

GEPHE SUMMARY

	Gephebase Gene	GephelD
POLLED locus (https://www.gephebase.org/search-criteria?/and+Gene Gephebase="POLLED locus">#gephebase-summary-title)	GP00002030	Main curator
Published	Entry Status	Courtier

PHENOTYPIC CHANGE

	Trait Category	
Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category="Morphology">#gephebase-summary-title)	Trait	
Horns absence (https://www.gephebase.org/search-criteria?/and+Trait=^Horns absence "#gephebase-summary-title)	Trait State in Taxon A	
Bos taurus - horns	Trait State in Taxon B	
Bos taurus - hornless - Mongolian allele P[sub]M OR P[sub]219ID	Ancestral State	
Taxon A	Taxonomic Status	
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status="Domesticated">#gephebase-summary-title)		
Taxon A	Latin Name	Latin Name
Bos taurus (#gephebase-summary-title)		
cattle	Common Name	Common Name
Bos taurus; Bos primigenius taurus; cattle; bovine; cow; dairy cow; domestic cattle; domestic cow; Bos taurus Linnaeus, 1758; Bos Tauurus	Synonyms	Synonyms
species	Rank	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Laurasiatheria; Artiodactyla; Ruminantia; Pecora; Bovidae; Bovinae; Bos	Lineage	Lineage
Bos (oxen, cattle) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9903)	Parent	Parent
9913 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9913)	NCBI Taxonomy ID	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
Taxon B #1	Latin Name	Latin Name
Bos taurus (#gephebase-summary-title)		
cattle	Common Name	Common Name
Bos taurus; Bos primigenius taurus; cattle; bovine; cow; dairy cow; domestic cattle; domestic cow; Bos taurus Linnaeus, 1758; Bos Tauurus	Synonyms	Synonyms
species	Rank	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Laurasiatheria; Artiodactyla; Ruminantia; Pecora; Bovidae; Bovinae; Bos	Lineage	Lineage
Bos (oxen, cattle) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9903)	Parent	Parent
9913 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9913)	NCBI Taxonomy ID	NCBI Taxonomy ID
No	is Taxon B an Infraspecies?	is Taxon B an Infraspecies?
Taxon B #2	Latin Name	Latin Name
Bos grunniens (#gephebase-summary-title)		
domestic yak	Common Name	Common Name
Bos mutus grunniens; Poephagus grunniens; domestic yak; yak	Synonyms	Synonyms
species	Rank	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Laurasiatheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae; Bovinae; Bos	Lineage	Lineage
Bos (oxen, cattle) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9903)	Parent	Parent

30521

<https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=30521>

is Taxon B an Infraspecies?

No

GENOTYPIC CHANGE

Generic Gene Name	UniProtKB
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Synonyms

GenebankID or UniProtKB

0

String

Sequence Similarities

GO - Molecular Function

GO - Biological Process

GO - Cellular Component

Presumptive Null

No (<https://www.gephbase.org/search-criteria/?and+Presumptive+Null=%22No%22#gephbase-summary-title>)

Molecular Type

Cis-regulatory (<https://www.gephbase.org/search-criteria/?and+Molecular+Type=%22Cis-regulatory%22#gephbase-summary-title>)

Aberration Type

Complex Change (<https://www.gephbase.org/search-criteria/?and+Aberration+Type=%22Complex+Change%22#gephbase-summary-title>)

Molecular Details of the Mutation

a complex 219-bp duplicationâ€“insertion (P219ID) beginning at 1:976;128 bp and a 7-bp deletion and 6-bp insertion (P1ID) located 621 bp upstream of this position. This rearrangement results in duplication of an 11-bp motif (5â€¢-AAAGAAGCAA-3â€¢) that is entirely conserved among Bovidae and that is also duplicated in the 80-kb duplication responsible for Friesian polledness.

Experimental Evidence

Association Mapping (<https://www.gephbase.org/search-criteria/?and+Experimental+Evidence=%22Association+Mapping%22#gephbase-summary-title>)

Main Reference

Whole-genome analysis of introgressive hybridization and characterization of the bovine legacy of Mongolian yaks. (2017) (<https://pubmed.ncbi.nlm.nih.gov/28135247>)

Authors

Medugorac I; Graf A; Grohs C; Rothammer S; Zagdsuren Y; Gladyr E; Zinovieva N; Barbieri J; Seichter D; Russ I; Eggen A; Hellenthal G; Brem G; Blum H; Krebs S; Capitan A

Abstract

The yak is remarkable for its adaptation to high altitude and occupies a central place in the economies of the mountainous regions of Asia. At lower elevations, it is common to hybridize yaks with cattle to combine the yak's hardiness with the productivity of cattle. Hybrid males are sterile, however, preventing the establishment of stable hybrid populations, but not a limited introgression after backcrossing several generations of female hybrids to male yaks. Here we inferred bovine haplotypes in the genomes of 76 Mongolian yaks using high-density SNP genotyping and whole-genome sequencing. These yaks inherited â€“41.3% of their genome from bovine ancestors after nearly continuous admixture over at least the last 1,500 years. The introgressed regions are enriched in genes involved in nervous system development and function, and particularly in glutamate metabolism and neurotransmission. We also identified a novel mutation associated with a polled (hornless) phenotype originating from Mongolian Turano cattle. Our results suggest that introgressive hybridization contributed to the improvement of yak management and breeding.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

3 (<https://www.gephbase.org/search-criteria/?or+Gene+Gephebase=%22POLLED+locus%22+and+Taxon+ID=%229913%22/or+Gene+Gephebase=%22POLLED+locus%22+and+Taxon+ID=%229913%22/or+Gene+Gephebase=%22POLLED+locus%22+and+Taxon+ID=%2230521%22#gephbase-summary-title>)

EXTERNAL LINKS

COMMENTS

Associated gene still not identified - @Parallelism @Introgression into yaks - <https://omia.org/OMIA000483/9913/> natural introgression resulting from backcrossing female yak-cattle hybrids to male yaks

