GEPHE SUMMARY

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

GepheID
GP00001978

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

Trait Category
Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Morphology^#gephebase-summary-title)

Trait
Coloration (coat) (https://www.gephebase.org/search-criteria?/and+Trait=^Coloration (coat)^#gephebase-summary-title)

Trait State in Taxon A
light-brown and white individuals

Trait State in Taxon B
black and dark-brown coat colors ; Magaheem and Sofor

Ancestral State
Taxon A

Taxonomic Status
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Domesticated^#gephebase-summary-title)

Taxon A

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

Common Name
Arabian camel

Synonyms
Arabian camel; camel; dromedaries; dromedary; dromedary camel; one-humped camel; Camelus dromedarius Linnaeus, 1758

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; Tylopoda; Camelidae; Camelus

Parent
Camelus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9836)

NCBI Taxonomy ID
9838 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9838)

is Taxon A an Infraspecies?
No

Taxon B

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

Common Name
Arabian camel

Synonyms
Arabian camel; camel; dromedaries; dromedary; dromedary camel; one-humped camel; Camelus dromedarius Linnaeus, 1758

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; Tylopoda; Camelidae; Camelus

Parent
Camelus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9836)

NCBI Taxonomy ID
9838 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9838)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
Asip

Synonyms
As; ASP; A<y>; ASIP; a

String
10090.ENSMUSP00000029123 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=10090.ENSMUSP00000029123)

Sequence Similarities
-

GO - Molecular Function
GO:0031779 : melanocortin receptor binding (https://www.ebi.ac.uk/QuickGO/term/GO:0031779)
GO:0031781 : type 3 melanocortin receptor binding (https://www.ebi.ac.uk/QuickGO/term/GO:0031781)
GO:0031782 : type 4 melanocortin receptor binding (https://www.ebi.ac.uk/QuickGO/term/GO:0031782)

UniProtKB Mus musculus
Q03288 (http://www.uniprot.org/uniprot/Q03288)

GenebankID or UniProtKB
()

GO - Biological Process

GO:0008343 : adult feeding behavior
(https://www.ebi.ac.uk/QuickGO/term/GO:0008343)
GO:0006091 : generation of precursor metabolites and energy
(https://www.ebi.ac.uk/QuickGO/term/GO:0006091)
GO:0071514 : genetic imprinting (https://www.ebi.ac.uk/QuickGO/term/GO:0071514)
GO:0009755 : hormone-mediated signaling pathway
(https://www.ebi.ac.uk/QuickGO/term/GO:0009755)
GO:0042438 : melanin biosynthetic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0042438)
GO:0032438 : melanosome organization
(https://www.ebi.ac.uk/QuickGO/term/GO:0032438)
GO:0032402 : melanosome transport
(https://www.ebi.ac.uk/QuickGO/term/GO:0032402)
GO:0043473 : pigmentation (https://www.ebi.ac.uk/QuickGO/term/GO:0043473)
GO:0048023 : positive regulation of melanin biosynthetic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0048023)
GO:0040030 : regulation of molecular function, epigenetic
(https://www.ebi.ac.uk/QuickGO/term/GO:0040030)

GO - Cellular Component

GO:0005576 : extracellular region (https://www.ebi.ac.uk/QuickGO/term/GO:0005576)
GO:0005623 : cell (https://www.ebi.ac.uk/QuickGO/term/GO:0005623)

Presumptive Null

Yes (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Yes^#gephebase-summary-title)

Molecular Type

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

Aberration Type

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

Deletion Size

1-9 bp

Molecular Details of the Mutation

1-bp deletion at position 23 resulting in frameshift

Experimental Evidence

Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Candidate Gene^#gephebase-summary-title)

Main Reference

Polymorphisms in MC1R and ASIP Genes are Associated with Coat Color Variation in the Arabian Camel. (2018) (https://pubmed.ncbi.nlm.nih.gov/29893870)

Authors

Almathen F; Elbir H; Bahbahani H; Mwacharo J; Hanotte O

Abstract

Pigmentation in mammals is primarily determined by the distribution of eumelanin and pheomelanin, the ratio of which is mostly controlled by the activity of melanocortin 1 receptor (MC1R) and agouti signaling protein (ASIP) genes. Using 91 animals from 10 Arabian camel populations, that included the 4 predominant coat color phenotypes observed in the dromedary (light brown, dark brown, black, and white), we investigated the effects of the MC1R and ASIP sequence variants and identified candidate polymorphisms associated with coat color variation. In particular, we identified a single nucleotide polymorphism (SNP), found in the coding region of MC1R (901C/T), linked to the white coat color, whereas a 1-bp deletion (23delT/T) and a SNP (25G/A) in exon 2 of ASIP are associated with both black and dark-brown coat colors. Our results also indicate support that the light-brown coat color is likely the ancestral coat color for the dromedary. These sequence variations at the MC1R and ASIP genes represent the first documented evidence of candidate polymorphisms associated with Mendelian traits in the dromedary.

Additional References

Comparative FISH-Mapping of MC1R, ASIP, and TYRP1 in New and Old World Camelids and Association Analysis With Coat Color Phenotypes in the Dromedary (Camelus dromedarius). (2019) (https://pubmed.ncbi.nlm.nih.gov/31040864)

RELATED GEPHE

Related Genes

1 (Kit (type III receptor protein-tyrosine kinase)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^9838^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

https://omia.org/OMIA000201/9838/