACTACAAGACCGTCGTCACCCTCGGCGCTCAACTGAGCTCCCTGCT
GGACGAAGGCGCTTATATTTCAGCGTGGCGAACGCAAGAAGGCGGTGACCGAGTTCAA
GGAAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATAC
AAAGGTCTGGGCGAGATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAGC
GTGCGCCGCATGCTCAAGGTCACCATCGAAGACGCCATCGGCGCCGACCAGATCTTCA
ACACCCTGATGGGTGATGCGGTCGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCT
GGCGGTATCCAACCTGGACTTCTGAATGTCCGGAAGCGCAACAGCAGTCTCGCCTC
AAAGAGTTGATCAGCCGTGGTCTGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACG
ACCACCTGCCGGAGGATATTTTCAGATCCGGAACAGGTGGAAGACATCATCCGCATGAT
CAACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTTG
GCCGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCTTGGCGGCT
GTGGAAACCGACATTGGTCGCACTACCGACCCAGTGCGTATGTACATGCGCGAAATGG
GCACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAG
AGGGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACAT
CCTCTCCGAATACACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCCTGAGC
GGTTACATCGACCCGGATGACGGCATTGCGCCGCCTGCCGCCGAAGTACCACCGCCTG
TCGATGCCAAGGCCGCGAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCA
GTGACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCT
TTGGCGCCGTTGCCGACCAGATGGAAATCACCCGCAAGGCGCTGAAAAAGCACGGTCG
CGAACACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCGATC
AACTGGTTCCGAAGCAATTTCGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATC
GCCTGCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCGCATGCC
ACGCGCCGACTTCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGAC
GCGCTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGCCGCCTGCAGCCGGAC
ATCATCCGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATTG
CCGAGATCAAGGACATCAACCGTCGCATGTGATCGGCGAGGCCAAGGCCCGTCGCGC
GAAGAAAGAGATGGTTCGAAGCCAACCTTGCGCCTGGTGATCTCCATCGCCAAGAAGTAC
ACCAACCGTGGCCTGCAGTTCCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGA
AAGCGGTAGACAAGTTCGAATACCGTCGCGGCTACAAGTTCTCGACTTATGCCACCTG
GTGGATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTC
CGGTGCACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCA
GGAAATGGGTGCGCAACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGA
GGACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCG
ATCGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGT
CGCCAATCGATGTCGCCACCGTTGAGAGCCTCAAGGAAGCGACTCGCGAAGTCCTCTC

CGGCCTCACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAAT
ACCGACCACACCCTTGAGGAAGTCGGTAAGCAGTTTCGACGTTACCCGTGAGCGGATTC
GTCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGAGAAGCGAGCATC
TGCGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGC
AGCATTTTTTCGCGGCGAAGCCATTGGAGCCGACGGTCAGACCGTTGGTGAGGTGGTGT
TTAACACCCGCAATGACCCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCCCAACAG
ATCGTTACCCTGACTTACCCGCACATCGGCAACACTGGCACCCACGCCGAAGACGCCG
AGTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCACTGGTTGCGAGC
AACTGGCGTAACACCCTGTCCCTGTCCGATTACCTGAAAGCCAACAATGTCGTGGCGA
TCGCCGGTATCGACACCCGTGCGCTGACGCGCATCCTGCGCGAGAAAGGCGCACAGAA
CGGCTGCATCATGGCCGGCGACAACATCTCCGACGAAGCGGCGATTGCTGCTGCACGC
GGCTTCCCTGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTGTCAGCACCAGGAAAGCT
ACGAGTGGCGCTCCAGCGTCTGGAGCCTGAAGACCGACAGTCATCCGACTATCGAGGC
TTCCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGC
GCATGCTGGTCGAGCGCGGTTGCCGCGTGACCGTAGTGCTGCGCAAACCCCGGCCAG
CGACGTCTGGCACTCAAGCCTGACGGTGTGTTCTGTCCAACGGTCTGGCGACCCCG
AGCCTTGCGATTACGCCATCCAGGCGATCAAGGACGTGCTGGAAACCGAGATTCCGGT
CTTCGGTATCTGCCTGGGCCACCAACTGCTGGCACTGGCCTCCGGCGCCAAGACGGTG
AAAATGGGCCACGGCCACCACGGCGCCAACCACCCGGTCCAGGACCTGGACAGCGGT
GTGGTGATGATCACCAGCCAGAACCACGGTTTTTGCGGTGGACGAAACCACCCTGCCGG
GCAACGTGCGGGCGATCCACAAGTCGCTGTTTCGATGGCACCCCTGCAAGGCATCGAGCG
TACCGACAAGAGCGCATTCAGCTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAAC
GATGTGGCGCCGCTGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATGA
GTAGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGA
CAGCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGAA
GTTTCAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTTGCGATGGGCTCCACCGAGG
GCTTGAAGCGCGGTCTGGACGTCAACAACACTGGCGCCGCCATCTCCGTACCGGTCCG
TAAAGCGACCCTGGGCCGGATCATGGACGTGCTGGGCAACCCGATCGACGAAGCTGGC
CCGATCGGCGAAGAAGAGCGTTGGGGCATTACCCGTCCTGCGCCGACCTTCGCTGAAC
AAGCTGGCGGCAACGACCTCCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCCC
GTTTCGCCAAGGGCGGTAAAGTCGGTCTGTTTCGGTGGTGCCGGTGTGGGCAAAACCGTA
AACATGATGGAATGATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTCG
CTGGTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTC
CAACGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAA
CCGTCTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGGT
AACGACGTTCTGCTGTTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGT
ATCCGCACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAA
GAGATGGGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGA
TCCAAGCGGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACCTT
CGCCCACTTGGACGCCACCGTCGTACTGTCCCGTGACATCGCTTCCCTGGGTATCTACC
CAGCGGTAGACCCACTGGATTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAA
CGAGCACTACGAAACCGCTCGCGGCGTTTCAGTACGTGCTGCAGCGCTACAAAGAGCTG
AAGGACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGG
TATCCCGCGCTCGTAAGATCCAGCGCTTCCCTGTCGCAGCCGTTCTTCGTGGCTGAAGTC
TTCCTGGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGG
CATCCTCAACGGTGACTACGACCACCTGCCAGAACAAGCGTTCTACATGGTTCGGCGGC
ATCGAAGAAGCGATCGAGAAAGCCAAGAAACTGTAA

NCBI Reference Sequence: NZ_CP027719.1

Strain: P2

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP027719_P2

GAAGTGAAGAGTTTGGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGAAGCTTGCTTCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTTTCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC
GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTCCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTAAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCTGTCAGCTCGTGTCTGTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCCTTGTCTTAGTTACCAGCACGTCATGGTGGGCACTCTAAGGAGACTGCCG
GTGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGG
GCTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTA
ATCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCG
GAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGATC
ACACCGCCCGTCACACCATGGGAGTGGGTGCAACAGAGTAGCTAGTCTAACCTTCG
GGAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCG
TAGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTT
GGCTGCGGCCCTGGGTGAGATCGAACGTCAATTTCGGCAAGGGTGCCGTAATGCGTATG
GGCGATCACGACCGCCAGGCGATCCCGGCCATTTCCTACTGGCTCTCTGGGTCTGGACAT
CGCACTCGGCATCGGCGGCCTGCCAAAAGGTTCGTATTGTTGAAATCTACGGTCCGGAA
TCGTCCGGTAAAACCAACCTGACCCTGTCCGTGATTGCCCAGGCACAGAAGATGGGCG
CCACCTGCGCCTTCGTGACGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAACCT
GGGGGTCAACGTTGACGACCTGCTGGTTTCCAGCCGGACACCGGCGAACAGGCGCTG
GAAATCACCGACATGCTGGTGCCTCCAATGCCATCGACGTGATCGTGATCGACTCCG
TGGCGGCACTGGTACCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGG
GTCTGCAGGCCCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGTAACATCAAGAA
CGCCAACTGCCTGGTGATCTTCATCAACCAGATCCGAATGAAAATCGGCGTGATGTTT
GGCAGCCCGGAAACCACCGGCGGTAAACGCGCTGAAGTTCTACGCTTCGGTTCGTC
TGGACATCCGTCGTACTGGCGCGGTGAAGGAAGGCGACGAAGTCGTCGGTAGCGAAA
CCCGGGTCAAGATCGTCAAGAACAAGGTGGCTCCACCGTTCCGCCAGGCTGAATTCCA
GATCCTGTACGGCAAGGGTATCTACCTGAACGGTGAGATCATCGATCTGGGCGTGCTG
CACGGTTTCCTCGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTC
AGGGCAAGGCCAACTCGGCCAAGTTCCTGCAGGACAATCCGGAAATCGGCAATGCCCT
CGAGAAGCAGATTTCGCGACAAGCTGCTGGCTCCAACCGCTGATGTCAAAGCTTCGCCG
GTCAAACGAGACCATCGATGACATGGCTGACGCGGATATCTGAATGAGCGAAGAAAAC
ACGTACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTC
CCGGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTCGA
GGTGGTCGATAACTCGATCGACGAAGCTCTGGCCGGCCATTGCGACGACATCAGCATC
ATCATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAG
ACGTGCATAAAGAAGAAGGCGTTTCCGCGGCCGAGGTCATCATGACCGTACTGCACGC

CGGCGGTAAAGTTCGACGATAACTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGT
GTGTCGGTAGTGAACGCCCTGTCCGAAGAACTGGTCCTGACCGTTCCGCCGACGCGAA
AGATCTGGGAACAGACCTACGTTACAGGTGTGCCTCAGGCGCCTATGGCGATCGTCGG
TGACAGCGAAACCACCGGTACCCAGATTCACTTCAAGGCGTCCAGCGAGACCTTCAAG
AACATCCATTTAGCTGGGACATCCTGGCCAAGCGGATTTCGTGAACTGTCCTTCTCAA
CTCCGGTGTCCGGTATCGTTCTGAAGGACGAACGCGAGTGGAAGGAAGAGCTGTTCAAG
TACGAAGGCGGCCTGCGTGCCTTCGTTGAATACCTGAACACCAACAAGACCGCGGTCA
ACCAGGTGTTCCACTTCAATGTGCAGCGTGAAGATGGCATCGGCGTGGAATCGCCCT
GCAGTGGAACGACAGCTTCAACGAAAACCTGCAGTGCTTACCAACAACATTCCGCAG
CGCGATGGCGGCACCCACTTGGTGGGCTTCCGTTCCGGCACTGACGCGTAACCTGAACA
ACTACATCGAACAGGAAGGTCTGGCGAAGAAGCACAAAGGTCGCCACCACCGGTGACG
ATGCCCCGGAAGGCTGACCGCGATCATTTCCGGTCAAGGTGCCGGATCCGAAGTTCAG
CTCCCAGACCAAAGACAAGCTGGTGTCTTCCGAAGTGAAGACCGCGGTTGAACAGGAA
ATGGGCAAGTACTTCTCCGACTTCCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGG
TCGGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAGGCTCGTGAGAT
GACCCGCCGTAAAGGCGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGC
CAGGAAAAAGACCCTGCCCTTCCGAACCTCTACCTGGTGAAGGTGACTCTGCTGGCG
GCTCCGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATTCTGCCGCTCAAGGGCAA
GATCCTTAACGTCGAGAAAGCGCGCTTCGACAAGATGATTTCTCGCAAGAGGTCCGGC
ACCTTGATCACTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGC
TGCGTTATCACAACATCATCATCATGACCGACGCTGACGTCGACGGTTCGCACATCCGT
ACCCTGCTGCTGACCTTCTTCTTCCGTCAGCTGCCGGAGCTGATCGAGCGTGGCTACAT
CTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATC
AAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGC
CTGCACCTGAACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGA
ACGACTTCCGCATGGTCATGAAAACCTCAAGCGTCTGTGCGGCCTGTACCCTCAGGA
GCTGACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAACTCTCCGATCAC
GCGGCCATGCAGGATTGGCTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGT
CCGGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCC
AGAGGTGCAACTGATCTCCACGGCCTGTCGAACTACGTCACCTTCAACCGCGACTTCT
TCGGTAGCAATGACTACAAGACCGTCGTTACCCTCGGCGCTCAACTGAGCTCCCTGCTG
GACGAAGGCGCTTATATTCAGCGTGGCGAACGCAAGAAGGCGGTGACCGAGTTCAAG
GAAGCCCTGGACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATACA
AAGGTCTGGGCGAGATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAGCG
TGCGCCGTATGCTCAAGGTCACGATTGAAGATGCCATCGGCGCCGACCAGATCTTCAA
CACCTGATGGGGGATGCGGTTCGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCTG
GCGGTATCCAATCTGGACTTCTGAATGTCCGGAAAAGCGCAACAGCAGTCTCGCCTCA
AAGAGTTGATCAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACGA
CCACCTGCCGGAGGATATTTAGATCCGGAACAGGTGGAAGACATCATCCGCATGATC
AACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTG
CCGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCGTTGGCGGCTG
TGGAACCCGACATTGGTCGCACTACCGACCCCGTGCGTATGTACATGCGCGAAATGGG
AACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAGA
GGGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACATC
CTCTCCGAATACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCCTGAGCG
GTTACATCGACCCGGACGACGGCATTGCGCCGCCTGCCGCCGAAGTACCACCGCCTGT
CGATGCCAAGGCTGCAAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCAG
TGACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCTTT
GGCGCCGTTGCCGACCAGATGGAAATCACCCGCAAGGCGCTGAAGAAGCACGGTCGC
GAACACAAGCAAGCCCTGGCCGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCGATCA
AACTGGTTCCGAAGCAATTCGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATCG

CCTGCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCCGCATGCCA
CGCGCCGACTTCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGACG
CGCTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATCGGCCGCCTGCAGCCGGACA
TCATCCGTTGCCAGCAGAAGCTGACCGCGCTCGAGACCGAGACCGGCCTGACGATCGC
CGAGATCAAGGACATCAACCGTCGCATGTCGATCGGCCGAGGCCAAGGCCCGTCGCGCG
AAGAAAGAGATGGTTCGAAGCCAACCTGCGTCTGGTGATCTCCATCGCCAAGAAGTACA
CCAACCGTGGCTTGCAATTCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGAA
AGCGGTAGACAAGTTCGAATACCGTCGCGGGCTACAAATTCTCGACTTATGCCACCTGG
TGGATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTCC
GGTGACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCAG
GAAATGGGTGCGCAACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGAG
GACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCGA
TCGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGTC
GCCAATCGATGTCGCCACCGTTGAGAGCCTTAAAGAAGCGACTCGCGAAGTACTCTCC
GGCCTCACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAATA
CCGACCACACCCTCGAGGAAGTCGGTAAGCAGTTCGACGTTACCCGTGAGCGGATTCCG
TCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGCGAAGCGAGCACCT
GCGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCA
GCATTTTTCGCGGGCGAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGTT
TAACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCAACAG
ATCGTTACCCTGACTTACCCGCATATCGGCAATACCGGCACCACGCCGGAAGACGCCG
AGTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCTCTGGTTGCGAGC
AACTGGCGTAACACCCTGTCCCTGTCCGACTACCTGAAAGCCAACAATGTCGTGGCGA
TCGCCGGTATCGACACCCGTCGCCTGACGCGCATCCTGCGCGAGAAAGGTGCGCAGAA
CGGTGCGATCATGGCCGGCGACAATATCTCCGACGAAGCGGGCATTGCCGCTGCACGC
GGCTTCCCGGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTCAGTACCAAGGAAAGCT
ACGAGTGGCGCTCCAGTGTCTGGAACCTGAAGACCGACAGTCATCCGACCATCGAAGC
TTCCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGC
GCATGCTGGTTCGAACGCGGTTGCCGCGTGACCGTGGTGCTGCGCAAACCCCGGCCAG
CGAAGCTCTGGCGCTCAAGCCTGACGGTGTGTTCTGTCCAACGGCCCTGGCGACCCC
GAGCCTTGCGATTACGCCATCCAGGCGATCAAGGACGTGCTGGAGACCGAGATTCCGG
TCTTCGGTATCTGTCTGGGCCACCAACTGCTGGCACTGGCCGCCGGCGCCAAGACAGT
GAAGATGGGCCACGGCCACCACGGCGCCAACCACCCGGTCCAGGACCTGGACAGCGG
TGTGGTGATGATCACCAGCCAGAACCACGGTTTTGCGGTGGACGAAGCCACCCTGCCG
GGCAACGTGCGGGCGATCCACAAGTCGCTGTTCGACGGCACCTGCAAGGCATCGAGC
TGACCGACAAGAGCGCATTACGCTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAA
CGATGTGGCGCCGCTGTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATG
AGTAGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCG
ACAGCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGA
AGTTCAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTGCGATGGGCTCCACCGAG
GGCTTGAAGCGCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTCCG
GTAAAGCGACCCTGGGCGCGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGG
CCCGATCGGTGAAGAAGAGCGTTGGGGCATTCACCGTCCTGCGCCGACCTTCGCTGAA
CAAGCTGGCGGCAACGACCTGCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCC
CGTTCGCCAAGGGCGGTAAAGTCGGTCTGTTCGGTGGTGCCGGTGTGGGCAAAACCGT
AAACATGATGGAACCTGATCCGTAACATCGCCATCGAGCACAGCGGTTATTCGTGTTC
GCCGGTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATT
CCAACGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAA
ACCGTCTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGG
TAACGACGTTCTGCTGTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAG
TATCCGCACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAA

GAGATGGGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGA
TCCAAGCGGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACCTT
CGCCCCTTGGACGCCACCGTCGTTCTGTCCCGTGACATCGCTTCCCTGGGTATCTACC
CAGCGGTAGACCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAC
CGAGCACTACGAAACCGCTCGTGGCGTTCAGTACGTGCTGCAGCGCTACAAAGAGCTG
AAGGACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGG
TATCCCGCGCTCGTAAGATCCAGCGCTTCTGTGTCGAGCCGTTCTTCGTGGCTGAAGTC
TTCCTGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGG
CATCCTCAACGGTGACTACGACCATCTGCCAGAACAAGCGTTCTACATGGTTGGTGGC
ATCGAAGAAGCGATCGAGAAAGCCAAGAACTGTAA

NCBI Reference Sequence: NZ_CP008696.1

Strain: PA23

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP008696_PA23

AGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGCAAGTCGA
GCGGTAGAGAGAAGCTTGCTTCTCTTGAGAGCGGCGGACGGGTGAGTAATGCCTAGGA
ATCTGCCTGGTAGTGGGGGATAACGTTTCGGAACGGACGCTAATACCGCATACGTCCT
ACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGGTCGGATT
AGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCTGAGAGGA
TGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCAGCAGTGGG
GAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGAAGAAGGTC
TTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATACGTGAGTATT
TTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCGCGGTAATAC
AGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGGTGGTTCGTT
AAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAACCTGGCGAGCT
AGAGTATGGTAGAGGGTGGTGGAATTTCCCTGTGTAGCGGTGAAATGCGTAGATATAGG
AAGGAACACCAGTGCGGAAGGCGACCACCTGGACTGATACTGACACTGAGGTGCGAA
AGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAAACGATGTCAA
CTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAAGTTGACCGCCT
GGGGAGTACGGCCGCAAGGTTAAACTCAAATGAATTGACGGGGGCCCCGCACAAGCG
GTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGCCTTGACATCC
AATGAACCTTCCAGAGATGGATTGGTGCCCTTCGGGAACATTGAGACAGGTGCTGCATG
GCTGTCGTCAGCTCGTGTCTGTGAGATGTTGGGTAAAGTCCCGTAACGAGCGCAACCCTT
GTCCTTAGTTACCAGCACGTAATGGTGGGCACTCTAAGGAGACTGCCGGTGACAAACC
GGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGGGCTACACACG
TGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTAATCCCATAAA
ACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCGGAATCGCTAG
TAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGACACACCGCCCG
TCACACCATGGGAGTGGGTTGCACCAGAAGTAGCTAGTCTAACCTTCGGGAGGACGGT
TACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCGTAGGGGAACC
TGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTTGGCTGCGGCC
CTGGGTCAGATCGAACGTCAATTTCGGCAAGGGTGCCGTAATGCGTATGGGCGATCACG
ACCGCCAGGCGATCCCGGCCATTTCCACTGGCTCTCTGGGTCTGGACATCGCACTCGGC
ATCGGCGGCCTGCCAAAAGGTCGTATTGTTGAAATCTACGGTCCGGAATCGTCCGGTA
AAACCACCCTGACCCTGTCCGTGATTGCCCAGGCACAGAAGATGGGCGCCACCTGCGC
CTTCGTCGACGCCGAGCACGCACTGGACCCGGAATACGCCGGCAAACCTGGGGGTCAAC
GTTGACGACCTGCTGGTTTCCCAGCCGGACACCGGCGAACAGGCGCTGGAAATCACCG
ACATGCTGGTGCCTCCAATGCCATCGACGTGATCGTGATCGACTCCGTGGCGGCACT
GGTACCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGGGCCTGCAGGC
CCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGTAACATCAAGAACGCCAACTGC

CTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTTCGGCAGCCCCG
AAACCACCACCGGCGGTAAACGCGCTGAAGTTCTACGTTTCGGTTCGTCTGGACATCCGT
CGTACTGGCGCGGTGAAGGAAGGCGACGAAGTCGTCGGTAGCGAAACCCGGGTCAAG
ATCGTCAAGAACAAGGTGGCTCCACCGTTCCGCCAGGCTGAATTCCAGATCCTGTACG
GCAAGGGTATCTACCTGAACGGTGAGATCATCGATCTGGGCGTGCTGCACGGTTTCCTC
GAGAAGTCCGGTGCCCTGGTACAGCTACCAGGGCAACAAGATCGGTCAGGGCAAGGCC
AACTCGGCCAAGTTCCTGCAGGACAATCCGGAAATCGGCAATGCCCTCGAGAAGCAGA
TTCGCGACAAGCTGCTGGCTCCAACCGCTGATGTCAAAGCTTCGCCGGTCAACGAGAC
CATCGATGACATGGCTGACGCGGATATCTGAATGAGCGAAGAAAACACGTACGACTCG
AGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCCCGGTATGTACA
TTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTTCGAGGTGGTCGATAA
CTCGATCGACGAAGCTCTGGCCGGCCATTGCGACGACATCAGCATCATCATCCACCCG
GACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGACGTGCATAAAG
AAGAAGGCGTGTCGCGCGCCGAGGTCATCATGACCGTGCTGCACGCTGGTGGTAAGTT
CGACGACAACCTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGTGTGTCGGTAGTG
AACGCCCTGTCCGAAGAAGTGGTCTGACCGTTCGCCGCAGCGGAAAGATCTGGGAAC
AGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCGGTGACAGCGAAAC
CACCGGTACCCAGATTCACTTCAAGGCGTCCAGCGAGACCTTCAAGAACATCCATTTC
AGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTCCTCAACTCCGGTGTCGG
TATCGTTCTGAAGGACGAACGCAGCGGCAAGGAAGAGCTGTTCAAGTACGAAGGCGG
CCTGCGTGCGTTTCGTTGAATACCTGAACACCAACAAGACCGCGGTCAACCAGGTGTTTC
CACTTCAATGTGCAGCGTGAAGATGGCATCGGCGTGGAATCGCCCTGCAGTGGAACG
ACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCAGCGCGATGGCGG
CACCCACTTGGTGGGCTTCCGTTTCGGCACTGACGCGTAACCTGAACAACTACATCGAA
CAGGAAGGTCTGGCGAAGAAGCACAAGGTCGCCACCACCGGTGACGATGCCCGCGAA
GGCCTGACCGCGATCATTTTCGGTCAAGGTGCCGGATCCGAAGTTCAGCTCCCAGACCA
AAGACAAGCTGGTGTCTTCCGAAGTGAAGACCGCGGTTGAACAGGAAATGGGCAAGT
ACTTCTCCGACTTCCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGTTCGGCAAGAT
GCTCGACGCCGCCCCTGCCCCTGAAGCGGCGCGTAAGGCTCGTGAGATGACCCGCCGT
AAAGGCGCGCTGGATATCGCCGGCCTGCCGGGCAAACTGGCGGACTGCCAGGAAAAA
GACCCTGCCCTTTCGAACTCTACCTGGTGGAAGGTGACTCTGCTGGCGGCTCCGCCAA
GCAGGGACGCAACCGTAAGACCCAGGCGATTCTGCCGCTCAAGGGCAAGATCCTTAAC
GTCGAGAAAGCGCGCTTCGACAAGATGATTTCTCGCAAGAGGTCGGCACCTTGATCA
CTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGCTGCGTTATCA
CAACATCATCATCATGACCGACGCCGACGTCGACGGTTCGCACATCCGCACCCTGCTG
CTGACCTTCTTCTTCCGTCAGCTGCCGGAGCTGATCGAGCGTGGCTACATCTACATCGC
TCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATCAAAGACGA
CGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGCCTGCACCTG
AACGAAGAAGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGAACGACTTCC
GCATGGTCATGAAAACCTCAAGCGTCTGTGCGCGCCTGTACCCTCAGGAGCTGACCGA
ACACTTCATCTACCTGCCAGCCGTGAGCCTGGAGCAACTCTCCGATCACGCAGCGATG
CAGGATTGGTTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGTCCGGCCTGG
TCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCCAGAGGTCGA
ACTGATCTCCCATGGCCTGTCGAACTACGTCACCTTCAACCGCGACTTCTTCGGCAGCA
ATGACTACAAGACCGTCGTCACCCTCGGCGCTCAACTGAGCTCCCTGCTGGACGAAGG
CGCTTATATTAGCGCGGCGAACGCAAGAAGGCGGTGACCGAGTTCAAGGAAGCCCTG
GACTGGCTGATGACCGAAAGCACCAAGCGCCACACCATCCAGCGATACAAAGGTCTGG
GCGAGATGAACCCGGACCAGCTGTGGGAAACCACCATGGATCCAAGCGTGCGCCGCAT
GCTCAAGGTCACCATCGAAGACGCCATCGGCGCCGACCAGATCTTCAACACCCTGATG
GGTGATGCGGTTCGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCTGGCGGTATCCA
ACTTGGACTTCTGAATGTCCGGAAAAGCGCAACAGCAGTCTCGCCTCAAAGAGTTGAT

CAGCCGTGGTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACGACCACCTGCCG
GAGGATATTTTCAGATCCGGAACAGGTGGAAGACATCATCCGCATGATCAACGACATGG
GGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTGGCCGAAGCCGA
TACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCTTGGCGGCCGTGGAAACCGA
CATTGGTCGCACTACCGACCCCGTGCGTATGTACATGCGCGAAATGGGAACGGTAGAG
CTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAGAGGGCATCCGTG
AAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACATCCTCTCCGAATA
CACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCCTGAGCGGTTACATCGAC
CCGGACGACGGCATCGCGCCGCCTGCCGCCGAAGTACCACCGCCTGTCGATGCCAAGG
CCGCAAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCAGTGACGACGAAG
AAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCAGCGCTTTGGCGCCGTTCG
CGACCAGATGGAAATCACCCGCAAGGCGCTGAAGAAGCACGGTCGCGAACACAAGCA
AGCCCTGGCTGAAATGCTGGCCCTGGCTGAACTGTTTCATGCCGATCAAACCTGGTTCCGA
AGCAATTTCGAAGGCCTGGTTGAACGTGTTTCGTAGCGCCCTGGATCGCCTGCGTCAGCA
AGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCGCATGCCACGCGCCGACTTCC
TGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGACGCGCTGGCCAAAGG
CAAGGCCAAGTACGCCGAAGCCATCGGCCGCCTGCAGCCGGACATTATCCGTTGCCAG
CAGAAGCTGACCGCGCTTGAGACCGAGACCGGCCTGACGATCGCCGAGATCAAGGAC
ATCAACCGTCGCATGTCGATCGGCGAGGCCAAGGCCCGTCGCGCGAAGAAAGAGATG
GTCGAAGCCAACCTGCGTCTGGTGATCTCCATCGCCAAGAAGTACACCAACCGTGGCT
TGCAATTCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGAAAGCGGTAGACAA
GTTTCGAATACCGTCGCGGCTACAAATTCTCGACTTATGCCACCTGGTGGATCCGTCAGG
CGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTCCGGTGCACATGATC
GAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCAGGAAATGGGTCGCG
AACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGAGGACAAGATCCGCA
AGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCGATCGGTGATGACGA
AGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGTCGCCAATCGATGTC
GCCACCGTCGAGAGTCTTAAAGAAGCGACTCGCGAAGTACTCTCCGGCCTCACTGCCC
GTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAATACCGACCACACCCT
CGAGGAAGTCGGTAAGCAGTTTGACGTTACCCGTGAGCGGATTTCGTCAGATCGAAGCC
AAGGCGCTGCGCAAGCTGCGCCACCCGACGCGAAGCGAGCACCTGCGCTCCTTCCTCG
ACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCAGCATTTTTCGCGGC
GAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGTTTAACACCGCAATGA
CCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCCAACAGATCGTTACCCTGACT
TACCCGCATATCGGCAATACCGGCACCACGCCGGAAGACGCCGAGTCCGATCGTGTCT
GGTCGGCCGGTCTGGTGATTGCGGACCTGCCTCTGGTTGCGAGCAACTGGCGTAACAC
CCTGTCCCTGTCCGACTACCTGAAAGCCAACAATGTCGTGGCAATCGCCGGTATCGAC
ACCCGTCGCCTGACGCGCATCCTGCGCGAGAAAGGTGCGCAGAACGGCTGCATCATGG
CCGGCGACAATATCTCCGACGAAGCGGCGATTGCCGCTGCACGCGGCTTCCCGGGCCT
GAAAGGCATGGATCTGGCGAAGGTGCTCAGTACCAAGGAAAGCTACGAGTGGCGCTC
CAGTGTCTGGAACCTGAAGACCGACAGTCATCCGACCATCGAAGCTTCCGAGCTGCCT
TACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGCGCATGCTGGTCG
AACGCGGTTGCCGCGTGACCGTGGTGCCTGCGCAAACCCCGGCCAGCGAAGCTCTGGC
GCTCAAGCCTGACGGTGTGTTCTGTCCAACGGCCCTGGCGACCCCGAGCCTTGCGATT
ACGCCATCCAGGCGATCAAGGACGTGCTGGAGACCGAGATTCCGGTCTTCGGTATCTG
TCTGGGCCACCAACTGCTGGCACTGGCCGCCGGCGCCAAGACAGTGAAGATGGGCCAC
GGCCACCACGGCGCCAACCACCCGGTCCAGGACCTGGACAGCGGTGTGGTGATGATCA
CCAGCCAGAACCACGGTTTTGCGGTGGACGAAGCCACCCTGCCGGGCAACGTGCGGGC
GATCCACAAGTCGCTGTTTCGACGGCACCCCTGCAAGGCATCGAGCTGATCGACAAGAGC
GCATTCAGCTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAACGATGTGGCGCCGC
TGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATGAGTAGCGGACGTAT

CGTTCAAATCATCGGGCGCCGTTATCGACGTGGAATTTCCACGCGACAGCGTACCGAGC
ATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGAAGTTCAGCAGCAGC
TGGGCGACGGCGTGGTACGTACCATTTGCGATGGGCTCCACCGAGGGCTTGAAGCGCGG
TCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTTCGGTAAAGCGACCCTG
GGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGGCCCCGATCGGCGAA
GAAGAGCGTTGGGGCATTACCGTTCCTGCGCCGACCTTCGCTGAACAAGCTGGCGGCA
ACGACCTGCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCCCGTTCGCCAAGGG
CGGTAAAGTCGGTCTGTTTCGGTGGTGCCGGTGTGGGCAAAACCGTAAACATGATGGAA
CTGATCCGTAAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTCGCCGGTGTGGGTGA
GCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTCCAACGTTCTGGAC
AAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAACCGTCTGCGCGTA
GCTCTGACCGGCCTGACCATGGCCGAGAAGTTCGTGACGAAGGTAACGACGTTCTGC
TGTTTCGTGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGTATCCGCACTGCTG
GGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAAGAGATGGGCGTTC
TGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGATCCAAGCGGTATA
CGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACCTTCGCCCACTTGGAC
GCCACCGTCGTTCTGTCCCGTGACATCGCTTCCCTGGGTATCTACCCAGCGGTAGACCC
ACTGGACTCGACTTCCCGCCAGCTGGACCCGAACGTGATCGGCACCGAGCACTACGAA
ACCGCTCGTGGCGTTCAGTACGTGCTGCAGCGCTACAAAGAGCTGAAGGACATCATTG
CGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGGTATCCCGCGCTCG
TAAGATCCAGCGCTTCCTGTGCGAGCCGTTCTTCGTGGCTGAAGTCTTCACTGGTTCTC
CAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGGCATCCTCAACGG
TGACTACGACCATCTGCCAGAACAAGCGTTCTACATGGTTGGTGGCATCGAAGAAGCG
ATCGAGAAAGCCAAGAACTGTAA

NCBI Reference Sequence: NC_007492.2

Strain: Pf01

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NC_007492_Pf01

GAAGTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGATGAAGGGAGCTTGCTCCTGGATTACGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGACAACGTTTCGAAAGGAACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTTGTAGATTAATAC
TCTGCAATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGGAAATTTCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCAGAGATGGATTGGTGCCTTCGGGAGCATTGAGACAG
GTGCTGCATGGCTGTCGTGAGCTCGTGTGCTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCCCTTGTCCTTAGTTACCAGCACGTTATGGTGGGCACTCTAAGGAGACTGCCGG
TGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGGG
CTACACACGTGCTACAATGGTCGGTACAAAGGGTTGCCAAGCCGCGAGGTGGAGCTAA

TCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCGG
AATCGCTAGTAATCGCGAATCAGAATGTGCGGGTGAATACGTTCCCGGGCCTTGTACA
CACCGCCCGTCACACCATGGGAGTGGGTTGCACCAGAAGTAGCTAGTCTAACCTTCGG
GAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCGT
AGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTTG
GCTGCGGCCCTGGGTCAGATCGAACGTCAATTTCGGCAAGGGTGCCGTAATGCGTATGG
GCGATCAGGACCGTCAGGCGATCCCGGCCATTTCCACCGGCTCTCTGGGTCTGGACATC
GCACTCGGCATCGGCGGCCTGCCAAAAGGCCGTATCGTTGAAATCTACGGTCCTGAAT
CTTCCGGTAAAACCACTGACGCTGTCCGTGATCGCCCAGGCTCAAAAAGCCGGTGC
GACCTGCGCCTTCGTGACGCCGAACACGCCCTCGACCCAGAGTACGCCGGCAAGCTG
GGCGTCAATGTGACGACCTGCTGGTTTCCAGCCGGACACCGGCGAGCAGGCCCTGG
AAATCACCGACATGCTGGTGCGCTCCAACGCCGTTGACGTGATCATCGTCGACTCCGTG
GCCGCTCTGGTACCGAAGGCAGAAATCGAAGGCGAAATGGGTGACATGCACGTGGGC
CTGCAAGCCCGTCTGATGTCCAGGCGCTGCGTAAAATCACCGGTAACATCAAGAACG
CCAAGTGCCTGGTGTCTTCATCAACCAGATCCGCATGAAGATCGGCGTGATGTTCCGGC
AGCCCGGAAACCACCACCGGTGGTAACGCGCTGAAGTTCTACGCCTCGGTTCTGTCTCG
ACATCCGCCGTACCGGCGCGGTGAAGGAAGGCGACGAAGTGGTCGGCAGCGAAACCC
GCGTCAAGGTTGTGAAGAACAAGGTGGCTTCGCCGTTCCGTGAGGCCGAGTTCCAGAT
TCTCTACGGCAAGGGTATCTACCTGAACGGCGAGATGATCGACCTGGGCGTTCTGCAC
GGGTTCTGTCGAGAAGTCCGGCGCCTGGTATGCCTACGAAGGCACCAAGATCGGTCAGG
GCAAGGCCAACTCGGCCAAGTTCTTGCGGACAACCCGGAAGTCGCGGCCAAGCTCGA
GAAGCAACTGCGTGACAAGCTGCTGTCGCCAGCCGTGATCGCCGACTCCAAGGCTTCT
GCGGTCAAAGAGACCGAAGACGACCTGGCTGACGCTGACATCTGATTGAGCGAAGAA
AATACGTACGACTCATCGAGCATTAAAGTGCTGAAAGGCCTGGATGCCGTGCGCAAAC
GTCCCGGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCACATGGTGTT
CGAGGTGGTCGACAACCTCGATCGACGAAGCCCTCGCCGGCCACTGCGACGACATCAGC
ATCATCATCCACCCGGATGAGTCCATCACCGTTAAAGACAACGGCCGTGGCATCCCGG
TAGACGTGCACAAAGAGGAAGGCGTTTCCGCCGCCGAGGTCATCATGACCGTCCTCCA
CGCCGGCGGTAAAGTTTGACGACAACCTCCTACAAGGTATCCGGTGGTCTGCACGGTGTA
GGTGTTTTCGGTCGTGAACGCGCTGTCTGAAGAACTGGTCCTGACCGTGCGCCGCAGCG
GCAAGATCTGGGAACAGACCTACGTCCACGGCGTGCTCAGGCACCGATGGCGATCGT
TGGCGACAGCGAAACCACTGGCACCCAGATTCACCTCAAGGCTTCCAGCGAAACCTTC
AAGAACATTCACTTCAGCTGGGATATCCTGGCCAAGCGCATTTCGTGAAGTGTCTTTCCT
CAACTCCGGTGTAGGCATCGTCCTCAAGGACGAGCGCAGCGGCAAGGAAGAACTGTTT
AAGTACGAAGGCGGCCTGCGTGCGTTTCGTTGAATACCTGAACACCAACAAGACTGCGG
TCAACCAGGTGTTCCACTTCAACATCCAGCGTGAAGACGGCATCGGCGTGGAATCGC
CCTGCAGTGGAACGACAGCTTCAACGAGAACCTGTTGTGCTTACCAACAACATTCCG
CAGCGCGACGGTGGCACTCACCTGGTGGGCTTCCGCTCGGCACTGACGCGTAACCTGA
ACAACTACATCGAGCAGGAAGGCCTGGCGAAGAAGCACAAAGTCGCCACCACCGGTG
ACGATGCCCCGTGAAGGCCTGACCGCGATCATCTCGGTGAAGGTGCCGGATCCGAAGTT
CAGTCCCAGACCAAGACAAGCTGGTTTCTTCCGAAGTGAAGACCGCGGTGCAACAG
GAAATGGGCAAGTACTTCTCCGACTTCTGCTGGAAAACCCGAACGAAGCCAAACTGG
TCGTGCGCAAGATGATCGACGCTGCCCCGTGCCCCGTGAAGCGGCGCGCAAGGCCCGTGA
GATGACCCGCCGCAAAGGCGCGCTGGACATCGCCGGCCTGCCGGGCAAGCTCGCTGAC
TGCCAGGAAAAAGACCCGGCGCTGTCCGAAGTGTACCTCGTGGAAGGTGACTCCGCGG
GCGGCTCTGCCAAGCAGGGACGTAACCGCAAGACCCAGGCCATCCTGCCGCTGAAGGG
CAAGATCCTCAACGTCGAGAAAGCCCGTTTCGACAAGATGATCTCGTCCCAGGAAGTG
GGCACCTGATCACCGCGCTGGGCTGCGGTATCGGTGCGGAAGAGTACAACATCGACA
AGCTGCGCTATCACAACATCATCATCATGACCGATGCTGACGTCGACGGTTTCGCACATC
CGTACCCTGCTGCTGACCTTCTTCTTCCGTCAGTTGCCTGAGCTGATCGAGCGTGGCTA
CATCTACATCGCCCAGCCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATAC

ATCAAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCG
AGCCTGCACCTGAACGAAGACGCCCCGGGCATTTCCGGCGAAGCGCTGGAACGTCTGG
TGAACGACTTCCGCATGGTGATGAAGACCCTCAAGCGTCTGTGCGCCTGTACCCGCA
GGAGCTGACCGAGCACTTCATCTACCTGCCGGCCGTCAGCCTGGAAATGCTCGGCGAC
CACGCGAAGATGCAGGACTGGCTGGCCCAGTACGAAGTCCGTCTGCGCACCGTCGAGA
AGTCGGGGCCTGGTCTACAAGGCCAGCCTGCGTGAAGATCGTGAACGTGGCGTTTGGCT
GCCAGAGGTCGAACTGATCTCCACGGTCTGTGCGAACTATGTACCTTTAACC GCGACT
TCTTCGGCAGCAACGACTACAAGACCGTCGTCAACCCTCGGCGCTCAACTGAGCACCCCT
CTTGATGAAGGGCGCATACATCCAGCGTGGCGAGCGTAAAAAAGCGGTCACTGAGTTCA
AGGAAGCCCTGGACTGGCTGATGGCCGAAAGCACCAAGCGCCACACCATT CAGCGATA
CAAAGGTCTGGGCGAAATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAG
CGTGCGCCGCATGCTGAAAGTCACCATCGAAGACGCCATTGGCGCAGACCAGATCTTC
AACACCCTGATGGGTGATGCGGTGCAACCTCGCCGTGACTTCATCGAGAGCAACGCTC
TGGCGGTGTCCAACCTGGATTTCTGAATGTCCGGAAAAGCGCAACAGCAGTCTCGTAT
TATTGAGTTGATCAAACCTGGGTGCTGAGCAGAAGTATCTGACTTACGCCGAGGTCAAC
GACCACCTGCCCCGAGGATATTTTCAGATCCGGAGCAGGTGGAAGACATCATCCGCATGA
TTAACGACATGGGGATCCCCGTACACGAGAGTGCTCCGGATGCGGACGCCCTTATGCT
GGCCGACGCCGATAACCGACGAGGCCGCTGCGGAAGAAGCAGCCGCTGCGTTGGCGGC
GGTGAGACCGATATCGGTGCGCACCACTGACCCGGTGCGCATGTACATGCGTGAAATG
GGTACGGTCGAGCTTCTGACTCGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAG
AAGGCATCCGTGAAGTGATGAGCGCCATCGCGCACTTCCCTGGCACGGTTGACCATAT
TCTCTCCGAGTACACTCGCGTCACCACCGAAGGTGGTCGCCTGTCCGACGTTCTGAGCG
GTTACATCGACCCGGACGACGGCATTACGCCGCTGCCGCCGAAGTACCGCCACCGAT
CGACGCGAAAGCCGCGAAAGCGGATGACGACTCCGAGGACGATGACGCCGAAGCTTC
CGATGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATTGCCGCACAGCGCTTC
GGTGCTGTGCGCCGACCAGATGGAAATCACCCGCAAGGCCCTGAAAAAGCACGGTCGTC
ACAACAAGGCGGCAATTGCCGAACCTGTTGGCCCTGGCCGAGCTGTTTCATGCCGATCAA
GCTGGTGCCGAAGCAGTTTCGAAGCCCTGGTTCGAGCGTGTTTCGACGCGCCCTGGATCGC
CTGCGTCAGCAAGAGCGCGCGATCATGCAACTGTGCGTACGTGATGCACGTATGCCTC
GTGCCGACTTCCTGCGCCAGTTCCCGGGCAACGAAGTCGACGAAAGCTGGTCCGACGC
CCTGGCCAAAGGCAAGAGCAAGTACGCCGAAGCCATCGCCCGCGTGCAACCGGACAT
CATCCGTTGCCAGCAAAAGCTGACCGCGCTGGAAACCGAGACCGGTTTGACCATCGCC
GAGATCAAGGACATCAACCGTCGCATGTGATCGGTGAGGCGAAAGCCCCGCCGCG
AAGAAAGAGATGGTTGAAGCGAACTTGCGTCTGGTGATCTCCATCGCCAAGAAGTACA
CCAACCGTGGCCTGCAATTCCTCGACCTGATCCAGGAAGGCAACATCGGTCTGATGAA
AGCGGTGGACAAGTTCGAATACCGTCGTGGTTACAAGTTCTCGACTTACGCCACCTGGT
GGATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTCC
GGTGACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGCTGCAG
GAAATGGGTGCGGAACCGACCCCGGAAGAGCTGGGTGAACGCATGGAAATGCCTGAG
GACAAGATCCGCAAGGTATTGAAGATCGCCAAGAGCCGATCTCCATGGAAACCCCGA
TCGGTGATGACGAAGACTCTCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGTC
GCCAATCGATGTGCGCACTGTGCGAGAGCCTGAAAGAAGCGACCCGCGAAGTGCTGTCC
GGCCTTACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGTTTCGGTATCGACATGAACA
CCGACCATAACGCTTGAAGAAGTCGGCAAACAGTTTGACGTGACCCGCGAGCGGATCCG
TCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGCGAAGCGAGCATCTG
CGCTCCTTCCTCGACGAGTGATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCAG
CATTTTTCGCGGCGAAGCCATTGGAGCCGACGGTCAGACCGTTGGTGAGGTGGTGTTC
AACACCGCAATGACCGGCTATCAGGAAATCCTTACCGATCCTTCCTACGCCCAACAGA
TCGTTACCCTGACTTACCCGACATCGGCAACACCGGCACCACGCCGGAAGACGCCGA
GTCCGATCGCGTCTGGTCCGCTGGCCTGGTCATTTCGTGACCTGCCGCTGGTAGCGAGCA
ACTGGCGTAACACGATGTCCCTGTCCGATTACCTGAAAGCCAACAATGTTGTGGCGAT

CGCCGGTATCGACACCCGCCGCCTGACCCGCATCCTGCGTGAAAAAGGCGCACAGAAC
GGCTGCATCATGGCCGGCGACAACATCTCCGAAGAGGCGGCCATCGCCGCGGCGCAAG
GCTTCCCGGGCCTGAAGGGCATGGATCTGGCGAAAGTCGTCAGCACCAAGACCCAATA
CGAATGGCGCTCCACTGTCTGGGATCTGAAAACCGACAGCCACGCGACCATCGAAGCC
TCCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGGTCAACATCCTGCG
CATGTTGGTCGAGCGCGGCTGCCGCGTCACTGTCTGTTCCGGCACAGACCCCGGGCGGCC
GACGTGCTGGCCTTGAAGCCGGACGGCGTGTTCTGTCCAACGGTCCTGGTGATCCGG
AGCCTTGC GACTACGCGATCCAAGCGATCAAGGAAGTGCTGGAAACCGAAATTCCAGT
CTTCGGCATCTGCCTCGGTACCAAGCTGCTGGCTCTGGCCTCCGGCGCCAAGACCCTGA
AAATGGGCCACGGCCACCACGGTGCCAACCACCCGGTGCAGGATCTGGACACTGGCGT
CGTGATGATCACCAGCCAGAACCACGGTTTCGCGGTTGACGAAGAAACCCTGCCAGCC
AACGTCCGCGCGATCCATAAATCGCTGTTTCGACGGCACCCCTGCAAGGCATCGAGCGCA
CCGACAAGAGCGCGTTTACGCTTCCAGGGTCAACCCTGAGGCGAGCCCGGGCCCGAACGA
TGTGGCCCCCTCTGTTTGACCGCTTCATCAACGAGATGGCCAAGCGACGCTAAATGAGT
AGCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGACA
GCGTACCGAGCATCTACGACGCCTTGAAGGTTCAAGGCGCCGAAACCCTCTGGAAGT
TCAGCAGCAGCTGGGCGACGGCGTGTTTCGTACCATTCGCGATGGGCTCCACCGAAGGC
TTGAAGCGCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTTCGGTA
AAGCGACTCTGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGGCCC
GATCGGCGAAGAAGAGCGCTGGGGTATCCACCGCGCCGCTCCTTCCTTCGCTGAACAA
GCCGGTGGCAACGAGCTGCTGGAAACAGGCATCAAGGTTATCGACCTGGTTTGCCCGT
TCGCCAAGGGCGGTAAAGTCGGTCTGTTTCGGTGGTGCCGGTGTAGGCAAGACCGTAAA
CATGATGGAAGTATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTCGCCG
GTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGACTCCAA
CGTTCTCGACAAGGTAGCCCTGGTCTACGGTCAGATGAACGAGCCACCGGGAAACCGT
CTGCGCGTAGCGCTGACCGGTCTGACCATGGCCGAGAAGTTCCGTGACGAAGGTAACG
ACGTTCTGCTGTTTCGTGACAAACATCTATCGTTACACCCTGGCCGGTACCGAAGTATCC
GCACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAAGAGA
TGGGCGTGCTGCAAGAGCGCATCACTTCGACCAAGCAAGGTTTCGATTACTTCGATCCA
GGCCGTATACGTACCAGCGGACGACTTGACTGACCCGTCGCCAGCGACCACGTTTGCT
CACCTGGACGCCACCGTCGTTCTGTCCCGTGACATCGCTTCTCTGGGTATCTACCCGGC
GGTAGACCCACTGGACTCGACTTCGCGTCAGCTGGACCCGAACGTGATCGGCAACGAT
CACTACGAGACCGCTCGTGGTGTTTACGTACGTGCTGCAGCGTTACAAAGAGCTGAAGG
ACATCATCGCGATCCTGGGTATGGACGAGCTGTTCGGAAGCCGACAAGCAGTTGGTAAA
CCGTGCTCGTAAGATCCAGCGCTTCTTGTGCGAGCCGTTCTTCGTGGCTGAAGTCTTCA
CCGGTGCTTCGGGTAAATACGTTTCCCTGAAAGACACCATTGCTGGCTTCAAAGGCATC
CTCAACGGTGACTACGACCACCTGCCAGAACAAAGCGTTCTACATGGTCGGCGGCATCG
AAGAAGCGATCGAGAAAGCCAAGAAACTGTAA

NCBI Reference Sequence: NZ_CP048051.1

Strain: zm-1

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_CP048051_zm1

GAAGTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGTAGAGAGAAGCTTGCTTCTCTTGAGAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGATAACGTCCGGAAACGGACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAAGTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGTACTTACCTAATAC

GTGAGTATTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCG
CGGTAATACAGAGGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGG
TGGTTCGTTAAGTTGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATCCAAAAC
TGGCGAGCTAGAGTATGGTAGAGGGTGGTGAATTTCTGTGTAGCGGTGAAATGCGT
AGATATAGGAAGGAACACCAGTGGCGAAGGCGACCACCTGGACTGATACTGACACTG
AGGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTAA
ACGATGTCAACTAGCCGTTGGGAGCCTTGAGCTCTTAGTGGCGCAGCTAACGCATTAA
GTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAAACTCAAATGAATTGACGGGGGCC
CGCACAAGCGGTGGAGCATGTGGTTTAATTCTGAAGCAACGCGAAGAACCTTACCAGGC
CTTGACATCCAATGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACATTGAGACAG
GTGCTGCATGGCTGTCGTCAGCTCGTGTCTGAGATGTTGGGTAAAGTCCCGTAACGAG
CGCAACCCTTGTCCTTAGTTACCAGCACGTTATGGTGGGCACTCTAAGGAGACTGCCGG
TGACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGGG
CTACACACGTGCTACAATGGTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTAA
TCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCGG
AATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTACA
CACCGCCCGTCACACCATGGGAGTGGGTTGCACCAGAAGTAGCTAGTCTAACCTTCGG
GAGGACGGTTACCACGGTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCGT
AGGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGAAAGCCTTG
GCTGCGGCCCTGGGTCAGATCGAACGTCAATTCGGCAAGGGTGCCGTAATGCGTATGG
GCGATCACGACCGCCAGGCGATCCCGGCCATTTCCACTGGCTCTCTGGGTCTGGACATC
GCACTCGGCATCGGCGGCCTGCCAAAAGGCCGTATTGTTGAAATCTACGGTCCGGAAT
CGTCCGGTAAAACCAACCCTGACCCTGTCGGTGATTGCCCAGGCACAGAAGATGGGCGC
CACCTGCGCCTTCGTCGACGCCGAGCACGCACTGGACCCGGAATACGCAGGCAAACTG
GGGGTCAACGTTGACGACCTGCTGGTTTCCAGCCGGACACCGGCGAACAGGCGCTGG
AAATCACCGACATGCTGGTGCGCTCCAATGCCATCGACGTGATCGTGATCGACTCCGT
GGCGGCACTGGTACCCAAGGCCGAGATCGAAGGCGAGATGGGCGACATGCACGTGGG
CCTGCAGGCCCGCCTGATGTCCCAGGCGCTGCGCAAGATCACCGGTAACATCAAGAAC
GCCAACTGCCTGGTGATCTTCATCAACCAGATCCGTATGAAAATCGGCGTGATGTTCCG
CAGCCCCGAAACCACCACCGGTGGTAACGCGCTGAAGTTCTACGCTTCGGTTCTGTCTG
GACATCCGTCGTACTGGCGCGGTGAAGGAAGGCGACGAAGTCGTCCGTAGCGAAACC
CGGGTCAAGATCGTCAAGAACAAAGGTGGCTCCACCGTTCCTGCAGGCTGAATTCCAGA
TCCTGTACGGCAAGGGTATCTACCTGAACGGCGAGATCATCGATCTGGGCGTGCTGCA
CGGTTTCCTCGAGAAGTCCGGTGCCTGGTACAGCTACCAGGGCAACAAGATCGGTCAG
GGCAAGGCCAACTCGGCCAAGTTCCTGCAGGACAATCCGGAAATCGGCAATGCCCTCG
AGAAGCAGATTTCGCGACAAGCTGCTGGCTCCAACCGCTGATGTCAAAGCTTCGCCGGT
CAACGAGACCATCGATGACATGGCTGACGCGGATATCTGAATGAGCGAAGAAAACAC
GTACGACTCGAGCAGCATTAAAGTGCTGAAAGGTTTGGATGCCGTACGCAAACGTCCC
GGTATGTACATTGGTGACACCGACGATGGCAGCGGTCTGCACCATATGGTGTTCGAGG
TGGTCGATAACTCGATCGACGAAGCTCTGGCCGGCCACTGCGACGACATCAGCATCAT
CATCCACCCGGACGAATCCATTACCGTGCGTGACAACGGTCGCGGCATCCCGGTAGAC
GTGCATAAAGAAGAAGGCGTTTCCGCGGCCGAGGTCATCATGACTGTGCTGCACGCCG
GCGGTAAGTTCGACGACAACCTCCTACAAAGTATCCGGCGGTCTGCACGGTGTGGGTGT
GTCGGTAGTGAACGCCCTGTCCGAAGAACTGGTCCTGACCGTTCGCCGCACTGGCAAG
ATCTGGGAACAGACCTACGTTACGGTGTGCCTCAGGCGCCTATGGCGATCGTCGGTG
ACAGTGAAACCACCGGTACCCAGATTCACTTCAAGGCTTCAGCGAGACCTTCAAGAA
CATCCATTTAGCTGGGACATCCTGGCCAAGCGGATTCGTGAACTGTCCTTCCTCAACT
CCGGTGTCCGTATCGTTCTGAAGGACGAGCGTAGCGGCAAGGAAGAACTGTTCAAGTA
CGAAGGCGGTCTGCGTGCGTTCGTTGAATACCTGAACACCAACAAGACCGCGGTCAAC
CAGGTGTTCCATTTCAATGTGCAGCGTGAAGATGGCATCGGCGTGGAATCGCCCTGC
AGTGGAATGACAGCTTCAACGAAAACCTGCAGTGCTTCACCAACAACATTCCGCAGCG

CGATGGCGGCACCCACCTGGTGGGCTTCCGTTTCGGCACTGACACGTAACCTGAACAAC
TACATCGAACAGGAAGGTCTGGCGAAGAAGCACAAAGGTCCGCCACCACCGGTGACGAT
GCCC GCGAAGGCCTGACCGCAATCATTTCCGGTCAAGGTGCCGGATCCGAAGTTCAGCT
CCCAGACCAAAGACAAGCTGGTGTCTTCCGAAGTGAAGACCGCGGTTCGAACAGGAAA
TGGGCAAGTACTTCTCCGACTTCCTGCTGGAAAACCCGAACGAAGCCAAGCTGGTGGT
CGGCAAGATGCTCGACGCCGCCCGTGCCCGTGAAGCGGCGCGTAAGGCTCGTGAGATG
ACCCGCCGTAAAGGTGCGCTGGATATCGCCGGCCTGCCGGGCAAACCTGGCGGACTGCC
AGGAAAAAGACCCTGCCCTTTCCGAACCTCTACCTGGTGGAAAGGTGACTCTGCTGGCGG
CTCCGCCAAGCAGGGACGCAACCGTAAGACCCAGGCGATTCTGCCGCTCAAGGGCAAG
ATCCTTAACGTCGAGAAAGCGCGTTTCGACAAGATGATTTCTCGCAAGAGGTTCGGCA
CCTTGATCACTGCACTCGGTTGCGGCATCGGCCGCGAAGAGTACAACATCGACAAGCT
GCGTTATCACAACATCATCATCATGACCGACGCCGACGTCGACGGTTCGCACATCCGT
ACCCTGCTGCTGACCTTCTTCTTCCGTCAGCTGCCGGAGCTGATCGAGCGTGGCTACAT
CTACATCGCTCAACCGCCGCTGTACAAGGTCAAGAAAGGCAAGCAAGAGCAATACATC
AAAGACGACGACGCCATGGAAGAGTACATGACGCAGTCGGCCCTGGAAGATGCGAGC
CTGCACCTGAACGAAGACGCACCGGGTATTTCCGGCGAGGCGCTGGAGCGCCTGGTGA
ACGACTTCCGCATGGTCATGAAAACCTCAAGCGTCTGTGCGCCTGTACCCTCAGGA
GCTGACCGAGCACTTCATCTACCTGCCGGCCGTGAGCCTGGAGCAGCTCTCCGATCAC
GCGGCGATGCAGGATTGGCTGGCCCAATATGAAGTCCGCCTGCGCACCGTCGAGAAGT
CCGGCCTGGTCTACAAGGCCAGCCTGCGTGAAGACCGTGAACGTAATGTCTGGCTGCC
AGAGGTCGAACTGATCTCCACGGCCTGTGCAACTACGTCACCTTCAACCGTGACTTCT
TCGGCAGCAATGACTACAAGACCGTCGTCACCCTCGGTGCTCAACTGAGCTCCCTGCTG
GACGAAGGCGCTTATATTCAGCGTGCGCAACGCAAGAAGGCAGTGACCGAGTTCAAG
GAAGCCCTGGACTGGCTGATGACCGAAAGTACCAAGCGCCACACCATCCAGCGATACA
AAGGTCTGGGCGAGATGAACCCGGATCAGCTGTGGGAAACCACCATGGACCCAAGCG
TGCGCCGTATGCTCAAGGTCACCATCGAAGACGCCATCGGCGCCGACCAGATCTTCAA
CACCTGATGGGTGATGCGGTCGAGCCTCGTCGCGACTTCATCGAAAGCAACGCCCTG
GCGGTATCCAACCTGGACTTCTGAATGTCCGGAAGCGCAACAGCAGTCTCGCCTCA
AAGAGTTGATCAGCCGTGGTTCGTGAGCAGGGTTACCTGACTTACGCGGAGGTCAACGA
CCACCTGCCGGAGGATATTTAGATCCGGAACAGGTGGAAGACATCATCCGCATGATC
AACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCCCTTTTGTTGG
CCGAAGCCGATACCGACGAAGCAGCAGCTGAAGAAGCCGCCGACGCTTGCGCGCTG
TGGAACCCGACATTGGTTCGCACTACCGACCCCGTGCGTATGTACATGCGCGAAATGGG
TACGGTAGAGCTGCTCACACGTGAAGGCGAAATCGAAATCGCCAAGCGTATCGAAGA
GGGCATCCGTGAAGTGATGGGCGCGATCGCGCACTTCCCTGGCACGGTTGAGCACATC
CTCTCCGAATACTCGCGTCACCACCGAAGGTGGCCGCCTGTCCGACGTCTTGAGCG
GTTACATCGACCCGGACGACGGTATTGCGCCGCCTGCCGCCGAAGTACCACCGCCTGT
CGATGCCAAGGCCGCAAAAGCGGACGACGACACCGACGACGATGACGCCGAAGCCAG
TGACGACGAAGAAGAAGCCGAAAGCGGTCCGGATCCGGTCATCGCAGCCCAGCGCTTT
GGCGCCGTTGCCGACCAGATGGAAATTACCCGCAAGGCGCTGAAAAAGCACGGTTCG
GAACACAAGCAAGCCCTGGCTGAAATGCTGGCCCTGGCTGAGCTGTTTATGCCGATCA
AACTGGTTCCGAAGCAATTTCGAAGGCCTGGTTGAACGTGTTTCGTAGTGCCCTGGATCG
CCTGCGTCAGCAAGAGCGCGCGATCATGCAGCTCTGTGTTTCGTGATGCCCGCATGCCA
CGCGCCGACTTCCTGCGCCAGTTCCCTGGCAATGAAGTGGACGAAAGCTGGTCCGACG
CACTGGCCAAAGGCAAGGCCAAGTACGCCGAAGCCATTGGCCGCCTGCAGCCGGACAT
CATCCGTTGCCAGCAGAAGCTGACCGCACTCGAGACCGAGACCGGCCTGACGATCGCC
GAGATCAAGGACATCAACCGTCGCATGTCGATCGGCGAGGCCAAGGCCCGTCGCGCGA
AGAAAGAGATGGTCGAAGCCAACCTTGCCTGCTGGTGTATCTCCATCGCCAAGAAGTACAC
CAACCGTGGCCTGCAATTCCTCGACCTGATCCAGGAAGGCAACATCGGTTTGATGAAA
GCAGTAGACAAGTTCGAATACCGTCGCGGCTACAAGTTCTCGACTTATGCCACCTGGT
GGATCCGTCAGGCGATCACTCGCTCGATCGCCGACCAGGCCCGCACCATCCGTATTCC

GGTGCACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGGCAGATGTTGCAG
GAAATGGGTCGCGAACCGACTCCGGAAGAGCTGGGCGAACGCATGGAAATGCCTGAG
GACAAGATCCGCAAGGTATTGAAGATCGCTAAAGAGCCGATCTCCATGGAAACCCCGA
TCGGTGATGACGAAGACTCCCATCTGGGTGACTTCATCGAAGACTCGACCATGCAGTC
GCCAATCGATGTCGCCACCGTTGAGAGCCTTAAAGAAGCGACTCGCGAAGTACTCTCC
GGCCTCACTGCCCCGTGAAGCCAAGGTACTGCGCATGCGCTTCGGCATCGACATGAATA
CCGACCACACCCTTGAGGAAGTCGGTAAGCAGTTCGATGTTACCCGTGAGCGGATTTCG
TCAGATCGAAGCCAAGGCGCTGCGCAAGCTGCGCCACCCGACGCGAAGCGAGCATCTG
CGCTCCTTCCTCGACGAGTAATTGACTAAGCCAGCCATACTCGCCCTTGCTGATGGCAG
CATTTTTTCGCGGCGAAGCCATTGGAGCCGACGGTCAAACCGTTGGTGAGGTGGTGT
AACACCGCAATGACCGGTATCAGGAAATCCTTACCGATCCTTCCTACGCCAACAGA
TCGTTACCTGACTTACCCACATATCGGCAATACCGGCACCACGCCGGAAGACGCCGA
GTCCGATCGTGTCTGGTCGGCCGGTCTGGTGATTTCGCGACCTGCCACTGGTTGCGAGCA
ACTGGCGTAACACCTTGTCCCTGTCCGACTACCTGAAAGCCAACAATGTTGTGGCGATC
GCCGGTATCGACACCCGTCGTCTGACGCGCATCCTGCGCGAGAAAGGCGCGCAGAACG
GCTGCATCATGGCCGGCGACAATATCTCCGACGAAGCGGCGATTGCCGCTGCGCGCGG
CTTCCCGGGCCTGAAAGGCATGGATCTGGCGAAGGTCGTCAGCACCAAGGAAAGCTAC
GAGTGGCGCTCCAGCGTCTGGAGCCTGAAGACCGACAGTCACCCGACCATCGAGGCTT
CCGAGCTGCCTTACCACGTGGTTGCCTACGACTACGGCGTCAAGCTGAACATCCTGCGC
ATGCTGGTCGAGCGCGGTTGCCGCGTGACCGTGGTACCTGCGCAAACCCCGGCCAGCG
ACGTCCTGGCGCTCAAGCCTGACGGTGTGTTCTGTCCAACGGTCCTGGCGACCCCGAG
CCTTGCGATTACGCCATCCAGGCGATCAAGGACGTGCTGGAAACCGAGATTCCGGTCT
TCGGTATCTGCCTGGGGCCACCAACTGCTGGCGCTGGCCGCGCGCCAAGACAGTGAA
GATGGGCCACGGCCACCACGGTGCCAACCACCCGGTCCAGGACCTGGACAGCGGTGTA
GTGATGATCACCAGCCAGAACCACGGTTTTGCGGTGGACGAAACCACCCTGCCGGGCA
ACGTGCGGGCGATCCACAAGTCGCTGTTTCGACGGCACCCCTGCAAGGCATCGAGTTGAC
CGACAAGAGCGCATTCAGCTTCCAGGGCCACCCTGAAGCGAGCCCGGGCCCGAACGAT
GTGGCGCCGCTGTTTCGATCGTTTCATCAACGAGATGGCCAAGCGACGCTGAATGAGTA
GCGGACGTATCGTTCAAATCATCGGCGCCGTTATCGACGTGGAATTTCCACGCGACAG
CGTACCGAGCATCTACGACGCTTGAAGGTTCAAGGCGCCGAAACCACTCTGGAAGTT
CAGCAGCAGCTGGGCGACGGCGTGGTACGTACCATTCGATGGGCTCCACCGAGGGCT
TGAAGCGCGGTCTGGACGTCAACAACACTGGCGCAGCCATCTCCGTACCGGTCGGTAA
AGCGACCCTGGGGCCGGATCATGGACGTACTGGGCAACCCGATCGACGAAGCTGGCCCCG
ATCGGCGAAGAAGAGCGTTGGGGCATTACCCGTCCTGCGCCGACCTTCGCTGAACAAG
CTGGCGGCAACGACCTGCTGGAAACCGGCATCAAGGTTATCGACCTGGTTTGCCCGTT
CGCCAAGGGCGGTAAAGTCGGTCTGTTTCGGTGGTGCCGGTGTGGGGCAAACCGTAAAC
ATGATGGAACCTGATCCGTAACATCGCCATCGAGCACAGCGGTTATTCCGTGTTTCGCCG
GTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATGAAGGATTCCAA
CGTTCTGGACAAAGTGGCACTGGTATACGGCCAGATGAACGAGCCGCCGGGAAACCGT
CTGCGCGTAGCTCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGACGAAGGTAACG
ACGTTCTGCTGTTTCGTCGACAACATCTATCGTTACACCCTGGCCGGTACCGAAGTATCC
GCACTGCTGGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCTGGCTGAAGAGA
TGGGCGTTCTGCAAGAACGTATCACTTCGACCAAGCAAGGCTCGATCACCTCGATCCA
AGCGGTATACGTGCCTGCGGACGACTTGACCGACCCGTCGCCAGCGACCACTTCGCC
CACTTGACGCCACCGTCGTTCTGTCCCGTGACATCGCTTCCTGGGTATCTACCCAGC
GGTAGACCCACTGGACTCGACTTCCCGTCAGCTGGACCCGAACGTGATCGGCAACGAG
CACTACGAAACCGCTCGCGGGCGTTACGTACGTGCTGCAGCGCTACAAAGAGCTGAAGG
ACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAGCAACTGGTATC
CCGCGCTCGTAAGATCCAGCGCTTCCTGTGCGAGCCGTTCTTCGTGGCTGAAGTCTTCA
CTGGTTCTCCAGGCAAATACGTTTCCCTGAAAGACACCATCGCTGGCTTCAAAGGCATC
CTCAACGGTGACTACGACCATCTGCCAGAACAAAGCGTTCTACATGGTTGGTGGCATCG

AAGAAGCGATCGAGAAAGCCAAGAAACTGTAA

NCBI Reference Sequence: NZ_LT799039.1

Strain: KT2440

Chained genes: 16S rRNA, recA, gyrB, rpoD, carA, atpD

>NZ_LT799039_KT2440

GAAGTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGC
AAGTCGAGCGGATGACGGGAGCTTGCTCCTTGATTTCAGCGGCGGACGGGTGAGTAATG
CCTAGGAATCTGCCTGGTAGTGGGGGACAAACGTTTCGAAAGGAACGCTAATACCGCAT
ACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGG
TCGGATTAGCTAGTTGGTGGGGTAATGGCTCACCAAGGCGACGATCCGTAACCTGGTCT
GAGAGGATGATCAGTCACACTGGAAGTGAAGACACGGTCCAGACTCCTACGGGAGGCA
GCAGTGGGGAATATTGGACAATGGGCGAAAGCCTGATCCAGCCATGCCGCGTGTGTGA
AGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGAGGAAGGGCAGTAAGTTAATAC
CTTGCTGTTTTGACGTTACCGACAGAATAAGCACCGGCTAACTCTGTGCCAGCAGCCGC
GGTAATACAGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTAGGT
GGTTTGTAAAGTTGGATGTGAAAGCCCCGGGCTCAACCTGGGAACTGCATCCAAAACCT
GGCAAGCTAGAGTACGGTAGAGGGTGGTGGAAATTCCTGTGTAGCGGTGAAATGCGTA
GATATAGGAAGGAACACCAAGTGGCGAAGGCGACCACTGGACTGATACTGACACTGA
GGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCCGTA
CGATGTCAACTAGCCGTTGGAATCCTTGAGATTTTAAAGTGGCGCAGCTAACGCATTAAGT
TGACCGCCTGGGGAGTACGGCCGCAAGGTTAAACTCAAATGAATTGACGGGGGGCCCG
CACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGCCT
TGACATGCAGAGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACTCTGACACAGGT
GCTGCATGGCTGTCGTCAGCTCGTGTGTCGTGAGATGTTGGGTAAAGTCCCGTAACGAGCG
CAACCCTTGTCTTAGTTACCAGCACGTAATGGTGGGCACTCTAAGGAGACTGCCGGT
GACAAACCGGAGGAAGGTGGGGATGACGTCAAGTCATCATGGCCCTTACGGCCTGGGC
TACACACGTGCTACAATGGTTCGGTACAGAGGGTTGCCAAGCCGCGAGGTGGAGCTAAT
CTCACAACACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTGCGTGAAGTCGGA
ATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTACAC
ACCGCCCGTCACACCATGGGAGTGGGTGTCACCAGAAGTAGCTAGTCTAACCTTCGGG
GGGACGGTTACCACGGTGTGATTTCATGACTGGGGTGAAGTCGTAACAAGGTAGCCGTA
GGGGAACCTGCGGCTGGATCACCTCCTTAAATGGACGACAACAAGAAGCGCGCCTTGG
CTGCGGCCCTGGGTCAGATCGAACGCCAATTCGGTAAAGGCGCGGTTCATGCGCATGGG
TGACCATGAGCGTCAAGGCATTCCGGCCATCTCCACCGGCTCGCTGGGGCTGGATATC
GCCCTGGGCATCGGCGGTCTGCCAAAAGGCCGTATCGTCGAGATCTACGGCCCGGAAT
CGTCGGGTAAGACCACGCTGACCCTGTCTGTCATCGCTGAAGCGCAAAAGAACGGTGC
TACCTGCGCCTTCGTCGACGCCGAACATGCCCTTGACCCTGAGTACGCCGGCAAGCTG
GGCGTCAACGTCGATGACCTGCTGGTTTCGCAGCCGGACACCGGTGAGCAGGCCCTTG
AAATCACCGACATGCTGGTGCCTTCCAACGCGGTTCGACGTGATCATTGTGCGACTCCGTT
GCCGCGCTGGTACCGAAGGCCGAGATCGAAGGCGAGATGGGTGACATGCATGTGGGC
CTGCAGGCCCCGCTGATGTCCCAGGCACTGCGTAAGATCACCGGTAACATCAAGAACG
CGAACTGCCTGGTCATCTTCATCAACCAGATCCGTATGAAGATCGGTGTGATGTTCCGGC
AGCCCCGGAACCACTACCGGTGGTAACGCCCTGAAGTTCTATGCTTCGGTCCGTCTGG
ACATCCGCCGTACCGGCGCGGTCAAGGAAGGCGACGAAGTGGTCGGCAGCGAAACCC
GCGTCAAGATCGTCAAGAACAAGGTCTCGCCTCCGTTCCGTCAGGCTGAGTTCCAGATT
CTTTACGGGAAAGGTATCTACCGTAACGGCGAGATCATTGATCTGGGGGTATCTCAGG
GCCTGGTTCGAAAAGTCCGGCGCCTGGTACGCCTACCAAGGCAACAAGATCGGTCAAGG
CAAAGCCAACGCTGCCAAGTACCTGGCTGAGAACCCGGCTATTGGTGCCGAGATCGAG
AAGCAGATTCGTGAGAAGTTGCTGAAAGCGGGTGCTGCTGCTGAAGCCGGCAAGCTG
CTGCTGCTGAAGCTGATGCCGATGACATGGCCGACGCTGACGCCGGTTATTGAATGAG

CGAAAATCAAACGTACGACTCCTCCAGCATCAAGGTGCTGAAAGGTTTGGATGCCGTA
CGCAAGCGTCCCGGCATGTACATTGGCGACACCGATGATGGTAGTGGCCTGCACCACA
TGGTCTTCGAGGTGGTCGACAACTCGATCGACGAAGCCCTCGCCGGTCACTGCGATGA
CATTACCGTCATCATCCACCCGGACGAATCTATCAGTGTGCGCGACAACGGTCGCGGC
ATTCCGGTCGATGTGCATAAGGAAGAAGGCGTTTCCGCAGCCGAGGTCATCATGACTG
TGCTGCACGCCGGCGGTAAGTTTGACGACAACCTCCTACAAAGTATCCGGCGGTCTGCA
CGGTGTAGGTGTGTCGGTTGTGAACGCCCTGTCCGAGAAGCTGGTTTTGACTGTTCCGC
GTAGCGGCAAGATCTGGGAACAGACTTACGTTACGGTGTTCACAAGCGCCCATGGC
GGTTGTCGGTGACAGTGAAACCACGGGTACCCACATCCACTTCAAGCCATCGGCTGAA
ACCTTCAAGAACATTCACTTCAGCTGGGACATCCTGGCCAAGCGCATCCGCGAGCTGT
CGTTCCTCAACTCGGGCGTTGGCATTCTGCTGAAGGATGAGCGCAGCGGTAAGGAAGA
GTTCTTCAAGTACGAAGGCGGTCTGCGTGCGTTCGTCGAGTACTTGAACACCAACAAG
ACGCCGGTCAACTCCCAGGTGTTCCACTTCAACGTTACGCGTGACGATGGCGTGGGTGT
TGAAGTCGCCCTGCAATGGAACGACAGCTTCAACGAAAACCTGCTGTGCTTTACCAAC
AATATTCCGCAGCGTGATGGCGGTACCCACCTGGTGGGTTTCCGTTCTCTGCTGACCCG
TAGCCTTAACAGCTACATCGAGCAGGAAGGCCTGGCCAAGAAGAACAAGGTGGCAAC
CACTGGCGACGACGCCCCGTGAAGGCCTGACCGCGATCATCTCGGTGAAGGTACCGGAC
CCGAAGTTCAGCTCGCAGACCAAGGACAAGCTGGTCTCCTCGGAGGTGAAAACCGCCG
TGGAACAGGAGATGAACAAGTACTTCGCCGATTTCCTCCTGGAAAACCCGAACGAGGC
GAAGGCCGTGTTGGCAAGATGATCGACGCCGCTCGCGCCCCGTGAAGCCGCCCGTAAA
GCCCGTGAGATGACCCGCCGTAAAGGTGCGCTGGATATCGCGGGTCTGCCGGGCAAGC
TGGCCGACTGCCAAGAGAAGGATCCTGCTCTCTCCGAAGTGTACCTGGTGGAGGGTGA
CTCCGCGGGTGGCTCGGCCAAGCAAGGCCGCAACCGTCGTACCCAGGCGATCTTGCCG
CTGAAGGGTAAAATCCTCAACGTCGAGAAAGCGCGCTTCGACAAGATGATTTCTGTC
AGGAAGTGGGCACGCTGATCACTGCGCTGGGCTGTGGCATCGGCCGCGAAGAGTACAA
CATCGACAACTGCGTTATCACAACATCATCATGACCGATGCTGACGTTGACGGTT
CGCACATCCGTACGCTGCTGCTGACCTTCTTCTTCCGTCAGCTGCCGGAGCTGGTCGAG
CGTGGCTACATCTATATTGCCAGCCGCCGCTGTACAAGGTGAAACGAGGCAAGCAGG
AGCAGTACATCAAGGACGATGAGGCCATGGAAGAGTACATGACCCAGTCGGCTCTGG
AAGATGCCAGCCTGCACCTGGACGAATCGGCGCCAGCAGTTTCCGGCGTGCAGCTGGA
AGCGCTGGTGAATGAGTTCCGTAGTGTATGAAGACTCTCAAGCGCCTGTCGCGCTTGT
ACCCGGAAGAGCTGACCGAGCACTTCGTCTACCTGCCTGAGGTGACCCTGGAGCAGTT
GGGTGACCACGCAGTGATGCAGGCCTGGCTGGCCCAGTTCCAGGCGCGTCTGAACTCC
AGCCAGAAGTCTGGCCTGGCTTACAACGCCAGCCTGCGTGAAGACAAAGAGCGCAAC
GTATGGCTGCCTGAAGTGGAATTACCTCTCACGGTCTGGCCAGCTACATCACCTTCAA
CCGCGATTTCTTCGGCAGCAATGACTACCGTACCGTAGTCAACATTGGTGCCAAGCTTT
CGAGCCTGTTGGGTGAAGGTGCGTACGTGCAGCGCGGTGAACGCCGCAAGGCAATCGT
CGAGTTCAAAGAGGGCCTGGATTGGCTGATGAACGAGACCACCAAGCGCCATACGATT
CAGCGATACAAAGGGCTGGGTGAGATGAACCCGGATCAACTGTGGGAAACCACCATG
GACCCGACCGTTTCGCCGTATGCTCAAGGTCACGATCGAAGATGCTATCGCCGCTGACC
AGATCTTCAACACCCTGATGGGTGATGCGGTGAGCCGCGTCTGTGACTTCATCGAAAG
TAACGCGCTGTCGGTGTGCAACCTGGACTTCTGAATGTCCGGAAAAGCGCAACAGCAG
TCTCGTATCAAAGAGTTGATCACCCGCGGTCTGTGAGCAGGGCTACCTGACTTACGCGG
AGGTCAACGACCACCTGCCTGAGGATATTTTCAGATCCGGAACAGGTGGAAGACATCAT
CCGCATGATCAACGACATGGGGATCAACGTATTCGAGAGTGCTCCGGATGCGGATGCC
CTTCTGTTGGCGGAAGCCGACACCGATGAAGCCGCGGCCGAAGAAGCCGCTGCTGCAT
TGGCGGCAGTTGAAACCGATATCGGCCGACGACCGACCCGGTGCGCATGTATATGCG
CGAAATGGGTACTGTGAGCTGCTGACCCGCGAAGGCGAGATCGAAATCGCCAAGCGT
ATCGAGGAAGGCATTCGTGAAGTCATGGGCGCCATCGCCCACTTCCCGGGCACTGTGCG
ACTACATTCTCGGCGAATATGACCGCGTCACCACCGAGGGTGGCCGCCTGTGCGGACGT
TCTCAGCGGTTACATCGACCCTGACGACAACATTGCCGCGCCAACCGAAGAAGTGCCG

ATCCCAGGTGCCAAGGCCGCTGCGGGCAAGGAAGAGTCCGACGACGACGAAGAAGAA
TCCGAAAGCGGTGACGACGAGGAAGAGGCCGAGAGCGGCCCGGATCCGGTCGTCGCA
GCCAACGCTTCGGTGCGGTATCCGATCAGCTTCAGGCAACCTCCAAGGTCCTGAAGA
AAAATGGTCGCAACCACAAGGAAAGCATCGAGGCCCTGCAGGCCCTGGCTGACCTGTT
CATGCCGATCAAGCTGGTACCGAAGCAGTTCGAGGTAAGTGGTCGAGCGTGTCCGTGAC
GCCCTGAACCGTCTGCGACAGCAAGAACGCGCCATCATGCAGCTGTGCGTACGTGACG
CCCGCATGCCGCGAGCCGACTTCCTGCGCATGTTCCCAAGCAACGAAACCGACCAGAC
CTGGAGCGGTGACCTGGCCAAGCGCAACACCAAGTGGGCTGCCGCCCTGGGTGAAAA
GAACGCTGCCATCGTCGCTTGCCAACAGAAGCTGATCGACCTTGAGACCGAAACCGGC
CTGACCGTTGCCGAGATCAAGGAAATCAACCGTCGCATGTTCGATCGGTGAAGCCAAGG
CCCGCCGCGCCAAGAAAGAAATGGTCGAGGCGAACCTGCGTCTGGTGATTTCCATCGC
CAAGAAGTACACCAACCGTGGCCTGCAGTTCCTCGACCTGATCCAGGAAGGCAACATC
GGTCTGATGAAAGCGGTGGACAAGTTCGAATACCGTCGCGGCTACAAGTTCTCGACCT
ATGCCACCTGGTGGATCCGTCAGGCGATCACCCGTTTCGATCGCCGACCAGGCACGCAC
CATCCGCATTCCGGTGACATGATCGAGACGATCAACAAGCTCAACCGTATTTCCCGCC
AGATGCTGCAGGAAATGGGTGCGCAACCGACTCCGGAAGAGCTGGGCGAGCGCATGG
AAATGCCTGAGGACAAAATCCGCAAGGTATTGAAGATCGCCAAAGAGCCGATCTCCAT
GGAAACCCCGATCGGTGACGACGAAGATTCGCACCTGGGCGACTTCATCGAGGACTCG
ACCATGCAGTCCCCGATCGACGTGGCCACGGTCGAAAGCCTCAAGGAAGCCACCCGTG
ACGTGCTCTCGGGCCTGACCGCACGTGAAGCCAAGGTGCTGCGCATGCGTTTCGGTAT
CGACATGAACACCGACCACACCCTCGAAGAGGTGGGCAAGCAGTTTGACGTAACGCGT
GAGCGGATCCGTCAGATCGAAGCGAAGGCGTTGCGCAAGCTGCGCCACCCGACTCGCA
GCGAGCACCTGCGCTCCTTCCTCGACGAGTGATTGACAAAGCCAGCCATACTCGCCCTT
GCCGACGGCAGTATTTTCCGCGGTGAAGCCATCGGTGCCGACGGTCAGACCGTTGGTG
AGGTGGTATTCAACACCGCTATGACCGGCTACCAGGAAATCCTTACAGACCCTTCCTAC
GCGCAGCAAATCGTTACCCTGACCTACCCGCACATCGGCAACACCGGTACTACCCCGG
AAGACGCCGAGTCGAGCCGCGTCTGGTCCGCTGGCCTGGTCATCCGTGACCTGCCGCT
GCTGGCCAGCAACTGGCGTAACACCCAGTCGCTGCCTGAGTACCTCAAGGCCAACAAC
GTCGTCGCCATCGCCGGCATCGACACCCGTCGCCTGACCCGTATCCTGCGTGAAAAGG
GCGCCCAGAACGGCTGCATTCTGGCGGGTGACAACATCAGCGAAGAAGCTGCCATCGC
TGCTGCCCCGCGGCTTCCCGGGCCTGAAGGGCATGGACCTGGCCAAGGTGCTCTCCACC
AAGGAACGTTACGAGTGGCGCTCCAGCGTGTGGGAGCTGAAAACCGACAGCCACCCG
ACCATCGACGCTGCCGACCTGCCGTACCACGTGGTTGCCTTCGACTATGGCGTCAAGCT
GAACATCCTGCGCATGCTGGTGGCCCCGCGGCTGCCGCGTGACCGTGGTACCAGCCCAG
ACCCCGGCCAGCGAAGTACTGGCACTCAACCCGGACGGCGTGTTCCTGTCCAACGGCC
CTGGTGACCCTGAGCCGTGCGACTACGCGATCCAGGCGATCAAGGAAATCCTCGAAAC
CGAGATCCCGGTATTCGGCATCTGCCTCGGCCACCAGCTGCTGGCCCTGGCGTCCGGCG
CCAAGACCGTGAAAATGGGCCACGGCCACCACGGTGCCAACCACCCGGTCCAGGACCT
GGATACTGGTGTGGTCATGATCACCAGCCAGAACCACGGTTTCGCCGTTGACGAGGCG
ACCCTGCCGGGCAACGTTTCGCGCCATTCACAAGTCGCTGTTTCGACGGCACCCCTGCAGG
GTATCGAGCGTACCGACAAGAGCGCGTTCAGCTTCAGGGCCACCCTGAAGCGAGCCC
GGGCCCCGACCGACGTCGCGCCTCTGTTTCGATCGTTTCACCGATGCCATGGCCAAGCGCC
GCTGAATGAGTAGCGGACGTATCGTTCAAATCATCGGCGCCGTCATCGACGTGGAATT
CCCACGTGACGTCGTGCCGAGTGTATACAACGCGCTTAAAGTACAAGGCGCGGAAACC
ACCCTGGAAGTTCAGCAGCAGCTGGGCGACGGCGTGGTTCGTACCATTGCGATGGGCT
CGACCGAAGGCCTGAAGCGCGGTCTGGATGTGCTCGACACCGGCGCTGCCATTTCCGT
TCCAGTTGGTAAGGCCACCCTGGGCCGTATCATGGACGTAAGTGGGCAACCCGATCGAC
GAAGCCGGCCCCGATCGGCGAAGAAGAGCGTCGCGGTATCCACCAGCCAGCGCCTTCGT
TCGCTGACCAGGCAGGCGGCAACGACCTGCTGGAAACCGGCATCAAGGTTATCGACCT
GGTTTGCCCGTTTCGCCAAGGGTGGTAAGGTTGGTCTGTTTCGGTGGTGCCGGTGTGCGCA
AGACCGTAACATGATGGAAGTATCCGTAACATCGCCATGGAACACAGCGGTTACTC

CGTGTTTCGCTGGTGTGGGTGAGCGTACTCGTGAGGGTAACGACTTCTACCACGAGATG
AAGGACTCCAACGTTCTCGACAAAGTAGCGCTGGTCTACGGTCAGATGAACGAGCCAC
CAGGAAACCGTCTGCGTGTAGCGCTGACCGGCCTGACCATGGCCGAGAAGTTCCGTGA
CGAAGGTAACGACGTTCTGCTGTTTCGTCGACAAACATCTATCGTTACACCCTGGCCGGTA
CCGAAGTATCCGCACTGCTGGGCCGTATGCCTTCGGCAGTAGGTTACCAGCCGACCCT
GGCTGAAGAGATGGGCGTTCTGCAAGAGCGCATCACCTCCACCAAGGAAGGTTTCGATC
ACCTCCGTACAGGCCGTATACGTACCTGCGGACGACTTGACCGACCCGTCGCCAGCGA
CCACCTTCGCCCCTTGGACGCCACCGTCGTTCTGTCCCGTGACATCGCCTCCCTGGGT
ATCTACCCAGCGGTTCGACCCACTGGACTCGACTTCGCGCCAGCTGGACCCGAACGTGA
TCGGCAACGAGCACTACGAGACCGCTCGTGGCGTTTCAGTATGTTCTGCAGCGCTATAA
AGAGCTGAAGGACATCATTGCGATCCTGGGTATGGACGAACTGTCCGAAGCCGACAAG
CAACTGGTAGCCCGCGCTCGTAAGATCCAGCGCTTCCTGTCGCAGCCGTTCTTCGTGGC
AGAAGTCTTCACCGGTTTCGCCAGGCAAGTACGTTTCCCTGAAAGACACCATCGCTGGC
TTCAGCGGCATCCTCAAAGGTGACTACGACCACCTGCCAGAACAAGCGTTCTACATGG
TCGGCAGCATCGACGAAGCGATCGAGAAAGCCAAGAAACTGTAA

Reference

1. Love, M.I.; Huber, W.; Anders, S. Moderated estimation of fold change and dispersion for RNA-seq data with DESeq2. *Genome biology* **2014**, *15*, 1-21.
2. Weisburg, W.G.; Barns, S.M.; Pelletier, D.A.; Lane, D.J. 16S ribosomal DNA amplification for phylogenetic study. *Journal of bacteriology* **1991**, *173*, 697-703.
3. Vargas, L.; de Carvalho, T.L.G.; Ferreira, P.C.G.; Baldani, V.L.D.; Baldani, J.I.; Hemerly, A.S. Early responses of rice (*Oryza sativa* L.) seedlings to inoculation with beneficial diazotrophic bacteria are dependent on plant and bacterial genotypes. *Plant and soil* **2012**, *356*, 127-137.
4. Song, Y.; Wang, L.; Xiong, L. Comprehensive expression profiling analysis of *OsIAA* gene family in developmental processes and in response to phytohormone and stress treatments. *Planta* **2009**, *229*, 577-591.
5. Lee, H.; Hong, J.; Kim, S. First report of leaf blight caused by *Pantoea agglomerans* on rice in Korea. *Plant Disease* **2010**, *94*, 1372-1372.
6. Brusamarello-Santos, L.; Pacheco, F.; Aljanabi, S.; Monteiro, R.; Cruz, L.; Baura, V.; Pedrosa, F.; Souza, E.; Wassem, R. Differential gene expression of rice roots inoculated with the diazotroph *Herbaspirillum seropedicae*. *Plant and Soil* **2012**, *356*, 113-125.