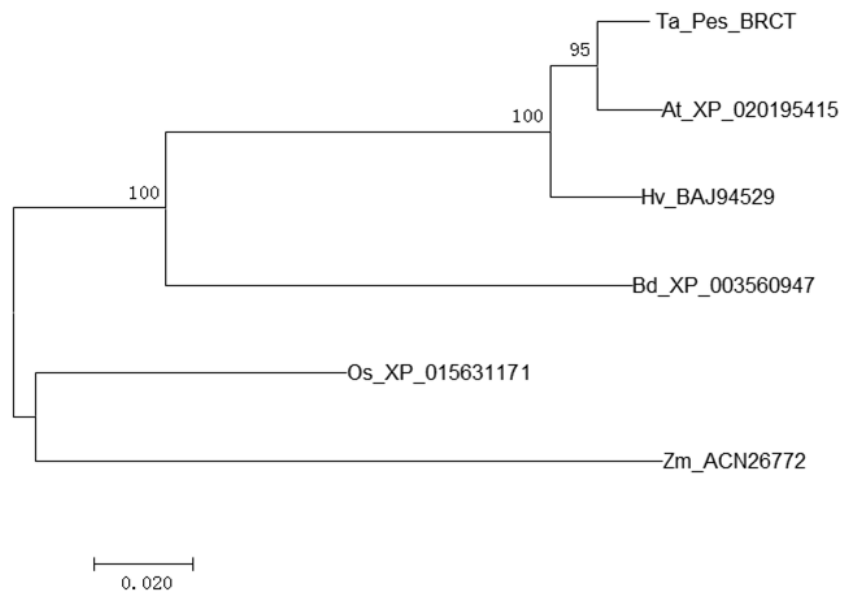


Physical integration map

Supplementary Figure S1. Physical integration map of candidate genes and markers linked to resistance gene *YrM86664-3*. Markers and candidate genes are shown on the right and their position on chromosome 4A of the IWGSC-RefSeq database are shown on the left. The numeric unit is 1×10^7 bp.

A



B

Ta_Pes_BRCT MPKHYRPAKKKEGNAAKYITRTKAVSYLQISLAVFRKLCILKGVFPREPKKKVEGNHKTYHMKDIAFLAHDLPIEKF
Hv_BAJ94529 MPKHYRPAKKKEGNAAKYITRTKAVSYLQISLAVFRKLCILKGVFPREPKKKVEGNHKTYHMKDIAFLAHDLPIEKF
Bd_XP_003560947 MPKHYRPAKKKEGNAAKYITRTKAVSYLQISLAVFRKLCILKGVFPREPKKKVEGNHKTYHMKDIAFLAHDLPIEKF
Os_XP_015631171 MPKHYRPAKKKEGNAAKYITRTKAVSYLQISLAVFRKLCILKGVFPREPKKKVEGNHKTYHMKDIAFLAHDLPIEKF
Zm_ACN26772 MPKHYRPAKKKEGNAAKYITRTKAVSYLQISLAVFRKLCILKGVFPREPKKKVEGNHKTYHMKDIAFLAHDLPIEKF
At_XP_020195415 MPKHYRPAKKKEGNAAKYITRTKAVSYLQISLAVFRKLCILKGVFPREPKKKVEGNHKTYHMKDIAFLAHDLPIEKF

Ta_Pes_BRCT REIKVHRKVKKAMAKKNRDLADRLLRNPPTYKLDRLIERYPSEFVDALRDLDDCLTMVHLFAALPAIEGERVQVQRIH
Hv_BAJ94529 REIKVHRKVKKAMAKKNRDLADRLLRNPPTYKLDRLIERYPSEFVDALRDLDDCLTMVHLFAALPAIEGERVQVQRIH
Bd_XP_003560947 REIKVHRKVKKAMAKKNRDLADRLLRNPPTYKLDRLIERYPSEFVDALRDLDDCLTMVHLFAALPAIEGERVQVQRIH
Os_XP_015631171 REIKVHRKVKKAMAKKNRDLADRLLRNPPTYKLDRLIERYPSEFVDALRDLDDCLTMVHLFAALPAIEGERVQVQRIH
Zm_ACN26772 REIKVHRKVKKAMAKKNRDLADRLLRNPPTYKLDRLIERYPSEFVDALRDLDDCLTMVHLFAALPAIEGERVQVQRIH
At_XP_020195415 REIKVHRKVKKAMAKKNRDLADRLLRNPPTYKLDRLIERYPSEFVDALRDLDDCLTMVHLFAALPAIEGERVQVQRIH

Ta_Pes_BRCT NCRRLSHEWQAYISRTNSLRKTFISVKGIIYQAEVQGQKITWLTTPHALQQVLTDDVDFNVMLTFLEFYETLLGFVNFKL
Hv_BAJ94529 NCRRLSHEWQAYISRTNSLRKTFISVKGIIYQAEVQGQKITWLTTPHALQQVLTDDVDFNVMLTFLEFYETLLGFVNFKL
Bd_XP_003560947 NCRRLSHEWQAYISRTNSLRKTFISVKGIIYQAEVQGQKITWLTTPHALQQVLTDDVDFNVMLTFLEFYETLLGFVNFKL
Os_XP_015631171 NCRRLSHEWQAYISRTNSLRKTFISVKGIIYQAEVQGQKITWLTTPHALQQVLTDDVDFNVMLTFLEFYETLLGFVNFKL
Zm_ACN26772 NCRRLSHEWQAYISRTNSLRKTFISVKGIIYQAEVQGQKITWLTTPHALQQVLTDDVDFNVMLTFLEFYETLLGFVNFKL
At_XP_020195415 NCRRLSHEWQAYISRTNSLRKTFISVKGIIYQAEVQGQKITWLTTPHALQQVLTDDVDFNVMLTFLEFYETLLGFVNFKL

Ta_Pes_BRCT YHSINVNYPPFLDRLRLEALAEALYALSRYSMSG..RLPGNPESNGFIEGKETEN.....NKES
Hv_BAJ94529 YHSINVNYPPFLDRLRLEALAEALYALSRYSMSG..RLPGNPESNGFIEGKETEN.....DKES
Bd_XP_003560947 YHSINVNYPPFLDRLRLEALAEALYALSRYSMSG..RLPGNPEETNGLIKDKETEN.....NEEG
Os_XP_015631171 YHSINVNYPPFLDRLRLEALAEALYALSRYSMSG..RVPGNSEPAGLIEDKEGED.....NKES
Zm_ACN26772 YHSINVNYPPFLDRLRLEALAEALYALSRYSMSG..RVMIGNSQTDVEMEDKDEKS.....KAEVVIKEEKVVKNKAS
At_XP_020195415 YHSINVNYPPFLDRLRLEALAEALYALSRYSMSG..RLPGNPESNGLIEDKETEN.....NKES

Ta_Pes_BRCT SKTDESELRLAQLQHLPANEPGALMLVLEBESTADDTTEESVKECRITLFDKDMKFYLSREVPRESLLFIIIPAFGGTVSWE
Hv_BAJ94529 SKTDESELRLAQLQHLPANEPGALMLVLEBESTADDTTEESVKECRITLFDKDMKFYLSREVPRESLLFIIIPAFGGTVSWE
Bd_XP_003560947 SKTDESELRLAQLQHLPANEPGALMLVLEBESTADDTTEESVKECRITLFDKDMKFYLSREVPRESLLFIIIPAFGGTVSWE
Os_XP_015631171 SKTDESELRLAQLQHLPANEPGALMLVLEBESTADDTTEESVKECRITLFDKDMKFYLSREVPRESLLFIIIPAFGGTVSWE
Zm_ACN26772 SKADESELRLAQLQHLPANEPGALMLVLEBESTADDTTEESVKECRITLFDKDMKFYLSREVPRESLLFIIIPAFGGTVSWE
At_XP_020195415 SKTDESELRLAQLQHLPANEPGALMLVLEBESTADDTTEESVKECRITLFDKDMKFYLSREVPRESLLFIIIPAFGGTVSWE

Ta_Pes_BRCT GEGAPFDETDODITHQIVDRPTQSHVFLSRHYVQPQWIFDCVNIILKVIPTDDYIVGRVPPPHISPFVDNDKEGHIIPDYA
Hv_BAJ94529 GEGAPFDETDODITHQIVDRPTQSHVFLSRHYVQPQWIFDCVNIILKVIPTDDYIVGRVPPPHISPFVDNDKEGHIIPDYA
Bd_XP_003560947 GEGAPFDETDODITHQIVDRPTQSHVFLSRHYVQPQWIFDCVNIILKVIPTDDYIVGRVPPPHISPFVDNDKEGHIIPDYA
Os_XP_015631171 GEGAPFDETDODITHQIVDRPTQSHVFLSRHYVQPQWIFDCVNIILKVIPTDDYIVGRVPPPHISPFVDNDKEGHIIPDYA
Zm_ACN26772 GEGAPFDETDODITHQIVDRPTQSHVFLSRHYVQPQWIFDCVNIILKVIPTDDYIVGRVPPPHISPFVDNDKEGHIIPDYA
At_XP_020195415 GEGAPFDETDODITHQIVDRPTQSHVFLSRHYVQPQWIFDCVNIILKVIPTDDYIVGRVPPPHISPFVDNDKEGHIIPDYA

Ta_Pes_BRCT VTLEG.YKSAQGNQVMPLPGLGDEDLGSS...IIVEA...KSEHNEFAQKKRELEMCKEKKYHEELKMEIEGTTFSN.LSN
Hv_BAJ94529 VTLEK.YKSAQGNQVMPLP...GDEDLGNS...IIVEA...KSEHNEFAQKKRELEMCKEKKYHEELKMEIEGTTFSN.LSN
Bd_XP_003560947 EKILKRLRAASKDKVLPPLPGLGDEDLGNS...MVDA...RSEYNEVAEKRRKLDMLEKQYHEELKMEIEGTTFSN.LAN
Os_XP_015631171 ETIKR.LQAARNEVLPPLPGLGDEDLGNS...IIVEA...KSEHNEFAQKKRELEMCKEKKYHEELKMEIEGTTFSN.RTA
Zm_ACN26772 ETIKR.LQAARNEVLPPLPGLGDEDLGNS...IIVEA...KSEHNEFAQKKRELEMCKEKKYHEELKMEIEGTTFSN.LSN
At_XP_020195415 VTLEG.YKSAQGNQVMPLPGLGDEDLGNS...IIVEA...KSEHNEFAQKKRELEMCKEKKYHEELKMEIEGTTFSN.LSN

Ta_Pes_BRCT KKADSAADVADDE.....EKAALAEQAEKDADDIAKSVVSRKKRGLMEAMKISNDRKKSKEVLLKQRKKAABSSASAK
Hv_BAJ94529 KKADSAADVADDE.....TQAAVEQAEKDADDIAKSVVSRKKRGLMEAMKISNDRKKSKEVLLKQRKKAABSSASAK
Bd_XP_003560947 KKGDNETHAVNDNAHAANDQVDDLVEQAKDEAEMSKSFVSNKTEGLIRATEINKEKRSNVLLKRRKKAABSSASAK
Os_XP_015631171 DNQPDVVDKSDTKHEAD..DHMEDSHKQAEKDAADISKTLMSRKORGILQATEINQERKKDKVNLKRRKKNADSSASAK
Zm_ACN26772 KEADKSPN..AKDDTQS.DREEDASKQEEEDDDDIGTALMSRKORGILYKAMKMGKEKKEKVEVLLKRRKKNADSSASAK
At_XP_020195415 KKADSAADVADDE.....AQAALAEQAEKDADDIAKSVVSRKKRGLMEAMQISNDRKKSKEVLLKQRKKAABSSASAK

Ta_Pes_BRCT RR
Hv_BAJ94529 RR
Bd_XP_003560947 RK
Os_XP_015631171 GR
Zm_ACN26772 KRH
At_XP_020195415 AKR

Supplementary Figure S2. (A) Phylogenetic analysis of Pes_BRCT proteins. A neighbor-joining tree of Pes_BRCT in *Triticum aestivum* (Ta_Pes_BRCT, KAF7044273), *Arabidopsis thaliana* (At_XP_020195415, XP_020195415), *Hordeum vulgare* (Hv_BAJ94529, BAJ94529), *B. distachyon*

(Bd_XP_003560947, XP_003560947), *Oryza sativa* (Os_XP_015631171, XP_015631171), and *Zea mays* (Zm_ACN26772, ACN26772). (B) Multiple amino acid sequence alignment of Ta_Pes_BRCT with At_XP_020195415, Hv_BAJ94529, Bd_XP_003560947, Os_XP_015631171, and Zm_ACN26772. Amino acid identity (black boxes) and similarity (gray boxes) are shown within the protein kinase domain.

2.2 Supplementary Tables

Supplementary Table S1. Primers used in this study.

	Gene	qPCR F	qPCR R	VIGS F	VIGS R	complete sequence F	complete sequence R
C1	TraesCS4A01G305600	GTCTCGGCAATAAT AAACT	CTAAGCCACTCTGG AAAA	TTCCCAACTCGGTAA TCT	TTCGGTATCAAAC CCACA	AAGACTTGGGAAT AGCAT	AAGAAGATAATC AATGCG
C2	TraesCS4A01G305700	TTTCCGTAACCAAA TCTC	TTGTAAAGTTGCAT GTCTT				
C3	TraesCS4A01G319000	ATGGAAGCGACAT CGTGAC	CGGAACTGGAATAC ATTGACCT	CGAGCAGCAAGGGCA GGT	GCAGGAACATCTT CAAGTAGTCAA		
C4	TraesCS4A01G319300	ATCAGCAGTTATCC AGCGT	ATCAGCGACCTCGG TTATG	TGCTTCGCTTTCTGTT CG	GCATATTTGTCAGC ACCTC		
C5	TraesCS4A01G255400	TGCGAGGCCAAGA AGAGCG	CGACCAGTACCCGT CCACCA				
C6	TraesCS4A01G365100	TACAGTAATGCCA AACAGG	GACTCCAGGAACAG TATGAA				
C7	TraesCS4A01G365200	TCACAAGGGGATG TTGAAAGC	AGGGAAAAGTTGGC GCAGT	CGTTCTCATCCACAA GTCTA	TCATACAGGCACA GGACC		
C8	TraesCS4A01G272000	GCCATACGGGATG ATTTAC	GCCACTTCCAGGTG CTTT	GCCGCCTCCTCGTCTT CC	GCTCCCCTTGGCCG TTGA	ATGGCGCTGGTCT CGCTC	TTACAACGGAACT CGGTATAATGG
C9	TraesCS4A01G272900	AACTCAGCAACAG AGCCTTACA	AGTGAACCTGGGCA ACCT	ACCAACTCAACTGAA GACCAAGCA	ACATCCCCGACGG CACGA		
C10	TraesCS4A01G276400	GGAGGAACTGTTT CGTGGG	GTTTGAACATAATG CCTGGAG	CGCCGTCTTCAGAAA CTA	ATGTGGAGTAAGC CAAGTG	ATGCCGAAGCACT ACCGCC	TCAGCGACGTTTG GCAGAA
C11	TraesCS4A01G290200	GACAGTGATTCGTC GGATAACAA	CCACCGCACAAAGCC AAGGG				
C12	TraesCS4A01G290400	AGTAGCAGAGCCA GCAAAACC	GCTCCGTGGGAAGC AATCT				
C13	TraesCS4A01G298300	GGCAAGGACGGGT CTCACA	CGCAAAGCAAGCC AGCATC	AAAGCCGTCCCCTTC CGC	GGTAATAGACCCC GAAGGAATG		
C14	TraesCS4A01G298400	TGGTGGGGCTGGG GCTAT	AAGAAGGTGAGGT AGATGACGATG				
C15	TraesCS4A01G181300	GCTCGCACCTATGA TCTCGC	CCTATCCTCGCCTC CCACC	CGGCGTCTGTTTCGCT TCC	CGCTACCGCAGCC TATCC		
C16	TraesCS4A01G216900	CGGTGCCGTCGTCC AAGAT	ACCACCACCCGAGT GCGATAT				
C17	TraesCS4A01G217000	GGCGTCCTCGGGG CTCTTT	GCGGTCATGTCGTC GTCCA				
C18	TraesCS4A01G255700	CTCCTCACGCTCTT TCCCA	TAGATGCCGCCCT GAAG				
C19	TraesCS4A01G255800	TGCCAGAGCAAGA AGGAATC	AGGGTGTCTCGGAC GCTTA				

Supplementary Table S2. Candidate genes and markers linked to resistance genes *YrM86664-3* on chromosome 4AL.

Position (bp)	No. of selected genes / Markers of <i>YrM8664-3</i>	Gene accession	Annotation
415683496-415683891	<i>BE446584</i>		
456290064-456292784	C15	TraesCS4A01G181300	AP2-like ethylene-responsive transcription factor
456292321-456292391	<i>AX111655681</i>		
456293850-456294616		TraesCS4A01G181400	Calcium-binding protein
456336315-456336770		TraesCS4A01G181500	Calcium-binding protein
456436432-456437241		TraesCS4A01G181600	Germin-like protein
456449294-456449968		TraesCS4A01G181700	Germin-like protein 1-1
456454952-456456006		TraesCS4A01G181800	Germin-like protein
456459540-456460466		TraesCS4A01G181900	Germin-like protein 1-1
456479864-456482398		TraesCS4A01G182000	transmembrane protein, putative (Protein of unknown function, DUF538)
456483993-456489034		TraesCS4A01G182100	tRNA (Ile)-lysidine synthase
457568303-457568758		TraesCS4A01G182200	Calcium-binding protein
457826318-457836526		TraesCS4A01G182300	Clathrin heavy chain
458233726-458261311		TraesCS4A01G182400	Proline-, glutamic acid-and leucine-rich protein 1

458517792-458534396	TraesCS4A01G182500	Proline-, glutamic acid-and leucine-rich protein 1
458856406-458858932	TraesCS4A01G182600	60S ribosomal protein L44
459627628-459631283	TraesCS4A01G182700	Omega-3 fatty acid desaturase
459631134-459637226	TraesCS4A01G182800	Chaperone ClpB
460229896-460238212	TraesCS4A01G182900	E3 SUMO-protein ligase SIZ1
460238966-460240171	TraesCS4A01G183000	Kinase family protein
460448898-460449233	TraesCS4A01G183100	Protein transport protein Sec61 subunit beta, putative
460451001-460454968	TraesCS4A01G183200	RNA-directed DNA methylation 4
460459288-460460764	TraesCS4A01G183300	Alpha/beta-Hydrolases superfamily protein, putative
460897370-460902867	TraesCS4A01G183400	transcription factor-like protein
460903866-460904732	TraesCS4A01G183500	Membrane-associated phospholipid phosphatase
461353961-461355490	TraesCS4A01G183600	Cytochrome P450
462201615-462203147	TraesCS4A01G183700	RING/U-box superfamily protein
462202745-462205391	TraesCS4A01G183800	caspase-6 protein
462204109-462205056	TraesCS4A01G183900	DUF868 family protein
462210624-462211955	TraesCS4A01G184000	Seipin
462212695-462216068	TraesCS4A01G184100	2,3-bisphosphoglycerate-dependent phosphoglycerate mutase

462216501-462219266	TraesCS4A01G184200	ATP-dependent RNA helicase
462219982-462224642	TraesCS4A01G184300	myosin-4 protein (DUF641)
462309235-462309875	TraesCS4A01G184400	SKP1-interacting partner 15
462825330-462834056	TraesCS4A01G184500	Nucleosome-remodeling factor subunit BPTF
463543053-463543944	TraesCS4A01G184600	stress response NST1-like protein
463923382-463925340	TraesCS4A01G184700	Heavy metal transport/detoxification superfamily protein
464110898-464112499	TraesCS4A01G184800	R3H domain protein
464549148-464568089	TraesCS4A01G184900	Long-Chain Acyl-CoA Synthetase
464685913-464691515	TraesCS4A01G185000	Protein Red
464692585-464694075	TraesCS4A01G185100	Structure-specific endonuclease subunit slx1
464696741-464696962	TraesCS4A01G185200	Ubiquitin-like protein 5
464762884-464764368	TraesCS4A01G185300	Glycosyltransferase
464767703-464771611	TraesCS4A01G185400	DNA-directed RNA polymerase II, putative
464989058-464989620	TraesCS4A01G185500	RING/U-box superfamily protein, putative
464989922-464994481	TraesCS4A01G185600	Phosphatidylinositol-4-phosphate 5-kinase 4, putative
465006134-465006929	TraesCS4A01G185700	RING/U-box superfamily protein, putative
465223300-465223743	TraesCS4A01G185800	RING/U-box superfamily protein

465226193-465228911	TraesCS4A01G185900	Scarecrow-like transcription factor 3 family protein
465275101-465276978	TraesCS4A01G186000	Pentatricopeptide repeat-containing family protein
465326992-465330134	TraesCS4A01G186100	Calcium-binding EF-hand protein
465403704-465408630	TraesCS4A01G186200	RNA-binding protein
465408869-465411396	TraesCS4A01G186300	50S ribosomal protein L24
465523379-465524129	TraesCS4A01G186400	Invertase/pectin methylesterase inhibitor family protein
465526094-465533623	TraesCS4A01G186500	Alpha-L-arabinofuranosidase 1
465535456-465536736	TraesCS4A01G186600	Ubiquitin carboxyl-terminal hydrolase family protein
465542897-465545035	TraesCS4A01G186700	Serine/threonine-protein kinase
465790367-465790657	TraesCS4A01G186800	Phytosulfokines 3
465794366-465799828	TraesCS4A01G186900	Heme oxygenase 1 protein
465890222-465892744	TraesCS4A01G187000	Serine/threonine-protein kinase
465893542-465899342	TraesCS4A01G187100	Glutamine--fructose-6-phosphate aminotransferase [isomerizing]
466107721-466111852	TraesCS4A01G187200	Rhamnogalacturonate lyase
466571843-466575387	TraesCS4A01G187300	Non-specific serine/threonine protein kinase
466632749-466636729	TraesCS4A01G187400	WD-repeat protein, putative
466638350-466644033	TraesCS4A01G187500	Protein ZINC INDUCED FACILITATOR-LIKE 1

466648899-466656351	TraesCS4A01G187600	Protein ZINC INDUCED FACILITATOR-LIKE 1
466910566-466916544	TraesCS4A01G187700	Protein ZINC INDUCED FACILITATOR-LIKE 1
466922580-466924670	TraesCS4A01G187800	4'-phosphopantetheinyl transferase family protein
466925867-466928007	TraesCS4A01G187900	Calcium-dependent protein kinase
466929045-466934390	TraesCS4A01G188000	S-locus lectin protein kinase family protein
466938805-466941669	TraesCS4A01G188100	Auxin efflux carrier component
467142674-467145702	TraesCS4A01G188200	weak chloroplast movement under blue light protein (DUF827)
467245403-467251748	TraesCS4A01G188300	Alpha-L-arabinofuranosidase 1
467258814-467260581	TraesCS4A01G188400	Mitochondrial import inner membrane translocase subunit
467264938-467266728	TraesCS4A01G188500	Pentatricopeptide repeat-containing protein
467311125-467312751	TraesCS4A01G188600	Lactation elevated protein 1
467516912-467538652	TraesCS4A01G188700	Regulation of nuclear pre-mRNA domain-containing protein 1B
467539358-467539961	TraesCS4A01G188800	Nuclear-interacting partner of ALK
467543882-467547234	TraesCS4A01G188900	ELMO domain containing protein
467681716-467686145	TraesCS4A01G189000	NAD(P)-binding Rossmann-fold superfamily protein
468147360-468160559	TraesCS4A01G189100	Methyl esterase
468207784-468209254	TraesCS4A01G189200	50S ribosomal protein L2

468210429-468210704	TraesCS4A01G189300	B3 domain-containing protein
468214233-468214691	TraesCS4A01G189400	Serine/threonine-protein phosphatase 4 regulatory subunit 3
468247494-468247931	TraesCS4A01G189500	Retrotransposon protein, putative, unclassified
468248620-468251401	TraesCS4A01G189600	Type I inositol-1,4,5-trisphosphate 5-phosphatase
468603186-468604307	TraesCS4A01G189700	Myb factor
468624255-468625997	TraesCS4A01G189800	Transposon Ty3-G Gag-Pol polyprotein
468627132-468628964	TraesCS4A01G189900	Cell division control protein 45-like protein
468652211-468652723	TraesCS4A01G190000	Ubiquitin-like-specific protease ESD4-like protein
468752522-468754917	TraesCS4A01G190100	Exostosin family protein
468757496-468758122	TraesCS4A01G190200	30S ribosomal protein S9
468849301-468849665	TraesCS4A01G190300	Ribonuclease H-like superfamily protein
469101407-469106508	TraesCS4A01G190400	Zeaxanthin epoxidase, chloroplastic
469101882-469102650	TraesCS4A01G190500	30S ribosomal protein S9
469240692-469243251	TraesCS4A01G190600	2-C-methyl-D-erythritol 4-phosphate cytidyltransferase
469244809-469246370	TraesCS4A01G190700	Dirigent protein
469512189-469515279	TraesCS4A01G190800	RNA-binding domain CCCH-type zinc finger protein
469829765-469839951	TraesCS4A01G190900	33 kDa chaperonin

470097916-470100678	TraesCS4A01G191000	Pentatricopeptide repeat-containing protein
470136300-470138148	TraesCS4A01G191100	Calcium uniporter protein, mitochondrial
470568648-470572941	TraesCS4A01G191200	NAD(P)-binding Rossmann-fold superfamily protein
470687270-470689755	TraesCS4A01G191300	Scarecrow transcription factor family protein
471695861-471712108	TraesCS4A01G191400	Ethanolamine-phosphate cytidyltransferase
471917815-471921872	TraesCS4A01G191500	Kinase family protein
471929454-471929858	TraesCS4A01G191600	P-loop containing nucleoside triphosphate hydrolases superfamily protein
471930743-471933286	TraesCS4A01G191700	Bis(5'-adenosyl)-triphosphatase
471937946-471938830	TraesCS4A01G191800	Retrotransposon protein, putative, unclassified
472194252-472198000	TraesCS4A01G191900	S-acyltransferase
472398571-472399305	TraesCS4A01G192000	LURP-one-like protein
472613393-472616378	TraesCS4A01G192100	DUF936 family protein
472648853-472651264	TraesCS4A01G192200	GH3 family protein
472918003-472921049	TraesCS4A01G192300	Protein kinase
472922679-472923350	TraesCS4A01G192400	Late embryogenesis abundant hydroxyproline-rich glycoprotein family, putative
472963183-472965902	TraesCS4A01G192500	Cytochrome P450-like protein

473496793-473508086	TraesCS4A01G192600	Coiled-coil domain-containing protein SCD2
473686557-473689766	TraesCS4A01G192700	heat-inducible transcription repressor
473765103-473767432	TraesCS4A01G192800	DUF1191 superfamily protein
473940082-473942130	TraesCS4A01G192900	Phototropic-responsive NPH3 family protein
473945535-473946623	TraesCS4A01G193000	BTB/POZ domain containing protein, expressed
474494136-474495065	TraesCS4A01G193100	Ethylene-responsive transcription factor, putative
474740916-474742519	TraesCS4A01G193200	Methyl esterase 17
474742975-474744402	TraesCS4A01G193300	Methyl esterase 17
474932400-474935597	TraesCS4A01G193400	Wall-associated receptor kinase 5
475389649-475390570	TraesCS4A01G193500	Polynucleotidyl transferase, ribonuclease H-like superfamily protein
475396081-475398440	TraesCS4A01G193600	WRKY transcription factor
475418550-475423746	TraesCS4A01G193700	GPI transamidase component PIG-T
475579120-475579921	TraesCS4A01G193800	AMP phosphorylase
475902731-475906968	TraesCS4A01G193900	Vacuolar sorting receptor family protein
475910551-475914614	TraesCS4A01G194000	Chloroplastic outer envelope membrane protein, putative, expressed
475914952-475919117	TraesCS4A01G194100	Elongation factor P
476065837-476066397	TraesCS4A01G194200	Ring finger protein, putative

476142148-476142510	TraesCS4A01G194300	Non-specific lipid-transfer protein
476145519-476146036	TraesCS4A01G194400	Non-specific lipid-transfer protein
476337610-476343287	TraesCS4A01G194500	MACPF domain protein
476345073-476346656	TraesCS4A01G194600	Pentatricopeptide repeat-containing protein
476744781-476752651	TraesCS4A01G194700	Poly (A) RNA polymerase cid14
476979044-476980393	TraesCS4A01G194800	Non-specific serine/threonine protein kinase
477019716-477022706	TraesCS4A01G194900	NBS-LRR resistance protein
477024828-477029268	TraesCS4A01G195000	ARM repeat superfamily protein
477026271-477026606	TraesCS4A01G195100	Class II aaRS and biotin synthetases superfamily protein
477032809-477034972	TraesCS4A01G195200	Methyltransferase-related protein, putative
477057713-477066814	TraesCS4A01G195300	Reticulocyte-binding protein 2 like a
477307630-477313109	TraesCS4A01G195400	Reticulocyte-binding protein 2 like a
477833503-477834478	TraesCS4A01G195500	Lipid transfer protein
477878202-477884489	TraesCS4A01G195600	ADP,ATP carrier protein
477886282-477888721	TraesCS4A01G195700	Saposin B domain-containing family protein
478191459-478192551	TraesCS4A01G195800	Ribosomal RNA apurinic site specific lyase-like
478209590-478216829	TraesCS4A01G195900	F-box family protein

478217881-478219705	TraesCS4A01G196000	Peroxidase
478227516-478228331	TraesCS4A01G196100	DNA topoisomerase
478228425-478228727	TraesCS4A01G196200	Cortactin-binding protein 2
478300560-478302737	TraesCS4A01G196300	Peroxidase
478338363-478340040	TraesCS4A01G196400	Peroxidase
478742792-478743707	TraesCS4A01G196500	type one serine/threonine protein phosphatase 6
478746523-478747467	TraesCS4A01G196600	Carbonic anhydrase
478751090-478752731	TraesCS4A01G196700	F-box family protein
478866899-478868300	TraesCS4A01G196800	BTB/POZ domain-containing protein
479400478-479402257	TraesCS4A01G196900	Serine/threonine-protein kinase Haspin, putative
479411679-479419052	TraesCS4A01G197000	XH/XS domain-containing family protein
479429746-479430999	TraesCS4A01G197100	F-box family protein
479623255-479625385	TraesCS4A01G197200	F-box family protein
480556438-480557244	TraesCS4A01G197300	F-box family protein
481063475-481064905	TraesCS4A01G197400	F-box family protein
481089393-481091981	TraesCS4A01G197500	Transposase
481409030-481415020	TraesCS4A01G197600	Signal recognition particle 54 kDa protein

481416936-481420804	TraesCS4A01G197700	Signal recognition particle 54 kDa protein
482132676-482133512	TraesCS4A01G197800	Fantastic four-like protein
482134696-482138841	TraesCS4A01G197900	Rho GTPase-activating protein
482391745-482392520	TraesCS4A01G198000	Cholesterol 7-alpha-monooxygenase
483174530-483177374	TraesCS4A01G198100	Transcription factor
483382511-483383497	TraesCS4A01G198200	F-box protein-like
483950328-483951403	TraesCS4A01G198300	B3 domain-containing protein
484097808-484099293	TraesCS4A01G198400	Alpha-1,4 glucan phosphorylase
484234292-484236962	TraesCS4A01G198500	Lysosomal Pro-X carboxypeptidase
484672134-484673187	TraesCS4A01G198600	transcription repressor
484731624-484732719	TraesCS4A01G198700	transcription repressor
485278938-485284016	TraesCS4A01G198800	HVA22-like protein
485284330-485285110	TraesCS4A01G198900	ATP binding microtubule motor family protein
485458851-485461751	TraesCS4A01G199000	Chaperone protein ClpB
485708491-485709243	TraesCS4A01G199100	Basic blue copper family protein
486124572-486126014	TraesCS4A01G199200	UDP-glucose 6-dehydrogenase
486638806-486643365	TraesCS4A01G199300	Cyclin family protein

486646174-486648440	TraesCS4A01G199400	Pentatricopeptide repeat-containing protein
487554653-487555210	TraesCS4A01G199500	Phospholipid-transporting ATPase
487862149-487866232	TraesCS4A01G199600	Cyclin family protein
487868350-487868991	TraesCS4A01G199700	Late embryogenesis abundant (LEA) hydroxyproline-rich glycoprotein family
487890910-487892157	TraesCS4A01G199800	Late embryogenesis abundant (LEA) hydroxyproline-rich glycoprotein family, putative
487916374-487918245	TraesCS4A01G199900	FBD-associated F-box protein
488110321-488112219	TraesCS4A01G200000	Non-specific serine/threonine protein kinase
488252084-488257189	TraesCS4A01G200100	Exocyst complex component, putative
488528980-488534766	TraesCS4A01G200200	Two-component response regulator-like protein
488535721-488536287	TraesCS4A01G200300	5'-AMP-activated protein kinase beta-2 subunit protein
489083272-489084464	TraesCS4A01G200400	Apoptosis-inducing factor
489090971-489091890	TraesCS4A01G200500	Pentatricopeptide repeat-containing protein family
489096748-489109008	TraesCS4A01G200600	Digalactosyldiacylglycerol synthase 1, chloroplastic
489426392-489431170	TraesCS4A01G200700	Transcription factor-related family protein
489432513-489436674	TraesCS4A01G200800	BEL1-like homeodomain protein 1
489434254-489434619	TraesCS4A01G200900	cysteine-rich RLK (RECEPTOR-like protein kinase) 40

489882900-489889416	TraesCS4A01G201000	Phox-associated domain,Phox-like,Sorting nexin isoform 3
490341785-490342748	TraesCS4A01G201100	B3 domain-containing protein
490356118-490360729	TraesCS4A01G201200	GDP-L-galactose phosphorylase 1
490593952-490604685	TraesCS4A01G201300	Phosphatidylinositol 4-kinase
490770671-490776196	TraesCS4A01G201400	Cysteine desulfurase
490776678-490776968	TraesCS4A01G201500	Retrotransposon protein, putative, unclassified
490919189-490920803	TraesCS4A01G201600	E3 ubiquitin-protein ligase
491452647-491453923	TraesCS4A01G201700	Peroxidase
491687825-491690070	TraesCS4A01G201800	Receptor lectin kinase
491709686-491710078	TraesCS4A01G201900	Fusarium resistance orphan protein
491712891-491713484	TraesCS4A01G202000	Expressed protein-RZ53
491715851-491719316	TraesCS4A01G202100	Alcohol dehydrogenase
491914988-491917720	TraesCS4A01G202200	Alcohol dehydrogenase
492030110-492032620	TraesCS4A01G202300	Alcohol dehydrogenase
492352265-492355446	TraesCS4A01G202400	HXXXD-type acyl-transferase family protein
492527492-492528949	TraesCS4A01G202500	Pentatricopeptide repeat-containing protein
492531159-492534557	TraesCS4A01G202600	Carboxypeptidase

492888236-492891745	TraesCS4A01G202700	Transport Sec24 family protein
492893652-492893990	TraesCS4A01G202800	Polynucleotidyl transferase, ribonuclease H-like superfamily protein
492938661-492943177	TraesCS4A01G202900	Sentrin-specific protease
493614079-493614654	TraesCS4A01G203000	Dirigent protein
493982436-493983254	TraesCS4A01G203100	Ta11-like non-LTR retrotransposon
494001389-494001703	TraesCS4A01G203200	cytochrome P450, family 705, subfamily A, polypeptide 1
494002781-494009702	TraesCS4A01G203300	Pyruvate kinase
494009956-494010940	TraesCS4A01G203400	Chaperone protein dnaJ
494044874-494045656	TraesCS4A01G203500	Tapetum determinant 1
494144197-494144595	TraesCS4A01G203600	Protein Ycf2 A
494457303-494457896	TraesCS4A01G203700	Protein tapetum determinant 1
494552792-494558815	TraesCS4A01G203800	ABC1-like kinase
494640795-494643747	TraesCS4A01G203900	DAG protein, chloroplastic
495078320-495087074	TraesCS4A01G204000	Methylthioribose-1-phosphate isomerase
495101081-495124433	TraesCS4A01G204100	mRNA-capping enzyme
495106845-495107264	TraesCS4A01G204200	hAT transposon superfamily
495796296-495799843	TraesCS4A01G204300	Basic-leucine zipper (bZIP) transcription factor family protein

495801483-495803606	TraesCS4A01G204400	DNA-directed RNA polymerase
496062509-496074870	TraesCS4A01G204500	ATP-dependent protease La (LON) domain-containing protein
496113929-496115045	TraesCS4A01G204600	Interferon-induced protein 44
496997901-497003812	TraesCS4A01G204700	ATP-dependent zinc metalloprotease FtsH
497010610-497013169	TraesCS4A01G204800	Ribosomal protein
497024216-497029204	TraesCS4A01G204900	Auxin-responsive protein
497075203-497076970	TraesCS4A01G205000	Auxin-responsive protein
497439926-497442580	TraesCS4A01G205100	Kinase family protein
497494359-497496234	TraesCS4A01G205200	Serpin family protein
497810191-497812673	TraesCS4A01G205300	RNA apurinic site specific lyase
497814133-497815577	TraesCS4A01G205400	XH/XS domain protein
497871084-497872221	TraesCS4A01G205500	ERD (early-responsive to dehydration stress) family protein
497888723-497890741	TraesCS4A01G205600	Protein FRIGIDA
498212114-498213790	TraesCS4A01G205700	glucan synthase-like 10
498675787-498677685	TraesCS4A01G205800	Receptor-like kinase
498693152-498701803	TraesCS4A01G205900	Shortage in chiasmata
498985630-498988773	TraesCS4A01G206000	Receptor-kinase, putative

498993712-498999838	TraesCS4A01G206100	FHA domain containing protein, expressed
499341534-499344935	TraesCS4A01G206200	protein kinase family protein
499351019-499352479	TraesCS4A01G206300	Integrator complex subunit 3-like protein
499354369-499356918	TraesCS4A01G206400	Fructose-bisphosphate aldolase
499953247-499954317	TraesCS4A01G206500	AGC (cAMP-dependent, cGMP-dependent and protein kinase C) kinase family protein
500113292-500118392	TraesCS4A01G206600	CBS domain-containing protein, putative, expressed
500139035-500144802	TraesCS4A01G206700	Filament-like plant protein
500146447-500151023	TraesCS4A01G206800	Glutamyl-tRNA(Gln) amidotransferase subunit A
500349681-500351705	TraesCS4A01G206900	V-type proton ATPase proteolipid subunit
500352424-500357005	TraesCS4A01G207000	Long-Chain Acyl-CoA Synthetase
500412502-500422120	TraesCS4A01G207100	Protein FAR1-RELATED SEQUENCE 5
500431374-500433104	TraesCS4A01G207200	Glyoxal oxidase
500629797-500631119	TraesCS4A01G207300	Hyccin
500635505-500637009	TraesCS4A01G207400	transmembrane protein, putative (DUF247)
500658557-500660041	TraesCS4A01G207500	C2H2-like zinc finger protein
500900825-500902375	TraesCS4A01G207600	Auxin influx transporter

500905280-500912000	TraesCS4A01G207700	Sec1 family domain-containing protein 2
501123018-501125005	TraesCS4A01G207800	Receptor-like kinase
501125644-501129860	TraesCS4A01G207900	Alba DNA/RNA-binding protein
501132294-501134463	TraesCS4A01G208000	Ribosomal protein L3
501138148-501140321	TraesCS4A01G208100	Syntaxin protein
501243616-501244080	TraesCS4A01G208200	Egg cell-secreted protein 1.1
501260011-501260936	TraesCS4A01G208300	Ta11-like non-LTR retrotransposon
501468566-501469147	TraesCS4A01G208400	Abscisic stress-ripening protein
501638027-501640621	TraesCS4A01G208500	Exocyst complex component, putative
501959071-501961411	TraesCS4A01G208600	heat shock protein
501961857-501966950	TraesCS4A01G208700	Meiosis arrest female protein 1
501967261-501972388	TraesCS4A01G208800	Protein FAM135B
501975190-501976419	TraesCS4A01G208900	Plant/F1M20-13 protein
502027925-502030925	TraesCS4A01G209000	Tubby-like F-box protein
502356611-502357930	TraesCS4A01G209100	Transcription factor, putative
502362586-502364491	TraesCS4A01G209200	Transposon protein, putative, Pong sub-class
502900389-502901207	TraesCS4A01G209300	MAU2 chromatid cohesion factor homolog

502901041-502905693	TraesCS4A01G209400	Cytochrome b-c1 complex subunit 6
503212518-503219328	TraesCS4A01G209500	Autophagy-related protein 13
503235890-503236489	TraesCS4A01G209600	Vacuolar iron transporter-like protein
503611371-503612855	TraesCS4A01G209700	NBS-LRR-like resistance protein
503616427-503617851	TraesCS4A01G209800	GRAS family transcription factor containing protein
503629170-503632543	TraesCS4A01G209900	Transcription factor
503683127-503683996	TraesCS4A01G210000	Major cell-surface adhesin PAc
504172557-504173584	TraesCS4A01G210100	Heavy metal transport/detoxification superfamily protein
504183854-504198776	TraesCS4A01G210200	RING/FYVE/PHD zinc finger protein, putative
504199319-504200044	TraesCS4A01G210300	histone acetyltransferase of the CBP family 12
504201715-504202428	TraesCS4A01G210400	DUF241 domain protein, putative (DUF241)
504204317-504205117	TraesCS4A01G210500	DUF241 domain protein, putative (DUF241)
504207555-504208259	TraesCS4A01G210600	DUF241 domain protein, putative (DUF241)
504210903-504211694	TraesCS4A01G210700	DUF241 domain protein, putative (DUF241)
504214309-504214932	TraesCS4A01G210800	DUF241 domain protein (DUF241)
504216896-504217294	TraesCS4A01G210900	DUF241 domain protein, putative (DUF241)
504675538-504676842	TraesCS4A01G211000	ORMDL family protein-like

504789781-504792520	TraesCS4A01G211100	MYB transcription factor
504860925-504875568	TraesCS4A01G211200	Polyamine oxidase-like protein
504875850-504876248	TraesCS4A01G211300	Small conductance calcium-activated potassium channel protein 2
505495653-505496209	TraesCS4A01G211400	Heavy-metal-associated domain-containing protein, putative, expressed
505789086-505790276	TraesCS4A01G211500	exosome complex exonuclease
505790616-505794673	TraesCS4A01G211600	Kinase
506164630-506171334	TraesCS4A01G211700	Transcriptional corepressor SEUSS
506709256-506720722	TraesCS4A01G211800	Transcriptional corepressor SEUSS
507107850-507108270	TraesCS4A01G211900	GTPase Der
507561295-507561837	TraesCS4A01G212000	Coiled-coil domain-containing protein 18, putative isoform 1
507592560-507594188	TraesCS4A01G212100	FAD-binding Berberine family protein, putative
507908870-507910036	TraesCS4A01G212200	External alternative NAD(P)H-ubiquinone oxidoreductase B2, mitochondrial
507959947-507962049	TraesCS4A01G212300	F-box family protein
507964089-507975633	TraesCS4A01G212400	Cysteine synthase
508273954-508274503	TraesCS4A01G212500	Acetyltransferase, GNAT family protein, expressed
508494103-508494603	TraesCS4A01G212600	Acetyltransferase (GNAT) domain protein
510638985-510639524	TraesCS4A01G212700	N-acetyllactosaminide alpha-2,3-sialyltransferase (Sialyltransferase 6)

511022104-511024508	TraesCS4A01G212800	UDP-N-acetylglucosamine--N-acetylmuramyl-(pentapeptide) pyrophosphoryl-undecaprenol N-acetylglucosamine transferase
511036932-511038507	TraesCS4A01G212900	Pentatricopeptide repeat-containing protein, putative
511079422-511083784	TraesCS4A01G213000	F-box family protein
511132296-511133523	TraesCS4A01G213100	NAC domain protein
511187957-511189477	TraesCS4A01G213200	Histone deacetylase
511227620-511229247	TraesCS4A01G213300	Monoxygenase, FAD-binding protein
511230595-511232468	TraesCS4A01G213400	Nucleoside diphosphate kinase
511702496-511703827	TraesCS4A01G213500	Aspartic proteinase nepenthesin-1
511753946-511754482	TraesCS4A01G213600	Eukaryotic translation initiation factor 3 subunit A
511824039-511826026	TraesCS4A01G213700	Dynamin family protein, putative, expressed
512012996-512023533	TraesCS4A01G213800	Uridine kinase
512020435-512021019	TraesCS4A01G213900	aluminum-activated malate transporter 1
512024465-512028065	TraesCS4A01G214000	myosin XI D
512343253-512349340	TraesCS4A01G214100	TOM1-like protein 2
512354009-512357372	TraesCS4A01G214200	Protein disulfide-isomerase
512538021-512539064	TraesCS4A01G214300	Protein BPS1, chloroplastic

512539933-512545282	TraesCS4A01G214400	transmembrane protein (DUF616)
512579358-512581370	TraesCS4A01G214500	DnaJ domain containing protein, expressed
512835458-512836424	TraesCS4A01G214600	Glycosyl hydrolase superfamily protein
513082798-513087480	TraesCS4A01G214700	B3 domain-containing protein
513089416-513089859	TraesCS4A01G214800	Ribonuclease E inhibitor RraA/Dimethylmenaquinone methyltransferase
513120167-513121106	TraesCS4A01G214900	Retrotransposon protein, putative, unclassified
513288348-513292999	TraesCS4A01G215000	magnesium transporter NIPA (DUF803)
513341536-513342366	TraesCS4A01G215100	WEB family protein
513349444-513349725	TraesCS4A01G215200	ABC-2 and Plant PDR ABC-type transporter family protein
513804403-513805973	TraesCS4A01G215300	Amino acid permease
513922366-513922801	TraesCS4A01G215400	Neurogenic differentiation factor 1
513999399-514003377	TraesCS4A01G215500	Rubredoxin
514078413-514081489	TraesCS4A01G215600	50S ribosomal protein L19, putative
514341519-514344118	TraesCS4A01G215700	F-box family protein
514353267-514354960	TraesCS4A01G215800	F-box family protein
514406360-514406623	TraesCS4A01G215900	Pyridoxine/pyridoxamine 5'-phosphate oxidase
514412272-514421374	TraesCS4A01G216000	Cytochrome P450

514429586-514433273		TraesCS4A01G216100	Phytoalexin-deficient 4-1 protein
514556905-514569017		TraesCS4A01G216200	Protein translocase subunit SecA
515000857-515007042		TraesCS4A01G216300	ATP-dependent RNA helicase family protein
515456321-515457192		TraesCS4A01G216400	Holliday junction ATP-dependent DNA helicase RuvA
515461630-515466775		TraesCS4A01G216500	O-fucosyltransferase family protein
515558080-515558421		TraesCS4A01G216600	phospholipase-like protein (PEARLI 4) family protein
515646346-515649454		TraesCS4A01G216700	Cyclic nucleotide-gated channel
515749585-515750250		TraesCS4A01G216800	Late embryogenesis abundant (LEA) hydroxyproline-rich glycoprotein
515779130-515782750	C16	TraesCS4A01G216900	ABC transporter G family member
516343042-516343722	C17	TraesCS4A01G217000	Late embryogenesis abundant (LEA) hydroxyproline-rich glycoprotein
516354856-516355404		TraesCS4A01G217100	Dirigent protein
516369536-516370081		TraesCS4A01G217200	Dirigent protein
516583296-516583874		TraesCS4A01G217300	Dirigent protein
516587843-516608751		TraesCS4A01G217400	Dirigent protein
516890842-516894346		TraesCS4A01G217500	DUF668 family protein
516931760-516937462		TraesCS4A01G217600	Receptor-type tyrosine-protein phosphatase
517400440-517410772		TraesCS4A01G217700	ATP-dependent RNA helicase RhlB

517884383-517885453	TraesCS4A01G217800	MYB transcription factor
518822694-518829375	TraesCS4A01G217900	Transmembrane 9 superfamily member
518970702-518985627	TraesCS4A01G218000	Protein ZINC INDUCED FACILITATOR-LIKE 1
519570632-519574956	TraesCS4A01G218100	MLO-like protein
519630531-519633743	TraesCS4A01G218200	Fe/S biogenesis protein nfuA
519675892-519678306	TraesCS4A01G218300	Short-chain dehydrogenase/reductase family protein
520125235-520127884	TraesCS4A01G218400	Methylsterol monooxygenase 1-2
520954343-520955011	TraesCS4A01G218500	arginine N-methyltransferase, putative (DUF688)
521069473-521078564	TraesCS4A01G218600	WD40 repeat-like protein
521263892-521272090	TraesCS4A01G218700	SWI/SNF complex subunit SWI3C
521300093-521300491	TraesCS4A01G218800	RNA-directed DNA polymerase; Ribonuclease H, related
521538536-521551738	TraesCS4A01G218900	U-box domain-containing protein
521556213-521557786	TraesCS4A01G219000	Replication protein A subunit
521557979-521562568	TraesCS4A01G219100	E3 ubiquitin-protein ligase SINA-like 10
521588243-521589369	TraesCS4A01G219200	Purine nucleoside phosphorylase DeoD-type
521602640-521603779	TraesCS4A01G219300	P-loop containing nucleoside triphosphate hydrolases superfamily protein
521624277-521625872	TraesCS4A01G219400	Heavy metal-associated protein

521812354-521815231	TraesCS4A01G219500	Aspartic proteinase Asp1
521846077-521847275	TraesCS4A01G219600	Eukaryotic aspartyl protease family protein, expressed
521918428-521919907	TraesCS4A01G219700	NAC domain-containing protein, putative
521945567-521946917	TraesCS4A01G219800	Major Facilitator Superfamily with SPX (SYG1/Pho81/XPR1) domain-containing protein
522153951-522157524	TraesCS4A01G219900	Aldehyde dehydrogenase
522293017-522295793	TraesCS4A01G220000	S-adenosyl-L-methionine-dependent methyltransferases superfamily protein
522907855-522921868	TraesCS4A01G220100	DNA polymerase
522972703-522973478	TraesCS4A01G220200	Pre-mRNA splicing factor, putative
523447064-523455580	TraesCS4A01G220300	Kinase family protein
523456273-523458075	TraesCS4A01G220400	Proteasome subunit beta type
524178707-524179452	TraesCS4A01G220500	Pre-mRNA splicing factor, putative
524272281-524273502	TraesCS4A01G220600	DNA ligase
524280168-524287073	TraesCS4A01G220700	Chromatin modification-related protein EAF1 A
525043352-525044383	TraesCS4A01G220800	Transposase
525110484-525111035	TraesCS4A01G220900	RING/U-box superfamily protein
525152818-525153189	TraesCS4A01G221000	Cartilage oligomeric matrix protein

525736772-525737806	TraesCS4A01G221100	GATA transcription factor
526640028-526642987	TraesCS4A01G221200	WD-repeat protein, putative
527001528-527002834	TraesCS4A01G221300	1-aminocyclopropane-1-carboxylate oxidase
527009136-527014811	TraesCS4A01G221400	NAD kinase
527112680-527113582	TraesCS4A01G221500	Sphingoid base hydroxylase 2
527120170-527132709	TraesCS4A01G221600	DNA ligase 1
527495980-527500050	TraesCS4A01G221700	Protein kinase family protein, putative, expressed
527575814-527576790	TraesCS4A01G221800	Myb/SANT-like DNA-binding domain protein
527902974-527913262	TraesCS4A01G221900	Transducin/WD-like repeat-protein
528604540-528605440	TraesCS4A01G222000	F-box family protein
528644556-528645197	TraesCS4A01G222100	F-box domain containing protein
529619251-529626266	TraesCS4A01G222200	Protein TPLATE
529625774-529626034	TraesCS4A01G222300	Homoserine/homoserine lactone efflux protein
529626929-529628377	TraesCS4A01G222400	Pentatricopeptide repeat-containing protein, putative
529629746-529631972	TraesCS4A01G222500	B3 domain-containing protein
529633638-529634432	TraesCS4A01G222600	Serpin family protein
530121870-530123027	TraesCS4A01G222700	Transcription factor, putative

530172977-530179549	TraesCS4A01G222800	RING-finger E3 ubiquitin ligase, putative
530815792-530819262	TraesCS4A01G222900	Neutral/alkaline invertase
530891468-530892193	TraesCS4A01G223000	Beta-1,3-N-Acetylglucosaminyltransferase family protein, putative
530935273-530935944	TraesCS4A01G223100	Harpin inducing protein
530936889-530938446	TraesCS4A01G223200	receptor kinase 1
531073743-531077003	TraesCS4A01G223300	NBS-LRR disease resistance protein-like
531077535-531097706	TraesCS4A01G223400	protein kinase family protein
531236819-531241694	TraesCS4A01G223500	Disease resistance protein RPM1
531247082-531249319	TraesCS4A01G223600	receptor kinase 1
531304423-531309137	TraesCS4A01G223700	Photosystem II reaction center PsbP family protein
531311802-531313877	TraesCS4A01G223800	Receptor-like protein kinase
531325926-531326657	TraesCS4A01G223900	receptor kinase 1
531383913-531386654	TraesCS4A01G224000	NBS-LRR disease resistance protein, putative, expressed
531677814-531680552	TraesCS4A01G224100	NBS-LRR disease resistance protein, putative, expressed
531952996-531955530	TraesCS4A01G224200	Transposon protein, putative, CACTA, En/Spm sub-class
532073805-532075311	TraesCS4A01G224300	Rpr4901.2
532208397-532209491	TraesCS4A01G224400	receptor kinase 1

532216853-532217890	TraesCS4A01G224500	NBS-LRR disease resistance protein, putative, expressed
532223673-532224099	TraesCS4A01G224600	Pentatricopeptide repeat (PPR) superfamily protein
532350376-532353361	TraesCS4A01G224700	Receptor protein kinase, putative
532791942-532797429	TraesCS4A01G224800	Non-specific serine/threonine protein kinase
532833164-532834197	TraesCS4A01G224900	Gibberellin receptor GID1a
532897177-532898552	TraesCS4A01G225000	Gibberellin receptor GID1A
533000510-533006669	TraesCS4A01G225100	Sucrose-phosphate synthase
533010789-533015786	TraesCS4A01G225200	Glycerophosphodiester phosphodiesterase
533032338-533032802	TraesCS4A01G225300	VQ motif-containing protein
533258157-533262230	TraesCS4A01G225400	Protein NRT1/ PTR FAMILY 1.2
533444658-533448029	TraesCS4A01G225500	PHD finger protein
533459478-533463467	TraesCS4A01G225600	B3 domain-containing protein
533843378-533844403	TraesCS4A01G225700	Gibberellin receptor GID1a
534042906-534057343	TraesCS4A01G225800	CCR4-NOT transcription complex subunit 11
534160530-534161546	TraesCS4A01G225900	BPS1-like protein (DUF793)
534167672-534170275	TraesCS4A01G226000	ATP-dependent Clp protease ATP-binding subunit
534229856-534237751	TraesCS4A01G226100	Serine carboxypeptidase family protein, expressed

534258202-534258657	TraesCS4A01G226200	DUF538 family protein, putative (Protein of unknown function, DUF538)
534523568-534526756	TraesCS4A01G226300	Protein phosphatase 2c, putative
534545306-534554553	TraesCS4A01G226400	Non-lysosomal glucosylceramidase
534780326-534790750	TraesCS4A01G226500	DNA polymerase III subunit
534790776-534791913	TraesCS4A01G226600	lysine ketoglutarate reductase trans-splicing-like protein, putative (DUF707)
534811309-534812238	TraesCS4A01G226700	Heat-shock protein, putative
535034849-535036054	TraesCS4A01G226800	Zinc finger-homeodomain protein 1
535242506-535243985	TraesCS4A01G226900	Chlorophyll a-b binding protein, chloroplastic
535244690-535248317	TraesCS4A01G227000	Glycine-rich protein
535425668-535426642	TraesCS4A01G227100	Glucuronoxylan 4-O-methyltransferase
535427916-535431632	TraesCS4A01G227200	Protein kinase-like protein
535464263-535466861	TraesCS4A01G227300	Chlorophyll a/b binding protein domain-containing protein
535819032-535819589	TraesCS4A01G227400	ethylene-responsive transcription factor
535845399-535855523	TraesCS4A01G227500	DNA-(apurinic or apyrimidinic site) lyase
535856321-535874270	TraesCS4A01G227600	ABC transporter, putative
535871696-535873014	TraesCS4A01G227700	Retrovirus-related Pol polyprotein from transposon TNT 1-94
536197440-536198627	TraesCS4A01G227800	ENTH/ANTH/VHS superfamily protein

536202329-536211191	TraesCS4A01G227900	PHD finger alfin-like protein
536327998-536328854	TraesCS4A01G228000	related to vernalization1 1
536770702-536772767	TraesCS4A01G228100	PCTP-like protein
536784520-536785344	TraesCS4A01G228200	Zinc finger MYM-type-like protein
536792875-536795577	TraesCS4A01G228300	Heparan-alpha-glucosaminide N-acetyltransferase
536820396-536820825	TraesCS4A01G228400	UPSTREAM OF FLC-like protein (DUF966)
536826088-536829987	TraesCS4A01G228500	E3 ubiquitin-protein ligase SINA-like 10
537182717-537184053	TraesCS4A01G228600	F-box/kelch-repeat protein
537231330-537232890	TraesCS4A01G228700	Transposon protein, putative, Mutator sub-class
537272548-537274101	TraesCS4A01G228800	F-box/kelch-repeat protein
537433962-537440469	TraesCS4A01G228900	Serine protease
537530140-537533999	TraesCS4A01G229000	Ankyrin repeat protein SKIP35
537543678-537544010	TraesCS4A01G229100	Argos-like protein
537592342-537596508	TraesCS4A01G229200	Hemolysin A family protein, expressed
537598043-537599866	TraesCS4A01G229300	At2g43990/F6E13.12
537949589-537957582	TraesCS4A01G229400	La
538212252-538215714	TraesCS4A01G229500	Retrovirus-related Pol polyprotein from transposon 297 family

538839324-538840786	TraesCS4A01G229600	Pectin lyase-like superfamily protein
538905249-538906763	TraesCS4A01G229700	Polygalacturonase
539126535-539129949	TraesCS4A01G229800	Receptor-like kinase
539147640-539153101	TraesCS4A01G229900	NADP-dependent alkenal double bond reductase
539156556-539160442	TraesCS4A01G230000	Acetolactate synthase small subunit
539288267-539295938	TraesCS4A01G230100	Protein transport protein SEC23
539297585-539299560	TraesCS4A01G230200	Pentatricopeptide repeat-containing protein
539299786-539302328	TraesCS4A01G230300	RNA polymerase sigma factor RpoD
539428704-539429399	TraesCS4A01G230400	Subtilisin-like protease
539583987-539585231	TraesCS4A01G230500	Calcineurin-like metallo-phosphoesterase superfamily protein
539751161-539754738	TraesCS4A01G230600	F-box/LRR protein
539755046-539761346	TraesCS4A01G230700	Plant regulator RWP-RK family protein
540014447-540017248	TraesCS4A01G230800	Transmembrane protein, putative
540058987-540060777	TraesCS4A01G230900	Glycosyltransferase family 92 protein
540416072-540417322	TraesCS4A01G231000	Glycosyltransferase family 92 protein
540433150-540437968	TraesCS4A01G231100	ER membrane protein complex subunit 10
540441364-540444518	TraesCS4A01G231200	COBRA-like protein

540600328-540604473	TraesCS4A01G231300	Homeobox-leucine zipper protein
540957727-540959091	TraesCS4A01G231400	Aspartic proteinase nepenthesin-1
541172421-541172911	TraesCS4A01G231500	cleavage and polyadenylation specificity factor 160
541337582-541340608	TraesCS4A01G231600	BSD domain containing protein, expressed
541357800-541358522	TraesCS4A01G231700	Protein MIZU-KUSSEI 1
541361828-541366225	TraesCS4A01G231800	Protein ApaG
541426996-541430264	TraesCS4A01G231900	DUF936 family protein
541672086-541679832	TraesCS4A01G232000	Dehydrogenase/reductase SDR family member
541680317-541686269	TraesCS4A01G232100	RNA-binding ASCH domain protein
541784613-541786988	TraesCS4A01G232200	Receptor-kinase, putative
541890982-541892848	TraesCS4A01G232300	NAD(P)H dehydrogenase subunit 48
541987324-541988376	TraesCS4A01G232400	Tetrapyrrole-binding protein, chloroplastic
541988817-541994144	TraesCS4A01G232500	UPF0454 protein C12orf49
542020316-542024151	TraesCS4A01G232600	Eukaryotic translation initiation factor 3 subunit B
542026261-542033155	TraesCS4A01G232700	Endonuclease III homolog
542033451-542038903	TraesCS4A01G232800	Chloroplast ATP-dependent Clp protease chaperone protein
542039991-542040407	TraesCS4A01G232900	ATP-dependent Clp protease, ATP-binding subunit

542045910-542047863	TraesCS4A01G233000	F-box protein-like protein
542248874-542250602	TraesCS4A01G233100	Kinesin-1 heavy chain
542261581-542263453	TraesCS4A01G233200	Pre-mRNA-processing protein 40A
542264619-542266973	TraesCS4A01G233300	40S ribosomal protein S27
542269885-542280729	TraesCS4A01G233400	Exocyst complex component SEC3A
542476351-542481624	TraesCS4A01G233500	ATP-dependent (S)-NAD(P)H-hydrate dehydratase
542499165-542500039	TraesCS4A01G233600	DUF1685 family protein
542532836-542533493	TraesCS4A01G233700	B3 domain-containing protein
542553417-542555908	TraesCS4A01G233800	B3 domain-containing protein
542617981-542621127	TraesCS4A01G233900	B3 domain-containing protein
542827942-542829242	TraesCS4A01G234000	Dof zinc finger protein
543332002-543333307	TraesCS4A01G234100	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase superfamily protein
543340553-543341184	TraesCS4A01G234200	Glutamine dumper, putative
543347199-543348170	TraesCS4A01G234300	Mitochondrial transcription termination factor family protein
543365697-543369614	TraesCS4A01G234400	N-acetyl-gamma-glutamyl-phosphate reductase
543374607-543375910	TraesCS4A01G234500	basic helix-loop-helix (bHLH) DNA-binding superfamily protein
543608520-543610470	TraesCS4A01G234600	Cyclin family protein

543735662-543740221	TraesCS4A01G234700	Calcium-transporting ATPase
543740661-543746036	TraesCS4A01G234800	DNA polymerase IV
544031261-544032679	TraesCS4A01G234900	F-box family protein
544033032-544036361	TraesCS4A01G235000	50S ribosomal protein L25
544046934-544047800	TraesCS4A01G235100	LOB domain family protein
544055775-544058074	TraesCS4A01G235200	Protein OSB1, mitochondrial
544058447-544060908	TraesCS4A01G235300	Oxidoreductase, aldo/keto reductase family protein, expressed
544062199-544067990	TraesCS4A01G235400	Surface presentation of antigens protein SpaR
544174235-544177981	TraesCS4A01G235500	Oxidoreductase, aldo/keto reductase family protein, expressed
544197932-544201050	TraesCS4A01G235600	Kinase family protein
544201959-544204242	TraesCS4A01G235700	Serpin family protein
544380953-544382209	TraesCS4A01G235800	Peroxidase
544389388-544390826	TraesCS4A01G235900	Serpin family protein
544397231-544397845	TraesCS4A01G236000	Zinc finger protein, putative
544887198-544891670	TraesCS4A01G236100	BTB/POZ domain-containing protein
544953084-544954778	TraesCS4A01G236200	LOB domain-containing protein, putative
545105716-545106960	TraesCS4A01G236300	Ethylene-responsive transcription factor

545114629-545117369	TraesCS4A01G236400	Fumarylacetoacetate hydrolase, putative
545124466-545124741	TraesCS4A01G236500	SWAP (Suppressor-of-White-APricot)/surp domain-containing protein / ubiquitin family protein
545192213-545193592	TraesCS4A01G236600	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase superfamily protein
545235570-545237367	TraesCS4A01G236700	Cyclin
545601815-545606948	TraesCS4A01G236800	MAR-binding filament-like protein
545761956-545762903	TraesCS4A01G236900	CCR4-NOT transcription complex subunit 7
545770348-545777493	TraesCS4A01G237000	Methionine S-methyltransferase
546005400-546005792	TraesCS4A01G237100	RNA-directed DNA polymerase; Ribonuclease H, related
546017711-546020208	TraesCS4A01G237200	Metal transporter
546210168-546212042	TraesCS4A01G237300	glutamyl-tRNA (Gln) amidotransferase subunit A (DUF620)
546256267-546259001	TraesCS4A01G237400	RING/U-box superfamily protein
546296550-546298853	TraesCS4A01G237500	Subtilisin-like protease
546477269-546483413	TraesCS4A01G237600	Ribosomal RNA small subunit methyltransferase H
546484423-546487035	TraesCS4A01G237700	A-kinase anchor protein 9, putative isoform 1
546795496-546797396	TraesCS4A01G237800	Transcriptional adapter 1
547044672-547047206	TraesCS4A01G237900	UDP-glucose 6-dehydrogenase

547200426-547201448	TraesCS4A01G238000	Zinc finger protein, putative
547203176-547204576	TraesCS4A01G238100	Presenilin
547228876-547233151	TraesCS4A01G238200	Pentatricopeptide repeat-containing protein
547300820-547303249	TraesCS4A01G238300	Mitochondrial import receptor subunit TOM5
547516971-547518642	TraesCS4A01G238400	Remorin
547928686-547930299	TraesCS4A01G238500	Adenine/guanine permease
547978932-547980325	TraesCS4A01G238600	Cysteine proteinase
547982698-547983024	TraesCS4A01G238700	Leucine-rich repeat protein kinase family protein
548053473-548056171	TraesCS4A01G238800	4-coumarate--CoA ligase like
548066534-548067145	TraesCS4A01G238900	Rho GTPase activation protein (RhoGAP) with PH domain-containing protein
548274831-548282171	TraesCS4A01G239000	4-coumarate--CoA ligase like
548341734-548344564	TraesCS4A01G239100	4-coumarate-CoA ligase
548515335-548515670	TraesCS4A01G239200	Dolichol phosphate-mannose biosynthesis regulatory protein
548518832-548527672	TraesCS4A01G239300	Exosome complex component
548523978-548525431	TraesCS4A01G239400	Retrovirus-related like polyprotein
548529652-548542423	TraesCS4A01G239500	ATP-dependent RNA helicase, putative
548774590-548779050	TraesCS4A01G239600	Receptor protein kinase-like protein

548779766-548784167	TraesCS4A01G239700	WD repeat protein-like
548819782-548822077	TraesCS4A01G239800	T-box transcription factor, putative (DUF863)
549670861-549672254	TraesCS4A01G239900	O-methyltransferase
549799338-549800138	TraesCS4A01G240000	Thioredoxin
549803298-549807400	TraesCS4A01G240100	Cycloeucaenol cycloisomerase
549816755-549820868	TraesCS4A01G240200	Receptor-like kinase
549879176-549882741	TraesCS4A01G240300	Haloacid dehalogenase-like hydrolase family protein
549922700-549924088	TraesCS4A01G240400	Phospholipase a1-chloroplastic-like
550082585-550083910	TraesCS4A01G240500	Phospholipase a1-chloroplastic-like
550324968-550328176	TraesCS4A01G240600	Mitochondrial substrate carrier family protein
550464945-550467229	TraesCS4A01G240700	Amino acid transporter family protein, putative
550476231-550480359	TraesCS4A01G240800	Thioredoxin-like protein 4B
550481163-550487426	TraesCS4A01G240900	Beta-xylosidase, putative
550488935-550489096	TraesCS4A01G241000	Ribosomal protein L2
550495384-550500502	TraesCS4A01G241100	Histidine triad nucleotide-binding protein
550501738-550508742	TraesCS4A01G241200	UBX domain containing protein, expressed
551132424-551133863	TraesCS4A01G241300	B3 domain-containing protein

551137905-551138171	TraesCS4A01G241400	O-acetylserine dependent cystathionine beta-synthase
551217304-551220548	TraesCS4A01G241500	B3 domain-containing protein
551493368-551493711	TraesCS4A01G241600	Thymidylate kinase
551764828-551772796	TraesCS4A01G241700	Eukaryotic aspartyl protease family protein
552145824-552146396	TraesCS4A01G241800	NADH dehydrogenase subunit 9
552147635-552152386	TraesCS4A01G241900	B3 domain-containing protein
552195896-552197461	TraesCS4A01G242000	B3 domain-containing protein
552214597-552214935	TraesCS4A01G242100	Retrotransposon protein, putative, unclassified
552221693-552227631	TraesCS4A01G242200	Deoxyuridine 5'-triphosphate nucleotidohydrolase
552254537-552258366	TraesCS4A01G242300	B3 domain-containing protein
552407850-552409300	TraesCS4A01G242400	B3 domain-containing protein
552409708-552413672	TraesCS4A01G242500	caspase-6 protein
552500448-552506097	TraesCS4A01G242600	Myb family transcription factor-like protein
552698535-552700166	TraesCS4A01G242700	NAC domain protein,
552816857-552818257	TraesCS4A01G242800	WD40-repeat protein
552831656-552833113	TraesCS4A01G242900	WD40-repeat protein
552877480-552877854	TraesCS4A01G243000	Transposon protein, putative, unclassified

552893219-552905734	TraesCS4A01G243100	Exocyst complex component SEC3A
553310632-553313968	TraesCS4A01G243200	RING/U-box superfamily protein
553316322-553317573	TraesCS4A01G243300	Metacaspase-1
553406089-553408630	TraesCS4A01G243400	DNA-directed RNA polymerase III subunit RPC4
553446992-553451942	TraesCS4A01G243500	Acetyltransferase component of pyruvate dehydrogenase complex
553535056-553535277	TraesCS4A01G243600	Chaperone protein dnaK
554542730-554543626	TraesCS4A01G243700	CCR4-NOT transcription complex subunit 7
554558280-554559514	TraesCS4A01G243800	CCR4-NOT transcription complex subunit 7
554629644-554630886	TraesCS4A01G243900	Polynucleotidyl transferase, ribonuclease H-like superfamily protein
554632753-554637781	TraesCS4A01G244000	WD40 repeat-like protein
554699174-554699974	TraesCS4A01G244100	Ubiquitin-conjugating enzyme E2
554840090-554850060	TraesCS4A01G244200	RING/U-box superfamily protein
554853298-554854887	TraesCS4A01G244300	UDP-glycosyltransferase
554920214-554920384	TraesCS4A01G244400	Mitochondrial import receptor subunit TOM6-like protein
554924159-554925889	TraesCS4A01G244500	Type I inositol-1,4,5-trisphosphate 5-phosphatase
554926632-554929378	TraesCS4A01G244600	Interferon-activable protein
554939208-554939585	TraesCS4A01G244700	lectin protein kinase family protein

554949269-554949565	TraesCS4A01G244800	Tetratricopeptide repeat (TPR)-like superfamily protein
554959780-554960157	TraesCS4A01G244900	lectin protein kinase family protein
554973466-554973886	TraesCS4A01G245000	K-box region and MADS-box transcription factor family protein
555440212-555441343	TraesCS4A01G245100	Dormancy-associated protein/auxin-repressed protein
555510132-555514424	TraesCS4A01G245200	Protein DA1-related 1
555515686-555523901	TraesCS4A01G245300	Protein DETOXIFICATION
555559271-555564187	TraesCS4A01G245400	Protein DETOXIFICATION
555746061-555750257	TraesCS4A01G245500	Calcineurin B-like protein
556009735-556010004	TraesCS4A01G245600	Methionine import ATP-binding protein MetN 1
556236782-556246954	TraesCS4A01G245700	Cytosolic Fe-S cluster assembly factor NBP35
556250003-556258435	TraesCS4A01G245800	RNA-binding KH domain-containing protein
556373092-556381517	TraesCS4A01G245900	p-loop containing nucleoside triphosphate hydrolases superfamily protein
556537589-556539531	TraesCS4A01G246000	WRKY transcription factor
556752351-556756416	TraesCS4A01G246100	Serine hydroxymethyltransferase
556822844-556825902	TraesCS4A01G246200	WD40 repeat-containing protein
556826154-556829503	TraesCS4A01G246300	BAT2 domain-containing protein 1
556830580-556842543	TraesCS4A01G246400	Vps51 vps67 family (Components of vesicular transport) protein

557245005-557247884	TraesCS4A01G246500	Kinase PfkB
557250646-557253918	TraesCS4A01G246600	Pentatricopeptide repeat-containing protein
557662346-557663145	TraesCS4A01G246700	Ubiquitin-conjugating enzyme E2
557729041-557733748	TraesCS4A01G246800	Poly(A) polymerase
557868542-557870242	TraesCS4A01G246900	Peptidyl-prolyl cis-trans isomerase
558210083-558213670	TraesCS4A01G247000	Cyclin-like protein
558214466-558217058	TraesCS4A01G247100	Magnesium-dependent phosphatase 1
558218404-558227155	TraesCS4A01G247200	E3 ubiquitin-protein ligase HOS1
558414331-558418509	TraesCS4A01G247300	CBS domain containing protein, expressed
558547016-558548074	TraesCS4A01G247400	Sorghum bicolor protein targeted either to mitochondria or chloroplast proteins T50848
558648418-558649786	TraesCS4A01G247500	GEM-like protein 1
558650444-558651111	TraesCS4A01G247600	ATP synthase delta-subunit protein
558655417-558656367	TraesCS4A01G247700	Syntaxin, putative
558667947-558669694	TraesCS4A01G247800	Plasma membrane ATPase
558676008-558676367	TraesCS4A01G247900	Cysteine proteinase inhibitor
558679245-558679673	TraesCS4A01G248000	Alpha amylase inhibitor protein

558845272-558848862	TraesCS4A01G248100	Methyltransferase
559044696-559047664	TraesCS4A01G248200	Endoglucanase
559048582-559049823	TraesCS4A01G248300	Pentatricopeptide repeat-containing protein
559067713-559069352	TraesCS4A01G248400	Glycerol-3-phosphate acyltransferase
559162733-559167933	TraesCS4A01G248500	Protein ZINC INDUCED FACILITATOR-LIKE 1
559486187-559487829	TraesCS4A01G248600	transmembrane protein, putative (DUF247)
559494215-559496292	TraesCS4A01G248700	Cell wall invertase
559894244-559897294	TraesCS4A01G248800	Alba DNA/RNA-binding protein
559945250-559946956	TraesCS4A01G248900	Eukaryotic translation initiation factor 3 subunit G
559949681-559950979	TraesCS4A01G249000	B3 domain-containing protein
560313977-560315500	TraesCS4A01G249100	Pentatricopeptide repeat-containing protein
560317324-560319518	TraesCS4A01G249200	RING finger and CHY zinc finger protein
560411162-560416428	TraesCS4A01G249300	Transducin/WD-like repeat-protein
560901278-560905179	TraesCS4A01G249400	GATA transcription factor
560905758-560906845	TraesCS4A01G249500	U-box domain-containing protein 57
560907883-560912041	TraesCS4A01G249600	Mitochondrial carrier protein, expressed
560951669-560951959	TraesCS4A01G249700	Alkyl hydroperoxide reductase subunit C

560964956-560965249	TraesCS4A01G249800	piezo-type mechanosensitive ion channel component
560970450-560971840	TraesCS4A01G249900	F-box domain containing protein
560994640-560996318	TraesCS4A01G250000	50S ribosomal protein L7/L12
560998060-560998512	TraesCS4A01G250100	Discoidin, CUB and LCCL domain-containing protein 1
561071827-561072185	TraesCS4A01G250200	SNF2 domain-containing protein / helicase domain-containing protein / zinc finger protein-like protein
561102971-561103327	TraesCS4A01G250300	GDP-Man:Man(3)GlcNAc(2)-PP-Dol alpha-1,2-mannosyltransferase
561105686-561106025	TraesCS4A01G250400	Protein phosphatase 2C family protein
561111934-561112400	TraesCS4A01G250500	Vacuolar protein sorting/targeting protein 10
561368126-561370971	TraesCS4A01G250600	GRF1-interacting factor-like protein
562280813-562281608	TraesCS4A01G250700	pumilio 2
562282443-562286220	TraesCS4A01G250800	Endoplasmic reticulum oxidoreductin-1
562290028-562291481	TraesCS4A01G250900	Dehydrin
562403111-562407137	TraesCS4A01G251000	Zinc finger BED domain-containing protein DAYSLEEPER
562408921-562413963	TraesCS4A01G251100	Pollen Ole e 1 allergen/extensin
562450576-562454617	TraesCS4A01G251200	Zinc finger BED domain-containing protein DAYSLEEPER
562458236-562458793	TraesCS4A01G251300	Pathogenesis-related protein 1

562482754-562484927	TraesCS4A01G251400	Kinase, putative
562573394-562574089	TraesCS4A01G251500	Protein MIZU-KUSSEI 1
563049929-563052786	TraesCS4A01G251600	4-hydroxy-3-methylbut-2-enyl diphosphate reductase
563268803-563269742	TraesCS4A01G251700	Pectinesterase
563511457-563512448	TraesCS4A01G251800	Homeobox transcription factor KN2
563677948-563679541	TraesCS4A01G251900	Sugar transporter family protein
563678635-563679387	TraesCS4A01G252000	1,4-alpha-glucan branching enzyme GlgB
564148415-564157977	TraesCS4A01G252100	Homeobox protein bell1-like protein
564163571-564167730	TraesCS4A01G252200	DNA double-strand break repair rad50 ATPase
564639556-564640280	TraesCS4A01G252300	Vacuolar sorting receptor family protein
564750385-564751806	TraesCS4A01G252400	ARM repeat superfamily protein
564951290-564953002	TraesCS4A01G252500	Peptide-N4-(N-acetyl-beta-glucosaminyl)asparagine amidase A
564954817-564956321	TraesCS4A01G252600	Glycosyltransferase
564971277-564974497	TraesCS4A01G252700	Cathepsin B-like cysteine protease
565040539-565043592	TraesCS4A01G252800	Cathepsin B-like cysteine protease
565302085-565305616	TraesCS4A01G252900	Cathepsin B-like cysteine protease
565306504-565317251	TraesCS4A01G253000	Leishmanolysin-like peptidase

565430040-565431392	TraesCS4A01G253100	F-box protein
565432182-565433195	TraesCS4A01G253200	Photosystem I reaction center subunit N
565433856-565434847	TraesCS4A01G253300	Photosystem I reaction center subunit N
565435085-565437902	TraesCS4A01G253400	Core-2/I-branching beta-1,6-N-acetylglucosaminyltransferase family protein
565699355-565725725	TraesCS4A01G253500	Calcium-transporting ATPase
565732767-565742099	TraesCS4A01G253600	Serine carboxypeptidase family protein, expressed
565747737-565750618	TraesCS4A01G253700	Serine carboxypeptidase family protein, expressed
565758829-565762061	TraesCS4A01G253800	Serine carboxypeptidase family protein, expressed
565841629-565843317	TraesCS4A01G253900	Lecithin-cholesterol acyltransferase-like 1
566289983-566291447	TraesCS4A01G254000	Lecithin-cholesterol acyltransferase-like 1
566293430-566300451	TraesCS4A01G254100	Ribosomal RNA small subunit methyltransferase F
566522605-566526929	TraesCS4A01G254200	BSD domain containing protein
566527387-566529939	TraesCS4A01G254300	ACT domain containing protein, expressed
566589200-566589644	TraesCS4A01G254400	Glutaredoxin, putative
566609902-566610346	TraesCS4A01G254500	Glutaredoxin, putative
566828841-566830249	TraesCS4A01G254600	Thioredoxin-like protein AAED1, chloroplastic
566905182-566907692	TraesCS4A01G254700	Zinc finger MYM-type-like protein

567036537-567037063		TraesCS4A01G254800	Carboxypeptidase
567037277-567038089		TraesCS4A01G254900	CVP2 like 1
567181746-567185221		TraesCS4A01G255000	Growth-regulating factor
567192867-567193136		TraesCS4A01G255100	B3 domain-containing protein
567470959-567471646		TraesCS4A01G255200	Imidazole glycerol phosphate synthase subunit HisH
567476443-567479410		TraesCS4A01G255300	Ribosomal RNA small subunit methyltransferase E
567479603-567482101	C5	TraesCS4A01G255400	Serine/threonine-protein kinase
567484301-567487389		TraesCS4A01G255500	Thioredoxin-like protein AAED1, chloroplastic
567489300-567492747		TraesCS4A01G255600	transmembrane protein
567493169-567495275	C18	TraesCS4A01G255700	ethylene-dependent gravitropism-deficient and yellow-green-like 2
567646583-567646825	<i>AX109496237</i>		
567650074-567650374	<i>AX109001562</i>		
567650160-567654340	C19	TraesCS4A01G255800	basic helix-loop-helix (bHLH) DNA-binding superfamily protein
567667591-567675909		TraesCS4A01G255900	ATP dependent RNA helicase
567676134-567678643		TraesCS4A01G256000	tRNA pseudouridine synthase
567682081-567685775		TraesCS4A01G256100	Pentatricopeptide repeat-containing protein
567686918-567691656		TraesCS4A01G256200	Chaperone protein DnaJ

567696212-567701939	TraesCS4A01G256300	GTPase obg
567706804-567708066	TraesCS4A01G256400	F-box family protein
568192908-568194707	TraesCS4A01G256500	1-aminocyclopropane-1-carboxylate synthase 1
568507891-568509412	TraesCS4A01G256600	Digeranylgeranylglyceryl phosphate synthase
569477449-569484409	TraesCS4A01G256700	homeobox-1
569866440-569868731	TraesCS4A01G256800	E3 ubiquitin-protein ligase FANCL
569869977-569874614	TraesCS4A01G256900	Alpha/beta-hydrolase superfamily protein
569877552-569878043	TraesCS4A01G257000	Epidermal patterning factor-like protein
569879972-569882429	TraesCS4A01G257100	GDP-mannose transporter
569886103-569892384	TraesCS4A01G257200	AMSH-like ubiquitin thioesterase 1
570189917-570190999	TraesCS4A01G257300	pleiotropic drug resistance 13
570262263-570267332	TraesCS4A01G257400	Sulfite exporter TauE/SafE family protein
570268678-570269961	TraesCS4A01G257500	myb-like protein X
570461424-570464905	TraesCS4A01G257600	ERD (Early-responsive to dehydration stress) family protein
570466398-570471904	TraesCS4A01G257700	Inositol-tetrakisphosphate 1-kinase
570478051-570480540	TraesCS4A01G257800	Tubulin alpha chain
570910048-570912528	TraesCS4A01G257900	basic helix-loop-helix (bHLH) DNA-binding superfamily protein

570973087-570978939	TraesCS4A01G258000	WD repeat-containing protein
570981432-570985759	TraesCS4A01G258100	Lariat debranching enzyme
570988372-570998526	TraesCS4A01G258200	Pre-mRNA polyadenylation factor Fip1
571031282-571031596	TraesCS4A01G258300	50S ribosomal protein L6, putative
571040698-571042292	TraesCS4A01G258400	Maf-like protein, expressed
571045891-571047818	TraesCS4A01G258500	Maf-like protein, expressed
571212794-571214353	TraesCS4A01G258600	dipeptide transport ATP-binding protein
571297190-571297483	TraesCS4A01G258700	Polynucleotidyl transferase, ribonuclease H-like superfamily protein
571359780-571364276	TraesCS4A01G258800	Glycine-rich family protein
571483446-571484903	TraesCS4A01G258900	Glycosyltransferase
571586153-571588969	TraesCS4A01G259000	dipeptide transport ATP-binding protein
571777303-571781968	TraesCS4A01G259100	Receptor kinase
571971770-571972432	TraesCS4A01G259200	Ethylene-responsive transcription factor
572302274-572303653	TraesCS4A01G259300	Anthocyanin 5-aromatic acyltransferase
572307556-572308866	TraesCS4A01G259400	Anthocyanin 5-aromatic acyltransferase
572535158-572539686	TraesCS4A01G259500	Sec14p-like phosphatidylinositol transfer family protein
572541723-572543895	TraesCS4A01G259600	Sec14p-like phosphatidylinositol transfer family protein

572549945-572551882	TraesCS4A01G259700	Sec14p-like phosphatidylinositol transfer family protein
572562465-572571488	TraesCS4A01G259800	Alanine--tRNA ligase
572641045-572642412	TraesCS4A01G259900	Glycosyltransferase
572649414-572650088	TraesCS4A01G260000	Glucans biosynthesis glucosyltransferase H
572702108-572705852	TraesCS4A01G260100	BTB/POZ domain-containing protein
572830903-572834487	TraesCS4A01G260200	Carbohydrate kinase-like
572836118-572837902	TraesCS4A01G260300	Pentatricopeptide repeat-containing protein
572845556-572846014	TraesCS4A01G260400	Histone H2B
572881559-572882628	TraesCS4A01G260500	late embryogenesis abundant protein
573172063-573173700	TraesCS4A01G260600	GRAS transcription factor
573316263-573318272	TraesCS4A01G260700	tetratricopeptide repeat (TPR)-containing protein
573321338-573325678	TraesCS4A01G260800	Adenylyl cyclase-associated protein
573326180-573328349	TraesCS4A01G260900	Glucan endo-1,3-beta-glucosidase
573358608-573365399	TraesCS4A01G261000	ATP-dependent DNA helicase DDM1
573367445-573367663	TraesCS4A01G261100	Myosin-J heavy chain
573665312-573669541	TraesCS4A01G261200	Short-chain dehydrogenase/reductase family protein
573670487-573671688	TraesCS4A01G261300	Phox domain-containing protein, putative isoform 1

573672265-573673733	TraesCS4A01G261400	tRNA modification GTPase MnmE
573878926-573880014	TraesCS4A01G261500	Kinase, putative
573886653-573891925	TraesCS4A01G261600	SWI/SNF complex subunit SWI3D
574158150-574159454	TraesCS4A01G261700	Protein with RNI-like/FBD-like domain
574167455-574168856	TraesCS4A01G261800	Complement decay-accelerating factor transmembrane isoform
574195994-574198659	TraesCS4A01G261900	tRNA (Ile)-lysidine synthase
574382652-574383662	TraesCS4A01G262000	Hyccin protein
574389413-574392229	TraesCS4A01G262100	actin cross-linking protein, putative (DUF569)
574524909-574526893	TraesCS4A01G262200	vacuolar protein sorting-associated protein (DUF946)
574527501-574551311	TraesCS4A01G262300	Translational activator GCN1
574765952-574766490	TraesCS4A01G262400	Heat stress transcription factor A-3
574840594-574842011	TraesCS4A01G262500	MYB transcription factor
574868896-574872931	TraesCS4A01G262600	Glutamate decarboxylase
575006274-575010252	TraesCS4A01G262700	Peptide transporter
575011484-575013303	TraesCS4A01G262800	Kinase family protein
575027251-575031340	TraesCS4A01G262900	Phytochrome
575183261-575191036	TraesCS4A01G263000	Inactive peptidyl-prolyl cis-trans isomerase shutdown

575423699-575430254	TraesCS4A01G263100	Protein kinase, putative, expressed
575735462-575737805	TraesCS4A01G263200	Alpha/beta-Hydrolases superfamily protein
575776753-575781334	TraesCS4A01G263300	Transcription factor Inducer of CBF expression 1
575798573-575801177	TraesCS4A01G263400	Helicase, putative
575802011-575802988	TraesCS4A01G263500	Alpha/beta-Hydrolases superfamily protein
575808456-575809123	TraesCS4A01G263600	Cortical cell-delineating protein
576036387-576043513	TraesCS4A01G263700	transmembrane protein, putative (DUF594)
576050429-576054653	TraesCS4A01G263800	65-kDa microtubule-associated-like protein
576157311-576166116	TraesCS4A01G263900	Dihydroxyacetone kinase family protein
576563119-576569037	TraesCS4A01G264000	Cytochrome c oxidase assembly protein ctaG
576575755-576576465	TraesCS4A01G264100	Zinc finger homeodomain protein
576590321-576596961	TraesCS4A01G264200	Cytosolic Fe-S cluster assembly factor CFD1
576602661-576610351	TraesCS4A01G264300	Ankyrin repeat-containing protein, putative
576702012-576703590	TraesCS4A01G264400	Actin
576922793-576924952	TraesCS4A01G264500	UV-B-induced protein, chloroplastic
576930523-576931965	TraesCS4A01G264600	UDP-glucose 6-dehydrogenase
577042628-577044913	TraesCS4A01G264700	Pentatricopeptide repeat-containing protein

577048828-577056229	TraesCS4A01G264800	Histidine kinase
577109148-577110539	TraesCS4A01G264900	Cytochrome b561 family protein, expressed
577115564-577116547	TraesCS4A01G265000	Expansin-like protein
577227821-577230321	TraesCS4A01G265100	Receptor protein kinase, putative
577468716-577471694	TraesCS4A01G265200	PHD finger protein family
577489413-577499663	TraesCS4A01G265300	Vam6/Vps39-like protein
577542217-577547732	TraesCS4A01G265400	Protein POLLEN DEFECTIVE IN GUIDANCE 1
577727666-577732739	TraesCS4A01G265500	Squamous cell carcinoma antigen recognized by T-cells 3
577756937-577761081	TraesCS4A01G265600	GPN-loop GTPase-like protein
577806459-577806872	TraesCS4A01G265700	Type I inositol-1,4,5-trisphosphate 5-phosphatase CVP2-like protein
577976925-577981919	TraesCS4A01G265800	RNA-binding protein 34
578007015-578008028	TraesCS4A01G265900	Protein kinase
578175175-578176188	TraesCS4A01G266000	Protein kinase
578233584-578234588	TraesCS4A01G266100	Protein kinase
578382450-578383463	TraesCS4A01G266200	protein kinase family protein
578392878-578393918	TraesCS4A01G266300	Protein kinase
578533601-578539054	TraesCS4A01G266400	NADH-ubiquinone oxidoreductase subunit

578539799-578540488	TraesCS4A01G266500	NADH-ubiquinone oxidoreductase 75 kDa subunit, mitochondrial
578540922-578547040	TraesCS4A01G266600	Dynamin
578553411-578559697	TraesCS4A01G266700	Threonine dehydratase
578573271-578574941	TraesCS4A01G266800	Pentatricopeptide repeat-containing protein
579428268-579430952	TraesCS4A01G266900	Glutamine synthetase
579431789-579438751	TraesCS4A01G267000	Phosphoglucosamine mutase
579519072-579523895	TraesCS4A01G267100	IGR motif protein
579526333-579529059	TraesCS4A01G267200	ATP-dependent Clp protease ATP-binding subunit
579609654-579612522	TraesCS4A01G267300	Receptor-like kinase
579848008-579850633	TraesCS4A01G267400	DNA (Cytosine-5-)-methyltransferase
579853617-579857109	TraesCS4A01G267500	Ubiquitin-conjugating enzyme, E2
579860024-579863556	TraesCS4A01G267600	Zinc finger protein VAR3, chloroplastic
579864436-579866269	TraesCS4A01G267700	Zinc-finger domain of monoamine-oxidase A repressor R1, putative
580288521-580301691	TraesCS4A01G267800	Kinase, putative
580302974-580304107	TraesCS4A01G267900	DNA-directed RNA polymerase subunit
580477666-580478491	TraesCS4A01G268000	Histone H1, putative
580485261-580490042	TraesCS4A01G268100	Coatomer subunit alpha

580654977-580661304	TraesCS4A01G268200	Protein kinase
580707381-580729754	TraesCS4A01G268300	Phosphatidylinositol 4-kinase
580730452-580731116	TraesCS4A01G268400	V-type proton ATPase subunit D
580734487-580735937	TraesCS4A01G268500	CONSTANS-like zinc finger protein
580895092-580903002	TraesCS4A01G268600	Protein CASP
580906525-580908057	TraesCS4A01G268700	14-3-3 protein
581142969-581144505	TraesCS4A01G268800	Accelerated cell death 11
581148192-581149603	TraesCS4A01G268900	AT-rich interactive domain protein
581150955-581151197	TraesCS4A01G269000	Acetyl-coenzyme A carboxylase carboxyl transferase subunit alpha
581191895-581195807	TraesCS4A01G269100	Protein kinase-like protein
581196871-581204088	TraesCS4A01G269200	Homologous-pairing protein 2-like protein
581200222-581201286	TraesCS4A01G269300	Regulator of Vps4 activity in the MVB pathway protein, putative
581270007-581270784	TraesCS4A01G269400	Basic blue protein
581274002-581275039	TraesCS4A01G269500	Basic blue protein
581278184-581279746	TraesCS4A01G269600	Microsomal glutathione S-transferase 3
581324889-581326814	TraesCS4A01G269700	Microsomal glutathione S-transferase 3
581329766-581330881	TraesCS4A01G269800	Microsomal glutathione S-transferase 3

581331452-581336479	TraesCS4A01G269900	Zinc finger protein VAR3, chloroplastic
581455498-581456574	TraesCS4A01G270000	DNA-binding storekeeper protein-related transcriptional regulator
581467493-581471226	TraesCS4A01G270100	Myosin-binding protein 2
581481563-581483746	TraesCS4A01G270200	ATP-dependent RNA helicase
581493890-581494297	TraesCS4A01G270300	60S ribosomal protein L5
581749794-581750715	TraesCS4A01G270400	Peptidylprolyl isomerase
581751238-581754972	TraesCS4A01G270500	3-oxo-5-alpha-steroid 4-dehydrogenase
581759713-581760915	TraesCS4A01G270600	F-box family protein
581867995-581871066	TraesCS4A01G270700	Phytanoyl-CoA dioxygenase family protein
581916832-581917610	TraesCS4A01G270800	Phospholipase A2
581934950-581944657	TraesCS4A01G270900	Glutamyl-tRNA(Gln) amidotransferase subunit A
582477716-582479578	TraesCS4A01G271000	GAI-like protein 1
582507114-582510391	TraesCS4A01G271100	Drug/metabolite transporter
582524342-582534665	TraesCS4A01G271200	Transmembrane fragile-X-F-associated protein
582839931-582840989	TraesCS4A01G271300	Transcription factor TEOSINTE BRANCHED 1
583150186-583155216	TraesCS4A01G271400	RuvB-like helicase
583162282-583163565	TraesCS4A01G271500	Fantastic four-like protein

583419318-583422909		TraesCS4A01G271600	Phosphatidylinositol-4-phosphate 5-kinase, putative
583525525-583534431		TraesCS4A01G271700	Oxysterol-binding protein, putative
583702432-583707366		TraesCS4A01G271800	Kinase family protein
583707903-583717668		TraesCS4A01G271900	Histone-lysine N-methyltransferase
583754800-583757140	C8	TraesCS4A01G272000	Plastid-lipid associated protein PAP / fibrillin family protein
583756221-583756371	<i>BE403251</i>		
583757696-583759270		TraesCS4A01G272100	30S ribosomal protein S13, putative, expressed
583760272-583763441		TraesCS4A01G272200	SNARE associated Golgi protein family
583867353-583867884		TraesCS4A01G272300	BnaA04g06320D protein
583869145-583869366		TraesCS4A01G272400	50S ribosomal protein L33
583899849-583905113		TraesCS4A01G272500	Protein kinase
583906671-583910180		TraesCS4A01G272600	Mitogen-activated protein kinase kinase kinase 1
583914291-583915891		TraesCS4A01G272700	Zinc finger family protein
583936151-583946383		TraesCS4A01G272800	Beta-glucosidase
583949402-583953409	C9	TraesCS4A01G272900	Beta-glucosidase
583949552-583949670	<i>BE403721</i>		
583959345-583960583		TraesCS4A01G273000	Ubiquitin-conjugating enzyme E2 B

583969485-583970798	TraesCS4A01G273100	Eukaryotic peptide chain release factor subunit 1-1
583975054-583980304	TraesCS4A01G273200	Nucleotide-sugar transporter family protein
584040603-584042579	TraesCS4A01G273300	Leucine-rich repeat receptor-like protein kinase family protein
584046355-584046963	TraesCS4A01G273400	S-adenosylmethionine decarboxylase proenzyme
584055111-584056903	TraesCS4A01G273500	Glycosyltransferase
584062945-584068329	TraesCS4A01G273600	Protein-protein interaction regulator
584071841-584072942	TraesCS4A01G273700	Cysteine protease, putative
584108425-584112758	TraesCS4A01G273800	Cysteine protease, putative
584111584-584111871	TraesCS4A01G273900	Cysteine protease, putative
584114748-584115922	TraesCS4A01G274000	Cysteine protease, putative
584117906-584119065	TraesCS4A01G274100	Cysteine protease, putative
584119978-584125481	TraesCS4A01G274200	Phosphatidylinositol-4-phosphate 5-kinase family protein
584272892-584276246	TraesCS4A01G274300	Ethylene receptor
584308413-584308760	TraesCS4A01G274400	transmembrane protein, putative (DUF247)
584308844-584313947	TraesCS4A01G274500	transmembrane protein, putative (DUF247)
584346191-584346772	TraesCS4A01G274600	DUF1764 domain-containing protein
584349415-584352161	TraesCS4A01G274700	RING finger protein

584382161-584387379	TraesCS4A01G274800	Retrotransposon protein, putative, unclassified
584388183-584389166	TraesCS4A01G274900	Elongation of very long chain fatty acids protein 3
584517620-584517790	TraesCS4A01G275000	RING/U-box superfamily protein
584520126-584522528	TraesCS4A01G275100	Pentatricopeptide repeat-containing protein
584523426-584525657	TraesCS4A01G275200	spindle pole body-associated protein
584532753-584535075	TraesCS4A01G275300	Haloacid dehalogenase-like hydrolase
584537677-584539036	TraesCS4A01G275400	Pre-mRNA-splicing factor 18
584543987-584553685	TraesCS4A01G275500	Importin-5
584663429-584669278	TraesCS4A01G275600	Divalent metal cation transporter MntH 2
584672019-584675743	TraesCS4A01G275700	F-box protein
584679839-584680678	TraesCS4A01G275800	Lipoxygenase
584694417-584699590	TraesCS4A01G275900	Lipoxygenase
584735545-584738842	TraesCS4A01G276000	Lipoxygenase
584783153-584785124	TraesCS4A01G276100	Laccase
584797507-584800051	TraesCS4A01G276200	N-acetyltransferase, putative
584810980-584813007	TraesCS4A01G276300	Adenylosuccinate synthetase
584817688-584823187	C10 TraesCS4A01G276400	Pescadillo homolog

584818692-584818992	<i>AX86179210</i>		
584882453-584885501		TraesCS4A01G276500	WD-repeat protein, putative
584931338-584934198		TraesCS4A01G276600	Alkaline ceramidase 3
584936954-584939511		TraesCS4A01G276700	Zinc finger CCCH domain-containing protein
584969965-584973282		TraesCS4A01G276800	Protein yippee-like
585027950-585033320		TraesCS4A01G276900	polyketide cyclase/dehydrase/lipid transport superfamily protein
585054611-585060791		TraesCS4A01G277000	Antimicrobial peptide MBP-1
585094397-585099779		TraesCS4A01G277100	Protein kinase superfamily protein
585209875-585211659		TraesCS4A01G277200	Cytokinin riboside 5'-monophosphate phosphoribohydrolase
585376976-585379886		TraesCS4A01G277300	Nuclear transcription factor Y subunit
585395987-585396268		TraesCS4A01G277400	Ran-binding protein 3
585396723-585400936		TraesCS4A01G277500	Late embryogenesis abundant hydroxyproline-rich glycoprotein
585432085-585444318		TraesCS4A01G277600	Chloride channel protein
585456231-585458315		TraesCS4A01G277700	Proteasome subunit beta type
585459229-585463234		TraesCS4A01G277800	Myelin-associated oligodendrocyte basic protein isoform 1
585539981-585541802		TraesCS4A01G277900	Cytochrome P450 family protein, expressed
585556795-585557127		TraesCS4A01G278000	RING/U-box superfamily protein

585646903-585647766	TraesCS4A01G278100	Leucine-rich repeat receptor-like protein kinase
585679342-585679971	TraesCS4A01G278200	Retrovirus-related Pol polyprotein from transposon 297 family
585687148-585693746	TraesCS4A01G278300	Ankyrin repeat family protein
586085800-586087244	TraesCS4A01G278400	Gag-pol polyprotein
586431958-586436984	TraesCS4A01G278500	Lysine--tRNA ligase
586437450-586437794	TraesCS4A01G278600	50S ribosomal protein L18
586439529-586442039	TraesCS4A01G278700	30S ribosomal protein S21
586449768-586452785	TraesCS4A01G278800	Nucleobase ascorbate transporter
586501219-586501902	TraesCS4A01G278900	Germin-like protein 1-1
586674210-586678377	TraesCS4A01G279000	Ankyrin-repeat containing protein, putative
586682057-586682725	TraesCS4A01G279100	Germin-like protein 1-1
586699223-586699897	TraesCS4A01G279200	Germin-like protein 1
586708732-586709403	TraesCS4A01G279300	Germin-like protein
586726830-586728762	TraesCS4A01G279400	Glycosyltransferase
586731120-586731695	TraesCS4A01G279500	DUF538 family protein, putative (Protein of unknown function, DUF538)
586732683-586737962	TraesCS4A01G279600	tRNA (Ile)-lysidine synthase
586857087-586858056	TraesCS4A01G279700	DEAD box RNA helicase family protein

587327316-587331588	TraesCS4A01G279800	Protein ENHANCED DISEASE RESISTANCE 2
587724356-587724601	TraesCS4A01G279900	Cytochrome bc1 complex cytochrome b subunit
588584846-588586918	TraesCS4A01G280000	Glycine-rich family protein
588633613-588643252	TraesCS4A01G280100	Heat stress transcription factor A-9
588658822-588659109	TraesCS4A01G280200	B3 domain-containing protein family
588744270-588744707	TraesCS4A01G280300	Neurogenic differentiation factor 1
588931457-588932492	TraesCS4A01G280400	Phenylalanine--tRNA ligase alpha subunit
588939567-588940103	TraesCS4A01G280500	DUF538 family protein, putative (Protein of unknown function, DUF538)
589011555-589015342	TraesCS4A01G280600	DUF538 family protein, putative (Protein of unknown function, DUF538)
589085090-589089709	TraesCS4A01G280700	Beta-1,3-galactosyltransferase-like protein
589108224-589111769	TraesCS4A01G280800	Protein UPSTREAM OF FLC
589321088-589321744	TraesCS4A01G280900	Disease resistance protein RPM1
589472934-589473664	TraesCS4A01G281000	Clavata3/ESR (CLE) gene family member
589486132-589487151	TraesCS4A01G281100	F-box family protein
589494063-589497494	TraesCS4A01G281200	Phosphatidylinositol N-acetylglucosaminyltransferase subunit P-like protein
589499333-589501718	TraesCS4A01G281300	Core-2/I-branching beta-1,6-N-acetylglucosaminyltransferase family protein
589503363-589507880	TraesCS4A01G281400	Hedgehog-interacting-like protein

589586237-589592352	TraesCS4A01G281500	Nuclease domain-containing protein 1
589600379-589601125	TraesCS4A01G281600	Octicosapeptide/Phox/Bem1p domain-containing family protein
589602948-589607173	TraesCS4A01G281700	BHLH family protein, putative, expressed
589661425-589662527	TraesCS4A01G281800	Thioesterase family protein
589777427-589780505	TraesCS4A01G281900	Receptor kinase
589787393-589791663	TraesCS4A01G282000	Serine/threonine-protein kinase
589812884-589814112	TraesCS4A01G282100	Thioesterase family protein
589835032-589836210	TraesCS4A01G282200	Thioesterase family protein
589842588-589846517	TraesCS4A01G282300	Serine/threonine-protein kinase
589878969-589879889	TraesCS4A01G282400	RNA-binding family protein isoform 1
590088220-590091470	TraesCS4A01G282500	TBC1 domain family member
590092917-590098247	TraesCS4A01G282600	FBD-associated F-box protein
590103056-590105464	TraesCS4A01G282700	Costars family protein
590107460-590112275	TraesCS4A01G282800	Tetratricopeptide repeat protein 38
590112905-590117974	TraesCS4A01G282900	Plasma membrane ATPase
590123388-590126855	TraesCS4A01G283000	B3 domain-containing protein
590180868-590186819	TraesCS4A01G283100	Plasma membrane ATPase

590204451-590236014	TraesCS4A01G283200	Inositol hexakisphosphate and diphosphoinositol-pentakisphosphate kinase
590265720-590267385	TraesCS4A01G283300	Mediator complex, subunit Med7
590277427-590280648	TraesCS4A01G283400	Calcium-dependent protein kinase
590498160-590502931	TraesCS4A01G283500	Glycine-rich family protein
590586089-590588803	TraesCS4A01G283600	Leucine-rich repeat protein kinase family protein
590590295-590593639	TraesCS4A01G283700	Hexosyltransferase
590625494-590626216	TraesCS4A01G283800	60S ribosomal protein L35a-like protein
590656013-590660306	TraesCS4A01G283900	NRT1/PTR family protein 2.2
590661142-590667513	TraesCS4A01G284000	5'-AMP-activated protein kinase subunit beta-2
590900054-590900341	TraesCS4A01G284100	NADH-ubiquinone oxidoreductase subunit
590901321-590912748	TraesCS4A01G284200	Calcineurin-binding protein cabin-1
590935529-590935893	TraesCS4A01G284300	Protein NRT1/ PTR FAMILY 5.1
590942611-590945363	TraesCS4A01G284400	GMP synthase [glutamine-hydrolyzing]
590987939-590989668	TraesCS4A01G284500	rRNA methyltransferase
590993812-590999321	TraesCS4A01G284600	Tesmin/TSO1-like CXC domain-containing protein
591070502-591074036	TraesCS4A01G284700	WAT1-related protein
591283782-591284566	TraesCS4A01G284800	Pollen allergen

591293757-591294554	TraesCS4A01G284900	Pollen allergen Phl p 5
591347606-591348302	TraesCS4A01G285000	Pollen allergen Phl p 5
591505601-591506486	TraesCS4A01G285100	Transcription elongation factor 1
591508137-591509534	TraesCS4A01G285200	Agmatine coumaroyltransferase-2
591522546-591523056	TraesCS4A01G285300	C2 calcium/lipid-binding and GRAM domain containing protein
591558800-591559460	TraesCS4A01G285400	Protein FAR1-RELATED SEQUENCE 5
591674857-591675826	TraesCS4A01G285500	Pollen allergen Phl p 5
591691741-591693220	TraesCS4A01G285600	zinc finger MYM-type-like protein
591696343-591699344	TraesCS4A01G285700	GDSL esterase/lipase
591700622-591709892	TraesCS4A01G285800	E3 ubiquitin-protein ligase
591711407-591715393	TraesCS4A01G285900	GATA transcription factor
591845836-591851939	TraesCS4A01G286000	ARM repeat superfamily protein
591854869-591856904	TraesCS4A01G286100	RecQ-mediated genome instability protein 2
591861715-591862961	TraesCS4A01G286200	Aquaporin
591864044-591866358	TraesCS4A01G286300	RecQ-mediated genome instability protein 2
591868807-591873831	TraesCS4A01G286400	Magnesium transporter MRS2-like protein
591874904-591877475	TraesCS4A01G286500	Exostosin-2

591877897-591880030	TraesCS4A01G286600	Integral membrane HPP family protein
591919611-591921968	TraesCS4A01G286700	Ferredoxin family protein, expressed
592308951-592309850	TraesCS4A01G286800	Pollen allergen Phl p 5
592334826-592335807	TraesCS4A01G286900	Pollen allergen Phl p 5
592361121-592362093	TraesCS4A01G287000	Pollen allergen Phl p 5
592486684-592491531	TraesCS4A01G287100	Hippocampus abundant transcript-like protein 1
592521252-592521762	TraesCS4A01G287200	C2 calcium/lipid-binding and GRAM domain containing protein
592543631-592547201	TraesCS4A01G287300	Peptide transporter
592762587-592763248	TraesCS4A01G287400	Protein FAR1-RELATED SEQUENCE 5
592820500-592821897	TraesCS4A01G287500	Agmatine coumaroyltransferase-2
592926089-592927358	TraesCS4A01G287600	Pollen allergen Phl p 5
593100272-593100766	TraesCS4A01G287700	Agmatine coumaroyltransferase-2
593105774-593106658	TraesCS4A01G287800	Transcription elongation factor 1
593113190-593115887	TraesCS4A01G287900	Peptide transporter
593194498-593201017	TraesCS4A01G288000	Argonaute protein
593204562-593205374	TraesCS4A01G288100	DUF674 family protein
593208070-593208944	TraesCS4A01G288200	DUF674 family protein

593278588-593284719	TraesCS4A01G288300	Argonaute family protein
593288154-593290058	TraesCS4A01G288400	Nodulin-like / Major Facilitator Superfamily protein
593333205-593337537	TraesCS4A01G288500	RNA-binding protein
593349509-593353817	TraesCS4A01G288600	WD40 repeat-like protein
593354895-593357505	TraesCS4A01G288700	Beta-xylosidase, putative
593376570-593380773	TraesCS4A01G288800	Ubiquitin-conjugating enzyme E2
593495080-593495886	TraesCS4A01G288900	rRNA N-glycosidase
593683757-593684092	TraesCS4A01G289000	Acetyl-coenzyme A carboxylase carboxyl transferase subunit beta
593732899-593733846	TraesCS4A01G289100	F-box domain containing protein
593735559-593753492	TraesCS4A01G289200	Golgi-body localization protein domain isoform 1
593761646-593766038	TraesCS4A01G289300	Serine/arginine rich splicing factor, putative
593915422-593918768	TraesCS4A01G289400	Homeobox protein BEL1 like
594002643-594004359	TraesCS4A01G289500	BEL1-like homeodomain protein
594005332-594010128	TraesCS4A01G289600	Ankyrin repeat family protein
594028246-594033990	TraesCS4A01G289700	Ankyrin repeat family protein
594039386-594040785	TraesCS4A01G289800	Leucine-rich repeat-containing protein 40
594129754-594138636	TraesCS4A01G289900	Ankyrin repeat protein-like

594140562-594147562		TraesCS4A01G290000	Ankyrin repeat family protein
594150389-594160413		TraesCS4A01G290100	Ankyrin repeat protein-like
594162606-594167272	C11	TraesCS4A01G290200	Ankyrin repeat protein-like
594165370-594165403	<i>BE406959</i>		
594180504-594186598		TraesCS4A01G290300	Ankyrin repeat family protein
594212051-594212608	<i>BE591356</i>		
594213511-594217122	C12	TraesCS4A01G290400	Phosphomethylpyrimidine synthase
594269604-594270674		TraesCS4A01G290500	Hexosyltransferase
594283074-594284324		TraesCS4A01G290600	E3 ubiquitin-protein ligase
594350894-594351879		TraesCS4A01G290700	AGAMOUS-like MADS-box transcription factor
594364173-594364763		TraesCS4A01G290800	VQ motif-containing protein
594367077-594367568		TraesCS4A01G290900	Glycine-rich protein
594378156-594378956		TraesCS4A01G291000	Thymocyte nuclear protein 1
594392621-594393043		TraesCS4A01G291100	myosin XI D
594427650-594428144		TraesCS4A01G291200	BZIP transcription factor
594441999-594443029		TraesCS4A01G291300	Neuropeptide Y receptor type 1
594460318-594460773		TraesCS4A01G291400	Fasciclin-like arabinogalactan protein 16

594533060-594535487	TraesCS4A01G291500	Growth-regulating factor
594663909-594668712	TraesCS4A01G291600	DUF21 domain-containing protein
594680010-594686220	TraesCS4A01G291700	ERD (Early-responsive to dehydration stress) family protein
594700662-594700862	TraesCS4A01G291800	double-stranded-RNA-binding protein 4
594706438-594711422	TraesCS4A01G291900	homeobox-1
594730519-594732003	TraesCS4A01G292000	Homeobox transcription factor KN2
594737676-594742642	TraesCS4A01G292100	homeobox-1
595046191-595056136	TraesCS4A01G292200	Homeobox protein knotted-1-like 1
595192015-595194917	TraesCS4A01G292300	Endo-1,4-beta-xylanase, putative, expressed
595216786-595217267	TraesCS4A01G292400	Epidermal patterning factor-like protein
595255785-595257327	TraesCS4A01G292500	Chalcone synthase
595262203-595264949	TraesCS4A01G292600	Transmembrane protein, putative
595282332-595284053	TraesCS4A01G292700	basic helix-loop-helix (bHLH) DNA-binding superfamily protein
595294357-595296747	TraesCS4A01G292800	basic helix-loop-helix (bHLH) DNA-binding superfamily protein
595329657-595352176	TraesCS4A01G292900	ADP-ribosylation factor
595359708-595360304	TraesCS4A01G293000	RNA-binding protein
595374853-595376903	TraesCS4A01G293100	NADH-ubiquinone oxidoreductase chain 5

595382839-595387139	TraesCS4A01G293200	Pentatricopeptide repeat-containing protein
595388538-595396020	TraesCS4A01G293300	Tryptophan--tRNA ligase
595391148-595393497	TraesCS4A01G293400	Hsp70-Hsp90 organizing protein 1
595417616-595419298	TraesCS4A01G293500	Glucan endo-1,3-beta-glucosidase
595422877-595424025	TraesCS4A01G293600	Ubiquitin carboxyl-terminal hydrolase-like protein
595442919-595443945	TraesCS4A01G293700	SBP (S-ribonuclease-binding protein) family protein, putative
595545817-595549141	TraesCS4A01G293800	Acidic leucine-rich nuclear phosphoprotein 32-related protein
595549815-595550617	TraesCS4A01G293900	Deoxyuridine 5'-triphosphate nucleotidohydrolase
595552210-595557131	TraesCS4A01G294000	Guanine nucleotide-binding protein subunit beta
595563706-595571876	TraesCS4A01G294100	Aminopeptidase
595655367-595659110	TraesCS4A01G294200	Zinc transporter
595661422-595663903	TraesCS4A01G294300	Zinc transporter
595817811-595821043	TraesCS4A01G294400	Regulatory protein NPR1
595844117-595846462	TraesCS4A01G294500	Transmembrane protein 56
595847372-595852760	TraesCS4A01G294600	Ras family protein
595873167-595876206	TraesCS4A01G294700	Trihelix transcription factor GT-4-like protein
595978865-595983627	TraesCS4A01G294800	Pleckstrin-like (PH) domain protein

595984431-595989792	TraesCS4A01G294900	Guanine nucleotide exchange family protein
595994746-595997670	TraesCS4A01G295000	Kinesin-like protein
596002078-596002431	TraesCS4A01G295100	DUF1677 family protein
596075859-596076185	TraesCS4A01G295200	UvrABC system protein C
596159177-596161899	TraesCS4A01G295300	senescence-associated family protein, putative (DUF581)
596165884-596166559	TraesCS4A01G295400	Acetyltransferase, GNAT family protein, expressed
596166617-596167246	TraesCS4A01G295500	Acetyltransferase, GNAT family protein, expressed
596214978-596215939	TraesCS4A01G295600	Lipid transfer protein
596221994-596223703	TraesCS4A01G295700	PHP
596238333-596239331	TraesCS4A01G295800	Lipid transfer protein
596297994-596300601	TraesCS4A01G295900	Nuclear transport factor 2 (NTF2) family protein with RNA binding (RRM-RBD-RNP motifs) domain-containing protein
596304904-596307334	TraesCS4A01G296000	Globulin 1
596446060-596448236	TraesCS4A01G296100	Globulin 1
596504054-596509118	TraesCS4A01G296200	Type I inositol-1,4,5-trisphosphate 5-phosphatase CVP2
596523171-596523860	TraesCS4A01G296300	Thaumatococcus-like protein
596537351-596537656	TraesCS4A01G296400	Thaumatococcus-like protein

596570488-596571926	TraesCS4A01G296500	Ethylene-responsive nuclear / ethylene-regulated nuclear protein (ERT2)-like protein
596624604-596628189	TraesCS4A01G296600	Tubulin beta chain
596672137-596673917	TraesCS4A01G296700	E3 ubiquitin-protein ligase
596680691-596680954	TraesCS4A01G296800	SAUR-like auxin-responsive protein family
596688333-596688617	TraesCS4A01G296900	SAUR-like auxin-responsive protein family
596713062-596713349	TraesCS4A01G297000	SAUR-like auxin-responsive protein family
596738067-596738378	TraesCS4A01G297100	SAUR-like auxin-responsive protein family
596743214-596743525	TraesCS4A01G297200	SAUR-like auxin-responsive protein family
596758261-596765940	TraesCS4A01G297300	S3 self-incompatibility locus-linked pollen protein
596767433-596769827	TraesCS4A01G297400	PH-response transcription factor pacC/RIM101 isoform 2
596770660-596773730	TraesCS4A01G297500	LOB domain protein
596789012-596792340	TraesCS4A01G297600	Pre-rRNA-processing protein TSR2
596817382-596821918	TraesCS4A01G297700	DWNN domain, a CCHC-type zinc finger
596825257-596827047	TraesCS4A01G297800	Lactoylglutathione lyase
596827940-596828380	TraesCS4A01G297900	Ferredoxin
596835928-596840310	TraesCS4A01G298000	TATA-box-binding protein

596920259-596923717		TraesCS4A01G298100	N utilization substance protein B-like protein
597013077-597015822		TraesCS4A01G298200	Glucan endo-1,3-beta-glucosidase, putative
597023208-597024827	C13	TraesCS4A01G298300	Non specific phospholipase C
597024543-597025097	<i>BE637642</i>		
597052406-597054154	C14	TraesCS4A01G298400	Cation calcium exchanger
597668209-597670977		TraesCS4A01G298500	Chaperone protein DnaJ
597671700-597672868		TraesCS4A01G298600	Heat shock family protein
597677918-597682345		TraesCS4A01G298700	5-methyltetrahydropteroyltriglutamate--homocysteine methyltransferase
597688356-597694717		TraesCS4A01G298800	Protein FAR1-RELATED SEQUENCE 5
597714516-597715616		TraesCS4A01G298900	Potassium channel
597724268-597725956		TraesCS4A01G299000	Ankyrin repeat-containing protein
597754246-597754554		TraesCS4A01G299100	Dehydrin family protein, expressed
597826624-597830284		TraesCS4A01G299200	HSP20-like chaperone superfamily protein
597833941-597837160		TraesCS4A01G299300	Membrin
597841374-597845533		TraesCS4A01G299400	Short-chain dehydrogenase/reductase family protein
597855871-597861216		TraesCS4A01G299500	Polyribonucleotide nucleotidyltransferase
597886889-597888409		TraesCS4A01G299600	Glycosyltransferase

597905256-597909732	TraesCS4A01G299700	Transmembrane protein
597912275-597916528	TraesCS4A01G299800	Cationic amino acid transporter, putative
597917105-597928087	TraesCS4A01G299900	Carboxypeptidase
597919165-597920004	TraesCS4A01G300000	nuclear pore anchor
597943888-597946110	TraesCS4A01G300100	Carboxypeptidase
597970675-597971288	TraesCS4A01G300200	Carboxypeptidase
598051227-598059177	TraesCS4A01G300300	CCR4-NOT transcription complex subunit 3
598146082-598149543	TraesCS4A01G300400	C2 calcium/lipid-binding and GRAM domain protein
598156692-598157063	TraesCS4A01G300500	calpain-type cysteine protease family
598236284-598237934	TraesCS4A01G300600	CsAtPR5
598240305-598241658	TraesCS4A01G300700	Phospholipase A1
598245669-598247060	TraesCS4A01G300800	Phospholipase A1
598294664-598296479	TraesCS4A01G300900	Phospholipase A1
598417709-598418041	TraesCS4A01G301000	Transducin/WD40 repeat-like superfamily protein
598435208-598437212	TraesCS4A01G301100	Phosphate transporter
598451057-598451640	TraesCS4A01G301200	Zinc finger protein 512B family
598453191-598455202	TraesCS4A01G301300	UDP-N-acetylmuramate--L-alanine ligase

598516610-598516873	TraesCS4A01G301400	syntaxin of plants 41
598583700-598584248	TraesCS4A01G301500	Formate-dependent phosphoribosylglycinamide formyltransferase
598590265-598592108	TraesCS4A01G301600	Methyltransferase
598601370-598603264	TraesCS4A01G301700	Xylose isomerase 1
598607823-598609741	TraesCS4A01G301800	kinase with adenine nucleotide alpha hydrolases-like domain-containing protein
598712564-598716142	TraesCS4A01G301900	Polyadenylation and cleavage factor
598719419-598726719	TraesCS4A01G302000	Protein kinase family protein
598730760-598732038	TraesCS4A01G302100	DUF868 family protein (DUF868)
598761093-598763505	TraesCS4A01G302200	Histidine-containing phosphotransfer protein
598778564-598781535	TraesCS4A01G302300	Histidine-containing phosphotransfer protein
598791728-598805534	TraesCS4A01G302400	Histidine-containing phosphotransfer protein
598807712-598810145	TraesCS4A01G302500	Histidine-containing phosphotransfer protein
598813075-598815848	TraesCS4A01G302600	Histidine-containing phosphotransfer protein
599082111-599084563	TraesCS4A01G302700	Histidine-containing phosphotransfer protein
599098473-599102373	TraesCS4A01G302800	Histidine-containing phosphotransfer protein
599123334-599125774	TraesCS4A01G302900	Histidine-containing phosphotransfer protein

599156292-599158592	TraesCS4A01G303000	Histidine-containing phosphotransfer protein
599219291-599223173	TraesCS4A01G303100	Histidine-containing phosphotransfer protein
599245371-599247813	TraesCS4A01G303200	Histidine-containing phosphotransfer protein
599318185-599321542	TraesCS4A01G303300	Monodehydroascorbate reductase
599321764-599326557	TraesCS4A01G303400	Aldo-keto reductase/ oxidoreductase
599348646-599351947	TraesCS4A01G303500	Histidine-containing phosphotransfer protein
599467504-599470183	TraesCS4A01G303600	GDSL esterase/lipase
599586672-599586953	TraesCS4A01G303700	50S ribosomal protein L23
599587932-599588347	TraesCS4A01G303800	UDP-N-acetylglucosamine 1-carboxyvinyltransferase
599611950-599613428	TraesCS4A01G303900	3-ketoacyl-CoA synthase
599620398-599621905	TraesCS4A01G304000	HXXXD-type acyl-transferase family protein, putative
599628039-599630576	TraesCS4A01G304100	Histidine-containing phosphotransfer protein
599643580-599646362	TraesCS4A01G304200	Histidine-containing phosphotransfer protein
599729672-599732995	TraesCS4A01G304300	GDSL esterase/lipase
599842221-599846313	TraesCS4A01G304400	Fatty acyl-CoA reductase
599887495-599892991	TraesCS4A01G304500	Protein HIRA
599893273-599897686	TraesCS4A01G304600	GDSL esterase/lipase

600387015-600387904		TraesCS4A01G304700	GDSL esterase/lipase
600465221-600466069		TraesCS4A01G304800	F-box domain containing protein
600515322-600517013		TraesCS4A01G304900	Gag polyprotein
600557899-600558255		TraesCS4A01G305000	acetyl Co-enzyme a carboxylase carboxyltransferase alpha subunit
600562291-600562677		TraesCS4A01G305100	PP2C protein (Clade A protein phosphatases type 2C)
600623641-600624018		TraesCS4A01G305200	Voltage-dependent calcium channel gamma-3 subunit
600898793-600901403		TraesCS4A01G305300	Ribosomal protein
600902966-600906006		TraesCS4A01G305400	R3h domain containing protein, putative
600912003-600913370		TraesCS4A01G305500	Leucine-rich repeat receptor-like protein kinase family protein
600913413-600914954	C1	TraesCS4A01G305600	Leucine-rich repeat receptor-like protein kinase family protein
600917368-600917668	<i>AX109895154</i>		
600918067-600918777	C2	TraesCS4A01G305700	Leucine-rich repeat receptor-like protein kinase family protein
600918976-600919929		TraesCS4A01G305800	Leucine-rich repeat receptor-like protein kinase family protein
600973780-600976674		TraesCS4A01G305900	Leucine-rich repeat receptor-like protein kinase family protein
601006374-601007264		TraesCS4A01G306000	Leucine-rich repeat receptor-like protein kinase family protein
601015641-601018036		TraesCS4A01G306100	Leucine-rich repeat receptor-like protein kinase family protein
601032932-601035720		TraesCS4A01G306200	Leucine-rich repeat receptor-like protein kinase family protein

601039945-601041268	TraesCS4A01G306300	Sulfate adenylyltransferase subunit 2
601042166-601044648	TraesCS4A01G306400	Nuclear transcription factor Y subunit B
601059795-601062569	TraesCS4A01G306500	Ubiquitin
601156437-601157280	TraesCS4A01G306600	Germin-like protein
601170067-601170582	TraesCS4A01G306700	Germin-like protein
601178223-601178885	TraesCS4A01G306800	Germin-like protein
601180599-601181212	TraesCS4A01G306900	Germin-like protein
601194129-601194761	TraesCS4A01G307000	Germin-like protein
601196302-601197426	TraesCS4A01G307100	40S ribosomal protein S25, putative
601243050-601248526	TraesCS4A01G307200	Hexosyltransferase
601276423-601279582	TraesCS4A01G307300	Copper ion-binding protein
601283765-601284744	TraesCS4A01G307400	Dirigent protein
601309805-601313807	TraesCS4A01G307500	Receptor protein kinase, putative
601337777-601338814	TraesCS4A01G307600	Cytochrome P450 family protein, expressed
601338817-601339314	TraesCS4A01G307700	Cytochrome P450 family protein, expressed
601356729-601357874	TraesCS4A01G307800	Haloacid dehalogenase-like hydrolase superfamily protein
601364149-601367728	TraesCS4A01G307900	Beta-amylase

601691310-601691909	TraesCS4A01G308000	DNA-directed RNA polymerase subunit
601721962-601724493	TraesCS4A01G308100	Queuine tRNA-ribosyltransferase
602053534-602061759	TraesCS4A01G308200	ABC transporter G family member
602106173-602113523	TraesCS4A01G308300	NBS-LRR disease resistance protein-like protein
602114965-602118639	TraesCS4A01G308400	Sn1-specific diacylglycerol lipase alpha
602131245-602131586	TraesCS4A01G308500	Endosperm transfer cell specific PR9
602248955-602250749	TraesCS4A01G308600	Cytochrome P450 family protein, expressed
602260036-602261169	TraesCS4A01G308700	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase superfamily protein
602269708-602272129	TraesCS4A01G308800	Cytochrome P450
602272639-602274102	TraesCS4A01G308900	Glycosyltransferase
602306511-602307929	TraesCS4A01G309000	Glycosyltransferase
602379677-602381627	TraesCS4A01G309100	F-box family protein
602621396-602653205	TraesCS4A01G309200	receptor kinase 1
602797611-602798738	TraesCS4A01G309300	Cysteine protease-like protein
602863275-602864408	TraesCS4A01G309400	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase superfamily protein
602870810-602873131	TraesCS4A01G309500	NBS-LRR-like resistance protein
602873144-602875409	TraesCS4A01G309600	NBS-LRR-like resistance protein

602898874-602900427	TraesCS4A01G309700	Disease resistance protein RGA2
602951973-602952419	TraesCS4A01G309800	nucleolar-like protein
603030535-603031895	TraesCS4A01G309900	Wall-associated receptor kinase 2
603031991-603032776	TraesCS4A01G310000	Receptor-like protein kinase
603034418-603038171	TraesCS4A01G310100	Receptor-like protein kinase
603043878-603048236	TraesCS4A01G310200	Disease resistance protein (NBS-LRR class) family
603124352-603125053	TraesCS4A01G310300	Ta11-like non-LTR retrotransposon
603281751-603283618	TraesCS4A01G310400	ACT domain-containing protein
603340065-603340286	TraesCS4A01G310500	Powder tolerance-related protein
603372855-603375220	TraesCS4A01G310600	PsbP-like protein 1
603377077-603380232	TraesCS4A01G310700	C2H2-like zinc finger protein, putative
603382876-603384074	TraesCS4A01G310800	Protein kinase, putative
603389076-603390446	TraesCS4A01G310900	F-box family protein
603405890-603409736	TraesCS4A01G311000	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase superfamily protein
603446017-603450038	TraesCS4A01G311100	Poly(A) RNA polymerase GLD2-A
603451508-603455462	TraesCS4A01G311200	RING/U-box superfamily protein
603458896-603462620	TraesCS4A01G311300	Phosphate transporter

603464816-603468137	TraesCS4A01G311400	Short-chain dehydrogenase/reductase family protein
603469204-603469938	TraesCS4A01G311500	F-box family protein
603481988-603482257	TraesCS4A01G311600	Histone H2B
603487771-603490362	TraesCS4A01G311700	ACT domain-containing protein
603497203-603499122	TraesCS4A01G311800	Protein UPSTREAM OF FLC
603504251-603504949	TraesCS4A01G311900	Antimicrobial peptide MBP-1 related (LEM1)
603506946-603507572	TraesCS4A01G312000	TRAF-like superfamily protein
603511086-603513774	TraesCS4A01G312100	Hydroxyproline-rich glycoprotein family protein
603531246-603533012	TraesCS4A01G312200	mesoderm induction early response protein
603533796-603535084	TraesCS4A01G312300	Calcium-dependent lipid-binding domain protein
603539694-603540551	TraesCS4A01G312400	AT hook motif DNA-binding family protein
603634761-603635540	TraesCS4A01G312500	LOB domain-containing protein, putative
603637548-603638907	TraesCS4A01G312600	Peptidyl-prolyl cis-trans isomerase
603666136-603667011	TraesCS4A01G312700	Aquaporin-like protein
603674525-603681868	TraesCS4A01G312800	Disease resistance protein (NBS-LRR class) family
603698121-603703864	TraesCS4A01G312900	Disease resistance protein (NBS-LRR class) family
603705420-603706858	TraesCS4A01G313000	Retrovirus-related Pol polyprotein from transposon TNT 1-94

603726600-603729539	TraesCS4A01G313100	Leucine-rich repeat receptor-like protein kinase family protein
603980200-603981915	TraesCS4A01G313200	Flavin-containing monooxygenase
604055487-604056041	TraesCS4A01G313300	AWPM-19-like membrane family protein
604068519-604069061	TraesCS4A01G313400	AWPM-19-like membrane family protein
604076529-604093392	TraesCS4A01G313500	Myosin
604101314-604103592	TraesCS4A01G313600	Ubiquitin-conjugating enzyme E2
604104116-604105207	TraesCS4A01G313700	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase superfamily protein, putative
604107899-604111305	TraesCS4A01G313800	B3 domain-containing protein
604208547-604211960	TraesCS4A01G313900	Receptor-like protein kinase
604594773-604595687	TraesCS4A01G314000	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase superfamily protein
604659700-604661064	TraesCS4A01G314100	Anthocyanin 5-aromatic acyltransferase
604672359-604672679	TraesCS4A01G314200	Receptor-like kinase
604772917-604775106	TraesCS4A01G314300	Disease resistance protein RPM1
604847255-604850213	TraesCS4A01G314400	Disease resistance protein RPM1
604856722-604857722	TraesCS4A01G314500	Ethylene-responsive transcription factor
604940612-604941666	TraesCS4A01G314600	Ethylene-responsive transcription factor

605011157-605019060	TraesCS4A01G314700	BTB/POZ/MATH-domain protein
605024348-605027787	TraesCS4A01G314800	transcription factor, putative (Protein of unknown function, DUF547)
605085385-605087313	TraesCS4A01G314900	Sugar transporter, putative
605135482-605137364	TraesCS4A01G315000	Serine/threonine-protein phosphatase
605559706-605576513	TraesCS4A01G315100	Protein kinase
605640606-605646822	TraesCS4A01G315200	OTU domain-containing protein
605644790-605646059	TraesCS4A01G315300	Trihelix transcription factor
605650689-605651247	TraesCS4A01G315400	Early nodulin-like protein
605656378-605659792	TraesCS4A01G315500	60 kDa chaperonin
605663621-605667985	TraesCS4A01G315600	Mediator of RNA polymerase II transcription subunit 15a
605711438-605714093	TraesCS4A01G315700	RNA polymerase sigma factor
605717729-605733179	TraesCS4A01G315800	Mediator of RNA polymerase II transcription subunit 13
605744972-605749290	TraesCS4A01G315900	ABC transporter G family member
606116328-606116585	TraesCS4A01G316000	Cytoplasmic polyadenylation element-binding protein 4
606339516-606340395	TraesCS4A01G316100	F-box family protein
606344404-606347550	TraesCS4A01G316200	Heavy metal-associated protein
606361307-606365891	TraesCS4A01G316300	La-related protein

606370348-606374153	TraesCS4A01G316400	GDSL esterase/lipase
606397501-606401304	TraesCS4A01G316500	GDSL esterase/lipase
606411251-606412810	TraesCS4A01G316600	Protein DETOXIFICATION
606523492-606525117	TraesCS4A01G316700	Avr9/Cf-9 rapidly elicited protein
606536601-606541208	TraesCS4A01G316800	WD40 repeat-containing protein
606586469-606587515	TraesCS4A01G316900	phosphotransferases/inositol or phosphatidylinositol kinase
606591102-606591425	TraesCS4A01G317000	Bifunctional inhibitor/lipid-transfer protein/seed storage 2S albumin-like protein
606593204-606593985	TraesCS4A01G317100	DNA translocase FtsK
606608746-606609752	TraesCS4A01G317200	Harpin-induced protein 1 (Hin1), putative
606644043-606645527	TraesCS4A01G317300	Galactose-6-phosphate isomerase subunit LacB
606647800-606648237	TraesCS4A01G317400	Mannonate dehydratase
606761195-606779668	TraesCS4A01G317500	Kinase family protein
606796975-606806270	TraesCS4A01G317600	Kinase family protein
606811790-606812212	TraesCS4A01G317700	Oxidoreductase/transition metal ion-binding protein
607045527-607055050	TraesCS4A01G317800	Exportin-1
607177428-607178300	TraesCS4A01G317900	Cytokinin riboside 5'-monophosphate phosphoribohydrolase

607178925-607179542		TraesCS4A01G318000	Plant invertase/pectin methylesterase inhibitor superfamily
607261315-607262061		TraesCS4A01G318100	Cytokinin riboside 5'-monophosphate phosphoribohydrolase
607270018-607270363		TraesCS4A01G318200	F-box only 46
607271201-607274122		TraesCS4A01G318300	Leucine-rich repeat receptor-like protein kinase family protein
607309139-607310644		TraesCS4A01G318400	ATP-dependent zinc metalloprotease FtsH
607374419-607374938		TraesCS4A01G318500	DNA topoisomerase
607378184-607378939		TraesCS4A01G318600	EMBRYO SURROUNDING FACTOR 1-like protein 8
607417310-607417758		TraesCS4A01G318700	Pentatricopeptide repeat-containing protein At1g19720
607427642-607428537		TraesCS4A01G318800	carbohydrate esterase, putative (DUF303)
607432191-607434672		TraesCS4A01G318900	NAD/NADP-dependent betaine aldehyde dehydrogenase
607633308-607635652	C3	TraesCS4A01G319000	PGR5-like protein 1A, chloroplastic
607888036-607888131	<i>BV211529</i>		
608043668-608044864		TraesCS4A01G319100	Gibberellin 20 oxidase
608260037-608261317		TraesCS4A01G319200	F-box protein PP2
608267651-608271046	C4	TraesCS4A01G319300	Disease resistance protein (NBS-LRR class) family
608478075-608481479		TraesCS4A01G319400	Disease resistance protein (NBS-LRR class) family
608554446-608556572		TraesCS4A01G319500	Pentatricopeptide repeat-containing protein

608558256-608560511	TraesCS4A01G319600	Coatomer subunit zeta
608560774-608562889	TraesCS4A01G319700	Dehydrogenase/reductase SDR family protein 7-like protein
608602654-608609084	TraesCS4A01G319800	ATP-dependent DNA helicase 2 subunit KU80
608610038-608610918	TraesCS4A01G319900	Acyl carrier protein
608828643-608834674	TraesCS4A01G320000	Sucrose nonfermenting 4-like protein
608836776-608838380	TraesCS4A01G320100	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase superfamily protein
608866790-608868195	TraesCS4A01G320200	Ribosome hibernation promotion factor
608879224-608880208	TraesCS4A01G320300	DNA-(apurinic or apyrimidinic site) lyase
608881132-608882197	TraesCS4A01G320400	F-box protein PP2
608983186-608987723	TraesCS4A01G320500	Outer envelope pore protein 24B, chloroplastic
608990462-608990752	TraesCS4A01G320600	RADIALIS-like transcription factor
609070959-609072655	TraesCS4A01G320700	F-box protein
609080072-609084634	TraesCS4A01G320800	WRKY transcription factor
609132923-609133702	TraesCS4A01G320900	RING/U-box superfamily protein
609182691-609183530	TraesCS4A01G321000	Protein YIPF
609416867-609417226	TraesCS4A01G321100	Retrotransposon protein, putative, unclassified, expressed
609564170-609566524	TraesCS4A01G321200	RING/U-box superfamily protein, putative

609804687-609807321	TraesCS4A01G321300	Poly [ADP-ribose] polymerase
609815821-609818981	TraesCS4A01G321400	Beta-fructofuranosidase, insoluble protein
609917868-609922743	TraesCS4A01G321500	Beta-fructofuranosidase, insoluble protein
609926193-609929495	TraesCS4A01G321600	Beta-fructofuranosidase, insoluble protein
610034075-610036709	TraesCS4A01G321700	Cell wall invertase
610041237-610042322	TraesCS4A01G321800	Xyloglucan endotransglucosylase/hydrolase
610089743-610090656	TraesCS4A01G321900	F-box family protein
610130944-610132777	TraesCS4A01G322000	F-box family protein
610250073-610252980	TraesCS4A01G322100	SPFH domain/band 7 family protein
610261683-610263056	TraesCS4A01G322200	Myb factor
610484185-610490550	TraesCS4A01G322300	Heat shock transcription factor family protein
610493560-610496978	TraesCS4A01G322400	RNA-binding family protein, putative
610497225-610500400	TraesCS4A01G322500	Polyribonucleotide nucleotidyltransferase, putative
610618883-610629153	TraesCS4A01G322600	E3 ubiquitin-protein ligase listerin
610640193-610642379	TraesCS4A01G322700	F-box family protein
610706805-610709026	TraesCS4A01G322800	F-box family protein
610816015-610818670	TraesCS4A01G322900	F-box family protein

611025042-611028000	TraesCS4A01G323000	F-box family protein
611029706-611030686	TraesCS4A01G323100	Retrovirus-related Pol polyprotein from transposon TNT 1-94
611071297-611073599	TraesCS4A01G323200	F-box family protein
611201294-611203594	TraesCS4A01G323300	F-box family protein
611264184-611266257	TraesCS4A01G323400	Receptor protein kinase, putative
611268602-611271640	TraesCS4A01G323500	Protein kinase
611278023-611278475	TraesCS4A01G323600	30S ribosomal protein S9
611579698-611583177	TraesCS4A01G323700	ADP-ribosylation factor GTPase-activating protein
611592308-611592874	TraesCS4A01G323800	AIG2-like (Avirulence induced gene) family protein
611656148-611656933	TraesCS4A01G323900	WPP domain associated protein
611687436-611690317	TraesCS4A01G324000	Protein BCCIP homolog
611932162-611935806	TraesCS4A01G324100	ATP-dependent Clp protease ATP-binding subunit
611976530-611977103	TraesCS4A01G324200	ATP-dependent Clp protease ATP-binding subunit ClpB
612040266-612041864	TraesCS4A01G324300	Anthocyanin 3'-O-beta-glucosyltransferase
612059812-612061668	TraesCS4A01G324400	Transmembrane 70, mitochondrial
612062177-612065071	TraesCS4A01G324500	GC-rich sequence DNA-binding factor 1
612072756-612078364	TraesCS4A01G324600	Ribonuclease P protein subunit P38, related protein

612079125-612084522	TraesCS4A01G324700	Protein BREVIS RADIX
612110333-612114060	TraesCS4A01G324800	Cleavage and polyadenylation specificity factor subunit 3
612372451-612392100	TraesCS4A01G324900	Methyl-CpG-binding domain-containing protein 9
612426443-612433137	TraesCS4A01G325000	Ankyrin repeat family protein
612442435-612443827	TraesCS4A01G325100	Methyl-CpG-binding domain-containing protein 9
612531673-612533481	TraesCS4A01G325200	F-box family protein
613266770-613268275	TraesCS4A01G325300	Pentatricopeptide repeat-containing protein
613268358-613271776	TraesCS4A01G325400	Flavin-containing monooxygenase
613319821-613321985	TraesCS4A01G325500	Ycf20-like protein
613322410-613325605	TraesCS4A01G325600	Tumor necrosis factor receptor superfamily member 21
613330067-613333466	TraesCS4A01G325700	Receptor-like protein kinase
613367368-613367595	TraesCS4A01G325800	Hydroxyproline-rich glycoprotein
613398947-613400085	TraesCS4A01G325900	Protein kinase family protein
613401832-613406707	TraesCS4A01G326000	Nuclear factor Y, putative
613412237-613416220	TraesCS4A01G326100	Derlin
613417884-613419340	TraesCS4A01G326200	Pentatricopeptide repeat-containing protein, putative
613422860-613423415	TraesCS4A01G326300	Hydroxyproline-rich glycoprotein family protein

613543523-613544365	TraesCS4A01G326400	Ethylene-responsive transcription factor
613559481-613562327	TraesCS4A01G326500	Epstein-Barr virus EBNA-1-like protein
613568109-613568616	TraesCS4A01G326600	Hydroxyproline-rich glycoprotein family protein
613581481-613582994	TraesCS4A01G326700	Acyl-[acyl-carrier-protein] desaturase
613606291-613615092	TraesCS4A01G326800	Transducin/WD-like repeat-protein
613667357-613668904	TraesCS4A01G326900	Organic cation/carnitine transporter
613697285-613704538	TraesCS4A01G327000	carboxyl-terminal peptidase, putative (DUF239)
613740671-613742242	TraesCS4A01G327100	Receptor-like protein kinase
613742362-613744101	TraesCS4A01G327200	Leucine-rich repeat receptor kinase-like protein
613765165-613767888	TraesCS4A01G327300	Disease resistance protein RPM1
613804119-613812765	TraesCS4A01G327400	carboxyl-terminal peptidase, putative (DUF239)
613816530-613819414	TraesCS4A01G327500	Protein transport protein Sec61 subunit alpha
613855345-613861730	TraesCS4A01G327600	carboxyl-terminal peptidase, putative (DUF239)
613996678-613998876	TraesCS4A01G327700	Transposon protein, putative, Mutator sub-class
613999134-613999892	TraesCS4A01G327800	Transposon protein, putative, Mutator sub-class
614004317-614006188	TraesCS4A01G327900	Tropinone reductase-like protein
614014654-614016256	TraesCS4A01G328000	Tropinone reductase-like protein

614018608-614019552	TraesCS4A01G328100	Aspartic proteinase nepenthesin-1
614027490-614029756	TraesCS4A01G328200	Pantothenate synthetase
614029976-614030492	TraesCS4A01G328300	mechanosensitive channel of small conductance-like 9
614031503-614033643	TraesCS4A01G328400	Pentatricopeptide repeat-containing protein
614101649-614103184	TraesCS4A01G328500	Pentatricopeptide repeat-containing protein
614106743-614108525	TraesCS4A01G328600	Ankyrin repeat domain protein, putative
614111306-614116597	TraesCS4A01G328700	Transducin/WD-like repeat-protein
614228693-614230620	TraesCS4A01G328800	Laccase
614241223-614243111	TraesCS4A01G328900	cobalt ion-binding protein
614244840-614247194	TraesCS4A01G329000	FRIGIDA-like protein, putative
614252518-614258300	TraesCS4A01G329100	Disease resistance protein (NBS-LRR class) family
614401759-614406887	TraesCS4A01G329200	Protein ZINC INDUCED FACILITATOR-LIKE 1
614411595-614415624	TraesCS4A01G329300	U2 small nuclear ribonucleoprotein A
614416477-614426973	TraesCS4A01G329400	E3 ubiquitin-protein ligase SspH2
614609275-614612070	TraesCS4A01G329500	DEAD-box ATP-dependent RNA helicase 52A
614867396-614871236	TraesCS4A01G329600	26S proteasome non-ATPase regulatory subunit
614906939-614908430	TraesCS4A01G329700	F-box family protein

615032206-615040140	TraesCS4A01G329800	Protein kinase family protein
615099611-615101105	TraesCS4A01G329900	F-box family protein
615104066-615106167	TraesCS4A01G330000	protein kinase family protein
615106331-615107512	TraesCS4A01G330100	Leucine-rich repeat receptor-like protein kinase family protein
615193675-615198039	TraesCS4A01G330200	Monothiol glutaredoxin
615205524-615209815	TraesCS4A01G330300	Glutaredoxin
615212565-615216245	TraesCS4A01G330400	Elongation factor Tu
615219045-615222583	TraesCS4A01G330500	BED zinc finger,hAT family dimerization domain
615362649-615364826	TraesCS4A01G330600	F-box/RNI-like/FBD-like domains-containing protein
615372042-615372374	TraesCS4A01G330700	Rust resistance-like protein RP1
615437069-615439255	TraesCS4A01G330800	Shikimate dehydrogenase (NADP(+))
615445461-615447633	TraesCS4A01G330900	LRR-RLK
615455264-615457337	TraesCS4A01G331000	F-box family protein
615694100-615702325	TraesCS4A01G331100	Pleiotropic drug resistance ABC transporter
615941151-615942218	TraesCS4A01G331200	Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit DAD1
615969199-615971265	TraesCS4A01G331300	Cytochrome b

616086874-616109275	TraesCS4A01G331400	meristematic receptor-like kinase
616229091-616229877	TraesCS4A01G331500	F-box domain containing protein
616230369-616234110	TraesCS4A01G331600	Alcohol dehydrogenase-like protein
616236683-616237678	TraesCS4A01G331700	F-box domain containing protein
616305755-616306168	TraesCS4A01G331800	18S pre-ribosomal assembly protein gar2-like protein
616310241-616313839	TraesCS4A01G331900	Cinnamoyl-CoA reductase 4
616501029-616501661	TraesCS4A01G332000	Serrate RNA effector molecule homolog
616507393-616508992	TraesCS4A01G332100	Nascent polypeptide-associated complex subunit beta
616611347-616612869	TraesCS4A01G332200	F-box and associated interaction domains-containing protein
616617242-616618711	TraesCS4A01G332300	F-box family protein
616662076-616664226	TraesCS4A01G332400	F-box family protein
616673096-616674421	TraesCS4A01G332500	F-box domain containing protein, expressed
616700796-616703444	TraesCS4A01G332600	FBD-associated F-box protein
616839912-616876772	TraesCS4A01G332700	F-box and associated interaction domains-containing protein
616875589-616876473	TraesCS4A01G332800	F-box domain containing protein
616884760-616886057	TraesCS4A01G332900	F-box and associated interaction domains-containing protein
616896068-616897536	TraesCS4A01G333000	F-box family protein

616900752-616903264	TraesCS4A01G333100	F-box family protein
616961344-616961814	TraesCS4A01G333200	Basic blue protein, putative
616977285-616977749	TraesCS4A01G333300	Basic blue protein
616981393-616985103	TraesCS4A01G333400	Transferase, transferring glycosyl groups
617001184-617002438	TraesCS4A01G333500	Sec14p-like phosphatidylinositol transfer family protein
617042496-617050788	TraesCS4A01G333600	Sec14p-like phosphatidylinositol transfer family protein
617049263-617049826	TraesCS4A01G333700	Ethylene-responsive transcription factor
617094599-617097896	TraesCS4A01G333800	Sec14p-like phosphatidylinositol transfer family protein
617230785-617234228	TraesCS4A01G333900	KH domain-containing protein
617281529-617282683	TraesCS4A01G334000	Glycine rich protein 3
617288987-617290506	TraesCS4A01G334100	Glycine rich protein 3
617349130-617350011	TraesCS4A01G334200	Glycine rich protein 3
617360412-617361293	TraesCS4A01G334300	Glycine rich protein 3
617445072-617446375	TraesCS4A01G334400	Integral membrane protein
617652694-617654247	TraesCS4A01G334500	Sucrose transporter
617657626-617659105	TraesCS4A01G334600	U3 small nucleolar RNA-associated protein 18-like protein
617849876-617853865	TraesCS4A01G334700	Actin-related protein 2/3 complex subunit 4

617856078-617859609	TraesCS4A01G334800	B-cell receptor-associated protein 31-like containing protein
617907195-617912173	TraesCS4A01G334900	Protein kinase family protein
617924650-617927527	TraesCS4A01G335000	lectin-receptor kinase
617930763-617932013	TraesCS4A01G335100	Zinc finger MYM-type-like protein
617933919-617940601	TraesCS4A01G335200	Protein kinase family protein
617942110-617944974	TraesCS4A01G335300	RPM1-interacting protein 4
617945575-617951208	TraesCS4A01G335400	Conserved oligomeric Golgi complex subunit 2
618084665-618089234	TraesCS4A01G335500	NBS-LRR disease resistance protein
618121544-618125040	TraesCS4A01G335600	NBS-LRR-like resistance protein
618158574-618175415	TraesCS4A01G335700	receptor kinase 1
618265643-618275366	TraesCS4A01G335800	Ankyrin repeat family protein
618411430-618413166	TraesCS4A01G335900	Pirin-like protein
618417500-618419188	TraesCS4A01G336000	Pirin-like protein
618463034-618464665	TraesCS4A01G336100	Pirin-like protein
618528523-618530057	TraesCS4A01G336200	Pirin-like protein
618564906-618567847	TraesCS4A01G336300	Nuclear RNA binding protein, putative
618620274-618627946	TraesCS4A01G336400	Long-chain-fatty-acid CoA ligase, putative

618660637-618674099	TraesCS4A01G336500	Long-chain-fatty-acid CoA ligase, putative
619147079-619160948	TraesCS4A01G336600	Cleavage and polyadenylation specificity factor subunit 3
619181209-619181706	TraesCS4A01G336700	B3 domain-containing protein
619184361-619188525	TraesCS4A01G336800	Kinase-like protein
619278543-619284761	TraesCS4A01G336900	Ubiquitin carboxyl-terminal hydrolase-related protein
619312282-619312990	TraesCS4A01G337000	CRIB domain-containing protein RIC4
619333716-619334321	TraesCS4A01G337100	CRIB domain-containing protein RIC4
619370063-619370655	TraesCS4A01G337200	ROP-interactive CRIB motif protein
619372946-619375424	TraesCS4A01G337300	UDP-4-amino-4-deoxy-L-arabinose--oxoglutarate aminotransferase
619582736-619583677	TraesCS4A01G337400	U3 small nucleolar RNA-associated protein 18-like protein
619590939-619591567	TraesCS4A01G337500	Serine/threonine-protein phosphatase 7 long form like
619686152-619686415	TraesCS4A01G337600	RING/FYVE/PHD-type zinc finger family protein
619948588-619950250	TraesCS4A01G337700	U3 small nucleolar RNA-associated protein 18-like protein
620189006-620194905	TraesCS4A01G337800	Aspartokinase
620260277-620261490	TraesCS4A01G337900	zinc finger/BTB domain protein, putative (DUF1644)
620289827-620290336	TraesCS4A01G338000	Invertase inhibitor
620323514-620325316	TraesCS4A01G338100	Pectinesterase

638240325-638241099	C6	TraesCS4A01G365100	SHAGGY-like kinase
638661695-638661817	<i>Xgpw2331</i>		
638791957-638796803	C7	TraesCS4A01G365200	Sn1-specific diacylglycerol lipase alpha
