

GEPHE SUMMARY

		Gephebase Gene		GepheID
amylase 2B (AMY2B) (https://www.gephebase.org/search-criteria?/and+Gene)			GP00000086	
Gephebase= [^] amylase 2B (AMY2B) [^] #gephebase-summary-title)				Main curator
		Entry Status	Martin	
Published				

PHENOTYPIC CHANGE

		Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+Trait)				
Category= [^] Physiology [^] #gephebase-summary-title)				
		Trait		
Starch processing (<a href="https://www.gephebase.org/search-criteria?/and+Trait=<sup>^</sup>Starch">https://www.gephebase.org/search-criteria?/and+Trait=[^]Starch)				
processing [^] #gephebase-summary-title)				
		Trait State in Taxon A		
Canis lupus				
		Trait State in Taxon B		
Canis familiaris				
		Ancestral State		
Taxon A				
		Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic)				
Status= [^] Domesticated [^] #gephebase-summary-title)				
Taxon A		Taxon B		
	Latin Name		Latin Name	
Canis lupus		Canis lupus familiaris		
(<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=<sup>^</sup>Canis">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=[^]Canis)		(<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=<sup>^</sup>Canis">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=[^]Canis)		
lupus [^] #gephebase-summary-title)		familiaris [^] #gephebase-summary-title)		
	Common Name		Common Name	
gray wolf		dog		
	Synonyms		Synonyms	
gray wolf; grey wolf; Canis lupus Linnaeus, 1758		Canis canis; Canis domesticus; Canis familiaris; dog; dogs; Canis familiaris Linnaeus, 1758;		
	Rank	Canis lupus familiaris Linnaeus, 1758		
species			Rank	
	Lineage	subspecies		
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia;			Lineage	
Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii;		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia;		
Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria;		Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii;		
Laurasiatheria; Carnivora; Caniformia; Canidae; Canis		Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria;		
	Parent	Laurasiatheria; Carnivora; Caniformia; Canidae; Canis; Canis lupus		
Canis () - (Rank: genus)			Parent	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9611)		Canis lupus (gray wolf) - (Rank: species)		
	NCBI Taxonomy ID	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9612)		
9612			NCBI Taxonomy ID	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9612)		9615		
	is Taxon A an Intraspecies?	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9615)		
No			is Taxon B an Intraspecies?	
		No		

GENOTYPIC CHANGE

		Generic Gene Name		UniProtKB Canis lupus familiaris
LOC479922			L7N0N6 (http://www.uniprot.org/uniprot/L7N0N6)	
		Synonyms		GenebankID or UniProtKB
AMY2B			()	
		String		
-				
		Sequence Similarities		
Belongs to the glycosyl hydrolase 13 family.				
		GO - Molecular Function		
GO:0004556 : alpha-amylase activity				
(https://www.ebi.ac.uk/QuickGO/term/GO:0004556)				
GO:0103025 : alpha-amylase activity (releasing maltohexaose)				
(https://www.ebi.ac.uk/QuickGO/term/GO:0103025)				
GO:0043169 : cation binding (https://www.ebi.ac.uk/QuickGO/term/GO:0043169)				
		GO - Biological Process		
GO:0005975 : carbohydrate metabolic process				
(https://www.ebi.ac.uk/QuickGO/term/GO:0005975)				

-		Presumptive Null
No (<a +no^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Presumptive+Null=">https://www.gephebase.org/search-criteria?/and+Presumptive Null="+No^#gephebase-summary-title)		Molecular Type
Gene Amplification (<a +gene+amplification^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Molecular+Type=">https://www.gephebase.org/search-criteria?/and+Molecular Type="+Gene Amplification^#gephebase-summary-title)		Aberration Type
Insertion (<a +insertion^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Aberration+Type=">https://www.gephebase.org/search-criteria?/and+Aberration Type="+Insertion^#gephebase-summary-title)		Insertion Size
1-10 kb		Molecular Details of the Mutation
Copy Number Variation		Experimental Evidence
Association Mapping (<a +association+mapping^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=">https://www.gephebase.org/search-criteria?/and+Experimental Evidence="+Association Mapping^#gephebase-summary-title)		Main Reference
The genomic signature of dog domestication reveals adaptation to a starch-rich diet. (2013) (https://pubmed.ncbi.nlm.nih.gov/23354050)		Authors
Axelsson E; Ratnakumar A; Arendt ML; Maqbool K; Webster MT; Perloski M; Liberg O; Arnemo JM; Hedhammar A; Lindblad-Toh K		Abstract
The domestication of dogs was an important episode in the development of human civilization. The precise timing and location of this event is debated and little is known about the genetic changes that accompanied the transformation of ancient wolves into domestic dogs. Here we conduct whole-genome resequencing of dogs and wolves to identify 3.8 million genetic variants used to identify 36 genomic regions that probably represent targets for selection during dog domestication. Nineteen of these regions contain genes important in brain function, eight of which belong to nervous system development pathways and potentially underlie behavioural changes central to dog domestication. Ten genes with key roles in starch digestion and fat metabolism also show signals of selection. We identify candidate mutations in key genes and provide functional support for an increased starch digestion in dogs relative to wolves. Our results indicate that novel adaptations allowing the early ancestors of modern dogs to thrive on a diet rich in starch, relative to the carnivorous diet of wolves, constituted a crucial step in the early domestication of dogs.		Additional References
Diet adaptation in dog reflects spread of prehistoric agriculture. (2016) (https://pubmed.ncbi.nlm.nih.gov/27406651)		
Amylase activity is associated with AMY2B copy numbers in dog: implications for dog domestication, diet and diabetes. (2014) (https://pubmed.ncbi.nlm.nih.gov/24975239)		
Copy number variations in the amylase gene (AMY2B) in Japanese native dog breeds. (2015) (https://pubmed.ncbi.nlm.nih.gov/26358734)		
Independent amylase gene copy number bursts correlate with dietary preferences in mammals. (2019) (https://pubmed.ncbi.nlm.nih.gov/31084707)		

RELATED GEPHE

2 (MGAM, SGLT1) (<a +9612^="" and+trait='Starch+processing/or+Taxon+ID="+9615^/and+Trait=Starch+processing/and+groupHaplotypes=true#gephebase-summary-title"' href="https://www.gephebase.org/search-criteria?/or+Taxon+ID=">https://www.gephebase.org/search-criteria?/or+Taxon ID="+9612^/and+Trait=Starch processing/or+Taxon ID="+9615^/and+Trait=Starch processing/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

CNV among dog breeds; with no amplification in Arctic and Australian breeds @ParallelEvolution in humans; mice; rats boars @TEPossibly