

**Table S1. Summary of the sequencing data of Midguts**

| <b>Samples</b>      | <b>Raw reads</b> | <b>Clean reads</b> | <b>Clean bases</b> | <b>Error rate</b> | <b>Q20</b> | <b>Q30</b> | <b>GC %</b> |
|---------------------|------------------|--------------------|--------------------|-------------------|------------|------------|-------------|
| <b>Rice_Female1</b> | 46010308         | 45059750           | 6.76G              | 0.02              | 98.04      | 94.43      | 45.35       |
| <b>Rice_Female2</b> | 46086786         | 44824336           | 6.72G              | 0.02              | 98.06      | 94.3       | 44.58       |
| <b>Rice_Female3</b> | 47322450         | 46341508           | 6.95G              | 0.02              | 98.07      | 94.45      | 45.33       |
| <b>Corn_Female1</b> | 48012490         | 47136864           | 7.07G              | 0.03              | 97.95      | 94.19      | 45.82       |
| <b>Corn_Female2</b> | 45554128         | 44784514           | 6.72G              | 0.02              | 98.04      | 94.41      | 46.49       |
| <b>Corn_Female3</b> | 50361454         | 49523244           | 7.43G              | 0.03              | 97.95      | 94.18      | 46.76       |
| <b>C_R_Female1</b>  | 47224770         | 46241700           | 6.94G              | 0.02              | 97.97      | 94.26      | 44.92       |
| <b>C_R_Female2</b>  | 46929568         | 46003002           | 6.9G               | 0.02              | 98.03      | 94.42      | 45.7        |
| <b>C_R_Female3</b>  | 50059668         | 49058420           | 7.36G              | 0.02              | 97.99      | 94.33      | 45.6        |
| <b>Rice_Male1</b>   | 45689210         | 44508098           | 6.68G              | 0.02              | 98.01      | 94.38      | 45.15       |
| <b>Rice_Male2</b>   | 47787892         | 46710430           | 7.01G              | 0.02              | 98.03      | 94.32      | 44.65       |
| <b>Rice_Male3</b>   | 47005582         | 46047096           | 6.91G              | 0.02              | 97.97      | 94.24      | 44.63       |
| <b>Corn_Male1</b>   | 45983330         | 45252070           | 6.79G              | 0.03              | 97.96      | 94.22      | 45.44       |
| <b>Corn_Male2</b>   | 46490752         | 45791600           | 6.87G              | 0.02              | 97.96      | 94.26      | 46.29       |
| <b>Corn_Male3</b>   | 45921054         | 45269004           | 6.79G              | 0.02              | 98.06      | 94.51      | 47.12       |
| <b>C_R_Male1</b>    | 47338076         | 46299766           | 6.94G              | 0.02              | 97.96      | 94.29      | 46.76       |
| <b>C_R_Male2</b>    | 46327828         | 45381322           | 6.81G              | 0.02              | 98.1       | 94.53      | 45.11       |
| <b>C_R_Male3</b>    | 47456696         | 46228984           | 6.93G              | 0.02              | 98.05      | 94.42      | 45.2        |

**Table S2. Summary of the sequencing data of Midguts**

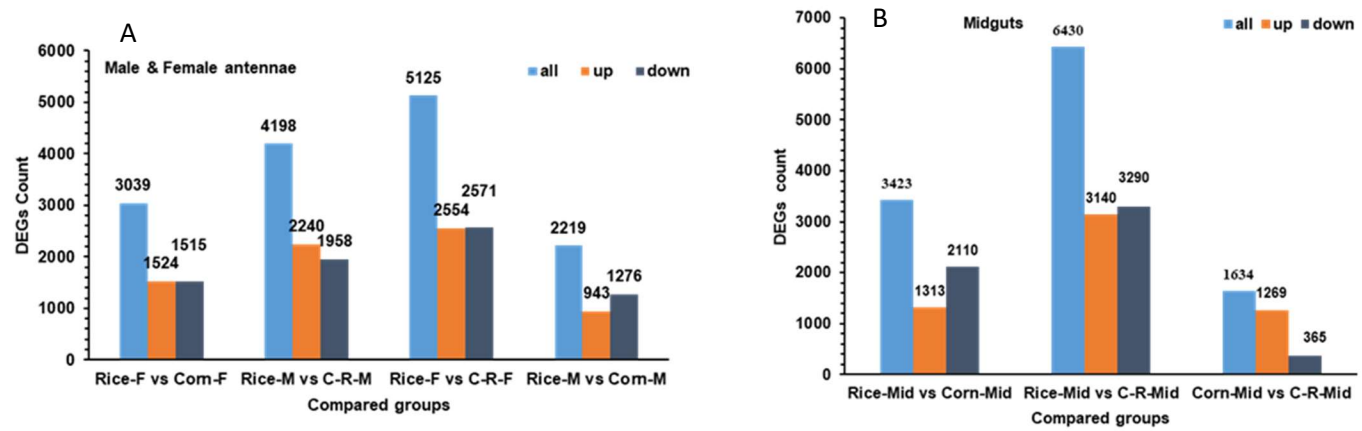
| <b>Samples</b>      | <b>Raw reads</b> | <b>Clean reads</b> | <b>Clean bases</b> | <b>Error rate</b> | <b>Q20</b> | <b>Q30</b> | <b>GC %</b> |
|---------------------|------------------|--------------------|--------------------|-------------------|------------|------------|-------------|
| <b>Rice_Midgut1</b> | 41418168         | 40553312           | 6.08G              | 0.02              | 98.1       | 94.55      | 48.3        |
| <b>Rice_Midgut2</b> | 46126022         | 45213780           | 6.78G              | 0.02              | 98.05      | 94.48      | 48.56       |
| <b>Rice_Midgut3</b> | 42695610         | 41842840           | 6.28G              | 0.02              | 97.99      | 94.25      | 48.05       |
| <b>Corn_Midgut1</b> | 50552144         | 49495892           | 7.42G              | 0.02              | 98         | 94.39      | 48.92       |
| <b>Corn_Midgut2</b> | 46716724         | 45436592           | 6.82G              | 0.02              | 98.14      | 94.58      | 45.71       |
| <b>Corn_Midgut3</b> | 45896862         | 44783588           | 6.72G              | 0.02              | 98.25      | 94.88      | 45.96       |
| <b>C_R_Midgut1</b>  | 45337686         | 44215144           | 6.63G              | 0.02              | 98.06      | 94.43      | 46.6        |
| <b>C_R_Midgut2</b>  | 48099646         | 46903402           | 7.04G              | 0.02              | 98.07      | 94.52      | 47.16       |
| <b>C_R_Midgut3</b>  | 46410788         | 45270418           | 6.79G              | 0.02              | 98.1       | 94.54      | 45.73       |

**Table S3. List of primers used in this study for qRT-PCR**

| Primers used for qRT-PCR | ID number           | Sense primers          | Anti-sense primers    | Size of the amplicon |
|--------------------------|---------------------|------------------------|-----------------------|----------------------|
| OR15                     | GSSPFG00004022001.5 | AGTCAAGTTGTCGCGCCTAT   | GGGACTCCCGATCTTCATCAC | 103                  |
| OR35                     | GSSPFG00031639001.3 | TGGTGAGGTACATGCGTGA    | GGGGCGCAATATGGGTATGA  | 102                  |
| OR1                      | GSSPFG00012479001.6 | GAGTACGACGATGCGACGAT   | GGGAGACGAAGCTCTCGAAC  | 97                   |
| OR17                     | GSSPFG00025871001.3 | TGGCAGCCACCTCTACCTAT   | GTGGCACAGCAACACAAACA  | 104                  |
| novel.5605               | novel.5605          | CCATCAGCCGTTACCAAGA    | GCAAAGTGCATCTCGTC     | 126                  |
| OR8                      | GSSPFG00031395001.6 | TGATGGCTCCTTGTTGGCTT   | GAGAGCGGTTTGTAGCCCT   | 148                  |
| OR11                     | GSSPFG00004819001.3 | ACAATAACTACGTGCCGGT    | CCAGCCACTAAGAGTCGCAA  | 140                  |
| OR15                     | GSSPFG00004022001.5 | TCGTGATGTGCGGTCTTCTT   | GACTAGCCTTTCGCTTCCGT  | 140                  |
| OR45                     | GSSPFG00035294001.4 | TCTTCAAAGACAACGAGGAGCA | TTCCGTCACCTCGTGTTCTGG | 90                   |
| OR5                      | GSSPFG00015711001.5 | ATGCGCCACTGATAGACAGG   | CATCGACATCAGGCACCGTA  | 73                   |
| OR4                      | GSSPFG00035258001.3 | TCAACTTCGCTCCGCTGATT   | CACGCAAATTCTCCCAACCG  | 132                  |
| OR51                     | GSSPFG00010075001.3 | GCGATCTACGGTGGAGGTTG   | CAACGCTACACCACGCTCTA  | 150                  |
| OR56                     | GSSPFG00032130001.3 | ACTGTGTACCTCAGGGCGTA   | ACGTGAGCATGGTGATCCTG  | 112                  |
| OR44                     | GSSPFG00003382001.6 | CTGTGATGACACAACCGGA    | TCTTCCGTGAGCTGGTTTCC  | 116                  |
| OR11                     | GSSPFG00004819001.3 | TGGAAGAGGTCGCTGTCAAG   | AATGAAGAGCGCCATTCCGA  | 104                  |
| Cytochrome P450          | GSSPFG00019627001   | TATCGGTTGGCATTGGTCGT   | ATACTGCGGCATTCGAGAGG  | 116                  |
| Cytochrome P450          | GSSPFG00033942001   | TTGAAGCGGATGCCGTACTT   | TATGGGCGCTACGAAGGAAC  | 147                  |
| Trypsin                  | GSSPFG00015539001   | TTACTGCTGCACACTGCTCA   | GTCTCAAAAGCCCAAGTGCG  | 72                   |
| novel.3161               | novel.3161          | CCAGCAGCCTCTGAGATACG   | AACAGCGTGATCACTAGCCC  | 107                  |

|                         |                     |                       |                       |     |
|-------------------------|---------------------|-----------------------|-----------------------|-----|
| Carboxylesterase family | GSSPFG00035313001.4 | ATGCCAGTCCTATTGCGGAG  | AATGGGCCCTCGGAAATGTT  | 71  |
| Cytochrome P450         | GSSPFG00019609001   | CGGCGGAGACTGTGATGTAA  | CTGAACAGGGAGTGCTCGTT  | 114 |
| UGT40Mc                 | GSSPFG00021628001.3 | ATCGTTTGACGAAGCCAGGT  | AAAGGTACGTGGAGTGCTGG  | 103 |
| Carboxylesterase family | GSSPFG00021093001.4 | ACGCACCGATGAGTGTCAATT | TCTCATTGCGCCTTCCATGT  | 86  |
| Trypsin                 | GSSPFG00024088001   | AAATGTTGTGCGCTGGTTGG  | CGAAAGAGTAGACGCCGACA  | 105 |
| novel.3161              | novel.3161          | CCAGCAGCCTCTGAGATACG  | AACAGCGTGATCACTAGCCC  | 107 |
| Trypsin                 | GSSPFG00031776001   | TGTTCTGGTGTAGTGGTCGC  | ACACGGTGGTGTCTCTTTT   | 118 |
| UGT39-01                | GSSPFG00035503001.3 | AGTTAGCCCGTAGGGGTCAT  | CTCGTCCAAGAACGTCCCAA  | 120 |
| Trypsin                 | GSSPFG00031776001   | TGTTCTGGTGTAGTGGTCGC  | ACACGGTGGTGTCTCTTTT   | 118 |
| Trypsin                 | GSSPFG00009802001   | TTATGTGCGGGAAGGCAAGG  | CCACATTGAGGTCCTCCGAA  | 110 |
| Trypsin                 | GSSPFG00034812001   | AGCACTACAGCATCAAGCGT  | CGTACGTGTAGGTCCTCGTG  | 107 |
| S30                     | AF400225.1          | CACCCTCGGTGTTAGACGTT  | CCACCGGGAAAGTGATACTGT | 119 |
| GAPDH                   | KC262638.1          | CGGTGTCTTCACAACCACAG  | TTGACACCAACGACGAACAT  | 111 |

Figure S1. Highly expressed DEGs in the antennae (A) and midguts (B) of Rice and Corn population



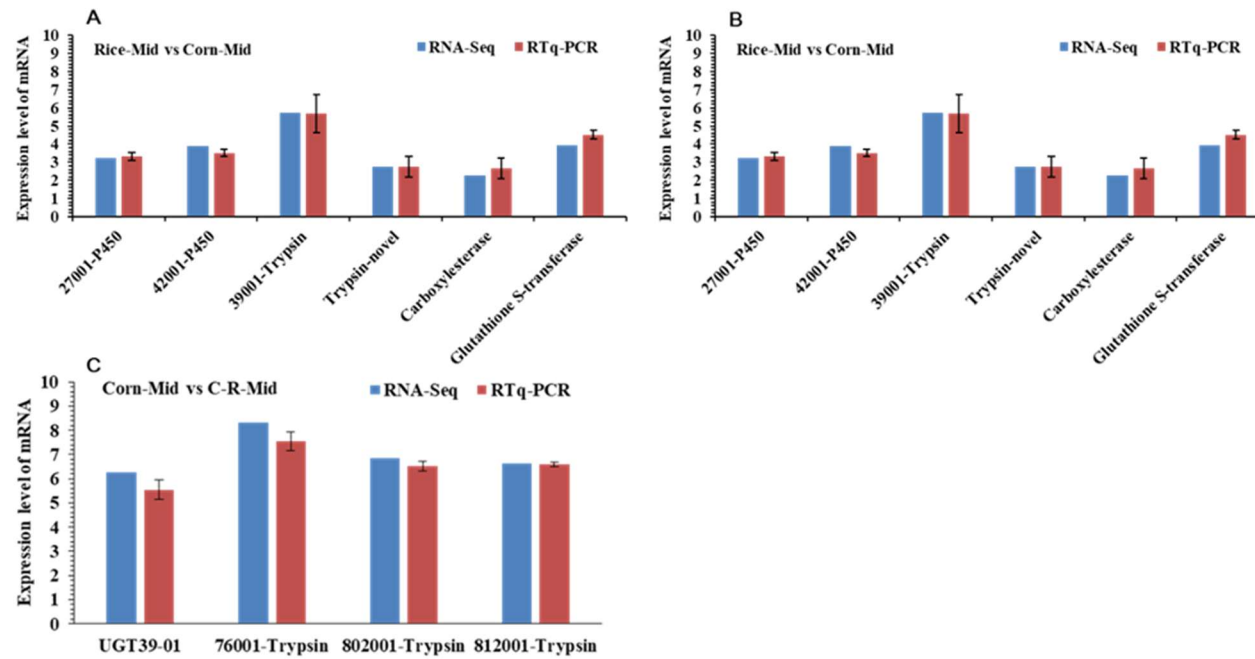
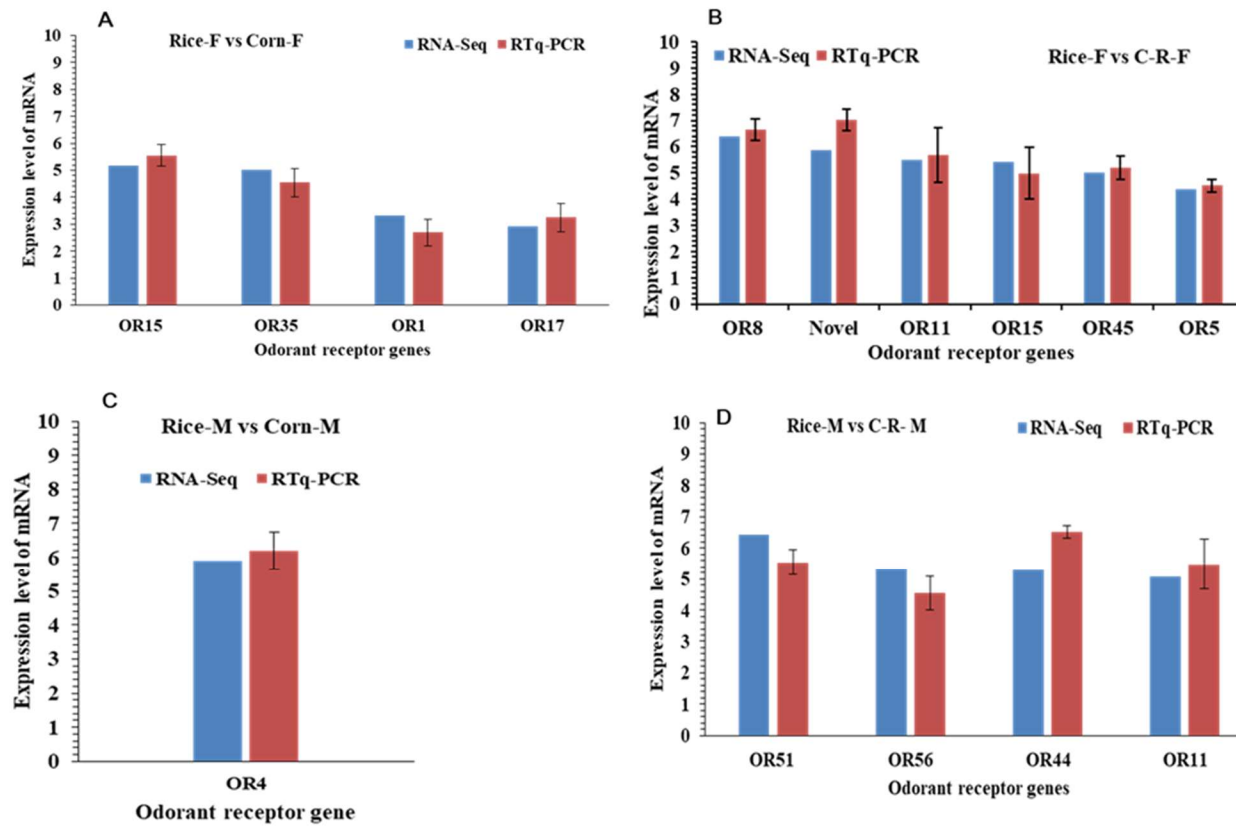


Fig. S2. Gene expression levels of differentially expressed genes through RNA-seq and qRT-PCR analysis in the Rice-Mid vs Corn-Mid (A), Rice-Mid vs C-R-Mid (B), Corn-Mid vs C-R-Mid (C) (After 20 generation of selection the corn population was fed on rice for one generation (C-R-midgut) of *Spodoptera frugiperda* when reared on corn and rice plants for 20 generations.



**Fig. S3.** Gene expression levels of differentially expressed genes through RNA-seq and qRT-PCR analysis in Female (F) and Male (M) antennae of Rice-F vs Corn-F (A), Rice-F vs C-R-F (B), (After 20 generation of selection the corn population was fed on rice for one generation (C-R-female) Rice-M vs Corn-M (C) and Rice-M vs C-R-M (After 20 generation of selection the corn population was fed on rice for one generation (C-R-male) of *Spodoptera frugiperda* when reared on corn and rice plants for 20 generations.