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Supplementary Material

Glucosinolate profile and *Myrosinase* gene expression are modulated upon *Plasmodiophora brassicae* infection in cabbage

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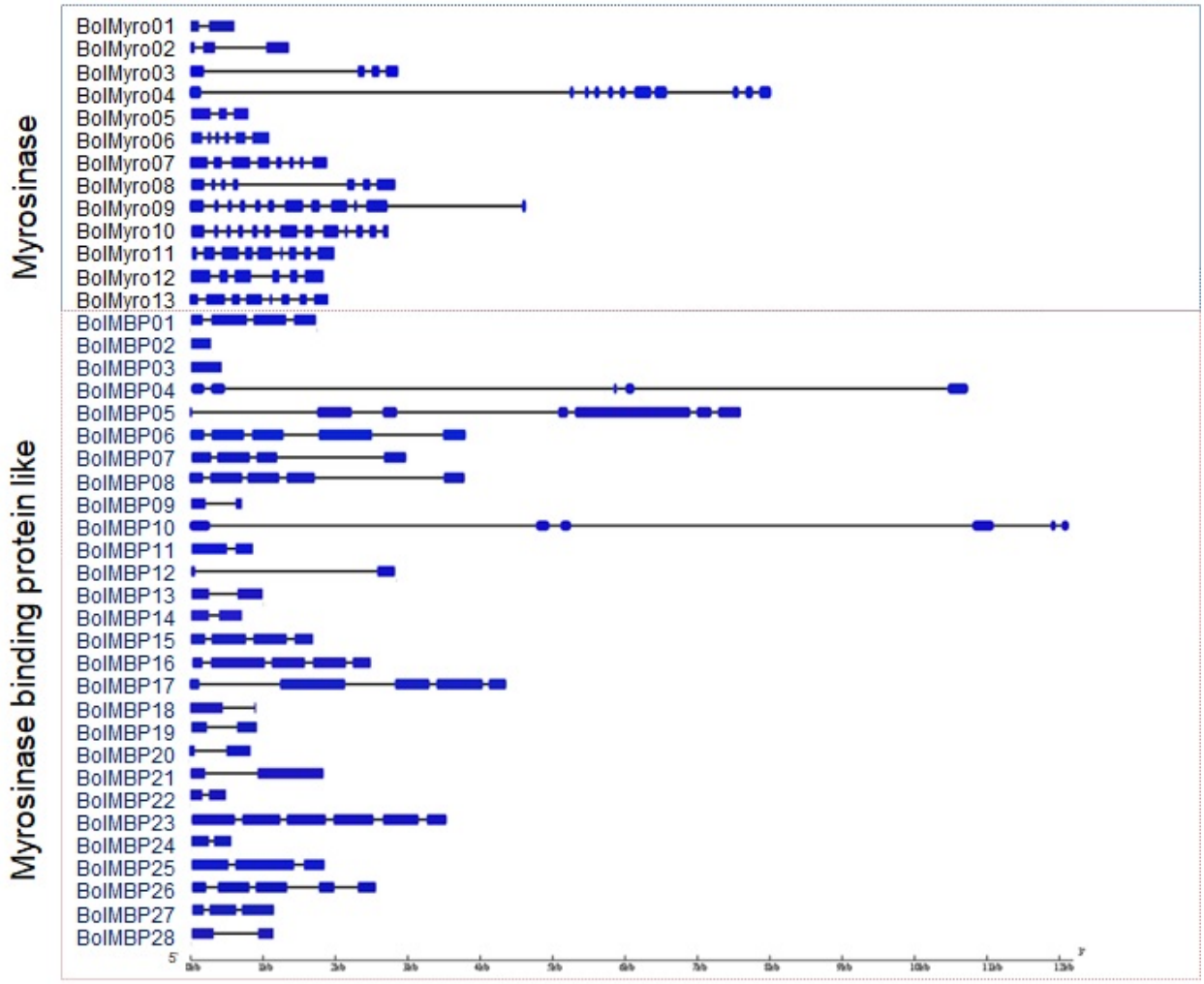


Fig. S1. Genomic structures of *myrosinase* and *myrosinase binding protein like* genes of *B. oleracea*. Solid blue boxes and black lines indicate exons and introns, respectively.

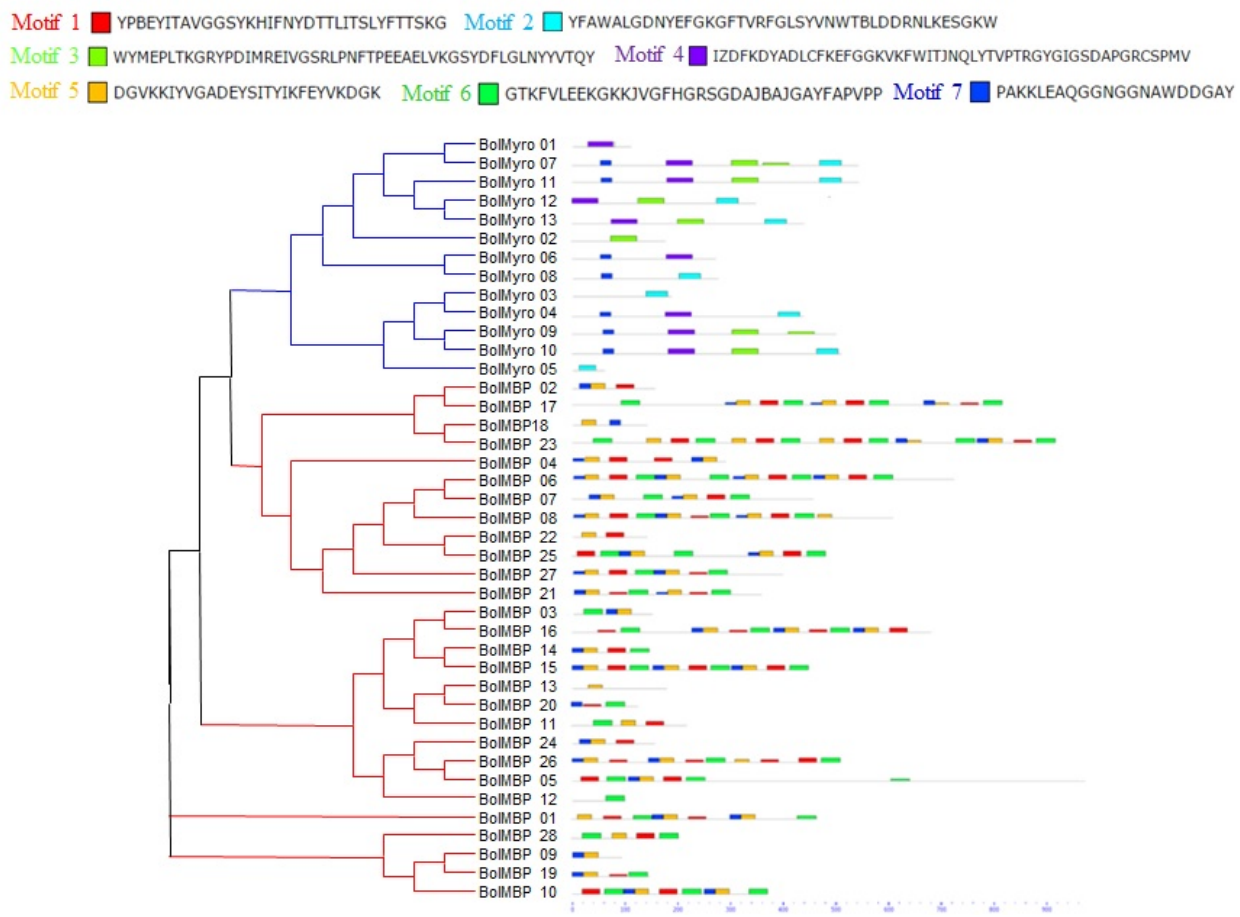
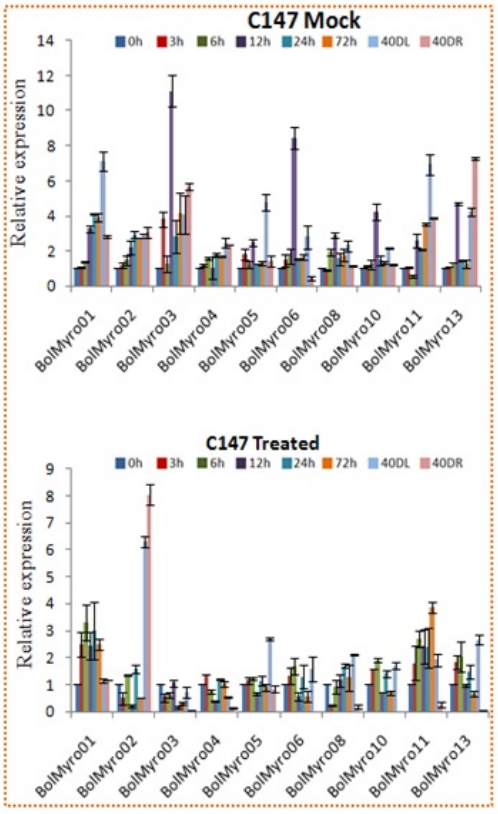
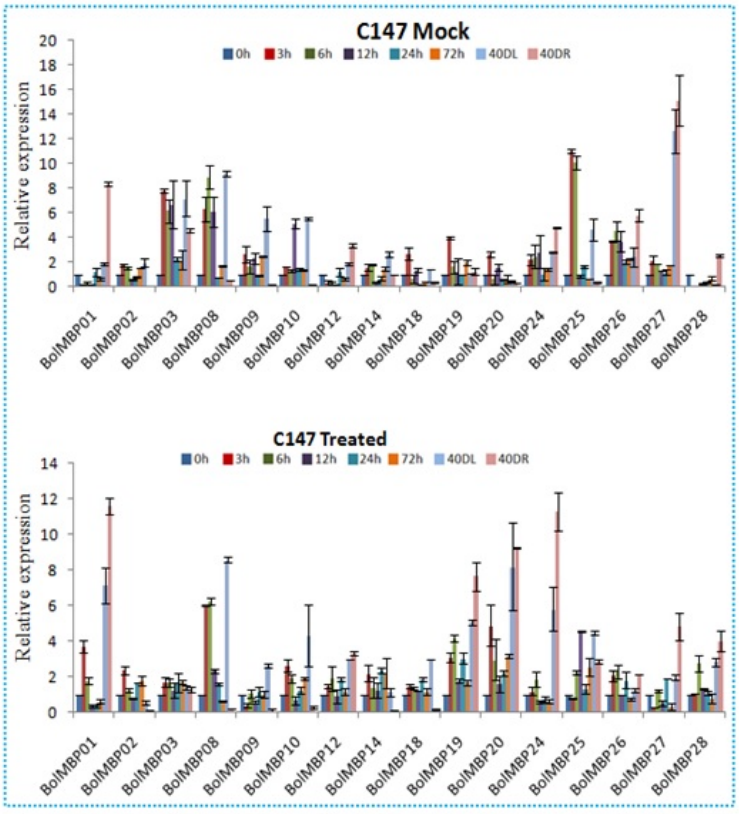


Fig. S2. Schematic representation of motif compositions in the myrosinase protein and myrosinase binding protein like sequences. Different motifs, numbered *1–7, are displayed* in different *colored boxes.* The names of all members are displayed on the left side while bottom scale indicates length of motifs.

Supplementary Figure 3 (a-I)



Supplementary Figure 3 (a-II)



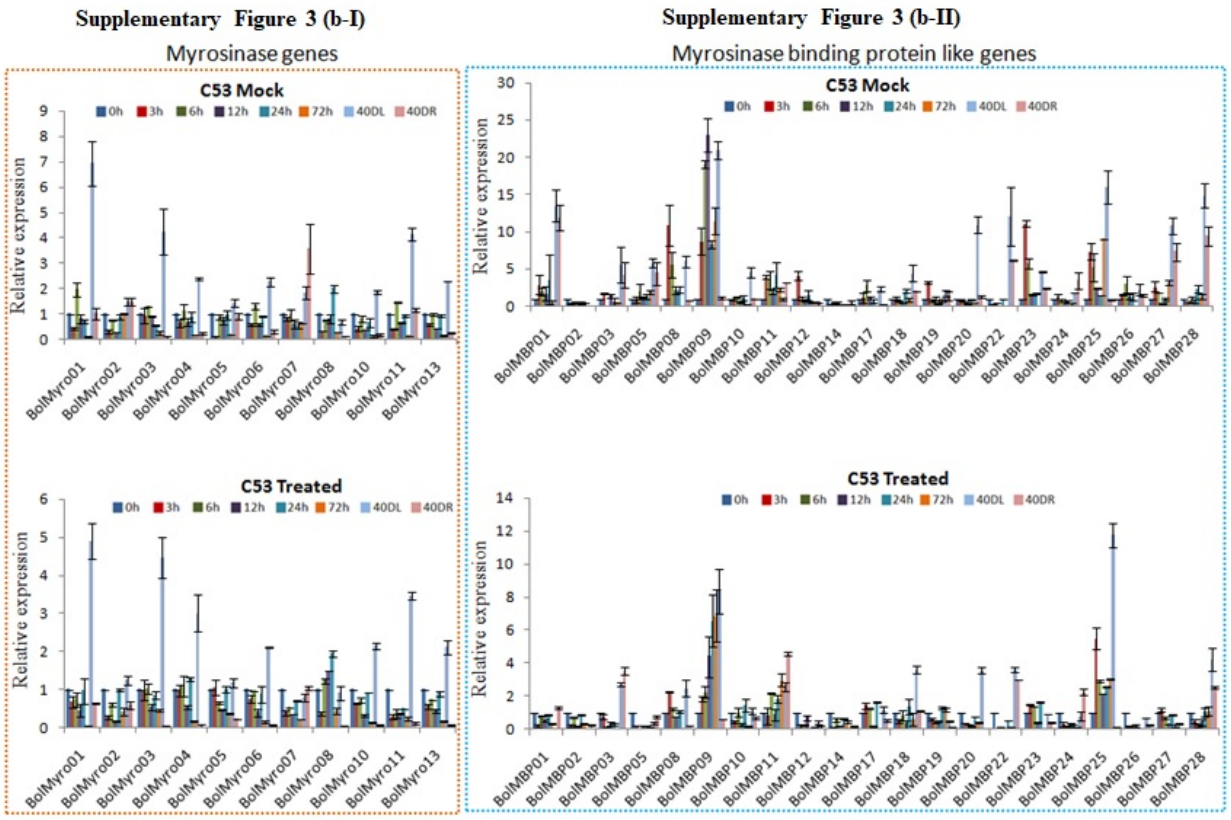


Fig. S3. Expression analysis of *BolMyro* and *BolMBP* genes under clubroot disease stresses. Real-time PCR was used to determine the relative expression levels of *BolMyro* and *BolMBP* genes upon (a) clubroot susceptible line C147, (b) clubroot resistant line C53. Error bars represent the standard error of the means of three independent replicates. Data represent the expression values of the genes in the leaf samples up to 72 h time points, but 40 DAI represent the expression data for both leaf and root samples, indicating by 40 DL for leaf and 40 DR for root samples.

Table S1. Primer sequence used for real time and RT-PCR amplification of *Myrosinase* and *Myrosinase binding protein like* genes of *B. oleracea*

Group	Gene name	Forward	Reverse
Myrosinase	BolMyro01	ATGACACTGATCCAGACTCC	TAGGACTTGGCTGGACATAC
	BolMyro02	CGTTAACAAAGGGTAGATAC	TACATGTGAGCTTTACGCCAG
	BolMyro03	GACAATCCCCTTACATTCAA	ATTCGTCCATTATCAGCAAG
	BolMyro04	CCAACTTCTGGCTCATGC	GCATCCGACGAAGAAATC
	BolMyro05	GATCCAGACAGCATAGCTG	GATTATGGCTTGGTTGGGC
	BolMyro06	TCCAGAAGGAAAGGTGAGTA	TGAGAGTGAGCCAGTTCTTC
	BolMyro07	TGCTTACCAGATTGAAGGTT	TCTTGGAATGATTCTTGACC
	BolMyro08	GCGTGTCAACATAAAAGGAT	TCATGCATCTGTGAGTGTCT
	BolMyro09	TTAACCGATCCACGAGTTAC	TACGGACGTAGGATTCTTGT
	BolMyro10	AGACACAGCCTAGCGTCTTA	TGCTACCGTTAAGTTTCCAT
	BolMyro11	AAACGGGAATGCCTATTACT	TTATGTTGACACCCTTCTCC
	BolMyro12	CTTCCATGGATGGTACATG	CAGGGTAGTGTGTGTCTCTG
	BolMyro13	CGTTATGGACTACTTCAAAACC	CTTCCCAATTAACGTAACTG
Myrosinase binding protein like	BolMBP01	CTAGGTGCAAATTTCGCTGT	CACCAAATTCATCGAAGTCC
	BolMBP02	GTGATCAAAACCAACATCG	TAAACCAAACGGAAGAAGAG
	BolMBP03	CGTATGGTCTCGAAGGTAGC	CCGCTGATATACCATCTTGG
	BolMBP04	GCACAGAAAGTGGGACCT	TCGTCTGGATAGTTAAGC
	BolMBP05	TGGAACCTCCTCAACTGGTA	TTGAAAGTGAACGAGCATGA
	BolMBP06	GTCGGTCTGGTGATGTTATT	GATTTCGACTTTTCCTTCCT
	BolMBP07	ACAAAGGAAACACATTCGAC	AGCGATGTAATAAGCGTTGT
	BolMBP08	CAATGTGGTTGGTAGGAAAT	TGCTCCAATGGTTACTTTCT
	BolMBP09	GCCACAAAAGTTTGAAGCTA	CAAACGACTCGGTGAAACT
	BolMBP10	ATGGGACAGAAAGTCAACAC	TCTTCTTTCCTTGATCCTCA
	BolMBP11	TGGTGGAAGCAACCTATGAT	AATCACCCCATGAATCTCCT
	BolMBP12	TGATACGATTCATCGCCTTT	GATGGGCACGACATAGACTC
	BolMBP13	GAAGTCACAATGGCATCCTC	TGGAACTGGAGGTACCAAAA
	BolMBP14	ACTGCGGTGGAGATTAACTA	CACTTGGAGATAGGCTTGAC
	BolMBP15	GAAAAAGTTGGATGCTCAAG	TGGATCAAGTTGAAACTCCT
	BolMBP16	ACGGAAAGTGTCTGTAGGAC	ATGTTAACGATCGCAGAGTT
	BolMBP17	ATCTACCATTGGAACGTTTG	AAGAGCATTGACGTGAGAGT
	BolMBP18	GCCACAAAAGTTTGAAGCTA	CAAACGACTCGGTGAAACT
	BolMBP19	TCATCATGAGGGTGTATCAA	AGGCCTTGTATCGCACCCT
	BolMBP20	GTGATCAAAACCAACATCG	TAAACCAAACGGAAGAAGAG
	BolMBP21	GAGGTTCGAAAAGACGATTA	GAAAAACATAAGCTCCGAGA
	BolMBP22	AAGTCGTAGTCCGTGAACAT	TTTGAGCTCGAAGTCTTTTC
	BolMBP23	AGTCGAGTGATTGAGCAAAT	TTTGTGTTGGTTGTGAACTG
	BolMBP24	GATGTCCAAGAGTTCACGTT	TTTGATGAAGCATGTAGCTG
	BolMBP25	CATTGGACCTTACTTCTTCG	CACAAACTCTTGTGGAACCT
	BolMBP26	GTTCTGAAGGCGTATACTGG	TTTTGAAAGTCCCCTCTACA
	BolMBP27	CATGATCATGGGAGGAGGCA	ACAAATCTCCTGCCAACCAC
	BolMBP28	ACCTACAACACAATCCCTGA	CGGAGTAATAATCGGTGAGA
BolActin		TCCATCGAGAAGAACTAC	GTGCAACCACCTTAATC

Table S2. Ct values of *Actin-1, Actin-2,* 13 *BolMyro* (blue colour) and 28 *BolMBP* genes (black colour) at four different concentrations (50ng/µl=1) of cDNA representing the amplification efficiencies of primers used in qPCR. Each data point represents an average of three qPCR observations

Gene name	cDNA concentration				Primer efficiency values (%)
	1	0.1	0.01	0.001	
Actin-1	25.4	27.8	29.9	30.8	97
Actin-2	18.2	19.4	19.4	19.9	98
BolMyro01	23.6	27.0	30.4	31.8	94
BolMyro02	17.3	20.9	24.5	27.5	95
BolMyro03	21.4	29.1	28.3	31.6	98
BolMyro04	27.6	28.2	28.6	28.8	93
BolMyro05	20.7	24.2	27.1	17.0	99
BolMyro06	24.8	28.3	31.0	33.4	97
BolMyro07	29.8	33.4	32.4	33.0	100
BolMyro08	23.9	24.1	23.9	24.4	91
BolMyro09	26.5	29.3	32.0	31.4	99
BolMyro10	17.5	21.1	24.8	28.2	90
BolMyro11	21.4	24.9	28.6	30.8	98
BolMyro12	31.3	33.8	30.8	31.8	95
BolMyro13	23.1	27.1	30.9	32.3	99
BolMBP01	17.0	20.4	24.0	27.2	99
BolMBP02	25.3	25.0	24.7	24.5	94
BolMBP03	17.4	21.0	24.3	27.5	99
BolMBP04	26.0	29.5	31.8	33.6	96
BolMBP05	26.2	27.9	28.4	28.9	100
BolMBP06	32.3	34.7	35.1	34.0	98
BolMBP07	27.3	28.7	29.0	29.0	95
BolMBP08	26.6	28.4	28.2	28.2	94
BolMBP09	31.5	32.3	32.2	32.7	100
BolMBP10	23.8	26.9	30.6	32.5	95
BolMBP11	18.1	21.5	25.2	28.9	100
BolMBP12	20.3	23.6	27.3	30.4	95
BolMBP13	29.8	37.1	36.1	35.1	99
BolMBP14	28.7	31.8	33.3	33.0	98
BolMBP15	26.6	29.5	34.9	33.7	97
BolMBP16	20.5	23.7	28.0	31.0	98
BolMBP17	32.8	34.7	33.3	36.3	98
BolMBP18	23.4	27.4	30.3	31.8	97
BolMBP19	18.3	20.4	24.3	28.0	100
BolMBP20	25.2	28.2	32.2	32.8	94
BolMBP21	28.1	30.3	33.3	34.5	97
BolMBP22	30.7	32.8	34.3	34.2	100
BolMBP23	26.3	26.1	26.2	26.2	99
BolMBP24	35.7	35.9	37.4	37.2	100
BolMBP25	27.4	29.6	32.1	32.2	93
BolMBP26	31.59	35	36.25	32.65	99
BolMBP27	31.69	35.08	36.56	37.66	94
BolMBP28	33.83	34.96	35.1	34.45	97

Table S3. Features of the 13 *Myro* and 28 *MBP* genes in the *B. oleracea* genome, including chromosome number, start and end position, strand type, and protein domains

Type	Gene name	Gene ID	Chromosome	Start	End	Strand	Domain name
Myrosinase	BolMyro01	Bol023254	C01	28189934	28190363	+	Glyco_hydro_1
	BolMyro02	Bol025706	C03	16496688	16498349	+	Glyco_hydro_1
	BolMyro03	Bol031595	C06	22830111	22832913	-	Glyco_hydro_1
	BolMyro04	Bol031599	C06	22870762	22878884	-	Glyco_hydro_1
	BolMyro05	Bol039915	C06	32462774	32463545	+	Glyco_hydro_1
	BolMyro06	Bol017328	C06	35713270	35714539	+	Glyco_hydro_1
	BolMyro07	Bol028319	C08	12701861	12703727	-	Glyco_hydro_1
	BolMyro08	Bol029231	C08	19494466	19497170	+	Glyco_hydro_1
	BolMyro09	Bol044759	C08	35484628	35488994	-	Glyco_hydro_1
	BolMyro10	Bol044760	C08	35490959	35493786	-	Glyco_hydro_1
	BolMyro11	Bol019343	C09	6008761	6015062	+	Glyco_hydro_1
	BolMyro12	Bol012713	Scaffold000194	80902	82762	-	Glyco_hydro_1
	BolMyro13	Bol012747	Scaffold000194	460571	462542	+	Glyco_hydro_1
Myrosinase binding protein like	BolMBP01	Bol028538	C01	9010417	9012121	+	Jacalin
	BolMBP02	Bol018789	C01	29017645	29017830	-	Jacalin
	BolMBP03	Bol034779	C01	32683147	32683599	-	Jacalin
	BolMBP04	Bol034776	C01	32714006	32724957	-	Jacalin
	BolMBP05	Bol020419	C03	10821373	10828766	-	Jacalin
	BolMBP06	Bol035042	C03	55678147	55681997	-	Jacalin
	BolMBP07	Bol035043	C03	55705473	55708537	-	Jacalin
	BolMBP08	Bol035044	C03	55715751	55719670	-	Jacalin
	BolMBP09	Bol035046	C03	55743687	55744378	-	Jacalin
	BolMBP10	Bol016258	C04	6727734	6739924	-	Jacalin
	BolMBP11	Bol025335	C04	38062216	38062976	-	Jacalin

BolMBP12	Bol025336	C04	38071577	38074346	-	Jacalin
BolMBP13	Bol041017	C05	1947178	1948070	-	Jacalin
BolMBP14	Bol038093	C05	5633315	5633869	+	Jacalin
BolMBP15	Bol036928	C05	27367453	27369078	+	Jacalin
BolMBP16	Bol036929	C05	27369467	27371907	-	Jacalin
BolMBP17	Bol026789	C06	11490867	11495291	+	Jacalin
BolMBP18	Bol026791	C06	11513709	11514531	+	Jacalin
BolMBP19	Bol019487	C06	12298571	12299394	+	Jacalin
BolMBP20	Bol019488	C06	12303687	12304471	+	Jacalin
BolMBP21	Bol019489	C06	12327280	12329054	+	Jacalin
BolMBP22	Bol019492	C06	12425543	12426071	+	Jacalin
BolMBP23	Bol019493	C06	12456682	12459896	+	Jacalin
BolMBP24	Bol032183	C09	1760502	1761040	+	Jacalin
BolMBP25	Bol009911	C09	24503502	24505156	-	Jacalin
BolMBP26	Bol030333	C09	34782138	34784629	-	Jacalin
BolMBP27	Bol002012	Scaffold000409	13787	15184	+	Jacalin
BolMBP28	Bol041674	Scaffold000009	1064958	1066296	+	Jacalin