**S1. Accession No**

|  |  |  |
| --- | --- | --- |
| **Family** | **Species** | **Gene Bank IDs** |
| **Vespidae** | *Vespa mandarinia* | XP\_035737952.1 |
|  | *Vespa crabro* | XP\_046824901.1 |
|  | *Vespa velutina* | XP\_047357593.1 |
|  | *Vespula vulgaris* | XP\_050858048.1 |
|  | *Vespula pensylvanica* | XP\_043673380.1 |
|  | *Polistes dominula* | XP\_015177827.1 |
|  | *Polistes fuscatus* | XP\_043495209.1 |
| **Apidae** | *Bombus vancouverensis nearcticus* | XP\_033205116.1 |
|  | subgenus *Bombus huntii* | XP\_050473413.1 |
|  | *Bombus impatiens* | XP\_003491527. 1 |
|  | *Bombus terrestris* | XP\_003394698.1 |
|  | *Bombus ignitus* | *8EW5\_A Chain A* |
|  | *Apis dorsata* | *XP\_006618153.1* |
|  | *Apis florea* | XP\_003696584.1 |
|  | *Apis laboriosa* | XP\_043792750 .1 |
|  | *Apis mellifera caucasica* | KAG6799352.1 |
|  | *Apis cerana* | XP\_016912210.1 |
|  | *Megachile rotundata* | XP\_003706340.1 |
|  | *Melipona quadrifasciata* | KOX67587.1 |
|  | *Frieseomel ittavaria* | XP\_043521843. 1 |
|  | *Habropoda laboriosa* | XP\_017790128.1 |
|  | *Colletes gigas* | XP\_043257386.1 |
|  | *Osmia lignaria* | XP\_034180962.1 |
|  | *Ceratina calcarata* | XP\_017884125.1 |
| **Formicidae** | *Camponotus floridanus* | XP\_011267943.1 |
|  | *Monomorium pharaonis* | XP\_012533138.1 |
|  | *Pogonomyrmex barbatus* | XP\_011629524.1 |
|  | *Dinoponera quadriceps* | XP\_014479977.1 |
|  | *Harpegnathos saltator* | XP\_011154535.1 |
|  | *Odontomachus brunneus* | XP\_032685464.1 |
|  | *Acromyrmex echinatior* | XP\_011064338.1 |
|  | *Pseudomyrmex gracilis* | XP\_020284828.1 |
|  | *Cataglyphis hispanica* | XP\_050455871.1 |
|  | *Formica exsecta* | XP\_029672853.1 |
|  | *Nylanderia fulva* | XP\_029155503.1 |
|  | *Solenopsis invicta* | XP\_011171429.1 |
|  | *Temnothorax longispinosus* | TG Z32040.1 |

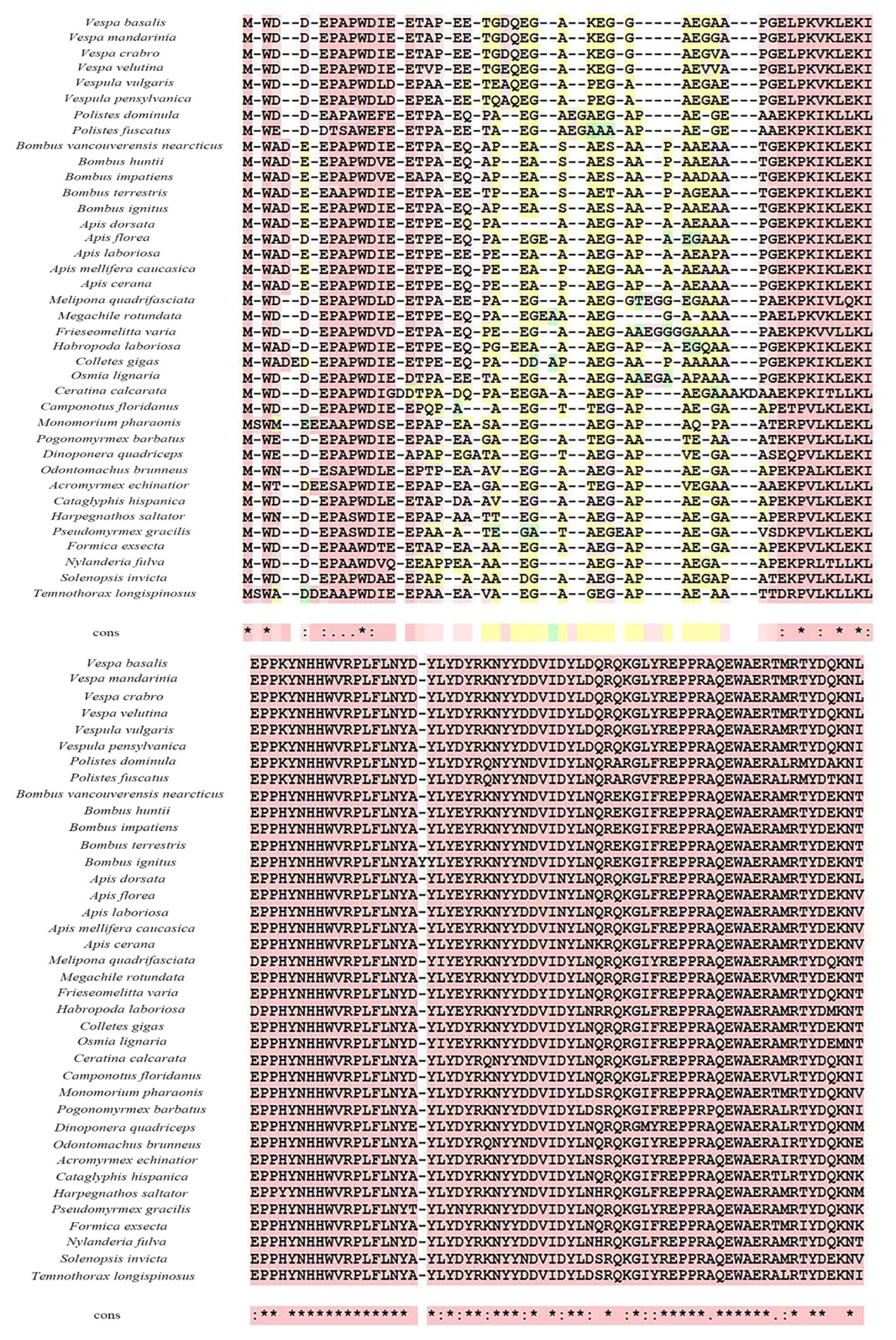


 Figure S2. Protein Homology

**S3. Primers details**

|  |  |  |
| --- | --- | --- |
| **primer name** | **Primer No** | **primer sequence 5-3** |
| *blue.fasta-1* | | |
| RT1569-A-P1F | P1 | *CATTCGATCTGTTTGATATAAAAGAGC* |
| RT1569-A-P1R | *CTTTAGCGATTCTAACTTCGACACT* |
| RT1569-A-P2F | P2 | *GGGATACCTAACTACGTGCAGTTTC* |
| RT1569-A-P2R | *TCCATTTGATGCTTGCTTTATTC* |
| *ul.fasta-1* | | |
| RT1569-C-P1F | P3 | *ATCTTTTAAAAAAGAACCGATTTGTTG* |
| RT1569-C-P1R | *GGTATCGGTTAAATAATCAAAAGAACAG* |
| RT1569-C-P2F | P4 | *ATGGAAAATTATCACGTGGTCAAGT* |
| RT1569-C-P2R | *TTATATGCCAGGAATTTACTTTATTGG* |
| *Vespa velutina flightin (LOC124952177), mRNA(1).fasta-1* | | |
| RT1569-D-2F | P4 | *ATAAAAGCAAGAAAGAAGGCAAGGT* |
| RT1569-D-2R | *TATCGGCGGATCTCTTAATACTCTT* |
| RT1569-D-P2F | P5 | *CGCCCATTATTTCTCAATTATGACT* |
| RT1569-D-P2R | *TAAGTAAAAGTGCACGTGTATTTTATAAT* |

S5. full length of flightin

|  |  |
| --- | --- |
| **identification number** | **sequence** |
| **blue.fasta-1** | CATTCGATCTGTTTGATATAAAAGAGCTCACTAACTTTGGTACGGGTCAAGTGAGTTGCGGAACGTGCTGTCAACTTATCGCACCGCGTCTCACTTCAATTCAGATTCGAACGGACGTAGAAATAAAGTAGAAGTTTATTTTACATCTTAACTTGACATATCTATTCAAGGTCCTAAGGGTTGAAACCTTTTGGACGTGGATAGGACGAGTCAAGACGACCACTAAAACTCTTCTTCGTTCAGACATCTCGTTTATCTCGGAAGATCCATTTTAACGATTCGTCAGTCTACCAACCGAGGACACAGCCTTGAAGAAGGATGCTGCTGCAAAACTATACCTTCGAGAACGGCCCTCAGCCTTTTGTAGGCGGAATGGGAGAGGTCCAACAAATGCAAGAAAGATTTTTGGGATGGAACGTACCACCGGAACACATGGGACTCGTACACGTTCATTGGAGGGGCTACCTAGCACCTGGAAAATACTGGCACATTGGTCTCTCGCTTATTTATTTTATGCTGTTTGTCATGTCCGTCGTTGGAAATGGATGCGTCGTATGGATATTTAGCACATCAAAAGCTCTTAGGACACCCTCGAACATGTTTATCGTCAATTTGGCTATATTCGATCTAACGATGGCGTTAGAAATTCCACATTTCATAATAAATAGCTTTATACAACGCATTTGGGGTTGGGAGATTGGTTGTGCTATATTTGCATTTTTGGGCAGTATTTCTGGTATCGGGCAGGCAATCTCCAACGTTGCCATTGCCTACGATCGTTACAGAACGATATCGTGTCCGATCGATGGTAGACTAAACGGATCGCAAGCTGGATTGATCGTTGCATTTACTTGGTTCTGGGCTTTACCATTTTCAGTTTTACCTCTTATAGAGGTATGGGGAAAATTTGTACCAGAGGGATACCTAACTACATGCAGTTTCGATTTTCTAACGGATAACTCGGATACGAGGGTTTTCGTAGCTTCGATCTTTCTTTGGTCTTATCTTTTACCATTGACCCTCATAGTTTATTTTTACTCGCAATTGATTAGATCCATTAGACAACACGAGAAGATGCTTCGCGATCAGGCAAAAAAAATGAACGTGAAATCTTTGGTTTCAAATCAGGATAAAGAACGTAGCGTCGAAGTTAGAATCGCTAAAGTAGCGTTCACTATTTTCTTCTTATTTCTCTGCGCGTGGACGCCTTATGCTGTTGTCGCTGTTATCGGTGCTTTTGGTAATAGCGACTTGTTGACACCTCACGTAGGTATGTTACCAGCAGTTTTCGCAAAATCGGTTTCGTGCATAGATCCATGGATTTATGCCATCAATCATCCAAGGTATCGTCAGGAATTACAAAAGCGATGCAAGTGGATGGGAATACGAGAACCCGAACCAGTTGCAGACAATGTTTCAGCGCAGACTGAAAAACTTAAGGCAGACGAAGCATAATTCTAAATGTTTTATGTACTTTATGGAAAATGAAAAAACGACGGCATGGATGATCGATCGTATCGAATCGTCAATCCACCACCGATTCGACATCGATCTTTTGTCTCGTCTACGATTTCTTTTATTTGTCAATATATTATAAATAGAAATTATTACCAAAATATTCTGTATAAAAATTGTCGTTATTATTATTATTATTATTATTATTATTATTATTATTCTTATTATTATTATTATTATCATTATACAGTAGAACGTGGCACATACACGCTAATCTGTGGTTTCTTATATAAATTTGAATAAAGCAAGCATCAAATGGA |
| **ul.fasta-1** | ATCTTTTAAAAAAGAACCGATTTGTTGGATTAAATTTCTACTTTTGTTCCATACAAAAATGGATACTAAAAATGGAACTAAATCGACACAAAATAAGATACTATGAAAAAGTAGTCAACAGCAATGAAGATAAGAATGTATACTATAATTCGAAATCGATTGATTTGACTTTGAAGTTTGCTCTTGCTGACCAACGGTAATCAAGGGATGATCCGTAGCTGATCCTCAAATGAAGCCATATCGTCGAGCTGATTAAAGGTTTCATGGATTTAATTTGACAGATATGGTATAAAAGGCCACATCTTGGTTAATTCAAAAACAAGGTGAGGGACTGGTAGACGGTGACCACCAACATGTTCAACGACAGTATTCATTGGGAGGCGAGAGTTCTACCAGCAGGTCCACCACGCCTATTGGGATGGAACGTCCCTGCCGAAGAATTGGTACATGTACCGGAACATTGGCTGGTCTTTCCTGAACCCAATCCCTCCCTTCATTATATGCTGGCCCTGTTATATATATTATTCACATTCATTGCTTTACTTGGCAATGGTCTCGTCATATGGATATTTTGCGCTGCCAAATCCTTGAGGACTCCCTCGAACATGTTCGTTGTGAATCTTGCGATTTGCGATTTTGCCATGATGATGAAGACACCAATTTTTATATACAATTCATTTAACACCGGCTTTGCTTTGGGCAATCTGGCATGCCAGATTTTTGCTACGATTGGTTCATTGTCTGGCATTGGTGCAGCGGTAACTAATGCTGCGATAGCATATGATAGATACAGTACCATAGCCAGACCATTGGATGGAAAATTATCACGTGGTCAAGTGATTCTCTTTGTCGGATTAATTTGGGTTTACGTTTTGCCTTGGGTATTAATGCCTGCAATGGGTGTTTGGGGTCGTTATGTACCTGAAGGATTTCTTACAAGCTGTTCTTTTGATTATTTAACCGATACCGCTGAAACAAGATATTTCGTTTTAACTTTATTTATTTTCTCCTATTGTTTACCAATGTCACTTATTGTATATTATTACAGTCAAATTGTTAGTCATGTTGTTAATCACGAAAAGGCTCTTCGAGAACAAGCAAAGAAGATGAACGTTGAAAGTTTACGAAGTAACGCCAATCAGAATGCTCAATCTGCTGAAATTCGTATAGCGAAGGCTGCCATTACGATTTGTTTCCTATTTGTTGCCGCATGGACACCATACGCAGTACTTGCTATGATCGGTGCATTTGGAAACAAAGCGTTGCTTACTCCCGGCGTTACTATGATCCCTGCATGCTTTTGCAAAAGTGTTGCCTGTATTGATCCATATGTTTATGCGATCAGTCATCCAAAATACAGACTCGAGTTGCAAAAACGATTACCATGGTTAGAGCTTCAAGAGAAACCAATCGCATCCGACAGTGCAAGTACAACTACCGAAACTGTAAATACAGCACCACCAGCTTCGAGTTAATCTACTTCTACATTTGACACAATAACGGATCGATGATAAAAAAAAAATGAAAAAAGTACGCTCGTAATACTCCGATTGTATGATTGCCTTCACTGTAACTCAAAATATGTGATTATATTCTTGTATAGTAAATGACATTCCAATAAAGTAAATTCCTGGCATATAA |
| **Vespa velutina flightin (LOC124952177), mRNA(1).fasta-1**  **partial experimental sequence** | ATAAAAGCAAGAAAGAAGGCAAGGTCCCCGCGAGTGGCGAAGCTTCAAAGACGAGAGGGTAGTTTTTTTTGCAGTCTGTATAGGTGCTTCGTAGAGCGAGCATCGTAGCAAAGGCTTTCTAAAGAGAATTGAAGAAAAAGAAGAAGAAGTAAAAGAAGGATGTGGGACGATGAACCAGCTCCGTGGGATATCGAAGAAACGGCTCCCGAAGAAACAGGAGACCAAGAAGGAGCCAAGGAAGGGGGAGCTGAAGGGGCTGCACCCGGTGAACTACCAAAAGTAAAGCTCGAAAAGATCGAACCTCCAAAGTACAATCATCATTGGGTGCGCCCATTATTTCTCAATTATGACTATCTTTACGATTACAGGAAGAATTATTACGACGACGTAATCGACTATCTCGATCAAAGACAAAAGGGTTTGTATCGTGAGCCTCCAAGAGCACAGGAATGGGCAGAAAGGACCATGAGGACGTACGATCAGAAGAACCTTGATAAGAGTACTAAGAGATCCGCCGATATGAAATACATCACTAAAATGATAGTTACGCCAAGACATTATAGCTATCATACGCGGGCATATTATAGCTTGAAGTACCAGAGAATTCTTTGAGTTATCATTTTTGATGGAGAATGATCGGCGAAGATTGACGATTAAAGATCTTACACTATTCTTCGTCGATATTGCTATTACCGATAATGCCAGTGGTAATCCTTTTTTTAATCGGCTTACCTATACGTTGTATATAACATCATCTTAGACATGAGGATGTTGTATTTTAAAAATAAATCGTAGTCGTCGTAGATATTTATTCTGGATCTTTCATTAAACGAGGGAAAAGATCACGGTTTACCTCTGGCCAAATTTATTTATCGAGTAGCACTTATCGTCTAATGTATCGATAATTTCATTTCTAGATAAATTCGATTCGATTTCATACGCGATTCATTTATCTTCGTAGATATATATTTTTCATAAATAGGGACAAACATTCGCATAGAACTTCGATATCTTATCCCATCAACAAATCAATCGTCATAAATTTAAACGCGTACTCGTTTTATTTGTTTCGTTTGATTATTTATTTGTCATCAATTTTATGATATAGCTATGACGTGCTTATGTACTATGCCTATTGTATATGTATTACTGTTATAAATCGGTATTATAAAATACACGTGCACTTTTACTTA |