

GEPHE SUMMARY

ACD6 = ACCELERATED CELL DEATH 6 (<a +acd6+='ACCELERATED+CELL+DEATH+6^#gephebase-summary-title"' href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^ACD6 = ACCELERATED CELL DEATH 6^#gephebase-summary-title)		Gephebase Gene	GP00000025	GepheID
Published		Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Trait #1	Trait Category
Physiology (<a +physiology^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)	Trait
Plant size (<a +plant+size^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait=^Plant size^#gephebase-summary-title)	Trait State in Taxon A
Arabidopsis thaliana	Trait State in Taxon B
Arabidopsis thaliana	

Trait #2	Trait Category
Physiology (<a +physiology^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)	Trait
Pathogen resistance (plant microbes) (<a +pathogen+resistance+(plant+microbes)^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait=^Pathogen resistance (plant microbes)^#gephebase-summary-title)	Trait State in Taxon A
-	Trait State in Taxon B
-	

Trait #3	Trait Category
Physiology (<a +physiology^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)	Trait
Herbivore resistance (<a +herbivore+resistance^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait=^Herbivore resistance^#gephebase-summary-title)	Trait State in Taxon A
-	Trait State in Taxon B
-	

Data not curated		Ancestral State		
Intraspecific (<a +intraspecific^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)		Taxonomic Status		
Taxon A	Latin Name	Taxon B	Latin Name	
Arabidopsis thaliana (<a +arabidopsis+thaliana^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Arabidopsis thaliana^#gephebase-summary-title)		Arabidopsis thaliana (<a +arabidopsis+thaliana^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Arabidopsis thaliana^#gephebase-summary-title)		
thale cress	Common Name	thale cress	Common Name	
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Synonyms	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Synonyms	
species	Rank	species	Rank	
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta;	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta;	Lineage	

Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	Parent	Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	Parent
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3701)	NCBI Taxonomy ID	Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3701)	NCBI Taxonomy ID
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3702)	is Taxon A an Infrappecies?	3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3702)	is Taxon B an Infrappecies?
No		No	

GENOTYPIC CHANGE

ACD6	Generic Gene Name	UniProtKB Arabidopsis thaliana
ACCELERATED CELL DEATH 6; DL3240W; FCAALL.190; At4g14400; dl3240w	Synonyms	GenebankID or UniProtKB
3702.AT4G14400.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier= 3702.AT4G14400.1)	String	CP002687 (https://www.ncbi.nlm.nih.gov/nuccore/CP002687)
-	Sequence Similarities	
-	GO - Molecular Function	
GO:0008219 : cell death (https://www.ebi.ac.uk/QuickGO/term/GO:0008219) GO:0071446 : cellular response to salicylic acid stimulus (https://www.ebi.ac.uk/QuickGO/term/GO:0071446) GO:0009816 : defense response to bacterium, incompatible interaction (https://www.ebi.ac.uk/QuickGO/term/GO:0009816) GO:1900426 : positive regulation of defense response to bacterium (https://www.ebi.ac.uk/QuickGO/term/GO:1900426) GO:1902290 : positive regulation of defense response to oomycetes (https://www.ebi.ac.uk/QuickGO/term/GO:1902290) GO:0016567 : protein ubiquitination (https://www.ebi.ac.uk/QuickGO/term/GO:0016567) GO:1900150 : regulation of defense response to fungus (https://www.ebi.ac.uk/QuickGO/term/GO:1900150) GO:2000031 : regulation of salicylic acid mediated signaling pathway (https://www.ebi.ac.uk/QuickGO/term/GO:2000031) GO:0009617 : response to bacterium (https://www.ebi.ac.uk/QuickGO/term/GO:0009617) GO:0050826 : response to freezing (https://www.ebi.ac.uk/QuickGO/term/GO:0050826) GO:0009416 : response to light stimulus (https://www.ebi.ac.uk/QuickGO/term/GO:0009416) GO:0009751 : response to salicylic acid (https://www.ebi.ac.uk/QuickGO/term/GO:0009751) GO:0009615 : response to virus (https://www.ebi.ac.uk/QuickGO/term/GO:0009615)		
GO:0016020 : membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016020) GO:0005887 : integral component of plasma membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0005887) GO:0030176 : integral component of endoplasmic reticulum membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0030176)	GO - Cellular Component	
Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Unknown^#gephebase-summary-title)	Presumptive Null	
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Coding^#gephebase-summary-title)	Molecular Type	
Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=^Unknown^#gephebase-summary-title)	Aberration Type	
Various	Molecular Details of the Mutation	
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Linkage Mapping^#gephebase-summary-title)	Experimental Evidence	
Natural allelic variation underlying a major fitness trade-off in Arabidopsis thaliana. (2010) (https://pubmed.ncbi.nlm.nih.gov/20520716)	Main Reference	
Todesco M; Balasubramanian S; Hu TT; Traw MB; Horton M; Epple P; Kuhns C; Sureshkumar S; Schwartz C; Lanz C; Laitinen RA; Huang Y; Chory J; Lipka V; Borevitz JO; Dangi JL; Bergelson J; Nordborg M; Weigel D	Authors	
	Abstract	

Plants can defend themselves against a wide array of enemies, from microbes to large animals, yet there is great variability in the effectiveness of such defences, both within and between species. Some of this variation can be explained by conflicting pressures from pathogens with different modes of attack. A second explanation comes from an evolutionary ‘tug of war’, in which pathogens adapt to evade detection, until the plant has evolved new recognition capabilities for pathogen invasion. If selection is, however, sufficiently strong, susceptible hosts should remain rare. That this is not the case is best explained by costs incurred from constitutive defences in a pest-free environment. Using a combination of forward genetics and genome-wide association analyses, we demonstrate that allelic diversity at a single locus, ACCELERATED CELL DEATH 6 (ACD6), underpins marked pleiotropic differences in both vegetative growth and resistance to microbial infection and herbivory among natural Arabidopsis thaliana strains. A hyperactive ACD6 allele, compared to the reference allele, strongly enhances resistance to a broad range of

pathogens from different phyla, but at the same time slows the production of new leaves and greatly reduces the biomass of mature leaves. This allele segregates at intermediate frequency both throughout the worldwide range of *A. thaliana* and within local populations, consistent with this allele providing substantial fitness benefits despite its marked impact on growth.

Additional References

Genome-wide association study of 107 phenotypes in *Arabidopsis thaliana* inbred lines. (2010) (<https://pubmed.ncbi.nlm.nih.gov/20336072>)

RELATED GEPHE

Related Genes

24 (AtGA20ox1 (=GA5=Sd1), CYP81F2, Epithiospecifier protein (ESP), ERECTA, RAC1, Resistance related Kinase 1 (RKS1), RLM1, RLM2 cluster, RLM3, RPM1, RPP1-WsA, RPP1-WsB, RPP1-WsC, RPP13, RPP2A-RPP2B, RPP4, RPP5, RPP8, RPS2, RPS4, RPS5, RRS1, WRR4, phytochrome D (PHYD)) ([https://www.gephebase.org/search-criteria?/or+TaxonID=~3702~/and+Trait=Plant size/or+Taxon ID=~3702~/and+Trait=Pathogen resistance/or+Taxon ID=~3702~/and+Trait=Herbivore resistance/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+TaxonID=~3702~/and+Trait=Plant+size/or+TaxonID=~3702~/and+Trait=Pathogen+resistance/or+TaxonID=~3702~/and+Trait=Herbivore+resistance/and+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

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