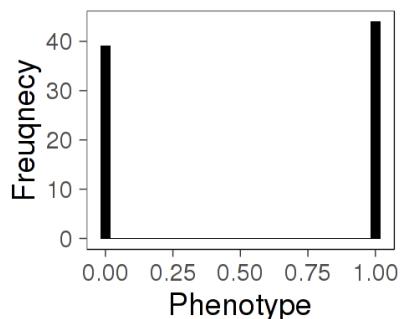
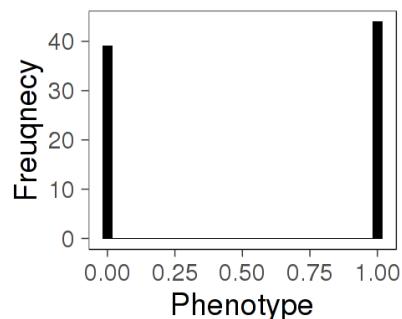


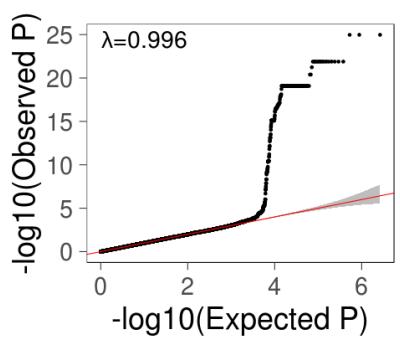
Phenotype histogram and quantile-quantile plots of p-values



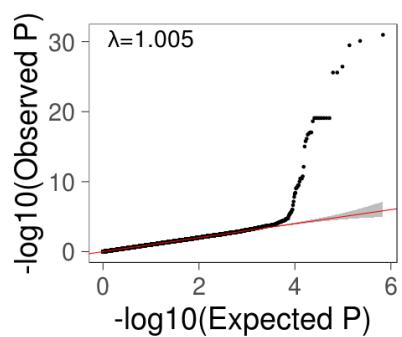
Original phenotype distribution



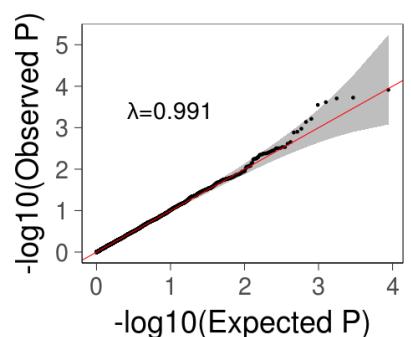
Transformed phenotype distribution



SNP

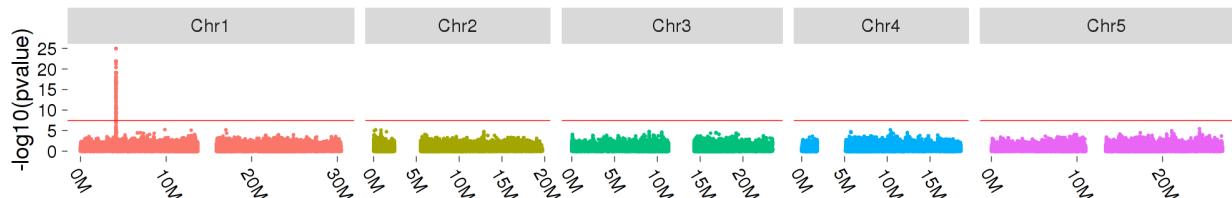


INDEL



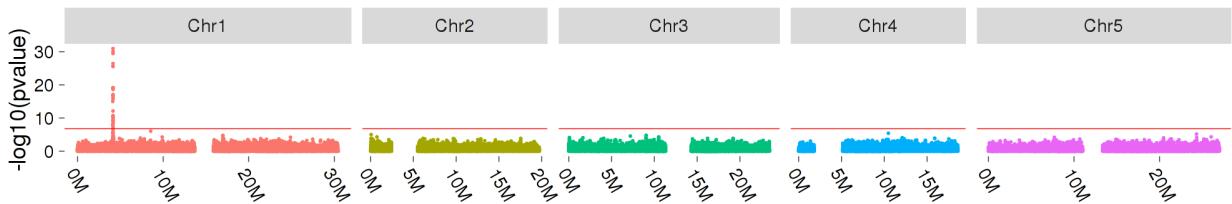
ORF

SNP results



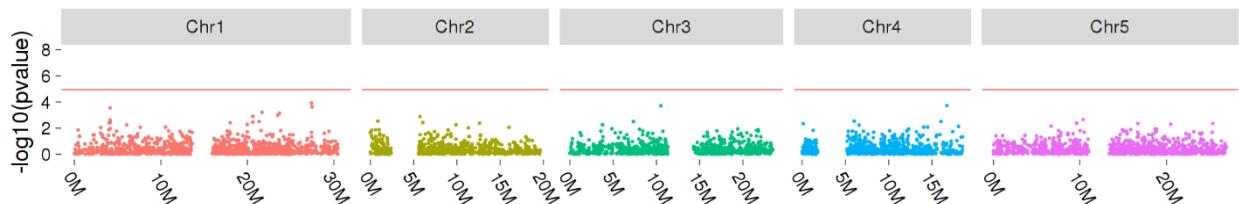
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	1	4140402	24.97581	AT1G12220	RPS5	4533

INDEL results

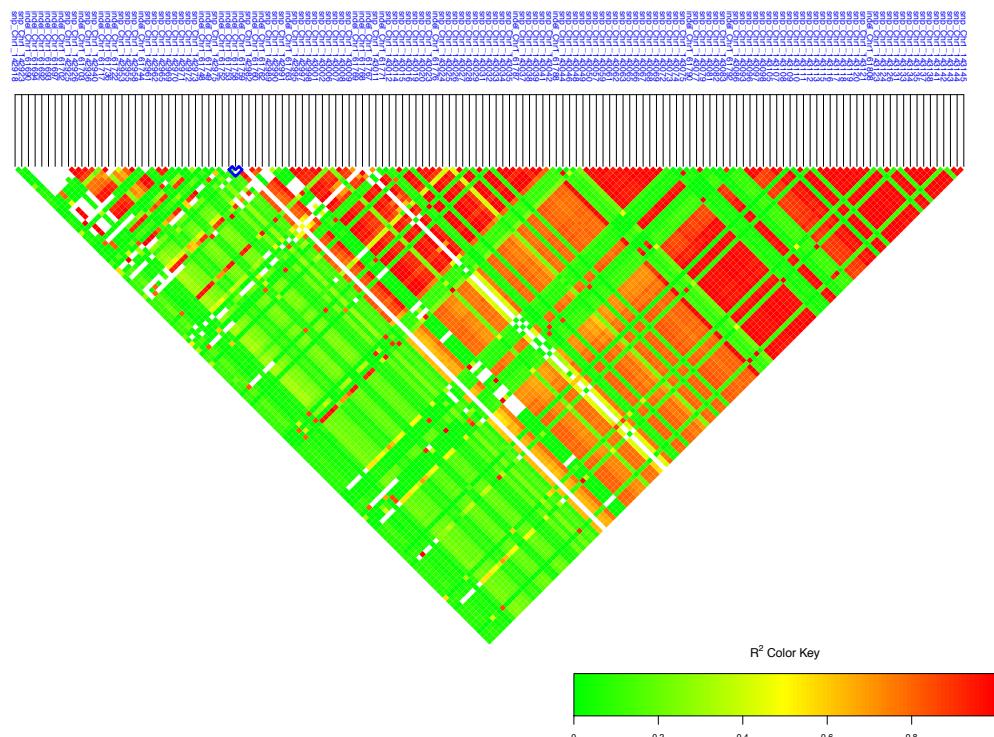


Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	1	4140250	30.98384	AT1G12220	RPS5	-1pb deletion	4685

ORFS results

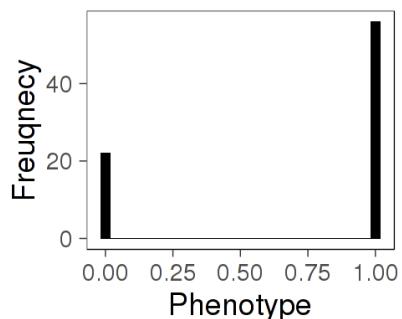


LD pattern nearby the significant INDEL

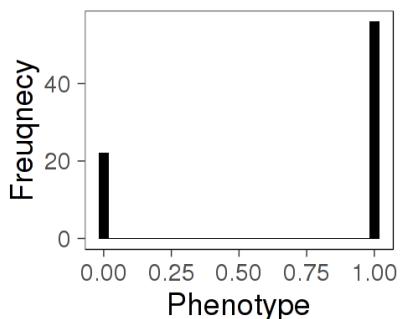


S Fig 13 Summary of GWAS results for AvrPphB (*Arabidopsis thaliana*)

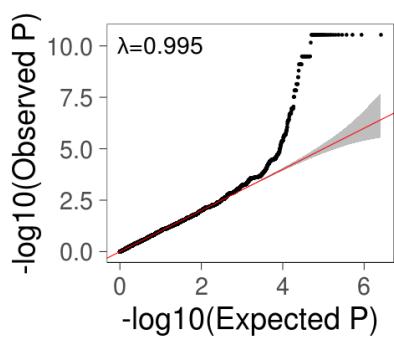
Phenotype histogram and quantile-quantile plots of p-values



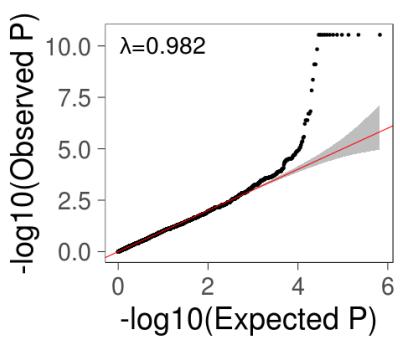
Original phenotype distribution



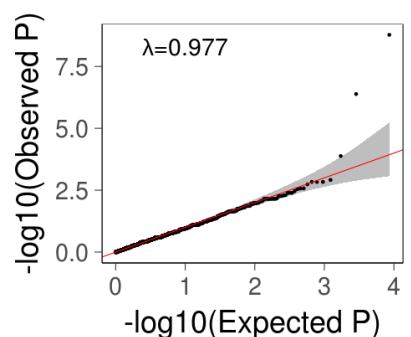
Transformed phenotype distribution



SNP

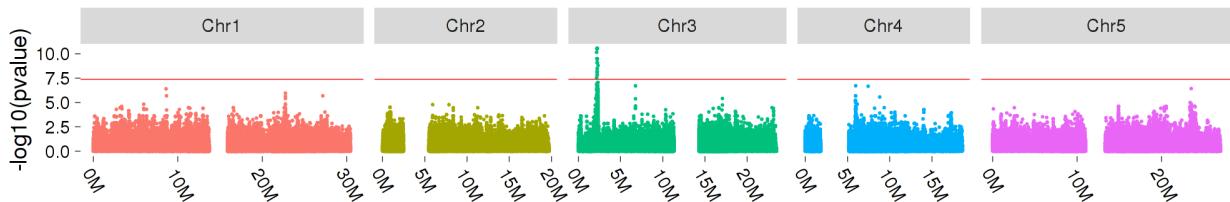


INDEL



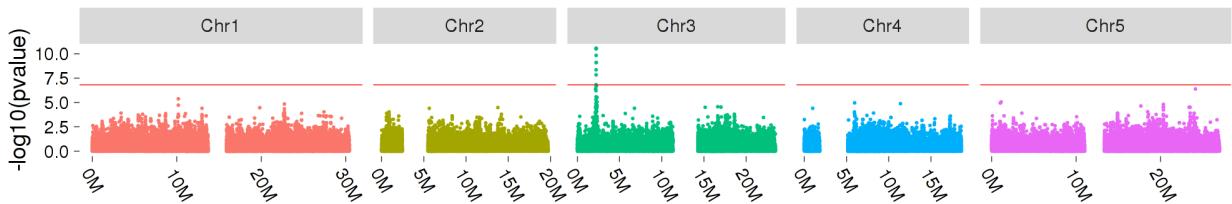
ORF

SNP results



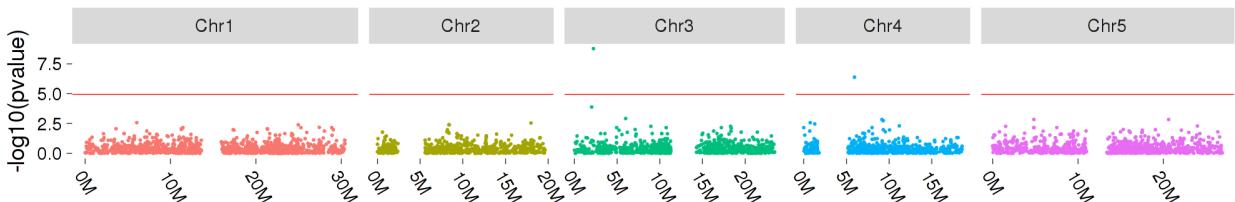
Peak rank	Chr	SNP pos(bp)	$-\log_{10}(\text{pvalue})$	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	3	2224655	10.53809	AT3G07040	RPM1	1297

INDEL results



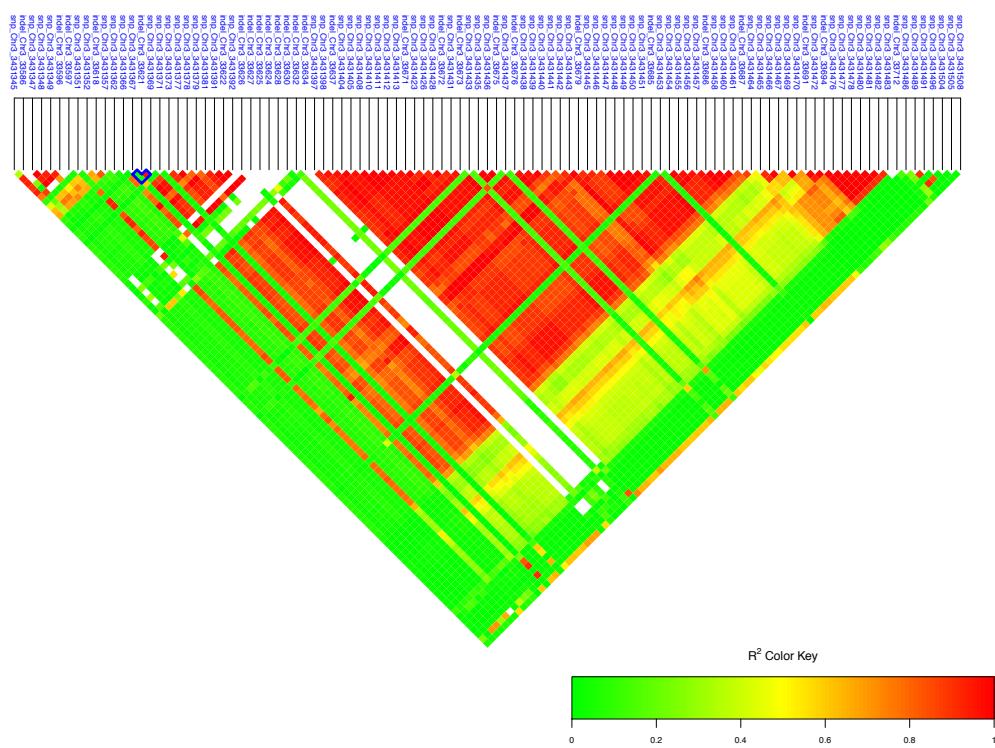
Peak rank	Chr	INDEL pos(bp)	-log ₁₀ (pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	3	2224259	10.53809	AT3G07040	RPM1	2bp deletion	1693

ORFS results



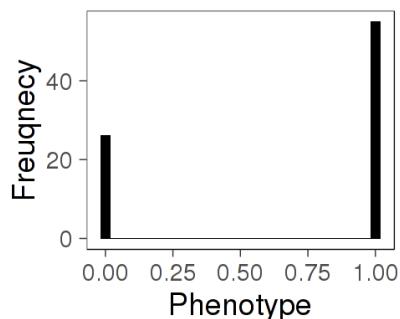
Peak rank	Chr	-log ₁₀ (pvalue)	Candidate gene ID	Candidate gene name
1	3	8.775945	AT3G07040	RPM1
2	4	6.383209	AT4G09360	NA

LD pattern nearby the significant INDEL

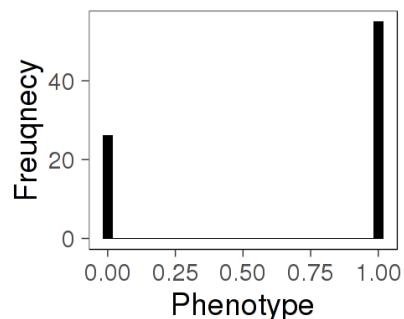


S Fig 14 Summary of GWAS results for *AvrRpm1* (*Arabidopsis thaliana*)

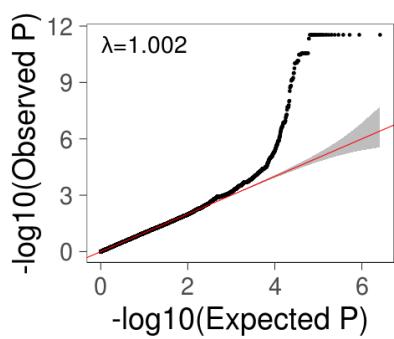
Phenotype histogram and quantile-quantile plots of p-values



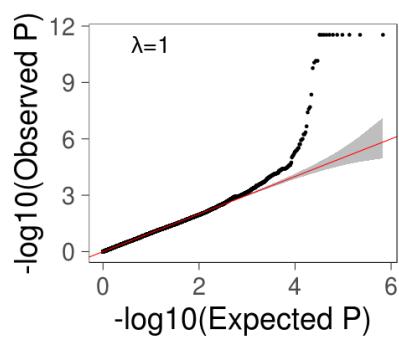
Original phenotype distribution



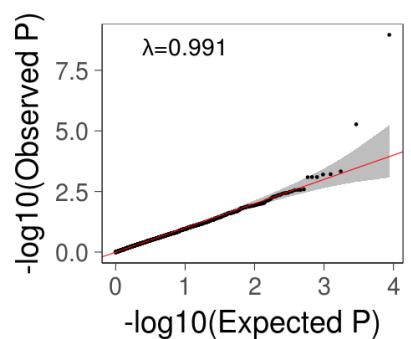
Transformed phenotype distribution



SNP

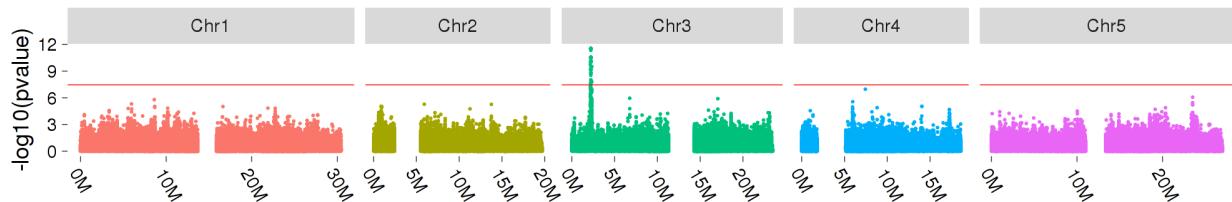


INDEL



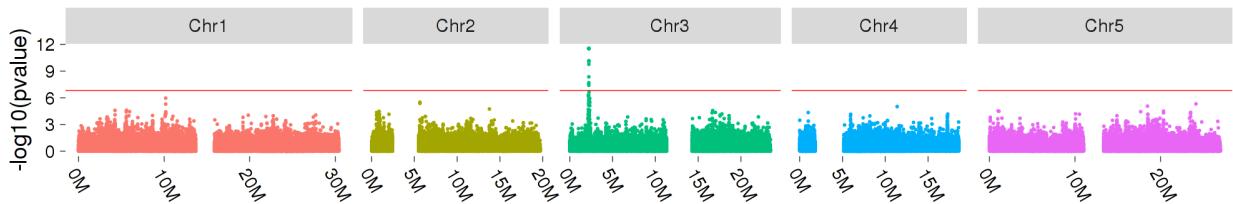
ORF

SNP results



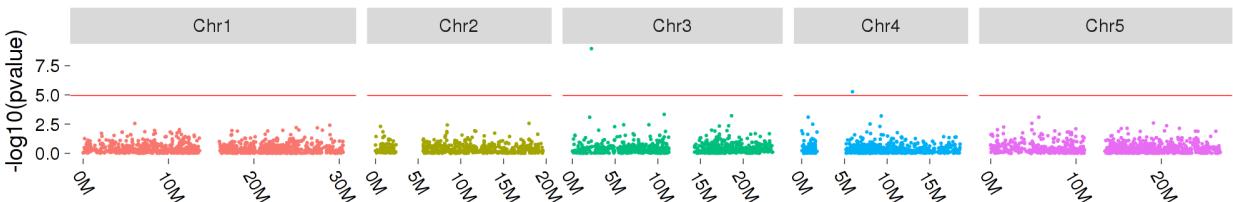
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	3	2224655	11.53682	AT3G07040	RPM1	1297

INDEL results



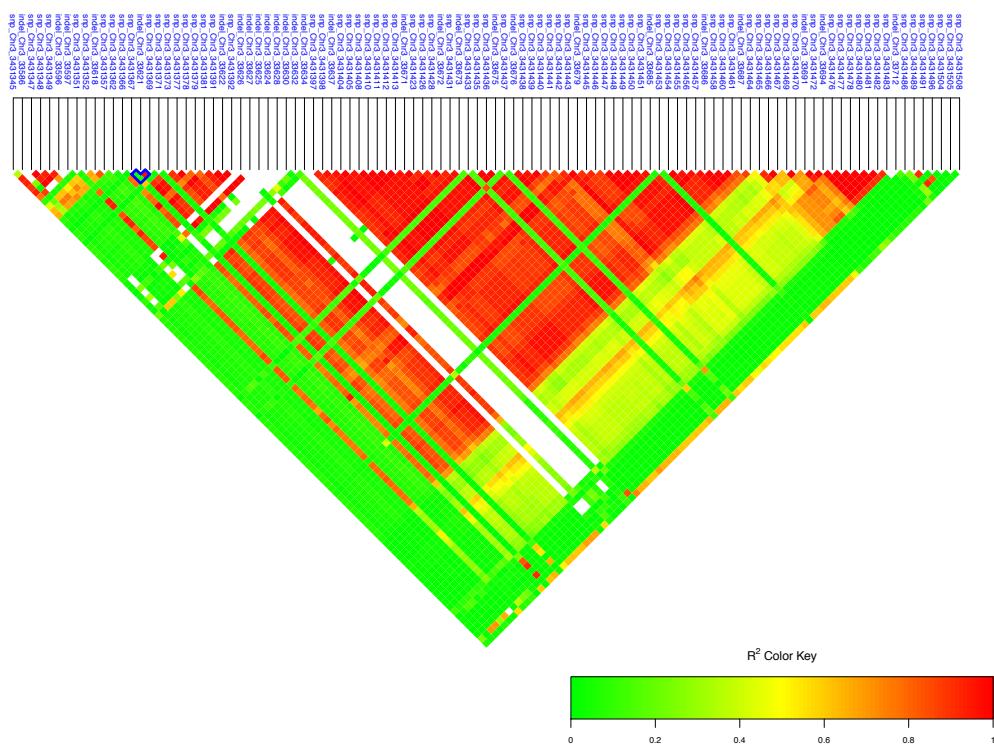
Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	3	2224259	11.53682	AT3G07040	RPM1	2bp deletion	1693

ORFS results



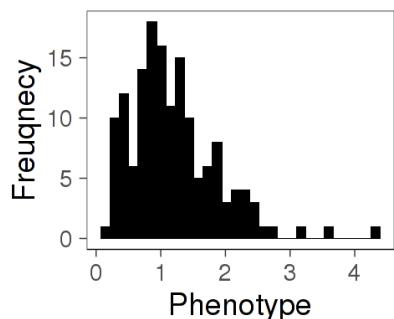
Peak rank	Chr	-log10(pvalue)	Candidate gene ID	Candidate gene name
1	3	8.963032	AT3G07040	RPM1
2	4	5.270777	AT4G09360	

LD pattern nearby the significant INDEL

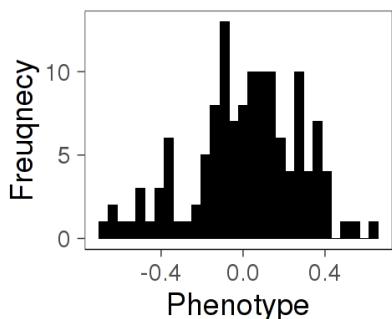


S Fig 15 Summary of GWAS results for *AvrB* (*Arabidopsis thaliana*)

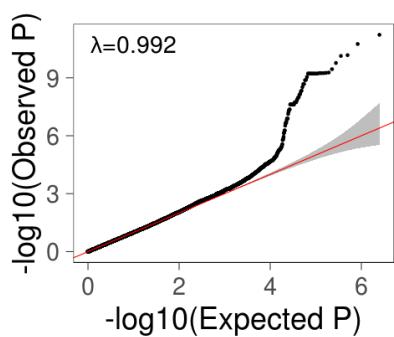
Phenotype histogram and quantile-quantile plots of p-values



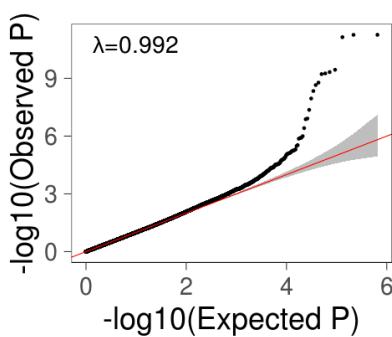
Original phenotype distribution



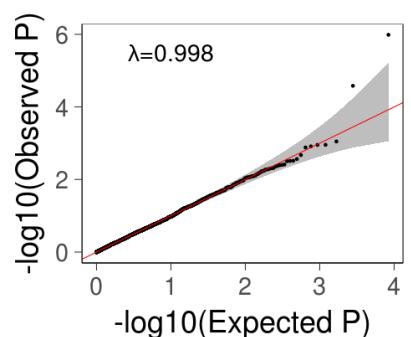
Transformed phenotype distribution



SNP

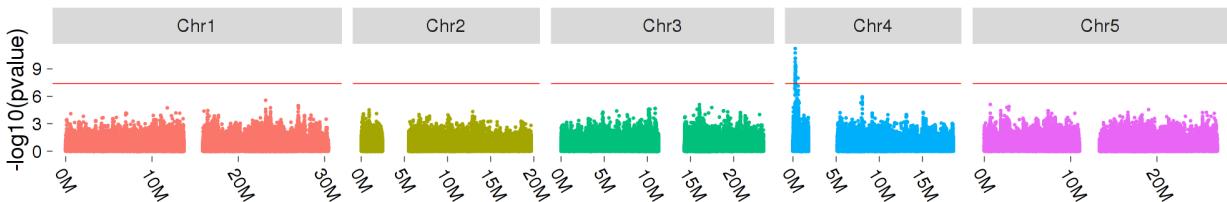


INDEL



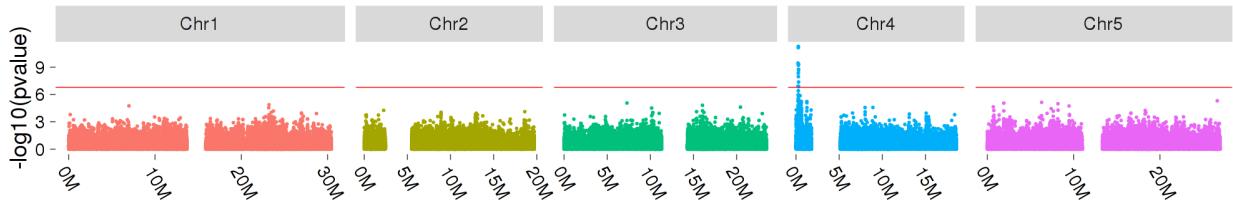
ORF

SNP results



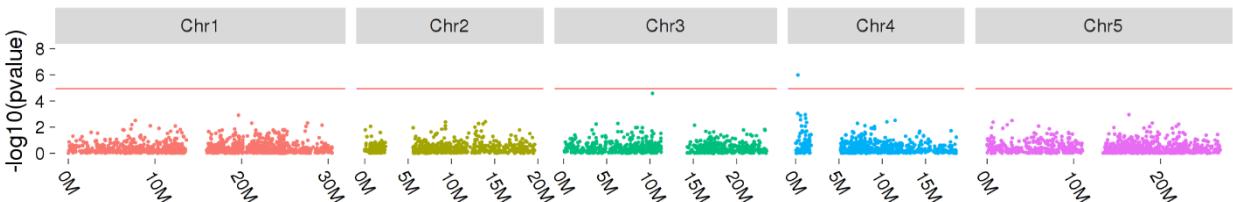
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	4	262690	11.22611	AT4G00650	FRI	6336
2	4	583422	7.995266	NA	NA	NA

INDEL results



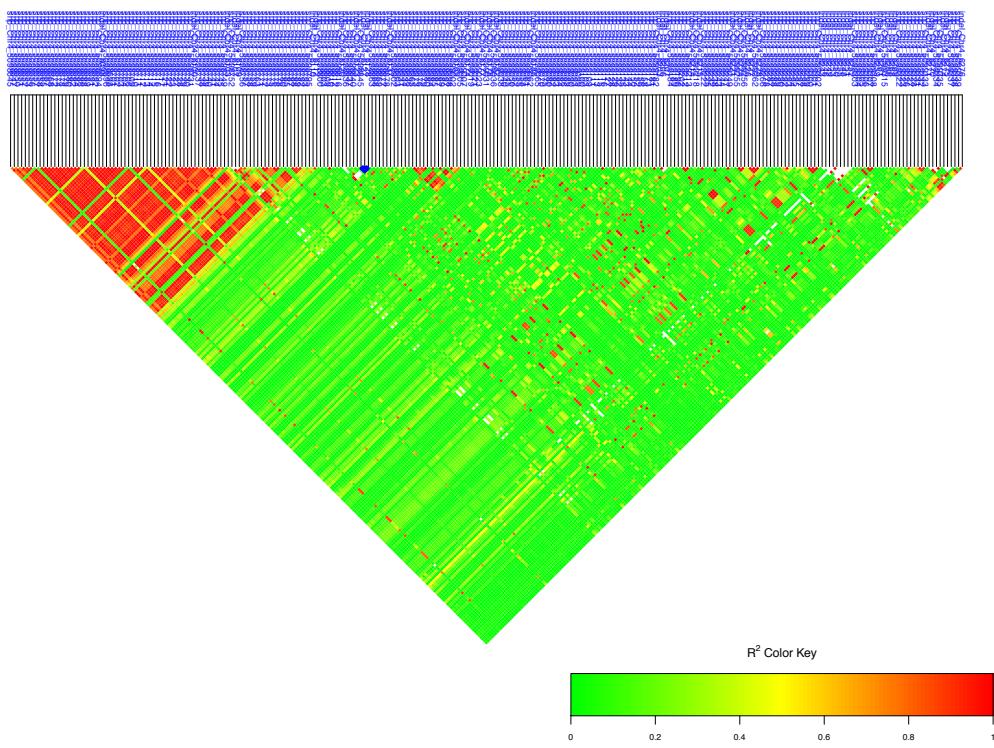
Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	4	268992	11.2613	AT4G00650	FRI	4bp deletion	34

ORFS results



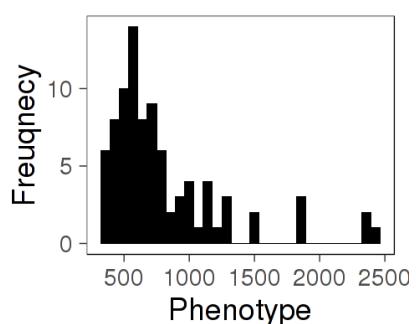
Peak rank	Chr	-log10(pvalue)	Candidate gene ID	Candidate gene name
1	4	5.985406	AT4G00650	FRI

LD pattern nearby the significant INDEL

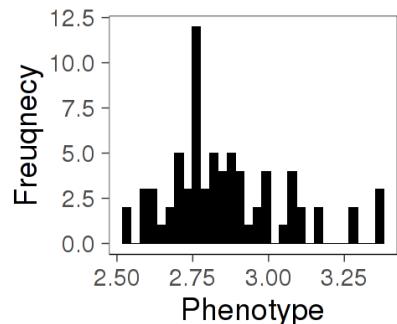


S Fig 16 Summary of GWAS results for FRI gene expression (FRI) (*Arabidopsis thaliana*)

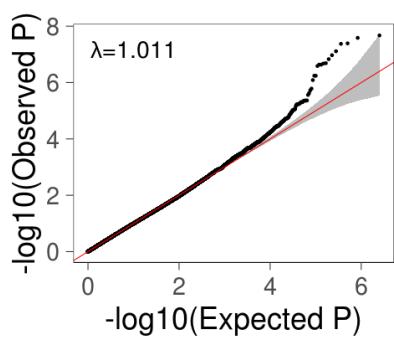
Phenotype histogram and quantile-quantile plots of p-values



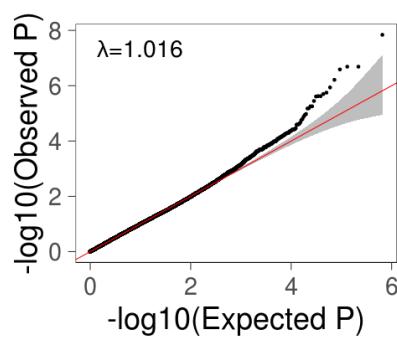
Original phenotype distribution



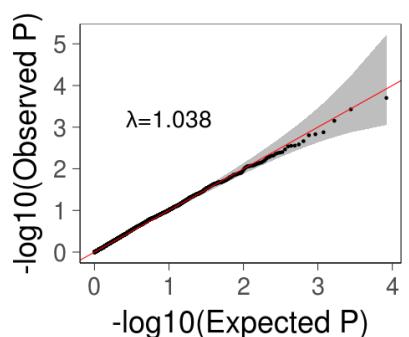
Transformed phenotype distribution



SNP

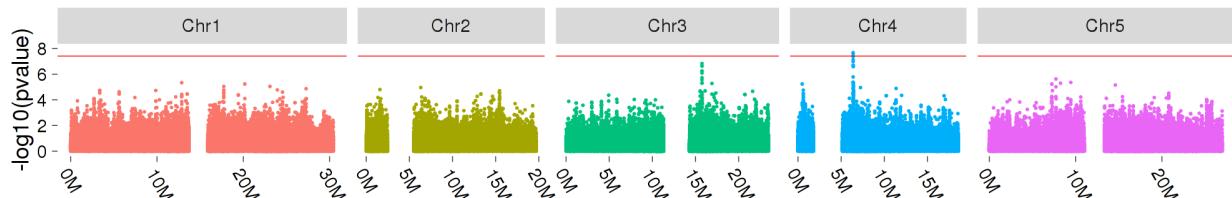


INDEL



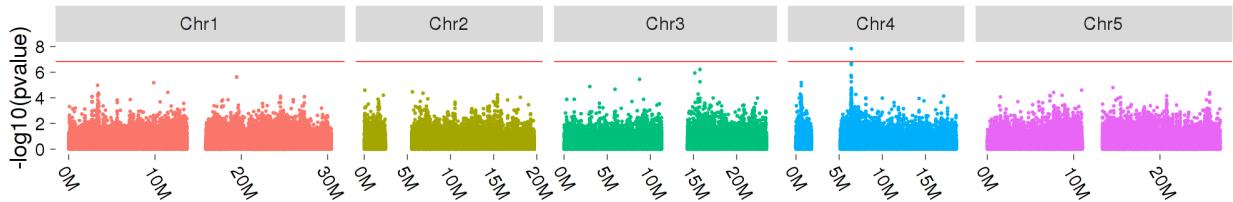
ORF

SNP results



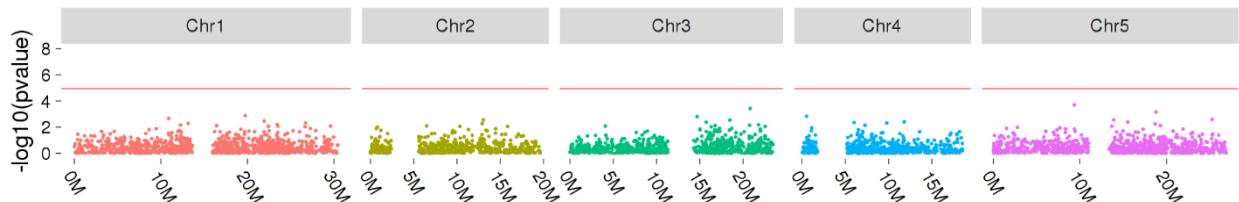
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	4	6388806	7.674211	AT4G10310	HKT1	3178

INDEL results

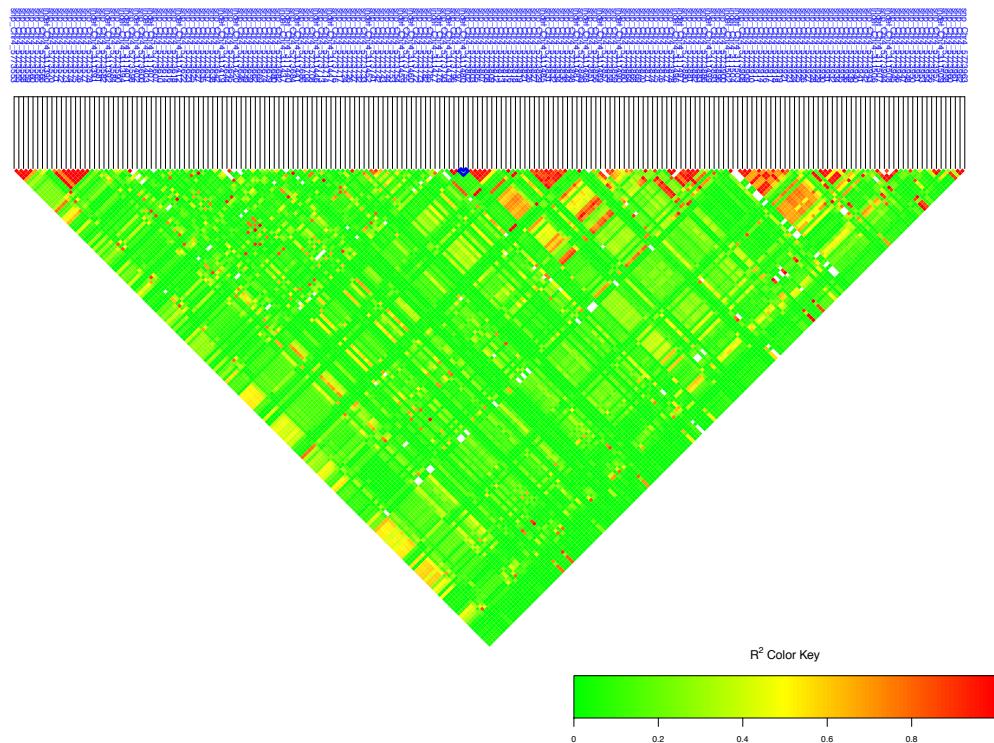


Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	4	6406799	7.840971	AT4G10310	HKT1	1bp deletion	10922

ORFS results

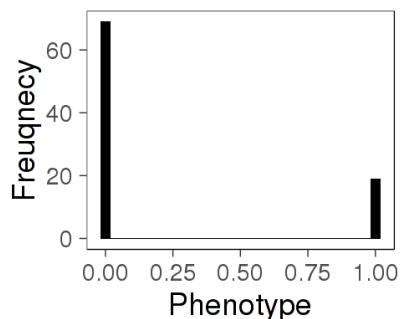


LD pattern nearby the significant INDEL

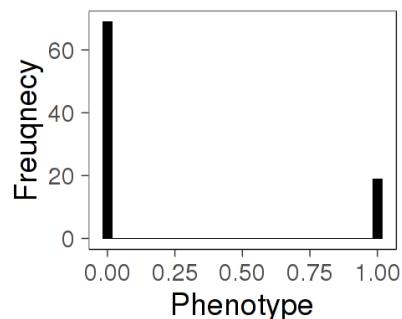


S Fig 17 Summary of GWAS results for Sodium concentration (Na) (*Arabidopsis thaliana*)

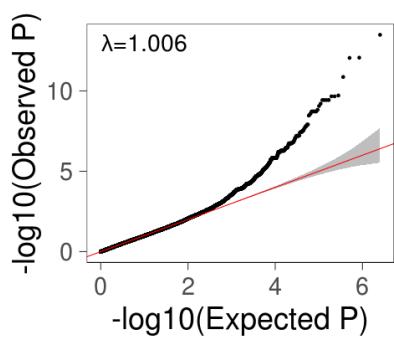
Phenotype histogram and quantile-quantile plots of p-values



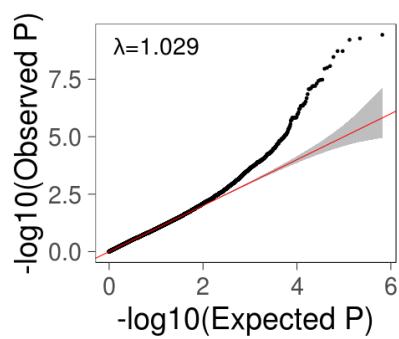
Original phenotype distribution



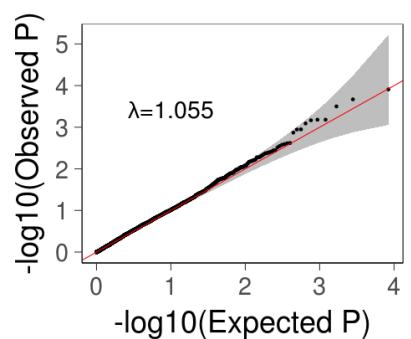
Transformed phenotype distribution



SNP

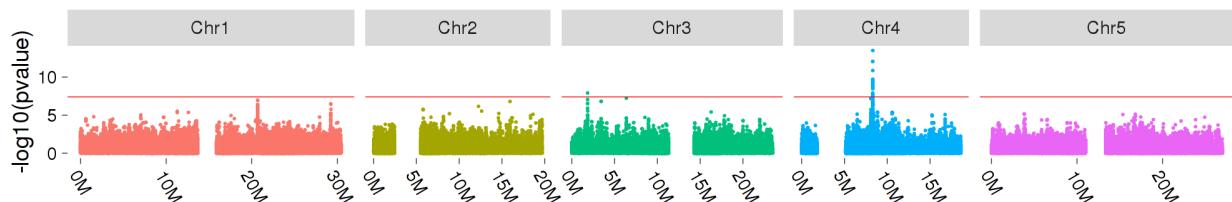


INDEL



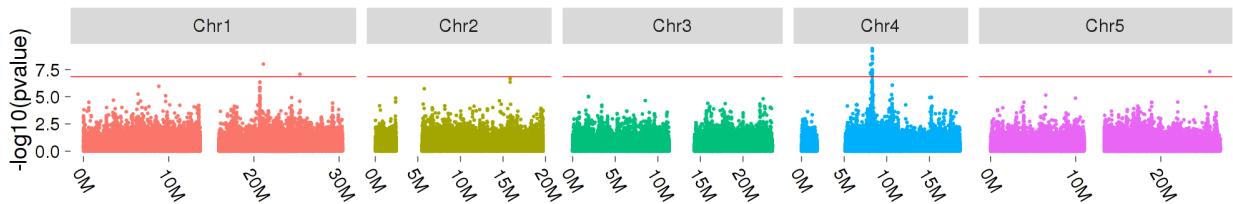
ORF

SNP results



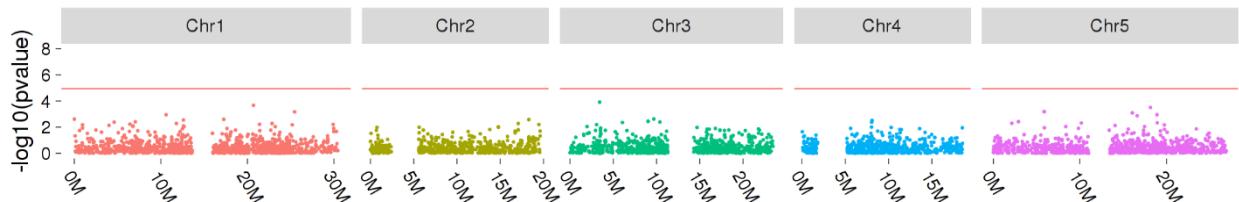
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	4	8308754	13.4916	AT4G14400	ACD6	10152
2	3	1849174	7.909341	NA	NA	NA

INDEL results

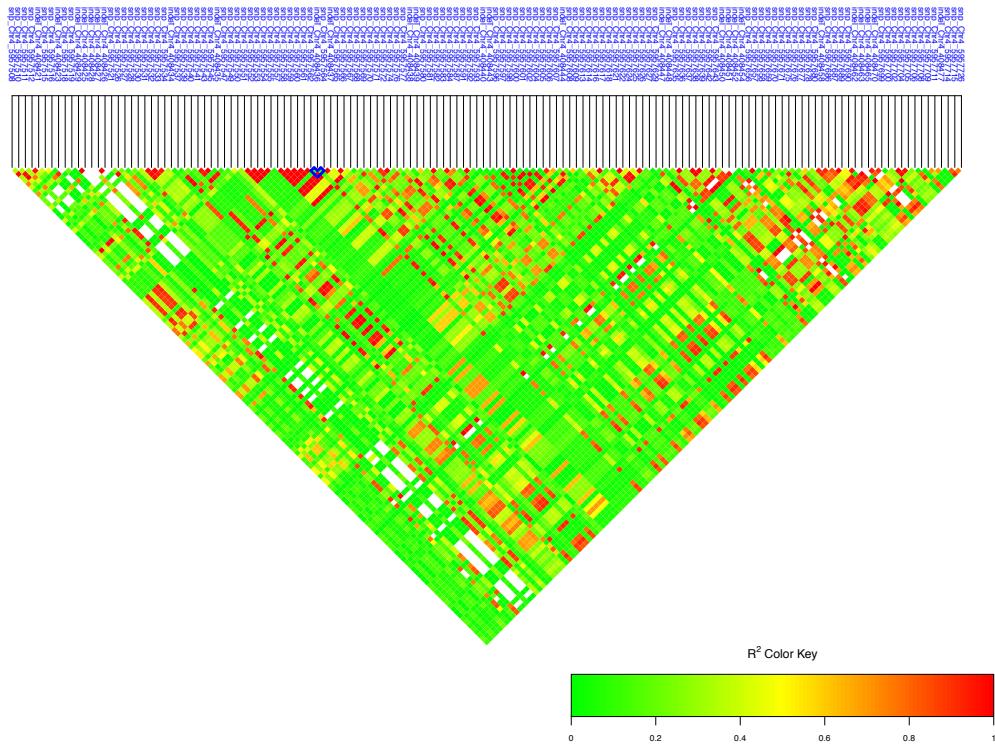


Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	4	8300788	9.431888	AT4G14400	ACD6	1bp insertion	2186
2	1	21108124	7.999914	NA	NA	6bp deletion	NA
3	4	8095232	7.956144	NA	NA	4bp insertion	NA
4	5	25738844	7.315178	NA	NA	1bp deletion	NA
5	1	25401861	7.074914	NA	NA	2bp insertion	NA

ORFS results

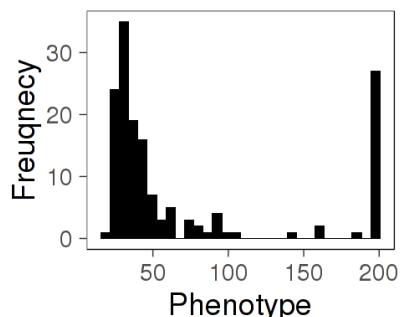


LD pattern nearby the significant INDEL

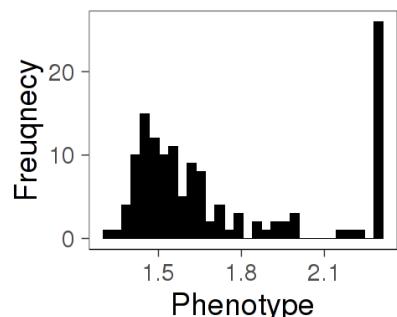


S Fig 18 Summary of GWAS results for leaf presence or absence of lesioning (LES)
(*Arabidopsis thaliana*)

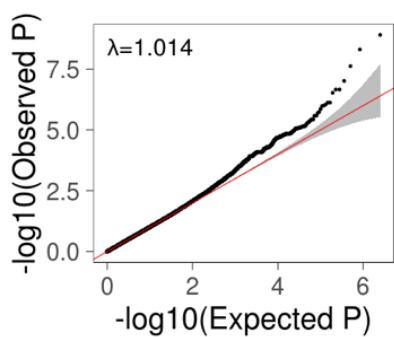
Phenotype histogram and quantile-quantile plots of p-values



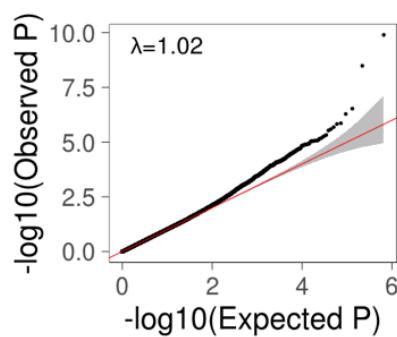
Original phenotype distribution



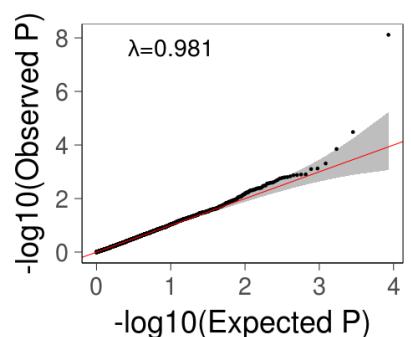
Transformed phenotype distribution



SNP

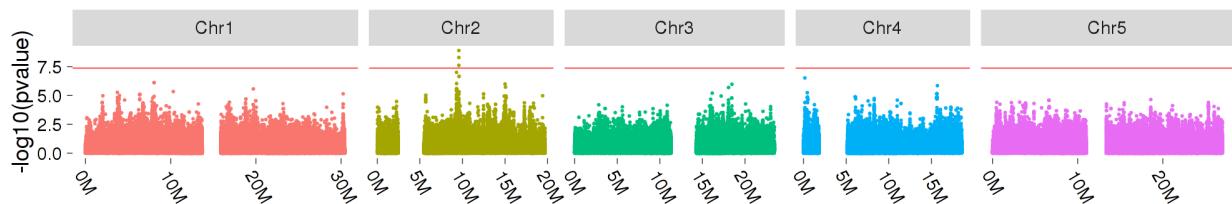


INDEL



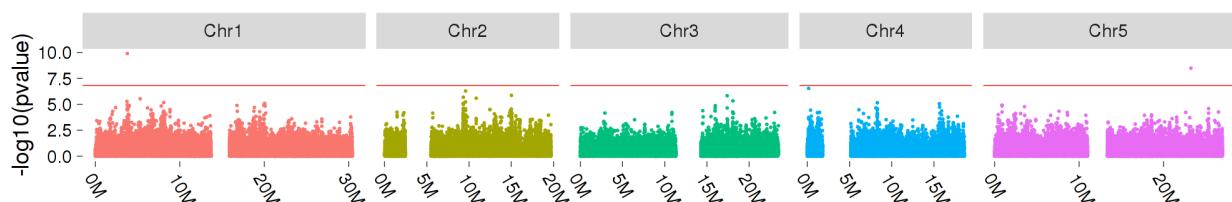
ORF

SNP results



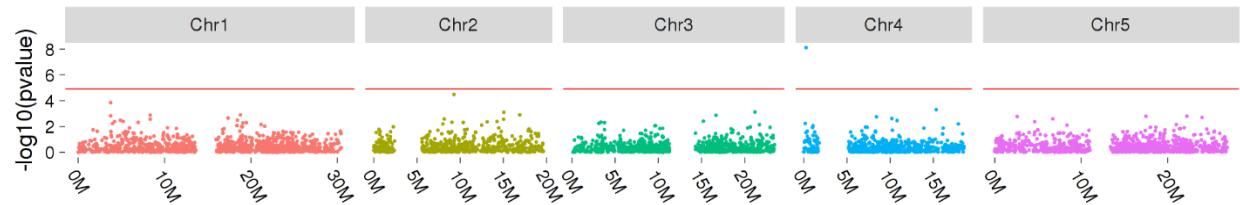
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	2	9581436	8.906688	AT2G22540	SVP	0

INDEL results



Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	1	3785721	9.89584	NA	NA	3bp deletion	NA
2	5	23249423	8.483741	AT5G57380	VIN3	4bp deletion	0

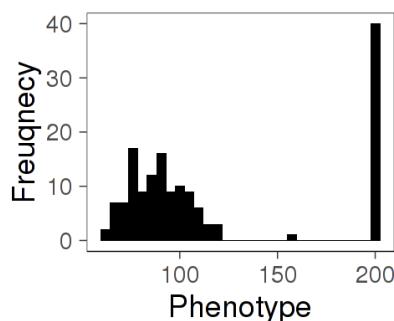
ORFS results



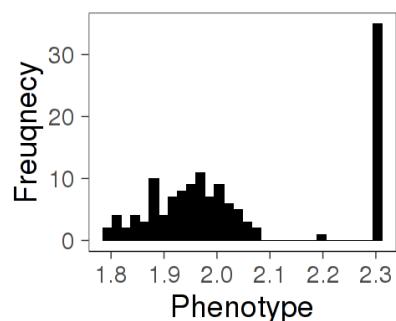
Peak rank	Chr	-log10(pvalue)	Candidate gene ID	Candidate gene name
1	4	8.114638	AT4G00650	FRI

S Fig 19 Summary of GWAS results for Days to Flowering under Long Days(LD) (*Arabidopsis thaliana*)

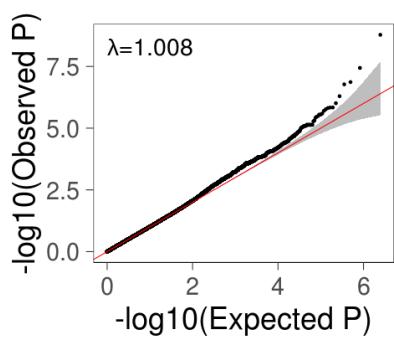
Phenotype histogram and quantile-quantile plots of p-values



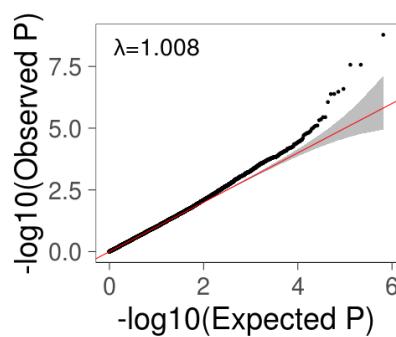
Original phenotype distribution



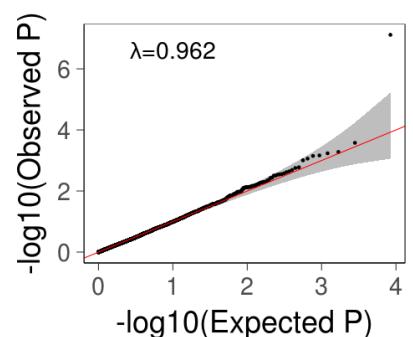
Transformed phenotype distribution



SNP

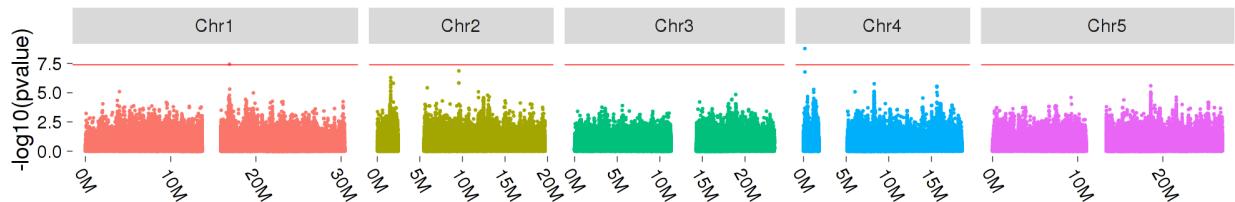


INDEL



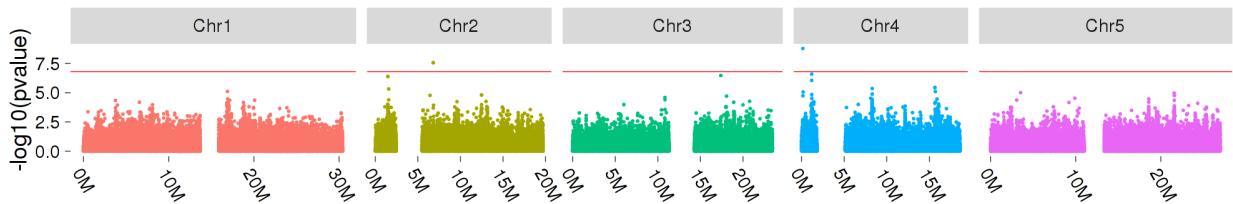
ORF

SNP results



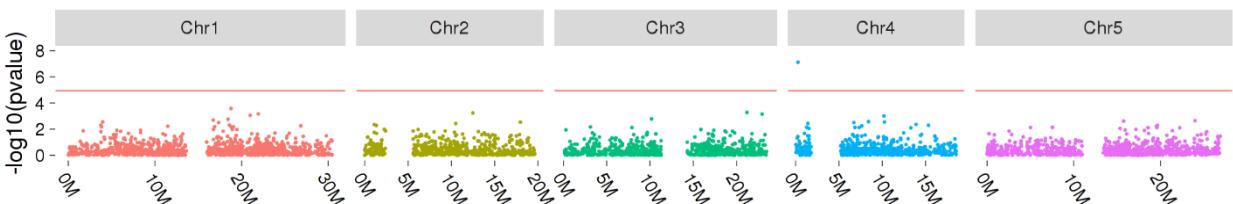
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	4	153182	8.780621	NA	NA	NA
2	1	16896471	7.440242	NA	NA	NA

INDEL results



Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	4	153183	8.780621	NA	NA	1bp deletion	NA
2	2	6809096	7.567506	NA	NA	1bp insertion	NA

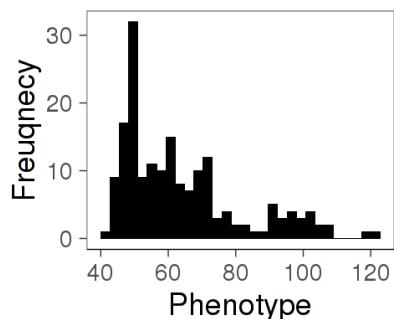
ORFS results



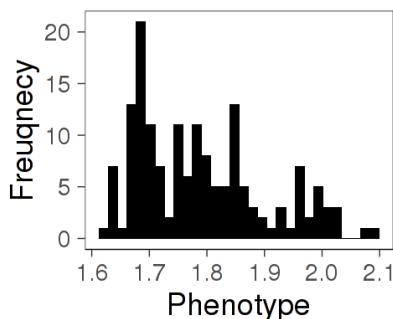
Peak rank	Chr	-log10(pvalue)	Candidate gene ID	Candidate gene name
1	4	7.113531	AT4G00650	FRI

S Fig 20 Summary of GWAS results for Days to Flowering under Short Days(SD) (*Arabidopsis thaliana*)

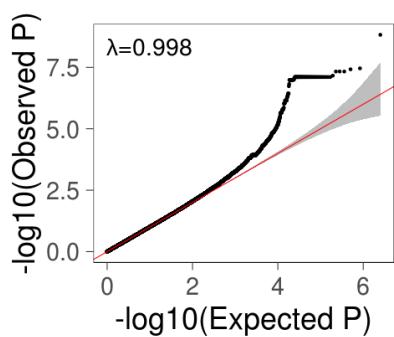
Phenotype histogram and quantile-quantile plots of p-values



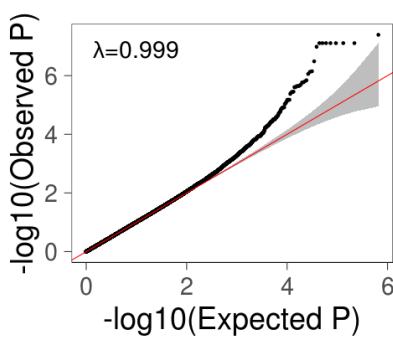
Original phenotype distribution



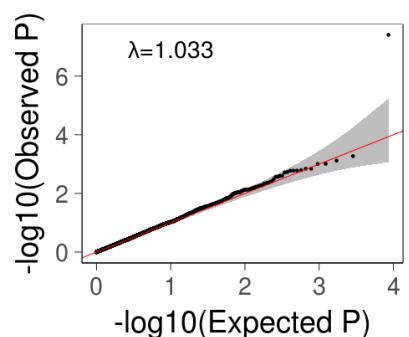
Transformed phenotype distribution



SNP

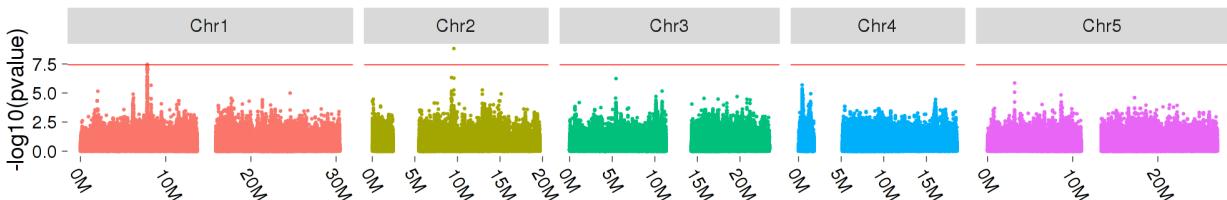


INDEL



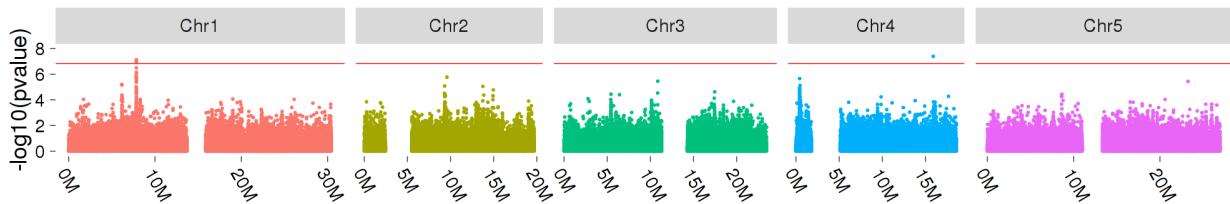
ORF

SNP results



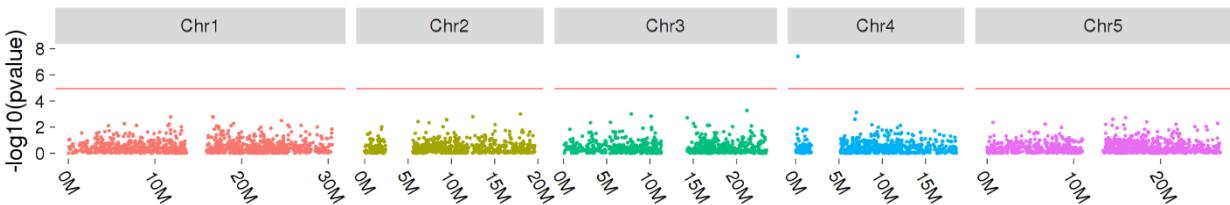
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	2	9581436	8.825307	AT2G22540	SVP	0
2	1	7840846	7.459525	NA	NA	NA

INDEL results



Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	4	15904286	7.391508	AT4G32980	ATH1	1bp insertion	10436
2	1	7839243	7.107148	NA	NA	1bp deletion	NA

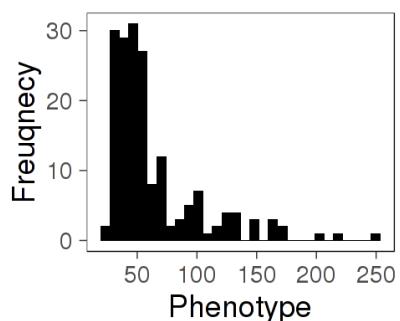
ORFS results



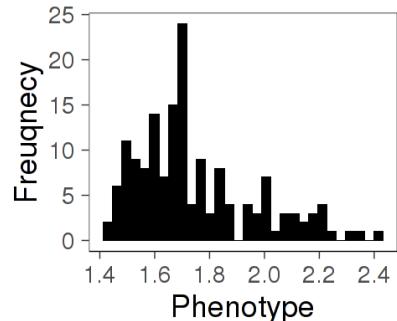
Peak rank	Chr	-log10(pvalue)	Candidate gene ID	Candidate gene name
1	4	7.349317	AT4G00650	FRI

S Fig 21 Summary of GWAS results for Days to Flowering at 10°C(FT10) (*Arabidopsis thaliana*)

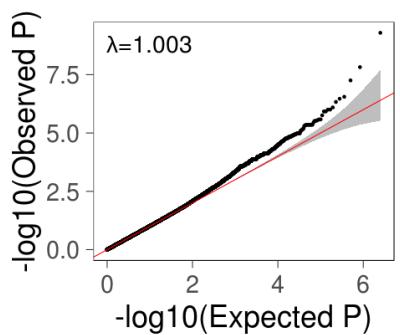
Phenotype histogram and quantile-quantile plots of p-values



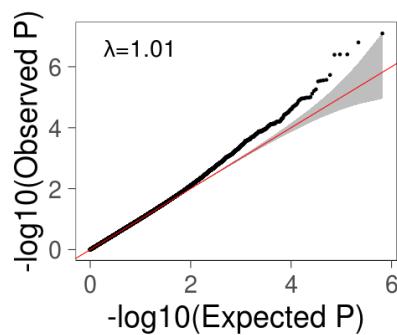
Original phenotype distribution



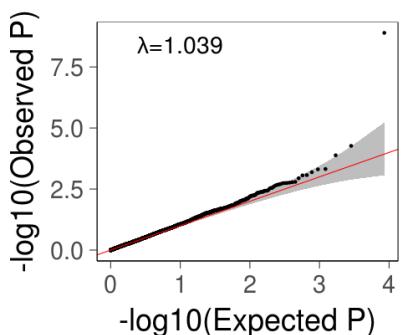
Transformed phenotype distribution



SNP

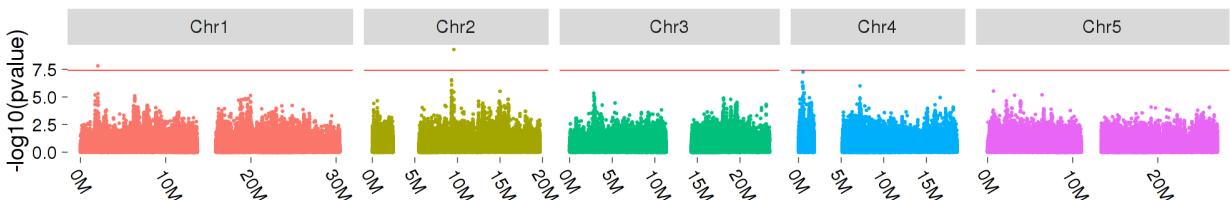


INDEL



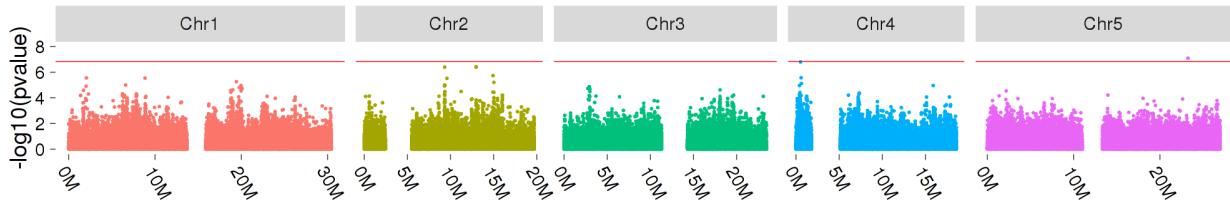
ORF

SNP results



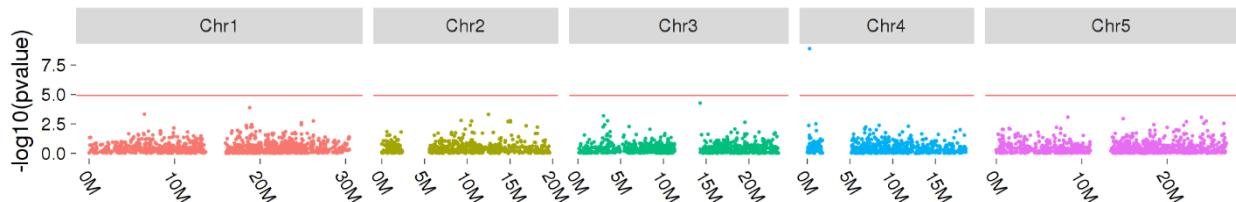
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	2	9581436	9.294797	AT2G22540	SVP	0
2	1	2033739	7.822843	NA	NA	NA

INDEL results



Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	5	23249423	7.09282	AT5G57380	VIN3	4bp deletion	0

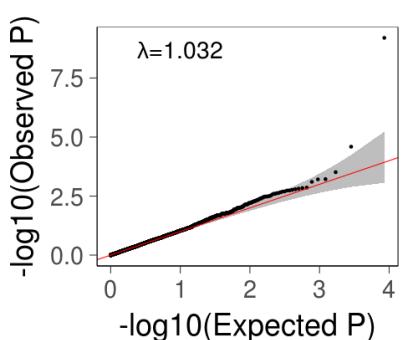
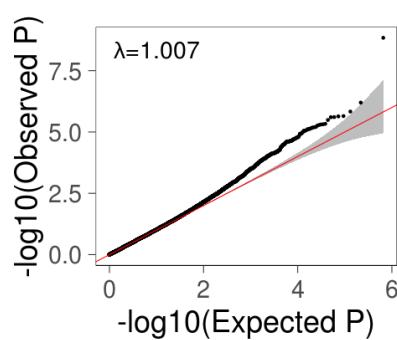
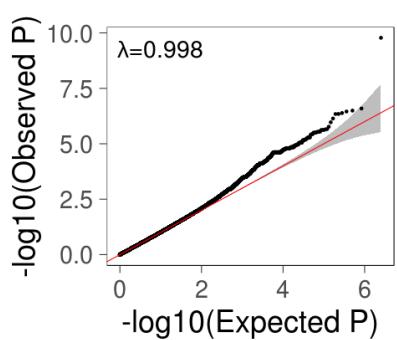
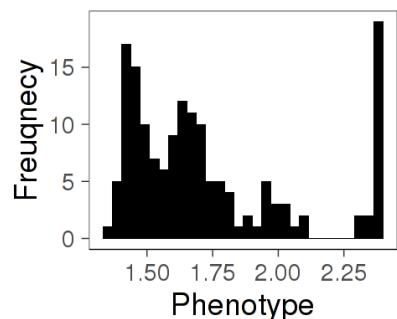
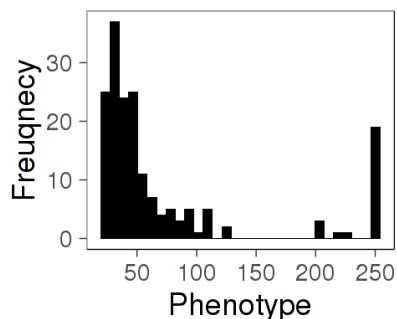
ORFS results



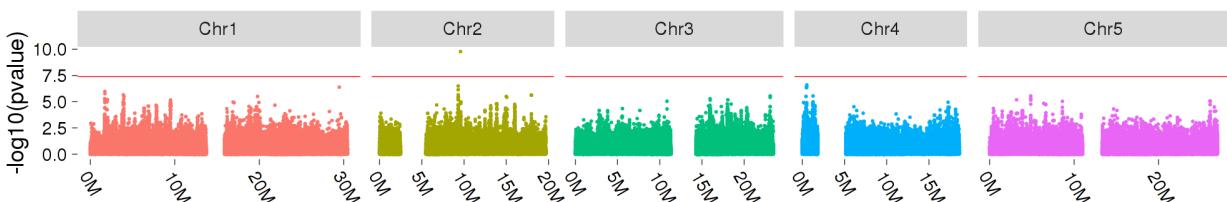
Peak rank	Chr	-log10(pvalue)	Candidate gene ID	Candidate gene name
1	4	8.438639	AT4G00650	FRI

S Fig 22 Summary of GWAS results for Days to Flowering at 16°C (FT16) (*Arabidopsis thaliana*)

Phenotype histogram and quantile-quantile plots of p-values

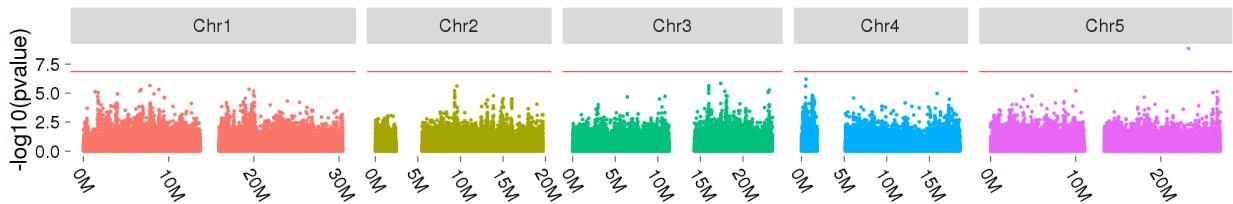


SNP results



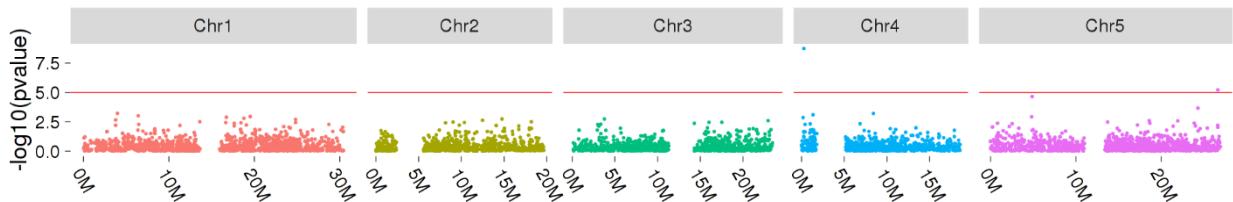
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	2	9581436	9.778797	AT2G22540	SVP	0

INDEL results



Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	5	23249423	8.84059	AT5G57380	VIN3	4bp deletion	0

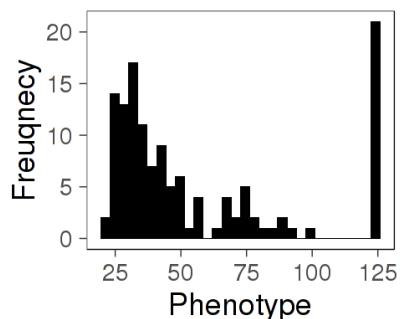
ORFS results



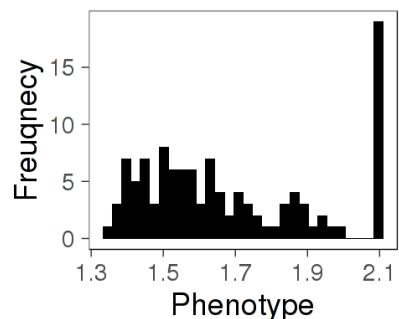
Peak rank	Chr	-log10(pvalue)	Candidate gene ID	Candidate gene name
1	4	8.740229	AT4G00650	FRI

S Fig 23 Summary of GWAS results for Days to Flowering at 22°C (FT22) (*Arabidopsis thaliana*)

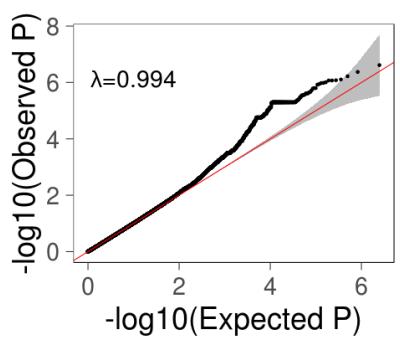
Phenotype histogram and quantile-quantile plots of p-values



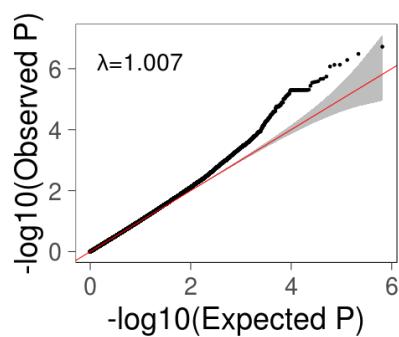
Original phenotype distribution



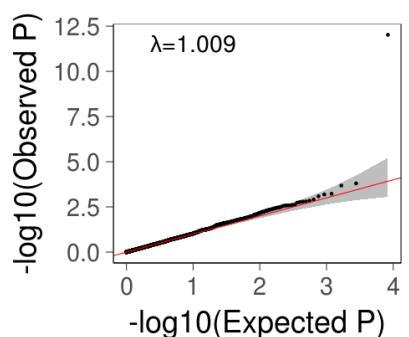
Transformed phenotype distribution



SNP

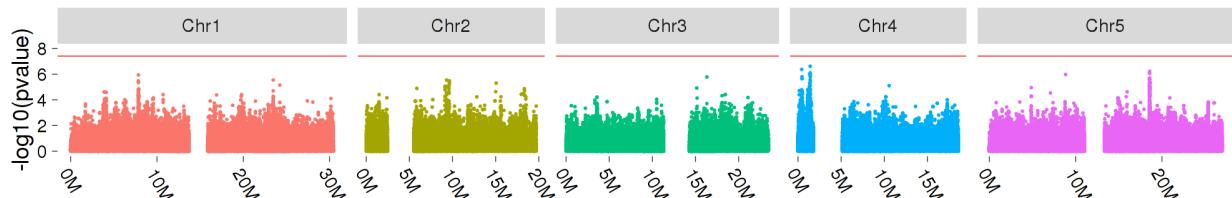


INDEL

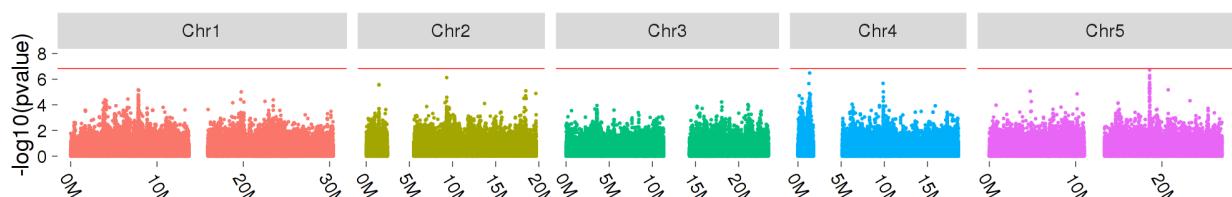


ORF

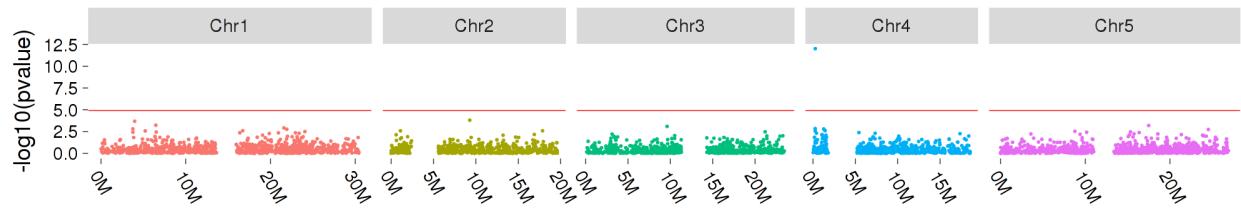
SNP results



INDEL results



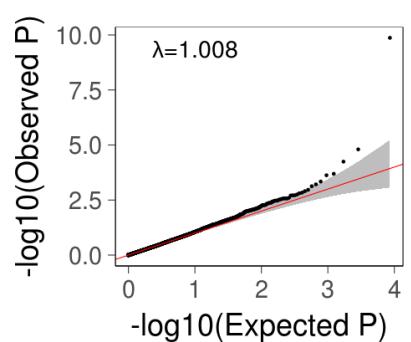
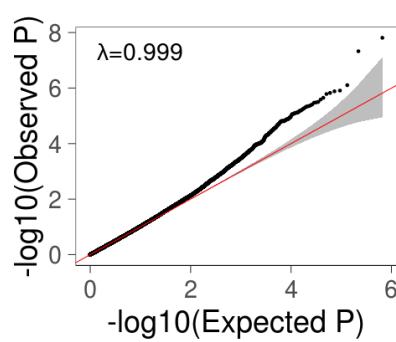
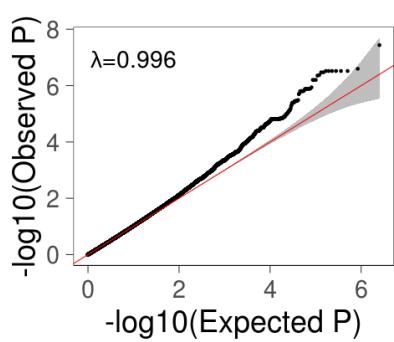
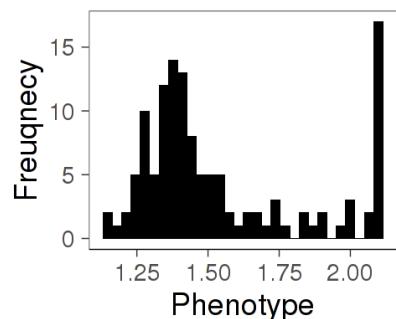
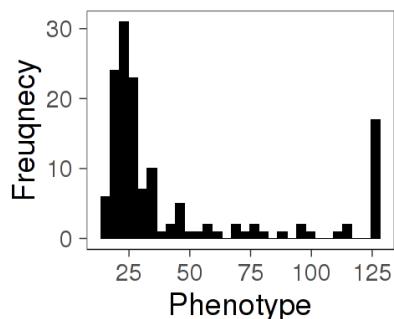
ORFS results



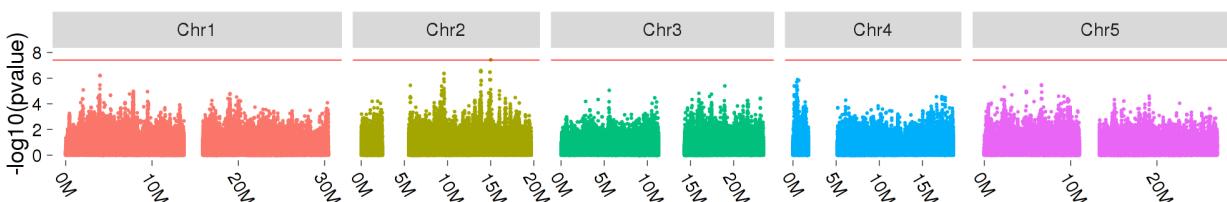
Peak rank	Chr	-log10(pvalue)	Candidate gene ID	Candidate gene name
1	4	12.02024	AT4G00650	FRI

S Fig 24 Summary of GWAS results for No vernalization, grown as JIC(0W) (*Arabidopsis thaliana*)

Phenotype histogram and quantile-quantile plots of p-values

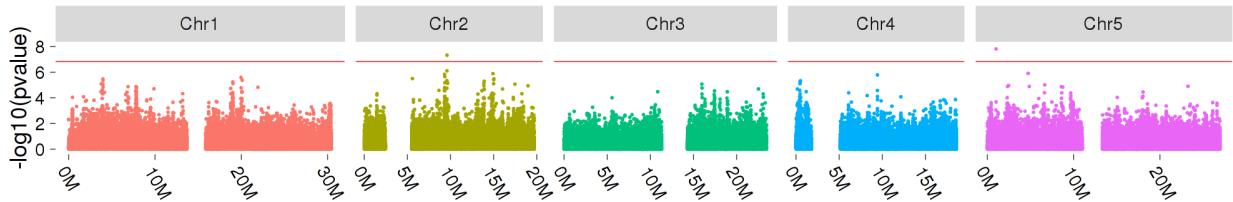


SNP results



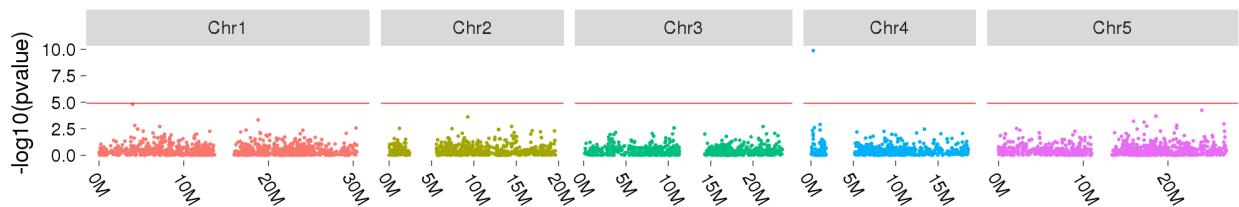
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	2	15002824	7.438567	NA	NA	NA

INDEL results



Peak rank	Chr	INDEL pos(bp)	$-\log_{10}(\text{pvalue})$	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	5	1026045	7.811765	AT5G03840	TFL1	1bp insertion	233
2	2	9592925	7.328116	AT2G22540	SVP	1bp deletion	9032

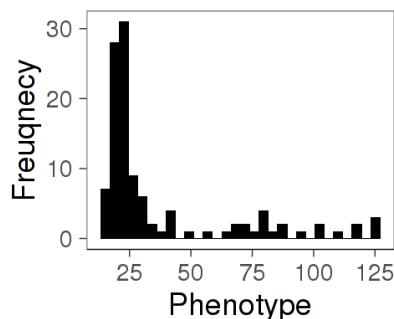
ORFS results



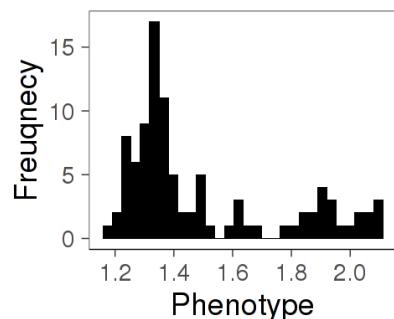
Peak rank	Chr	$-\log_{10}(\text{pvalue})$	Candidate gene ID	Candidate gene name
1	4	9.868338	AT4G00650	FRI

S Fig 25 Summary of GWAS results for 2 weeks vernalization, grown as JIC(2W)
(*Arabidopsis thaliana*)

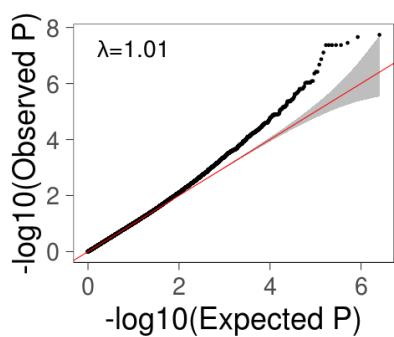
Phenotype histogram and quantile-quantile plots of p-values



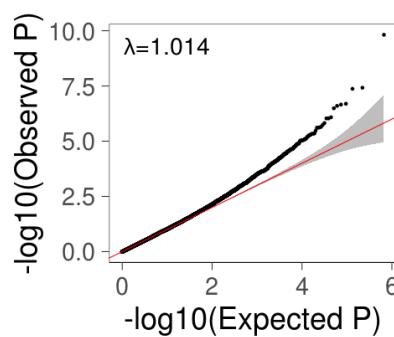
Original phenotype distribution



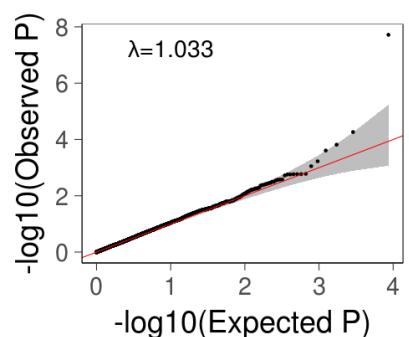
Transformed phenotype distribution



SNP

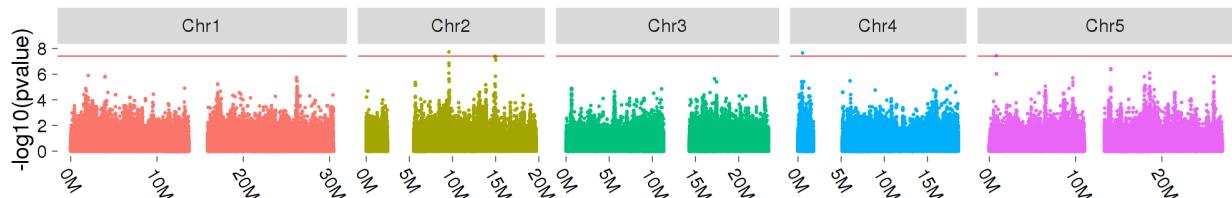


INDEL



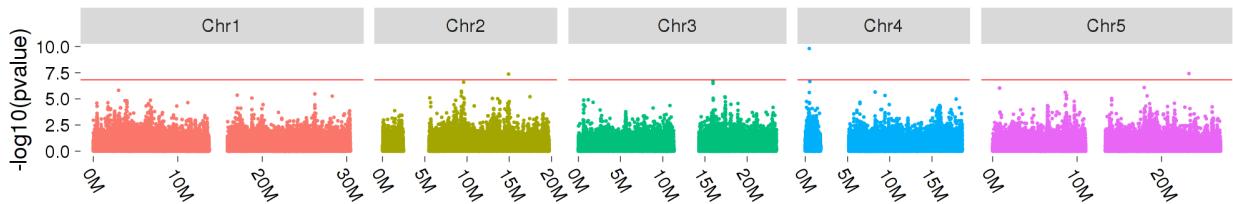
ORF

SNP results



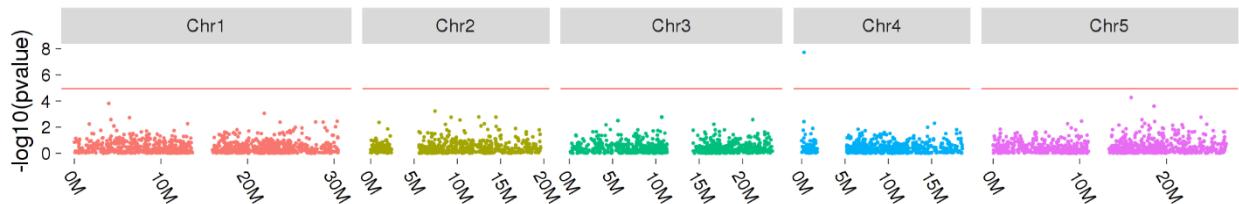
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	2	9581605	7.737116	AT2G22540	SVP	0
2	4	529243	7.657906	NA	NA	NA
3	5	820292	7.448856	NA	NA	NA

INDEL results



Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	4	468530	9.815293	NA	NA	1bp insertion	NA
2	5	23249423	7.419748	AT5G57380	VIN3	4bp deletion	0
3	2	14920101	7.370329	NA	NA	7bp deletion	NA

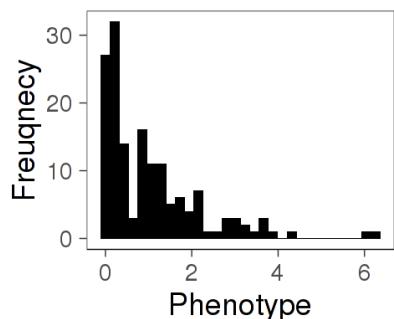
ORFS results



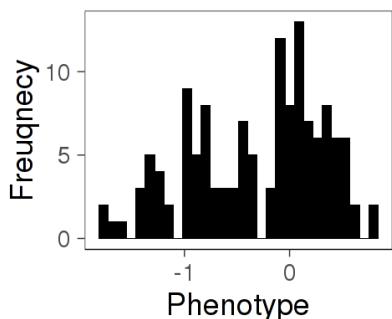
Peak rank	Chr	-log10(pvalue)	Candidate gene ID	Candidate gene name
1	4	7.716635	AT4G00650	FRI

S Fig 26 Summary of GWAS results for 4 weeks vernalization, grown as JIC(4W) (*Arabidopsis thaliana*)

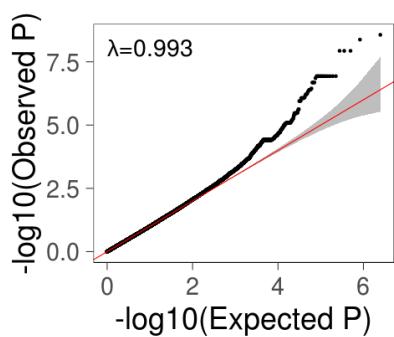
Phenotype histogram and quantile-quantile plots of p-values



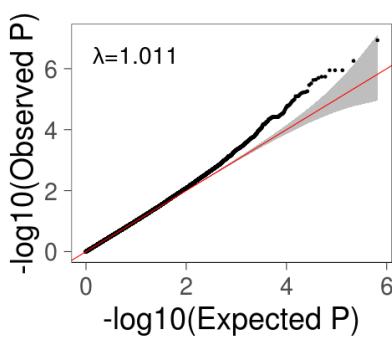
Original phenotype distribution



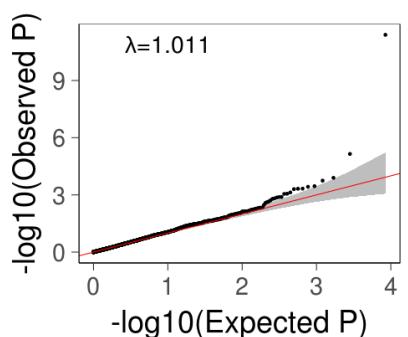
Transformed phenotype distribution



SNP

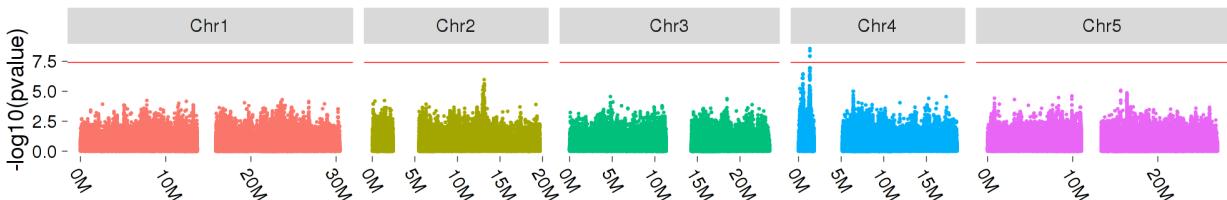


INDEL



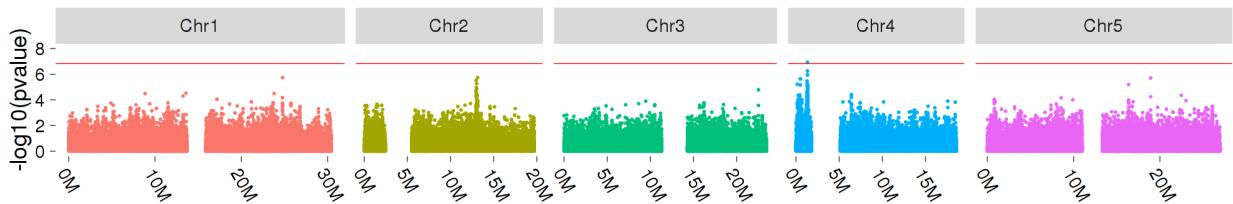
ORF

SNP results



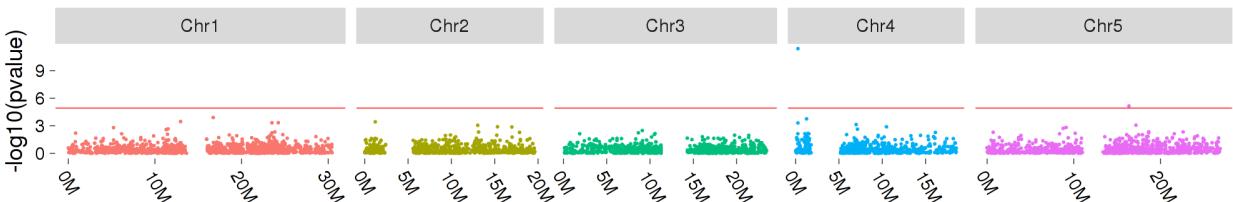
Peak rank	Chr	SNP pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Distance to gene(bp)
1	4	1330471	8.565995	NA	NA	NA

INDEL results



Peak rank	Chr	INDEL pos(bp)	-log10(pvalue)	Candidate gene ID	Candidate gene name	Variation	Distance to gene(bp)
1	4	1331333	6.932413	NA	NA	5bp deletion	NA

ORFS results



Peak rank	Chr	-log10(pvalue)	Candidate gene ID	Candidate gene name
1	4	11.39408	AT4G00650	FRI
2	5	5.147964	AT5G40860	NA

S Fig 27 Summary of GWAS results for FLC gene expression (FLC) (*Arabidopsis thaliana*)