GEPHE SUMMARY

Gephebase Gene
POLLED locus (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^POLLED locus^#gephebase-summary-title)

GepheID
GP00002030

Entry Status
Published

Main curator
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 bovis - horns

Trait State in Taxon B
Bos bovis - 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
Bos taurus (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Bos taurus^#gephebase-summary-title)

Common Name
cattle

Synonyms
Bos bovis; Bos primigenius taurus; cattle; bovine; cow; dairy cow; domestic cattle; domestic cow; Bos taurus Linnaeus, 1758; Bos Tauurus

Rank
species

Lineage
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

Parent
Bos (oxen, cattle) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9903)

NCBI Taxonomy ID
9913 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9913)

is Taxon A an Infraspecies?
No

Taxon B #1

Latin Name
Bos taurus (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Bos taurus^#gephebase-summary-title)

Common Name
cattle

Synonyms
Bos bovis; Bos primigenius taurus; cattle; bovine; cow; dairy cow; domestic cattle; domestic cow; Bos taurus Linnaeus, 1758; Bos Tauurus

Rank
species

Lineage
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

Parent
Bos (oxen, cattle) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9903)

NCBI Taxonomy ID
9913 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9913)

is Taxon B an Infraspecies?
No

Taxon B #2

Latin Name
Bos grunniens (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Bos grunniens^#gephebase-summary-title)

Common Name
domestic yak

Synonyms
Bos mutus grunniens; Poephagus grunniens; domestic yak; yak

Rank
species

Lineage
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

Parent
Bos (oxen, cattle) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9903)

NCBI Taxonomy ID

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

()

Synonyms

-

GenebankID or UniProtKB

()

String

-

Sequence Similarities

-

GO - Molecular Function

-

GO - Biological Process

-

GO - Cellular Component

-

Presumptive Null

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title)

Molecular Type

Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Cis-regulatory^#gephebase-summary-title)

Aberration Type

Complex Change (https://www.gephebase.org/search-criteria?/and+Aberration Type=^Complex Change^#gephebase-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€²-AAAGAAGCAAA-3â€²) 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.gephebase.org/search-criteria?/and+Experimental Evidence=^Association Mapping^#gephebase-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 âˆ¼1.3% 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.gephebase.org/search-criteria?/or+Gene Gephebase=^POLLED locus^/and+Taxon ID=^9913^/or+Gene Gephebase=^POLLED locus^/and+Taxon ID=^9913^/or+Gene Gephebase=^POLLED locus^/and+Taxon ID=^30521^#gephebase-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