

**Additional file 2. *TvPirin* gene structure**

**A. Multiple alignments of *TvPirin* cDNA clones and EST assemblies**

The sequences are 5'RACE products (5'Pirin\_#), full-length *TvPirin* cDNAs (cTvPirin\_#), *TvPirin* ESTs from SSH libraries at [http://www.plantsciences.ucdavis.edu/yoder/lab/Sequence\\_index.html](http://www.plantsciences.ucdavis.edu/yoder/lab/Sequence_index.html) (Contig492, Contig5118), and *Triphysaria versicolor* contig assemblies from Wickett *et al* (2011) at <http://ppgp.huck.psu.edu/search.php> (TrVeBC1\_14677, TrVeBC2\_244713, TrVe61FuB1\_8246, TrVe61GuB1\_71237, TrVe62GuB1\_70666, TrVe63GuB1\_32652, TrVe3GB1\_60414, TrVeGnuB1\_1027). Assemblies in reverse complementation orientation are *italicized*. The accession **JN606867** is highlighted in **gray** as part of the TrVeBC2\_244713 clone. The part of the *TrVe61FuB1\_8246* clone identical to the 3' end of TrVeBC2\_244713 clone if aligned in the same orientation (see Additional file 3) is highlighted in **yellow**. The full-length *TvPirin* cDNA sequences are colored **blue** with SNPs in **red** (common alleles) or black (rare alleles). The bona-fide start codon is depicted with **green bold** letters and the stop codon in **purple bold** letters. The artificial start codon is depicted in **black bold** letters. Dashes represent missing nucleotides.

|                   |                   |                   |                   |                   |                   |                    |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------|
|                   | 1                 |                   |                   |                   |                   | 60                 |
| 5' Pirin_1        | -----             | -----             | -----             | -----             | -----             | -----              |
| 5' Pirin_3        | -----             | -----             | -----             | -----             | -----             | -----              |
| 5' Pirin_2        | -----             | -----             | -----             | -----             | -----             | -----              |
| 5' Pirin_4        | -----             | -----             | -----             | -----             | -----             | -----              |
| 5' Pirin_5        | -----             | -----             | -----             | -----             | -----             | -----              |
| cTvPirin_1        | -----             | -----             | -----             | -----             | -----             | -----              |
| cTvPirin_2        | -----             | -----             | -----             | -----             | -----             | -----              |
| cTvPirin_4        | -----             | -----             | -----             | -----             | -----             | -----              |
| TrVeBC2_24        | -----             | -----             | -----             | -----             | -----             | -----              |
| <i>TrVeGnuB1_</i> | -----             | -----             | -----             | -----             | -----             | -----              |
| cTvPirin_3        | -----             | -----             | -----             | -----             | -----             | -----              |
| <i>TrVe63GuB1</i> | -----             | -----             | -----             | -----             | -----             | -----              |
| TrVe62GuB1        | -----             | -----             | -----             | -----             | -----             | -----              |
| <i>TrVe61GuB1</i> | -----             | -----             | -----             | -----             | -----             | -----              |
| TrVe3GB1_6        | -----             | -----             | -----             | -----             | -----             | -----              |
| Contig5118        | -----             | -----             | -----             | -----             | -----             | -----              |
| <i>TrVeBC1_14</i> | -----             | -----             | -----             | -----             | -----             | -----              |
| <i>TrVe61FuB1</i> | <b>TCATGATCAT</b> | <b>GATCACAAGG</b> | <b>ATGAGACTAC</b> | <b>TTCTCATTGA</b> | <b>TTATCATCGA</b> | <b>TCCATTCTTC</b>  |
| Contig492         | -----             | -----             | -----             | -----             | -----             | -----              |
|                   | 61                |                   |                   |                   |                   | 120                |
| 5' Pirin_1        | -----             | -----             | -----             | -----             | -----             | -----              |
| 5' Pirin_3        | -----             | -----             | -----             | -----             | -----             | -----              |
| 5' Pirin_2        | -----             | -----             | -----             | -----             | -----             | -----              |
| 5' Pirin_4        | -----             | -----             | -----             | -----             | -----             | -----              |
| 5' Pirin_5        | -----             | -----             | -----             | -----             | -----             | -----              |
| cTvPirin_1        | -----             | -----             | -----             | -----             | -----             | -----              |
| cTvPirin_2        | -----             | -----             | -----             | -----             | -----             | -----              |
| cTvPirin_4        | -----             | -----             | -----             | -----             | -----             | -----              |
| TrVeBC2_24        | -----             | -----             | -----             | -----             | -----             | -----              |
| <i>TrVeGnuB1_</i> | -----             | -----             | -----             | -----             | -----             | -----              |
| cTvPirin_3        | -----             | -----             | -----             | -----             | -----             | -----              |
| <i>TrVe63GuB1</i> | -----             | -----             | -----             | -----             | -----             | -----              |
| TrVe62GuB1        | -----             | -----             | -----             | -----             | -----             | -----              |
| <i>TrVe61GuB1</i> | -----             | -----             | -----             | -----             | -----             | -----              |
| TrVe3GB1_6        | -----             | -----             | -----             | -----             | -----             | -----              |
| Contig5118        | -----             | -----             | -----             | -----             | -----             | -----              |
| <i>TrVeBC1_14</i> | -----             | -----             | -----             | -----             | -----             | -----              |
| <i>TrVe61FuB1</i> | <b>TCTTTTGGGG</b> | <b>CCCTAAGCAG</b> | <b>TTGCTTATAT</b> | <b>GTAGCTCATT</b> | <b>TAGATTTCCA</b> | <b>TTTTTTTTGCC</b> |
| Contig492         | -----             | -----             | -----             | -----             | -----             | -----              |

121 180

5' Pirin\_1 -----

5' Pirin\_3 -----

5' Pirin\_2 -----

5' Pirin\_4 -----

5' Pirin\_5 -----

cTvPirin\_1 -----

cTvPirin\_2 -----

cTvPirin\_4 -----

TrVeBC2\_24 -----AAA TATTTCAATT TATTAGAAAT GCCAC-----

TrVeGnuB1\_ -----AAA TATTTCAATT TATTAGAAAT GCCAC-----

cTvPirin\_3 -----

TrVe63GuB1 -----C-----

TrVe62GuB1 -----

TrVe61GuB1 -----

TrVe3GB1\_6 -----

Contig5118 -----

TrVeBC1\_14 -----

TrVe61FuB1 **AGCTCGAAAC CATTCTTGCC ATAGTAATAG TCTTCCATTG TTTTGTCAAT CTCAGCGTGC**

Contig492 -----

181 240

5' Pirin\_1 -----

5' Pirin\_3 -----

5' Pirin\_2 -----

5' Pirin\_4 -----

5' Pirin\_5 -----

cTvPirin\_1 -----

cTvPirin\_2 -----

cTvPirin\_4 -----

TrVeBC2\_24 -TATTACTC- -AGCTGGTTT GTAGACGGGC GGGCGCCTAT ATAA**ATGATC** TCTGTATCTA

TrVeGnuB1\_ -TATTACTC- -AGCTGGTTT GTAGACGGGC GGGCGCCTAT ATAA**ATGATC** TCTGTATCTA

cTvPirin\_3 -----

TrVe63GuB1 -TATTACTCT AAGCTGGTTT GTAGACGGGC GGGCGCCTAT ATAA**ATGATC** TCTGTATCTA

TrVe62GuB1 -----

TrVe61GuB1 -----CGGGC GGGCGCCTAT ATAA**ATGATC** TCTGTATCTA

TrVe3GB1\_6 -----

Contig5118 -----

TrVeBC1\_14 -----ACGGGC GGGCGCCTAT ATAA**ATGATC** TCTGTATCTA

TrVe61FuB1 **GTATTCATCA CAAACGGACC GT**-GACGGGC GGGCGCCTAT ATAA**ATGATC** TCTGTATCTA

Contig492 -----

241 300

5' Pirin\_1 -----AAA ATTCCTCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

5' Pirin\_3 -----AAA ATTCCTCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

5' Pirin\_2 -----AAA ATTCCTCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

5' Pirin\_4 ---AAAATTC ATTCATCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

5' Pirin\_5 -----AAA ATTCATCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

cTvPirin\_1 ----- ATTCCTCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

cTvPirin\_2 ----- ATTCCTCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

cTvPirin\_4 ----- ATTCCTCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

TrVeBC2\_24 CTAAACTTTC **ATTCCTCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC**

TrVeGnuB1\_ CTAAACTTTC **ATTCCTCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC**

cTvPirin\_3 ----- ATTCCTCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

TrVe63GuB1 CTAAACTTTC **ATTCATCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC**

TrVe62GuB1 -----CAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

TrVe61GuB1 CTAAACTTTC **ATTCATCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC**

TrVe3GB1\_6 -----CAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

Contig5118 -----CAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC

TrVeBC1\_14 CTAAACTTTC **ATTCCTCATA AACATCAAAT CCCCAATAAT AAAAAACCCG TCTTCTCGAC**

TrVe61FuB1 CTAAACTTTC **ATTCCTCATA AACATCAAAT CCCMAATAAT AAAAAACCCG TCTTCTCGAC**

Contig492 -----

301 360

5' Pirin\_1 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
5' Pirin\_3 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGGCTAGT TGCCAAGAAG ATCTTGGCCA  
5' Pirin\_2 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
5' Pirin\_4 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
5' Pirin\_5 GTTATATCAT CATGTCCAGT TTCCAACAAC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
cTvPirin\_1 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTCGGCCA  
cTvPirin\_2 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
cTvPirin\_4 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
TrVeBC2\_24 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
TrVeGnuB1\_ GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
cTvPirin\_3 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
TrVe63GuB1 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
TrVe62GuB1 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
TrVe61GuB1 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
TrVe3GB1\_6 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
Contig5118 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
TrVeBC1\_14 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
TrVe61FuB1 GTTATATCAT CATGTCCAGT TTCCAACAGC CCAGACTAGT TGCCAAGAAG ATCTTGGCCA  
Contig492 -----

361 420

5' Pirin\_1 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
5' Pirin\_3 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
5' Pirin\_2 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
5' Pirin\_4 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
5' Pirin\_5 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
cTvPirin\_1 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
cTvPirin\_2 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
cTvPirin\_4 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
TrVeBC2\_24 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
TrVeGnuB1\_ AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
cTvPirin\_3 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
TrVe63GuB1 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
TrVe62GuB1 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
TrVe61GuB1 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
TrVe3GB1\_6 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
Contig5118 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
TrVeBC1\_14 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
TrVe61FuB1 AGTCCCAGTC CGAGGGCGAT GGTGCACTTG TAAGAAGAAG CATTGGCAGG CCTGAGTTGA  
Contig492 -----

421 480

5' Pirin\_1 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATCTGCTGT TACACCTCCT GCTGGATTTT  
5' Pirin\_3 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
5' Pirin\_2 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
5' Pirin\_4 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
5' Pirin\_5 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
cTvPirin\_1 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
cTvPirin\_2 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
cTvPirin\_4 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
TrVeBC2\_24 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
TrVeGnuB1\_ AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
cTvPirin\_3 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
TrVe63GuB1 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
TrVe62GuB1 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
TrVe61GuB1 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
TrVe3GB1\_6 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
Contig5118 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
TrVeBC1\_14 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
TrVe61FuB1 AGTCCCTAGA TCCATTTCTC TTGCTAGATG AATTTGCTGT TACACCTCCT GCTGGATTTT  
Contig492 -----

|            |            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|------------|
|            | 481        |            |            |            |            | 540        |
| 5' Pirin_1 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| 5' Pirin_3 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| 5' Pirin_2 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| 5' Pirin_4 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| 5' Pirin_5 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| cTvPirin_1 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| cTvPirin_2 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| cTvPirin_4 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| TrVeBC2_24 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| TrVeGnuB1_ | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| cTvPirin_3 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| TrVe63GuB1 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| TrVe62GuB1 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| TrVe61GuB1 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| TrVe3GB1_6 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| Contig5118 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| TrVeBC1_14 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| TrVe61FuB1 | CTGACCATCC | TCACCGAGGC | TTTGAGACTG | TTACATATAT | GTTGCAGGGA | GGCGTCACAC |
| Contig492  | -----      | -----      | -----      | -----      | -----      | -----      |

|            |            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|------------|
|            | 541        |            |            |            |            | 600        |
| 5' Pirin_1 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| 5' Pirin_3 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| 5' Pirin_2 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGATGTGCAG | TGGATGACTG |
| 5' Pirin_4 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| 5' Pirin_5 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| cTvPirin_1 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| cTvPirin_2 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| cTvPirin_4 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| TrVeBC2_24 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| TrVeGnuB1_ | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| cTvPirin_3 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| TrVe63GuB1 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| TrVe62GuB1 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| TrVe61GuB1 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| TrVe3GB1_6 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| Contig5118 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| TrVeBC1_14 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| TrVe61FuB1 | ATCAAGATTT | TGCCGGTCAT | AAGGGCACCA | TAGGTGCTGG | TGACGTGCAG | TGGATGACTG |
| Contig492  | -----      | -----      | -----      | -----      | -----      | -----      |

|            |            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|------------|
|            | 601        |            |            |            |            | 660        |
| 5' Pirin_1 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGC-----  | -----      | -----      |
| 5' Pirin_3 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGC-----  | -----      | -----      |
| 5' Pirin_2 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGC-----  | -----      | -----      |
| 5' Pirin_4 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGC-----  | -----      | -----      |
| 5' Pirin_5 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGC-----  | -----      | -----      |
| cTvPirin_1 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| cTvPirin_2 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| cTvPirin_4 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| TrVeBC2_24 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| TrVeGnuB1_ | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| cTvPirin_3 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| TrVe63GuB1 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| TrVe62GuB1 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| TrVe61GuB1 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| TrVe3GB1_6 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| Contig5118 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| TrVeBC1_14 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| TrVe61FuB1 | CCGGCAGAGG | TATTGTTTAC | TCAGAAATGC | CCGCCGGAGA | AGGCACTCAC | ACTGGTCTCC |
| Contig492  | -----      | -----      | -----      | -----      | -----      | -----      |

|            |            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|------------|
|            | 661        |            |            |            |            | 720        |
| 5' Pirin_1 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_3 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_2 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_4 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_5 | -----      | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_1 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGTA | TCAAGAATTG |
| cTvPirin_2 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGTA | TCAAGAATTG |
| cTvPirin_4 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGTA | TCAAGAATTG |
| TrVeBC2_24 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGTA | TCAAGAATTG |
| TrVeGnuB1  | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGTA | TCAAGAATTG |
| cTvPirin_3 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGCA | TCAAGAATTG |
| TrVe63GuB1 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGTA | TCAAGAATTG |
| TrVe62GuB1 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGTA | TCAAGAATTG |
| TrVe61GuB1 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGTA | TCAAGAATTG |
| TrVe3GB1_6 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGTA | TCAAGAATTG |
| Contig5118 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGTA | TCAAGAATTG |
| TrVeBC1_14 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAA-TGATTG | AACCTAGGTA | TCAAGAATTG |
| TrVe61FuB1 | AATTGTGGAT | CAATCTCTCT | TCCAAGGACA | AAAATGATTG | AACCTAGGTA | TCAAGAA--- |
| Contig492  | -----      | -----      | -----      | -----      | -----      | -----      |

|            |            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|------------|
|            | 721        |            |            |            |            | 780        |
| 5' Pirin_1 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_3 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_2 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_4 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_5 | -----      | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_1 | CTGAGTAATG | ACATCCCCAA | ATCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GATCGCAGGA |
| cTvPirin_2 | CTGAGTAATG | ACATCCCCAA | AGCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GATCGCAGGA |
| cTvPirin_4 | CTGAGTAATG | ACATCCCCAA | AGCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GGTCGCAGGA |
| TrVeBC2_24 | CTGAGTAATG | ACATCCCCAA | AGCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GATCGCAGGA |
| TrVeGnuB1  | CTGAGTAATG | ACATCCCCAA | AGCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GATCGCAGGA |
| cTvPirin_3 | CTGAGTAATG | ACATCCCCAA | AGCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GATCGCAGGA |
| TrVe63GuB1 | CTGAGTAATG | ACATCCCCAA | AGCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GATCGCAGGA |
| TrVe62GuB1 | CTGAGTAATG | ACATCCCCAA | AGCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GATCGCAGGA |
| TrVe61GuB1 | CTGAGTAATG | ACATCCCCAA | AGCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GATCGCAGGA |
| TrVe3GB1_6 | CTGAGTAATG | ACATCCCCAA | AGCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GATCGCAGGA |
| Contig5118 | CTGAGTAATG | ACATCCCCAA | AGCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GATCGCAGGA |
| TrVeBC1_14 | CTGAGTAATG | ACATCCCCAA | AKCACAAAAA | GATGGGGTTG | AAGTAAAAGT | GATCGCAGGA |
| TrVe61FuB1 | -----      | -----      | -----      | -----      | -----      | -----      |
| Contig492  | -----      | -----      | -----      | -----      | -----      | -----      |

|            |            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|------------|
|            | 781        |            |            |            |            | 840        |
| 5' Pirin_1 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_3 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_2 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_4 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_5 | -----      | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_1 | GAAGCAATGG | GTGTTCACTC | ACAAGTTTTT | ACACGAACCC | CAACAATGTA | CGTCGATTTT |
| cTvPirin_2 | GAAGCAATGG | GTGTTCACTC | ACAAGTTTTT | ACACGAACCC | CAACAATGTA | CGTCGATTTT |
| cTvPirin_4 | GAAGCAATGG | GTGTTCACTC | ACAAGTTTTT | CCACGAACCC | CAACAATGTA | CGTCGATTTT |
| TrVeBC2_24 | GAAGCAATGG | GTGTTCACTC | ACAAGTTTTT | ACACGAACCC | CAACAATGTA | CGTCGATTTT |
| TrVeGnuB1  | GAAGCAATGG | GTGTTCACTC | ACAAGTTTTT | ACACGAACCC | CAACAATGTA | CGTCGATTTT |
| cTvPirin_3 | GAAGCAATGG | GTGTTCACTC | ACAAGTTTTT | ACACGAACCC | CAACAATGTA | CGTCGATTTT |
| TrVe63GuB1 | GAAGCAATGG | GTGTTCACTC | ACAAGTTTTT | ACACGAACCC | CAACAATGTA | CGTCGATTTT |
| TrVe62GuB1 | GAAGCAATGG | GTGTTCACTC | ACAAGTTTTT | ACACGAACCC | CAACAATGTA | CGTCGATTTT |
| TrVe61GuB1 | GAAGCAATGG | GTGTTCACTC | ACAAGTTTTT | ACACGAACCC | CAACAATGTA | CGTCGATTTT |
| TrVe3GB1_6 | GAAGCAATGG | GTGTTCACTC | ACAAGTTTTT | ACACGAACCC | CAACAATGTA | CGTCGATTTT |
| Contig5118 | GAAGCAATGG | GTGTTCACTC | ACAAGTTTTT | ACACGAACCC | CAACAATGTA | CGTCGATTTT |
| TrVeBC1_14 | GAAG-----  | -----      | -----      | -----      | -----      | -----      |
| TrVe61FuB1 | -----      | -----      | -----      | -----      | -----      | -----      |
| Contig492  | -----      | -----      | -----      | -----      | -----      | -----      |

|            |            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|------------|
|            | 841        |            |            |            |            | 900        |
| 5' Pirin_1 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_3 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_2 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_4 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_5 | -----      | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_1 | ACTCTAAAAC | CAAATTCCGA | GTATCATCAA | GGCATTCCGG | ATTCTTGGAA | TGCGTTTGTG |
| cTvPirin_2 | ACTCTAAAAC | CAAATTCCGA | GTATCATCAA | GGCATTCCGG | ATTCTTGGAA | TGCGTTTGTG |
| cTvPirin_4 | ACTCTAAAAC | CAAATTCCGA | GTATCATCAA | GGCATTCCGG | ATTCTTGGAA | TGCGTTTGTG |
| TrVeBC2_24 | ACTCTAAAAC | CAAATTCCGA | GTATCATCAA | GGCATTCCGG | ATTCTTGGAA | TGCGTTTGTG |
| TrVeGnuB1  | ACTCTAAAAC | CAAATTCCGA | GTATCATCAA | GGCATTCCGG | ATTCTTGGAA | TGCGTTTGTG |
| cTvPirin_3 | ACTCTAAAAC | CAGATTCCGA | GTATCATCAA | GGCATTCCGG | ATTCTTGGAA | TGCGTTTGTG |
| TrVe63GuB1 | ACTCTAAAAC | CAAATTCCGA | GTATCATCAA | GGCATTCCGG | ATTCTTGGAA | TGCGTTTGTG |
| TrVe62GuB1 | ACTCTAAAAC | CAAATTCCGA | GTATCATCAA | GGCATTCCGG | ATTCTTGGAA | TGCGTTTGTG |
| TrVe61GuB1 | ACTCTAAAAC | CAAATTCCGA | GTATCATCAA | GGCATTCCGG | ATTCTTGGAA | TGCGTTTGTG |
| TrVe3GB1_6 | ACTCTAAAAC | CAAATTCCGA | GTATCATCAA | GGCATTCCGG | ATTCTTGGAA | TGCGTTTGTG |
| Contig5118 | ACTCTAAAAC | CAAATTCCGA | GTATCATCAA | GGCATTCCGG | ATTCTTGGAA | TGCGTTTGTG |
| TrVeBC1_14 | -----      | -----      | -----      | -----      | -----      | -----      |
| TrVe61FuB1 | -----      | -----      | -----      | -----      | -----      | -----      |
| Contig492  | -----      | -----      | -----      | -----      | -----      | -----      |

|            |            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|------------|
|            | 901        |            |            |            |            | 960        |
| 5' Pirin_1 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_3 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_2 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_4 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_5 | -----      | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_1 | TACATTATTG | AAGGTGAAGG | TGTATTTGGC | ATCCCGAATT | CGAAGCCTGC | AGAAGCTCAT |
| cTvPirin_2 | TACATTATTG | AAGGCGAGGG | TGTATTTGGC | ATCCCGAATT | CGAAGCCTGC | AGAAGCTCAT |
| cTvPirin_4 | TACATTATTG | AAGGTGAAGG | TGTATTTGGC | ATCCCGAATT | CGAAGCCTGC | AGAAGCTCAT |
| TrVeBC2_24 | TACATTATTG | AAGGTGAAGG | TGTATTTGGC | ATCCCGAATT | CGAAGCCTGC | AGAAGCTCAT |
| TrVeGnuB1  | TACATTATTG | AAGGTGAAGG | TGTATTTGGC | ATCCCGAATT | CGAAGCCTGC | AGAAGCTCAT |
| cTvPirin_3 | TACATTATTG | AAGGTGAAGG | TGTATTTGGC | ATCCCGAATT | CGAAGCCTGC | AGAAGCTCAT |
| TrVe63GuB1 | TACATTATTG | AAGGTGAAGG | TGTATTTGGC | ATCCCGAATT | CGAAGCCTGC | AGAAGCTCAT |
| TrVe62GuB1 | TACATTATTG | AAGGTGAAGG | TGTATTTGGC | ATCCCGAATT | CGAAGCCTGC | AGAAGCTCAT |
| TrVe61GuB1 | TACATTATTG | AAGGTGAAGG | TGTATTTGGC | ATCCCGAATT | CGAAGCCTGC | AGAAGCTCAT |
| TrVe3GB1_6 | TACATTATTG | AAGGTGAAGG | TGTATTTGGC | ATCCCGAATT | CGAAGCCTGC | AGAAGCTCAT |
| Contig5118 | TA-----    | -----      | -----      | -----      | -----      | -----      |
| TrVeBC1_14 | -----      | -----      | -----      | -----      | -----      | -----      |
| TrVe61FuB1 | -----      | -----      | -----      | -----      | -----      | -----      |
| Contig492  | TACATTATTG | AAGGTGAAGG | TGTATTTGGC | ATCCCGAATT | CGAAGCCTGC | AGAAGCTCAT |

|            |            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|------------|
|            | 961        |            |            |            |            | 1020       |
| 5' Pirin_1 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_3 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_2 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_4 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_5 | -----      | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_1 | CATATCTTGG | TTTTGGGACC | TGGAGAGGGG | CTAAGTGTGT | GGAACAAGTT | CACAGAACCA |
| cTvPirin_2 | CATATCTTGG | TTTTGGGACC | TGGAGAGGGG | CTAAGTGTGT | GGAACAAGTT | CACAGAACCA |
| cTvPirin_4 | CATATCTTGG | TTTTGGGACC | TGGAGAGGGG | CTAAGTGTGT | GGAACAAGTT | CACAGAACCA |
| TrVeBC2_24 | CATATCTTGG | TTTTGGGACC | TGGAGAGGGG | CTAAGTGTGT | GGAACAAGTT | CACAGAACCA |
| TrVeGnuB1  | CATATCTTGG | TTTTGGGACC | TGGAGAGGGG | CTAAGTGTGT | GGAACAAGTT | CACAGAACCA |
| cTvPirin_3 | CATATCTTGG | TTTTGGGACC | TGGAGAGGGG | CTAAGTGTGT | GGAACAAGTT | CACAGAACCA |
| TrVe63GuB1 | CATATCTTGG | TTTTGGGACC | TGGAGAGGGG | CTAAGTGTGT | GGAACAAGTT | CACAGAACCA |
| TrVe62GuB1 | CATATCTTGG | TTTTGGGACC | TGGAGAGGGG | CTAAGTGTGT | GGAACAAGTT | CACAGAACCA |
| TrVe61GuB1 | CATATCTTGG | TTTTGGGACC | TGGAGAGGGG | CTAAGTGTGT | GGAACAAGTT | CACAGAACCA |
| TrVe3GB1_6 | CATATCTTGG | TTTTGGGACC | TGGAGAGGGG | CTAAGTGTGT | GGAACAAGTT | CACAGAACCA |
| Contig5118 | -----      | -----      | -----      | -----      | -----      | -----      |
| TrVeBC1_14 | -----      | -----      | -----      | -----      | -----      | -----      |
| TrVe61FuB1 | -----      | -----      | -----      | -----      | -----      | -----      |
| Contig492  | CATATCTTGG | TTTTGGGACC | TGGAGAGGGG | CTAAGTGTGT | GGAACAAGTT | CACAGAACCA |

|            |             |            |            |            |            |            |
|------------|-------------|------------|------------|------------|------------|------------|
|            | 1021        |            |            |            |            | 1080       |
| 5' Pirin_1 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_3 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_2 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_4 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_5 | -----       | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_1 | TTGAGGTTTA  | TTTTGGTAGG | CGGGCAGCCA | CTGAATGAGC | CTGTGGTTCA | GCACGGTCCG |
| cTvPirin_2 | TTGAGGTTTA  | TTTTGGTAGG | CGGGCAGCCA | CTGAATGAGC | CTGTGGTTCA | GCACGGTCCG |
| cTvPirin_4 | TTGAGGTTTA  | TTTTGGTAGG | CGGGCAGCCA | CTGAATGAGC | CTGTGGTTCA | GCACGGTCCG |
| TrVeBC2_24 | TTGAGGTTTA  | TTTTGGTAGG | CGGGCAGCCA | CTGAATGAGC | CTGTGGTTCA | GCACGGTCCG |
| TrVeGnuB1  | TTGAGGTTTA  | TTTTGGTAGG | CGGGCAGCCA | CTGAATGAGC | CTGTGGTTCA | GCACGGTCCG |
| cTvPirin_3 | TTGAGGTTTA  | TTTTGGTAGG | CGGGCAGCCA | CTGAATGAGC | CTGTGGTTCA | GCACGGTCCG |
| TrVe63GuB1 | TTGAGGTTTA  | TTTTGGTAGG | CGGGCAGCCA | CTGAATGAGC | CTGTGGTTCA | GCACGGTCCG |
| TrVe62GuB1 | TTGAGGTTTA  | TTTTGGTAGG | CGGGCAGCCA | CTGAATGAGC | CTGTGGTTCA | GCACGGTCCG |
| TrVe61GuB1 | TTGAGGTTTA  | TTTTGGTAGG | CGGGCAGCCA | CTGAATGAGC | CTGTGGTTCA | GCACGGTCCG |
| TrVe3GB1_6 | TTGAGGTTTA  | TTTTGGTAGG | CGGGCAGCCA | CTGAATGAGC | CTGTGGTTCA | G-----     |
| Contig5118 | -----       | -----      | -----      | -----      | -----      | -----      |
| TrVeBC1_14 | -----       | -----      | -----      | -----      | -----      | -----      |
| TrVe61FuB1 | -----       | -----      | -----      | -----      | -----      | -----      |
| Contig492  | TTGAGGTTTA  | TTTTGGTAGG | CGGGCAGCCA | CTGAATGAGC | CTGTGGTTCA | GCACGGTCCG |
|            | 1081        |            |            |            |            | 1140       |
| 5' Pirin_1 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_3 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_2 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_4 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_5 | -----       | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_1 | TTTGTGATGA  | ATACGCACGC | TGAGATTGAC | AAAACAATGG | AAGACTATTA | CTATGGCAAG |
| cTvPirin_2 | TTTGTGATGA  | ATACGCACGC | TGAGATTGAC | AAAACAATGG | AAGACTATTA | CTATGGCAAG |
| cTvPirin_4 | TTTGTGATGA  | ATACGCACGC | TGAGATTGAC | AAAACAATGG | AAGACTATTA | CTATGGCAAG |
| TrVeBC2_24 | TTTGTGATGA  | ATACGCACGC | TGAGATTGAC | AAAACAATGG | AAGACTATTA | CTATGGCAAG |
| TrVeGnuB1  | TTTGTGATGA  | ATACGCACGC | TGAGATTGAC | AAAACAATGG | AAGACTATTA | CTATGGCAAG |
| cTvPirin_3 | TTTGTGATGA  | ATACGCACGC | TGAGATTGAC | AAAACAATGG | AAGACTATTA | CTATGGCAAG |
| TrVe63GuB1 | TTTGTGATGA  | ATACGCACGC | TGAGATTGAC | AAAACAATGG | AAGACTATTA | CTATGGCAAG |
| TrVe62GuB1 | TTTGTGATGA  | ATACGCACGC | TGAGATTGAC | AAAACAATGG | AAGACTATTA | CTATGGCAAG |
| TrVe61GuB1 | TTTGTGATGA  | ATACGCACGC | TGAGATTGAC | AAAACAATGG | AAGACTATTA | CTATGGCAAG |
| TrVe3GB1_6 | -----       | -----      | -----      | -----      | -----      | -----      |
| Contig5118 | -----       | -----      | -----      | -----      | -----      | -----      |
| TrVeBC1_14 | -----       | -----      | -----      | -----      | -----      | -----      |
| TrVe61FuB1 | -----       | -----      | -----      | -----      | -----      | -----      |
| Contig492  | TTTGTGATGA  | ATACGCACGC | TGAGATTGAC | AAAACAATGG | AAGACTATTA | CTATGGCAAG |
|            | 1141        |            |            |            |            | 1200       |
| 5' Pirin_1 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_3 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_2 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_4 | -----       | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_5 | -----       | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_1 | AATGGTTTTCG | AGCTGGCAAA | AAAATGGAAA | TCTAAATGAG | CTACATATAA | GCAACTGCTT |
| cTvPirin_2 | AATGGTTTTCG | AGCTGGCAAA | AAAATGGAAA | TCTAAATGAG | CTACATATAA | GCAACTGCTT |
| cTvPirin_4 | AATGGTTTTCG | AGCTGGCAAA | AAAATGGAAA | TCTAAATGAG | CTACATATAA | GCAACTGCTT |
| TrVeBC2_24 | AATGGTTTTCG | AGCTGGCAAA | AAAATGGAAA | TCTAAATGAG | CTACATATAA | GCAACTGCTT |
| TrVeGnuB1  | AATGGTTTTCG | AGCTGGCAAA | AAAATGGAAA | TCTAAATGAG | CTACATATAA | GCAACTGCTT |
| cTvPirin_3 | AATGGTTTTCG | AGCTGGCAAA | AAAATGGAAA | TCTAAATGAG | CTACATATAA | GCAACTGCTT |
| TrVe63GuB1 | AATGGTTTTCG | AGCTGGCAAA | AAAATGGAAA | TCTAAATGAG | CTACATATAA | GCAACTGCTT |
| TrVe62GuB1 | AATGGTTTTCG | AGCTGGCAAA | AAAATGGAAA | TCTAAATGAG | CTACATATAA | GCAACTGCTT |
| TrVe61GuB1 | AATGGTTTTCG | AGCTGGCAAA | AAAATGGAAA | TCTAAATGAG | CTACATATAA | GCAACTGCTT |
| TrVe3GB1_6 | -----       | -----      | -----      | -----      | -----      | -----      |
| Contig5118 | -----       | -----      | -----      | -----      | -----      | -----      |
| TrVeBC1_14 | -----       | -----      | -----      | -----      | -----      | -----      |
| TrVe61FuB1 | -----       | -----      | -----      | -----      | -----      | -----      |
| Contig492  | AATGGTTTTCG | AGCTGGCAAA | AAAATGGAAA | TCTAAATGAG | CTACATATAA | GCAACTGCTT |

1201 1260

5' Pirin\_1 -----  
5' Pirin\_3 -----  
5' Pirin\_2 -----  
5' Pirin\_4 -----  
5' Pirin\_5 -----  
cTvPirin\_1 AGGGCCCCAA AAGAATATTT AGAACGTCCA TGTTTTAAAA AGTCCTTATT TCCATTTTCAT  
cTvPirin\_2 AGGGCCCCAA AAGAATATTT AGAACGTCCA TGTTTTAAAA AGTCCTTATT TCCATTTTCAT  
cTvPirin\_4 AGGGCCCCAA AAGAATATTT AGAACGTCCA TGTTTTAAAA AGTCCTTATT TCCATTTTCAT  
TrVeBC2\_24 AGGGCCCCAA AAGAATATTT AGAACGTCCA TGTTTTAAAA AGTCCTTATT TCCATTTTCAT  
TrVeGnuB1 AGGGCCCCAA AAGAATATTT AGAACGTCCA TGTTTTAAAA AGTCCTTATT TCCATTTTCAT  
cTvPirin\_3 AGGGCCCCAA AAGAATATTT AGAACGTCCA TGTTTTAAAA AGTCCTTATT TCCATTTTCAT  
TrVe63GuB1 AGGGCCCCAA AAGAATATTT AGAACGTCTA TCTT---CGA TGTTCAACGG GC---TTGCAA  
TrVe62GuB1 AGGGCCCCAA AAGAATATTT AGAACGTCCA TGTTTTAAAA AGTCCTTATT TCCATTTTCAT  
TrVe61GuB1 AGGGCCCCAA AAGAATATTT AGAACGTCCA -----  
TrVe3GB1\_6 -----  
Contig5118 -----  
TrVeBC1\_14 -----  
TrVe61FuB1 -----  
Contig492 AGGGCCCCAA AAGAATATTT AGAACGTCCA TGTTTTAAAA AGTCCTTATT TCCATTTTCAT

1261 1320

5' Pirin\_1 -----  
5' Pirin\_3 -----  
5' Pirin\_2 -----  
5' Pirin\_4 -----  
5' Pirin\_5 -----  
cTvPirin\_1 GTCTTTTTTT T----GTTTA AAAAATAAAG ATATAGGAAA ATAAATATGA AGTGAAATGT  
cTvPirin\_2 GTCTTTTTTT TT---GTTTA AAAAATAAAG ATATAGGAAA ATAAATATGA AGTGAAATGT  
cTvPirin\_4 GTCTTTTTTT TT---GTTTA AAAAATAAAG ATATAGGAAA ATAAATATGA AGTGAAATGT  
TrVeBC2\_24 GTCTTTTTTT TT---GTTTA AAAAATAAAG ATATAGGAAA ATAAATATGA AGTGAAATGT  
TrVeGnuB1 GTCTTTTTTT TT---GTTTA AAAAATAAAG ATATAGGAAA ATAAATATGA AGTGAAATGT  
cTvPirin\_3 GTCTTTTTTT TTTTGTGTTA AAAAATAAAG ATATAGGAAA ATAAATATGA AGTGAAATGT  
TrVe63GuB1 GATCGTTCTC ----AATAAA GAAACTAAA AGCCCGAATA ACAATTCCGA CG---GACGG  
TrVe62GuB1 GTCTTTTTTT TT-----  
TrVe61GuB1 -----  
TrVe3GB1\_6 -----  
Contig5118 -----  
TrVeBC1\_14 -----  
TrVe61FuB1 -----  
Contig492 GTCTTTTTTT TTT--GTTTA AAAAATAAAG ATATAGGAAA ATAAATATGA AGTGAAATGT

1321 1380

5' Pirin\_1 -----  
5' Pirin\_3 -----  
5' Pirin\_2 -----  
5' Pirin\_4 -----  
5' Pirin\_5 -----  
cTvPirin\_1 AATACATCTC GTATTGTGAT TTGTGCCATT TATTTTTATT GGAAAGCTTT TGGTTTCGTT  
cTvPirin\_2 AATACATCTC GTATTGTGAT TTGTGCCATT TATTTTTATT GGAAAGCTTT TGGTTTCGTT  
cTvPirin\_4 AATACATCTC GTATTGTGAT TTGTGCCATT TATTTTTATT GGAAAGCTTT TGGTTTCGTT  
TrVeBC2\_24 AATACATCTC GTATTGTGAT TTGTGCCATT TATTTTTATT GGAAAGCTTT TGGTTTCGTT  
TrVeGnuB1 AATACATCTC GTATTGTGAT TTGTGCCATT TATTTTTATT GGAAAGCTTT TGGTTTCGTT  
cTvPirin\_3 AATACATCTC GTATTGTGAT TTGTGCCATT TATTTTTATT GGAAAGCTTT TGGTTTCGTT  
TrVe63GuB1 GAGGC-TGTC GAAG-----  
TrVe62GuB1 -----  
TrVe61GuB1 -----  
TrVe3GB1\_6 -----  
Contig5118 -----  
TrVeBC1\_14 -----  
TrVe61FuB1 -----  
Contig492 AATACATCTC GTATTGTGAT TTGTGCCATT TATTTTTATT GGAAAGCTTT TGGTTTCGTT



|            |            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|------------|
|            | 1381       |            |            |            |            | 1440       |
| 5' Pirin_1 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_3 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_2 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_4 | -----      | -----      | -----      | -----      | -----      | -----      |
| 5' Pirin_5 | -----      | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_1 | -----      | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_2 | -----      | -----      | -----      | -----      | -----      | -----      |
| cTvPirin_4 | -----      | -----      | -----      | -----      | -----      | -----      |
| TrVeBC2_24 | ACATAGGTTT | GATTTGATTT | TGAAGATCCA | AAATGTCATT | GGCTTGCCCT | GTCTATCACT |
| TrVeGnuB1  | ACATAGGTTT | GATTTGATTT | TGAAGATCCA | AAATGTCATT | GGCTTGCCCT | GTCTATCACT |
| cTvPirin_3 | -----      | -----      | -----      | -----      | -----      | -----      |
| TrVe63GuB1 | -----      | -----      | -----      | -----      | -----      | -----      |
| TrVe62GuB1 | -----      | -----      | -----      | -----      | -----      | -----      |
| TrVe61GuB1 | -----      | -----      | -----      | -----      | -----      | -----      |
| TrVe3GB1_6 | -----      | -----      | -----      | -----      | -----      | -----      |
| Contig5118 | -----      | -----      | -----      | -----      | -----      | -----      |
| TrVeBC1_14 | -----      | -----      | -----      | -----      | -----      | -----      |
| TrVe61FuB1 | -----      | -----      | -----      | -----      | -----      | -----      |
| Contig492  | AAAAAAAAAA | AAAAAAAAAA | AAAAGCTTGT | -----      | -----      | -----      |

  

|            |            |            |            |            |       |      |
|------------|------------|------------|------------|------------|-------|------|
|            | 1441       |            |            |            |       | 1483 |
| 5' Pirin_1 | -----      | -----      | -----      | -----      | ----- | ---  |
| 5' Pirin_3 | -----      | -----      | -----      | -----      | ----- | ---  |
| 5' Pirin_2 | -----      | -----      | -----      | -----      | ----- | ---  |
| 5' Pirin_4 | -----      | -----      | -----      | -----      | ----- | ---  |
| 5' Pirin_5 | -----      | -----      | -----      | -----      | ----- | ---  |
| cTvPirin_1 | -----      | -----      | -----      | -----      | ----- | ---  |
| cTvPirin_2 | -----      | -----      | -----      | -----      | ----- | ---  |
| cTvPirin_4 | -----      | -----      | -----      | -----      | ----- | ---  |
| TrVeBC2_24 | GTCAATCCAA | TCTTTCTTCC | TGAGAATGCT | GCATACAGAT | TTG   |      |
| TrVeGnuB1  | GTCAATCCAA | TCTTTCTTCC | TGAGAATGCT | GCATACAGAT | TTG   |      |
| cTvPirin_3 | -----      | -----      | -----      | -----      | ----- | ---  |
| TrVe63GuB1 | -----      | -----      | -----      | -----      | ----- | ---  |
| TrVe62GuB1 | -----      | -----      | -----      | -----      | ----- | ---  |
| TrVe61GuB1 | -----      | -----      | -----      | -----      | ----- | ---  |
| TrVe3GB1_6 | -----      | -----      | -----      | -----      | ----- | ---  |
| Contig5118 | -----      | -----      | -----      | -----      | ----- | ---  |
| TrVeBC1_14 | -----      | -----      | -----      | -----      | ----- | ---  |
| TrVe61FuB1 | -----      | -----      | -----      | -----      | ----- | ---  |
| Contig492  | -----      | -----      | -----      | -----      | ----- | ---  |

### B. Schematic *TvPirin* gene structure

The genomic sequence of the *TvPirin* gene is presented in Additional file 6.

