

GEPHE SUMMARY

	Gephebase Gene	GephelD
VGLL3 (vestigial-like family member 3 gene) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^VGLL3 (vestigial-like family member 3 gene)^#gephebase-summary-title)	GP00001167	
	Entry Status	Main curator
Published	Martin	

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)	Trait		
Age of sexual maturity (https://www.gephebase.org/search-criteria?/and+Trait=^Age of sexual maturity^#gephebase-summary-title)	Trait State in Taxon A		
Salmo salar	Trait State in Taxon B		
Salmo salar	Ancestral State		
Data not curated	Taxonomic Status		
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)			
	Taxon A	Taxon B	
	Latin Name	Latin Name	
Salmo salar (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Salmo salar^#gephebase-summary-title)	Salmo salar (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Salmo salar^#gephebase-summary-title)	Salmo salar (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Salmo salar^#gephebase-summary-title)	
	Common Name	Common Name	
Atlantic salmon	Atlantic salmon	Atlantic salmon	
	Synonyms	Synonyms	
Atlantic salmon; Salmo salar Linnaeus, 1758	Atlantic salmon; Salmo salar Linnaeus, 1758	Atlantic salmon; Salmo salar Linnaeus, 1758	
	Rank	Rank	
species	species	species	
	Lineage	Lineage	
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii; Teleostei; Osteoglossocephalai; Clupeocephala; Euteleosteomorpha; Protacanthopterygii; Salmoniformes; Salmonidae; Salmoninae; Salmo	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii; Teleostei; Osteoglossocephalai; Clupeocephala; Euteleosteomorpha; Protacanthopterygii; Salmoniformes; Salmonidae; Salmoninae; Salmo		
	Parent	Parent	
Salmo () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8028)	Salmo () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8028)	Salmo () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8028)	
	NCBI Taxonomy ID	NCBI Taxonomy ID	
8030 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8030)	8030 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8030)	8030 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8030)	
	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?	
No	No	No	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Homo sapiens
VGLL3	A8MV65 (http://www.uniprot.org/uniprot/A8MV65)	
	Synonyms	GenebankID or UniProtKB
VGL3; VGL-3	0	
	String	
9606.ENSP00000381436 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=9606.ENSP00000381436)		
	Sequence Similarities	
Belongs to the vestigial family.	GO - Molecular Function	
-	GO - Biological Process	
GO:0006357 : regulation of transcription by RNA polymerase II (https://www.ebi.ac.uk/QuickGO/term/GO:0006357)	GO - Cellular Component	
GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)		

Unknown (#gephebase-summary-title)	Presumptive Null
Unknown (#gephebase-summary-title)	Molecular Type
Unknown (#gephebase-summary-title)	Aberration Type
candidate amino-acid substitutions	Molecular Details of the Mutation
Association Mapping (#gephebase-summary-title)	Experimental Evidence
Sex-dependent dominance at a single locus maintains variation in age at maturity in salmon. (2015) (https://pubmed.ncbi.nlm.nih.gov/26536110)	Main Reference
Barson NJ; Aykanat T; Hindar K; Baranski M; Bolstad GH; Fiske P; Jacq C; Jensen AJ; Johnston SE; Karlsson S; Kent M; Moen T; NiemelÄ E; Nome T; NÄsje TF; Orell P; Romakkaniemi A; SÄrgrova H; Urdal K; Erkinaro J; Lien S; Primmer CR	Authors
Abstract	
<p>Males and females share many traits that have a common genetic basis; however, selection on these traits often differs between the sexes, leading to sexual conflict. Under such sexual antagonism, theory predicts the evolution of genetic architectures that resolve this sexual conflict. Yet, despite intense theoretical and empirical interest, the specific loci underlying sexually antagonistic phenotypes have rarely been identified, limiting our understanding of how sexual conflict impacts genome evolution and the maintenance of genetic diversity. Here we identify a large effect locus controlling age at maturity in Atlantic salmon (<i>Salmo salar</i>), an important fitness trait in which selection favours earlier maturation in males than females, and show it is a clear example of sex-dependent dominance that reduces intralocus sexual conflict and maintains adaptive variation in wild populations. Using high-density single nucleotide polymorphism data across 57 wild populations and whole genome re-sequencing, we find that the vestigial-like family member 3 gene (<i>VGLL3</i>) exhibits sex-dependent dominance in salmon, promoting earlier and later maturation in males and females, respectively. <i>VGLL3</i>, an adiposity regulator associated with size and age at maturity in humans, explained 39% of phenotypic variation, an unexpectedly large proportion for what is usually considered a highly polygenic trait. Such large effects are predicted under balancing selection from either sexually antagonistic or spatially varying selection. Our results provide the first empirical example of dominance reversal allowing greater optimization of phenotypes within each sex, contributing to the resolution of sexual conflict in a major and widespread evolutionary trade-off between age and size at maturity. They also provide key empirical evidence for how variation in reproductive strategies can be maintained over large geographical scales. We anticipate these findings will have a substantial impact on population management in a range of harvested species where trends towards earlier maturation have been observed.</p>	
Additional References	
The <i>vgl3</i> Locus Controls Age at Maturity in Wild and Domesticated Atlantic Salmon (<i>Salmo salar</i> L.) Males. (2015) (https://pubmed.ncbi.nlm.nih.gov/26551894)	

RELATED GEPHE

No matches found.	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

@BalancingSelection @SexualTrait ; dominance ; complex trait