Figure 1S. Alignment of *T. pallidum* Nichols and Sea 81-4 strain *tprJ*-*tprI* (A) and *tprG*-*tprF* (B) loci. Identical residues are indicated by black shading and non-synonymous changes are indicated in a gray or no shading, respectively. Predicted start codons (according to Fraser et al, 1998) are indicated by asterisks for each *tpr* gene along with stop codons in the Nichols strain sequences. The Sea 81-4 *tprJ* locus contains a *tprG*-like ORF whose central nonconserved region shows sequence identity with the corresponding Nichols and Sea 81-4 strain *tprG* sequence. Frameshift and premature stop codon positions in Sea 81-4 *tprG,* are indicated by asterisks. -35 and -10 predicted Sigma 70 consensus sequences are underlined. Due to its premature termination, the Sea 81-4 *tprG* intergenic spacer is 422 bp long instead of 58 bp as in Nichols.

Figure 2S. Alignment of TprI homologs in *T. pallidum* Nichols and Sea 81-4 Strain.

Figure 3S. Alignment of TprG homologs in *T. pallidum* Nichols and Sea 81-4 Strain showing a shorter TprG ORF in Sea 81-4. Frameshift position is indicated by an asterisk.

Figure 4S. Alignment of TprF homologs in *T. pallidum* Nichols and Sea 81-4 Strain.

FIGURE 1S

A

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Sea 81-4 tprJ/I loci    1 CGAGTGAGGCTCATCAAGAATTACTTATTCGCGCGTACAGTGGTTCAGGTCGTGCGCAGG
Nichols  tprJ/I loci    1 CGAGTGAGGCTCATCAAGAATTACTTATTCGCGCGTACAGTGGTTCAGGTCGTGCGCAGG


Sea 81-4 tprJ/I loci   61 AGGCGATTTCTCTTGCGCGGCGTTTATATCATTCGGCACAGCCTCCGTCTGAGACGGTCA
Nichols  tprJ/I loci   61 AGGCGATTTCTCTTGCGCGGCGTTTATATCATTCGGCACAGCCTCCGTCTGAGACGGTCA


Sea 81-4 tprJ/I loci  121 TCGTCTTGTACTTAGATACGTTGTATGAGGCGCGTCATTACCGGGAGATCCGTGCGGTGG
Nichols  tprJ/I loci  121 TCGTCTTGTACTTAGATACGTTGTATGAGGCGCGTCATTACCGGGAGATCCGTGCGGTGA


Sea 81-4 tprJ/I loci  181 TTGCAGCTCGGAGTGCGTCCGCGCGTGGTACGCTGCGGTCGATATTTTCGTACTATGAAG
Nichols  tprJ/I loci  181 TTGCAGCTCGGAGTGCGTCCGCGCGTGGTACGCTGCGGTCGATATTTTCGTACTATGAAG


Sea 81-4 tprJ/I loci  241 CGTTGTTGTCAGTGCACGAGGAGGAGCGATTAAGTTTATTGCGTGCAAGTTTGCTTTCAG
Nichols  tprJ/I loci  241 CGTTGTTGTCAGTGCACGAGGAGGAGCGATTAAGTTTATTGCGTGCAAGTTTGCTTTCAG


Sea 81-4 tprJ/I loci  301 ATCCGCGCAATGGACGCACTCTTTTTGCGTTATATGAATGGTACCGAAAGAAAAAGGATT
Nichols  tprJ/I loci  301 ATCCGCGCAATGGACGCACTCTTTTTGCGTTATATGAATGGTACCGAAAGAAAAAGGATT


Sea 81-4 tprJ/I loci  361 TCCGCAAAGCGCAGTACTATTTGCATCAGGTGATTGCACTGGATCCGAACAATGCGCAGC
Nichols  tprJ/I loci  361 TCCGCAAAGCGCAGTACTATTTGCATCAGGTGATTGCACTGGATCCGAACAATGCGCAGC


Sea 81-4 tprJ/I loci  421 ACCGTGCGCTGTCTAAGCAGCTGGATACCTTGATTGGGCAGTAGTGTTAGAAAAGAAGGG
Nichols  tprJ/I loci  421 ACCGTGCGCTGTCTAAGCAGCTGGATACCTTGATTGGGCAGTAGTGTTAGAAAAGAAGGG


                                                                 tprJ start
                                                              (genome sequence)
                                                                     ***
Sea 81-4 tprJ/I loci  481 TGAGGGGGCTACTAGACAGGGCCGGGGGGGGGG-TGAGGTAGCATGGGGTGCATGCGGTG
Nichols  tprJ/I loci  481 TGAGGGGGCTACTAGACAGGGCCGGGGGGGGGGGTGAGGTAGCATGGGGTGCATGCGGTG
                                      ------                ------
                                       -35                   -10
                                  Predicted Sigma 70 consensus sequences

Sea 81-4 tprJ/I loci  540 GGGGAGTGTGCTGTGTGTGGTGGTGGGGGTAGGAGCGAGCGGGGGAGTGCTCGGACAGGA
Nichols  tprJ/I loci  541 GGGGAGTGTGCTGTGTGTGGTGGTGGGGGTAGGAGCGAGCGGGGGAGTGCTCGGACAGGA


Sea 81-4 tprJ/I loci  600 GTTTTCCCCGAAGCTAACTGGCTCTGCCACACTTGAGTGGGGCATCAGCTATGGCAAGGG
Nichols  tprJ/I loci  601 GTTTTCCCCGAAGCTAACTGGCTCTGCCACACTTGAGTGGGGCATCAGCTATGGCAAGGG


Sea 81-4 tprJ/I loci  660 GGTAGGCAGTCATGGCCAGGCCCCTGGTGCAGTTATGGGCACCGGTCCCTACAATCTGAA
Nichols  tprJ/I loci  661 GGTAGGCAGTCATGGCCAGGCCCCTGGTGCAGTTATGGGCACCGGTCCCTACAATCTGAA


Sea 81-4 tprJ/I loci  720 GCACGGGTTTCGTACTACCAACACGGTGGGAGTATCCTTTCCCCTGGTTATGCGCACCAC
Nichols  tprJ/I loci  721 GCACGGGTTTCGTACTACCAACACGGTGGGAGTATCCTTTCCCCTGGTTATGCGCACCAC
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Sea 81-4 tprJ/I loci  780 CCACACGCGCCGTGGGCAGCACCCGGCACTGTATGCGGAGCTGAAGGTGGCGGACCTGCA
Nichols  tprJ/I loci  781 CCACACGCGCCGTGGGCAGCACCCGGCACTGTATGCGGAGCTGAAGGTGGCGGACCTGCA

Sea 81-4 tprJ/I loci  840 GGCGGACCTGAGTCAGGGGAAGGCAGGTTTTGCCATTAAGCGCAAGGGGAAGGTAGAGGC
Nichols  tprJ/I loci  841 GGCGGACCTGAGTCAGGGGAAGGCAGGTTTTGCCGTTAAGCGCAAGGGGAAGGTAGAGGC

Sea 81-4 tprJ/I loci  900 GACACTACACTGTTATGGGGCCTACCTGACGATTGGGAAGAACCCCACGTTTCTGACGAA
Nichols  tprJ/I loci  901 GACACTACACTGTTATGGGGCCTACCTGACGATTGGGAAGAACCCCACGTTTCTGACGAA

Sea 81-4 tprJ/I loci  960 CTTTGCCCGGCTGTGGAAGCCGTGGGTGACAGCGCAGTACCAGGAGGATGCGGTACAGTA
Nichols  tprJ/I loci  961 CTTTGCCCGGCTGTGGAAGCCGTGGGTGACAGCGCAGTACCAGGAGGATGCGGTACAGTA

Sea 81-4 tprJ/I loci 1020 TGCGCCGGGGTTTGGGGGTTTAGGCGGCAAGGTTGGGTATCGGGCACAGGACATTGGGGG
Nichols  tprJ/I loci 1021 TGCGCCGGGGTTTGGGGGTTTAGGCGGCAAGGTTGGGTATCGGGCACAGGACATTGGGGG

Sea 81-4 tprJ/I loci 1080 CAGTGGGGTCAGCCTTGATGTGGGGTTTCTCTCCTTTGCCTCTAACGGTGCCTGGGATAG
Nichols  tprJ/I loci 1081 CAGTGGGGTCAGCCTTGATGTGGGGTTTCTCTCCTTTGCCTCTAACGGTGCCTGGGATAG

Sea 81-4 tprJ/I loci 1140 TACTGACCCCACGCACAGTAAGTATGGCTTTGGGGCAGACTTGAAGCTAATGTATGCGCG
Nichols  tprJ/I loci 1141 TACTGACCCCACGCACAGTAAGTATGGCTTTGGGGCAGACTTGAAGCTAATGTATGCGCG

Sea 81-4 tprJ/I loci 1200 TGCAGGACACCCTCTGTGCACGGTAGAGCTTGCCAGCAATGTTACGCTAGAAGACGGATA
Nichols  tprJ/I loci 1201 TGCAGGACACCCTCTGTGCACGGTAGAGCTTGCCAGCAATGTTACGCTAGAAGACGGATA

Sea 81-4 tprJ/I loci 1260 CCTCATCGGTGCACAGAAGGACGCAAACAATCAGAACAAGGATAAACTGCTGTGGAATGT
Nichols  tprJ/I loci 1261 CCTCATCGGTGCACAGAAGGACGCAAACAATCAGAACAAGGATAAACTGCTGTGGAATGT

Sea 81-4 tprJ/I loci 1320 AGGGGGCCGACTCACCCTCGAACCAGGCGCCGGCTTCCGCTTCTCCTTCGCCCTCGACGC
Nichols  tprJ/I loci 1321 AGGGGGCCGACTCACCCTCGAACCAGGCGCCGGCTTCCGCTTCTCCTTCGCCCTCGACGC

Sea 81-4 tprJ/I loci 1380 CGGTAACCAACACCAGAGTGCACAGGACTTTCAAAATCGCACACAGAGGGCGCAGAGTGA
Nichols  tprJ/I loci 1381 CGGTAACCAACACCAGAGTGCACAGGACTTTCAAAATCGCACACAGAGGGCGCAGAGTGA

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Sea 81-4 tprJ/I loci 1440 ACTCACCGCCCTCTCAAATAACCTCTTCCAGGGAGAAAGTCAAAAACAGGAAGCCTGGCT
Nichols  tprJ/I loci 1441 ACTCACCGCCCTCTCAAATAACCTCTTCCAGGGAGAAAGTCAAAAACAGGAAGCCTGGGT

                          ------------------------------------------------------------
Sea 81-4 tprJ/I loci 1500 GGAC--GAATATGCAA-AGAAGGTGCTTGATGCCGTAACGGCAGCCAC-CGAAACCGCCC
Nichols  tprJ/I loci 1501 AACCCAGGTAGTGCAACAGGCGACGC---AGACAGTAACGGCTGGAGTTCGAAGC-GCGC

                          ------------------------------------------------------------
Sea 81-4 tprJ/I loci 1556 TTCAGTCGAGGGGAAACGCGTACATAA-CG--------GCAGTGTCAAACGTAAAAGTC-
Nichols  tprJ/I loci 1557 TGGAATCTCGGGGGACTACGTACATAAACGCGCTAGAGGCAGT-TCAGCCTAATCCTGCT

                          ------------------------------------------------------------
Sea 81-4 tprJ/I loci 1606 -ACCCCTCCGGTA--GCTGC-CACGCTTTTGACGAACCTGAAGGTGTTCATTACCGACCC
Nichols  tprJ/I loci 1616 AAACCTACCGGTAAGGTTGTGCAAAATCTTCACACCCCGCAGGGAAGTC--CGCCGAACC

                          ------------------------------------------------------------
Sea 81-4 tprJ/I loci 1662 TCCTACACCGTCACCGCTTCCCGCGCTTCCTGCATTTTCCCTGATGGGGCAGGTTTTGCT
Nichols  tprJ/I loci 1674 TGC--------CGCCGCTTCCTGCACTTCCTGCATTTTCCCTGATGGGGCAGGTTTTGCT
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Sea 81-4 tprJ/I loci 1722 GCAGTACGATGCGGAGCAGGTGGTGAAGGGGTTTGAGCAGGTACAGACGCAAATCGTTGC
Nichols  tprJ/I loci 1726 GCAGTACGATGCGGAGCAGGTGGTGAAGGGGTTTGAGCAGGTACAGACGCAAATCGTCAC

                            ---------------------tprJ central unique region-------------
Sea 81-4 tprJ/I loci 1782 TGAAATTAACCAGAAAGTGCAAGCGGCTGTGGCTCAGAGCAAGGCTGCAGCACAGGCATT
Nichols  tprJ/I loci 1786 TGAAATTAATCAGAAAGTGCAAGCGGCTGTGGCAAAAAATAATGCAA----ACATGCAAG

                            ------------------------------------------------------------
Sea 81-4 tprJ/I loci 1842 CA-TCAACGGTCTTACCAAGGCAATA----GAAGACG--TGGCTGATGCGTTGCTT--GC
Nichols  tprJ/I loci 1842 CGGTCGGGGGTAGT--CTAGGCGATACTGCGAGAATGGTAGGC-GAAGCGCTCATTAAGC

                            ------------------------------------------------------------
Sea 81-4 tprJ/I loci 1893 A-CCGCATAAGGGAAATCCGATGAGCCTCTTCA-ACCTTCCGGATCAA-CAAAAATTACT
Nichols  tprJ/I loci 1899 AGCAACTATCACGTAAGCAGAACAGCA--TTCTGACCATGGTGAGCGTGCAAGATGAGGT

                            ------------------------------------------------------------
Sea 81-4 tprJ/I loci 1950 GAAGGACGATCTCGCTGATCTTATTCCAAAGCTTACGG-CTGAGGCTACAAAGTTTTTCA
Nichols  tprJ/I loci 1957 GAAACAGGATCTGGCAGATTTAGTGCCGATG-ATGCGAACGGAAATAACGGCGTTTTTCG

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Sea 81-4 tprJ/I loci 2009 CTGAGGGTCAGACGTTT-GTAACCGAAGAAGTGAAGAAGAAGACGGATGCGTTGAATGCG
Nichols  tprJ/I loci 2016 C-GAGTGTCCAGCAACACATAACCGAAGAAGTGAAGAAGAAGACGGATGCGTTGAATGCG

Sea 81-4 tprJ/I loci 2068 GGGCAGCAGATACGTCAGGCTATACAGAACCTGCGTGCGTCTGCATGGCGTGCCTTTCTA
Nichols  tprJ/I loci 2075 GGGCAGCAGATACGTCAGGCTATACAGAACCTGCGTGCGTCTGCATGGCGTGCCTTTCTA

Sea 81-4 tprJ/I loci 2128 ATGGGAGTCAGCGCCGTGTGTCTGTATCTTGACACCTACAATGTCGCCTTCGATGCACTG
Nichols  tprJ/I loci 2135 ATGGGAGTCAGCGCCGTGTGTCTGTATCTTGACACCTACAATGTCGCCTTCGATGCGCTG

Sea 81-4 tprJ/I loci 2188 CTTACAGCGCAGTGGAAGTGGCTGTCTTCTGGCATATACGTTGCCACAGCACCGGCAAAC
Nichols  tprJ/I loci 2195 TTTACGGCGCAGTGGAAGTGGCTGTCTTCTGGCATATACTTTGCCACAGCACCGGCAAAC

Sea 81-4 tprJ/I loci 2248 GTTTTTGGCACCAGGGTGTTAGATAACACCATCGCAAGCTGTGGCGACTTTGCCGGATTC
Nichols  tprJ/I loci 2255 GTTTTTGGCACCAGGGTGTTAGATAACACCATCGCAAGCTGTGGCGACTTTGCCGGATTC

Sea 81-4 tprJ/I loci 2308 CTCAAACTCGAAACTAAGAGCGGTGACCCCTACACCCACCTGCTCACCGGCCTGGACGCC
Nichols  tprJ/I loci 2315 CTTAAGCTCGAAACTAAGAGCGGTGACCCCTACACCCACCTGCTCACCGGCCTGGACGCC

Sea 81-4 tprJ/I loci 2368 GGCGTTGAAACACGCGTGTACATCCCCCTCACCCATGACCTGTACAAAAATAATAACGGG
Nichols  tprJ/I loci 2375 GGCGTTGAAACACGCGTGTACATCCCCCTCACCCATGACCTGTACAAAAATAATAACGGG

Sea 81-4 tprJ/I loci 2428 AACCCTCTCCCTTCCGGCGGTTCCTCAGGGCACATTGGCCTGCCGGTGGTGGGAAAGGCG
Nichols  tprJ/I loci 2435 AACCCTCTCCCTTCCGGCGGTTCCTCAGGGCACATTGGCCTGCCGGTGGTGGGGAAGGCG

Sea 81-4 tprJ/I loci 2488 TGGTGTAGCTATCGCATCCCGGTGCAGGATTATGGCTGGGTGAAGCCAAGCGTTACGGTC
Nichols  tprJ/I loci 2495 TGGTGTAGCTATCGCATCCCGGTGCAGGATTACGGCTGGGTGAAGCCAAGCGTTACGGTC

Sea 81-4 tprJ/I loci 2548 CATGCCTCTACCAACCGTGCACACCTGAATGCCCCTGCTGCAGGTGGAGCAGTAGGAGCT
Nichols  tprJ/I loci 2555 CATGCCTCTACCAACCGTGCACACCTGAATGCCCCTGCTGCAGGTGGAGCAGTAGGAGCT
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Sea 81-4 tprJ/I loci 2608 ACCTATCTAACCAAGGAGTACTGTGCACAGCTGCGTGCTGGTATTTCAGCCAGTCTCATA
Nichols  tprJ/I loci 2615 ACCTATCTAACCAAGGAGTACTGTGCACAGCTGCGTGCTGGTATTTCAGCCAGTCTCATA


Sea 81-4 tprJ/I loci 2668 GAGAAGACGGTATTCTCCCTTGATTGGGAACAGGGTATGCTCTCTGATGTCCCGTACCTG
Nichols  tprJ/I loci 2675 GAGAAGACGGTATTCTCCCTTGATTGGGAACAGGGTATGCTCTCTGATGTCCCGTACCTG


Sea 81-4 tprJ/I loci 2728 CTGGTGTCCGAGTGCCTCACCCAGGGAATCGGCCGCATCGTGTGCGGCGTCACCCTCTCC
Nichols  tprJ/I loci 2735 CTGGTGTCCGAGTGCCTCACCCAGGGAATCGGCCGCATCGTGTGCGGCGTCACCCTCTCC

                    tprJ stop (genome sequence)
                             ***
Sea 81-4 tprJ/I loci 2788 TGGTAGTCACACGCGGCTAGACGGGTGGGGGGGGGTGAGGTAGAAGTGAGAGGAGGGGGA
Nichols  tprJ/I loci 2795 TGGTAGTCACACGCGGCTAGACGGGTGGGGGGGG-TGAGGTAGAAGTGAGAGGAGGGGGA

                    tprI start (genome sequence)
                              ***
Sea 81-4 tprJ/I loci 2848 GTGAGTGGGCAGGCAGGTGATGCAAGCGGGGGTACTTGCGGGCATGGTATGTGCTGCTTC
Nichols  tprJ/I loci 2854 GTGAGTGGGCAGGCAGGTGATGCAAGCGGGGGTACTTGCGGGCATGGTATGTGCTGCTTC


Sea 81-4 tprJ/I loci 2908 TGGTTATGCAGGCGTACTCACTCCGCAGGTCAGTGGCACAGCCCAGCTCCAGTGGGGCAT
Nichols  tprJ/I loci 2914 TGGTTATGCAGGCGTACTCACTCCGCAGGTCAGTGGCACAGCCCAGCTCCAGTGGGGCAT


Sea 81-4 tprJ/I loci 2968 TGCGTTCCAGAAGAATCCACGCACTGGCCCGGGCAAGCACACCCATGGGTTTCGCACTAC
Nichols  tprJ/I loci 2974 TGCGTTCCAGAAGAATCCACGCACTGGCCCGGGCAAGCACACCCATGGGTTTCGCACTAC


Sea 81-4 tprJ/I loci 3028 CAATGGTCTGACTATTTCCCTGCCGTTGGTGTCAAAGCACACCCACACCCGCCGAGGGGA
Nichols  tprJ/I loci 3034 CAATAGTCTGACTATTTCCCTGCCGTTGGTGTCAAAGCACACCCACACCCGCCGAGGGGA


Sea 81-4 tprJ/I loci 3088 GGCACGCTCAGGGGTGTGGGCACAGCTGCAGCTGAAGGACCTGGCAGTAGAGCTTGCGTC
Nichols  tprJ/I loci 3094 GGCACGCTCAGGGGTGTGGGCACAGCTGCAGCTGAAGGACCTGGCAGTAGAGCTTGCGTC


Sea 81-4 tprJ/I loci 3148 TTCTAAAAGCTCAACGGCCCTGTCCTTTACCAAACCTACCGCTTCCTTCCAGGCAACCCT
Nichols  tprJ/I loci 3154 TTCTAAAAGCTCAACGGCCCTGTCCTTTACCAAACYTACCGCTTCCTTCCAGGCAACCCT


Sea 81-4 tprJ/I loci 3208 GCACTGTTATGGGGCCTACCTGACAGTGGGTACCAGTCCTTCCTGTGTGGTTAACTTTGC
Nichols  tprJ/I loci 3214 GCACTGTTATGGGGCCTACCTGACAGTGGGTACCAGTCCTTCCTGTGTGGTTAACTTTGC


Sea 81-4 tprJ/I loci 3268 CCAGCTGTGGAAACCCTTTGTCACCCGTGCCTATTCAGAAAAGGACACTCGCTATGCCCC
Nichols  tprJ/I loci 3274 CCAGCTGTGGAAACCCTTTGTCACCCGTGCCTATTCAGAAAAGGACACTCGCTATGCCCC


Sea 81-4 tprJ/I loci 3328 TGGTTTCTCCGGCTCCGGGGCAAAACTCGGCTACCAGGCCCACAATGTGGGAAACAGCGG
Nichols  tprJ/I loci 3334 TGGTTTCTCCGGYTCCGGGGCAAAACTCGGCTACCAGGCCCACAATGTGGGAAACAGCGG



Sea 81-4 tprJ/I loci 3388 AGTAGATGTGGACATCGGTTTCCTCTCCTTCCTTTCCAATGGTGCCTGGGATAGTACTGA
Nichols  tprJ/I loci 3394 AGTAGATGTGGACATCGGTTTCCTCTCCTTCCTTTCCAATGGTGCCTGGGATAGTACTGA


Sea 81-4 tprJ/I loci 3448 CACCACGCACAGCAAGTATGGCTTCGGGGACGATGCAACGCTTTCCTATGGCGTCGACCG
Nichols  tprJ/I loci 3454 CACCACGCACAGCAAGTATGGCTTCGGGGCCGATGCAACGCTTTCCTATGGCGTCGACCG
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Sea 81-4 tprJ/I loci 3508 TCAGCGGCTGCTTACGTTGGAGCTGGCAGGGAATGCCACACTGGACCAGAACTACGTTAA
Nichols  tprJ/I loci 3514 TCAGCGGCTGCTTACGTTGGAGCTGGCAGGGAATGCCACACTGGAGCAGCACTACCGTAA


Sea 81-4 tprJ/I loci 3568 GGGTACCGAAGACTCCAAGAACGAAAACAAAACAGCACTCCTGTGGGGAGTAGGAGGCCG
Nichols  tprJ/I loci 3574 GGGTACCGAAGACTCCACGAACGAAAACAAAACAGCACTCCTGTGGGGAGTAGGAGGCCG

Sea 81-4 tprJ/I loci 3628 ACTCACCCTCGAACCAGGCGCCGGCTTCCGCTTCTCCTTCGCCCTCGACGCCGGTAACCA
Nichols  tprJ/I loci 3634 ACTCACCCTCGAACCAGGCGCCGGCTTCCGCTTCTCCTTCGCCCTCGACGCCGGTAACCA

Sea 81-4 tprJ/I loci 3688 ACGCCAGGACCCTGCCGATGCAGGTAATCGCCTTCTGGCAACGGGGAGCTCACGGGAGAA
Nichols  tprJ/I loci 3694 ACACCAGGACCCTGCCGATGCAGGTAATCGCCTTCTGGCAACGGGGAGCTCACGGGAGAA

Sea 81-4 tprJ/I loci 3748 GTTTCACAGCGCGTTCGATGCCCTCAGGGTGGAGCAATACCGTGTAAAGGATAAGTATCT
Nichols  tprJ/I loci 3754 GTTTGACAGCGCGTTCGATGCCCTCAGGGTGGAGCAATACCGTGTAAAGGATAAGTATCT

Sea 81-4 tprJ/I loci 3808 TGAATTTTTGCTGGGACAGATGGCGGAGTCCTCGATTCTCGAGCGGGTGGGGCTTGCCCT
Nichols  tprJ/I loci 3814 TGAATTTTTGCTGGGACAGATGGCGGAGTCCTCGATTCTCGAGCGGGTGGGGCTTGCCCT

Sea 81-4 tprJ/I loci 3868 CACGCTGCAGGACGGTACGCTCGTCTCTACGCTGACGAAGGTTGCCACTGATAGTGGAGA
Nichols  tprJ/I loci 3874 CACGCTGCAGGACGGTACGCTCGTCTCTACGCTGACGAAGGTTGCCACTGATAGTGGAGA

Sea 81-4 tprJ/I loci 3928 TCGGTTTATCCAAATGGCGTTGGTAAAACTCTTGCCCCAGAGGGCGCAGGCGGAGCAGAG
Nichols  tprJ/I loci 3934 TCGGTTTATCCAAATGGCGTTGGTAAAACTCTTGCCCCAGAGGGCGCAGGCGGAGCAGAG

Sea 81-4 tprJ/I loci 3988 ACTACAGGAGATTGTGGCGCCGAGTCAGTCGGACATCGTGCTTATCATGCTGCTAACCTG
Nichols  tprJ/I loci 3994 ACTACAGGAGATTGTGGCGCCGAGTCAGTCGGACATCGTGCTTATCATGCTGCTAACCTG

Sea 81-4 tprJ/I loci 4048 GCTTGAGCGTGCACGGCTGGACCGGTTCAATGCTGATGCGCTGCTTACGGCGCAGTGGAC
Nichols  tprJ/I loci 4054 GCTTGAGCGTGCACGGCTGGACCGGTTCAATGCTGATGCGCTGCTTACGGCGCAGTGGAC

Sea 81-4 tprJ/I loci 4108 CTATGTGTCGGCTGGACTGTATGGGGCGACGGCGGGTACCAATGTATTTGGTAAGCGCGT
Nichols  tprJ/I loci 4114 CTATGTGTCGGCTGGACTGTATGGGGCGACGGCGGGTACCAATGTATTTGGTAAGCGCGT

Sea 81-4 tprJ/I loci 4168 GCTGCCTGCGCTGCGGTCCTGGCATTTTGATTTTGCCGGATTCCTCAAACTCGAAACCAA
Nichols  tprJ/I loci 4174 GCTGCCTGCGCTGCGGTCCTGGCATTTTGATTTTGCCGGATTCCTCAAACTCGAAACCAA

Sea 81-4 tprJ/I loci 4228 AAGCGGTGACCCCTACACCCACCTGCTCACCGGCCTGAACGCCGGCGTCGAAGCACGCGT
Nichols  tprJ/I loci 4234 AAGCGGTGACCCCTACACCCACCTGCTCACCGGCCTGAACGCCGGCGTCGAAGCACGCGT

Sea 81-4 tprJ/I loci 4288 GTACATCCCCCTCACCTACATCCGTTACAGAAATAACGGAGGGTACGAACTGAATGGAGC
Nichols  tprJ/I loci 4294 GTACATCCCCCTCACCTACATCCGTTACAGAAATAACGGAGGGTACGAACTGAATGGAGC
Sea 81-4 tprJ/I loci 4348 TGTGCCCCCTGGGACTATCAATATGCCAATTTTGGGGAAGGCGTGGTGCAGCTATCGCAT
Nichols  tprJ/I loci 4354 TGTGCCCCCTGGGACTATCAATATGCCAATTTTGGGGAAGGCGTGGTGCAGCTATCGCAT

Sea 81-4 tprJ/I loci 4408 CCCCCTCGGTTCCCACGCCTGGCTTACACCGCATACATCCGTGCTCGGCACAACCAATCG
Nichols  tprJ/I loci 4414 CCCCCTCGGTTCCCACGCCTGGCTTACACCGCATACATCCGTGCTCGGCACAACCAATCG
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Sea 81-4 tprJ/I loci 4468 CTTTAACGTTATTAACCCCGCGTACACCCTGTTGAATGAACGAGCGCTCCAGTACCAGGT
Nichols  tprJ/I loci 4474 CTTTAACGTTATTAACCCCGCGTACACCCTGTTGAATGAACGAGCGCTCCAGTACCAGGT

Sea 81-4 tprJ/I loci 4528 GGGACTGACGTTCAGTCCCTTCGAGAAGGTGGAGCTCAGCGCCCAGTGGGAACAGGGGGT
Nichols  tprJ/I loci 4534 GGGACTGACGTTCAGTCCCTTCGAGAAGGTGGAGCTCAGCGCCCAGTGGGAACAGGGGGT

Sea 81-4 tprJ/I loci 4588 GCTTGCTGACGCTCCTTACATGGGTATTGCCGAGAGTATGTGGTCTGAGCGTTACTTTGG
Nichols  tprJ/I loci 4594 GCTTGCTGACGCTCCTTACATGGGTATTGCCGAGAGTATGTGGTCTGAGCGTTACTTTGG

                                               tprI stop (genome sequence)
                                                         ***
Sea 81-4 tprJ/I loci 4648 CACGTTTATCTGTGGGGTGAAGGTGGTTTGGTGAGGGGTTGTCGTGTGGGCCAGAGAACG
Nichols  tprJ/I loci 4654 CACGTTTATCTGTGGGGTGAAGGTGGTTTGGTGAGGGGTTGTCGTGTGGGCCAGAGAACG

Sea 81-4 tprJ/I loci 4708 GGTACGGTGGGGGTGCGCGTTTTTCCCCGTGGGGCTGTGCGCGCTCAGTTTACAGGCGAG
Nichols  tprJ/I loci 4714 GGTACGGTGGGGGTGCGCGTTTT-CCCCGTGGGGCTGTGCGCGCTCAGTTTACAGGCGAG

Sea 81-4 tprJ/I loci 4768 GGATTGCAGGGGTATGTGCGGGAAGCGTCTGGGTAAAGTGATGGTGCTCGGGTGTATGTT
Nichols  tprJ/I loci 4773 GGATTGCAGGGGTATGTGCGGGAAGCGTCTGGGTAAAGTGATGGTGCTCGGGTGTATGTT

Sea 81-4 tprJ/I loci 4828 GCCGGGTGTGGCGGCGCGTGTTTCTCTCTCCCCCAAGCTCGGGGTGTACGGGGACGCACG
Nichols  tprJ/I loci 4833 GCCGGGTGTGGCGGCGCGTGTTTCTCTCTCCCCCAAGCTCGGGGTGTACGGGGACGCACG

Sea 81-4 tprJ/I loci 4888 CGGCGGTTCTGACCTGTGGGGCATCTGCATACAAGCTCCCACAATGCCAGATACAGAGAA
Nichols  tprJ/I loci 4893 CGGCGGTTCTGACCTGTGGGGCATCTGCATACAAGCTCCCACAATGCCAGATACAGAGAA

Sea 81-4 tprJ/I loci 4948 CCAGGCGCCTCCGCGCTATGCGCCGGAGACACCGTTGGTGGGGCTGGACGTGGCGTTCCG
Nichols  tprJ/I loci 4953 CCAGGCGCCTCCGCGCTATGCGCCGGAGACACCGTTGGTGGGGCTGGACGTGGCGTTCCG

Sea 81-4 tprJ/I loci 5008 TGCGGAAAATGGCTTCCTGCTCCAACTGACGGTGGACGCGGCACTCACGCGTTTAATGTT
Nichols  tprJ/I loci 5013 TGCGGAAAATGGCTTCCTGCTCCAACTGACGGTGGACGCGGCACTCACGCGTTTAATGTT

Sea 81-4 tprJ/I loci 5068 CTGCGGCCGGTGTTTGGCCGGTTATTCGTTCAGACCGGGGGAAGGTAGTACGCATCTGTC
Nichols  tprJ/I loci 5073 CTGCGGCCGGTGTTTGGCCGGTTATTCGTTCAGACCGGGGGAAGGTAGTACGCATCTGTC

Sea 81-4 tprJ/I loci 5128 GGTAGCGGCGGGTTTTGAGTGCACCGCGCTCATCTACGATAGCCAGCACTTTCTTTCGGT
Nichols  tprJ/I loci 5133 GGTAGCGGCGGGTTTTGAGTGCACCGCGCTCATCTACGATAGCCAGCACTTTCTTTCGGT

Sea 81-4 tprJ/I loci 5188 TCTTGGGCAGGGCTTACT
Nichols  tprJ/I loci 5193 TCTTGGGCAGGGCTTACT
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B

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Sea 81-4 tprG/F loci   1 CCCTGCGTTTCCCATCTGCGGCCTGTCGCTCTTAGAGCAGCCGATGAGCAGCATGGCGCA
Nichols  tprG/F loci   1 CCCTGCGTTTCCCATCTGCGGCCTGTCGCTCTTAGAGCAGCCGATGAGCAGCATGGCGCA


Sea 81-4 tprG/F loci  61 AAAAACGCCCGCAAACCCTTCGCGTACCCACTTCTCTCTCACAAGAATCCTCCCCCCTTT
Nichols  tprG/F loci  61 AAAAACGCCCGCAAACGC---GCGTACCCACTTCTCTCTCACAAGAATCCTCCCCCCTTT


Sea 81-4 tprG/F loci 121 ATCGACAAACATGCGCAAAATAAGGGGTCACAGTGTAACCCAAGGGGACAAGGAGGTGCA
Nichols  tprG/F loci 118 ATCGACAAACATGCGCAAAATAAGGGGTCACAGTGTAACCCAAGGGGACAAGGAGGTGCA


Sea 81-4 tprG/F loci 181 AGGAGTGGTGAGTTTTTGCGTGTGTGCAGGTGGCAGGGTGAGGGGGCTACTAGACAGGGC
Nichols  tprG/F loci 178 AGGAGTGGTGAGTTTTTGCGTGTGTGCAGGTGGCAGGGTGAGGGGGCTACTAGACAGGGC
                                                                           ------
                                                                             -10

                                          tprG start
                                       (genome sequence)
                                              ***
Sea 81-4 tprG/F loci 241 CGGGGGGGGGGGTGAGGTAGCATGGGGTGCATGCGGTGGGGGAGTGTGCTGTGTGTGGTG
Nichols  tprG/F loci 238 CGGGGGGGGGGGTGAGGTAGCATGGGGTGCATGCGGTGGGGGAGTGTGCTGTGTGTGGTG
                                     ------
                                      -35
                      Predicted Sigma 70 consensus sequences

Sea81-4  tprG/F loci 301 GTGGGGGTAGGAGCGAGCGGGGGAGTGCTCGGACAGGAGTTTCCCCCGAAGCTAACTGGC
Nichols  tprG/F loci 298 GTGGGGGTAGGAGCGAGCGGGGGAGTGCTCGGACAGGAGTTTTCCCCGAAGCTAACTGGC


Sea 81-4 tprG/F loci 361 TCTGCCACACTTGAGTGGGGCATCAGCTATGGCAAGGGGGTAGGCAGTCATGGCCAGGCC
Nichols  tprG/F loci 358 TCTGCCACACTTGAGTGGGGCATCAGCTATGGCAAGGGGGTAGGCAGTCATGGCCAGGCC


Sea 81-4 tprG/F loci 421 CCTGGTGCAGTTATGGGCACCGGTCCCTACAATCTGAAGCACGGGTTTCGTACTACCAAC
Nichols  tprG/F loci 418 CCTGGTGCAGTTATGGGCACCGGTCCCTACAATCTGAAGCACGGGTTTCGTACTACCAAC


Sea 81-4 tprG/F loci 481 ACGGTGGGAGTATCCTTTCCCCTGGTTATGCGCACCACCCACACGCGCCGTGGGCAGCAC
Nichols  tprG/F loci 478 ACGGTGGGAGTATCCTTTCCCCTGGTTATGCGCACCACCCACACGCGCCGTGGGCAGCAC


Sea 81-4 tprG/F loci 541 CCGGCACTGTATGCGGAGCTGAAGGTGGCGGACCTGCAGGCGGACCTGAGTCAGGGGAAG
Nichols  tprG/F loci 538 CCGGCACTGTATGCGGAGCTGAAGGTGGCGGACCTGCAGGCGGACCTGAGTCAGGGGAAG


Sea 81-4 tprG/F loci 601 GCAGGTTTTGCCGTTAAGCGCAAGGGGAAGGTAGAGGCGACACTACACTGTTATGGGGCC
Nichols  tprG/F loci 598 GCAGGTTTTGCCGTTAAGCGCAAGGGGAAGGTAGAGGCGACACTACACTGTTATGGGGCC


Sea 81-4 tprG/F loci 661 TACCTGACGATTGGGAAGAACCCCACGTTTCTGACGAACTTTGCCCGGCTGTGGAAGCCG
Nichols  tprG/F loci 658 TACCTGACGATTGGGAAGAACCCCACGTTTCTGACGAACTTTGCCCGGCTGTGGAAGCCG


Sea 81-4 tprG/F loci 721 TGGGTGACAGCGCAGTACCAGGAGGATGCGGTACAGTATGCGCCGGGGTTTGGGGGTTTA
Nichols  tprG/F loci 718 TGGGTGACAGCGCAGTACCAGGAGGATGCGGTACAGTATGCGCCGGGGTTTGGGGGTTTA
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Sea 81-4 tprG/F loci  781 GGCGGCAAGGTTGGGTATCGGGCACAGGACATTGGGGGCAGTGGGGTCAGCCTTGATGTG
Nichols  tprG/F loci  778 GGCGGCAAGGTTGGGTATCGGGCACAGGACATTGGGGGCAGTGGGGTCAGCCTTGATGTG

Sea81-4  tprG/F loci  841 GGGTTTCTCTCCTTTGCCTCTAACGGTGCCTGGGATAGTACTGACCCCACGCACAGTAAG
Nichols  tprG/F loci  838 GGGTTTCTCTCCTTTGCCTCTAACGGTGCCTGGGATAGTACTGACCCCACGCACAGTAAG

Sea 81-4 tprG/F loci  901 TATGGCTTTGGGGCAGACTTGAAGCTAATGTATGCGCGTGCAGGACACCCTCTGTGCACG
Nichols  tprG/F loci  898 TATGGCTTTGGGGCAGACTTGAAGCTAATGTATGCGCGTGCAGGACACCCTCTGTGCACG

Sea 81-4 tprG/F loci  961 GTAGAGCTTGCCAGCAATGTTACGCTAGAAGACGGATACCTCATCGGTGCACAGAAGGAC
Nichols  tprG/F loci  958 GTAGAGCTTGCCAGCAATGTTACGCTAGAAGACGGATACCTCATCGGTGCACAGAAGGAC

Sea 81-4 tprG/F loci 1021 GCAAACAATCAGAACAAGGATAAACTGCTGTGGAATGTAGGGGGCCGACTCACCCTCGAA
Nichols  tprG/F loci 1018 GCAAACAATCAGAACAAGGATAAACTGCTGTGGAATGTAGGGGGCCGACTCACCCTCGAA

Sea 81-4 tprG/F loci 1081 CCAGGCGCCGGCTTCCGCTTCTCCTTCGCCCTCGACGCCGGTAACCAACACCAGAGTGCA
Nichols  tprG/F loci 1078 CCAGGCGCCGGCTTCCGCTTCTCCTTCGCCCTCGACGCCGGTAACCAACACCAGAGTGCA

Sea 81-4 tprG/F loci 1141 CAGGACTTTCAAAATCGCACACAGAGGGCGCAGAGTGAACTCACCGCCCTCTCAAATAAC
Nichols  tprG/F loci 1138 CAGGACTTTCAAAATCGCACACAGAGGGCGCAGAGTGAACTCACCGCCCTCTCAAATAAC

Sea 81-4 tprG/F loci 1201 CTCTTCCAGGGAGAAAGTCAAAAACAGGAAGCCTGGCTGGACGAATATGCAAAGAAGGTG
Nichols  tprG/F loci 1198 CTCTTCCAGGGAGAAAGTCAAAAACAGGAAGCCTGGCTGGACGAATATGCAAAGAAGGTG

Sea 81-4 tprG/F loci 1261 CTTGATGCCGTAACGGCAGCCACCGAAACCGCCCTTCAGTCGAGGGGAAACGCGTACATA
Nichols  tprG/F loci 1258 CTTGATGCCGTAACGGCAGCCACCGAAACCGCCCTTCAGTCGAGGGGAAACGCGTACATA

Sea 81-4 tprG/F loci 1321 ACGGCAGTGTCAAACGTAAAAGTCACCCCTCCGGTAGCTGCCACGCTTTTGACGAACCTG
Nichols  tprG/F loci 1318 ACGGCAGTGTCAAACGTAAAAGTCACCCCTCCGGTAGCTGCCACGCTTTTGACGAACCTG

Sea 81-4 tprG/F loci 1381 AAGGTGTTCATTACCGACCCTCCTACACCGTCACCGCTTCCCGCGCTTCCTGCATTTTCC
Nichols  tprG/F loci 1378 AAGGTGTTCATTACCGACCCTCCTACACCGTCACCGCTTCCCGCGCTTCCTGCATTTTCC

Sea 81-4 tprG/F loci 1441 CTGATGGGGCAGGTTTTGCTGCAGTACGATGCGGAGCAGGTGGTGAAGGGGTTTGAGCAG
Nichols  tprG/F loci 1438 CTGATGGGGCAGGTTTTGCTGCAGTACGATGCGGAGCAGGTGGTGAAGGGGTTTGAGCAG

Sea 81-4 tprG/F loci 1501 GTACAGACGCAAATCGTTGCTGAAATTAACCAGAAAGTGCAAGCGGCTGTGGCTCAGAGC
Nichols  tprG/F loci 1498 GTACAGACGCAAATCGTTGCTGAAATTAACCAGAAAGTGCAAGCGGCTGTGGCTCAGAGC

Sea 81-4 tprG/F loci 1561 AAGGCTGCAGCACAGGCATTCATCAACGGTCTTACCAAGGCAATAGAAGACGTGGCTGAT
Nichols  tprG/F loci 1558 AAGGCTGCAGCACAGGCATTCATCAACGGTCTTACCAAGGCAATAGAAGACGTGGCTGAT

Sea 81-4 tprG/F loci 1621 GCGTTGCTTGCACCGCATAAGGGAAATCCGATGAGCCTCTTCAACCTTCCGGATCAACAA
Nichols  tprG/F loci 1618 GCGTTGCTTGCACCGCATAAGGGAAATCCGATGAGCCTCTTCAACCTTCCGGATCAACAA

Sea 81-4 tprG/F loci 1681 AAATTACTGAAGGACGATCTCGCCGATCTTATTCCAAAGCTTACGGCTGAGGCTACAAAG
Nichols  tprG/F loci 1678 AAATTACTGAAGGACGATCTCGCCGATCTTATTCCAAAGCTTACGGCTGAGGCTACAAAG
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Sea 81-4 tprG/F loci 1741 TTTTTCACTGAGGGTCAGACGTTTGTAACCGAAGAAGTGAAGAAGAAGACGGATGCGTTG
Nichols  tprG/F loci 1738 TTTTTCACTGAGGGTCAGACGTTTGTAACCGAAGAAGTGAAGAAGAAGACGGATGCGTTG

Sea 81-4 tprG/F loci 1801 GACGCGGGGCAGCAGATACGTCAGGCTATACAGAACCTGCGTGCGTCTGCATGGCGTGCC
Nichols  tprG/F loci 1798 GACGCGGGGCAGCAGATACGTCAGGCTATACAGAACCTGCGTGCGTCTGCATGGCGTGCC

Sea 81-4 tprG/F loci 1861 TTTCTAATGGGAGTCAGCGCCGTGTGTCTGTATCTTGACACCTACAATGTCGCCTTCGAT
Nichols  tprG/F loci 1858 TTTCTAATGGGAGTCAGCGCCGTGTGTCTGTATCTTGACACCTACAATGTCGCCTTCGAT

Sea 81-4 tprG/F loci 1921 GCGCTGTTTACGGCGCAGTGGAAGTGGCTGTCTTCTGGCATATACGTTGCCACAGCACCG
Nichols  tprG/F loci 1918 GCGCTGTTTACGGCGCAGTGGAAGTGGCTGTCTTCTGGCATATACTTTGCCACAGCACCG

Sea 81-4 tprG/F loci 1981 GCAAACGTTTTTGGCACCAGGGTGTTAGATAACACCATCGCAAGCTGTGGCGACTTTGCC
Nichols  tprG/F loci 1978 GCAAACGTTTTTGGCACCAGGGTGTTAGATAACACCATCGCAAGCTGTGGCGACTTTGCC

Sea 81-4 tprG/F loci 2041 GGATTCCTTAAGCTCGAAACTAAGAGCGGTGACCCCTACACCCACCTGCTCACCGGCCTG
Nichols  tprG/F loci 2038 GGATTCCTTAAGCTCGAAACTAAGAGCGGTGACCCCTACACCCACCTGCTCACCGGCCTG

                                                                        Sea 81-4
                                                                frameshift  premature stop
                                                                     *             ***
Sea 81-4 tprG/F loci 2101 GACGCCGGCGTTGAAACACGCGTGTACATCCCCCTCACCCATGACGCTATACAAAAATAA
Nichols  tprG/F loci 2098 GACGCCGGCGTTGAAACACGCGTGTACATCCCCCTCACCTATG-CGCTATACAAAAATAA

                          ============================================================
Sea 81-4 tprG/F loci 2161 TAACGGGGGAACCGCTCTCCCTTCCGGCAGTTCCTCAGGAAAAGCACTATATCCGGCCAG
Nichols  tprG/F loci 2157 ---CGGGGGGACGGCTGTGCGTGGCAT-------TCAGGAAAAGGAGTATATCCGTCCA-

                          ============================================================
Sea 81-4 tprG/F loci 2221 CCGGTGGTGGGGAAGGCGTGGTGTAGCTATCGCATCCCGGTGCAGGATTACGGCTGGGTG
Nichols  tprG/F loci 2206 CCGGTGGTGGGGAAGGCGTGGTGTAGCTATCGCATCCCGGTGCAGGATTACGGCTGGGTG

                          ============================================================
Sea 81-4 tprG/F loci 2281 AAGCCAAGCGTTACGGTCCATGCCTCTACCAACCGTGCACACCTGAATGCCCCTGCTGCA
Nichols  tprG/F loci 2266 AAGCCAAGCGTTACGGTCCATGCCTCTACCAACCGTGCACACCTGAATGCCCCTGCTGCA

                          ============================================================
Sea 81-4 tprG/F loci 2341 GGTGGAGCAGTAGGAGCTACCTATCTAACCAAGGAGTACTGTGCACAGCTGCGTGCTGGT
Nichols  tprG/F loci 2326 GGTGGAGCAGTAGGAGCTACCTATCTAACCAAGGAGTACTGTGCACAGCTGCGTGCTGGT

                          ============================================================
Sea 81-4 tprG/F loci 2401 ATTTCAGCCAGTCTCATAGAGAAGACGGTATTCTCCCTTGATTGGGAACAGGGTATGCTC
Nichols  tprG/F loci 2386 ATTTCAGCCAGTCTCATAGAGAAGACGGTATTCTCCCTTGATTGGGAACAGGGTATGCTC

                          ============================================================
Sea 81-4 tprG/F loci 2461 TCTGATGTCCCGTACCTGCTGGTGTCCGAGTGCCTCACCCAGGGAATCGGCCGCATCGTG
Nichols  tprG/F loci 2446 TCTGATGTCCCGTACCTGCTGGTGTCCGAGTGCCTCACCCAGGGAATCGGCCGCATCGTG

                          ============================================================
Sea 81-4 tprG/F loci 2521 TGCGGCGTCACCCTCTCCTGGTAGCCACACGCGGCTAGACGGGTGGGGGGGGGTGAGGTA
Nichols  tprG/F loci 2506 TGCGGCGTCACCCTCTCCTGGTAGTCACACGCGGCTAGACGGGTGGGGGGGGGTGAGGTA
                                               ***>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
                                          Nichols tprG
                                           stop codon
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                          ======================
Sea 81-4 tprG/F loci 2581 GAAGTGAGAGGAGGGGGAGTGAGTGGGCAGGCAGGTGATGCAAGCGGGGGTACTTGCGGG
Nichols  tprG/F loci 2566 GAAGTGAGAGGAGGGGGAGTGAGTGGGCAGGCAGGTGATGCAAGCGGGGGTACTTGCGGG
                          >>>>>>>>>>>>>>>>>>>>>>***
                                 Nichols (genome sequence) and Sea 81-4
                                          tprF start codon

Sea 81-4 tprG/F loci 2641 CATGGTATGTGCTGCTTCTGGTTATGCAGGCGTACTCACTCCGCAGGTCAGTGGCACAGC
Nichols  tprG/F loci 2626 CATGGTATGTGCTGCTTCTGGTTATGCAGGCGTACTCACTCCGCAGGTCAGTGGCACAGC

Sea 81-4 tprG/F loci 2701 CCAGCTCCAGTGGGGCATTGCGTTCCAGAAGAATCCACGCACTGGCCCGGGCAAGCACAC
Nichols  tprG/F loci 2686 CCAGCTCCAGTGGGGCATTGCGTTCCAGAAGAATCCACGCACTGGCCCGGGCAAGCACAC

Sea 81-4 tprG/F loci 2761 CCATGGGTTTCGCACTACCAATAATCTGACTATTTCCCTGCCGTTGGTGTCAAAGCACAC
Nichols  tprG/F loci 2746 CCATGGGTTTCGCACTACCAATAGTCTGACTATTTCCCTGCCGTTGGTGTCAAAGCACAC

Sea 81-4 tprG/F loci 2821 CCACACCCGCCGAGGGGAGGCACGCTCAGGGGTGTGGGCACAGCTGCAGCTGAAGGACCT
Nichols  tprG/F loci 2806 CCACACCCGCCGAGGGGAGGCACGCTCAGGGGTGTGGGCACAGCTGCAGCTGAAGGACCT

Sea 81-4 tprG/F loci 2881 GGCAGTAGAGCTTGCGTCTTCTAAAAGCTCAACGGCCCTGTCCTTTACCAAACCTACCGC
Nichols  tprG/F loci 2866 GGCAGTAGAGCTTGCGTCTTCTAAAAGCTCAACGGCCCTGTCCTTTACCAAACCTACCGC

Sea 81-4 tprG/F loci 2941 TTCCTTCCAGGCAACCCTGCACTGTTATGGGGCCTACCTGACAGTGGGTACCAGTCCTTC
Nichols  tprG/F loci 2926 TTCCTTCCAGGCAACCCTGCACTGTTATGGGGCCTACCTGACAGTGGGTACCAGTCCTTC

Sea 81-4 tprG/F loci 3001 CTGTGTGGTTAACTTTGCCCAGCTGTGGAAACCCTTTGTCACCCGTGCCTATTCAGAAAA
Nichols  tprG/F loci 2986 CTGTGTGGTTAACTTTGCCCAGCTGTGGAAACCCTTTGTCACCCGTGCCTATTCAGAAAA

Sea 81-4 tprG/F loci 3061 GGACACTCGCTATGCCCCTGGTTTCCCCGGCTCCGGGGCAAAACTCGGCTACCAGGCCCA
Nichols  tprG/F loci 3046 GGACACTCGCTATGCCCCTGGTTTCTCCGGCTCCGGGGCAAAACTCGGCTACCAGGCCCA

Sea 81-4 tprG/F loci 3121 CAATGTGGGAAACAGCGGAGTAGATGTGGACATCGGTTTCCTCTCCTTCCTTTCCAATGG
Nichols  tprG/F loci 3106 CAATGTGGGAAACAGCGGAGTAGATGTGGACATCGGTTTCCTCTCCTTCCTTTCCAATGG

Sea 81-4 tprG/F loci 3181 TGCCTGGGATAGTACTGACACCACGCACAGCAAGTATGGCTTCGGGGCCGATGCAACGCT
Nichols  tprG/F loci 3166 TGCCTGGGATAGTACTGACACCACGCACAGCAAGTATGGCTTCGGGGCCGATGCAACGCT

Sea 81-4 tprG/F loci 3241 TTCCTATGGCGTCGACCGTCAGCGGCTGCTTACGTTGGAGCTGGCAGGGAATGCCACACT
Nichols  tprG/F loci 3226 TTCCTATGGCGTCGACCGTCAGCGGCTGCTTACGTTGGAGCTGGCAGGGAATGCCACACT

Sea 81-4 tprG/F loci 3301 GGAGCAGCACTACCGTAAGGGTACCGAAGACTCCACGAACGAAAACAAAACAGCACTCCT
Nichols  tprG/F loci 3286 GGAGCAGCACTACCGTAAGGGTACCGAAGACTCCACGAACGAAAACAAAACAGCACTCCT

Sea 81-4 tprG/F loci 3361 GTGGGGAGTAGGAGGCCGACTCACCCTCGAACCAGGCGCCGGCTTCCGCTTCTCCTTCGC
Nichols  tprG/F loci 3346 GTGGGGAGTAGGAGGCCGACTCACCCTCGAACCAGGCGCCGGCTTCCGCTTCTCCTTCGC

Sea 81-4 tprG/F loci 3421 CCTCGACGCCGGTAACCAACACCAGGACCCTGCCGATGCAGGTAATCGCCTTCTGGCAAC
Nichols  tprG/F loci 3406 CCTCGACGCCGGTAACCAACACCAGGACCCTGCCGATGCAGGTAATCGCCTTCTGGCAAC
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Sea 81-4 tprG/F loci 3481 GGGGAGCTCACGGGAGAAGTTTGACAGCGCGTTCGATGCCCTCAGGGTGGAGCAATACCG
Nichols  tprG/F loci 3466 GGGGAGCTCACGGGAGAAGTTTGACAGCGCGTTCGATGCCCTCAGGGTGGAGCAATACCG

Sea 81-4 tprG/F loci 3541 TGTAAAGGATAAGTATCTTGAATTTTTGTTGGGACAGATGGCGGAGTCCTCGATTCTCGA
Nichols  tprG/F loci 3526 TGTAAAGGATAAGTATCTTGAATTTTTGCTGGGACAGATGGCGGAGTCCTCGATTCTCGA

Sea 81-4 tprG/F loci 3601 GCGGGTGGGGCTTGCCCTCACGCTGCAGGACGGTACGCTCGTCTCTACGCTGACGAAGGT
Nichols  tprG/F loci 3586 GCGGGTGGGGCTTGCCCTCACGCTGCAGGACGGTACGCTCGTCTCTACGCTGACGAAGGT

                                                                       tprF stop
                                                                          ***
Sea 81-4 tprG/F loci 3661 TGCCACTGATAGTGGAGCTCAGCGCCCAGTGGAACAGGGGGTGCTTGCTGACGCTCCTT
Nichols  tprG/F loci 3646 TGCCACTGATAGTGGAGCTCAGCGCCCAGTGGAACAGGGGGTGCTTGCTGACGCTCCTT

Sea 81-4 tprG/F loci 3721 ACATGGGTATTGCCGAGAGTATGTGGTCTGAGCGTTACTTTGGCACGTTTATCTGTGGGG
Nichols  tprG/F loci 3706 ACATGGGTATTGCCGAGAGTATGTGGTCTGAGCGTTACTTTGGCACGTTTATCTGTGGGG

Sea 81-4 tprG/F loci 3781 TGAAGGTGGTTTGGTGAGGGGTTGTCGTGTGGGCCAGAGAACGGGTACGGTGGGGGTGCG
Nichols  tprG/F loci 3766 TGAAGGTGGTTTGGTGAGGGGTTGTCGTGTGGGCCAGAGAACGGGTACGGTGGGGGTGCG

Sea 81-4 tprG/F loci 3841 CGTTTTCCCCGTGGGGCTGTGCGCGCTCAGTTTACAGGCGAGGGATTGCAGGGGTATGTG
Nichols  tprG/F loci 3826 CGTTTTCCCCGTGGGGCTGTGCGCGCTCAGTTTACAGGCGAGGGATTGCAGGGGTATGTG

Sea 81-4 tprG/F loci 3901 CGGGAAGCGTCTGGGTAAAGTGATGGTGCTCGGGTGTATGTTGCCGGGTGTGGCGGCGCG
Nichols  tprG/F loci 3886 CGGGAAGCGTCTGGGTAAAGTGATGGTGCTCGGGTGTATGTTGCCGGGTGTGGCGGCGCG

Sea 81-4 tprG/F loci 3961 TGTTTCTCTCTCCCCCAAGCTCGGGGTGTACGGGGACGCACGCGGCGGTTCTGACCTGTG
Nichols  tprG/F loci 3946 TGTTTCTCTCTCCCCCAAGCTCGGGGTGTACGGGGACGCACGCGGCGGTTCTGACCTGTG

Sea 81-4 tprG/F loci 4021 GGGCATCTGCATACAAGCTCCCACAATGCCAGATACAGAGAACCAGGCGCCTCCGCGCTA
Nichols  tprG/F loci 4006 GGGCATCTGCATACAAGCTCCCACAATGCCAGATACAGAGAACCAGGCGCCTCCGCGCTA

Sea 81-4 tprG/F loci 4081 TGCGCCGGAGACACCGTTGGTGGGGCTGGACGTGGCGTTCCGTGCGGAAAATGGCTTCCT
Nichols  tprG/F loci 4066 TGCGCCGGAGACACCGTTGGTGGGGCTGGACGTGGCGTTCCGTGCGGAAAATGGCTTCCT

Sea 81-4 tprG/F loci 4141 GCTCCAACTGACGGTGGACGCGGCACTCACGCGTTTAATGTTCTGCGGCCGGTGTTTGGC
Nichols  tprG/F loci 4126 GCTCCAACTGACGGTGGACGCGGCACTCACGCGTTTAATGTTCTGCGGCCGGTGTTTGGC

Sea 81-4 tprG/F loci 4201 CGGTTATCCGTTCAGACCGGGGGAAGGTAGTAC
Nichols  tprG/F loci 4186 CGGTTATTCGTTCAGACCGGGGGAAGGTAGTAC
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======== : Sea81-4 strain *tprG/F* intergenic spacer
>>>>>>>> : Nichols strain *tprG/F* intergenic spacer

FIGURE 2S

```
Sea 81-4 TprI    1 MGRQVMQAGVLAGMVCAASGYAGVLTPQVSGTAQLQWGIAFQKNPRTGPGKHTHGFRTTN
Nichols  TprI    1 MGRQVMQAGVLAGMVCAASGYAGVLTPQVSGTAQLQWGIAFQKNPRTGPGKHTHGFRTTN


Sea 81-4 TprI   61 GLTISLPLVSKHTHTRRGEARSGVWAQLQLKDLAVELASSKSSTALSFTKPTASFQATLH
Nichols  TprI   61 SLTISLPLVSKHTHTRRGEARSGVWAQLQLKDLAVELASSKSSTALSFTKXTASFQATLH


Sea 81-4 TprI  121 CYGAYLTVGTSPSCVVNFAQLWKPFVTRAYSEKDTRYAPGFSGSGAKLGYQAHNVGNSGV
Nichols  TprI  121 CYGAYLTVGTSPSCVVNFAQLWKPFVTRAYSEKDTRYAPGFSGSGAKLGYQAHNVGNSGV


Sea 81-4 TprI  181 DVDIGFLSFLSNGAWDSTDTTHSKYGFGDDATLSYGVDRQRLLTLELAGNATLDQNYVKG
Nichols  TprI  181 DVDIGFLSFLSNGAWDSTDTTHSKYGFGADATLSYGVDRQRLLTLELAGNATLEQHYRKG


Sea 81-4 TprI  241 TEDSKNENKTALLWGVGGRLTLEPGAGFRFSFALDAGNQRQDPADAGNRLLATGSSREKF
Nichols  TprI  241 TEDSTNENKTALLWGVGGRLTLEPGAGFRFSFALDAGNQHQDPADAGNRLLATGSSREKF


Sea 81-4 TprI  301 HSAFDALRVEQYRVKDKYLEFLLGQMAESSILERVGLALTLQDGTLVSTLTKVATDSGDR
Nichols  TprI  301 DSAFDALRVEQYRVKDKYLEFLLGQMAESSILERVGLALTLQDGTLVSTLTKVATDSGDR


Sea 81-4 TprI  361 FIQMALVKLLPQRAQAEQRLQEIVAPSQSDIVLIMLLTWLERARLDRFNADALLTAQWTY
Nichols  TprI  361 FIQMALVKLLPQRAQAEQRLQEIVAPSQSDIVLIMLLTWLERARLDRFNADALLTAQWTY


Sea 81-4 TprI  421 VSAGLYGATAGTNVFGKRVLPALRSWHFDFAGFLKLETKSGDPYTHLLTGLNAGVEARVY
Nichols  TprI  421 VSAGLYGATAGTNVFGKRVLPALRSWHFDFAGFLKLETKSGDPYTHLLTGLNAGVEARVY


Sea 81-4 TprI  481 IPLTYIRYRNNGGYELNGAVPPGTINMPILGKAWCSYRIPLGSHAWLTPHTSVLGTTNRF
Nichols  TprI  481 IPLTYIRYRNNGGYELNGAVPPGTINMPILGKAWCSYRIPLGSHAWLTPHTSVLGTTNRF


Sea 81-4 TprI  541 NVINPAYTLLNERALQYQVGLTFSPFEKVELSAQWEQGVLADAPYMGIAESMWSERYFGT
Nichols  TprI  541 NVINPAYTLLNERALQYQVGLTFSPFEKVELSAQWEQGVLADAPYMGIAESMWSERYFGT


Sea 81-4 TprI  601 FICGVKVVW
Nichols  TprI  601 FICGVKVVW
```

FIGURE 3S

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Sea 81-4 TprG    1 MGCMRWGSVLCVVVGVGASGGVLGQEFPPKLTGSATLEWGISYGKGVGSHGQAPGAVMGT
Nichols  TprG    1 MGCMRWGSVLCVVVGVGASGGVLGQEFSPKLTGSATLEWGISYGKGVGSHGQAPGAVMGT


Sea 81-4 TprG   61 GPYNLKHGFRTTNTVGVSFPLVMRTTHTRRGQHPALYAELKVADLQADLSQGKAGFAVKR
Nichols  TprG   61 GPYNLKHGFRTTNTVGVSFPLVMRTTHTRRGQHPALYAELKVADLQADLSQGKAGFAVKR


Sea 81-4 TprG  121 KGKVEATLHCYGAYLTIGKNPTFLTNFARLWKPWVTAQYQEDAVQYAPGFGGLGGKVGYR
Nichols  TprG  121 KGKVEATLHCYGAYLTIGKNPTFLTNFARLWKPWVTAQYQEDAVQYAPGFGGLGGKVGYR


Sea 81-4 TprG  181 AQDIGGSGVSLDVGFLSFASNGAWDSTDPTHSKYGFGADLKLMYARAGHPLCTVELASNV
Nichols  TprG  181 AQDIGGSGVSLDVGFLSFASNGAWDSTDPTHSKYGFGADLKLMYARAGHPLCTVELASNV


Sea 81-4 TprG  241 TLEDGYLIGAQKDANNQNKDKLLWNVGGRLTLEPGAGFRFSFALDAGNQHQSAQDFQNRT
Nichols  TprG  241 TLEDGYLIGAQKDANNQNKDKLLWNVGGRLTLEPGAGFRFSFALDAGNQHQSAQDFQNRT


Sea 81-4 TprG  301 QRAQSELTALSNNLFQGESQKQEAWLDEYAKKVLDAVTAATETALQSRGNAYITAVSNVK
Nichols  TprG  301 QRAQSELTALSNNLFQGESQKQEAWLDEYAKKVLDAVTAATETALQSRGNAYITAVSNVK


Sea 81-4 TprG  361 VTPPVAATLLTNLKVFITDPPTPSPLPALPAFSLMGQVLLQYDAEQVVKGFEQVQTQIVA
Nichols  TprG  361 VTPPVAATLLTNLKVFITDPPTPSPLPALPAFSLMGQVLLQYDAEQVVKGFEQVQTQIVA


Sea 81-4 TprG  420 EINQKVQAAVAQSKAAAQAFINGLTKAIEDVADALLAPHKGNP-MSLFNLPDQQKLLKDD
Nichols  TprG  420 EINQKVQAAVAQSKAAAQAFINGLTKAIEDVADALLAPHKGNP-MSLFNLPDQQKLLKDD


Sea 81-4 TprG  479 LADLIPKLTAEATKFFTEGQTFVTEEVKKKTDALDAGQQIRQAIQNLRASAWRAFLMGVS
Nichols  TprG  479 LADLIPKLTAEATKFFTEGQTFVTEEVKKKTDALDAGQQIRQAIQNLRASAWRAFLMGVS


Sea 81-4 TprG  539 AVCLYLDTYNVAFDALFTAQWKWLSSGIYVATAPANVFGTRVLDNTIASCGDFAGFLKLE
Nichols  TprG  539 AVCLYLDTYNVAFDALFTAQWKWLSSGIYFATAPANVFGTRVLDNTIASCGDFAGFLKLE

                                           frameshift
                                               *
Sea 81-4 TprG  599 TKSGDPYTHLLTGLDAGVETRVYIPLTHDAIQK---------------------------
Nichols  TprG  599 TKSGDPYTHLLTGLDAGVETRVYIPLTY-ALYKNNGGTAVRGIQEKEYIRPPVVGKAWCS


Sea 81-4 TprG       ------------------------------------------------------------
Nichols  TprG  658 YRIPVQDYGWVKPSVTVHASTNRAHLNAPAAGGAVGATYLTKEYCAQLRAGISASLIEKT


Sea 81-4 TprG       --------------------------------------
Nichols  TprG  718 VFSLDWEQGMLSDVPYLLVSECLTQGIGRIVCGVTLSW
```

FIGURE 4S

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Sea 81-4 TprF     1 VGRQVMQAGVLAGMVCAASGYAGVLTPQVSGTAQLQWGIAFQKNPRTGPGKHTHGFRTTN
Nichols  TprF     1 VGRQVMQAGVLAGMVCAASGYAGVLTPQVSGTAQLQWGIAFQKNPRTGPGKHTHGFRTTN

Sea 81-4 TprF    61 NLTISLPLVSKHTHTRRGEARSGVWAQLQLKDLAVELASSKSSTALSFTKPTASFQATLH
Nichols  TprF    61 SLTISLPLVSKHTHTRRGEARSGVWAQLQLKDLAVELASSKSSTALSFTKPTASFQATLH

Sea 81-4 TprF   121 CYGAYLTVGTSPSCVVNFAQLWKPFVTRAYSEKDTRYAPGFPGSGAKLGYQAHNVGNSGV
Nichols  TprF   121 CYGAYLTVGTSPSCVVNFAQLWKPFVTRAYSEKDTRYAPGFSGSGAKLGYQAHNVGNSGV

Sea 81-4 TprF   181 DVDIGFLSFLSNGAWDSTDTTHSKYGFGADATLSYGVDRQRLLTLELAGNATLEQHYRKG
Nichols  TprF   181 DVDIGFLSFLSNGAWDSTDTTHSKYGFGADATLSYGVDRQRLLTLELAGNATLEQHYRKG

Sea 81-4 TprF   241 TEDSTNENKTALLWGVGGRLTLEPGAGFRFSFALDAGNQHQDPADAGNRLLATGSSREKF
Nichols  TprF   241 TEDSTNENKTALLWGVGGRLTLEPGAGFRFSFALDAGNQHQDPADAGNRLLATGSSREKF

Sea 81-4 TprF   301 DSAFDALRVEQYRVKDKYLEFLLGQMAESSILERVGLALTLQDGTLVSTLTKVATDSGAQ
Nichols  TprF   301 DSAFDALRVEQYRVKDKYLEFLLGQMAESSILERVGLALTLQDGTLVSTLTKVATDSGAQ

Sea 81-4 TprF   361 RPVGTGGAC
Nichols  TprF   361 RPVGTGGAC
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