

Table S1: List of the candidate QDR loci identified using the local score analysis (ksi = 2, chromosome-wide FWER of 20%) from GWAS of QDR to five different *A. euteiches* isolates.

phenotype	Aphanomyces_isolate	chromosome	beg_int	end_int	maximum_Lindley	SNPs_int	minimum_p-value	closest_gene_model(s)	gene_model(s)_position	gene_annotation	local_score_quantile_0.8
Root Rot Index	MF1	1	10878511	10879559	22,18478	25	0,000224184	Medtr1g031150	10878163-10881162	nudix hydrolase-like protein	9,221932566
Root Rot Index	ATCC 201684	1	14554714	14555748	14,45859	37	1,78E-05	Medtr1g039380	14556668-14563651	serine/threonine protein phosphatase 2A	11,82315958
PC1	ATCC 201684	1	14554714	14555604	14,22802	29	3,54E-05	Medtr1g039380	14556668-14563651	serine/threonine protein phosphatase 2A	13,97505369
Root Rot Index	MF1	1	15268016	15274081	25,48755	144	2,49E-05	Medtr1g041135 Medtr1g041155	15268312-15274191 15287020-15289220	hypothetical protein DUF506 family protein	9,221932566
Root Rot Index	RB84	1	17291546	17295225	16,81812	40	5,17E-06	Medtr1g045930	17288890-17303141	triacylglycerol lipase, putative	13,64821914
Root Rot Index	ATCC 201684	1	24912754	24913589	12,80374	31	0,000151341	Medtr1g056890	24911996-24915821	DNA-directed RNA polymerase I, II	11,82315958
Root Rot Index	ATCC 201684	1	25126456	25127994	13,9366	43	0,000109948	Medtr1g057160	25122651-25123180	transmembrane protein, putative	11,82315958
PC1	ATCC 201684	1	25126666	25127994	18,33914	36	3,76E-05	Medtr1g057160	25122651-25123180	transmembrane protein, putative	13,97505369
Root Rot Index	RB84	2	7286918	7289512	25,77647	43	3,94E-05	Medtr2g021400	7282174-7290385	mediator of RNA polymerase II transcription subunit 33A	14,29983252
Root Rot Index	NC1	2	17087034	17087326	9,819844	11	0,000379457	Medtr2g039010	17086581-17087721	NBS-LRR type disease resistance protein	9,267976009
Root Rot Index	Ae109	2	17757970	17763738	27,5009	48	0,000109361	Medtr2g040470	17749011-17761009	plant/F27B13-30 protein	15,69930025
Root Rot Index	ATCC 201684	2	28549842	28550386	14,64863	17	3,67E-05	Medtr2g068760	28555522-28560775	LOB domain protein	12,58553576
Root Rot Index	ATCC 201684	2	30363772	30365390	41,60256	68	7,07E-07	Medtr2g072210 Medtr2g072240	30355770-30361583 30371049-30374014	transmembrane protein, putative FBD, F-box and LRR protein	12,58553576
Root Rot Index	RB84	2	30365092	30365390	16,0537	13	7,12E-06	Medtr2g072210 Medtr2g072240	30355780-30361636 30371049-30374014	transmembrane protein, putative FBD, F-box and LRR protein	14,29983252
Root Rot Index	RB84	2	36813859	36814635	28,675	25	9,22E-06	Medtr2g087520 Medtr2g087530	36818481-36824372 36825444-36835604	chaperone DnaJ domain protein serine/threonine-protein phosphatase BSL2-like protein	14,29983252
Root Rot Index	Ae109	2	36813934	36814635	15,71384	22	3,22E-05	Medtr2g087520 Medtr2g087530	36818481-36824372 36825444-36835604	chaperone DnaJ domain protein serine/threonine-protein phosphatase BSL2-like protein	15,69930025
Root Rot Index	ATCC 201684	2	36813934	36814635	17,003	22	2,08E-05	Medtr2g087520 Medtr2g087530	36818481-36824372 36825444-36835604	chaperone DnaJ domain protein serine/threonine-protein phosphatase BSL2-like protein	12,58553576
Root Rot Index	RB84	3	2819204	2819911	15,2738	32	1,40E-05	Medtr3g011420	2817873-2821404	NBS-LRR type disease resistance protein	14,14513314
PC1	ATCC 201684	3	2819204	2819911	23,53528	32	2,95E-06	Medtr3g011420	2817873-2821404	NBS-LRR type disease resistance protein	13,92118305
Root Rot Index	ATCC 201684	3	2819240	2820250	19,63161	49	3,17E-05	Medtr3g011420	2817873-2821404	NBS-LRR type disease resistance protein	12,17778442
PC1	ATCC 201684	3	2833877	2839136	101,10319	167	3,93E-07	Medtr3g011460	2834874-2839356	LRR and NB-ARC domain disease resistance protein	13,92118305
Root Rot Index	ATCC 201684	3	2835821	2838658	48,94302	109	3,90E-06	Medtr3g011460	2834874-2839356	LRR and NB-ARC domain disease resistance protein	12,17778442
Root Rot Index	RB84	3	2836882	2838194	21,35922	40	6,86E-06	Medtr3g011460	2834874-2839356	LRR and NB-ARC domain disease resistance protein	14,14513314
Root Rot Index	ATCC 201684	3	2855462	2855546	14,5176	13	8,95E-05	Medtr3g011480	2852782-2856642	LRR and NB-ARC domain disease resistance protein	12,17778442
PC1	ATCC 201684	3	2855462	2855546	15,67875	13	3,58E-05	Medtr3g011480	2852782-2856642	LRR and NB-ARC domain disease resistance protein	13,92118305
Root Rot Index	RB84	3	2912666	2924125	463,04928	164	4,78E-17	Medtr3g011610 Medtr3g011620 Medtr3g011630	2911993-2917319 2917554-2922861 2923472-2926629	myb transcription factor NB-ARC domain disease resistance protein tyrosine kinase family protein	14,14513314

PC1	ATCC 201684	3	2912666	2924125	1179,93284	164	5,25E-35	Medtr3g011610	2911993-2917319	myb transcription factor	13,92118305
								Medtr3g011620	2917554-2922861	NB-ARC domain disease resistance protein	
								Medtr3g011630	2923472-2926629	tyrosine kinase family protein	
Root Rot Index	ATCC 201684	3	2913290	2924125	600,96744	160	5,83E-18	Medtr3g011610	2911993-2917319	myb transcription factor	12,17778442
								Medtr3g011620	2917554-2922861	NB-ARC domain disease resistance protein	
								Medtr3g011630	2923472-2926629	tyrosine kinase family protein	
PC1	ATCC 201684	3	3036962	3037802	14,14819	27	5,10E-05	Medtr3g011840	3027773-3044636	multidrug resistance protein ABC transporter family protein	13,92118305
Root Rot Index	RB84	3	3235322	3236858	17,57822	45	0,000106124	Medtr3g012080	3214097-3216757	disease resistance protein (CC-NBS-LRR class) family protein	14,14513314
								Medtr3g012090	3218807-3222313	protein	
Root Rot Index	ATCC 201684	3	13484913	13485684	17,77861	20	4,10E-06	Medtr3g036290	13478759-13479838	NBS-LRR type disease resistance protein	12,17778442
								Medtr3g036310	13484893-13485833	F-box protein interaction domain protein	
										hypothetical protein	
PC1	ATCC 201684	3	14799474	14830831	38,47211	202	1,52E-06	Medtr3g045530	14812943-14814931	hypothetical protein	13,92118305
								Medtr3g041760	14820578-14820826	hypothetical protein	
								Medtr3g041730	14832295-14834177	DEAD-box helicase family protein	
								Medtr3g041720	14836286-14837577	molybdopterin biosynthesis protein MoaE	
Root Rot Index	RB84	3	14829650	14830059	25,46016	28	5,00E-06	Medtr3g041730	14832295-14834177	DEAD-box helicase family protein	14,14513314
								Medtr3g041720	14836286-14837577	molybdopterin biosynthesis protein MoaE	
Root Rot Index	MF1	3	16011317	16019229	17,72545	46	2,57E-05	Medtr3g047980	16010859-16011971	F-box SKIP23-like protein, putative	9,489304074
								Medtr3g048000	16023789-16026007	serpin-like protein	
Root Rot Index	MF1	3	16256496	16257466	11,63113	26	1,32E-06	Medtr3g089500	16265962-16266185	transmembrane protein, putative	9,489304074
								Medtr3g089510	16268615-16275519	MAP kinase-like protein	
Root Rot Index	NC1	3	16350319	16350416	22,478036	18	2,51E-05	Medtr3g448620	16349669-16351514	pentatricopeptide (PPR) repeat protein	9,853467472
Root Rot Index	NC1	3	20174390	20174707	15,965279	11	8,95E-06	Medtr3g051120	20169884-20174798	tryptophan synthase beta type 2	9,853467472
Root Rot Index	MF1	3	23313527	23313861	10,52367	17	0,0010368	Medtr3g058610	23307135-23311370	naringenin 3-dioxygenase (flavanone-3-hydroxylase)	9,489304074
								Medtr3g058620	23311920-23316111	50S ribosomal protein L19-2	
Root Rot Index	MF1	3	25713638	25714823	28,57215	50	6,56E-05	Medtr3g464020	25713879-25714306	hypothetical protein	9,489304074
								Medtr3g464030	25719727-25724275	disease resistance protein (TIR-NBS-LRR class)	
Root Rot Index	ATCC 201684	3	39735220	39736211	24,056	43	0,000134894	Medtr3g087700	39733238-39734754	DUF581 family protein	12,17778442
Root Rot Index	ATCC 201684	3	43582596	43584452	23,64819	42	3,17E-05	Medtr3g095380	43576349-43579439	transcription elongation factor (TFIIS) family protein	12,17778442
								Medtr3g095390	43587855-43588527	transmembrane protein, putative	
Root Rot Index	ATCC 201684	4	4366146	4366318	12,24964	14	8,59E-05	Medtr4g015060	4356331-4364912	disease resistance protein (TIR-NBS-LRR class)	12,1038147
Root Rot Index	RB84	4	6592109	6596295	66,63734	133	2,42E-09	Medtr4g020590	6586360-6594472	disease resistance protein (TIR-NBS-LRR class), putative	13,79874408
Root Rot Index	NC1	4	8418674	8418794	13,379621	9	8,46E-07	Medtr4g024830	8415912-8417670	F-box/RNI/FBD-like domain protein	9,202556916
								Medtr4g024850	8419903-8424452	DNA repair and recombination protein RadA	
Root Rot Index	MF1	4	12764922	12766006	11,5275	18	7,07E-05	Medtr4g035955	12762546-12767438	glycosyl hydrolase family 9 protein	9,79882802
Root Rot Index	MF1	4	24983236	24983947	16,76364	24	1,61E-05	Medtr4g066210	24984112-24988288	cyanogenic beta-glucosidase, putative	9,79882802
Root Rot Index	Ae109	4	25098185	25099496	17,43247	4	4,52E-06	Medtr4g066380	25062108-25065460	basic helix loop helix (bHLH) DNA-binding family protein	15,76593599
								Medtr4g066460	25111953-25114108	basic helix loop helix (bHLH) DNA-binding family protein	
Root Rot Index	Ae109	4	42323830	42325077	15,94455	11	8,39E-06	Medtr4g102230	42319525-42325193	immature colon carcinoma transcript 1 protein	15,76593599
								Medtr4g102220	42326288-42327158	DUF1442 family protein	
Root Rot Index	NC1	4	49713238	49713441	19,662803	11	1,00E-06	Medtr4g119930	49700820-49704236	cullin-like protein	9,202556916
								Medtr4g119960	49717329-49723519	BTB/POZ domain protein	
Root Rot Index	RB84	5	5045294	5047542	17,87015	27	9,14E-06	Medtr5g014850	5045676-5047471	cytochrome P450 family protein	15,19397128
								Medtr5g014860	5052966-5054490	Clavata3/ESR (CLE) gene family member MtCLE04	

Root Rot Index	RB84	5	6943599	6944735	18,06522	23	2,10E-05	Medtr5g018570 Medtr5g018580 Medtr5g018600	6931244-6936289 6936600-6939549 6944048-6947851	wall associated kinase-like protein thioredoxin-like protein TPR domain protein	15,19397128
PC1	ATCC 201684	5	7272508	7273746	16,59735	22	3,38E-09	Medtr5g019220 Medtr5g019300	7265809-7267481 7291465-7292943	CAZy family GT8 glycosyltransferase zinc finger, C3HC4 type (RING finger) protein	14,53974623
PC1	ATCC 201684	5	7347441	7349282	21,18521	45	1,60E-06	Medtr5g019480 Medtr5g019490	7350958-7354820 7356021-7360381	ubiquitin-conjugating enzyme MFS transporter	14,53974623
PC1	ATCC 201684	5	7446807	7447516	14,54324	9	1,83E-07	Medtr5g019650	7445674-7447386	homeobox leucine zipper protein	14,53974623
PC1	ATCC 201684	5	16280245	16281578	19,74503	31	7,92E-06	Medtr5g037260 Medtr5g037270	16273998-16280229 16296142-16300981	transmembrane protein, putative plant/F14N23-31 protein	14,53974623
Root Rot Index	RB84	5	16411866	16412110	22,2787	11	4,02E-06	Medtr5g037490 Medtr5g037500	16409929-16410237 16412122-16415833	blight resistance protein, putative NB-ARC domain disease resistance protein	15,19397128
Root Rot Index	NC1	5	19787152	19787660	10,371545	14	0,000258803	Medtr5g045130 Medtr5g045135	19784322-19786700 19787647-19788118	plant/T31B5-30 protein zinc ion-binding protein, putative	9,146080217
Root Rot Index	NC1	5	34260380	34260854	17,849599	25	0,0001047	Medtr5g080040 Medtr5g080050	34260315-34260533 34262486-34264057	hypothetical protein organic cation/carnitine transporter	9,146080217
Root Rot Index	NC1	5	36910084	36910744	15,483275	41	0,000438758	Medtr5g085380	36908086-36913115	vacuolar protein sorting-associated protein	9,146080217
Root Rot Index	NC1	5	40263267	40264975	43,008716	48	4,20E-05	Medtr5g092190	40256638-40265309	disease resistance protein (TIR-NBS-LRR class)	9,146080217
Root Rot Index	MF1	6	3001668	3001723	10,31715	8	2,41E-05	Medtr6g011060 Medtr6g011050	2996587-2998229 3002811-3004508	DUF247 domain protein DUF247 domain protein	9,383866389
Root Rot Index	ATCC 201684	6	6410276	6411329	17,98182	30	8,57E-05	Medtr6g016720	6409485-6411057	RNI superfamily protein, putative	12,10880618
Root Rot Index	RB84	6	6410276	6411264	19,07363	29	0,000100013	Medtr6g016720	6409485-6411057	RNI superfamily protein, putative	15,05851623
PC1	ATCC 201684	6	7568015	7569115	14,45387	20	4,76E-06	Medtr5g019940 Medtr5g019950	7562647-7565982 7568245-7572174	proline extensin-like receptor kinase, putative sulfite exporter TauE/SafE family protein	13,737706
PC1	ATCC 201684	7	12860085	12861362	15,03289	22	1,92E-05	Medtr7g034380	12859987-12862394	subtilisin-like serine protease	13,83206897
Root Rot Index	Ae109	7	16885827	16886996	17,31878	43	5,95E-06	Medtr7g050590 Medtr7g050640	16873037-16874565 16888705-16889309	transcriptional factor B3 family protein B3 DNA-binding domain protein	16,75382638
PC1	ATCC 201684	7	26986478	26987111	19,0822	22	0,000210513	Medtr7g072550 Medtr7g072560 Medtr7g072575	26985106-26988340 26990065-26995299 27004942-27008240	WEB family plant protein saposin B domain protein CBL-interacting kinase	13,83206897
PC1	ATCC 201684	8	4439777	4441811	40,119	32	3,01E-06	Medtr8g014260	4439386-4442597	F-box/RNI/FBD-like domain protein	13,78773838
Root Rot Index	ATCC 201684	8	6294736	6296369	16,98636	36	4,79E-05	Medtr8g018450 Medtr8g018470	6287218-6291683 6297035-6301008	seed linoleate 9S-lipoxygenase hypothetical protein	13,02758454
Root Rot Index	RB84	8	19152643	19157601	23,21853	72	2,37E-05	Medtr8g051540 Medtr8g051580	19148365-19151700 19162447-19162992	cysteine-rich RLK (receptor-like kinase) protein MADS-box transcription factor family protein	15,67275528
PC1	ATCC 201684	8	19156776	19157689	18,17782	54	0,000111332	Medtr8g051540 Medtr8g051580	19148365-19151700 19162447-19162992	cysteine-rich RLK (receptor-like kinase) protein MADS-box transcription factor family protein	13,78773838
Root Rot Index	ATCC 201684	8	19156776	19157601	15,93477	49	0,000137802	Medtr8g051540 Medtr8g051580	19148365-19151700 19162447-19162992	cysteine-rich RLK (receptor-like kinase) protein MADS-box transcription factor family protein	13,02758454
Root Rot Index	MF1	8	30590512	30595353	24,80352	66	2,26E-05	Medtr8g072360	30587928-30595373	GDA1/CD39 nucleoside phosphatase family protein	10,03905383