

Appendix S3.

Johannesen, J.: Tracing the history and ecological context of *Wolbachia* double infection in a specialist host (*Urophora cardui*) – parasitoid (*Eurytoma serratulae*) system

Blastn search for the Wolbachia Eser_A strain on a contig SOAPdeNovo (kmer=63) genome assembly of *Urophora cardui* generated from Illumina Miseq reads.

Query = Wolbachia strain from *Eurytoma serratulae*, Eser_A
Subject = contig retrieved from assembly.

The subject contigs are colour coded for sequences corresponding to strain

Subject **Yellow = E. serratulae strain** (U. cardui excluded)

Subject **Green = U. cardui strain**(E. serratulae excluded)

Subject **Gray = other sequence**

Subject **Blue = not discernible between U. cardui and E. serratulae strains**

BLASTN 2.2.30+

Reference: Zheng Zhang, Scott Schwartz, Lukas Wagner, and Webb Miller (2000), "A greedy algorithm for aligning DNA sequences", J Comput Biol 2000; 7(1-2):203-14.

Database: 120L_kmer63.contig
11,496,826 sequences; 1,346,736,270 total letters

Query= fbpA_Wolbachia_Host_E.serratulae

Length=429

Sequences producing significant alignments:	Score (Bits)	E Value
22763017 length 706 cvg_33.5_tip_0	793	0.0
22022860 length 281 cvg_60.9_tip_0	399	2e-109
21643576 length 235 cvg_1.0_tip_0	250	2e-64
17623531 length 127 cvg_2.0_tip_0	180	2e-43
18086659 length 127 cvg_2.0_tip_0	178	8e-43
20753312 length 191 cvg_1.0_tip_1	165	6e-39
19628033 length 148 cvg_63.0_tip_0	154	1e-35
14504053 length 98 cvg_63.0_tip_0	143	3e-32
13905850 length 92 cvg_63.0_tip_0	143	3e-32
13865782 length 92 cvg_63.0_tip_0	135	5e-30

> 22763017 length 706 cvg_33.5_tip_0
Length=706

Score = 793 bits (429), Expect = 0.0
Identities = 429/429 (100%), Gaps = 0/429 (0%)
Strand=Plus/Minus

```
Query 1 GCTGGAATGCTCCCACCTTATTTTGAAACTTAATAGTTCCAACCTCTTTACATTCAAAGGAT 60
      |||
Sbjct 578 GCTGGAATGCTCCCACCTTATTTTGAAACTTAATAGTTCCAACCTCTTTACATTCAAAGGAT 519

Query 61 CTAACCTCTGATCAGGCAATAACCTCTTCTGTGAAAGATGCGCTGCGTTTGGGATGCTTA 120
      |||
Sbjct 518 CTAACCTCTGATCAGGCAATAACCTCTTCTGTGAAAGATGCGCTGCGTTTGGGATGCTTA 459

Query 121 GCTGTCCGATTTACTATATATCCTGGTTCTGCTAAGTGTTCGATATGATGGAGGAAGCC 180
      |||
Sbjct 458 GCTGTCCGATTTACTATATATCCTGGTTCTGCTAAGTGTTCGATATGATGGAGGAAGCC 399

Query 181 CGTGAATCATAGCTGAAGCCAAATCTTATGGACTTGCAGTAGTGCTATGGTCTTATCCA 240
      |||
Sbjct 398 CGTGAATCATAGCTGAAGCCAAATCTTATGGACTTGCAGTAGTGCTATGGTCTTATCCA 339

Query 241 CGCGGTGAAGGGATTTCCAAAGAAGGTGAAACAGCAGTTGATGTTATTGCCTATGCTGCG 300
      |||
Sbjct 338 CGCGGTGAAGGGATTTCCAAAGAAGGTGAAACAGCAGTTGATGTTATTGCCTATGCTGCG 279

Query 301 CACATGGCAGCTTTGCTTGGCGCTAATATAATAAAAGTAAAACCTCCAACCTAAATATTTG 360
      |||
Sbjct 278 CACATGGCAGCTTTGCTTGGCGCTAATATAATAAAAGTAAAACCTCCAACCTAAATATTTG 219

Query 361 GAAAGGGAGAAAATAGAAACAGAAAATATTGAATCATTATCTAAAAGAATTGAATATGTT 420
      |||
Sbjct 218 GAAAGGGAGAAAATAGAAACAGAAAATATTGAATCATTATCTAAAAGAATTGAATATGTT 159

Query 421 AAAAGGTCT 429
      |||
Sbjct 158 AAAAGGTCT 150
```

> 22022860 length 281 cvg_60.9_tip_0
Length=281

Score = 399 bits (216), Expect = 2e-109
Identities = 250/267 (94%), Gaps = 0/267 (0%)
Strand=Plus/Minus

```
Query 158 GTTTCGATATGATGGAGGAAGCCCCTGGAATCATAGCTGAAGCCAAATCTTATGGACTTG 217
      |||
Sbjct 281 GTTTGATATGATGGAGAAGCCCCTGAAATCTAGCTGAAGCCAAATCTTATGGCCTTG 222

Query 218 CAGTAGTGCTATGGTCTTATCCACGCGGTGAAGGGATTTCCAAAGAAGGTGAAACAGCAG 277
      |||
Sbjct 221 CAGTAGTGCTATGGTCTTATCCACGTGGTGAAGGAATTTCCAAAGAAGGTGAAACAGCAG 162

Query 278 TTGATGTTATTGCCTATGCTGCGCACATGGCAGCTTTGCTTGGCGCTAATATAATAAAAG 337
      |||
Sbjct 161 TTGATGTTATTGCCTATGCTGCGCACATAGCAGCTTTACTTGGCGCTAATATAATCAAAG 102

Query 338 TAAAACCTCCAACCTAAATATTTGGAAAGGGAGAAAATAGAAACAGAAAATATTGAATCAT 397
      |||
Sbjct 101 TAAAGCTTCCAACCTAATATTTGGAAAAGAAAGATAGAAACAGAAAATATTGAATCAT 42
```

Query 398 TATCTAAAAGAATTGAATATGTTAAAA 424
|||||
Sbjct 41 TATCTAAAAGAATTGAATATATTTAAAA 15

> 21643576 length 235 cvg_1.0_tip_0
Length=235

Score = 250 bits (135), Expect = 2e-64
Identities = 171/189 (90%), Gaps = 0/189 (0%)
Strand=Plus/Minus

Query 1 GCTGGAATGCTCCCACTTATTTTGAACCTTAATAGTTCCAACCTCTTTACATTCAAAGGAT 60
|||||
Sbjct 191 GCTGGAATGCTCCCACTTACTTTTGAACATAATAGTTCCAACCTCTTTACATTCAAATAAT 132
Query 61 CTAACCTCTGATCAGGCAATAACCTCTTCTGTGAAAGATGCGCTGCGTTTGGGATGCTTA 120
|| |
Sbjct 131 CTGGCTTCTGATCAAGCAATAACCTCTTCTGTGAAAGAAGCACTGCGTTTGGGCTGCTTG 72
Query 121 GCTGTCCGATTTACTATATATCCTGGTTCTGCTAAGTGTTCGATATGATGGAGGAAGCC 180
|||||
Sbjct 71 GCTGTGTTTACTATATATCCTGGTTCTGCTAAGTGTTCGATATGATGGAGGAAGCC 12
Query 181 CGTGGAATC 189
||||
Sbjct 11 CGTGAATC 3

> 17623531 length 127 cvg_2.0_tip_0
Length=127

Score = 180 bits (97), Expect = 2e-43
Identities = 117/127 (92%), Gaps = 0/127 (0%)
Strand=Plus/Plus

Query 94 AAAGATGCGCTGCGTTTGGGATGCTTAGCTGTCCGATTTACTATATATCCTGGTTCTGCT 153
|||||
Sbjct 1 AAAGATGCACTGCGTTTGGGCTGCTTGGCTGTGGATTTACTATATATCCTGGTTCTGCT 60
Query 154 AAGTGTTCGATATGATGGAGGAAGCCCCTGGAATCATAGCTGAAGCCAAATCTTATGGA 213
|| |
Sbjct 61 AAGCGTTTGGATATGATGGAAGAAGCCCCTGGAATCATAGCTGAAGCCAAATCTTATGGC 120
Query 214 CTTGCAG 220
|||||
Sbjct 121 CTTGCAG 127

> 18086659 length 127 cvg_2.0_tip_0
Length=127

Score = 178 bits (96), Expect = 8e-43
Identities = 116/126 (92%), Gaps = 0/126 (0%)
Strand=Plus/Plus

Query 59 ATCTAACCTCTGATCAGGCAATAACCTCTTCTGTGAAAGATGCGCTGCGTTTGGGATGCT 118
|||||
Sbjct 1 ATCTGACTTCTGATCAAGCAATAACCTCTTCTGTGAAAGATGCACTGCGTTTGGGCTGCT 60
Query 119 TAGCTGTCCGATTTACTATATATCCTGGTTCTGCTAAGTGTTCGATATGATGGAGGAAG 178
| | |
Sbjct 61 TCGTTGTTGGATTTACTATATATCCTGGTTCTGCTAAGTGTTCGATATGATGGAGGAAG 120

Query 179 CCCGTG 184
|||||
Sbjct 121 CCCGTG 126

> 20753312 length 191 cvg_1.0_tip_1
Length=191

Score = 165 bits (89), Expect = 6e-39
Identities = 105/113 (93%), Gaps = 0/113 (0%)
Strand=Plus/Minus

Query 1 GCTGGAATGCTCCCACTTATTTTGAACCTTAATAGTTCCAACCTCTTTACATTCAAAGGAT 60
|||||
Sbjct 113 GCTGGAATGCTCCCACTTATTTTGAACCTTAATAGTTCCAACCTCCTTACCTTCAAATAAT 54

Query 61 CTAACCTCTGATCAGGCAATAACCTCTTCTGTGAAAGATGCGCTGCGTTTGGG 113
|| || ||
Sbjct 53 CTCACTTCTGATCAAGCAATAACCTCTTCTGTGAAAGATGCACTGCGTTTGGG 1

> 19628033 length 148 cvg_63.0_tip_0
Length=148

Score = 154 bits (83), Expect = 1e-35
Identities = 95/101 (94%), Gaps = 0/101 (0%)
Strand=Plus/Plus

Query 1 GCTGGAATGCTCCCACTTATTTTGAACCTTAATAGTTCCAACCTCTTTACATTCAAAGGAT 60
|||||
Sbjct 45 GCTGGAATGCTCCCACTTATTTTGAACCTTAATAGTTCCAACCTCCTTACATTCAAAAAAT 104

Query 61 CTAACCTCTGATCAGGCAATAACCTCTTCTGTGAAAGATGC 101
|| || ||
Sbjct 105 CTGACTTCTGATCAAGCAATAACCTCTTCTGTGAAAGATGC 145

> 14504053 length 98 cvg_63.0_tip_0
Length=98

Score = 143 bits (77), Expect = 3e-32
Identities = 91/98 (93%), Gaps = 0/98 (0%)
Strand=Plus/Plus

Query 59 ATCTAACCTCTGATCAGGCAATAACCTCTTCTGTGAAAGATGCGCTGCGTTTGGGATGCT 118
|||| ||
Sbjct 1 ATCTGACTTCTGATCAAGCAATAACCTCTTCTGTGAAAGATGCACTGCGTTTGGGCTGCT 60

Query 119 TAGCTGTTCGGATTTACTATATATCCTGGTTCTGCTAAG 156
| |||||
Sbjct 61 TGGCTGTTGGATTTACTATATATCCTGGTTCTGCTAAG 98

> 13905850 length 92 cvg_63.0_tip_0
Length=92

Score = 143 bits (77), Expect = 3e-32
Identities = 87/92 (95%), Gaps = 0/92 (0%)
Strand=Plus/Plus

Query 129 ATTTACTATATATCCTGGTTCTGCTAAGTGTTCGATATGATGGAGGAAGCCCGTGAAT 188
|||||

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Sbjct 1      ATTTACTATATATCCTGGTTCTGCTAAGTGTTTTGATATGATGGAAGAAGCCCGTGAAAT 60
Query 189     CATAGCTGAAGCCAAATCTTATGGACTTGCGAG 220
          | |||||
Sbjct 61     CGTAGCTGAAGCCAAATCTTATGGGCTTGCGAG 92

```

```

> 13865782 length 92 cvg_63.0_tip_0
Length=92

```

```

Score = 135 bits (73), Expect = 5e-30
Identities = 85/91 (93%), Gaps = 0/91 (0%)
Strand=Plus/Plus

```

```

Query 94      AAAGATGCGCTGCGTTTGGGATGCTTAGCTGTCCGATTTACTATATATCCTGGTTCTGCT 153
          |||
Sbjct 1      AAAGATGCACTGCGTTTGGGCTGCTTGGCTGTTGGATTTACTATATATCCTGGTTCTGCT 60

```

```

Query 154     AAGTGTTTTGATATGATGGAGGAAGCCCGTG 184
          |||
Sbjct 61     AAGTGTTTTGATATGATGGAAGAAGCCCGTG 91

```

```

Lambda      K      H
1.33      0.621  1.12

```

```

Gapped
Lambda      K      H
1.28      0.460  0.850

```

Effective search space used: 410954881942

Query= hcpA_Wolbachia_Host_E.serratulae

Length=444

Sequences producing significant alignments:	Score (Bits)	E Value
22057630 length 287 cvg_1.0_tip_1	473	1e-131
21830227 length 253 cvg_1.0_tip_1	446	2e-123
20976622 length 199 cvg_36.7_tip_0	368	5e-100
21427278 length 220 cvg_1.0_tip_1	340	1e-91
20709012 length 190 cvg_1.0_tip_0	327	8e-88
22043540 length 285 cvg_1.0_tip_1	263	2e-68
21081276 length 203 cvg_1.0_tip_1	255	4e-66
16987487 length 124 cvg_37.0_tip_0	230	2e-58
19075283 length 132 cvg_60.3_tip_0	228	8e-58
19569559 length 146 cvg_63.0_tip_0	226	3e-57
15521461 length 111 cvg_33.4_tip_0	206	4e-51
15424818 length 110 cvg_63.0_tip_0	204	1e-50
14894712 length 103 cvg_60.8_tip_0	180	2e-43
14221445 length 95 cvg_61.5_tip_0	176	3e-42
16301770 length 119 cvg_63.0_tip_0	172	4e-41
14962368 length 103 cvg_63.0_tip_0	163	2e-38
13234477 length 87 cvg_61.3_tip_0	161	9e-38
11246909 length 76 cvg_63.0_tip_0	134	2e-29
10545799 length 73 cvg_42.0_tip_0	122	4e-26
21173064 length 207 cvg_58.8_tip_0	117	2e-24

21996609 length 277 cvg_1.0_tip_1

115 7e-24

> 22057630 length 287 cvg_1.0_tip_1
Length=287

Score = 473 bits (256), Expect = 1e-131
Identities = 276/286 (97%), Gaps = 0/286 (0%)
Strand=Plus/Plus

```

Query 5 CCGAACTCAACCCGCGCCTTCGCTCTGCTATATTTGCTGCACGCAAGGAAAATCTACCAA 64
      |||
Sbjct 1 CCGAACTCAACCCGCGCCTTCGCTCTGCTATATTTTCTGCACGCAAGGAAAATCTACCAA 60

Query 65 AAGATAAAATAGAAACAGCAATAAAAAATGCAACTGGTAACGTTGCTGGAGAAAATTACG 124
      |||
Sbjct 61 AAGATAAAATAGAAACAGCAATAAAAAATGCAACTGGCAACGTTGCTGGAGAAAATTATG 120

Query 125 AGGAAATACAATATGAAGGTCATGGGCCTTCTGGCACTGCACTCATTGTCCATGCCTTGA 184
      |||
Sbjct 121 AGGAAATCCAATATGAAGGTCATGGGCCTTCTGTCACTGCACTTATTGTCCATGCCTTGA 180

Query 185 CTAATAACCGCAACCGTACTGCTTCTGAGGTACGTTATATATTTTCTCGCAAGGGTGGAA 244
      |||
Sbjct 181 CTAATAACCGCAACCGTACTGCGTCTGGGGTACGTTATATATTTGTCTCGCAAGGGTGGAA 240

Query 245 ACTTGGGAGAAACAGGAAGTGTTAGTTACCTTTTTGATCATGTAGG 290
      |||
Sbjct 241 ACTTGGGAGAAACAGGAAGTGTTAGTTACCTTTTTCGATCATGTAGG 286

```

> 21830227 length 253 cvg_1.0_tip_1
Length=253

Score = 446 bits (241), Expect = 2e-123
Identities = 249/253 (98%), Gaps = 0/253 (0%)
Strand=Plus/Plus

```

Query 36 ATTTGCTGCACGCAAGGAAAATCTACCAAAGATAAAATAGAAACAGCAATAAAAAATGC 95
      |||
Sbjct 1 ATTTGCTGCACGCAAGGAAAATCTACCAAAGATAAAATAGAAACAGCAATAAAAAATGC 60

Query 96 AACTGGTAACGTTGCTGGAGAAAATTACGAGGAAATACAATATGAAGGTCATGGGCCTTC 155
      |||
Sbjct 61 AACGGGTAACGTTGCTGGAGAAAATTACGAGGAAATACAATATGAAGGTCATGGGCCCTC 120

Query 156 TGGCACTGCACTCATTGTCCATGCCTTGACTAATAACCGCAACCGTACTGCTTCTGAGGT 215
      |||
Sbjct 121 TGGCACTGCACTCATTGTCCATGCCTTGACTAATAACCGCAATCGTACTGCTTCTGAGGT 180

Query 216 ACGTTATATATTTTCTCGCAAGGGTGGAAACTTGGGAGAAACAGGAAGTGTTAGTTACCT 275
      |||
Sbjct 181 ACGTTATATATTTTCTCGTAAGGGTGGAAACTTGGGAGAAACAGGAAGTGTTAGTTACCT 240

Query 276 TTTTGATCATGTA 288
      |||
Sbjct 241 TTTTGATCATGTA 253

```

> 20976622 length 199 cvg_36.7_tip_0
Length=199

Score = 368 bits (199), Expect = 5e-100

Identities = 199/199 (100%), Gaps = 0/199 (0%)
Strand=Plus/Minus

```
Query 216 ACGTTATATATTTTCTCGCAAGGGTGGAAACTTGGGAGAAACAGGAAGTGTAGTTACCT 275
          |||
Sbjct 199 ACGTTATATATTTTCTCGCAAGGGTGGAAACTTGGGAGAAACAGGAAGTGTAGTTACCT 140

Query 276 TTTTGATCATGTAGGTTTAATTGTCTATAAAGCAGAGGGTGTGAATTTTGATGATTTATT 335
          |||
Sbjct 139 TTTTGATCATGTAGGTTTAATTGTCTATAAAGCAGAGGGTGTGAATTTTGATGATTTATT 80

Query 336 CAGTCATGGAATCGAATTAGAAGTATTGAATGTTGAGGAAAATGACAAAGAAGGATTACA 395
          |||
Sbjct 79 CAGTCATGGAATCGAATTAGAAGTATTGAATGTTGAGGAAAATGACAAAGAAGGATTACA 20

Query 396 CGTTATAACTTGTGAAATA 414
          |||
Sbjct 19 CGTTATAACTTGTGAAATA 1
```

> 21427278 length 220 cvg_1.0_tip_1
Length=220

Score = 340 bits (184), Expect = 1e-91
Identities = 208/220 (95%), Gaps = 0/220 (0%)
Strand=Plus/Plus

```
Query 155 CTGGCACTGCACTCATTGTCCATGCCTTGACTAATAACCGCAACCGTACTGCTTCTGAGG 214
          |||
Sbjct 1 CTGGCACTGCACTTATTGTCCATGCCTTGACTAATAACCGCAACCGTACTGCTCCTGAGG 60

Query 215 TACGTTATATATTTTCTCGCAAGGGTGGAAACTTGGGAGAAACAGGAAGTGTAGTTACC 274
          |||
Sbjct 61 TACGTTATATATTTTCTCGCAAGGGTGGAAACTTGGGAGAAACAGGAAGTGTAGTTACC 120

Query 275 TTTTGTGATCATGTAGGTTTAATTGTCTATAAAGCAGAGGGTGTGAATTTTGATGATTTAT 334
          |||
Sbjct 121 TTTTGTGATCATGTAGGCTTAATCGTCTATAAAGCAGTGGGTGTGAATTTTGATGATTTAT 180

Query 335 TCAGTCATGGAATCGAATTAGAAGTATTGAATGTTGAGGA 374
          |||
Sbjct 181 TTAATTATGGGATCGAGTTAGAAGTATTGAATGTTGAGGA 220
```

> 20709012 length 190 cvg_1.0_tip_0
Length=190

Score = 327 bits (177), Expect = 8e-88
Identities = 181/183 (99%), Gaps = 0/183 (0%)
Strand=Plus/Minus

```
Query 1 CTACCCGAAGTCAACCCGCGCCTTCGCTCTGCTATATTTGCTGCACGCAAGGAAAATCTA 60
          |||
Sbjct 183 CTACCCGAAGTCAACCCGCGCCTTCGCTCTGCTATATTTGCTGCACGCAAGGAAAATACTA 124

Query 61 CCAAAAGATAAAAATAGAAACAGCAATAAAAAATGCAACTGGTAACGTTGCTGGAGAAAAT 120
          |||
Sbjct 123 CCAAAAGATAAAAATAGAAACAGCAATAAAAAATGCAACTGGTAACGTTGCTGGAGAAAAA 64

Query 121 TACGAGGAAATACAATATGAAGGTCATGGGCCTTCTGGCACTGCACTCATTGTCCATGCC 180
          |||
Sbjct 63 TACGAGGAAATACAATATGAAGGTCATGGGCCTTCTGGCACTGCACTCATTGTCCATGCC 4
```

Query 181 TTG 183
|||
Sbjct 3 TTG 1

> 22043540 length 285 cvg_1.0_tip_1
Length=285

Score = 263 bits (142), Expect = 2e-68
Identities = 148/151 (98%), Gaps = 0/151 (0%)
Strand=Plus/Plus

Query 294 AATTGTCTATAAAGCAGAGGGTGTGAATTTTGGATGATTTATTCAGTCATGGAATCGAATT 353
|||||
Sbjct 1 AATTGTCTATAAAGCAGAGGGTGTGAATTTTGGATGATTTATTCAGTCATGGAATCGAATT 60

Query 354 AGAAGTATTGAATGTTGAGGAAAATGACAAAGAAGGATTACACGTTATAACTTGTGAAAT 413
|| |||||
Sbjct 61 AGCAGTATTGAATGTTGAGGAAAATGACAAAGAAGGTTTACACGTTATACTTGTGAAAT 120

Query 414 AAAAGATTTTGGTAAAGTACGCGATGCCTTT 444
|||||
Sbjct 121 AAAAGATTTTGGTAAAGTACGCGATGCCTTT 151

> 21081276 length 203 cvg_1.0_tip_1
Length=203

Score = 255 bits (138), Expect = 4e-66
Identities = 152/159 (96%), Gaps = 0/159 (0%)
Strand=Plus/Minus

Query 4 CCCGAACTCAACCCGCGCCTTCGCTCTGCTATATTTGCTGCACGCAAGGAAAATCTACCA 63
||| |||||
Sbjct 159 CCCAAACTCAACCCGCGCCTTCGCTCTGCTATATTTGCAGCACGCAAGGAAAATCTACCA 100

Query 64 AAAGATAAAATAGAAACAGCAATAAAAAATGCAACTGGTAACGTTGCTGGAGAAAATTAC 123
| ||| |||||
Sbjct 99 AGAGAAAAATAGAAACAGCAATAAAAAATGCAACGGGTAACGTTGCTGGAGAAAATTAT 40

Query 124 GAGGAAATACAATATGAAGGTCATGGGCCTTCTGGCACT 162
||||| |||||
Sbjct 39 GAGGAAATCCAATATGAAGGTCATGGGCCTTCTGGCACT 1

> 16987487 length 124 cvg_37.0_tip_0
Length=124

Score = 230 bits (124), Expect = 2e-58
Identities = 124/124 (100%), Gaps = 0/124 (0%)
Strand=Plus/Plus

Query 60 ACCAAAAGATAAAATAGAAACAGCAATAAAAAATGCAACTGGTAACGTTGCTGGAGAAAA 119
|||||
Sbjct 1 ACCAAAAGATAAAATAGAAACAGCAATAAAAAATGCAACTGGTAACGTTGCTGGAGAAAA 60

Query 120 TTACGAGGAAATACAATATGAAGGTCATGGGCCTTCTGGCACTGCACTCATTGTCCATGC 179
|||||
Sbjct 61 TTACGAGGAAATACAATATGAAGGTCATGGGCCTTCTGGCACTGCACTCATTGTCCATGC 120

Query 180 CTTG 183
|||
Sbjct 121 CTTG 124

Strand=Plus/Minus

```
Query 169 ATTGTCCATGCCTTGACTAATAACCGCAACCGTACTGCTTCTGAGGTACGTTATATATTT 228
          |||
Sbjct 110 ATTGTCCATGCCTTGACTAATAACCGCAACCGTACTGCTTCTGAGGTACGTTATATATTT 51

Query 229 TCTCGCAAGGGTGGAAACTTGGGAGAAACAGGAAGTGTTAGTTACCTTTT 278
          |||
Sbjct 50 TCTCGCAAGGGTGGAAACTTGGGAGAAACAGGAAGTGTTAGTTACCTTTT 1
```

> 14894712 length 103 cvg_60.8_tip_0
Length=103

Score = 180 bits (97), Expect = 2e-43
Identities = 101/103 (98%), Gaps = 0/103 (0%)
Strand=Plus/Plus

```
Query 60 ACCAAAAGATAAAAATAGAAACAGCAATAAAAAATGCAACTGGTAACGTTGCTGGAGAAAA 119
          |||
Sbjct 1 ACCAAAAGATAAAAATAGAAACAGCAATAAAAAATGCAACTGGTAACGTTGCTGGAGAAAA 60

Query 120 TTACGAGGAAATACAATATGAAGGTCATGGGCCTTCTGGCACT 162
          |||
Sbjct 61 TTATGAGGAAATCCAATATGAAGGTCATGGGCCTTCTGGCACT 103
```

> 14221445 length 95 cvg_61.5_tip_0
Length=95

Score = 176 bits (95), Expect = 3e-42
Identities = 95/95 (100%), Gaps = 0/95 (0%)
Strand=Plus/Minus

```
Query 4 CCCGAACTCAACCCGCGCCTTCGCTCTGCTATATTTGCTGCACGCAAGGAAAATCTACCA 63
          |||
Sbjct 95 CCCGAACTCAACCCGCGCCTTCGCTCTGCTATATTTGCTGCACGCAAGGAAAATCTACCA 36

Query 64 AAAGATAAAAATAGAAACAGCAATAAAAAATGCAAC 98
          |||
Sbjct 35 AAAGATAAAAATAGAAACAGCAATAAAAAATGCAAC 1
```

> 16301770 length 119 cvg_63.0_tip_0
Length=119

Score = 172 bits (93), Expect = 4e-41
Identities = 93/93 (100%), Gaps = 0/93 (0%)
Strand=Plus/Minus

```
Query 352 TTAGAAGTATTGAATGTTGAGGAAAATGACAAAGAAGGATTACACGTTATAACTTGTGAA 411
          |||
Sbjct 119 TTAGAAGTATTGAATGTTGAGGAAAATGACAAAGAAGGATTACACGTTATAACTTGTGAA 60

Query 412 ATAAAAGATTTTGGTAAAGTACGCGATGCCTTT 444
          |||
Sbjct 59 ATAAAAGATTTTGGTAAAGTACGCGATGCCTTT 27
```

> 14962368 length 103 cvg_63.0_tip_0
Length=103

Score = 163 bits (88), Expect = 2e-38

Score = 117 bits (63), Expect = 2e-24
 Identities = 63/63 (100%), Gaps = 0/63 (0%)
 Strand=Plus/Minus

Query 4 CCCGAACTCAACCCGCGCCTTCGCTCTGCTATATTTGCTGCACGCAAGGAAAATCTACCA 63
 |||
 Sbjct 63 CCCGAACTCAACCCGCGCCTTCGCTCTGCTATATTTGCTGCACGCAAGGAAAATCTACCA 4

Query 64 AAA 66
 |||
 Sbjct 3 AAA 1

> 21996609 length 277 cvg_1.0_tip_1
 Length=277

Score = 115 bits (62), Expect = 7e-24
 Identities = 62/62 (100%), Gaps = 0/62 (0%)
 Strand=Plus/Plus

Query 84 AATAAAAAATGCAACTGGTAACGTTGCTGGAGAAAATTACGAGGAAATACAATATGAAGG 143
 |||
 Sbjct 216 AATAAAAAATGCAACTGGTAACGTTGCTGGAGAAAATTACGAGGAAATACAATATGAAGG 275

Query 144 TC 145
 ||
 Sbjct 276 TC 277

Lambda K H
 1.33 0.621 1.12

Gapped
 Lambda K H
 1.28 0.460 0.850

Effective search space used: 426327259072

Query= CoxA_Wolbachia_Host_E.serratulae

Length=402

Sequences producing significant alignments:	Score (Bits)	E Value
21853093 length 256 cvg_1.0_tip_1	414	5e-114
20563934 length 184 cvg_38.1_tip_0	340	9e-92
21022630 length 201 cvg_1.0_tip_0	333	2e-89
22438024 length 412 cvg_32.5_tip_0	279	2e-73
21190622 length 208 cvg_1.0_tip_1	272	3e-71
20023104 length 162 cvg_62.7_tip_0	267	2e-69
18361237 length 127 cvg_2.0_tip_0	224	1e-56
14852056 length 102 cvg_61.1_tip_0	189	4e-46
14331621 length 96 cvg_63.0_tip_0	178	8e-43
15243986 length 107 cvg_63.0_tip_0	172	4e-41
14097458 length 94 cvg_63.0_tip_0	169	5e-40
13770563 length 91 cvg_63.0_tip_0	169	5e-40
14514057 length 98 cvg_63.0_tip_0	159	3e-37
13017009 length 85 cvg_63.0_tip_0	147	2e-33

18281483 length 127 cvg_63.0_tip_0 141 1e-31
17442278 length 126 cvg_2.0_tip_0 134 2e-29

> 21853093 length 256 cvg_1.0_tip_1
Length=256

Score = 414 bits (224), Expect = 5e-114
Identities = 236/242 (98%), Gaps = 0/242 (0%)
Strand=Plus/Minus

```
Query 1 ATGCGCACAAAAGGAATGTCATTAAC TAAGATGCCACTGTTTGGTCTGTCTTGCTA 60
      |||
Sbjct 242 ATGCGCACAAAAGGAATGTCATTAAC TAAGATGCCACTGTTTGGTATGTCTTGCTA 183

Query 61 ACAGCATTTATGTTGATTGTTGCCTTACCAGTGCTTGCCGGTGCTATAACTATGCTTCTT 120
      |||
Sbjct 182 ACAGCATTTATGTTGATTGTTGCCTTACCAGTGCTTGCCGGTGCCATAACTATGCTTCTT 123

Query 121 ACTGATCGCAATATTGGTACTTCCTTTTTTGATCCTGCAGGTGGTGGTGACCCTGTGTTA 180
      |||
Sbjct 122 ACTGATCGCAATATTGGTACTTCCTTTTTTGATCCTGTAGGTGGTGGTGACCCCGTGTTA 63

Query 181 TTTCAACATTTATTTTGGTTTTTTGGTCATCCAGAAGTTTACGTAATTATTTTCTGCA 240
      |||
Sbjct 62 TTTCAACATATATTTTGGTTTTTTGGGCATCCAGAAGTTTACGTAATTATTTTCTGCA 3

Query 241 TT 242
      ||
Sbjct 2 TT 1
```

> 20563934 length 184 cvg_38.1_tip_0
Length=184

Score = 340 bits (184), Expect = 9e-92
Identities = 184/184 (100%), Gaps = 0/184 (0%)
Strand=Plus/Minus

```
Query 70 ATGTTGATTGTTGCCTTACCAGTGCTTGCCGGTGCTATAACTATGCTTCTTACTGATCGC 129
      |||
Sbjct 184 ATGTTGATTGTTGCCTTACCAGTGCTTGCCGGTGCTATAACTATGCTTCTTACTGATCGC 125

Query 130 AATATTGGTACTTCCTTTTTTGATCCTGCAGGTGGTGGTGACCCTGTGTTATTTCAACAT 189
      |||
Sbjct 124 AATATTGGTACTTCCTTTTTTGATCCTGCAGGTGGTGGTGACCCTGTGTTATTTCAACAT 65

Query 190 TTATTTTGGTTTTTTGGTCATCCAGAAGTTTACGTAATTATTTTCTGCAATTTGGCATC 249
      |||
Sbjct 64 TTATTTTGGTTTTTTGGTCATCCAGAAGTTTACGTAATTATTTTCTGCAATTTGGCATC 5

Query 250 ATAA 253
      |||
Sbjct 4 ATAA 1
```

> 21022630 length 201 cvg_1.0_tip_0
Length=201

Score = 333 bits (180), Expect = 2e-89
Identities = 194/201 (97%), Gaps = 0/201 (0%)
Strand=Plus/Minus

```
Query 31 ATGCCACTGTTTGGTCTGTCTTGCTAACAGCATTATGTTGATTGTTGCCTTACCA 90
|
Sbjct 201 ATGCCACTGTTTGGTCTGTCTTGCTAACAGCATTATGTTGATTGTTGCCTTACCA 142

Query 91 GTGCTTGCCGGTGCTATAACTATGCTTCTTACTGATCGCAATATTGGTACTTCCTTTTTT 150
|
Sbjct 141 GTGTTTGCCGGTGCTATAACTATGCTTCTTACTGATCGCCATGTTGGTACTTCCTTTTTT 82

Query 151 GATCCTGCAGGTGGTGGTGACCCTGTGTTATTTCAACATTTATTTTGGTTTTTGGTCAT 210
|
Sbjct 81 GATCCTGCCGGTGGCGGTGATCCTGTGTTATTTCAACATCTATTTTGGTTTTTGGTCAT 22

Query 211 CCAGAAGTTTACGTAATTATT 231
|
Sbjct 21 CCAGAAGTTTACGTAATTATT 1
```

> 22438024 length 412 cvg_32.5_tip_0
Length=412

Score = 279 bits (151), Expect = 2e-73
Identities = 151/151 (100%), Gaps = 0/151 (0%)
Strand=Plus/Plus

```
Query 252 AAGTCAGGTTGTATCAACTTTTTCTCACAGACCTGTATTTGGTTACATAGGGATGGTTTA 311
|
Sbjct 1 AAGTCAGGTTGTATCAACTTTTTCTCACAGACCTGTATTTGGTTACATAGGGATGGTTTA 60

Query 312 TGCAATGATAGGTATAGCAGTATTTGGCTTTATGGTTTGGGCTCACCATATGTTCACTGT 371
|
Sbjct 61 TGCAATGATAGGTATAGCAGTATTTGGCTTTATGGTTTGGGCTCACCATATGTTCACTGT 120

Query 372 TGGGCTTAGTGCTGACGCTGCTGCATTTTTT 402
|
Sbjct 121 TGGGCTTAGTGCTGACGCTGCTGCATTTTTT 151
```

> 21190622 length 208 cvg_1.0_tip_1
Length=208

Score = 272 bits (147), Expect = 3e-71
Identities = 157/162 (97%), Gaps = 0/162 (0%)
Strand=Plus/Minus

```
Query 1 ATGCGCACAAAAGGAATGTCATTAACCTAAGATGCCACTGTTTGGTCTGTCTTGCTA 60
|
Sbjct 162 ATGCGCACAAAAGGAATATCATTAACTAAGATGACACTGTTTGGTATGTCTTGCTA 103

Query 61 ACAGCATTTATGTTGATTGTTGCCTTACCAGTGCTTGCCGGTGCTATAACTATGCTTCTT 120
|
Sbjct 102 ACAGCATTTATGTTGATTATTGCCTTACCAGTGCTTGCCGGTGCTATAACTATGCTTCTT 43

Query 121 ACTGATCGCAATATTGGTACTTCCTTTTTTATCCTGCAGGT 162
|
Sbjct 42 ACTGATCGAAATATTGGTACTTCCTTTTTTATCCTGCAGGT 1
```

> 20023104 length 162 cvg_62.7_tip_0
Length=162

Score = 267 bits (144), Expect = 2e-69
Identities = 156/162 (96%), Gaps = 0/162 (0%)
Strand=Plus/Minus

```
Query 70 ATGTTGATTGTTGCCTTACCAGTGCTTGCCGGTGCTATAACTATGCTTCTTACTGATCGC 129
|||||
Sbjct 162 ATGTTGATTGTTGCCTTACCAGTGCTTGCCGGTGCTATAACTATGCTTCTTACTGATCGC 103

Query 130 AATATTGGTACTTCCTTTTTTGGATCCTGCAGGTGGTGGTGACCCTGTGTTATTTCAACAT 189
||| |||||
Sbjct 102 AATGTTGGTACTTCCTTTTTTGGATCCTGCAGGTGGCGGAGATCCTGTGTTATTTCAACAT 43

Query 190 TTATTTTGGTTTTTTTGGTCATCCAGAAGTTTACGTAATTATT 231
|||||
Sbjct 42 CTATTTTGGTTTTTTTGGTCATCCAGAAGTTTACGTAATTATT 1
```

> 18361237 length 127 cvg_2.0_tip_0
Length=127

Score = 224 bits (121), Expect = 1e-56
Identities = 125/127 (98%), Gaps = 0/127 (0%)
Strand=Plus/Minus

```
Query 219 TTACGTAATTATTTTTCCTGCATTTGGCATCATAAGTCAGGTTGTATCAACTTTTTCTCA 278
|||||
Sbjct 127 TTACGTAATTATTTTTCCTGCATTTGGCATCATAAGTCAGGTTGTATCAACTTTTTCTCA 68

Query 279 CAGACCTGTATTTGGTTACATAGGGATGGTTTATGCAATGATAGGTATAGCAGTATTTGG 338
||| |||||
Sbjct 67 CAGGCTGTATTTGGTTACATAGGGATGGTTTATGCTATGATAGGTATAGCAGTATTTGG 8

Query 339 CTTTATG 345
|||||
Sbjct 7 CTTTATG 1
```

> 14852056 length 102 cvg_61.1_tip_0
Length=102

Score = 189 bits (102), Expect = 4e-46
Identities = 102/102 (100%), Gaps = 0/102 (0%)
Strand=Plus/Minus

```
Query 31 ATGCCACTGTTTGGTCTGTCTTGCTAACAGCATTATGTTGATTGTTGCCTTACCA 90
|||||
Sbjct 102 ATGCCACTGTTTGGTCTGTCTTGCTAACAGCATTATGTTGATTGTTGCCTTACCA 43

Query 91 GTGCTTGCCGGTGCTATAACTATGCTTCTTACTGATCGCAAT 132
|||||
Sbjct 42 GTGCTTGCCGGTGCTATAACTATGCTTCTTACTGATCGCAAT 1
```

> 14331621 length 96 cvg_63.0_tip_0
Length=96

Score = 178 bits (96), Expect = 8e-43
Identities = 96/96 (100%), Gaps = 0/96 (0%)
Strand=Plus/Minus

```
Query 219 TTACGTAATTATTTTTCCTGCATTTGGCATCATAAGTCAGGTTGTATCAACTTTTTCTCA 278
|||||
Sbjct 96 TTACGTAATTATTTTTCCTGCATTTGGCATCATAAGTCAGGTTGTATCAACTTTTTCTCA 37

Query 279 CAGACCTGTATTTGGTTACATAGGGATGGTTTATGC 314
```

Sbjct 36 |||||
CAGACCTGTATTTGGTTACATAGGGATGGTTTATGC 1

> 15243986 length 107 cvg_63.0_tip_0
Length=107

Score = 172 bits (93), Expect = 4e-41
Identities = 93/93 (100%), Gaps = 0/93 (0%)
Strand=Plus/Plus

Query 1 ATGCGCACAAAAGGAATGTCATTAAGATGCCACTGTTTGGTCTGTCTTGCTA 60
Sbjct 15 ATGCGCACAAAAGGAATGTCATTAAGATGCCACTGTTTGGTCTGTCTTGCTA 74

Query 61 ACAGCATTTATGTTGATTGTTGCCTTACCAGTG 93
Sbjct 75 ACAGCATTTATGTTGATTGTTGCCTTACCAGTG 107

> 14097458 length 94 cvg_63.0_tip_0
Length=94

Score = 169 bits (91), Expect = 5e-40
Identities = 93/94 (99%), Gaps = 0/94 (0%)
Strand=Plus/Plus

Query 252 AAGTCAGGTTGTATCAACTTTTTCTCACAGACCTGTATTTGGTTACATAGGGATGGTTTA 311
Sbjct 1 AAGTCAGGTTGTATCAACTTTTTCTCACAGACCTGTATTTGGTTACATAGGGATGGTTTA 60

Query 312 TGCAATGATAGGTATAGCAGTATTTGGCTTTATG 345
Sbjct 61 TGCTATGATAGGTATAGCAGTATTTGGCTTTATG 94

> 13770563 length 91 cvg_63.0_tip_0
Length=91

Score = 169 bits (91), Expect = 5e-40
Identities = 91/91 (100%), Gaps = 0/91 (0%)
Strand=Plus/Minus

Query 191 TATTTTGGTTTTTTGGTTCATCCAGAAGTTTACGTAATTATTTTCTGCATTTGGCATCA 250
Sbjct 91 TATTTTGGTTTTTTGGTTCATCCAGAAGTTTACGTAATTATTTTCTGCATTTGGCATCA 32

Query 251 TAAGTCAGGTTGTATCAACTTTTTCTCACAG 281
Sbjct 31 TAAGTCAGGTTGTATCAACTTTTTCTCACAG 1

> 14514057 length 98 cvg_63.0_tip_0
Length=98

Score = 159 bits (86), Expect = 3e-37
Identities = 94/98 (96%), Gaps = 0/98 (0%)
Strand=Plus/Minus

Query 283 CCTGTATTTGGTTACATAGGGATGGTTTATGCAATGATAGGTATAGCAGTATTTGGCTTT 342
Sbjct 98 CCTGTATTTGGTTACATAGGGATGGTTTATGCTATGATAGGTATAGCAGTATTTGGCTTT 39


```
Query 343 ATGGTTTGGGCTCACCATATGTTCACTGTTGGGCTTAG 380
          ||||| |||| ||| |||||||||||||||||||||||||
Sbjct 38 ATGGTGTGGGTTTCATCATATGTTCACTGTTGGGCTTAG 1
```

> 13017009 length 85 cvg_63.0_tip_0
Length=85

Score = 147 bits (79), Expect = 2e-33
Identities = 81/82 (99%), Gaps = 0/82 (0%)
Strand=Plus/Minus

```
Query 172 CCTGTGTTATTTCAACATTTATTTTGGTTTTTTGGTCATCCAGAAGTTTACGTAATTATT 231
          ||||||||||||||||||| |||||||||||||||||||||||||||||||||||
Sbjct 82 CCTGTGTTATTTCAACATCTATTTTGGTTTTTTGGTCATCCAGAAGTTTACGTAATTATT 23
```

```
Query 232 TTCCTGCATTTGGCATCATAA 253
          |||||||||||||||||||
Sbjct 22 TTCCTGCATTTGGCATCATAA 1
```

> 18281483 length 127 cvg_63.0_tip_0
Length=127

Score = 141 bits (76), Expect = 1e-31
Identities = 82/85 (96%), Gaps = 0/85 (0%)
Strand=Plus/Plus

```
Query 318 GATAGGTATAGCAGTATTTGGCTTTATGGTTTGGGCTCACCATATGTTCACTGTTGGGCT 377
          ||||||||||||||||||| |||| ||| |||||||||||||||||||
Sbjct 1 GATAGGTATAGCAGTATTTGGCTTTATGGTGTGGGTTTCATCATATGTTCACTGTTGGGCT 60
```

```
Query 378 TAGTGCTGACGCTGCTGCATTTTTTT 402
          |||||||||||||||||||
Sbjct 61 TAGTGCTGACGCTGCTGCATTTTTTT 85
```

> 17442278 length 126 cvg_2.0_tip_0
Length=126

Score = 134 bits (72), Expect = 2e-29
Identities = 81/85 (95%), Gaps = 1/85 (1%)
Strand=Plus/Minus

```
Query 318 GATAGGTATAGCAGTATTTGGCTTTATGGTTTGGGCTCACCATATGTTCACTGTTGGGCT 377
          ||||||||||||||||||| |||| ||| |||||||||||||||||||
Sbjct 126 GATAGGTATAGCAGTATTTGGCTTTATGGTGTGGGTTTCATCATATGTTCACTGTTGGGCT 67
```

```
Query 378 TAGTGCTGACGCTGCTGCATTTTTTT 402
          ||| |||||||||||||||||||
Sbjct 66 TAG-GCTGACGCTGCTGCATTTTTTT 43
```

Lambda K H
1.33 0.621 1.12

Gapped
Lambda K H
1.28 0.460 0.850

Effective search space used: 383284603108

Query= fstZ_Wolbachia_Host_E.serratulae

Length=435

Sequences producing significant alignments:	Score (Bits)	E Value
20372568 length 175 cvg_39.8_tip_0	324	1e-86
20373274 length 175 cvg_62.6_tip_0	313	2e-83
18459913 length 127 cvg_41.4_tip_0	235	5e-60
21442191 length 221 cvg_1.0_tip_1	230	2e-58
22135616 length 301 cvg_38.6_tip_0	228	8e-58
17614347 length 127 cvg_2.0_tip_0	224	1e-56
20450530 length 179 cvg_63.0_tip_0	217	2e-54
15315059 length 108 cvg_63.0_tip_0	200	2e-49
21144322 length 206 cvg_1.0_tip_0	193	3e-47
14485123 length 98 cvg_63.0_tip_0	182	6e-44
14246929 length 95 cvg_61.9_tip_0	176	3e-42
14373293 length 97 cvg_63.0_tip_0	174	1e-41
13200020 length 86 cvg_63.0_tip_0	159	3e-37
12489093 length 82 cvg_63.0_tip_0	147	2e-33
10590477 length 74 cvg_63.0_tip_0	132	7e-29
19289967 length 138 cvg_2.0_tip_0	128	8e-28
14421785 length 97 cvg_63.0_tip_0	119	5e-25
20052480 length 163 cvg_55.0_tip_0	117	2e-24
21412982 length 219 cvg_1.0_tip_1	108	1e-21

> 20372568 length 175 cvg_39.8_tip_0
Length=175

Score = 324 bits (175), Expect = 1e-86
Identities = 175/175 (100%), Gaps = 0/175 (0%)
Strand=Plus/Plus

```
Query 228 TAGAATTGCAAATGAAAAAACTACATTTTCTGATGCATTTAAACTTGCTGATAATGTTCT 287
          |||
Sbjct 1 TAGAATTGCAAATGAAAAAACTACATTTTCTGATGCATTTAAACTTGCTGATAATGTTCT 60

Query 288 GCACATTGGCATCAGAGGAGTAACTGACTTGATGGTCATGCCAGGGCTTATCAATCTTGA 347
          |||
Sbjct 61 GCACATTGGCATCAGAGGAGTAACTGACTTGATGGTCATGCCAGGGCTTATCAATCTTGA 120

Query 348 CTTGCTGATATAGAAACAGTAATGAGCGAGATGGGCAAAGCGATGATCGGCACC 402
          |||
Sbjct 121 CTTGCTGATATAGAAACAGTAATGAGCGAGATGGGCAAAGCGATGATCGGCACC 175
```

> 20373274 length 175 cvg_62.6_tip_0
Length=175

Score = 313 bits (169), Expect = 2e-83
Identities = 173/175 (99%), Gaps = 0/175 (0%)
Strand=Plus/Plus

```
Query 228 TAGAATTGCAAATGAAAAAACTACATTTTCTGATGCATTTAAACTTGCTGATAATGTTCT 287
          |||
Sbjct 1 TAGAATTGCAAATGAAAAAACTACATTTTCTGATGCATTTAAACTTGCTGATAATGTTCT 60

Query 288 GCACATTGGCATCAGAGGAGTAACTGACTTGATGGTCATGCCAGGGCTTATCAATCTTGA 347
```

```
Sbjct 61      ||| ||||||||||||||||||||||||||||||||||||||||||||||||||||||| 120
GCATATTGGCATCAGAGGAGTAACTGACTTGATGGTCATGCCAGGGCTTATTAATCTTGA

Query 348     CTTCGCTGATATAGAAACAGTAATGAGCGAGATGGGCAAAGCGATGATCGGCACC 402
|||||||||||||||||||||||||||||||||||||||||||||||||||||||||

Sbjct 121     CTTCGCTGATATAGAAACAGTAATGAGCGAGATGGGCAAAGCGATGATCGGCACC 175
```

> 18459913 length 127 cvg_41.4_tip_0
Length=127

Score = 235 bits (127), Expect = 5e-60
Identities = 127/127 (100%), Gaps = 0/127 (0%)
Strand=Plus/Plus

```
Query 84      AGaaaaaaaaGATATTGACTGTTGGAGTTGTAATAAACCGTTCGGTTTTGAAGGTGTGCG 143
|||||||||||||||||||||||||||||||||||||||||||||||||||||||||

Sbjct 1       AGAAAAAAAAAGATATTGACTGTTGGAGTTGTAATAAACCGTTCGGTTTTGAAGGTGTGCG 60

Query 144     CCGTATGCGCATTGCAGAGCTTGGACTTGAAGAACTGCAAAAATACGTGGATACACTTAT 203
|||||||||||||||||||||||||||||||||||||||||||||||||||||||||

Sbjct 61      CCGTATGCGCATTGCAGAGCTTGGACTTGAAGAACTGCAAAAATACGTGGATACACTTAT 120

Query 204     TGTCATT 210
|||||||
Sbjct 121     TGTCATT 127
```

> 21442191 length 221 cvg_1.0_tip_1
Length=221

Score = 230 bits (124), Expect = 2e-58
Identities = 134/139 (96%), Gaps = 0/139 (0%)
Strand=Plus/Plus

```
Query 297     CATCAGAGGAGTAACTGACTTGATGGTCATGCCAGGGCTTATCAATCTTGACTTCGCTGA 356
|||||||||||||||||||||||||||||| || |||||||||||||| |||||||||||||||

Sbjct 1       CATCAGAGGAGTAACTGACTTGATGGGCAGGCCAGGGCTTATTAATCTTGACTTCGCTGA 60

Query 357     TATAGAAACAGTAATGAGCGAGATGGGCAAAGCGATGATCGGCACCGGAGAGGCAGAAGG 416
|| |||||||||||||||||||||||||||||||||||||||||||||||||||||||

Sbjct 61      TAGAGAAACAGTAATGAGCGAGATGGGCAAAGCGATGATCTGCACCGGAGAGGCAGAAGG 120

Query 417     AGAAGATAGAGCAATTAGT 435
|||||||||||||||||||||
Sbjct 121     AGAAGATAGAGCAATTAGT 139
```

> 22135616 length 301 cvg_38.6_tip_0
Length=301

Score = 228 bits (123), Expect = 8e-58
Identities = 123/123 (100%), Gaps = 0/123 (0%)
Strand=Plus/Plus

```
Query 1       GGTGGTACTGGAACCGGTGCAGCACCGGTAATTGCAAAAAGCAGCCAGAGAAGCAAGAGCC 60
|||||||||||||||||||||||||||||||||||||||||||||||||||||||||

Sbjct 179     GGTGGTACTGGAACCGGTGCAGCACCGGTAATTGCAAAAAGCAGCCAGAGAAGCAAGAGCC 238

Query 61      GCAGTTAAGGATAGAGCGCCAAAAGaaaaaaaaGATATTGACTGTTGGAGTTGTAATAAAA 120
|||||||||||||||||||||||||||||||||||||||||||||||||||||||||

Sbjct 239     GCAGTTAAGGATAGAGCGCCAAAAGAAAAAAAAAGATATTGACTGTTGGAGTTGTAATAAAA 298
```

Query 121 CCG 123
|||
Sbjct 299 CCG 301

> 17614347 length 127 cvg_2.0_tip_0
Length=127

Score = 224 bits (121), Expect = 1e-56
Identities = 125/127 (98%), Gaps = 0/127 (0%)
Strand=Plus/Minus

Query 129 TTTTGAAGGTGTGCGCCGATGCGCATTGCAGAGCTTGGACTTGAAGAAGTGCAAAAATA 188
|||||
Sbjct 127 TTTTGAAGGTGTGCGCCGATGCGCATTGCAGAGCTTGGACTTGAAGAAGTGCAAAAATA 68

Query 189 CGTGGATACACTTATTGTCATTCCAAATCAGAATTTATTTAGAATTGCAAATGAAAAAAC 248
|||
Sbjct 67 CGTTGATACACTTATTGTCATTCCAAATCAGAATTTATTTAGAATTGCAAATGAAAAAAC 8

Query 249 TACATTT 255
|||||
Sbjct 7 TACATTT 1

> 20450530 length 179 cvg_63.0_tip_0
Length=179

Score = 217 bits (117), Expect = 2e-54
Identities = 121/123 (98%), Gaps = 0/123 (0%)
Strand=Plus/Minus

Query 1 GGTGGTACTGGAACCGGTGCAGCACCGGTAATTGCAAAAGCAGCCAGAGAAGCAAGAGCC 60
|||||
Sbjct 123 GGTGGTACCGGAACCGGTGCAGCACCGGTAATTGCAAAAGCAGCCAGAGAAGCAAGAGCT 64

Query 61 GCAGTTAAGGATAGAGCGCCAAAAGaaaaaaaGATATTGACTGTTGGAGTTGTAATAAAA 120
|||||
Sbjct 63 GCAGTTAAGGATAGAGCGCCAAAAGAAAAAAGATATTGACTGTTGGAGTTGTAATAAAA 4

Query 121 CCG 123
|||
Sbjct 3 CCG 1

> 15315059 length 108 cvg_63.0_tip_0
Length=108

Score = 200 bits (108), Expect = 2e-49
Identities = 108/108 (100%), Gaps = 0/108 (0%)
Strand=Plus/Plus

Query 148 ATGCGCATTGCAGAGCTTGGACTTGAAGAAGTGCAAAAATACGTGGATACACTTATTGTC 207
|||||
Sbjct 1 ATGCGCATTGCAGAGCTTGGACTTGAAGAAGTGCAAAAATACGTGGATACACTTATTGTC 60

Query 208 ATTCCAAATCAGAATTTATTTAGAATTGCAAATGAAAAAACTACATTT 255
|||||
Sbjct 61 ATTCCAAATCAGAATTTATTTAGAATTGCAAATGAAAAAACTACATTT 108

> 21144322 length 206 cvg_1.0_tip_0
Length=206

Score = 193 bits (104), Expect = 3e-47
Identities = 110/113 (97%), Gaps = 0/113 (0%)
Strand=Plus/Minus

```
Query 323 TCATGCCAGGGCTTATCAATCTTGACTTCGCTGATATAGAAACAGTAATGAGCGAGATGG 382
          |||
Sbjct 146 TCATGCCAGGGCTTATTAATCTTGACTTCGCTGATATGGAACAGTAATGAGCGAGATGG 87

Query 383 GCAAAGCGATGATCGGCACCGGAGAGGCAGAAGGAGAAGATAGAGCAATTAGT 435
          |||
Sbjct 86 GCAAAGCGATGATCGGCACCGGGGAGGCAGAAGGAGAAGATAGAGCAATTAGT 34
```

> 14485123 length 98 cvg_63.0_tip_0
Length=98

Score = 182 bits (98), Expect = 6e-44
Identities = 98/98 (100%), Gaps = 0/98 (0%)
Strand=Plus/Minus

```
Query 193 GATACTTATTGTCATTCCAAATCAGAATTTATTTAGAATTGCAAATGAAAAAACTACA 252
          |||
Sbjct 98 GATACTTATTGTCATTCCAAATCAGAATTTATTTAGAATTGCAAATGAAAAAACTACA 39

Query 253 TTTTCTGATGCATTTAAACTTGCTGATAATGTTCTGCA 290
          |||
Sbjct 38 TTTTCTGATGCATTTAAACTTGCTGATAATGTTCTGCA 1
```

> 14246929 length 95 cvg_61.9_tip_0
Length=95

Score = 176 bits (95), Expect = 3e-42
Identities = 95/95 (100%), Gaps = 0/95 (0%)
Strand=Plus/Minus

```
Query 340 AATCTTGACTTCGCTGATATAGAAACAGTAATGAGCGAGATGGGCAAAGCGATGATCGGC 399
          |||
Sbjct 95 AATCTTGACTTCGCTGATATAGAAACAGTAATGAGCGAGATGGGCAAAGCGATGATCGGC 36

Query 400 ACCGGAGAGGCAGAAGGAGAAGATAGAGCAATTAG 434
          |||
Sbjct 35 ACCGGAGAGGCAGAAGGAGAAGATAGAGCAATTAG 1
```

> 14373293 length 97 cvg_63.0_tip_0
Length=97

Score = 174 bits (94), Expect = 1e-41
Identities = 96/97 (99%), Gaps = 0/97 (0%)
Strand=Plus/Plus

```
Query 84 AGaaaaaaGATATTGACTGTTGGAGTTGTAACTAAACCGTTCGGTTTTGAAGGTGTGCG 143
          |||
Sbjct 1 AGAAAAAAGATATTGACTGTTGGAGTTGTAACTAAACCGTTCGGTTTTGAAGGTGTGCG 60

Query 144 CCGTATGCGCATTGCAGAGCTTGGACTTGAAGAACTG 180
          |||
Sbjct 61 CCGCATGCGCATTGCAGAGCTTGGACTTGAAGAACTG 97
```

> 13200020 length 86 cvg_63.0_tip_0

Length=86

Score = 159 bits (86), Expect = 3e-37
Identities = 86/86 (100%), Gaps = 0/86 (0%)
Strand=Plus/Minus

```
Query 61 GCAGTTAAGGATAGAGCGCCAAAAGaaaaaaaaGATATTGACTGTTGGAGTTGTA ACTAAA 120
          |||
Sbjct 86 GCAGTTAAGGATAGAGCGCCAAAAGAAAAAAGATATTGACTGTTGGAGTTGTA ACTAAA 27

Query 121 CCGTTCGGTTTTGAAGGTGTGCGCCG 146
          |||
Sbjct 26 CCGTTCGGTTTTGAAGGTGTGCGCCG 1
```

> 12489093 length 82 cvg_63.0_tip_0
Length=82

Score = 147 bits (79), Expect = 2e-33
Identities = 81/82 (99%), Gaps = 0/82 (0%)
Strand=Plus/Minus

```
Query 129 TTTTGAAGGTGTGCGCCGATGCGCATTGCAGAGCTTGGACTTGAAGAACTGCAAAAATA 188
          |||
Sbjct 82 TTTTGAAGGTGTGCGCCGATGCGCATTGCAGAGCTTGGACTTGAAGAACTGCAAAAATA 23

Query 189 CGTGGATACACTTATTGTCATT 210
          |||
Sbjct 22 CGTGGATACACTTATTGTCATT 1
```

> 10590477 length 74 cvg_63.0_tip_0
Length=74

Score = 132 bits (71), Expect = 7e-29
Identities = 73/74 (99%), Gaps = 0/74 (0%)
Strand=Plus/Plus

```
Query 118 AAACCGTTCGGTTTTGAAGGTGTGCGCCGATGCGCATTGCAGAGCTTGGACTTGAAGAA 177
          |||
Sbjct 1 AAACCGTTCGGTTTTGAAGGTGTGCGCCGATGCGCATTGCAGAGCTTGGACTTGAAGAA 60

Query 178 CTGCAAAAATACGT 191
          |||
Sbjct 61 CTGCAAAAATACGT 74
```

> 19289967 length 138 cvg_2.0_tip_0
Length=138

Score = 128 bits (69), Expect = 8e-28
Identities = 74/76 (97%), Gaps = 1/76 (1%)
Strand=Plus/Plus

```
Query 118 AAACCGTTCGGTTTTGAAGGTGTGCGCCGATGCGCATTGCAGAGCTTGGACTTGAAGAA 177
          |||
Sbjct 1 AAACCGTTCGGTTTTGAAGGTGTGCGCCGATGCGCATTGCAGAGCTTGGACTTGAAGAA 60

Query 178 CTGCAAAAATACGTGG 193
          |||
Sbjct 61 CTG-AAAAATACGTGG 75
```

> 14421785 length 97 cvg_63.0_tip_0
Length=97

Score = 119 bits (64), Expect = 5e-25
Identities = 64/64 (100%), Gaps = 0/64 (0%)
Strand=Plus/Minus

```
Query 372 GAGCGAGATGGGCAAAGCGATGATCGGCACCGGAGAGGCAGAAGGAGAAGATAGAGCAAT 431
          |||
Sbjct 97  GAGCGAGATGGGCAAAGCGATGATCGGCACCGGAGAGGCAGAAGGAGAAGATAGAGCAAT 38

Query 432 TAGT 435
          |||
Sbjct 37  TAGT 34
```

> 20052480 length 163 cvg_55.0_tip_0
Length=163

Score = 117 bits (63), Expect = 2e-24
Identities = 63/63 (100%), Gaps = 0/63 (0%)
Strand=Plus/Minus

```
Query 372 GAGCGAGATGGGCAAAGCGATGATCGGCACCGGAGAGGCAGAAGGAGAAGATAGAGCAAT 431
          |||
Sbjct 163 GAGCGAGATGGGCAAAGCGATGATCGGCACCGGAGAGGCAGAAGGAGAAGATAGAGCAAT 104

Query 432 TAG 434
          |||
Sbjct 103 TAG 101
```

> 21412982 length 219 cvg_1.0_tip_1
Length=219

Score = 108 bits (58), Expect = 1e-21
Identities = 60/61 (98%), Gaps = 0/61 (0%)
Strand=Plus/Plus

```
Query 229 AGAATTGCAAATGAAAAAACTACATTTTCTGATGCATTTAAACTTGCTGATAATGTTCTG 288
          |||
Sbjct 159 AGAATTGAAAATGAAAAAACTACATTTTCTGATGCATTTAAACTTGCTGATAATGTTCTG 218

Query 289 C 289
          |
Sbjct 219 C 219
```

Lambda K H
1.33 0.621 1.12

Gapped
Lambda K H
1.28 0.460 0.850

Effective search space used: 417103832794

Query= gatB_Wolbachia_Host_E.serratulae

Length=369

Sequences producing significant alignments:	Score (Bits)	E Value
21381538 length 218 cvg_1.0_tip_1	357	8e-97
20417994 length 177 cvg_2.0_tip_0	316	1e-84
20741170 length 191 cvg_1.0_tip_1	305	3e-81
20109650 length 165 cvg_63.0_tip_0	294	7e-78
19292641 length 138 cvg_33.4_tip_0	255	3e-66
18969591 length 130 cvg_63.0_tip_0	230	2e-58
18736645 length 127 cvg_2.0_tip_0	230	2e-58
18076019 length 127 cvg_63.0_tip_0	211	7e-53
14638785 length 99 cvg_47.0_tip_0	183	1e-44
15078638 length 105 cvg_46.9_tip_0	176	2e-42
14245495 length 95 cvg_63.0_tip_0	176	2e-42
21871023 length 258 cvg_1.0_tip_1	171	1e-40
13582182 length 89 cvg_32.4_tip_0	165	5e-39
13402912 length 88 cvg_49.6_tip_0	163	2e-38
13056619 length 85 cvg_44.0_tip_0	158	9e-37
13056441 length 85 cvg_63.0_tip_0	158	9e-37
21564999 length 229 cvg_37.0_tip_0	135	4e-30
10262355 length 73 cvg_63.0_tip_0	135	4e-30
10213031 length 72 cvg_63.0_tip_0	134	2e-29
8722663 length 69 cvg_47.0_tip_0	128	7e-28
20838530 length 194 cvg_62.4_tip_0	124	9e-27
3629341 length 64 cvg_0.0_tip_0	119	4e-25

> 21381538 length 218 cvg_1.0_tip_1
Length=218

**Not in Wolbachia MLST database, Blast -> most related Drosophila ananassae sequence.
But this latter sequence is identical to Wol-allele 22**

Score = 357 bits (193), Expect = 8e-97
Identities = 209/217 (96%), Gaps = 0/217 (0%)
Strand=Plus/Plus

```
Query 153 AAATCTGAACTCGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAAT 212
          |||
Sbjct 1 AAATCTGAACTCGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAAT 60

Query 213 TGAAATTTTAGAAAGTGGGGAAGAAATAAGTCAAGATACCTTATTGTTTGATGTTGCTTC 272
          |||
Sbjct 61 TGACATTTTAGAAAGTGGGGAAGAAATAAGTCAACTATACCTTATTGTTTGATGTTGCTTC 120

Query 273 GGGAAAACAAAAGTGATGCGAAACAAAGAAGATGCAAGCGACTATAGATACTTCCCTGA 332
          |||
Sbjct 121 GGGAAACACAACAGTGATGCGAAACAAAGAAGATGCAAGCGCCTACAGATACTTCCCTGA 180

Query 333 GCCTGATTTATTACCTGTTGAGGTAAGGCAGGATAAA 369
          |||
Sbjct 181 GCCCGATTTATTACCTGTTGAGGTAAGGCAGGATAAA 217
```

> 20417994 length 177 cvg_2.0_tip_0
Length=177

Score = 316 bits (171), Expect = 1e-84
Identities = 175/177 (99%), Gaps = 0/177 (0%)

Strand=Plus/Minus

```
Query 125 GCGCACTTGGCACTCGTTGTGAGATAAAAAATCTGAACTCGATACGTTATATTGTGCAAG 184
          |||
Sbjct 177 GCGCACTTGGCACTCGTTGTGAGATAAAAAATCTGAACTCGATACGTTATATTGTGCAAG 118

Query 185 CTATAGACTATGAAATACAAAGACAAATTGAAATTTTAGAAAGTGGGGAAGAAATAAGTC 244
          |||
Sbjct 117 CTAAAGACTATGAAATACAAAGACAAATTGAAATTTTAGAAAGTGGGGAAGAAAGTAAGTC 58

Query 245 AAGATACCTTATTGTTTGATGTTGCTTCGGGAAAAACAAAAGTGATGCGAAACAAAG 301
          |||
Sbjct 57 AAGATACCTTATTGTTTGATGTTGCTTCGGGAAAAACAAAAGTGATGCGAAACAAAG 1
```

> 20741170 length 191 cvg_1.0_tip_1
Length=191

Score = 305 bits (165), Expect = 3e-81
Identities = 171/174 (98%), Gaps = 0/174 (0%)
Strand=Plus/Minus

```
Query 1 GAAGCTGCAGAATGCATGAAAAAATTGAGGCAGATTTTGC GTTACATTGGTTCGTGTGAT 60
          |||
Sbjct 174 GAAGCTGCAGAATGCATGAAAAAATTGAGGCAGATTTTGC GTTACAGTGGTTCGTGTGAT 115

Query 61 GGTGATATGGAAAAGGGATCACTTCGTTGTGATGCAAATGTTTCTGTCCGCCTAAAAGGC 120
          |||
Sbjct 114 GGTGATATGGAAAAGGGATCACGTCGTTGTGATGCAAATGTTTCTGTCCGACTAAAAGGC 55

Query 121 AGTAGCGCACTTGGCACTCGTTGTGAGATAAAAAATCTGAACTCGATACGTTAT 174
          |||
Sbjct 54 AGTAGCGCACTTGGCACTCGTTGTGAGATAAAAAATCTGAACTCGATACGTTAT 1
```

> 20109650 length 165 cvg_63.0_tip_0
Length=165

Score = 294 bits (159), Expect = 7e-78
Identities = 163/165 (99%), Gaps = 0/165 (0%)
Strand=Plus/Minus

```
Query 163 TCGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAATTGAAATTTTA 222
          |||
Sbjct 165 TCGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAATTGAAATTTTA 106

Query 223 GAAAGTGGGGAAGAAATAAGTCAAGATACCTTATTGTTTGATGTTGCTTCGGGAAAAACA 282
          |||
Sbjct 105 GAAGGTGGGGAAGAAATAAGTCAAGATACCTTATTGTTTGACGTTGCTTCGGGAAAAACA 46

Query 283 AAAGTGATGCGAAACAAAGAAGATGCAAGCGACTATAGATACTTC 327
          |||
Sbjct 45 AAAGTGATGCGAAACAAAGAAGATGCAAGCGACTATAGATACTTC 1
```

> 19292641 length 138 cvg_33.4_tip_0
Length=138

Score = 255 bits (138), Expect = 3e-66
Identities = 138/138 (100%), Gaps = 0/138 (0%)
Strand=Plus/Minus

```
Query 164 CGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAATTGAAATTTTAG 223
```

```

|||||
Sbjct 138 CGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAATTGAAATTTTAG 79
Query 224 AAAGTGGGGAAGAAATAAGTCAAGATACCTTATTGTTTGATGTTGCTTCGGGAAAAACAA 283
|||||
Sbjct 78 AAAGTGGGGAAGAAATAAGTCAAGATACCTTATTGTTTGATGTTGCTTCGGGAAAAACAA 19
Query 284 AAGTGATGCGAAACAAAG 301
|||||
Sbjct 18 AAGTGATGCGAAACAAAG 1

```

> 18969591 length 130 cvg_63.0_tip_0
Length=130

Score = 230 bits (124), Expect = 2e-58
Identities = 128/130 (98%), Gaps = 0/130 (0%)
Strand=Plus/Plus

```

Query 64 GATATGGAAAAGGGATCACTTCGTTGTGATGCAAATGTTTCTGTCCGCCTAAAAGGCAGT 123
|||||
Sbjct 1 GATATGGAAAAGGGATCACTTCGTTGTGATGCAAATGTTTCTGTCCGCCTAAAAGGCAGT 60
Query 124 AGCGCACTTGGCACTCGTTGTGAGATAAAAAATCTGAACTCGATACGTTATATTGTGCAA 183
||| || |||||
Sbjct 61 AGCACATTTGGCACTCGTTGTGAGATAAAAAATCTGAACTCGATACGTTATATTGTGCAA 120
Query 184 GCTATAGACT 193
|||||
Sbjct 121 GCTATAGACT 130

```

> 18736645 length 127 cvg_2.0_tip_0
Length=127

Score = 230 bits (124), Expect = 2e-58
Identities = 126/127 (99%), Gaps = 0/127 (0%)
Strand=Plus/Minus

```

Query 100 GTTTCTGTCCGCCTAAAAGGCAGTAGCGCACTTGGCACTCGTTGTGAGATAAAAAATCTG 159
|||||
Sbjct 127 GTTTCTGTCCGCCTAAAAGGCAGTAGCGCACTTGGCACTCGTTGTGAGATAAAAAATCTG 68
Query 160 AACTCGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAATTGAAATT 219
||| |||||
Sbjct 67 AACCCGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAATTGAAATT 8
Query 220 TTAGAAA 226
|||||
Sbjct 7 TTAGAAA 1

```

> 18076019 length 127 cvg_63.0_tip_0
Length=127

Score = 211 bits (114), Expect = 7e-53
Identities = 116/117 (99%), Gaps = 0/117 (0%)
Strand=Plus/Minus

```

Query 1 GAAGCTGCAGAATGCATGAAAAAATTGAGGCAGATTTTGC GTTACATTGGTTCGTGTGAT 60
|||||
Sbjct 117 GAAGCTGCAGAATGCATGAAAAAATTGAGGCAGATTTTGC GTTACATTGGTTCATGTGAT 58

```

Query 61 GGTGATATGGAAAAGGGATCACTTCGTTGTGATGCAAATGTTTCTGTCCGCCTAAAA 117
|
Sbjct 57 GGTGATATGGAAAAGGGATCACTTCGTTGTGATGCAAATGTTTCTGTCCGCCTAAAA 1

> 14638785 length 99 cvg_47.0_tip_0
Length=99

Score = 183 bits (99), Expect = 1e-44
Identities = 99/99 (100%), Gaps = 0/99 (0%)
Strand=Plus/Plus

Query 64 GATATGGAAAAGGGATCACTTCGTTGTGATGCAAATGTTTCTGTCCGCCTAAAAGGCAGT 123
|
Sbjct 1 GATATGGAAAAGGGATCACTTCGTTGTGATGCAAATGTTTCTGTCCGCCTAAAAGGCAGT 60

Query 124 AGCGCACTTGGCACTCGTTGTGAGATAAAAAATCTGAAC 162
|
Sbjct 61 AGCGCACTTGGCACTCGTTGTGAGATAAAAAATCTGAAC 99

> 15078638 length 105 cvg_46.9_tip_0
Length=105

Score = 176 bits (95), Expect = 2e-42
Identities = 95/95 (100%), Gaps = 0/95 (0%)
Strand=Plus/Minus

Query 1 GAAGCTGCAGAATGCATGAAAAAATTGAGGCAGATTTTTCGTTACATTGGTTCGTGTGAT 60
|
Sbjct 95 GAAGCTGCAGAATGCATGAAAAAATTGAGGCAGATTTTTCGTTACATTGGTTCGTGTGAT 36

Query 61 GGTGATATGGAAAAGGGATCACTTCGTTGTGATGC 95
|
Sbjct 35 GGTGATATGGAAAAGGGATCACTTCGTTGTGATGC 1

> 14245495 length 95 cvg_63.0_tip_0
Length=95

Score = 176 bits (95), Expect = 2e-42
Identities = 95/95 (100%), Gaps = 0/95 (0%)
Strand=Plus/Minus

Query 265 GTTGCTTCGGGAAAAACAAAAGTGATGCGAAACAAAGAAGATGCAAGCGACTATAGATAC 324
|
Sbjct 95 GTTGCTTCGGGAAAAACAAAAGTGATGCGAAACAAAGAAGATGCAAGCGACTATAGATAC 36

Query 325 TTCCCTGAGCCTGATTTATTACCTGTTGAGGTAAG 359
|
Sbjct 35 TTCCCTGAGCCTGATTTATTACCTGTTGAGGTAAG 1

> 21871023 length 258 cvg_1.0_tip_1
Length=258

Score = 171 bits (92), Expect = 1e-40
Identities = 94/95 (99%), Gaps = 0/95 (0%)
Strand=Plus/Plus

Query 1 GAAGCTGCAGAATGCATGAAAAAATTGAGGCAGATTTTTCGTTACATTGGTTCGTGTGAT 60
|
Sbjct 164 GAAGCTGCAGAATGCATGAAAAAATTGAGGCCGATTTTTCGTTACATTGGTTCGTGTGAT 223

Query 61 GGTGATATGGAAAAGGGATCACTTCGTTGTGATGC 95
|
Sbjct 224 GGTGATATGGAAAAGGGATCACTTCGTTGTGATGC 258

> 13582182 length 89 cvg_32.4_tip_0
Length=89

Score = 165 bits (89), Expect = 5e-39
Identities = 89/89 (100%), Gaps = 0/89 (0%)
Strand=Plus/Plus

Query 239 TAAGTCAAGATACCTTATTGTTTGATGTTGCTTCGGGAAAAACAAAAGTGATGCGAAACA 298
|
Sbjct 1 TAAGTCAAGATACCTTATTGTTTGATGTTGCTTCGGGAAAAACAAAAGTGATGCGAAACA 60

Query 299 AAGAAGATGCAAGCGACTATAGATACTTC 327
|
Sbjct 61 AAGAAGATGCAAGCGACTATAGATACTTC 89

> 13402912 length 88 cvg_49.6_tip_0
Length=88

Score = 163 bits (88), Expect = 2e-38
Identities = 88/88 (100%), Gaps = 0/88 (0%)
Strand=Plus/Minus

Query 100 GTTTCTGTCCGCCTAAAAGGCAGTAGCGCACTTGGCACTCGTTGTGAGATAAAAAATCTG 159
|
Sbjct 88 GTTTCTGTCCGCCTAAAAGGCAGTAGCGCACTTGGCACTCGTTGTGAGATAAAAAATCTG 29

Query 160 AACTCGATACGTTATATTGTGCAAGCTA 187
|
Sbjct 28 AACTCGATACGTTATATTGTGCAAGCTA 1

> 13056619 length 85 cvg_44.0_tip_0
Length=85

Score = 158 bits (85), Expect = 9e-37
Identities = 85/85 (100%), Gaps = 0/85 (0%)
Strand=Plus/Plus

Query 33 GATTTTGC GTTACATTGGTTTCGTGTGATGGTGATATGGAAAAGGGATCACTTCGTTGTGA 92
|
Sbjct 1 GATTTTGC GTTACATTGGTTTCGTGTGATGGTGATATGGAAAAGGGATCACTTCGTTGTGA 60

Query 93 TGCAAATGTTTCTGTCCGCCTAAAA 117
|
Sbjct 61 TGCAAATGTTTCTGTCCGCCTAAAA 85

> 13056441 length 85 cvg_63.0_tip_0
Length=85

Score = 158 bits (85), Expect = 9e-37
Identities = 85/85 (100%), Gaps = 0/85 (0%)
Strand=Plus/Plus

Query 131 TTGGCACTCGTTGTGAGATAAAAAATCTGAACTCGATACGTTATATTGTGCAAGCTATAG 190
|

Sbjct 1 TTGGCACTCGTTGTGAGATAAAAAATCTGAACTCGATACGTTATATTGTGCAAGCTATAG 60

Query 191 ACTATGAAATACAAAGACAAATTGA 215

|||||

Sbjct 61 ACTATGAAATACAAAGACAAATTGA 85

> 21564999 length 229 cvg_37.0_tip_0

Length=229

Score = 135 bits (73), Expect = 4e-30
Identities = 73/73 (100%), Gaps = 0/73 (0%)
Strand=Plus/Plus

Query 297 CAAAGAAGATGCAAGCGACTATAGATACTTCCCTGAGCCTGATTTATTACCTGTTGAGGT 356

|||||

Sbjct 1 CAAAGAAGATGCAAGCGACTATAGATACTTCCCTGAGCCTGATTTATTACCTGTTGAGGT 60

Query 357 AAGGCAGGATAAA 369

|||||

Sbjct 61 AAGGCAGGATAAA 73

> 10262355 length 73 cvg_63.0_tip_0

Length=73

Score = 135 bits (73), Expect = 4e-30
Identities = 73/73 (100%), Gaps = 0/73 (0%)
Strand=Plus/Plus

Query 153 AAATCTGAACTCGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAAT 212

|||||

Sbjct 1 AAATCTGAACTCGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAAT 60

Query 213 TGAAATTTTAGAA 225

|||||

Sbjct 61 TGAAATTTTAGAA 73

> 10213031 length 72 cvg_63.0_tip_0

Length=72

Score = 134 bits (72), Expect = 2e-29
Identities = 72/72 (100%), Gaps = 0/72 (0%)
Strand=Plus/Plus

Query 55 TGTGATGGTGATATGGAAAAGGGATCACTTCGTTGTGATGCAAATGTTTCTGTCCGCTA 114

|||||

Sbjct 1 TGTGATGGTGATATGGAAAAGGGATCACTTCGTTGTGATGCAAATGTTTCTGTCCGCTA 60

Query 115 AAAGGCAGTAGC 126

|||||

Sbjct 61 AAAGGCAGTAGC 72

> 8722663 length 69 cvg_47.0_tip_0

Length=69

Score = 128 bits (69), Expect = 7e-28
Identities = 69/69 (100%), Gaps = 0/69 (0%)
Strand=Plus/Minus

Query 125 GCGCACTTGGCACTCGTTGTGAGATAAAAAATCTGAACTCGATACGTTATATTGTGCAAG 184

```
|||||
Sbjct 69 GCGCACTTGGCACTCGTTGTGAGATAAAAAATCTGAACTCGATACGTTATATTGTGCAAG 10
```

```
Query 185 CTATAGACT 193
          |||||
Sbjct 9 CTATAGACT 1
```

```
> 20838530 length 194 cvg_62.4_tip_0
Length=194
```

```
Score = 124 bits (67), Expect = 9e-27
Identities = 71/73 (97%), Gaps = 0/73 (0%)
Strand=Plus/Plus
```

```
Query 297 CAAAGAAGATGCAAGCGACTATAGATACTTCCCTGAGCCTGATTTATTACCTGTTGAGGT 356
          |||||
Sbjct 1 CAAAGAAGATGCAAGCGACTATAGATACTTCCCTGAGCCTGATTTATTACCTGTTGAGGT 60
```

```
Query 357 AAGGCAGGATAAA 369
          ||| ||||| |||
Sbjct 61 AAGCCAGGAGAAA 73
```

```
> 3629341 length 64 cvg_0.0_tip_0
Length=64
```

```
Score = 119 bits (64), Expect = 4e-25
Identities = 64/64 (100%), Gaps = 0/64 (0%)
Strand=Plus/Plus
```

```
Query 163 TCGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAATTGAAATTTTA 222
          |||||
Sbjct 1 TCGATACGTTATATTGTGCAAGCTATAGACTATGAAATACAAAGACAAATTGAAATTTTA 60
```

```
Query 223 GAAA 226
          ||||
Sbjct 61 GAAA 64
```

```
Lambda K H
1.33 0.621 1.12
```

```
Gapped
Lambda K H
1.28 0.460 0.850
```

```
Effective search space used: 349465373422
```