

Supplementary Information

| | | |
|------|--|------|
| 1 | AGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCCTAACACATGCAAGTCGAACGGAGTTATAT | 70 |
| | AGAGTTTGATCTGGCTCAGAAATGAACGCTGGCGGCAGGCCTAACACATGCAAGTCGAACGGAGTTATAT | |
| 71 | TGTAGCTTGCTATGGTATAACTTAGTGGCAGACGGGTGGTAAATGTATAGGAATCTACCTAATAGTGCGG | 140 |
| | TGTAGCTTGCTATGGTATAACTTAGTGGCAGACGGGTGAGTAATGTATAGGAATCTACCTAGTAGTACGG | |
| 141 | AATAATTGTTGAAACGGCAACTAATACCGTATACGCCCTACGGGGGAAAAATTTATTGCTATTAGATGA | 210 |
| | AATAATTGTTGAAACGGCAACTAATACCGTATACGCCCTACGGGGGAAAAATTTATTGCTATTAGATGA | |
| 211 | GCCTATATTAGATTAGCTAGTTGGTGGAGTAATAGCCTACCAAGGCAATGATCTATAGCTGATCTGAGAG | 280 |
| | GCCTATATTAGATTAGCTAGTTGGTGGAGTAATAGCCTACCAAGGCAATGATCTATAGCTGATCTGAGAG | |
| 281 | GATGATCAGCCCACTGGAAGTGAAGTACGGTCCAGACTCCTACGGGAGGCAGCAGTGGGGAATATTGGA | 350 |
| | GATGATCAGCCCACTGGAAGTGAAGTACGGTCCAGACTCCTACGGGAGGCAGCAGTGGGGAATATTGGA | |
| 351 | CAATGGGCGAAAGCCTGATCCAGCCATGCCGCATGAGTGAAGAAGGCCCTTGGGTTGTAAAGCTCTTTTA | 420 |
| | CAATGGGCGAAAGCCTGATCCAGCCATGCCGCATGAGTGAAGAAGGCCCTTGGGTTGTAAAGCTCTTTTA | |
| 421 | GTGAGGAAGATAATGACGGTACTCAGAGAAGAAGTCTGGCTAACTCCGTGCCAGCAGCCGCGTAATAC | 490 |
| | GTGAGGAAGATAATGACGGTACTCAGAGAAGAAGTCTGGCTAACTCCGTGCCAGCAGCCGCGTAATAC | |
| 491 | GGAGAGGGCTAGCGTTATTCGGAATTATTGGCGTAAAGGGCGCGTAGGCGGATTAGTAAGTTAAAAGTG | 560 |
| | GGAGAGGGCTAGCGTTATTCGGAATTATTGGCGTAAAGGGCGCGTAGGCGGATTAGTAAGTTAAAAGTG | |
| 561 | AAATCCCAAGGCTCAACCTTGAATTGCTTTTAAACTGCTAATCTAGAGATTGAAAGAGGATAGAGGAA | 630 |
| | AAATCCCAAGGCTCAACCTTGAATTGCTTTTAAACTGCTAATCTAGAGATTGAAAGAGGATAGAGGAA | |
| 631 | TTCCTAGTGTAGAGGTGAAATTCGTAATATTAGGAGGAACACCAAGTGGCGAAGGCGTCTATCTGGTTCA | 700 |
| | TTCCTAGTGTAGAGGTGAAATTCGTAATATTAGGAGGAACACCAAGTGGCGAAGGCGTCTATCTGGTTCA | |
| 701 | AATCTGACGCTGAGGCGCGAAGGCGTGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCTGTAAA | 770 |
| | AATCTGACGCTGAGGCGCGAAGGCGTGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCTGTAAA | |
| 771 | CGATGAATGTTAAATATGGGAAGTTTACTTTCTGTATTACAGTAACGCGTTAAACATTCCGCTGGGG | 840 |
| | CGATGAATGTTAAATATGGGAAGTTTACTTTCTGTATTACAGTAACGCGTTAAACATTCCGCTGGGG | |
| 841 | ACTACGGTCGCAAGATTAATACTCAAAGGAATTGACGGGGACCCGCACAAGCGGTGGAGCATGTGGTTTA | 910 |
| | ACTACGGTCGCAAGATTAATACTCAAAGGAATTGACGGGGACCCGCACAAGCGGTGGAGCATGTGGTTTA | |
| 911 | ATTCGACGCAACGCGAAGAACCTTACCTGGTCTTGACATCCATAGAATTTTATAGAAATATAGAAGTGCC | 980 |
| | ATTCGATGCAACGCGAAGAACCTTACCTGGTCTTGACATCCATAGAATTTTATAGAAATATAGAAGTGCC | |
| 971 | ATTCGATGCAACGCGAAGAACCTTACCTGGTCTTGACATCCATAGAATTTTATAGAAATATAGAAGTGCC | 1040 |
| | ATTCGATGCAACGCGAAGAACCTTACCTGGTCTTGACATCCATAGAATTTTATAGAAATATAGAAGTGCC | |
| 981 | TTCGGGAAGTATGAGACAGGTGCTGCATGGCTGTCGTCAGCTCGTGTGTGAAATGTTGGGTTAAGTCCC | 1050 |
| 1041 | TTCGGGAAGTATGAGACAGGTGCTGCATGGCTGTCGTCAGCTCGTGTGTGAAATGTTGGGTTAAGTCCC | 1110 |
| | TTCGGGAAGTATGAGACAGGTGCTGCATGGCTGTCGTCAGCTCGTGTGTGAAATGTTGGGTTAAGTCCC | |
| 1051 | GCAACGAGCGCAACCCCTATCCTTTGTTGCCATCGGTTGGCCGGGAACTCAGGGGAGACTGCCGGTTAT | 1120 |
| 1111 | GCAACGAGCGCAACCCCTATCCTTTGTTGCCATCGGTTGGCCGGGAACTCAGGGGAGACTGCCGGTTAT | 1180 |
| | GCAACGAGCGCAACCCCTATCCTTTGTTGCCATCGGTTGGCCGGGAACTCAGGGGAGACTGCCGGTTAT | |
| 1121 | AAACCGGAGGAAGGTGGGGACGACGTCAAGTCATCATGGCCCTTACGACCAGGGCTACACACGTGCTACA | 1190 |
| 1181 | AAACCGGAGGAAGGTGGGGACGACGTCAAGTCATCATGGCCCTTACGACCAGGGCTACACACGTGCTACA | 1250 |
| | AAACCGGAGGAAGGTGGGGACGACGTCAAGTCATCATGGCCCTTACGACCAGGGCTACACACGTGCTACA | |
| 1191 | ATGGTATATACAAAGAGAAGCGACTCCGTAAAGATAAGCAAACCTCATAAAGTATATCGTAGTCCGGACT | 1260 |
| 1251 | ATGGTATATACAAAGAGAAGCGACTCCGTAAAGATAAGCAAACCTCATAAAGTATATCGTAGTCCGGACT | 1320 |
| | ATGGTATATACAAAGAGAAGCGACTCCGTAAAGATAAGCAAACCTCATAAAGTATATCGTAGTCCGGACT | |
| 1261 | GGAGTCTGCAACTCGACTCCACGAAGTCGGAATCGCTAGTAATCGTGGATCAGAATGCCACGGTGAATAC | 1330 |
| 1321 | GGAGTCTGCAACTCGACTCCACGAAGTCGGAATCGCTAGTAATCGTGGATCAGAATGCCACGGTGAATAC | 1390 |
| | GGAGTCTGCAACTCGACTCCACGAAGTCGGAATCGCTAGTAATCGTGGATCAGAATGCCACGGTGAATAC | |
| 1331 | GTTCCCGGGCCTTGACACGCCGCCGTCACACCATGGGAGTGGGTTGCAAAAGAAGCAGATATCTTAAC | 1400 |
| 1391 | GTTCCCGGGCCTTGACACGCCGCCGTCACACCATGGGAGTGGGTTGCAAAAGAAGCAGATATCTTAAC | 1460 |
| | GTTCCCGGGCCTTGACACGCCGCCGTCACACCATGGGAGTGGGTTGCAAAAGAAGCAGATATCTTAAC | |
| 1401 | TGTTTTAAACA--GAGGGAATCTATCACTTTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGT | 1463 |
| 1461 | CGTTTTAAAAACGGAGGGAATCTATCACTTTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGT | 1525 |
| | CGTTTTAAAAACGGAGGGAATCTATCACTTTGTGATTCATGACTGGGGTGAAGTCGTAACAAGGT | |

Figure S1. The composition of the chimeric sequence from the aphid *Stomaphis sinisalicis*.

Black represents the chimeric sequence, green represents the *Wolbachia* sequence, and blue represents the *Buchnera* sequences. The red bar indicates different bases in alignment. In the region of the pink square frame, the sequences of *Wolbachia* and *Buchnera* are the same.

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NCBI/BLAST/blastn suite/Formatting Results - 4AF90Z5W014

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Nucleotide Sequence (1504 letters)

RID: 4AF90Z5W014 (Expires on 09-28 16:09 pm)

Query ID: Id111635

Description: None

Molecule type: nucleic acid

Query Length: 1504

Database Name: nr

Description: Nucleotide collection (nr)

Program: BLASTN 2.2.28+ Citation

Other reports: Search Summary [Taxonomy reports] [Distance tree of results]

Descriptions

Sequences producing significant alignments:

Select: All None Selected: 0

Alignments Download GenBank Graphics Distance tree of results

| Description | Max score | Total score | Query cover | E value | Ident | Accession |
|---|-----------|-------------|-------------|---------|-------|----------------------------|
| <input type="checkbox"/> Buchnera aphidicola (Lachnus roboris) partial 16S rRNA gene | 2287 | 2287 | 100% | 0.0 | 94% | AJ296756.1 |
| <input type="checkbox"/> Buchnera aphidicola (Tuberolachnus salignus) partial 16S rRNA gene | 2270 | 2270 | 100% | 0.0 | 94% | AJ296754.1 |
| <input type="checkbox"/> Buchnera aphidicola (Lachnus roboris) 16S ribosomal RNA gene, partial sequence | 2261 | 2261 | 99% | 0.0 | 94% | FJ655507.1 |
| <input type="checkbox"/> Buchnera aphidicola (Nippolachnus pini) 16S ribosomal RNA gene, partial sequence | 2222 | 2222 | 99% | 0.0 | 93% | FJ655512.1 |
| <input type="checkbox"/> Buchnera aphidicola (Pterochloroides sp.) 16S ribosomal RNA gene, partial sequence | 2218 | 2218 | 99% | 0.0 | 93% | FJ655511.1 |
| <input type="checkbox"/> Buchnera aphidicola (Nippolachnus pini) 16S ribosomal RNA gene, partial sequence | 2209 | 2209 | 99% | 0.0 | 93% | FJ655513.1 |
| <input type="checkbox"/> Buchnera aphidicola (Stomaphis fagi) 16S ribosomal RNA gene, partial sequence | 2207 | 2207 | 99% | 0.0 | 93% | FJ655501.1 |
| <input type="checkbox"/> Buchnera aphidicola (Stomaphis takahashii) 16S ribosomal RNA gene, partial sequence | 2200 | 2200 | 99% | 0.0 | 93% | FJ655500.1 |
| <input type="checkbox"/> Buchnera aphidicola (Stomaphis sp.) 16S ribosomal RNA gene, partial sequence | 2193 | 2193 | 99% | 0.0 | 93% | FJ655498.1 |
| <input type="checkbox"/> Buchnera aphidicola (Stomaphis yanonis) 16S ribosomal RNA gene, partial sequence | 2189 | 2189 | 99% | 0.0 | 93% | FJ655497.1 |
| <input type="checkbox"/> Buchnera aphidicola (Stomaphis sp.) 16S ribosomal RNA gene, partial sequence | 2178 | 2178 | 99% | 0.0 | 93% | FJ655499.1 |
| <input type="checkbox"/> Buchnera aphidicola (Maculolachnus submacula) partial 16S rRNA gene | 2178 | 2178 | 100% | 0.0 | 93% | AJ296755.1 |
| <input type="checkbox"/> Buchnera aphidicola (Stomaphis quercus) 16S ribosomal RNA gene, partial sequence | 2169 | 2169 | 99% | 0.0 | 93% | FJ655505.1 |
| <input type="checkbox"/> Buchnera aphidicola (Stomaphis aphananthae) 16S ribosomal RNA gene, partial sequence | 2154 | 2154 | 99% | 0.0 | 92% | FJ655495.1 |
| <input type="checkbox"/> Buchnera aphidicola (Stomaphis quercus) partial 16S rRNA gene | 2154 | 2154 | 100% | 0.0 | 92% | AJ296753.1 |
| <input type="checkbox"/> Buchnera aphidicola (Stomaphis pini) 16S ribosomal RNA gene, partial sequence | 2145 | 2145 | 99% | 0.0 | 92% | FJ655503.1 |
| <input type="checkbox"/> Buchnera aphidicola (Cinara tujafilina), complete genome | 2141 | 2141 | 100% | 0.0 | 92% | CP001817.1 |

Figure S2. The webpage interface that indicates the results of the BLAST search of the chimeric sequence from *Lachnus quercihabitanis*.

Table S1. The detailed host information and GenBank accession numbers of *Buchnera* download from GenBank.

| Subfamily | Species | GB. Number |
|-----------------|-----------------------------------|------------|
| Aphidinae | <i>Aphis nerii</i> | JQ269567 |
| | <i>Aphis nasturtii</i> | JQ269568 |
| | <i>Aphis craccivora</i> | JQ269569 |
| | <i>Rhopalosiphum maidis</i> | M63247 |
| | <i>Schizaphis graminum</i> | NR074512 |
| | <i>Acyrtosiphon pisum</i> | NR074159 |
| | <i>Aspidophorodon longicaudus</i> | JQ269566 |
| | <i>Capitophorus hudsonicus</i> | JQ269564 |
| | <i>Diuraphis noxia</i> | M63251 |
| | <i>Macrosiphoniella sanborn</i> | JQ269571 |
| | <i>Myzus persicae</i> | AY849937 |
| | <i>Sitobion miscanthi</i> | HM156635 |
| | <i>Uroleucon sonchi</i> | M63250 |
| | <i>Chaitophorus viminalis</i> | M63252 |
| Chaitophorinae | <i>Sipha elegans</i> | JQ269587 |
| Drepanosiphinae | <i>Yamatocallis tokyoensis</i> | AB064514 |

Table S1. Cont.

| Subfamily | Species | GB. Number |
|-----------------|---|------------|
| | <i>Eutrichosiphum sinense</i> | JQ269580 |
| Greenideinae | <i>Mollitrachosiphum nigrofasciatum</i> | JQ269579 |
| | <i>Greenideinae</i> sp. | JQ269578 |
| Hormaphidinae | <i>Hamamelistes spinosus</i> | JQ269574 |
| | <i>Cinara edulis</i> | FJ655493 |
| | <i>Cinara gudarisi</i> | EU334771 |
| | <i>Cinara maghrebica</i> | EU334772 |
| | <i>Cinara pinea</i> | FJ655490 |
| | <i>Cinara tujaefilina</i> | EU334773 |
| | <i>Cinara wahtolca</i> | FJ655492 |
| Lachninae | <i>Lachnus roboris</i> | FJ655507 |
| | <i>Nippolachnus piri</i> | FJ655513 |
| | <i>Pterochloroides</i> sp. | FJ655511 |
| | <i>Stomaphis aphananthae</i> | FJ655495 |
| | <i>Stomaphis fagi</i> | FJ655501 |
| | <i>Stomaphis quercus</i> | FJ655505 |
| | <i>Tuberolachnus salignus</i> | AJ296754 |
| | <i>Myzocallis agrifolicola</i> | JQ269546 |
| Myzocallidinae | <i>Hoplocallis pictus</i> | AJ296759 |
| | <i>Panaphis juglandis</i> | AJ296758 |
| Mindarinae | <i>Mindarus victoria</i> | M63253 |
| | <i>Baizongia pistaciae</i> | NR074609 |
| | <i>Eriosoma lanigerum</i> | DQ418492 |
| Pemphiginae | <i>Melaphis rhois</i> | JQ269582 |
| | <i>Pemphigus populi</i> | AJ296750 |
| | <i>Prociphilus caryae</i> | JQ269572 |
| | <i>Tetraneura caerulescens</i> | AJ296749 |
| Pterocommatinae | <i>Pterocomma populeum</i> | AJ296747 |
| Thelaxinae | <i>Thelaxes suberi</i> | AJ296757 |

Table S2. The detailed information and GenBank accession numbers of *Serratia* download from GenBank as outgroups.

| Subfamily | Species | GB. Number |
|-----------|-----------------------------|------------|
| Aphidinae | <i>Aphis fabae</i> | GU394001 |
| | <i>Cinara cedri</i> | CP002295 |
| Lachninae | <i>Cinara cedri</i> | EU348324 |
| | <i>Cinara schimitscheki</i> | EU348318 |