Supplementary Information

Genome-wide analysis of complex wheat gliadins, the dominant carriers of celiac disease epitopes

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Figure S1. Transcript levels of 25 α-gliadin genes (*Gli-α1* to -*α25*) in the developing grains of Xiaoyan 81 at 0, 10, 15 and 25 days after flowering (DAF). The 25 genes came from the A, B or D genome of common wheat. The transcript level was expressed as reads per kilobase per million mapped reads (RPKM).

Figure S2. Amino acid sequence comparison of 25 α-gliadins (Gli-α1 to -α25). The deduced protein sequences were aligned using Clustal Omega (http://www.ebi.ac.uk/Tools/msa/clustalo/) with manual adjustment. The 25 α-gliadins shared a common primary structure composed of a signal peptide (SP), a N-terminal repetitive region (NRR), two poly-glutamine regions (PQR1 and PQR2), and two unique regions (UR1 and UR2). The six conserved cysteine residues are marked in red. The additional cysteine found in Gli-α25 is boxed in purple. The CSTT element shared by Gli-α8 to -α19 is shaded in yellow. The amino acid substitutions, which are unique to CSTT α-gliadins and located in PQR1 and UR1, respectively, are also shaded in yellow.

Figure S3. Transcript levels of 11 γ-gliadin genes (*Gli-γ1* to -*γ11*) in the developing grains of Xiaoyan 81 at 0, 10, 15 and 25 days after flowering (DAF). The 11 genes resided in the A, B or D genome of common wheat. The transcript level was expressed as reads per kilobase per million mapped reads (RPKM).

Figure S4. Amino acid sequence comparison of 11 γ-gliadins (Gli-γ1 to -γ11). The protein sequences were aligned using Clustal Omega with manual adjustment. The 11 γ-gliadins possessed a common primary structure consisted of a signal peptide (SP), a N-terminal region (NR), a repetitive region (RR), two unique regions (UR1 and UR2), and a poly-glutamine region (PQR). These five regions have also been designated as I (NR), II (RR), III (UR1), IV (PQR) and V (UR2) by past studies[40,41]. The eight conserved cysteine residues are marked in red. The extra cysteine found in the repetitive region of Gli-γ5 or Gli-γ10 is boxed in purple.

Figure S5. Analysis of the transcript level of *Gli-δ1* and its deduced protein. **a** Transcript level of *Gli-δ1*, expressed as reads per kilobase per million mapped reads (RPKM), in the developing grains of Xiaoyan 81 at 0, 10, 15 and 25 days after flowering (DAF). This gene was located in the D genome of common wheat. **b** comparison of Gli-δ1 with two representative homologous proteins (Gli-δ-CS1B and Gli-δ-CS1D) from the common wheat variety Chinese Spring (CS). The three proteins

shared a common primary structure composed of a signal peptide (SP), a N-terminal region (NR), a repetitive region (RR), and a C-terminal region (CR). The eight conserved cysteines are labelled in blue. Gli-δ-CS1B and Gli-δ-CS1D were characterized by two previous studies[28,29].

Figure S6. Transcript levels of five ω-gliadin genes (*Gli-ω1* to *-ω5*) in the developing grains of Xiaoyan 81 at 0, 10, 15 and 25 days after flowering (DAF). The transcript level was expressed as reads per kilobase per million mapped reads (RPKM). The five genes resided in the A, B or D genome of common wheat.

Figure S7. Analysis of the five deduced ω-gliadins (Gli-ω1 to -ω5) of Xiaoyan 81. **a** Comparison of Gli-ω1, -ω4 and -ω5 to two previously published homologous ω-gliadins with the N-terminus starting by AREL or ARQL (GenBank accessions AAT74547 and CAR82268, respectively). **b** Comparison of Gli-ω3 to a representative homologous ω-gliadin with the N-terminus starting by SRLL (GenBank accession BAE20328). **c** Comparison of Gli-ω2 to a previously reported D-type glutenin protein (GenBank accession AJ937839). In the above comparisons, the putative signal peptide is marked in blue, and the first four residues in the N-terminus (AREE, ARQL SRLL or ARPL) are written in brown. The cysteine residue found in Gli-ω2 or Gli-ω5 is boxed in purple. Asterisks indicate identical residues, whereas colons and periods represent conserved and semi-conserved substitutions, respectively.

Figure S8. Examination of the MALDI-TOF-MS peaks of Xiaoyan 81 gliadin extract. **a** The 10 compound MALDI-TOF-MS peaks of Xiaoyan 81 gliadin extract in the mass range of 25 - 45 kD. **b** Overlapping between the main MALDI-TOF-MS peaks of the gliadin extracts of Xiaoyan 81 (blue) and Chinese Spring (red). **c** Chromosomal control of the 10 main gliadin MS peaks as investigated using Chinese Spring (CS) and derivative nulli-tetrasomic (NT) lines lacking chromosome 1A (N1AT1D), 1B (N1BT1D), 1D (N1DT1A), 6A (N6AT6D), 6B (N6BT6A) or 6D (N6DT6B). The gliadin MS peak(s) missed in each of the six NT lines is indicated by red arrow(s).

Figure S9. Analysis of the six *Gli* locus deletion lines of Xiaoyan 81 using microsatellite markers. The deletion of the chromosomal fragment carrying *Gli-A1*, *-B1*, *-D1*, *-A2*, *-B2* or *-D2* in the six lines (DLGliA1, DLGliB1, DLGliD1, DLGliA2, DLGliB2 and DLGliD2) was investigated using chromosome specific microsatellite

markers. The total number of markers used was five (1AS), four (1BS), six (1DS), eight (6AS), seven (6BS) or six (6DS). The markers missed in the deletion lines are indicated by red arrows, whereas those still detectable are labeled by green arrows. The unlabeled markers were not examined. The genetic positions of the markers (cM) are provided on the left side of each graph. The linkage data of the markers are from GrainGenes (http://wheat.pw.usda.gov/ggpages/SSRclub/GeneticPhysical/).

Figure S10. Grains harvested from Xiaoyan 81 and the six *Gli* locus deletion lines. Xiaoyan 81 and the *Gli* locus deletion lines (DLGliA1, DLGliB1, DLGliD1, DLGliA2, DLGliB2 and DLGliD2) were cultivated in the field. The grains shown are typical of the harvests from four field environments conducted in 2013 to 2016.

Figure S11. A typical 2-DE gel image of Xiaoyan 81 gliadin extract obtained by using the IPG strip with a linear pH gradient of 6-11 in the first dimension. The second dimension was run in 12% SDS-PAGE. The majority of the gliadin spots were well separated (see also insets). The spots in the two dash-line boxes were found to be LMW-GSs by subsequent MS/MS analysis. The size (kD) of the protein markers is indicated on the left side of the graph.

Figure S12. A representative 2-DE gel graph of Xiaoyan 81 gliadin extract generated by using the IPG strip with a linear pH gradient of 3-10 in the first dimension. The second dimension was conducted in 12% SDS-PAGE. The gliadin spots in the two boxes were better resolved than using the IPG strip with a linear pH gradient of 6-11 in the first dimension. The size (kD) of the protein markers is shown on the left side of the image.

Figure S13. A typical result of validating the location of gliadin genes in specific *Gli* loci by PCR mapping. The validation was carried out with gene specific primers and the genomic DNA samples of Xiaoyan 81 and the six *Gli* locus deletion lines (DLGliA1, DLGliB1, DLGliD1, DLGliA2, DLGliB2 and DLGliD2) lacking *Gli-A1*, *Gli-B1*, *Gli-D1*, *Gli-A2*, *Gli-B2* and *Gli-D2*, respectively. The gliadin genes validated were *Gli-γ1*, *Gli-ω2*, *Gli-α9* and *Gli-α20*. The lengths of the PCR amplicons for the four genes are indicated in the brackets. The size (bp) of the DNA markers is shown on the left side of the image.

Figure S14. Absence of CD epitopes in previously reported δ-gliadins. The five

δ-gliadins were identified in Chinese Spring (Gli-δ-CS1B and Gli-δ-CS1D), Hereward (Gli-δ-He1) or *Aegilops tauschii* (Gli-δ-Aet1 and Gli-δ-Aet2) by two previous studies[28,29]. The GenBank accession numbers for Gli-δ-He1, Gli-δ-Aet1 and Gli-δ-Aet2 are HE819390, JX081265 and JX295577, respectively.

Table S1. Summary of the data of RNA sequencing experiment 3 (RSE3).

Table S2. Sequence information of the 52 gliadin genes transcribed in the grains of Xiaoyan 81.

Table S3: Analysis of mass spectrometry data obtained for the 82 gliadin spots of Xiaoyan 81 separated by 2-DE.

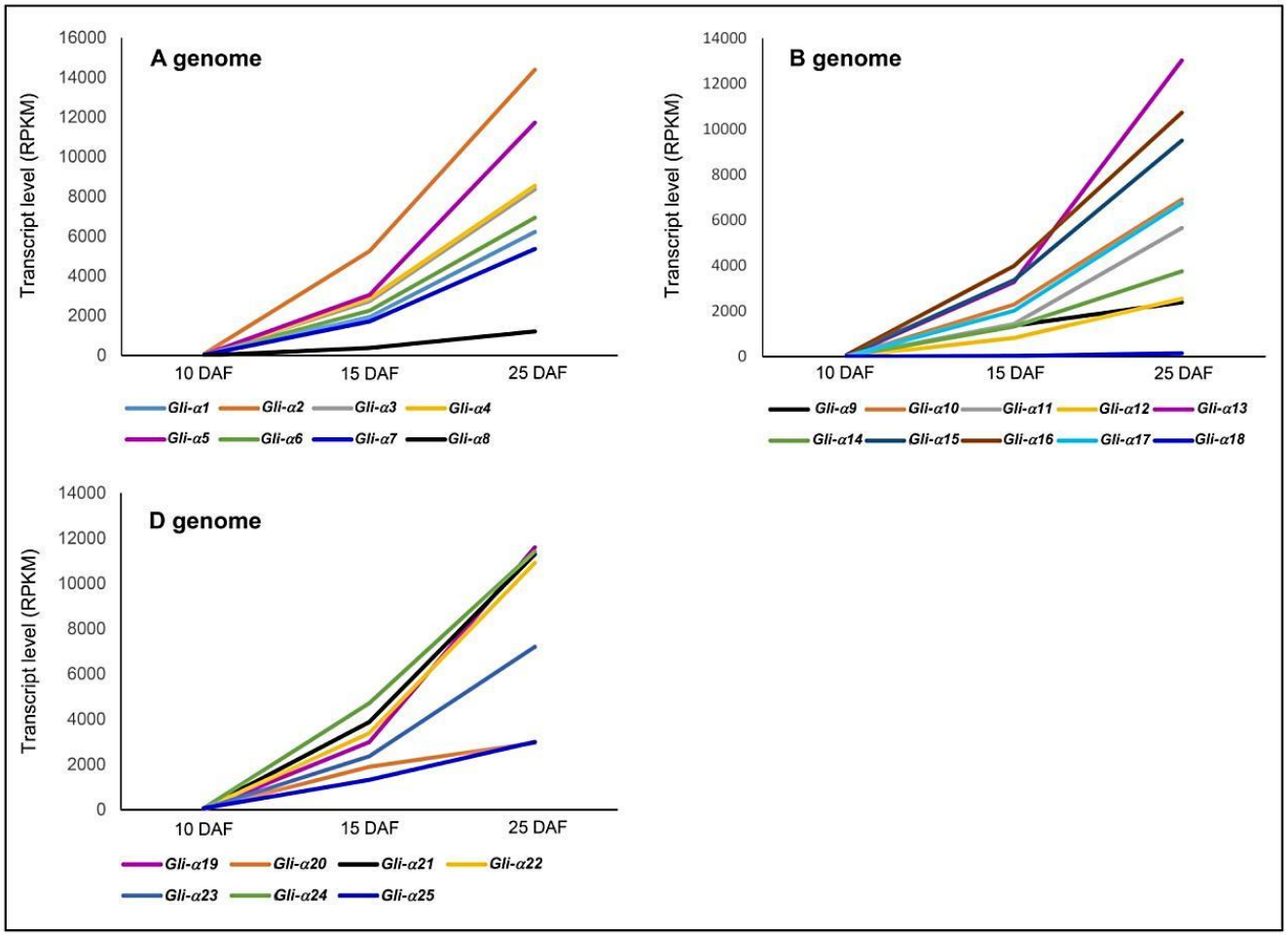
Table S4. Computation of coeliac disease (CD) epitopes in the 21 α-gliadins accumulated in Xiaoyan 81 mature grains.

Table S5. Computation of coeliac disease (CD) epitopes in the 11 γ-gliadin, 1 δ-gliadin and 5 ω-gliadin proteins accumulated in Xiaoyan 81 mature grains.

Table S6. PCR primers used for microsatellite marker analysis of the six *Gli* locus deletion lines.

Table S7. PCR primers used for mapping the chromosomal locations of 17 gliadin genes.

Figure S1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Gli-α4
Gli-α5
Gli-α6
Gli-α7
Gli-α8
B genome
Transcript level (RPKM)
14000
12000
10000
8000
6000
4000
2000
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15 DAF
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Gli-α9
Gli-α10
Gli-α11
Gli-α12
Gli-α13
Gli-α14
Gli-α15
Gli-α16
Gli-α17
Gli-α18
D genome
Transcript level (RPKM)
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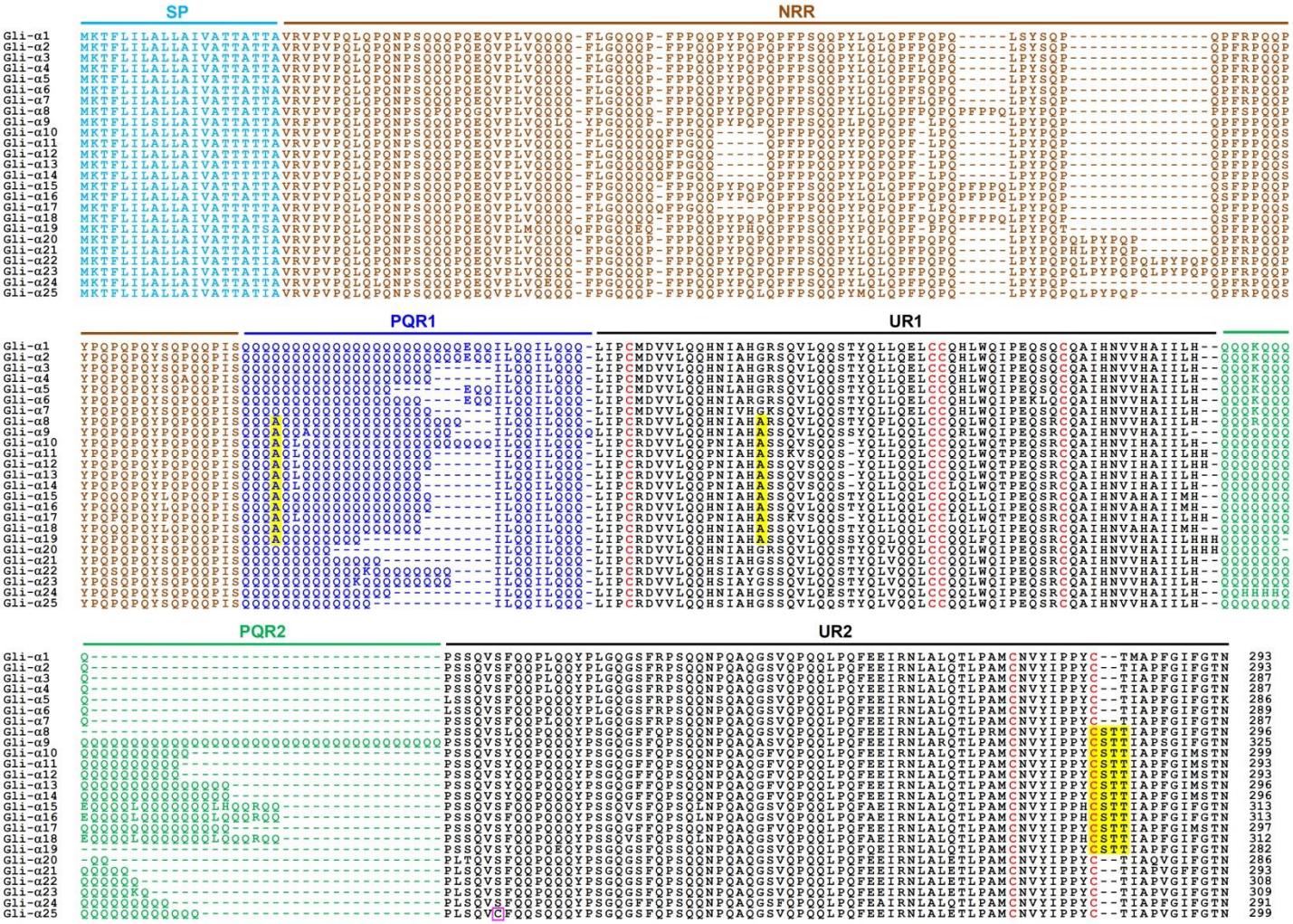
Gli-α25

Figure S2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UR1
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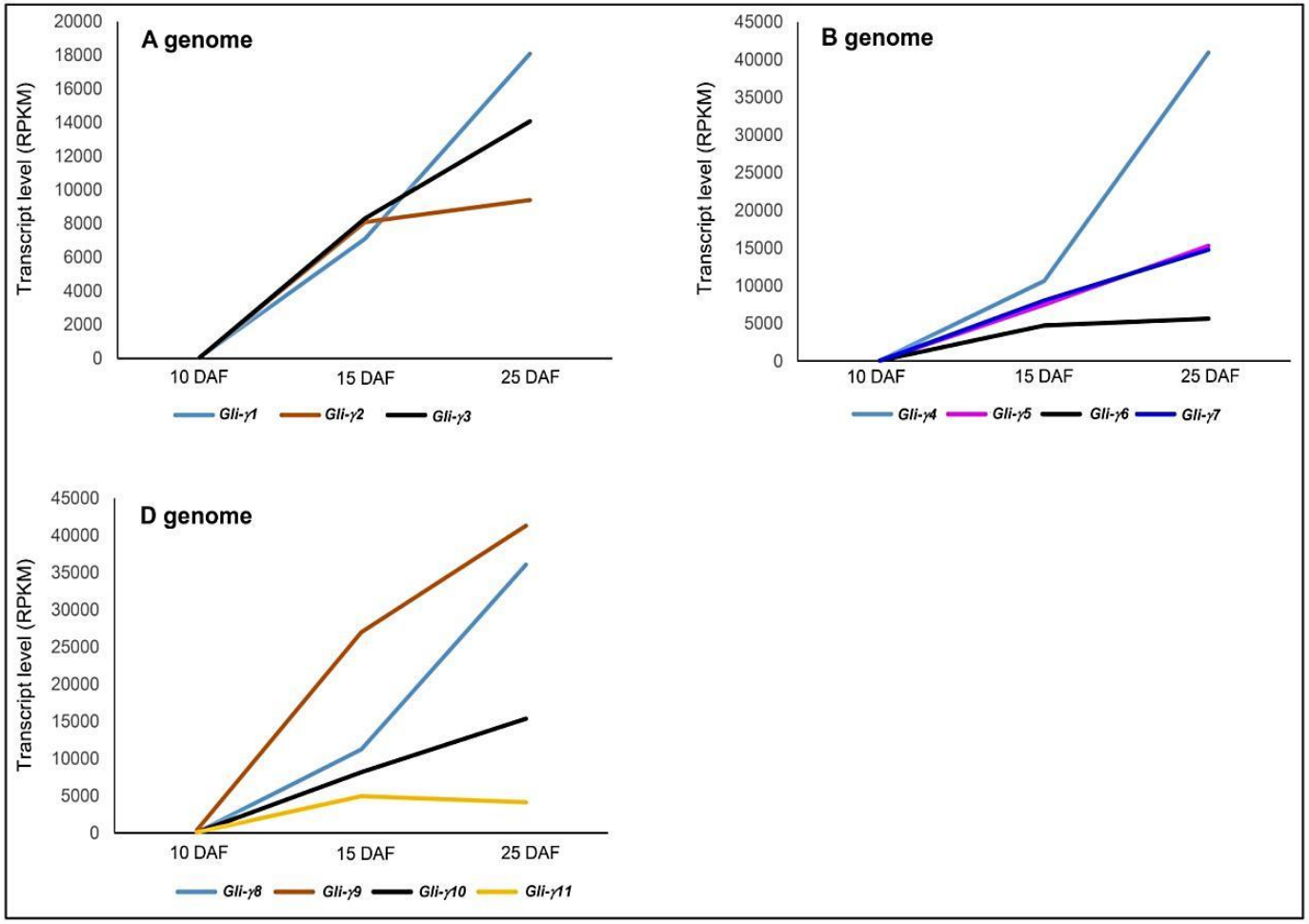
Figure S3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Gli-γ2
Gli-γ3
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0
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Gli-γ4
Gli-γ5
Gli-γ6
Gli-γ7
D genome
Transcript level (RPKM)
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35000
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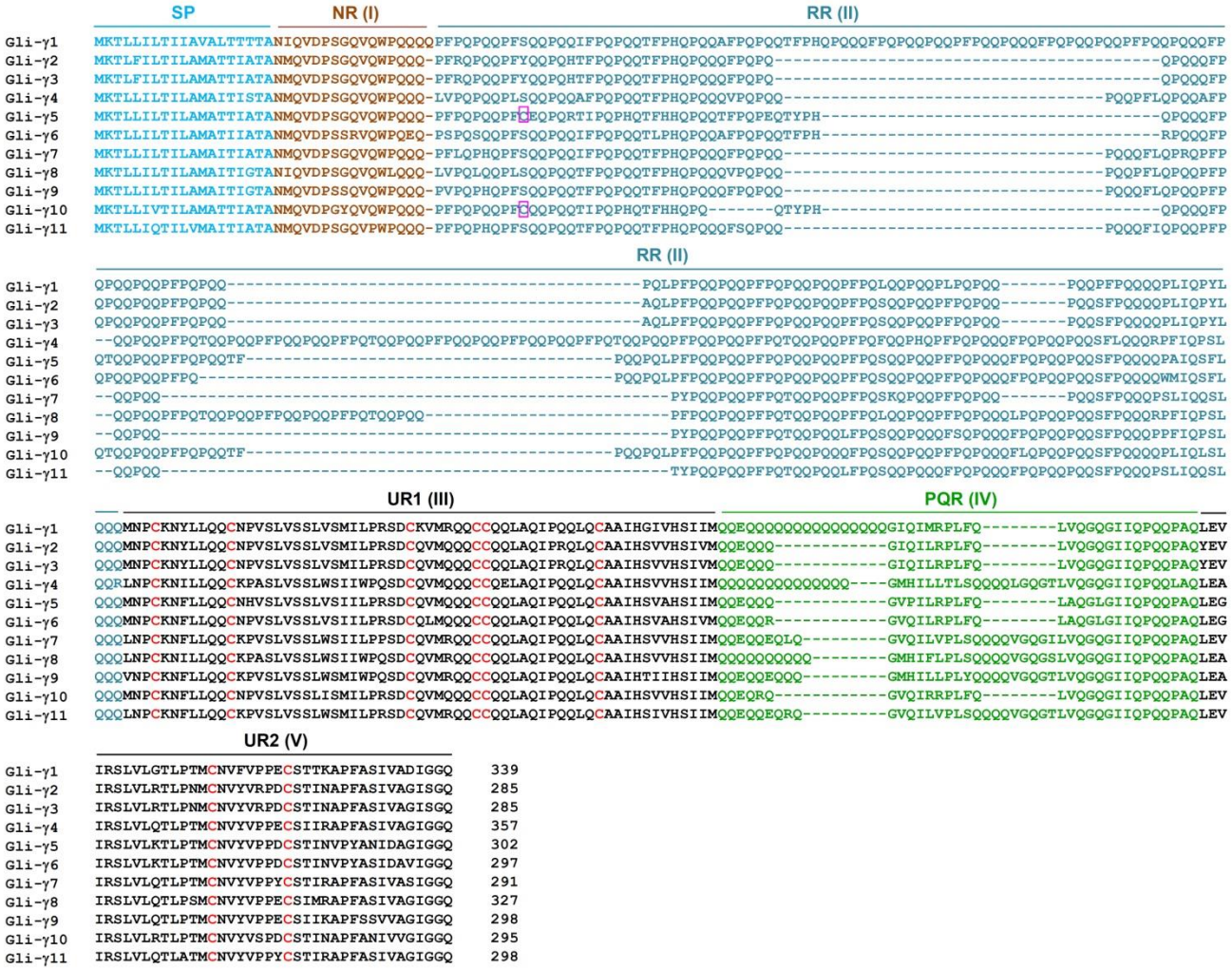
Figure S4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RR (II)
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Gli-γ2 MKTLFILTILAMATTIATANMQVDPSGQVQWPQQQ-PFRQPQQPFYQQPQHTFPQPQQTFPHQPQQQFPQPQ----------QPQQQFP
Gli-γ3 MKTLFILTILAMATTIATANMQVDPSGQVQWPQQQ-PFRQPQQPFYQQPQHTFPQPQQTFPHQPQQQFPQPQ----------QPQQQFP
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Gli-γ5 MKTLLILTILAMATTIATANMQVDPSGQVQWPQQQ-PFPQPQQPFEQPQRTIPQPHQTFHHQPQQTFPQPEQTYPH----------QPQQQFP
Gli-γ6 MKTLLILTILAMATTIATANMQVDPSSRVQWPQEQ-PSPQSQQPFSQQPQQIFPQPQQTLPHQPQQAFPQPQQTFPH----------RPQQQFP
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Gli-γ9 MKTLLILTILAMAITIGTANMQVDPSSQVQWPQQQ-PVPQPHQPFSQQPQQTFPQPQQTFPHQPQQQFPQPQQ----------PQQQFLQPQQPFP
Gli-γ10 MKTLLIVTILAMATTIATANMQVDPGYQVQWPQQQ-PFPQPQQPFEQQPQQTIPQPHQTFHHQPQ-------QTYPH----------QPQQQFP
Gli-γ11 MKTLLIQTILVMAITIATANMQVDPSGQVPWPQQQ-PFPQPHQPFSQQPQQTFPQPQQTFPHQPQQQFSQPQQ----------PQQQFIQPQQPFP
RR (II)
Gli-γ1 QPQQPQQPFPQPQQ----------PQLPFPQQPQQPFPQPQQPQQPFPQLQQPQQPLPQPQQ-------PQQPFPQQQQPLIQPYL
Gli-γ2 QPQQPQQPFPQPQQ----------AQLPFPQQPQQPFPQPQQPQQPFPQSQQPQQPFPQPQQ-------PQQSFPQQQQPLIQPYL
Gli-γ3 QPQQPQQPFPQPQQ----------AQLPFPQQPQQPFPQPQQPQQPFPQSQQPQQPFPQPQQ-------PQQSFPQQQQPLIQPYL
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Gli-γ7 --QQPQQ----------PYPQQPQQPFPQTQQPQQPFPQSKQPQQPFPQPQQ-------PQQSFPQQQPSLIQQSL
Gli-γ8 --QQPQQPFPQTQQPQQPFPQQPQQPFPQTQQPQQ----------PFPQQPQQPFPQTQQPQQPFPQLQQPQQPFPQPQQQLPQPQQPQQSFPQQQRPFIQPSL
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Gli-γ10 QTQQPQQPFPQPQQTF----------PQQPQLPFPQQPQQPFPQPQQPQQQFPQSQQPQQPFPQPQQQFLQPQQPQQSFPQQQQPLIQLSL
Gli-γ11 --QQPQQ----------TYPQQPQQPFPQTQQPQQLFPQSQQPQQQFPQPQQQFPQPQQPQQSFPQQQPSLIQQSL
UR1 (III)
PQR (IV)
Gli-γ1 QQQMNPCKNYLLQQCNPVSLVSSLVSMILPRSDCKVMRQQCCQQLAQIPQQLQCAAIHGIVHSIIMQQEQQQQQQQQQQQQQQQGIQIMRPLFQ--------LVQGQGIIQPQQPAQLEV
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UR2 (V)
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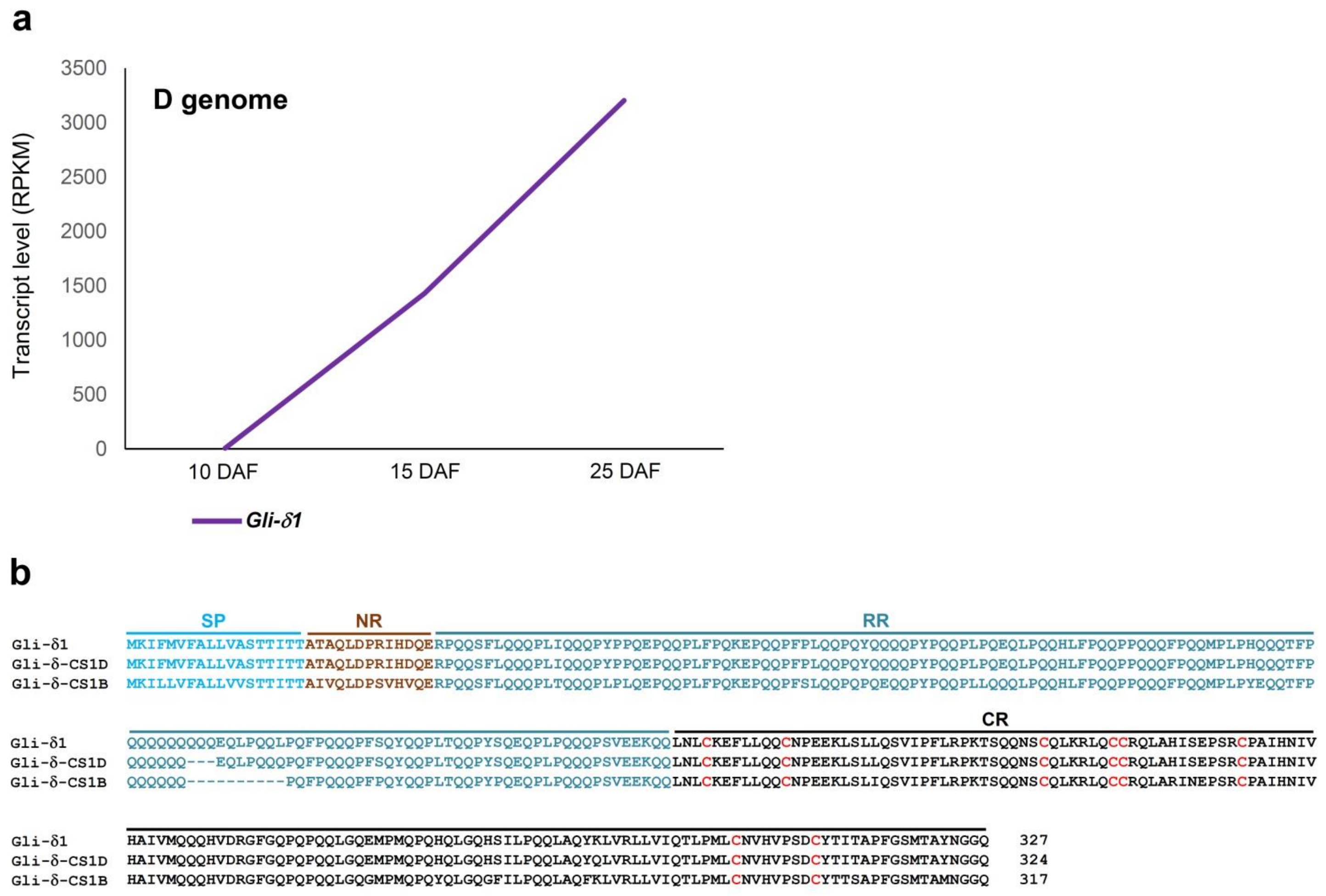
Figure S5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CR
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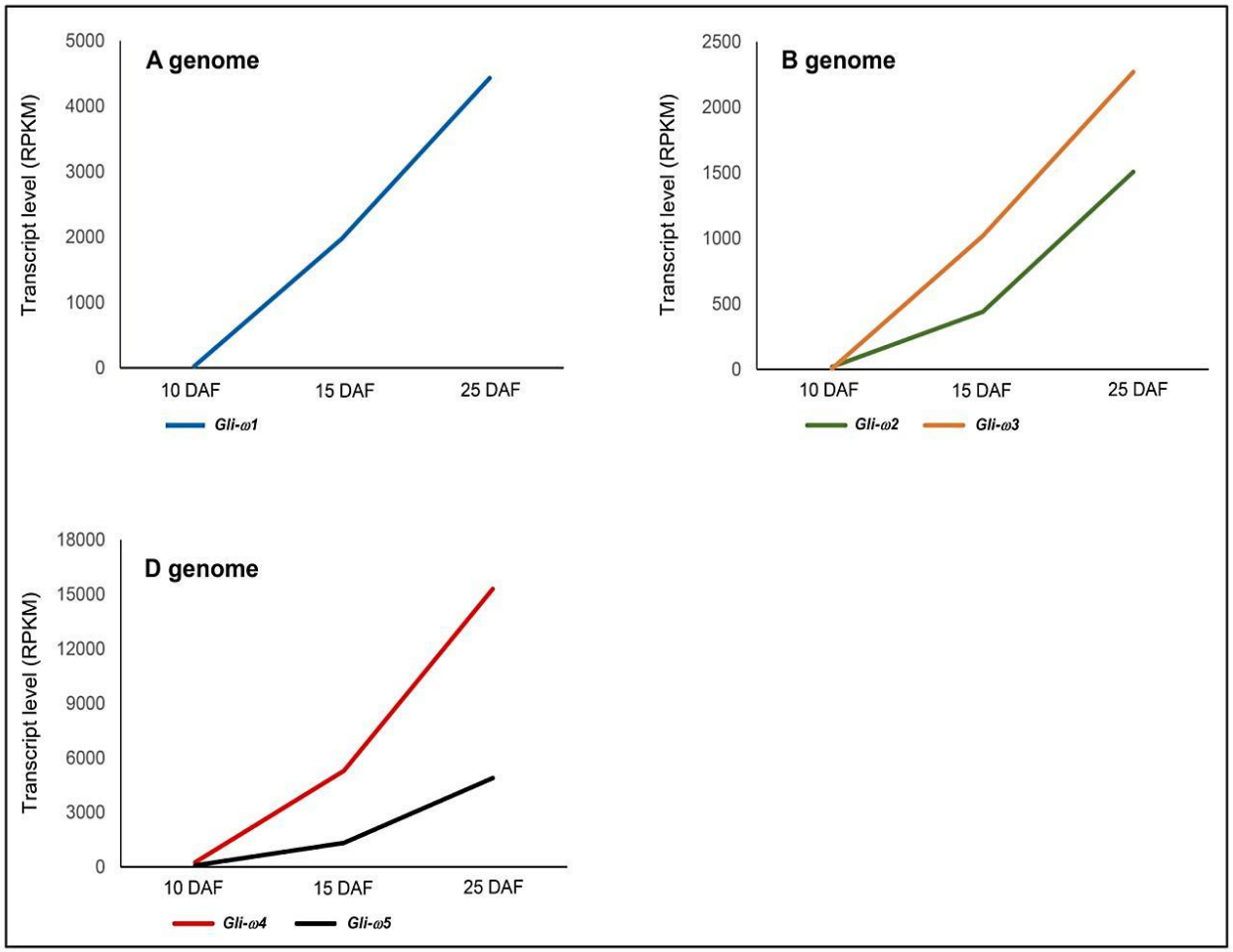
Figure S6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15 DAF
25 DAF
Gli-ω2
Gli-ω3
D genome
Transcript level (RPKM)
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9000
6000
3000
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10 DAF
15 DAF
25 DAF
Gli-ω4
Gli-ω5

Figure S7


a
Gli-ω1
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Figure S8

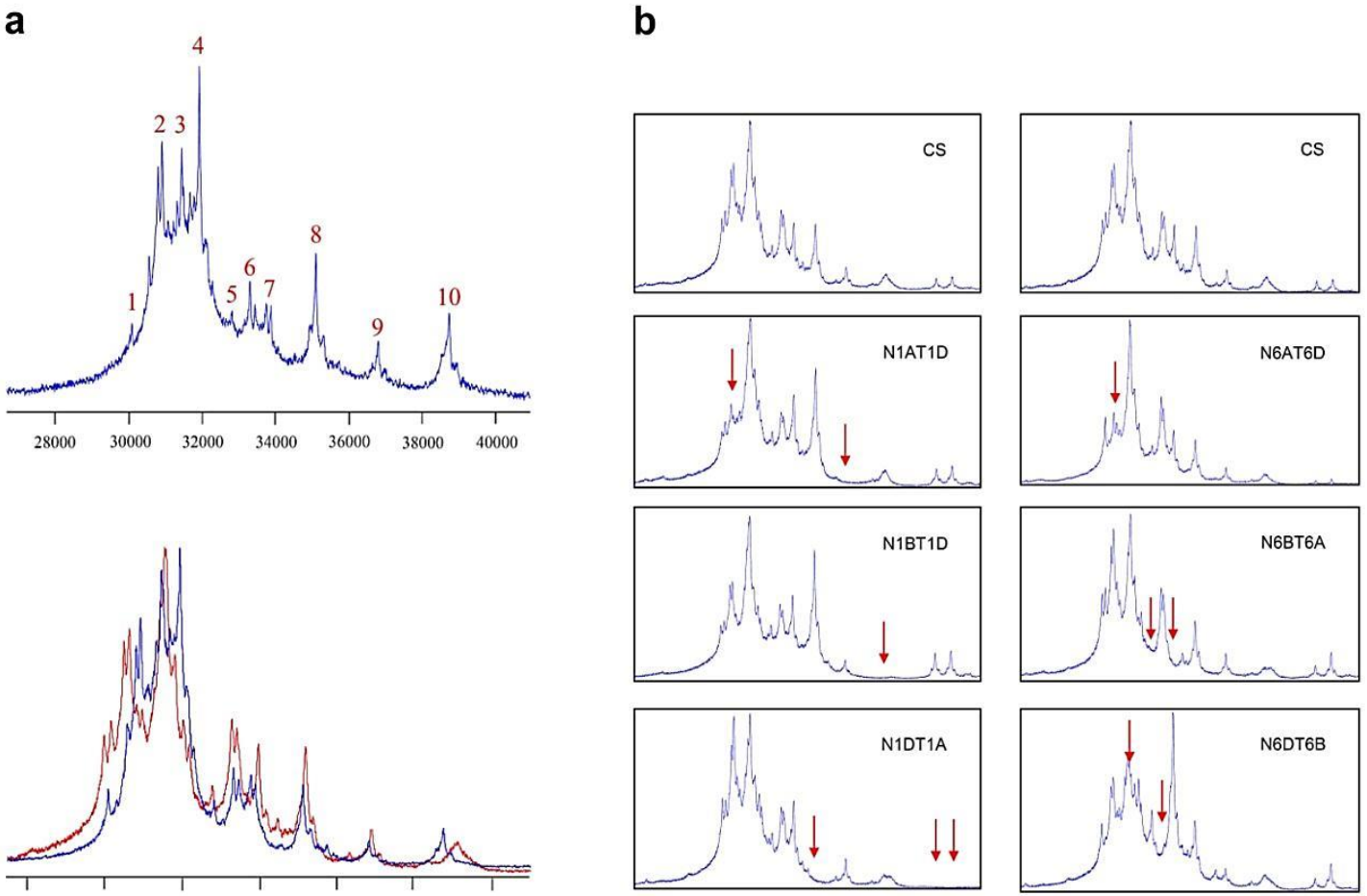
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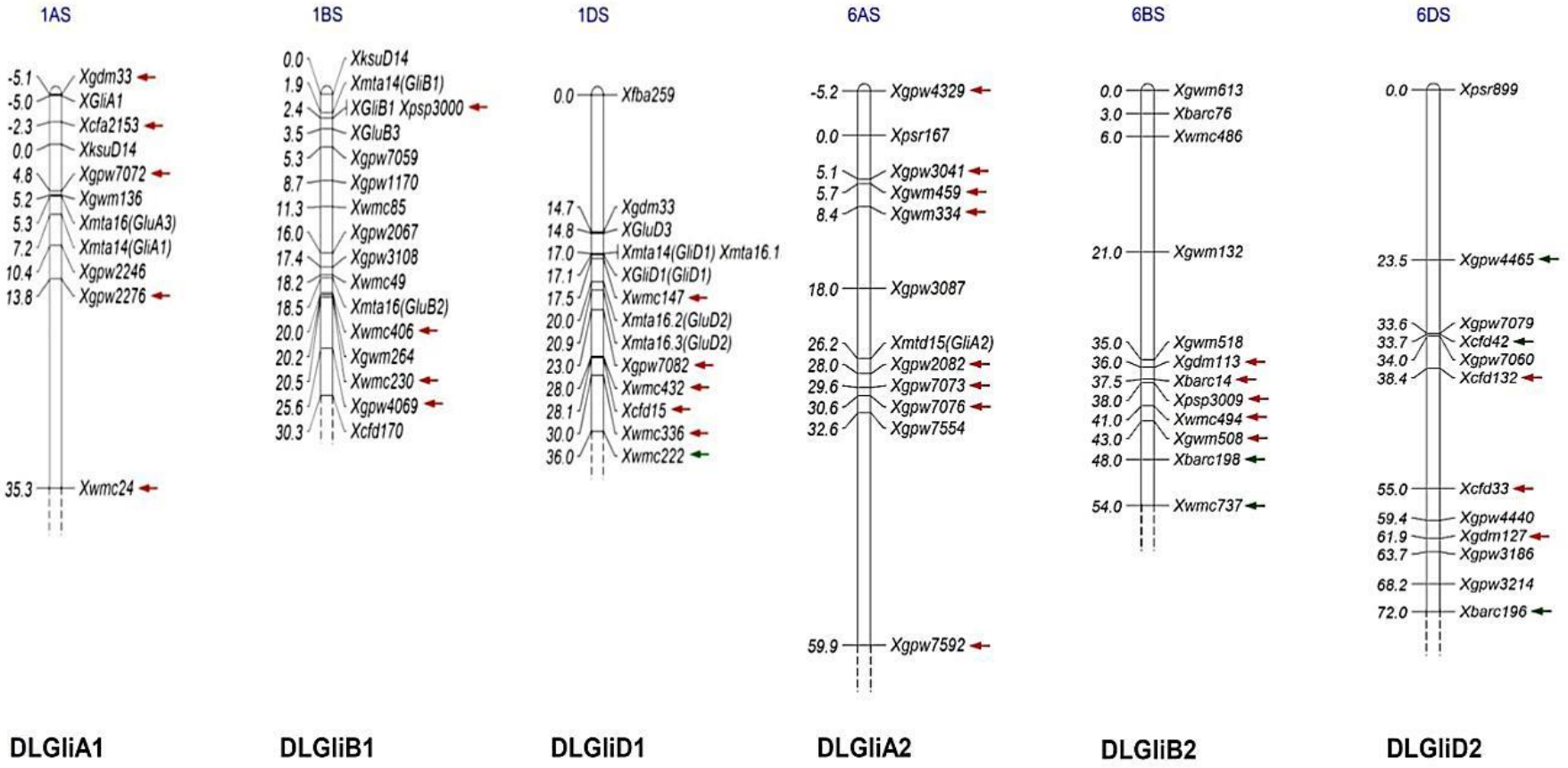
Figure S9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5.3 Xmta16(GluA3)
7.2 Xmta14(GliA1)
10.4 Xgpw2246
13.8 Xgpw2276
35.3 Xwmc24
DLGliA1
1BS
0.0 XksuD14
1.9 Xmta14(GliB1)
2.4 XGliB1 Xpsp3000
3.5 XGluB3
5.3 Xgpw7059
8.7 Xgpw1170
11.3 Xwmc85
16.0 Xgpw2067
17.4 Xgpw3108
18.2 Xwmc49
18.5 Xmta16(GluB2)
20.0 Xwmc406
20.2 Xgwm264
20.5 Xwmc230
25.6 Xgpw4069
30.3 Xcfd170
DLGliB1
1DS
0.0 Xfba259
14.7 Xgdm33
14.8 XGluD3
17.0 Xmta14(GliD1) Xmta16.1
17.1 XGliD1(GliD1)
17.5 Xwmc147
20.0 Xmta16.2(GluD2)
20.9 Xmta16.3(GluD2)
23.0 Xgpw7082
28.0 Xwmc432
28.1 Xcfd15
30.0 Xwmc336
36.0 Xwmc222
DLGliD1
6AS
-5.2 Xgpw4329
0.0 Xpsr167
5.1 Xgpw3041
5.7 Xgwm459
8.4 Xgwm334
18.0 Xgpw3087
26.2 Xmtd15(GliA2)
28.0 Xgpw2082
29.6 Xgpw7073
30.6 Xgpw7076
32.6 Xgpw7554
59.9 Xgpw7592
DLGliA2
6BS
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3.0 Xbarc76
6.0 Xwmc486
21.0 Xgwm132
35.0 Xgwm518
36.0 Xgdm113
37.5 Xbarc14
38.0 Xpsp3009
41.0 Xwmc494
43.0 Xgwm508
48.0 Xbarc198
54.0 Xwmc737
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33.6 Xgpw7079
33.7 Xcfd42
34.0 Xgpw7060
38.4 Xcfd132
55.0 Xcfd33
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72.0 Xbarc196
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Figure S10

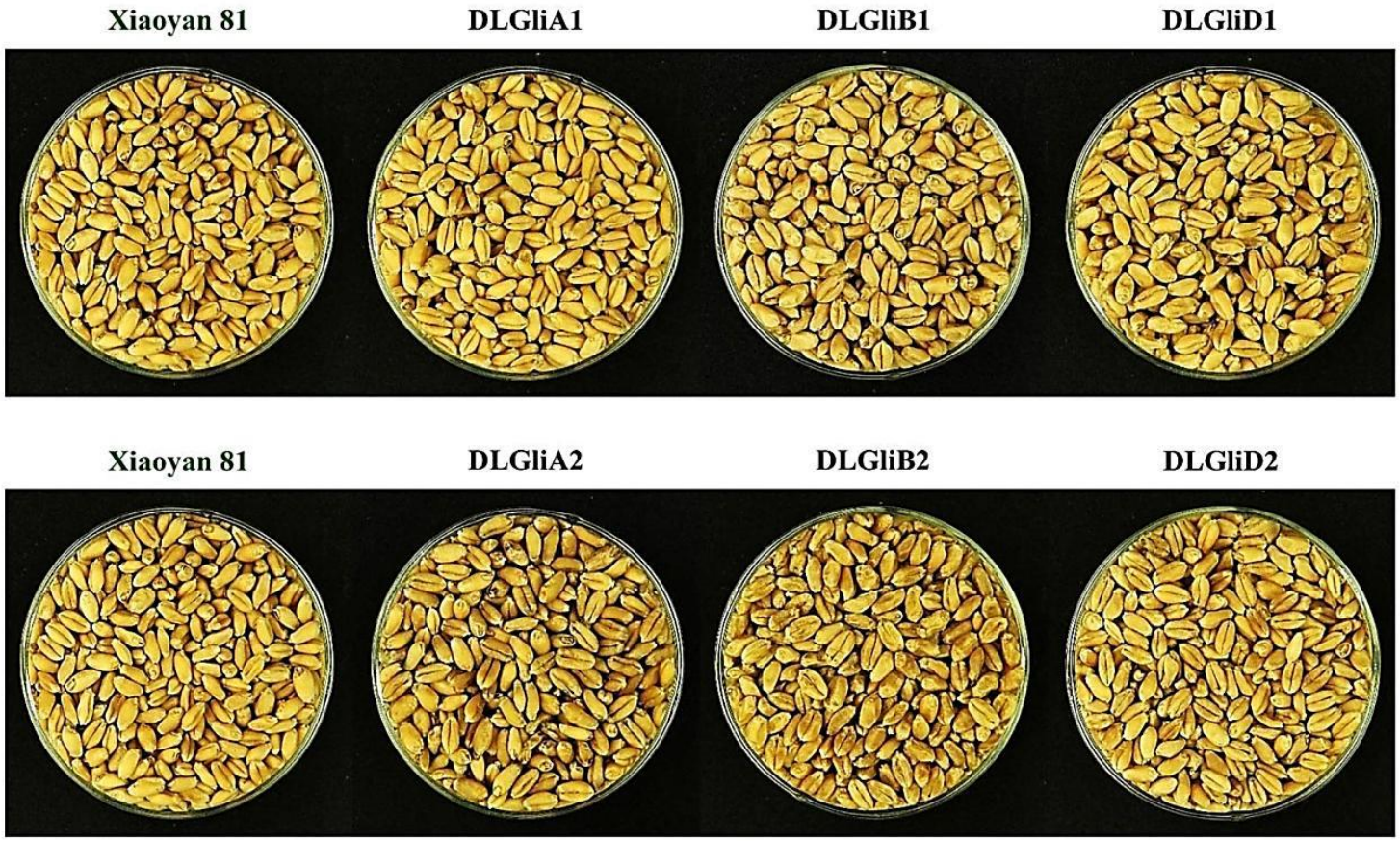
Xiaoyan 81
DLGliA1
DLGliB1
DLGliD1
Xiaoyan 81
DLGliA2
DLGliB2
DLGliD2

Figure S11

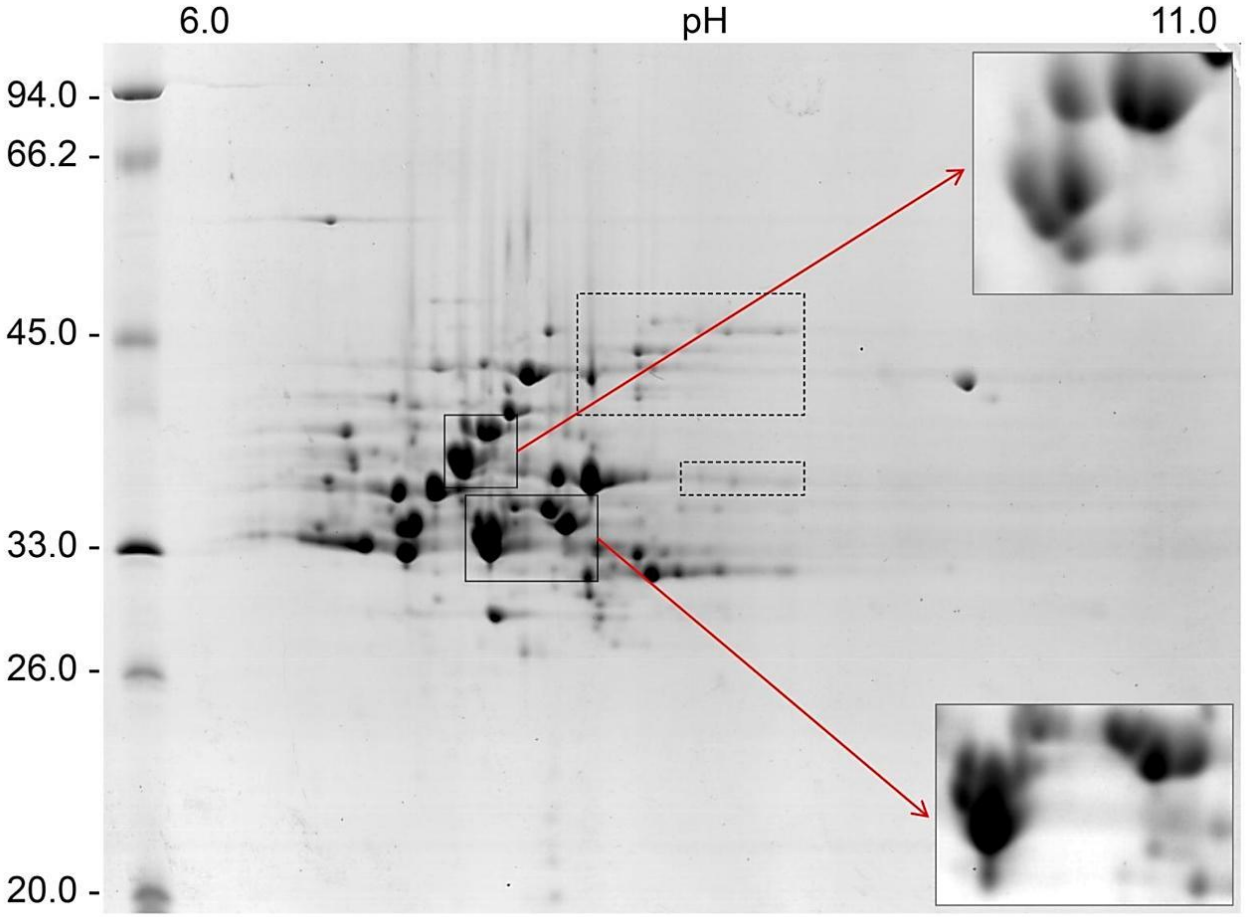

Figure S12

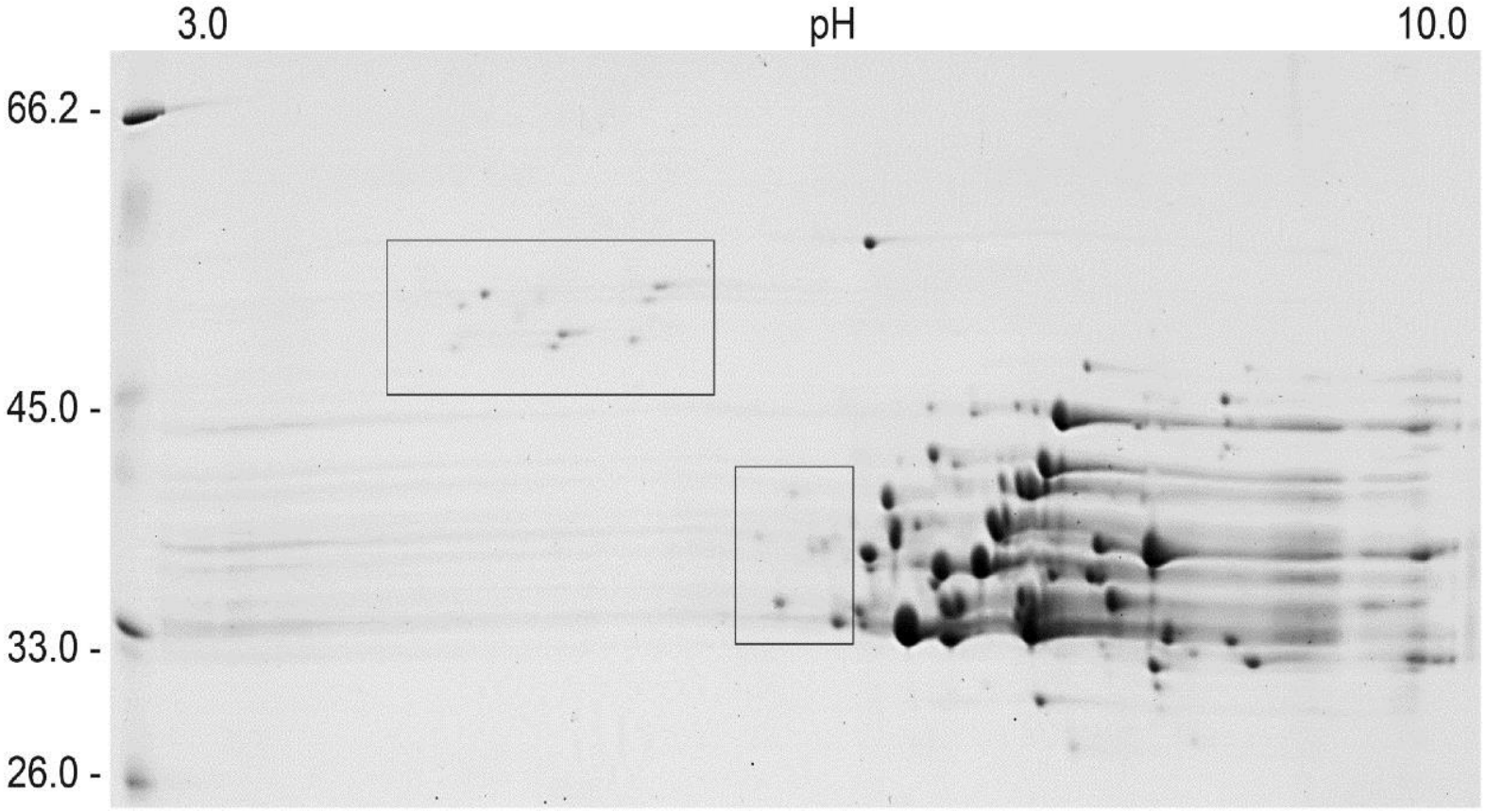

Figure S13

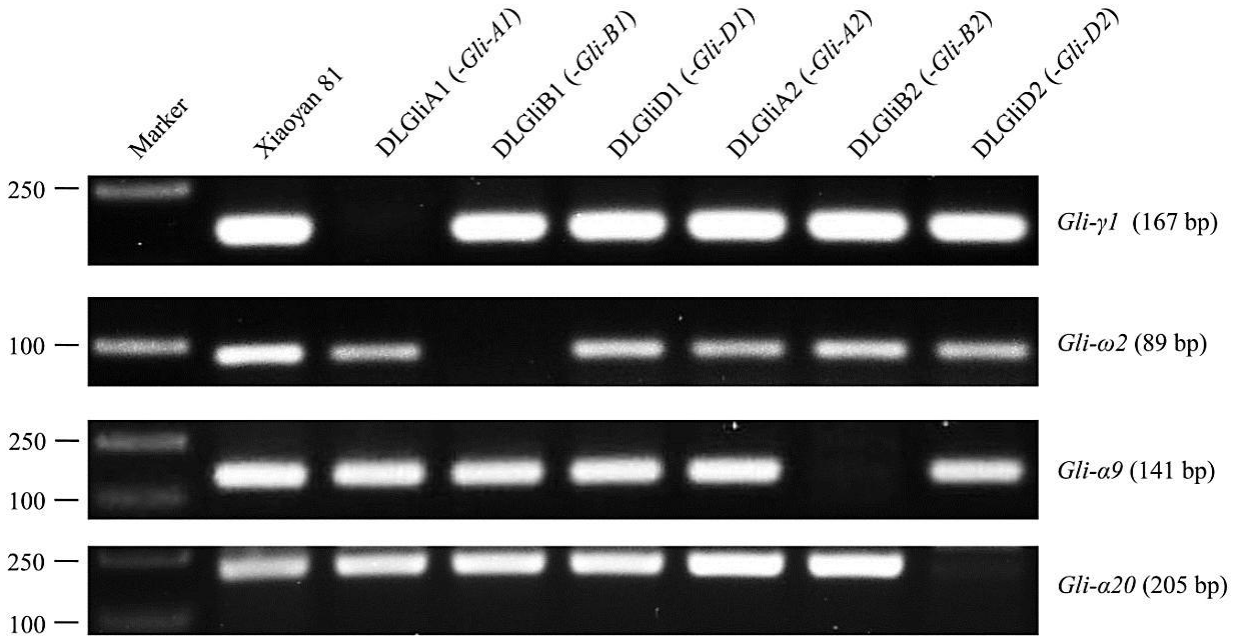
Marker
Xiaoyan 81
DLGliA1 (-Gli-A1)
DLGliB1 (-Gli-B1)
DLGliD1 (-Gli-D1)
DLGliA2 (-Gli-A2)
DLGliB2 (-Gli-B2)
DLGliD2 (-Gli-D2)
250
Gli-γ1 (167 bp)
100
Gli-ω2 (89 bp)
250
100
Gli-α9 (141 bp)
250
100
Gli-α20 (205 bp)

Figure S14

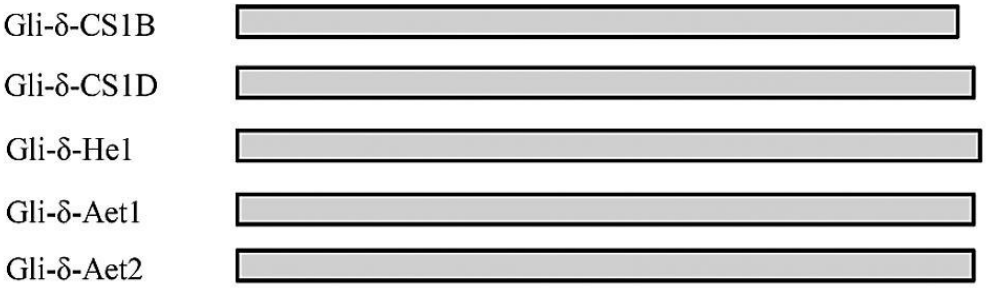

Table S1. Summary of the data of RNA sequencing experiment 3 (RSE3).

Number of cDNA library sequenced	Three (1-2 kb, 2-3 kb, and > 3 kb)
Total number of full-length non-chimeric reads obtained	187,279
Total number of unique transcripts identified	41,611
Number of transcripts mapped to Chinese Spring draft genome sequences	35,380
Number of extant chromosomal loci covered	14,747 (by 25,011 transcripts)
Number of new chromosomal loci identified	5,449 (by 10,369 transcripts)
Total number chromosomal loci mapped	20,916

Note: RSE3 was executed using the PacBio RSII platform. The three cDNA libraries sequenced were constructed with the RNA sample extracted from Xiaoyan 81 grains at 25 days after flowering.

Table S2. Sequence information of the 52 gliadin genes transcribed in the grains of Xiaoyan 81.

	Sequence
Active members	1) Transcript and deduced protein sequences for 25 transcribed and intact α-gliadin genes (each transcript sequence is provided from start to stop codons) >*Gli-α1* transcript (882 bp) ATGAAGACCTTTCTCATCCTTGCCCTCCTTGCTATCGTGGCGACCACCGCCACAACTGCAGTTAGAGTTCCAGTGCCACAATTGCAGCCACAAA ATCCATCTCAGCAACAGCCACAAGAGCAAGTTCCGTTGGTACAACAACAACAATTTCTAGGGCAGCAACAACCATTTCCACCACAACAACCATA TCCACAGCCGCAACCATTTCCATCACAACAACCATATCTGCAACTGCAACCATTTCCGCAGCCGCAACTATCATATTCGCAGCCACAACCATTT CGACCACAACAACCATATCCACAACCGCAACCACAGTATTCGCAACCACAACAACCAATTTCACAGCAGCAGCAGCAGCAACAACAACAACAAC AACAACAACAACAACAACAACAACAACAACAACAAGAACAACAAATCCTTCAACAAATTTTGCAACAACAACTGATTCCATGCATGGATGTTGT ATTGCAGCAACACAACATAGCGCATGGAAGATCACAAGTTTTGCAACAAAGTACTTACCAGCTGTTGCAAGAATTGTGTTGTCAGCACCTATGG CAGATCCCTGAGCAGTCGCAGTGCCAGGCCATCCACAATGTTGTTCATGCTATTATTCTGCATCAACAACAAAAACAACAACAACAACCATCGA GCCAGGTCTCCTTCCAACAGCCTCTGCAACAATATCCATTAGGCCAGGGCTCCTTCCGGCCATCTCAGCAAAACCCACAGGCCCAGGGCTCTGT CCAGCCTCAACAACTGCCCCAGTTCGAGGAAATAAGGAACCTAGCGCTACAGACGCTACCTGCAATGTGCAATGTTTACATCCCTCCATATTGC ACCATGGCGCCATTTGGCATCTTCGGTACTAACTGA >Gli-α1 deduced protein (293 aa) MKTFLILALLAIVATTATTAVRVPVPQLQPQNPSQQQPQEQVPLVQQQQFLGQQQPFPPQQPYPQPQPFPSQQPYLQLQPFPQPQLSYSQPQPF RPQQPYPQPQPQYSQPQQPISQQQQQQQQQQQQQQQQQQQQQQQEQQILQQILQQQLIPCMDVVLQQHNIAHGRSQVLQQSTYQLLQELCCQHLW QIPEQSQCQAIHNVVHAIILHQQQKQQQQPSSQVSFQQPLQQYPLGQGSFRPSQQNPQAQGSVQPQQLPQFEEIRNLALQTLPAMCNVYIPPYC TMAPFGIFGTN* >*Gli-α2* transcript (882 bp) ATGAAGACCTTTCTCATCCTTGCCCTCCTTGCTATCGTGGCGACCACCGCCACAACTGCAGTTAGAGTTCCAGTGCCACAATTGCAGCCACAAA ATCCATCTCAGCAACAGCCACAAGAGCAAGTTCCGTTGGTACAACAACAACAATTTCTAGGGCAGCAACAACCATTTCCACCACAACAACCATA TCCACAGCCGCAACCATTTCCATCACAACAACCATATCTGCAACTGCAACCATTTCCGCAGCCGCAACTATCATATTCGCAGCCACAACCATTT CGACCACAACAACCATATCCACAACCGCAACCACAGTATTCGCAACCACAACAACCAATTTCACAGCAGCAGCAGCAGCAACAACAACAACAAC AACAACAACAACAACAACAACAACAACAACAACAAGAACAACAAATCCTTCAACAAATTTTGCAACAACAACTGATTCCATGCATGGATGTTGT ATTGCAGCAACACAACATAGCGCATGGAAGATCACAAGTTTTGCAACAAAGTACTTACCAGCTGTTGCAAGAATTGTGTTGTCAGCACCTATGG CAGATCCCTGAGCAGTCGCAGTGCCAGGCCATCCACAATGTTGTTCATGCTATTATTCTGCATCAACAACAAAAACAACAACAACAACCATCGA GCCAGGTCTCCTTCCAACAGCCTCTGCAACAATATCCATTAGGCCAGGGCTCCTTCCGGCCATCTCAGCAAAACCCACAGGCCCAGGGCTCTGT

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>Gli-α2 deduced protein (293 aa)
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>*Gli-α3* transcript (864 bp)
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>Gli-α3 deduced protein (287 aa)
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IFGTN*

>*Gli-α4* transcript (864 bp)
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>Gli-α4 deduced protein (287 aa)
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IFGTN*

>*Gli-α5* transcript (861 bp)
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>Gli-α5 deduced protein (286 aa)
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>Gli-α6 deduced protein (289 aa)

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>*Gli-α7* transcript (864 bp)

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>Gli-α7 deduced protein (287 aa)

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>*Gli-α8* transcript (891 bp)

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>Gli-α8 deduced protein (296 aa)
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>*Gli-α9* transcript (978 bp)
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>Gli-α9 deduced protein (325 aa)
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>*Gli-α10* transcript (900 bp)
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>Gli-α10 deduced protein (299 aa)
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>*Gli-α11* transcript (882 bp)
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>*Gli-α12* transcript (882 bp)
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>*Gli-α13* transcript (891 bp)
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>*Gli-α14* transcript (891 bp)
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>*Gli-α15* transcript (942 bp)
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>*Gli-α16* transcript (942 bp)
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>*Gli-α17* transcript (894 bp)
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>*Gli-α18* transcript (939 bp)
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>*Gli-α19* transcript (849 bp)
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>*Gli-α20* transcript (861 bp)
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>*Gli-α21* transcript (882 bp)
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>*Gli-α22* transcript (927 bp)
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>*Gli-α23* transcript (930 bp)
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>*Gli-α24* transcript (876 bp)
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AACAACAACAACAAATCCTACAACAAATTTTGCAACAACAACTGATTCCATGCAGGGATGTTGTATTGCAACAACACAACATAGCGCATGGAAG
CTCACAAGTTTTGCAAGAAAGTACTTACCAGCTGGTGCAACAATTGTGTTGTCAGCAGCTGTGGCAGATCCCCGAGCAGTCGCGGTGCCAAGCC
ATCCACAATGTTGTTCATGCTATTATTCTGCATCAACAACACCACCACCACCAACAACAACAACAACAACAACAACAACCGTTGAGCCAAG
TCTCCTTCCAACAGCCTCAGCAACAATATCCATCAGGCCAGGGCTTCTTCCAACCATCTCAGCAAAACCCACAGGCCCAGGGCTCTTTCCAGCC
TCAACAACTGCCCCAGTTTGAGGCAATAAGGAACCTAGCGCTACAGACGCTACCTGCAATGTGCAATGTGTATATCCCTCCATATTGCACCATT
GCTCCATTTGGCATCTTCGGTACTAACTGA
>Gli-α24 deduced protein (291 aa)
MKTFLILALLAIVATTATTAVRVPVPQLQLQNPSQQQPQEQVPLVQEQQFPGQQQPFPPQQPYPQPQPFPSQQPYLQLQPFPQPQLPYPQPQPF
RPQQPYPQPQPQYSQPQQPISQQQQQQQQQQQQQQQILQQILQQQLIPCRDVVLQQHNIAHGSSQVLQESTYQLVQQLCCQQLWQIPEQSRCQA
IHNVVHAIILHQQHHHHQQQQQQQQQQPLSQVSFQQPQQQYPSGQGFFQPSQQNPQAQGSFQPQQLPQFEAIRNLALQTLPAMCNVYIPPYCTI
APFGIFGTN*

>*Gli-α25* transcript (900 bp)
ATGAAGACCTTTCTCATCCTTGCCCTCCTTGCTATTGTAGCAACCACCGCCACAATTGCAGTTAGAGTTCCAGTGCCACAATTGCAGCCACAAA
ATCCATCTCAGCAACAACCACAAGAGCAAGTTCCATTGGTACAACAACAACAATTTCCAGGGCAGCAACAACCATTTCCACCACAACAGCCATA
TCCGCAGCTGCAACCATTTCCATCACAACAACCATATATGCAGCTGCAACCATTTCCGCAGCCGCAACTACCATATCCGCAGCCGCAACTACCA
TATCCGCAGCCGCAACCATTTCGACCACAACAATCATATCCACAACCGCAACCACAGTATTCGCAACCACAACAACCAATTTCGCAGCAGCAGC
AGCAGCAGCAGCAACAACAACAACAACAGATCCTTCAACAAATTTTGCAACAACAACTGATTCCATGCAGGGATGTTGTATTGCAACAACACAG
CATAGCGCATGGAAGCTCACAAGTTTTGCAACAAAGTACTTACCAGCTGGTGCAACAATTGTGTTGTCAGCAGCTGTGGCAGATCCCCGAGCAG
TCGCGGTGCCAAGCCATCCACAATGTTGTTCATGCTATTATTCTGCATCAACAACAACAACAACAACAACAACAACAACAACAACAACAACAAC
AACAACAACAACCGTTGAGCCAGGTCTGCTTCCAACAGTCTCAACAACAATATCCATCAGGCCAGGGCTCCTTCCAGCCATCTCAGCAAAACCC
ACAGGCCCAGGGCTCTGTCCAGCCTCAACAACTGCCCCAGTTTGAGGAAATAAGGAACCTAGCGCTAGAGACGCTACCTGCAATGTGCAATGTC

TATATCCCTCCATATTGCACCATTGCTCCAGTTGGCATCTTCGGTACTAACTGA
>Gli-α25 deduced protein (299 aa)
MKTFLILALLAIVATTATIAVRVPVPQLQPQNPSQQQPQEQVPLVQQQQFPGQQQPFPPQQPYPQLQPFPSQQPYMQLQPFPQPQLPYPQPQLP
YPQPQPFRPQQSYPQPQPQYSQPQQPISQQQQQQQQQQQQQILQQILQQQLIPCRDVVLQQHSIAHGSSQVLQQSTYQLVQQLCCQQLWQIPEQ
SRCQAIHNVVHAIILHQQQQQQQQQQQQQQQQQQQPLSQVCFQQSQQQYPSGQGSFQPSQQNPQAQGSVQPQQLPQFEEIRNLALETLPAMCNV
YIPPYCTIAPVGIFGTN*

2) Transcript and deduced protein sequences for 11 transcribed and intact γ-gliadin genes (each transcript sequence is provided from start to stop codons)

> *Gli-γ1* transcript (1020 bp)
ATGAAGACCTTACTCATCCTGACAATCATTGCGGTGGCACTAACTACCACCACCGCCAATATACAGGTCGACCCTAGTGGCCAAGTACAATGGC
CACAACAACAACAACCATTCCCCCAGCCCCAACAACCATTCTCCCAACAACCACAACAAATTTTTCCCCAACCCCAACAAACATTCCCCCATCA
ACCACAACAAGCATTTCCCCAACCCCAACAAACATTCCCCCATCAACCACAACAACAATTTCCCCAGCCCCAGCAACCACAACAACCATTTCCC
CAGCAACCACAACAACAATTTCCCCAGCCCCAACAACCACAACAACCATTTCCCCAGCAACCACAACAACAATTTCCCCAGCCCCAACAACCAC
AACAACCATTTCCCCAGCCCCAACAACCCCAACTACCATTTCCGCAACAACCACAACAACCATTCCCCCAGCCTCAACAACCCCAACAACCATT
TCCCCAGTTACAGCAACCACAACAACCTTTACCCCAGCCCCAACAACCGCAACAACCATTCCCCCAGCAACAACAACCATTGATTCAGCCATAC
CTACAACAACAGATGAACCCCTGCAAGAATTACCTCTTGCAGCAATGCAACCCTGTGTCATTGGTGTCATCCCTCGTGTCAATGATCTTGCCAC
GAAGTGATTGCAAGGTGATGCGGCAACAATGTTGCCAACAACTAGCACAGATTCCTCAGCAGCTCCAGTGCGCAGCCATCCATGGCATCGTGCA
TTCCATCATCATGCAGCAAGAACAACAACAACAACAACAACAACAACAACAACAACAACAACAACAACAACAAGGCATACAGATCATGCGGCCACTATTT
CAGCTCGTCCAGGGTCAGGGCATCATCCAACCTCAACAACCAGCTCAATTGGAGGTGATCAGGTCATTGGTATTGGGAACTCTTCCAACCATGT
GCAACGTGTTTGTTCCACCTGAGTGCTCCACCACCAAGGCACCATTTGCCAGCATAGTCGCCGACATTGGTGGCCAATGA
> Gli-γ1 deduced protein (339 aa)
MKTLLILTIIAVALTTTTANIQVDPSGQVQWPQQQQPFPQPQQPFSQQPQQIFPQPQQTFPHQPQQAFPQPQQTFPHQPQQQFPQPQQPQQPFP
QQPQQQFPQPQQPQQPFPQQPQQQFPQPQQPQQPFPQPQQPQLPFPQQPQQPFPQPQQPQQPFPQLQQPQQPLPQPQQPQQPFPQQQQPLIQPY
LQQQMNPCKNYLLQQCNPVSLVSSLVSMILPRSDCKVMRQQCCQQLAQIPQQLQCAAIHGIVHSIIMQQEQQQQQQQQQQQQQQQGIQIMRPLF
QLVQGQGIIQPQQPAQLEVIRSLVLGTLPTMCNVFVPPECSTTKAPFASIVADIGGQ*

> *Gli-γ2* transcript (858 bp)
ATGAAGACCTTATTCATCCTAACAATCCTTGCGATGGCAACAACTATCGCCACCGCGAATATGCAGGTCGACCCCAGCGGCCAAGTACAATGGC
CACAACAACAACCATTCCGCCAGCCCCAACAACCATTCTACCAGCAACCACAACACACATTTCCCCAACCCCAACAAACATTCCCCCATCAACC

ACAACAACAATTTCCCCAGCCCCAGCAACCACAACAACAATTTCCGCAGCCCCAGCAACCACAACAACCATTTCCCCAGCCCCAACAAGCCCAA
CTACCATTTCCCCAACAACCACAACAACCATTCCCCCAGCCTCAACAACCCCAACAACCATTTCCCCAGTCACAGCAACCACAACAACCTTTTC
CCCAGCCCCAACAACCGCAACAATCATTCCCCCAGCAACAACAACCGTTGATTCAGCCATATCTACAACAACAGATGAACCCTTGCAAGAATTA
CCTCTTACAACAATGCAACCCTGTGTCATTGGTGTCATCCCTCGTGTCAATGATATTGCCACGAAGTGATTGCCAGGTGATGCAGCAACAATGT
TGCCAACAACTAGCACAGATTCCTCGCCAGCTCCAGTGTGCAGCCATCCATAGCGTCGTGCATTCCATCGTCATGCAGCAAGAACAACAACAAG
GCATACAGATCCTCCGGCCACTGTTTCAGCTCGTCCAAGGTCAGGGCATCATCCAACCTCAACAACCAGCTCAATATGAGGTGATCAGGTCATT
GGTATTGAGAACCCTTCCAAACATGTGCAACGTGTATGTCCGACCTGACTGCTCCACCATCAACGCACCATTTGCCAGCATAGTCGCCGGCATC
AGTGGACAATGA

> Gli-γ2 deduced protein (285 aa)

MKTLFILTILAMATTIATANMQVDPSGQVQWPQQQPFRQPQQPFYQQPQHTFPQPQQTFPHQPQQQFPQPQQPQQQFPQPQQPQQPFPQPQQAQ
LPFPQQPQQPFPQPQQPQQPFPQSQQPQQPFPQPQQPQQSFPQQQQPLIQPYLQQQMNPCKNYLLQQCNPVSLVSSLVSMILPRSDCQVMQQQC
CQQLAQIPRQLQCAAIHSVVHSIVMQQEQQQGIQILRPLFQLVQGQGIIQPQQPAQYEVIRSLVLRTLPNMCNVYVRPDCSTINAPFASIVAGI
SGQ*

> *Gli-γ3* transcript (858 bp)

ATGAAGACCTTATTCATCCTAACAATCCTTGCGATGGCAACAACTATCGCCACCGCGAATATGCAGGTCGACCCCAGCGGCCAAGTACAATGGC
CACAACAACAACCATTCCGCCAGCCCCAACAACCATTCTACCAGCAACCACAACACACATTTCCCCAACCCCAACAAACATTCCCCCATCAACC
ACAACAACAATTTCCCCAGCCCCAGCAACCACAACAACAATTTCCGCAGCCCCAGCAACCACAACAACCATTTCCCCAGCCCCAACAAGCCCAA
CTACCATTTCCCCAACAACCACAACAACCATTCCCCCAGCCTCAACAACCCCAACAACCATTTCCCCAGTCACAGCAACCACAACAACCTTTTC
CCCAGCCCCAACAACCGCAACAATCATTCCCCCAGCAACAACAACCGTTGATTCAGCCATATCTACAACAACAGATGAACCCTTGCAAGAATTA
CCTCTTACAGCAATGCAACCCTGTGTCATTGGTGTCATCCCTCGTGTCAATGATCTTGCCACGAAGTGATTGCCAGGTGATGCAGCAACAATGT
TGCCAACAACTAGCACAGATTCCTCGCCAGCTCCAGTGTGCAGCCATCCATAGCGTCGTGCATTCCATCGTCATGCAGCAAGAACAACAACAAG
GCATACAGATCCTCCGGCCACTGTTTCAGCTCGTCCAAGGTCAGGGCATCATCCAACCTCAACAACCAGCTCAATATGAGGTGATCAGGTCATT
GGTATTGAGAACCCTTCCAAACATGTGCAACGTGTATGTCCGACCTGACTGCTCCACCATCAACGCACCATTTGCCAGCATAGTCGCCGGCATC
AGTGGACAATGA

> Gli-γ3 deduced protein (285 aa)

MKTLFILTILAMATTIATANMQVDPSGQVQWPQQQPFRQPQQPFYQQPQHTFPQPQQTFPHQPQQQFPQPQQPQQQFPQPQQPQQPFPQPQQAQ
LPFPQQPQQPFPQPQQPQQPFPQSQQPQQPFPQPQQPQQSFPQQQQPLIQPYLQQQMNPCKNYLLQQCNPVSLVSSLVSMILPRSDCQVMQQQC
CQQLAQIPRQLQCAAIHSVVHSIVMQQEQQQGIQILRPLFQLVQGQGIIQPQQPAQYEVIRSLVLRTLPNMCNVYVRPDCSTINAPFASIVAGI
SGQ*

> *Gli-γ4* transcript (1074 bp)

ATGAAGACCTTACTCATCCTGACGATCCTTGCGATGGCAATAACCATCAGCACCGCCAATATGCAGGTCGACCCTAGTGGCCAAGTACAATGGC
CACAACAACAACTAGTCCCCCAACCCCAACAGCCATTATCCCAGCAACCGCAACAAGCATTTCCCCAACCCCAACAAACATTTCCCCATCAACC
ACAACAACAAGTTCCCCAGCCTCAGCAACCACAACAACCATTTCTCCAGCCCCAACAAGCATTCCCCCAACAACCACAACAACCATTCCCTCAG
ACTCAACAACCACAACAACCATTTCCCCAGCAACCACAACAACCATTCCCCCAGACTCAACAACCACAACAACCATTTCCCCAGCAACCACAAC
AACCATTTCCCCAGCAACCACAACAACCATTCCCCCAGACTCAACAACCACAACAACCATTTCCCCAGCAACCACAACAACCATTCCCCCAGAC
TCAACAACCACAACAACCATTTCCCCAGTTCCAGCAACCACACCAACCTTTTCCCCAGCCCCAACAACAATTCCCGCAGCCCCAACAACCGCAA
CAATCATTCCTCCAGCAACAACGACCGTTCATTCAGCCATCTCTACAACAACGTTTGAACCCATGCAAGAATATCCTCTTGCAACAATGCAAAC
CTGCGTCATTGGTGTCATCCCTCTGGTCGATAATCTGGCCACAAAGCGATTGCCAAGTGATGCAGCAACAATGCTGCCAAGAACTAGCACAGAT
TCCTCAGCAGCTCCAGTGCGCAGCCATCCATAGCGTCGTGCATTCCATCATCATGCAGCAGCAACAACAACAACAACAACAACAACAACAACAA
CAAGGCATGCATATCCTGCTGACACTATCTCAACAACAACAGTTGGGTCAAGGTACTCTCGTCCAAGGCCAGGGCATCATCCAACCTCAACAAC
TAGCTCAATTGGAGGCGATCAGGTCATTGGTGTTGCAAACTCTTCCAACCATGTGCAACGTGTATGTCCCACCTGAGTGCTCCATCATCAGGGC
ACCATTTGCCAGCATAGTCGCGGGGATTGGTGGCCAATGA

> Gli-γ4 deduced protein (357 aa)

MKTLLILTILAMAITISTANMQVDPSGQVQWPQQQLVPQPQQPLSQQPQQAFPQPQQTFPHQPQQQVPQPQQPQQPFLQPQQAFPQQPQQPFPQ
TQQPQQPFPQQPQQPFPQTQQPQQPFPQQPQQPFPQQPQQPFPQTQQPQQPFPQQPQQPFPQTQQPQQPFPQFQQPHQPFPQPQQQFPQPQQPQ
QSFLQQQRPFIQPSLQQRLNPCKNILLQQCKPASLVSSLWSIIWPQSDCQVMQQQCCQELAQIPQQLQCAAIHSVVHSIIMQQQQQQQQQQQQQ
QGMHILLTLSQQQQLGQGTLVQGQGIIQPQQLAQLEAIRSLVLQTLPTMCNVYVPPECSIIRAPFASIVAGIGGQ*

> *Gli-γ5* transcript (909 bp)

ATGAAGACCTTACTCATCCTAACAATCCTTGCGATGGCAACAACCATCGCCACCGCCAATATGCAAGTCGACCCCAGCGGCCAAGTACAATGGC
CACAACAACAACCATTCCCCCAGCCCCAACAACCATTCTGCGAGCAACCACAACGAACTATTCCCCAACCCCATCAAACATTCCACCATCAACC
ACAACAAACATTTCCCCAACCCGAACAAACATACCCCCATCAACCACAACAACAATTTCCCCAGACCCAACAACCACAACAACCATTTCCCCAG
CCCCAACAAACATTCCCCCAACAACCCCAACTACCATTTCCCCAACAACCCCAACAACCATTCCCCCAGCCTCAGCAACCCCAACAACCATTTC
CCCAGTCACAACAACCACAACAACCTTTTCCCCAGCCCCAACAACAATTTCCGCAGCCCCAACAACCACAACAATCATTCCCCCAACAACAACA
ACCGGCGATTCAGTCATTTCTACAACAACAGATGAACCCCTGCAAGAATTTCCTCTTGCAGCAATGCAACCATGTGTCATTGGTGTCATCTCTC
GTGTCAATAATTTTGCCACGAAGTGATTGCCAGGTGATGCAGCAACAATGTTGCCAACAACTAGCACAAATTCCTCAACAGCTCCAGTGCGCAG
CCATCCACAGCGTCGCGCATTCCATCATCATGCAACAAGAACAACAACAAGGCGTGCCGATCCTGCGGCCACTATTTCAGCTCGCCCAGGGTCT
GGGTATCATCCAACCTCAACAACCAGCTCAATTGGAGGGGATCAGGTCATTGGTATTGAAAACTCTTCCAACCATGTGCAACGTGTATGTGCCA
CCTGACTGCTCCACCATCAACGTACCATATGCCAACATAGACGCTGGCATTGGTGGCCAATGA

> Gli-γ5 deduced protein (302 aa)

MKTLLILTILAMATTIATANMQVDPSGQVQWPQQQPFPQPQQPFCEQPQRTIPQPHQTFHHQPQQTFPQPEQTYPHQPQQQFPQTQQPQQPFPQ

PQQTFPQQPQLPFPQQPQQPFPQPQQPQQPFPQSQQPQQPFPQPQQQFPQPQQPQQSFPQQQQPAIQSFLQQQMNPCKNFLLQQCNHVSLVSSL
VSIILPRSDCQVMQQQCCQQLAQIPQQLQCAAIHSVAHSIIMQQEQQQGVPILRPLFQLAQGLGIIQPQQPAQLEGIRSLVLKTLPTMCNVYVP
PDCSTINVPYANIDAGIGGQ*

> *Gli-γ6* transcript (894 bp)
ATGAAGACCTTACTCATCCTAACAATCCTTGCGATGGCAACAATAATCGCCACTGCCAATATGCAGGTCGACCCTAGCAGCCGAGTACAATGGC
CACAAGAACAACCATCCCCCCAGTCCCAACAACCATTCTCCCAGCAACCACAACAAATATTTCCCCAACCCCAACAAACATTGCCCCATCAACC
ACAACAAGCATTTCCCCAACCTCAACAAACATTCCCCCATCGACCACAACAACAATTTCCCCAGCCCCAGCAACCACAACAACCATTTCCTCAG
CCCCAACAACCCCAACTACCATTTCCCCAACAACCACAACAACCATTCCCCCAGCCTCAACAACCCCAACAACCATTTCCCCAGTCACAGCAAC
CACAACAACCTTTTCCCCAGCCCCAACAACAATTTCCGCAGCCCCAACAACCACAACAATCATTCCCCCAACAACAACAATGGATGATTCAGTC
ATTTCTACAACAACAGATGAACCCCTGCAAGAATTTCCTCTTGCAGCAATGCAACCCTGTGTCATTGGTGTCATCTCTCGTGTCAATAATCTTG
CCACGAAGTGATTGCCAGCTGATGCAGCAACAATGTTGCCAACAACTAGCACAAATTCCTCAACAGCTCCAGTGCGCAGCCATCCACAGCGTCG
CGCATTCCATCGTCATGCAGCAAGAACAACAACGAGGCGTGCAGATCCTGCGGCCACTATTTCAGCTCGCCCAGGGTCTGGGTATCATCCAACC
TCAACAACCAGCTCAATTGGAGGGGATCAGGTCATTGGTATTGAAAACTCTTCCAACCATGTGCAATGTGTATGTCCCACCTGACTGCTCCACC
ATCAACGTGCCATATGCCAGCATAGACGCTGTCATTGGTGGCCAATGA

> Gli-γ6 deduced protein (297 aa)
MKTLLILTILAMATIIATANMQVDPSSRVQWPQEQPSPQSQQPFSQQPQQIFPQPQQTLPHQPQQAFPQPQQTFPHRPQQQFPQPQQPQQPFPQ
PQQPQLPFPQQPQQPFPQPQQPQQPFPQSQQPQQPFPQPQQQFPQPQQPQQSFPQQQQWMIQSFLQQQMNPCKNFLLQQCNPVSLVSSLVSIIL
PRSDCQLMQQQCCQQLAQIPQQLQCAAIHSVAHSIVMQQEQQRGVQILRPLFQLAQGLGIIQPQQPAQLEGIRSLVLKTLPTMCNVYVPPDCST
INVPYASIDAVIGGQ*

> *Gli-γ7* transcript (876 bp)
ATGAAGACCTTACTCATCCTGACAATCCTTGCGATGGCAATAACCATCGCCACCGCCAATATGCAGGTCGACCCTAGCGGCCAAGTACAATGGC
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ACAACAACAATTTCCCCAGCCTCAGCAACCACAACAACAATTTCTCCAGCCCCGACAACCATTCCCCCAACAACCACAACAACCATATCCCCAG
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CGCAACAATCATTCCCCCAACAACAACCATCATTGATTCAACAATCTCTACAACAACAGTTGAACCCATGCAAGAATTTCCTCTTGCAGCAATG
CAAACCTGTGTCCTTGGTGTCATCCCTCTGGTCAATCATCTTGCCACCAAGCGATTGCCAGGTGATGCGGCAACAATGTTGTCAACAACTAGCA
CAAATTCCTCAGCAACTCCAGTGTGCAGCCATCCATAGCGTCGTGCATTCCATCATCATGCAGCAAGAACAACAAGAACAACTACAGGGTGTGC
AAATCCTGGTGCCACTGTCTCAACAGCAACAGGTGGGTCAAGGTATTCTCGTCCAGGGTCAAGGCATCATCCAACCTCAACAACCAGCTCAATT
GGAGGTGATCAGGTCATTGGTGTTGCAAACTCTTCCAACCATGTGCAACGTGTATGTCCCACCTTACTGCTCCACCATCAGGGCACCATTTGCT
AGCATAGTCGCCAGCATTGGTGGCCAATGA

	>Gli-γ7 deduced protein (291 aa) MKTLLILTILAMAITIATANMQVDPSGQVQWPQQQPFLQPHQPFSQQPQQIFPQPQQTFPHQPQQQFPQPQQPQQQFLQPRQPFPQQPQQPYPQ QPQQPFPQTQQPQQPFPQSKQPQQPFPQPQQPQQSFPQQQPSLIQQSLQQQLNPCKNFLLQQCKPVSLVSSLWSIILPPSDCQVMRQQCCQQLA QIPQQLQCAAIHSVVHSIIMQQEQQEQLQGVQILVPLSQQQQVGQGILVQGQGIIQPQQPAQLEVIRSLVLQTLPTMCNVYVPPYCSTIRAPFA SIVASIGGQ* >*Gli-γ8* transcript (984 bp) ATGAAGACCTTACTCATCCTGACAATCCTTGCGATGGCAATAACCATCGGCACCGCCAATATCCAGGTCGACCCTAGCGGCCAAGTACAATGGC TACAACAACAACTAGTCCCCCAGCTCCAACAGCCATTATCCCAGCAACCACAACAAACATTTCCCCAACCTCAACAAACATTCCCCCATCAACC ACAACAACAAGTTCCCCAGCCTCAGCAACCACAACAACCATTTCTCCAGCCCCAACAACCATTCCCCCAACAACCACAACAACCATTCCCCCAG ACTCAACAACCACAACAACCATTTCCCCAGCAACCACAACAACCATTTCCCCAGACTCAACAACCCCAACAACCATTTCCCCAACAACCACAAC AACCATTCCCCCAGACTCAACAACCCCAACAACCATTTCCCCAGCTCCAGCAACCACAACAACCTTTTCCCCAGCCCCAACAACAATTGCCGCA GCCCCAACAACCGCAACAATCATTCCCCCAACAACAACGGCCATTCATTCAACCATCTCTACAACAACAGTTGAACCCATGCAAGAATATCCTC TTGCAACAATGCAAACCTGCGTCATTGGTGTCATCCCTCTGGTCAATAATCTGGCCACAAAGCGATTGCCAAGTGATGCGGCAACAATGCTGCC AACAACTAGCACAGATTCCTCAACAGCTCCAGTGCGCAGCCATCCATAGCGTCGTGCATTCCATCATCATGCAGCAGCAGCAGCAACAACAACA ACAACAAGGCATGCATATCTTTCTGCCACTATCTCAGCAGCAACAGGTGGGTCAAGGTTCTCTAGTCCAAGGCCAGGGCATCATCCAACCACAA CAACCAGCTCAATTGGAGGCGATCAGATCATTGGTGTTGCAAACTCTTCCATCCATGTGCAACGTGTATGTCCCACCTGAGTGCTCCATCATGA GGGCACCATTTGCCAGCATAGTCGCGGGCATTGGTGGCCAATGA >Gli-γ8 deduced protein (327 aa) MKTLLILTILAMAITIGTANIQVDPSGQVQWLQQQLVPQLQQPLSQQPQQTFPQPQQTFPHQPQQQVPQPQQPQQPFLQPQQPFPQQPQQPFPQ TQQPQQPFPQQPQQPFPQTQQPQQPFPQQPQQPFPQTQQPQQPFPQLQQPQQPFPQPQQQLPQPQQPQQSFPQQQRPFIQPSLQQQLNPCKNIL LQQCKPASLVSSLWSIIWPQSDCQVMRQQCCQQLAQIPQQLQCAAIHSVVHSIIMQQQQQQQQQQQGMHIFLPLSQQQQVGQGSLVQGQGIIQPQ QPAQLEAIRSLVLQTLPSMCNVYVPPECSIMRAPFASIVAGIGGQ* >*Gli-γ9* transcript (897 bp) ATGAAGACCTTACTCATCCTGACAATCCTTGCGATGGCAATAACCATCGGCACCGCCAATATGCAGGTCGACCCTAGCAGCCAAGTACAATGGC CACAACAACAACCAGTCCCACAGCCTCACCAACCATTCTCCCAGCAACCACAACAAACATTTCCCCAACCCCAACAAACATTCCCCCATCAACC ACAACAACAATTTCCCCAGCCTCAGCAACCACAACAACAATTTCTCCAGCCCCAACAACCATTCCCCCAACAACCACAACAACCATATCCCCAG CAACCACAACAACCATTCCCCCAGACTCAACAACCCCAACAACTATTTCCCCAGTCCCAGCAACCACAACAACAATTTTCTCAGCCCCAACAAC AATTCCCGCAGCCCCAACAACCGCAACAATCATTCCCCCAACAACAACCACCGTTCATTCAGCCATCTCTACAACAACAGGTGAACCCATGCAA GAATTTCCTCTTGCAGCAATGCAAACCTGTGTCACTGGTGTCATCCCTCTGGTCAATGATCTGGCCACAAAGCGATTGCCAAGTGATGCGGCAA CAATGCTGCCAACAACTAGCACAGATTCCTCAGCAGCTCCAGTGTGCAGCCATCCATACCATCATACATTCCATCATCATGCAGCAAGAACAAC

AAGAACAACAACAAGGCATGCATATCCTGCTGCCACTATATCAGCAGCAACAGGTGGGTCAAGGTACTCTCGTCCAGGGCCAGGGCATCATCCA
ACCCCAACAACCAGCTCAATTGGAGGCGATCAGGTCATTGGTGTTGCAAACTCTTCCAACCATGTGCAACGTGTATGTCCCACCTGAGTGCTCC
ATCATCAAGGCACCATTTTCCAGCGTAGTCGCCGGCATTGGTGGCCAATGA

> Gli-γ9 deduced protein (298 aa)

MKTLLILTILAMAITIGTANMQVDPSSQVQWPQQQPVPQPHQPFSQQPQQTFPQPQQTFPHQPQQQFPQPQQPQQQFLQPQQPFPQQPQQPYPQ
QPQQPFPQTQQPQQLFPQSQQPQQQFSQPQQQFPQPQQPQQSFPQQQPPFIQPSLQQQVNPCKNFLLQQCKPVSLVSSLWSMIWPQSDCQVMRQ
QCCQQLAQIPQQLQCAAIHTIIHSIIMQQEQQEQQQGMHILLPLYQQQQVGQGTLVQGQGIIQPQQPAQLEAIRSLVLQTLPTMCNVYVPPECS
IIKAPFSSVVAGIGGQ*

> *Gli-γ10* transcript (888 bp)

ATGAAGACCTTACTCATCGTAACAATCCTTGCGATGGCAACAACCATCGCCACCGCCAATATGCAAGTCGACCCCGGCTACCAAGTACAATGGC
CACAACAACAACCATTCCCCCAGCCCCAACAACCATTCTGCCAGCAACCACAACAAACTATTCCCCAACCCCATCAAACGTTCCACCATCAACC
ACAGCAAACATACCCCCATCAACCACAACAACAATTTCCCCAGACCCAGCAACCACAACAACCATTTCCCCAGCCCCAACAAACATTCCCCCAA
CAACCCCAACTACCATTTCCCCAACAACCCCAACAACCATTCCCCCAGCCTCAACAACCCCAACAACAATTTCCCCAGTCACAGCAACCACAAC
AACCTTTTCCCCAGCCCCAACAACAATTCCTGCAGCCCCAACAACCGCAACAATCATTCCCCCAGCAACAACAACCGTTGATTCAGCTATCTCT
ACAACAACAGATGAACCCCTGCAAGAATTTTCTCTTGCAGCAATGCAACCCTGTGTCATTGGTGTCATCCCTCATATCAATGATCTTGCCACGA
AGTGATTGCCAGGTGATGCAGCAACAATGTTGCCAACAACTGGCACAGATTCCTCAGCAGCTCCAGTGTGCAGCCATCCATAGTGTCGTGCATT
CCATCATCATGCAGCAAGAACAACGACAAGGCGTGCAGATCCGGCGGCCACTGTTTCAGCTCGTTCAGGGTCAGGGCATCATCCAACCTCAACA
ACCAGCTCAATTGGAGGTGATCAGGTCATTGGTATTGAGAACTCTTCCAACCATGTGCAACGTGTATGTCTCACCTGACTGCTCCACCATCAAC
GCACCATTTGCCAACATAGTCGTCGGCATTGGTGGCCAATGA

> Gli-γ10 deduced protein (295 aa)

MKTLLIVTILAMATTIATANMQVDPGYQVQWPQQQPFPQPQQPFCQQPQQTIPQPHQTFHHQPQQTYPHQPQQQFPQTQQPQQPFPQPQQTFPQ
QPQLPFPQQPQQPFPQPQQPQQQFPQSQQPQQPFPQPQQQFLQPQQPQQSFPQQQQPLIQLSLQQQMNPCKNFLLQQCNPVSLVSSLISMILPR
SDCQVMQQQCCQQLAQIPQQLQCAAIHSVVHSIIMQQEQRQGVQIRRPLFQLVQGQGIIQPQQPAQLEVIRSLVLRTLPTMCNVYVSPDCSTIN
APFANIVVGIGGQ*

> *Gli-γ11* transcript (897 bp)

ATGAAGACCTTACTCATCCAAACAATCCTCGTGATGGCAATAACCATCGCCACCGCCAATATGCAGGTCGACCCTAGCGGCCAAGTACCATGGC
CACAACAACAACCATTCCCGCAGCCTCACCAACCATTCTCCCAGCAACCGCAACAAACATTTCCCCAACCCCAACAAACATTCCCCCATCAACC
ACAACAACAATTTTCCCAGCCTCAGCAACCACAACAACAATTTATCCAGCCCCAACAACCATTCCCCCAACAACCACAACAAACATATCCCCAG
CAACCACAACAACCATTCCCCCAGACTCAACAACCCCAACAACTATTTCCCCAGTCCCAGCAACCACAACAACAATTTCCCCAGCCCCAACAAC
AATTCCCGCAGCCCCAACAACCACAACAATCATTCCCCCAACAACAACCATCGTTGATTCAACAATCTCTACAACAACAGTTGAACCCATGCAA

GAATTTCCTCTTGCAACAATGCAAACCTGTGTCCTTGGTGTCATCCCTCTGGTCAATGATCTTGCCACGAAGCGATTGCCAGGTGATGCGGCAA
CAATGTTGCCAACAACTAGCACAAATTCCTCAGCAACTCCAGTGTGCAGCCATCCATAGCATCGTGCATTCCATCATCATGCAGCAAGAACAAC
AAGAACAACGACAGGGTGTGCAAATCCTGGTGCCACTGTCTCAACAGCAACAGGTAGGTCAAGGTACTCTCGTCCAAGGTCAGGGCATCATCCA
ACCTCAACAACCAGCTCAATTGGAGGTGATTAGGTCATTGGTGTTGCAAACTCTTGCAACCATGTGCAACGTGTATGTCCCACCTTACTGCTCC
ACCATCAGGGCACCATTTGCCAGCATAGTCGCCGGCATTGGTGGCCAATGA

> Gli-γ11 deduced protein (298)

MKTLLIQTILVMAITIATANMQVDPSGQVPWPQQQPFPQPHQPFSQQPQQTFPQPQQTFPHQPQQQFSQPQQPQQQFIQPQQPFPQQPQQTYPQ
QPQQPFPQTQQPQQLFPQSQQPQQQFPQPQQQFPQPQQPQQSFPQQQPSLIQQSLQQQLNPCKNFLLQQCKPVSLVSSLWSMILPRSDCQVMRQ
QCCQQLAQIPQQLQCAAIHSIVHSIIMQQEQQEQRQGVQILVPLSQQQQVGQGTLVQGQGIIQPQQPAQLEVIRSLVLQTLATMCNVYVPPYCS
TIRAPFASIVAGIGGQ*

3) Transcript and deduced protein sequences for the single transcribed and intact δ-gliadin gene (the transcript sequence is provided from start to stop codons)

> *Gli-δ1* transcript (984 bp)

ATGAAGATCTTCATGGTCTTTGCCCTCCTCGTTGCATCAACGACCATCACCACCGCGACCGCACAGCTCGACCCTCGCATCCATGACCAAGAAA
GGCCACAACAATCGTTTCTGCAACAGCAACCACTTATCCAGCAACAACCATACCCGCCTCAAGAGCCACAACAACCACTATTCCCGCAAAAAGA
GCCACAACAACCATTTCCGCTGCAGCAGCCACAATACCAGCAACAACAACCGTATCCACAACAACCACTTCCCCAAGAACAACTTCCCCAGCAA
CATTTATTTCCGCAGCAGCCGCCACAACAACAATTTCCACAACAGATGCCACTTCCGCATCAACAACAAACATTCCCGCAACAACAACAACAAC
AACAACAACAAGAACAACTCCCACAACAACTCCCACAATTCCCGCAACAACAACCATTTTCCCAATATCAACAACCATTAACACAACAACCATA
CTCGCAAGAGCAACCATTGCCACAACAACAACCTTCTGTAGAGGAAAAACAACAATTGAACTTGTGCAAGGAGTTCCTCCTGCAGCAGTGTAAC
CCAGAGGAGAAACTGTCGTTACTCCAGTCAGTGATCCCGTTCCTCCGACCAAAGACCTCGCAACAGAACAGCTGCCAGTTGAAGCGACTACAAT
GTTGTCGACAACTTGCACATATCAGTGAACCGTCCCGATGCCCGGCCATCCACAACATTGTGCATGCCATCGTCATGCAACAACAACATGTGGA
TAGAGGTTTCGGCCAGCCTCAACCACAACAGTTGGGCCAGGAAATGCCCATGCAGCCTCAACATCAATTGGGCCAGCACTCTATCCTACCTCAA
CAACTAGCCCAGTACAAGTTGGTTAGGTTACTTGTGATTCAGACCCTTCCTATGTTATGCAACGTGCATGTCCCGTCTGATTGCTACACCATTA
CTGCACCATTTGGTAGCATGACTGCCTACAATGGTGGACAATGA

> Gli-δ1 deduced protein (327 aa)

MKIFMVFALLVASTTITTATAQLDPRIHDQERPQQSFLQQQPLIQQQPYPPQEPQQPLFPQKEPQQPFPLQQPQYQQQQPYPQQPLPQEQLPQQ
HLFPQQPPQQQFPQQMPLPHQQQTFPQQQQQQQQQEQLPQQLPQFPQQQPFSQYQQPLTQQPYSQEQPLPQQQPSVEEKQQLNLCKEFLLQQCN
PEEKLSLLQSVIPFLRPKTSQQNSCQLKRLQCCRQLAHISEPSRCPAIHNIVHAIVMQQQHVDRGFGQPQPQQLGQEMPMQPQHQLGQHSILPQ
QLAQYKLVRLLVIQTLPMLCNVHVPSDCYTITAPFGSMTAYNGGQ*

4) Transcript and deduced protein sequences for five transcribed and intact ω-gliadin genes (each transcript sequence is provided from start to stop codons)

> *Gli-ω1* transcript (1080 bp)

ATGAAGACCTTCCTCATCTTCGTCCTCCTTGCCATGGCGATGAGCATCGTCACTGCTGCTAGGCAGCTAAACCCTAGCAAGCAAGAGTTGCAAT
CACCACAACAATTATATCCGCAGCAACCATATCCACAGCAACCATATCCACCACAACAACCATTTCCCACACCCCAACAATATTTCCCCCATCA
ATCACAACAACCATTTTCCCCACCACAACAATCATTTCCCCAACCCCAACAAGCAACCCCCCTACAACCACAACAACCATTCCCCCAGCAACCC
CAACAACCACAACAAGCTTTTCCCCAACCCCAACAACAATTTGCCTTGCAACCACAACAACAATTTCCCCAGCTCCAACAACCACAACAATCAT
TCCCACAACAACCCCAGAGACCACACCCATTCCCCCAACAACTAGAACAAGTAATTTCACAGCAACCACAACAACCATTCCTCCTGCAACCGCA
ACAACCATTCCCCCAGCAACCAGAACAAATAATATCCCAGCAACCCCAACAACTATTTTCTCAGTCACAACAACCATTTCCCCAGCAACCCCAA
CAACCATTTCCCCTGCAACCGCAACAACCATTTCCCCAACAACCAGCACAAATAATTGCTCAGCAACCTCAACAACCATCCCCTCTGCAACCAC
AACAACCGTTCCTCCGGCAACCACAACAATCGTTCCTCCAGCAACCACAACAACCATTTCCCCAACCCCAACAAGTAGTACAAATAAATCCCCA
GCAACCCCAACAACCATTTTCCCAGTCACGACAACCATTTCCCCAGCAACCCCAACAACCATTCCCACTGCAACCGCAACAACCATTTCCCCAG
CAATCAGCACAAATAATTCCTCAGCAACCCCAACAACCATTCCCTCTACAACCACAACAATCATTCCTTCGGCAATCACAACAACCGTTCCTCC
AACAACCACAACAACCATCTCCCCAACCCCAACAAGTAGTACAAATAATTCCCCAGCAACCCCAACAACCATTCCCTCTGCTGGCAAACCAACC
TCAGCAACCTTATCCACAACAGCAACCATCAGGAGTAATGGTATAG

> Gli-ω1 deduced protein (359 aa)

MKTFLIFVLLAMAMSIVTAARQLNPSKQELQSPQQLYPQQPYPQQPYPPQQPFPTPQQYFPHQSQQPFSPPQQSFPQPQQATPLQPQQPFPQQP
QQPQQAFPQPQQQFALQPQQQFPQLQQPQQSFPQQPQRPHPFPQQLEQVISQQPQQPFLLQPQQPFPQQPEQIISQQPQQLFSQSQQPFPQQPQ
QPFPLQPQQPFPQQPAQIIAQQPQQPSPLQPQQPFLRQPQQSFLQQPQQPFPQPQQVVQINPQQPQQPFSQSRQPFPQQPQQPFPLQPQQPFPQ
QSAQIIPQQPQQPFPLQPQQSFLRQSQQPFLQQPQQPSPQPQQVVQIIPQQPQQPFPLLANQPQQPYPQQQPSGVMV*

> *Gli-ω2* transcript (1221 bp)

ATGAAGACCTTCCTCATCTTGGTCCTCCTTGCCATGGCGACGAGCATGGTCACTGCTGCTAGGCCGCTAAACCCTAGCGACCAAGAGTTGCAAT
CACCACAACAACAATTTCCGGAAGAACAATCATATCCGCAGCAACCATATCCACAGCAAGCATTTCCCATACCCCAACAATATTCCCCGCATCA
ACCACAACAACCATTTCCTCAACCCCAACGACCAACCCCCCTCCAACCACAACAACCATTCCCCCAGCAACCCAAACAACCACAACAATCTTTTT
CCCCAGCCCCAACAACAATTCCCCTTGCAACCACAACAACCATTTCCCCAGCCTCAACAGCCGATTCCCCAACAACCACGAATACCATTCCCGG
AGCAACCCCAGAGACCCCAACAACCACAACAATCTTTTCCTCAGCCCCAACAACAATTCCCCTTGCAACCACAACAACCATTTCCCCAGCCCCA
ACAACCACAACAACCATTCCCCCAGCAACCCCAGAGACCACAACAATCATTCCCCCAGCAACCAGAACAAATAATTCCCCAGCAACCGCAACAA
CCATTCCCCCTACAACCGCAACAACCATTCCCCCAGCAACCAGAACAAATAATTTCCCAGCAATCCCAACAACCATTCTCTCTGCAGCCACAAC
AACCATTTTCCCAGCCCCAACAACCATTATCCCAGCAACCAGGACAAATAATTCCCCAGCAATCCCAACAACCATGCCCCCTCCAACCACAACA
ACCATTCCCCCAGCAACCAGAACAAATAATTCGCCAGCAACCGCAACAACCATTCCTCCTACAATCGCAACAACCATTCCACCAGCAACCAGAA

CAAATAATTTCTCAGCAACCCCAAAAACCATTCTCTCTGCAGCCCCAACAACCATTTTCCCAGCCCCAACAACCATTTCCCCAGCAACCAGGAC
AAATAATTCCCCAGCAACCCCAACAACCATTCTCCCTGCAACCTCAACAACCATTCCCCCAGCAACTCCAACAACCATTCGCTCTGCAACCACA
ACAATCGTTCCCCCAGCAACCACAACAACCATTTCCCCAACCCCAACAAGCATTCCCAGAACAAGCCAGAACAGATAATTCCCCAGCAACCCTA
ACAACCATTCCCTCTGCAGCCACACCAACCTCAGCAACCTTATCCACAACAACAACCATCTGGAGTAGCGGTATAGGCATCAGGGGCCAATGA

> Gli-ω2 deduced protein (406 aa)

MKTFLILVLLAMATSMVTAARPLNPSDQELQSPQQQFPEEQSYPQQPYPQQAFPIPQQYSPHQPQQPFPQPQRPTPLQPQQPFPQQPKQPQQSF
PQPQQQFPLQPQQPFPQPQQPIPQQPRIPFPEQPQRPQQPQQSFPQPQQQFPLQPQQPFPQPQQPQQPFPQQPQRPQQSFPQQPEQIIPQQPQQ
PFPLQPQQPFPQQPEQIISQQSQQPFSLQPQQPFSQPQQPLSQQPGQIIPQQSQQPCPLQPQQPFPQQPEQIIRQQPQQPFLLQSQQPFHQQPE
QIISQQPQKPFSLQPQQPFSQPQQPFPQQPGQIIPQQPQQPFSLQPQQPFPQQLQQPFALQPQQSFPQQPQQPFPQPQQAFPEQARTDNSPATL
TTIPSAATPTSATLSTTTTIWSSGIGIRGQ*

> *Gli-ω3* transcript (1320 bp)

ATGAAGACCTTCATCATATTTGTCCTCCTTGCCATGGCGATGAACATCGCCAGTGCCAGTAGGCTGCTAAGCCCTAGAGGCAAGGAATTGCATA
CTCCACAAGAACAATTCCCCCAACAACAACAATTCCCCCAACCACAACAATTCCCCCAACAACAAATCCCCCAACAACATCAAATCCCCCAGCA
ACCACAACAATTCCCCCAACAACAACAATTCTTCCAACAACAACAAATCCCGCAACAACAAATCCCCCAACAACATCAAATCCCCCAGCAACCA
CAACAATTCCCCCAGCAACAGCAATTCCCCCAACAACACCAATCCCCCCAACAACAATTCCCACAACAACAATTCCCCCAACAGAAATTGCCGC
AACAGGAATTCCCACAACAACAAATCTCCCAGCAACCACAACAACTCCCCCAGCAACATCAAATCCCCCAGCAACCTCAACAATTTCTCCAACA
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CCCCAGCAACCACAACAAATCCCCCAACAACAACAAATCCCCCAGCAACCACAACAATTCCCCCAACAACAATTCCCGCAACAACAATTTCCCC
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AATCCCCCAGCAACCACAACAATTTCCCCAACAACAACAATTCCCCCAGCAACAATCACCCCAACAACAGCAATTTCCCCAACAACAATTCCCC
CAACAACAACAATTACCGCAAAAACAATTCCCCCAACCACAACAAATACCCCAACAACAACAAATCCCCCAGCAACCACAACAATTCCCCCAGC
AACAATTCCCCCAACAACAGCAATTTCCCCAACAACAAGAATTCTCCCCACAGCAATTCCCGCAACAACAATTCCACCAACAACAATTACCGCA
ACAACAATTTCCCCAACAACAATTCCCCCAACAACAATTCCCCCAACAACAACAGTTCCCCCAACAACAACAATTAACGCAACAACAATTCCCC
CGGCCACAACAATACCCTGAACAACAACAATTCCCCCAACAACAATTCCCCCAGCAACCACCACAACAATTCCCCCAACAACAATTTCCAATAC
CATACCCACCCCAGCAATCACAAGAACCTTCCCCATACCAACAATATCCACAACAACAACCATCTGGGAGCGACGTTATAAGTATCAGTGGCCT
ATGA

> Gli-ω3 deduced protein (439 aa)

MKTFIIFVLLAMAMNIASASRLLSPRGKELHTPQEQFPQQQQFPQPQQFPQQQIPQQHQIPQQPQQFPQQQQFFQQQQIPQQQIPQQHQIPQQP
QQFPQQQQFPQQHQSPQQQFPQQQFPQQKLPQQEFPQQQISQQPQQLPQQHQIPQQPQQFLQQQQFPQQQPPQQHQFPQQQLPQQQQIPQQQQI
PQQPQQIPQQQQIPQQPQQFPQQQFPQQQFPQQQFPQQEFPQQQQFPQQQIAQQPQQLPQQQQIPQQPQQFPQQQQFPQQQSPQQQQFPQQQFP
QQQQLPQKQFPQPQQIPQQQQIPQQPQQFPQQQFPQQQQFPQQQEFSPQQFPQQQFHQQQLPQQQFPQQQFPQQQFPQQQQFPQQQQLTQQQFP

RPQQYPEQQQFPQQQFPQQPPQQFPQQQFPIPYPPQQSQEPSPYQQYPQQQPSGSDVISISGL*

> *Gli-ω4* transcript (1164 bp)

ATGAAGACCTTCCTCATCTTTGTCCTCCTTGCCATGGCGATGAAGATCGCCACTGCCGCTAGGGAGTTAAACCCTAGCAACAAAGAGTTACAAT
CACCTCAACAATCATTTTCCCATCAACAACAACCATTTCCACAGCAGCCATATCCACAACAACCATATCCATCACAGCAACCATATCCATCGCA
ACAACCATTTCCCACACCCCAACAACAATTTCCCCAGCAATCACAACAACCATTTACCCAGCCCCAACAACCGACCCCCTTACAACCACAACAA
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AACAATCGTTCCCTCTCCAACCACAACAGCCATTCCCCCAGCAACCCCAACAACCATTTCCCCAGCCCCAACTACCATTCCCCCAGCAATCAGA
ACAAATAATTCCCCAGCAACCCCAACAACCATTCCCCCTGCAACCGCAACAACCATTCCCCCAGCAACCCCAACAACCATTTCCCCAGCCCCAA
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TCCAACAACCAATTCCCCAGCAACCACAACAACCATTCCCCCTGCAACCGCAACAACCATTCCCCCAGCAACCGCAACAACCATTCCCCCAGCA
ACCGCAACAATCATTTCCCCAGCAACCACAACAACCATTCCCCCAGCAACCGCAACAACCATTCCCCCAACAACCACAACAACCATTCCCTCAA
CAACCACAACAACCATTCCCCCTACGACCGCAACAACCATTTCCCCAGCAACCCCAACAATCACAACAATCATTTCCCCAGCCCCAACCCCAAC
CCCAGCAACCCCCACAACCATCCATCCTTCAACCACAACAACCATTACCCCAACAACCACAACAACCATTTCAACAGCCCCAACAACAATTATC
CCAGCAACCAGAACAAACAATTTCCCAGCAACCCCAACAACCATTCCCCCAGCAACCACACCAACCTCAACAACCATATCCACAACAACAACCA
TATGGGAGTAGTCTTACAAGCATCGGTGGCCAATGA

> Gli-ω4 deduced protein (387 aa)

MKTFLIFVLLAMAMKIATAARELNPSNKELQSPQQSFSHQQQPFPQQPYPQQPYPSQQPYPSQQPFPTPQQQFPQQSQQPFTQPQQPTPLQPQQ
PFPQQPQQPQQPFPQPQQPFPWQPQQPFPQTQQSFPLQPQQPFPQQPQQPFPQPQLPFPQQSEQIIPQQPQQPFPLQPQQPFPQQPQQPFPQPQ
QPIPVQPQQSFPQQSQQSQQPFAQPQQLFPELQQPIPQQPQQPFPLQPQQPFPQQPQQPFPQQPQQSFPQQPQQPFPQQPQQPFPQQPQQPFPQ
QPQQPFPLRPQQPFPQQPQQSQQSFPQPQPQPQQPSQPSILQPQQPLPQQPQQPFQQPQQQLSQQPEQTISQQPQQPFPQQPHQPQQPYPQQQP
YGSSLTSIGGQ*

> *Gli-ω5* transcript (1134 bp)

ATGAAGACCTTCCTCATCTTTGTCCTCCTTGCCATGGCGATGAACATCGCCACTGCTGCTAGGCAGCTAAACCCTAGCAACAAAGAGCTACAAT
CACCTCAACAATCATTTTCCCATCAACAACAACCATTTCCACAGCAACCATATCCACAACAACCATATCCATCACAGCAACCATATCCATCGCA
ACAACCATTTCCCACACCCCAACCACAATTTCCCCAGCAATCACAACAACCATTTACCCAGCCCCAACAACCGACCCCCCTACAACCACAACAA
CCATTCCCCCAGCAACCCCAACAACCACAACAACCTTTTCCACAGCCGCAACAACCATTTCCCTGGCAACCACAACAACCATTTCCCCAGACCC
AACAATCTTTCCCTCTGCAACCACAACAACCATTCCCCCAGCAACCCCAACAACCATTTCCCCAGCCCCAACTACAATTCCCCCAGCAACCAGA
ACAAATAATTCCCCAGCAACCCCAACAACCATTCCTCCTGGAATCGCAACAACCATTCCCCCAGCAACCCCAACAACCATTTCCCCAGCCCCAA
CAACTGATCCCCATGCAACCACAACAACCATTCCCCCAGCAATCCCAACAATCACAACAACCTTTTCCCGGGCCCCAACAATTATTTCCTGAAC
TCCAACAACCAATTCCCCAGCAACCACAACAACCATTCCCCCTGCAACCGCAACAACCATTCCCCCAGCAATCGCAACAACCATTCCCCCAGCA

	ACCCCAACAACCATGCCCCCTGCAACCGCAACAACCATTCCCCCAACAACCACAACAACCATTCCCCCAACAACCACAACAACCTTTCCCCCTA CAACCACAACAACCATTCCCCCTACGACCGCAACAACCATTTTCCCAGCAACCCCAACAATCACAACAATCATTTCCCCAGCCCCAACCCCAGC AACCCCAACAACCATCCATCCTGCAACCACAACAACCATTTCTGCAGCCCCAACAACAATTATCCCAGCAACTAGAACAAACAATTTCCCAGCA ACCCCAACAACCATTCCCCCAGCAACCACACCAACCTCAACAACCATATCCACAACAACAACCATATGGGAGTAGTCTTACAAGCATCGGTGGC CAATGA >Gli-ω5 deduced protein (377 aa) MKTFLIFVLLAMAMNIATAARQLNPSNKELQSPQQSFSHQQQPFPQQPYPQQPYPSQQPYPSQQPFPTPQPQFPQQSQQPFTQPQQPTPLQPQQ PFPQQPQQPQQPFPQPQQPFPWQPQQPFPQTQQSFPLQPQQPFPQQPQQPFPQPQLQFPQQPEQIIPQQPQQPFLLESQQPFPQQPQQPFPQPQ QLIPMQPQQPFPQQSQQSQQPFPGPQQLFPELQQPIPQQPQQPFPLQPQQPFPQQSQQPFPQQPQQPCPLQPQQPFPQQPQQPFPQQPQQPFPL QPQQPFPLRPQQPFSQQPQQSQQSFPQPQPQQPQQPSILQPQQPFLQPQQQLSQQLEQTISQQPQQPFPQQPHQPQQPYPQQQPYGSSLTSIGG Q*
Inactive members	5) Transcript sequence for 10 inactive gliadin genes (each transcript sequence is provided from 5' to 3' end) >*Gli-α-ψ1* transcript (868 bp, coding sequence interrupted) ATGAAGACATTTCTCATCCTTGCCCTCCTTGCTATCGTGGCGACCACCGCCACAACTGCAGTTAGAGTTCCAGTGCCACAATTGCAGCCACAAA ATCCATCTCAGCAACAGCCACAAGAGCAAGTTCCATTGGTACAACAACAACAATTTCTAGGGCAGCAACAACCATTTCCACCACAACAACCATA TCCACAGCCGCAACCATTTCCATCACAACAACCATATCTGCAGCTGCAACCATTTTCGCAGCCGCAACTACCATATTCGCAGCCACAACCATTT CGACCACAACAACCATATCCACAACCGCAACCACAGTATTCGCAACCACAACAACCAATTTCACAGCAGCAGCAGCAGCCAGCAACAACAACAA CAACAACAACAACAACAACAAGAACAACAAATCCTTCAACAAATTTTGCAACAACAACTGACTCCATGCATGGATGTTGTATTGCAGCAACACA ACATAGCGCGTGGAAGATCACAAGTTTTGCAACAAAGTACTTACCAGCTGTTGCAAGAATTGTGTTGTCAGCACCTATGGCAGATCCCTGAGAA GTTGCAGTGCCAGGCCATCCACAATGTTGTTCATGCTATTATTCTGCATCAACAACAAAAACAACAACAACAACTATCGAGCCAGGTCTCCTTC CAACAGCCTCAGCAACAATATCCATTAGGCCAGGGCTCCTTCCGGCCATCTCAGCAAAACCCACAGGCCCAGGGCTCTGTCCAGCCTCAACAAC TGCCCCAGTTCGAGGAAATAAGGAACCTAGCGCTACAGACGCTACCTGCAATGTGCAATGTCTACATCCCTCCATATTGCACCATCGCGCCATT TGGCATCTTCGGTACTAATTGA >*Gli-α-ψ2* transcript (863 bp, coding sequence interrupted) ATGAAGACCTTTCTCATCCTTGTCCTCCTTGCTATTGTGGCGACCACCGCCACAACTGCAGTTAGATTTCCAGTGCCACAATTGCAGCCACAAA AATCCATCTCAGCAACAGCCACAAGAGCAAGTTCCATTGGTACAACAACAACAATTTCTAGGGCAGCAACAACCATTTCCACCACAACAACCAT ATCCACAGCCGCAACCATTTCCATCACAACTACCATATCTGCAGCTGCAACCATTTCCGCAGCCGCAACTACCATATTCACAGCCACAACCATT TCGACCACAACAACCATATCCACAACCGCAACCACAGTATTCGCAACCACAACAACCAATTTCACAGCAGCAGCAGCAGCAGCAGCAGCAGCAA CAACAACAACAACAACAACAACAAATCCTTCAACAAATTTTGCAACAACAACTGATTCCATGCATGGATGTTGTATTGCAGCAACACAACATAG CGCATGGAAGATCACAAGTTTTGCAACAAAGTACTTACCAGCTGTTGCAAGAATTGTGTTGTCAACACCTATGGCAGATCCCTGAGCAGTCGCA

GTGCCAGGCCATCCACAATGTTGTTCATGCTATTATTCTGCATCAACAACAAAAACAACAACAAACAACCATCGAGCCAGGTCTCCTTCCAACA
GCCTCTGCAACAATATCCATTAGGCCAGGGCTCCTTCCGGCCATCTCAGCAAAACCCACAGGCCCAGGGCTCTGTCCAGCCTCAACAACTGCCC
CAGTTCGAGGAAATAAGGAACCTAGCGCTACAGACGCTACCTGCAATGTGCAATGTCTACATCCCTCCATATTGCACCATCGCGCCATTTGGCA
TCTTCGGTACTAACTGA

>*Gli-α-ψ3* transcript (1386 bp, coding sequence interrupted)
ATGGCAACAACCATCGCCACCGCCAATATGCAAGTCGACCCCGGCTACCAAGTACAATGGCCACAACAACAACCATTCCCCCAGCCCCAACAAC
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TTTCCCCAGACCCAGCAACCACAACAACCATTTCCCCAGCCCCAACAAACATTCCCCCAACAACCCCAACTACCATTTCCCCAACAACCCCAAC
AACCATTCCCCCAGCCTCAACAACCCCAACAACAATTTCCCCAGTCACAGCAACCACAACAACCTTTTCCCCAGCCCCAACAACAATTCCTGCA
GCCCCAACAACCGCAACAATCATTCCCCCAGCAACAACAACCGTTGATTCAGCTATCTCTACAACAACAGATGAACCCCTGCAAGAATTTTCTC
TTGCAGCAATGCAACCCTGTGTCATTGGTGTCATCCCTCATATCAATGATCTTGCACGAAGTGATTGCCAGGTGATGCAGCAACAATGTTGCCA
ACAACTGGCACAGATTCCTCAGCAGTTCCAGTGCCACAATTGCAGCCACAAAATCCATCTCAGCAACAGCCACAAGAGCAAGTTCCATTGGTAC
AACAACAACAATTTCTAGGGCAGCAACAACCATTTCCACCACAACAACCATATCCACAGCCGCAACCATTTCCATCACAACAACCATATCTGCA
GCTGCAACCATTTCTGCAGCCGCAACTACCATATTCACAGCCACAACCATTTCGACCACAACAACCATATCCACAACCACAACCACAGTATTCG
CAACCACAACAACCAATTTCACAGCAGCAGCAGCAGCAGCAACAACAACAACAACAACAACAACAACAACAACAACAACAAATCCTTCAACAAATTT
TGCAACAACAACTGATTCCATGCATGGATGTTGTATTGCAGCAACACAACATAGCCCATGGAAGATCACAAGTTTTGCAACAAAGTACTTACCA
GCTGCTGCAAGAATTGTGTTGTCAGCACCTATGGCAGATCCCTGAGCAGTCGCAGTGCCAGGCCATCCACAATGTTGTTCATGCTATTATTCTG
CATCAACAACAAAAACAACAACAACAACCATCGAGCCAGGTCTCCTTCCAACAGCCTCTGCAACAATATCCATTAGGCCAGGGCTCCTTCCGGC
CATCTCAGCAAAACCCACAGGCCCAGGGCTCTGTCCAGCCTCAACAACTGCCCCAGTTCGAGGAAATAAGGAACCAAGCGCTACAGACGCTACC
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>*Gli-α-ψ4* transcript (1364 bp, coding sequence interrupted)
ATGAAGACCATTCTCATCCTTGCCCTCCTTACTATCGTGGCGACCACCGCCACAACTGCAGTTAGAGTCCAAGTTCCACAATTGTAGCCACAAA
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TCCGCGGCCGCAACCATTTTCATCACAACAACCATATCTGCAGCTGCAACCATTTCCGCAGCCGCAACTACCATATCCGCAGCCGCAACCATTT
CGACCACAACAACCATATCCACAACCGCAACCACAGTATTAGCAACCACAACAACCAATTTCGCAGCTGCAGCAGCAACAACAACAACAATAGC
AACAACAACAGCAACAAAAACAGCAGCAACAACAACAGCAGCAGCAACAACAACAACAACAGCAACAACACCAGCAACAACAGCACCAACAGCA
GTAGCAGCAGCAGCAGCAACAACAACAACAACAACAACAACAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAACAA
CAACAACAACAACAACAACAACAACAACAACAACAACAACAGCAGCAGCAGCAGCAGCAGCAGCAGCAACAACAACAACAACAATAACAGCAAC
AACCATTTCCACCACAACAACCATATCCACAGCCGCAACCATTTCCATCACAACAACCATATCTGCAACTGCAACCATTTCCGCAGCCGCAACT
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CAGCAGCAGCAGCAGCAACAACAACAACAACAACAACAACAACAACAACAACAACAAATCCTTCAACAAATTTTGCAACAACAACTGATTCCAT
GCATGGATGTTGTATTGCAGCAACACAACATAGCGCATGGAAGATCACAAGTTTTGCAACAAAGTACTTACCAGCTGTTGCAAGAATTGTGTTG
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CAACAACCATCGAGCCAGGTCTCCTTCCAACAGCCTCTGCAACAATATCCATTAGGCCAGGGCTCCTTCGGCCATCTCAGCAAAACCCACAGGC
CCAGGGCTCTGTCCAGCCTCAACAACTGCCCCAGTTCGAGGAAATAAGGAACCTAGCGCTACAGACGCTACCTGCAATGTGCAATGTCTACATC
CCTCCATATTGCACCATCACGCCATTTGGCATCTTCGATACTAACTGA

>*Gli-α-ψ5* transcript (804 bp, coding sequence interrupted)
CAGCCACAAAATCCATCTCAGCAACAGCCACAAGAGCAAGTTCCGTTGGTACAACAACAACAATTTCTAGGGCAGCAACAACCATTTCCACCAC
AACAACCATATCCACAGCCGCAACCATTTCCATCACAAACAACCATATCTGCAACTGCAACCATTTCCGCAGCCGCAACTATCATATTCGCAGC
CACAACCATTTCGACCACAACAACTATATCCACAACCGCAACCACAGTATTCGCAACCACAACAACCAATTTCACAGCAGCAGCAGCAACAACA
ACAACAACAACAACAACAACAACAACAACAACAACAACAACAACAACAACAACAAGAACAACAAATCCTTCAACAAATTTTGCAACAACAACTGATT
CCATGCATGGATGTTGTATTGCAGCAACACAACATAGCGCATGGAAGATCACAAGTTTTGCAACAAAGTACTTACCAGCTGTTGCAAGAATTGT
GTTGTCAGCACCTATGGCAGATCCCTGAGCAGTCGCAGTGCCAGGCCATCCACAATGTTGTTCATGCTATTATTCTGCATCAACAACAAAAACA
ACAACAACAACCATCGAGCCAGGTCTCCTTCCAACAGCCTCTGCAACAATATCCATTAGGCCAGGGCTCCTTCCGGCCATCTCAGCAAAACCCA
CAGGCCAGGGCTCTGTCCAGCCTCAACAACTGCCCCAGTTCGAGGAAATAAGGAACCTAGCGCTACAGACGCTACCTGCAATGTGCAATGTCTA
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>*Gli-α-ψ6* transcript (805 bp, coding sequence interrupted)
CAGCCACAAAATCCATCTCAGCAACAGCCACAAGAGCAAGTTCCGTTGGTACAACAACAACAATTTCTAGGGCAGCAACAACCATTTCCACCAC
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CACAACCATTTCGACCACAACAACCATATCCACAACCGCAACCACAGTATTCGCAACCACAACAACCAATTTCACAGCAGCAGCAGCAGCAACA
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ACAACAACAACCATCGAGCCAGGTCTCCTTCCAACAGCCTCTGCAACAATATCCATTAGGCCCAGGGCTCCTTCCGGCCATCTCAGCAAAACCC
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>*Gli-α-ψ7* transcript (887 bp, coding sequence interrupted)
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ATCCATCTCAGCAACACCCACAAGAGCAAGTTCCGTTGGTACAACAACAACAATTTCTAGGGCAGCAACAATCATTTCCACCACAACAACCATA

TCCACAGCCGCAACCATTTCCATCACAACAACCATATCTGCAGCTGCAACCATTTCCGCAGCCGCAACTACCATATTTGCAGCCACAACCATTT
CGACCACAACAACCATATCCACAACCGCAACCACAATATTCGCAACCACAACAACCAATTTCACAGCAGCAGCAGCAGCAACAACAACAAC
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TGTTGTATTGCAGCAACACAACATAGCGCATGGAAGATCACAAGTTTTGCAACAAAGTACTTACCAGCTGTTGCAAGAATTGTGTTGTCAGCAC
CTATGGCAGATCCCTGAGCAGTCGCAGTGCCAGGCCATCCACAATGTTGTTCATGCTATTATTCTGCATCAACAACAAAAACAACAACAACAAC
CATCGAGCCAGGTCTCCTTCCAACAGCCTCTGCAACAATATCATTAGGCCAGGGCTCCTTCCGGCCATCTCAGCAAAACCCACTGGCCCAGGGC
TCTGTCCAGCCTCAACAACTGCCCCAGTTCGAGGAAATAAGGAACCTAGCGCTACAGACGCTACCTGCAATGTGCAATGTCTACATCCCTCCAT
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>*Gli-γ-ψ1* transcript (863 bp, coding sequence interrupted)
ATGGCAATAACCATCGGCACCGCCAATATGCAGGTCGACCCTAGCAGCCAAGTACAATGGCCACAACAACAACCAGTCCCACAGCCTCACCAAC
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CCCAACAACTATTTCCCCAGTCCCAGCAACCACAACAACAATTTTCTCAGCCCCAACAACAATTCCCGCAGCCCCAACAACCGCAACAATCATT
CCCCCAACAACAACCACCGTTCATTCAGCCATCTCTACAACAACAGGTGAACCCATGCAAGAATTTCCTCTTGCAGCAATGCAAACCTGTGTCA
CTGGTGTCATCCCTCTGGTCAATGATCTGGCCACAAAGCGATTGCCAAGTGATGCGGCAACAATGCTGCCAACAACTAGCACAGATTCCTCAGC
AGCTCCAGTGTGCAGCCATCCATACCATCATACATTCCATCATCATGCAGCAAGAACAACAAGAACAACAACAAGGCATGCATATCCTGCTGCC
ACTATATCAGCAGCAACAGGTGGGTCAAGGTACTCTCGTCCAGGGCCAGGGCATCATCCAACCCCAACAACCAGCTCAATTGGAGGCGATCAGG
TCATTGGTGTTGCAAACTCTTCCAACCATGTGCAACGTGTATGTCCCACCTGAGTGCTCCATCATCAAGGCACCATTTTCCAGCGTAGTCGCCG
GCATTGGTGGCCAATGA

>*Gli-γ-ψ2* transcript (1201 bp, coding sequence interrupted)
ATGAAGACCTTACTCATCCTAACAATCCTTGCGATGGCAACAATAATCGCCACTGCCAATATGCAGGTCGACCTAGCAGCCGAGTACAATGGCC
ACAAGAACAACCATCCCCCCAGTCCCAACAACCATTCTCCAGCAACCACAACAAATATTTCCCCAACCCCAACAAACATTGCCCCATCAACCAC
AACAAGCATTTCCCCAACCTCAACAAACATTCCCCCATCGACCACAACAACAATTTCCCCAGCCCCAGCAACCACAACAACCATTTCCTCAGCC
CCAACAACCCCAACTACCATTTCCCCAACAACTACAACAACAACTAGTCCCCAGCTCCAACAGCCATTATCCAGCAACCACAACAAACATTTCC
CCAACCTCAACAAACATTCCCCATCAACCACAACAACAAGTTCCCCAGCCTCAGCAACCACAACAACCATTTCTCCAGCCCCAACAACCATTCC
CCCAACAACCACAACAACCATTCCCCCAGACTCAACAACCACAACAACCATTTCCCCAGCAACCACAACAACCATTTCCCCAGACTCAACAACC
CCAACAACCATTTCCCCAACAACCACAACAACCATTCCCCCAGACTCAACAACCCCAACAACCATTTCCCCAGCTCCAGCAACCACAACAACCT
TTTCCCCAGCCCCAACAACAATTGCCGCAGCCCCAACAACCGCAACAATCATTCCCCCAACAACAACGGCCATTCATTCAACCATCTCTACAAC
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TTGCCAAGTGATGCGGCAACAATGCTGCCAACAACTAGCACAGATTCCTCAACAGCTCCAGTGCGCAGCCATCCATAGCGTCGTGCATTCCATC

	ATCATGCAGCAGCAGCAGCAACAACAACAACAACAAGGCATGCATATCTTTCTGCCACTATCTCAGCAGCAACAGGTGGGTCAAGGTTCTCTAG TCCAAGGCCAGGGCATCATCCAACCACAACAACCAGCTCAATTGGAGGCGATCAGATCATTGGTGTTGCAAACTCTTCCATCCATGTGCAACGT GTATGTCCCACCTGAGTGCTCCATCATGAGGGCACCATTTGCCAGCATAGTCGCGGGCATTGGTGGCCAATGA >*Gli-ω-ψ1*(1319 bp, coding sequence interrupted) ATGAAGACCTTCATCATATTTGTCCTCCTTGCCATGGCGATGAACATCGCCAGTGCCAGTAGGCTGCTAAGCCCTAGAGGCAAGGAATTGCATA CTCCACAAGAACAATTCCCCCAACAACAACAATTCCCCCAACCACAACAATTCCCCCAACAACAAATCCCCCAACAACATCAAATCCCCCAGCA ACCACAACAATTCCCCCAACAACAACAATTCCTCCAACAACAACAAATCCCGCAACAACAAATCCCCCAACAACATCAAATCCCCCAGCAACCA CAACAATTCCCCCAGCAACAGCAATTCCCCAACAACACCAATCCCCCCAACAACAATTCCCACAACAACAATTCCCCCAACAGAAATTGCCGCA ACAGGAATTCCCACAACAACAAATCTCCCAGCAACCACAACAACTCCCCCAGCAACAACAAATCCCCCAGCAACCACAACAATTTCTCCAACAA CAACAATTCCCCCAGCAACAACCCCCCCAACAACATCAATTTCCCCAACAGCAATTGCCCCAACAACAACAAATCCCCCAACAACAACAAATCC CCCAGCAACCACAACAAATCCCCCAACAACAACAAATCCCCCAGCAACCACAACAATTCCCCCAACAACAATTCCCGCAACAACAATTTCCCCA ACAGCAATTCCCGCAACAGGAATTCCCACAACAACAACAATTCCCACAACAACAAATCGCCCAGCAACCACAACAACTCCCCCAACAACAACAA ATCCCCCAGCAACCACAACAATTTCCCCAACAACAACAATTCCCCCAGCAACAATCACCCCAACAACAGCAATTTCCCCAACAACAATTCCCCC AACAACAACAATTACCGCAAAAACAATTCCCCCAACCACAACAAATACCCCAACAACAACAAATCCCCCAGCAACCACAACAATTCCCCCAGCA ACAATTCCCCCAACAACAGCAATTTCCCCAACAACAAGAATTCTCCCAACAGCAATTCCCGCAACAACAATTCCACCAACAACAATTACCGCAA CAACAATTTCCCCAACAACAATTCCCCCAACAACAATTCCCCCAACAACAACAGTTCCCCCAACAACAACAATTAACGCAACAACAATTCCCCC GGCCACAACAATACCCTGAACAACAACAATTCCCCCAACAACAATTCCCCCAGCAACCACCACAACAATTCCCCCAACAACAATTTCCAATACC ATACCCACCCCAGCAATCACAAGAACCTTCCCCATACCAACAATATCCACAACAACAACCATCTGGGAGCGACGTTATAAGTATCAGTGGCCTA TGA

Table S4. Computation of coeliac disease (CD) epitopes in the 21 α-gliadins accumulated in Xiaoyan 81 mature grains.

α-Gliadin	*Gli* locus	DQ2.5																DQ2.2	DQ8				DQ8.5		
		DQ2.5-glia-α1a	DQ2.5-glia-α1b	DQ2.5-glia-α2	DQ2.5-glia-α3	DQ2.5-glia-γ1	DQ2.5-glia-γ2	DQ2.5-glia-γ3	DQ2.5-glia-γ4a	DQ2.5-glia-γ4b	DQ2.5-glia-γ4c	DQ2.5-glia-γ4d	DQ2.5-glia-γ4	DQ2.5-glia-γ5	DQ2.5-glia-ω1	DQ2.5-glia-ω2	DQ2.5-glut-L1	DQ2.5-glut-L2	DQ2.2-glut-L1	DQ8-glia-α1	DQ8-glia-γ1a	DQ8-glia-γ1b	DQ8-glut-H1	DQ8.5-glia-α1	DQ8.5-glia-γ1	DQ8.5-glut-H1
Gli-α1	*Gli-A2*	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α2	(6A)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α3		1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α4		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α5		1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α6		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α9	*Gli-B2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-
Gli-α10	(6B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-
Gli-α11		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α12		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α13		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α14		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α15		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α16		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α17		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α19	*Gli-D2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-α20	(6D)	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-
Gli-α21		1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-
Gli-α22		1	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-
Gli-α23		1	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-
Gli-α24		1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: The CD epitopes are divided into four groups based on specific human leucocyte antigen class II proteins (DQ2.5, DQ2.2, DQ8 and DQ8.5) to which they bind. Each color shaded value indicates the number of times a particular epitope is found in a given gliadin protein. The eight gliadins marked in blue do not carry CD epitopes.

Table S5. Computation of coeliac disease (CD) epitopes in the 11 γ-gliadin, 1 δ-gliadin and 5 ω-gliadin proteins accumulated in Xiaoyan 81 mature grains.

		DQ2.5																DQ2.2	DQ8				DQ8.5		
Gliadin	*Gli* locus	DQ2.5-glia-α1a	DQ2.5-glia-α1b	DQ2.5-glia-α2	DQ2.5-glia-α3	DQ2.5-glia-γ1	DQ2.5-glia-γ2	DQ2.5-glia-γ3	DQ2.5-glia-γ4a	DQ2.5-glia-γ4b	DQ2.5-glia-γ4c	DQ2.5-glia-γ4d	DQ2.5-glia-γ5	DQ2.5-glia-ω1	DQ2.5-glia-ω2	DQ2.5-glut-L1	DQ2.5-glut-L2	DQ2.2-glut-L1	DQ8-glia-α1	DQ8-glia-γ1a	DQ8-glia-γ1b	DQ8-glut-H1	DQ8.5-glia-α1	DQ8.5-glia-γ1	DQ8.5-glut-H1
Gli-γ1	*Gli-A1*	-	-	-	-	-	1	-	-	-	6	-	2	1	-	-	-	-	-	6	-	-	-	-	-
Gli-γ2	(1A)	-	-	-	-	1	-	-	-	-	4	-	-	-	-	-	-	-	-	4	-	-	-	1	-
Gli-γ3		-	-	-	-	1	-	-	-	-	4	-	-	-	-	-	-	-	-	4	-	-	-	1	-
Gli-γ4	*Gli-B1*	-	-	-	-	-	-	-	-	1	6	-	3	-	-	-	-	-	-	6	-	-	-	-	-
Gli-γ5	(1B)	-	-	-	-	1	1	-	-	1	4	-	-	1	-	-	-	-	-	4	-	-	-	1	-
Gli-γ6		-	-	-	-	1	1	-	-	1	4	-	-	-	-	-	-	-	-	4	-	-	-	1	-
Gli-γ7		-	-	-	-	1	1	1	-	-	2	-	-	-	-	-	-	-	-	2	1	-	-	1	-
Gli-γ8	*Gli-D1*	-	-	-	-	1	1	-	-	-	5	-	3	-	-	-	-	-	-	5	-	-	-	1	-
Gli-γ9	(1D)	-	-	-	-	1	1	1	1	-	1	-	1	-	-	-	-	-	-	1	1	-	-	1	-
Gli-γ10		-	-	-	-	1	1	-	-	-	3	1	-	1	-	-	-	-	-	3	-	-	-	1	-
Gli-γ11		-	-	-	-	1	1	-	-	1	1	-	1	-	-	-	-	-	-	1	-	-	-	1	-
Gli-δ1	*Gli-D1* (1D)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-ω1	*Gli-A1* (1A)	-	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	1	-	-	-	-	-
Gli-ω2	*Gli-B1*	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	2	-	-	-	-	-
Gli-ω3	(1B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gli-ω4	*Gli-D1*	-	-	-	-	-	-	-	-	-	7	-	7	1	1	-	-	-	-	7	-	-	-	-	-
Gli-ω5	(1D)	-	-	-	-	-	-	-	-	-	5	-	5	1	1	-	-	-	-	5	-	-	-	-	-

Note: The CD epitopes are divided into four groups based on specific human leucocyte antigen class II proteins (DQ2.5, DQ2.2, DQ8 and DQ8.5) to which they bind. Each color shaded value indicates the number of times a particular epitope is found in a given gliadin protein. The two gliadins marked in blue do not carry CD epitopes.

Table S6. PCR primers used for microsatellite marker analysis of the six *Gli* locus deletion lines.

Marker	Primer sequence (5' - 3')	Chromosomal location	For the analysis of
Xgdm33	F: GGCTCAATTCAACCGTTCTT	1AS, -5.1 cM	DLGliA1
	R: TACGTTCTGGTGGCTGCTC		
Xcfa2153	F: TTGTGCATGATGGCTTCAAT	1AS, -2.3 cM	
	R: CCAATCCTAATGATCCGCTG		
Xgpw7072	F: AATGCAGCGATGTCTTGCTA	1AS, 4.8 cM	
	R: ACTGTTGGGGTTGTTGTTGC		
Xgpw2276	F: ATAGGGTTCTTCTGTGCCCC	1AS, 13.8 cM	
	R: ACCCACAGTTGAACTTGGG		
Xwmc24	F: GTGAGCAATTTTGATTATACTG	1AS, 35.3 cM	
	R: TACCCTGATGCTGTAATATGTG		
Xpsp3000	F: GCAGACCTGTGTCATTGGTC	1BS, 2.4 cM	DLGliB1
	R: GATATAGTGGCAGCAGGATACG		
Xwmc406	F: TATGAGGGTCGGATCAATACAA	1BS, 20.0 cM	
	R: CGAGTTTACTGCAAACAAATGG		
Xwmc230	F: AGAAGCGAGCAGGTGTGTTTGA	1BS, 20.5 cM	
	R: CTGCTTCCTCCCACAACAGATG		
Xgpw4069	F: GCTCCCTTTGCGTATCATGT	1BS, 25.6 cM	
	R: GCTCTTGCTCAGAAGCGAAT		
Xwmc147	F: AGAACGAAAGAAGCGCGCTGAG	1DS, 17.5 cM	DLGliD1
	R: ATGTGTTTCTTATCCTGCGGGC		
Xgpw7082	F: AGGTACGGAGTGCAATGGAA	1DS, 23.0 cM	
	R: CCCAACAGTCAGGTCAAGGT		
Xwmc432	F: ATGACACCAGATCTAGCAC	1DS, 28.0 cM	
	R: AATATTGGCATGATTACACA		
Xcfd15	F: CTCCCGTATTGAGCAGGAAG	1DS, 28.1 cM	
	R: GGCAGGTGTGGTGATGATCT		
Xwmc336	F: GTCTTACCCCGCGATCTGC	1DS, 30.0 cM	
	R: GCGGCCTGAGCTTCTTGAG		
Xwmc222	F: AAAGGTGCGTTCATAGAAAATTAGA	1DS, 36.0 cM	
	R: AGAGGTGTTTGAGACTAATTTGGTA		
Xgpw4329	F: AGGAGGACACTTGACTGTAGCC	6AS, -5.2 cM	DLGliA2
	R: GTTCATGCTTTTCTTCGTCTCA		
Xgpw3041	F: GCGTTTTTCCTATTCCTGCA	6AS, 5.1 cM	
	R: ACACCCAAACACTCGGTCTC		
Xgwm459	F: ATGGAGTGGTCACACTTTGAA	6AS, 5.7 cM	
	R: AGCTTCTCTGACCAACTTCTCG		
Xgwm334	F: AATTTCAAAAAGGAGAGAGA	6AS, 8.4 cM	
	R: AACATGTGTTTTTAGCTATC		
Xgpw2082	F: AGCAAAATCATGCATTGAAAA	6AS, 28.0 cM	
	R: CAACAACAGAAGGTGGGTGG		
Xgpw7073	F: CAACCATTTCGACCACAACA	6AS, 29.6 cM	
	R: CTCAGGGATCTGCCATAGGT		
Xgpw7076	F: ATTCGCAACCACAACCATTT	6AS, 30.6 cM	
	R: CTCAGGGATCTGCCATAGGT		
Xgpw7592	F: CAAGACAAGGACAGCAACGA	6AS, 59.9 cM	
	R: TCAGGCGCTTTTGAAGATG		
Xgdm113	F: ACCCATCTGATATTTTGGGG	6BS, 36.0 cM	DLGliB2
	R: AAAATGCCCTTCCCAACC		
Xbarc14	F: GCGTTGTGGAAACTCAGTTTTGTTGATTTA	6BS, 37.6 cM	
	R: GCGGAAAGGAACGAAGTACATTTTGTAGA		
Xpsp3009	F: CACCGGTTTTGACACCGATAGCC	6BS, 38.0 cM	
	R: TGGGTAAGCTGCATGGGCAAACC		

Xwmc494	F: GGATCGAGTCTCAAGTCTACAA	6BS, 41.0 cM	
	R: AGAAGGAACAAGCAACATCATA		
Xgwm508	F: GTTATAGTAGCATATAATGGCC	6BS, 43.0 cM	
	R: GTGCTGCCATGATATTT		
Xbarc198	F: CGCTGAAAAGAAGTGCCGCATTATGA	6BS, 48.0 cM	
	R: CGCTGCCTTTTCTGGATTGCTTGTCA		
Xwmc737	F: CGACTAGGACTAGACGACTCTAACGG	6BS, 54.0 cM	
	R: GTCGATCACCAGAGGCATTG		
Xgpw4465	F: GGTCATTATCTGTCCCCTTGC	6DS, 23.5 cM	DLGliD2
	R: CGGTTTCAGTTTGCTACTTGC		
Xcfd42	F: AGGTTCTAGGGGGCATGTCT	6DS, 33.7 cM	
	R: GCTCTCAATGACTGCACTGG		
Xcfd132	F: CAAATGCTAATCCCCGCC	6DS, 38.4 cM	
	R: TGTAAACAAGGTCGCAGGTG		
Xcfd33	F: TACCGCAATAATCACACCCA	6DS, 55.0 cM	
	R: GGTCGATGGACTGTCCCTAA		
Xgdm127	F: ACGGGGAAATTAAAACGACC	6DS, 61.9 cM	
	R: TGAGATGGAATCGACAGAAA		
Xbarc196	F: GGTGGGTTTTATCGAATAGATTTGCT	6DS, 72.0 cM	
	R: GCGTTTCGTCAAGATTAATGCAGGTTT		

Note: F, forward primer; R, reverse primer. The primer sequences and chromosomal positions of the 36 microsatellite markers were derived from GrainGenes (http://wheat.pw.usda.gov/ggpages/SSRclub/GeneticPhysical/).

Table S7. PCR primers used for mapping the chromosomal locations of 17 gliadin genes.

Target gene	Sequence (5' - 3')	Tm (℃)	Amplicon size (bp)
Gli-α1	F: TCTCCTTCCAACAGCCTCTGC	58	180
	R: GTGCAATATGGAGGGATGTAA		
Gli-α4	F: CATCATTCTCATTAGTAGAG	58	414
	R: CTGTGAAATTGGTTGTTGTGC		
Gli-α5	F: TCCGGCCATCTCAGCAAAACT	52	187
	R: CTAGAGTTATTTTCTTCTCAT		
Gli-α7	F: ATTGCAGCAACACAACATAGT	61	345
	R: CATTGCAGTAGCGTCTGTAGG		
Gli-α8	F: ACCATCGAGCCAGGTCTCCTTG	65	137
	R: TTATTTCCTCGAACTGGGGCAA		
Gli-α9	F: GCCTCAGCAACAATATCCATCG	63	141
	R: GCCTCAGCAACAATATCCATCG		
Gli-α10	F: TCATGCTATTATTTTGCATCA	58	287
	R: ATGGCGCAATGGTGGTCGAGC		
Gli-α11	F: CATGCTATTATTTTGCATCAT	58	276
	R: ATGGCGCAATGGTGGTCGAGC		
Gli-α16	F: CAACAGCAACCACAGTATCTA	58	410
	R: TGGAAGGAGACCTGGCTCGAC		
Gli-α17	F: CATTCATGCTATTATTTTGCA	58	305
	R: ATGGCGCAATGGTGGTCGAGC		
Gli-α18	F: TGTTGCTCATGCTATTATTAT	58	320
	R: ATGGCGCAATGGTGGTCGAGC		
Gli-α20	F: CACAACATAGCGCATGGAAGG	65	205
	R: GCTGTTGGAAGGAGACCTGGG		
Gli-α24	F: AGCAAGTTCCATTGGTACAGG	60	160
	R: TGCGAATACTGTGGTTGCGGC		
Gli-α25	F: ACAACAGCCATATCCGCAGCT	65	139
	R: TGGTTGCGGTTGTGGATATGA		
Gli-γ1	F: CAGATCATGCGGCCACTATTTC	62	167
	R: CTGGCAAATGGTGCCTTGG		
Gli-γ11	F: GCAACAATGTTGCCAACAACTG	62	135
	R: AGCTGAAACAGTGGCCGCC		
Gli-ω2	F: GAGTAGCGGTATAGGCATCAGG	58	89
	R: GAACACTCCATTGACTAAACGC		

Note: F, forward primer; R, reverse primer.