

Malus domestica gbrowse analysis on LG16					BLASTP results			BLASTN results							
ORF	Gene name	Gene position	Direction ¹	Contig name	Contig position on chromosome 16	Most similar sequence ID	Description	E-value	Most similar sequence ID	Description	SNP in CDS	E-value	Mal d 1 locus	Corresponding ORF in Flotina BACs	Nomenclature in Yang et al., 2011
CH05a04					MDC003086.270	892700..896767									
GD-ORF1	MDP0000399350	10737669..10738272	↑	MDC012403.580	10733976..10745025	CBL94134	putative Mal d 1.06A isoallergen	2.00E-83	AY827703	Mal d 1.06A.03.01	0	0.0	Mal d 1.06A	ORF6	absent
MC-12 Sp6 End															
Contig gap															
GD-ORF2	MDP0000942514	10753144..10753344	↑	MDC012384.247	10753008..10771737	CBL94138	putative Mal d 1.10 isoallergen	1.00E-36	FN823234	Mal d 1.1001	2	1.00E-99	Mal d 1.10	ORF10, partial (exon II)	absent
GD-ORF3	MDP0000942516	10767444..10768094	↑	MDC012384.247	10753008..10771737	CBL94141	putative Mal d 1.02 isoallergen	1.00E-85	AY827656	Mal d 1.0201.04	0	0.0	Mal d 1.02	ORF13	Mal d 1.02
GD-ORF4	MDP0000196487	10760110..10760891	↑	MDC012384.247	10753008..10771737	CBL94145	putative Mal d 1.12 isoallergen	2.00E-74	FN823234	Mal d 1.1201	5	3.00E-156	Mal d 1.12	ORF17	absent
GD-ORF5	MDP0000197252	10772669..10773259	↑	MDC013442.401	10767880..10774262	CBL94145	putative Mal d 1.12 isoallergen	3.00E-78	FN823234	Mal d 1.1201	0	0.0	Mal d 1.12	ORF17, gap of 45 bp	absent
GD-ORF6	MDP0000101911	10789840..10789841	↑	MDC013442.313	10789806..10782809	CBL94148	putative Mal d 1.11 isoallergen	7.00E-92	FN823234	Mal d 1.1101	0	0.0	Mal d 1.11	ORF20	absent
GD-ORF7	MDP0000789174	10791065..10791179	↑	MDC012636.208	10789541..10800326	CBL94148	putative Mal d 1.11 isoallergen	7.00E-92	FN823234	Mal d 1.1101	0	0.0	Mal d 1.11	ORF20	absent
MC-12 Sp6 End															
Contig gap															
GD-ORF8	MDP0000216906	10801484..10801777	↑	MDC003056.321	10796110..10810077	AAX20989	Mal d 1.06C04	8.00E-42	FN823234	Mal d 1ps2 pseudogene	0	2.00E-150	Mal d 1ps3	ORF25, pseudogene	absent
GD-ORF9	MDP0000216907	10805767..10806399	↑	MDC003056.321	10796110..10810077	CBL94151	putative Mal d 1.06B isoallergen	3.00E-83	AY827716	Mal d 1.06B05.02	3	0.0	Mal d 1.06B	ORF23	Mal d 1.06B
GD-ORF10	MDP0000122064	10808145..10809328	↑	MDC012403.573	10807573..10811474	BAJ11954	Mal d 1.06B	2.00E-160							
GD-ORF11	MDP0000151113	10815185..10817248	↑	MDC014177.202	10811474..10849046	dbjBAE99683	oxidoreductase like protein	4.00E-27							
GD-ORF12	MDP0000151118	10842863..10843862	↑	MDC014177.202	10811474..10849046	ABJ30321	inositol phosphate kinase	1.00E-137							
GD-ORF13	MDP0000910638	10879414..10880761	↑	MDC022482.156	10862235..10888654	BAC75671	transcription factor MYB101	5.00E-62							
Contig gap															
GD-ORF14	MDP0000258746	11054048..11054825	↓	MDC009119.487	11053823..11058752	XP_002531787	Glycerol-3-phosphate transporter, putative	8.00E-59							
GD-ORF15	MDP0000329942	11070760..11071020	↓	MDC003466.686	11066682..11073239	YP_04021721	ribosomal protein S15	4.00E-42							
Contig gap															
GD-ORF16	MDP0000058403	11131427..11136795	↑	MDC018179.210	11129614..11143912	XP_002547414	hypothetical protein	2.00E-172							
GD-ORF17	MDP0000128092	11181509..11187055	↑	MDC016215.185	11170521..11190953	ADL3668	GATA domain class transcription factor	0.0							
MC-20 Sp6 End															
Contig gap															
GD-ORF18	MDP0000290818	11207635..11210754	↓	MDC010650.585	11186478..11226800	CBL94183	putative type-b response regulator (sensor histidine kinase)	0.0						ORF55	
GD-ORF19	MDP0000290819	11212662..11215416	↑	MDC010650.585	11186478..11226800	CBL94184	putative COBL7 (COBRA-LIKE 7)	0.0						ORF56	
GD-ORF20	MDP0000120300	11242410..11244614	↑	MDC004233.457	11242847..11272017	CBL94180	Conserved hypothetical protein with drought induced 19 protein (DI19) domain	2.00E-90						ORF52	
GD-ORF21	MDP0000307900	11247889..11250676	↑	MDC017486.371	11242847..11272017	CBL94179	Hypothetical protein with DUF789; conserved domain found in several plant proteins of unknown function							ORF52	
GD-ORF22	MDP0000864747	11248648..11250127	↑	MDC017486.371	11242847..11272017	CBL94174	putative Mal d 1.07 isoallergen	5.00E-85	AY822717	Mal d 1.0701	0	0.0	Mal d 1.07	ORF46	Mal d 1.07
GD-ORF23	MDP0000142814	11250682..11251161	↑	MDC017486.371	11242847..11272017	CBL94177	putative Mal d 1.08 isoallergen	8.00E-87	AY822718	Mal d 1.0801.01	0	0.0	Mal d 1.08	ORF49	Mal d 1.08
GD-ORF24	MDP0000864748	11251946..11252425	↑	MDC017486.371	11242847..11272017	CBL94175	putative Mal d 1.09 isoallergen	6.00E-86	AY822721	Mal d 1.0903	0	0.0	Mal d 1.09	ORF47	Mal d 1.09
GD-ORF25	MDP0000197322	11259130..11260799	↑	MDC013119.235	11252528..11268799	XP_002531219	histone-lysine n-methyltransferase, suvH, putative	0.0							
GD-ORF26	MDP0000174018	11263047..11263526	↑	MDC013119.235	11252528..11268799	CBL94177	putative Mal d 1.08 isoallergen	8.00E-87	AY822719	Mal d 1.0801.02	0	0.0	Mal d 1.08	ORF49	Mal d 1.08
GD-ORF27	MDP0000174019	11266664..11269470	↑	MDC012689.443	11272527..11296236	CBL94179	Conserved hypothetical protein	1.00E-136							
GD-ORF28	MDP0000875302	11275095..11276059	↑	MDC021689.443	11272527..11296236	XP_002531220	Major pollen allergen Ory s 1 precursor, putative (Expansin-like protein)	1.00E-75		No significant similarities					new apple allergen ?
GD-ORF29	MDP0000312569	11281899..11282378	↓	MDC015329.200	11276101..11282361	CBL94173	putative Mal d 1.03G isoallergen	2.00E-83	AY822733	Mal d 1.03G01	0	0.0	Mal d 1.03G	ORF45	Mal d 1.03G
MC-20 T1 End															
GD-ORF30	MDP0000638667	11287535..11288646	↓	MDC016850.183	11287106..11289520	XP_002264538	hypothetical protein, Hy-III related family	4.00E-113							
GD-ORF31	MDP0000157399	11288621..11300225	↓	MDC021689.437	11288343..11301838	XP_002264538	hypothetical protein, Hy-III related family	4.00E-184							
GD-ORF32	MDP0000617435	11307267..11309382	↓	MDC010116.248	11305084..11312468	XP_002264538	hypothetical protein, Hy-III related family	3.00E-165							
GD-ORF33	MDP0000868415	11313523..11316359	↓	MDC044024.5	11308897..11318098	XP_002264538	hypothetical protein, Hy-III related family	6.00E-152							
GD-ORF34	MDP0000199982	11319610..11320908	↓	MDC012403.590	11317776..11324340	XP_002272437	hypothetical protein	2.00E-60							
GD-ORF35	MDP0000288293	11340375..11341271	↑	MDC008788.391	11321059..11341473	AAS00045	Mal d 1 like	3.00E-84	AY428581	Malus x domestica clone 1f Mal d 1 like	0	0.0	Mal d 1.06D 99.6% nucleotide similarity to Mal d 1.06A, but 1.06A of GD (Cao et al 2009) is actually present at a different location (LG16:10737669..10738272), due to which this must be a different gene	Missing in Flotina BAC sequences	Mal d 1.06A
GD-ORF36	MDP0000151829	11343444..11344406	↓	MDC012403.589	11341474..11351243	CBL94138	putative Mal d 1.10 isoallergen	9.00E-86	FN823234	Mal d 1.1001	0	0.0	Mal d 1.10	ORF10	Mal d 1.10
MC-12 T7 End															
GD-ORF37	MDP0000144838	11350987..11351199	↑	MDC021689.441	11350241..11358529	CBL94134	putative Mal d 1.06A isoallergen	1.00E-31	AY827703	Mal d 1.06A03.01	0	0.0	Mal d 1.06A	ORF6, partial (exon II)	absent
GD-ORF38	MDP0000593385	11350286..11351353	↑	MDC021689.441	11350241..11358529	CBL94129	putative reverse transcriptase (RNA-dependent DNA polymerase) domain containing protein	0.0						ORF1, partial (exon I)	
GD-ORF39	MDP0000593386	11351384..11353273	↑	MDC021689.441	11350241..11358529	CAE01862	Putative retroelement pol polyprotein	4.00E-152							
GD-ORF40	MDP0000313454	11354205..11354798	↑	MDC021689.441	11350241..11358529	AAX18292	major allergen Mal d 1.04	3.00E-85	AY827664	Mal d 1.0404.02	0	0.0	Mal d 1.04	Missing in Flotina BAC sequences	Mal d 1.04
GD-ORF41	MDP0000245051	11366759..11367052	↓	MDC020307.193	11363677..11367315	CBL94138	putative Mal d 1.10 isoallergen	4.00E-27	FN823234	Mal d 1.1001	1	0.0	Mal d 1.10	ORF10, partial (exon I)	absent
Contig gap															
GD-ORF42	MDP0000116244	11433701..11434305	↓	MDC010239.242	11431490..11456921	AAX18306	major allergen Mal d 1.06C	7.00E-82	AY827725	Mal d 1.06C02.01	1	0.0	Mal d 1.06C	ORF28	Mal d 1.06C
GD-ORF43	MDP0000287647	11436376..11436747	↓	MDC010239.242	11431490..11456921	AY827730	Mal d 1ps2.02	1	0.0	Mal d 1ps2.02	1	0.0	Mal d 1ps2	ORF29, pseudogene identical to MDP0000840722	absent
MC-12 Sp6 End															
Contig gap															
GD-ORF44	MDP0000120847	11456001..11457698	↓	MDC003279.119	11452931..11466541	CBL94161	Putative protein with Heavy Metal Associated (HMA) domain	0.0						ORF33	
GD-ORF45	MDP0000286768	11458537..11466416	↑	MDC003279.119	11452931..11466541	CBL94162	putative transducin family protein / WD-40 repeat family protein	0.0						ORF34	

The arrows indicate the 5'→3' direction. *The gene sequences are identical. **The gene sequences are identical except for a Y (C/T) indicating a SNP among the two GD alleles. In black are highlighted the gap positions between contigs; in dark gray the SSR markers positions and in light gray the BAC ends positions.