

GEPHE SUMMARY

HAO1 (<a +hao1+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+HAO1+"#gephebase-summary-title)	Gephebase Gene	GP00000437	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Trait #1	Trait Category
Physiology (<a +physiology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Physiology+"#gephebase-summary-title)	Trait
Fertility (egg production) (<a +fertility+(egg+production)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Fertility+(egg+production)+"#gephebase-summary-title)	Trait State in Taxon A
Gallus gallus; wild and domesticated Red Jungle Fowl	Trait State in Taxon B
Gallus gallus; White Leghorn	

Trait #2	Trait Category
Morphology (<a +morphology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Morphology+"#gephebase-summary-title)	Trait
Bird head morphology (male comb) (<a +bird+head+morphology+(male+comb)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Bird+head+morphology+(male+comb)+"#gephebase-summary-title)	Trait State in Taxon A
-	Trait State in Taxon B
-	

Data not curated	Ancestral State
Domesticated (<a +domesticated+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Domesticated+"#gephebase-summary-title)	Taxonomic Status

Taxon A	Latin Name	Taxon B	Latin Name
Gallus gallus (<a +gallus+gallus+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Gallus+gallus+"#gephebase-summary-title)	Gallus gallus (<a +gallus+gallus+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Gallus+gallus+"#gephebase-summary-title)	Gallus gallus (<a +gallus+gallus+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Gallus+gallus+"#gephebase-summary-title)	Gallus gallus (<a +gallus+gallus+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Gallus+gallus+"#gephebase-summary-title)
chicken	Common Name	chicken	Common Name
Gallus gallus domesticus; chicken; bantam; chickens	Synonyms	Gallus gallus domesticus; chicken; bantam; chickens	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Sauropsida; Sauria; Archelosauria; Archosauria; Dinosauria; Saurischia; Theropoda; Coelurosauria; Aves; Neognathae; Galloanserae; Galliformes; Phasianidae; Phasianinae; Gallus	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Sauropsida; Sauria; Archelosauria; Archosauria; Dinosauria; Saurischia; Theropoda; Coelurosauria; Aves; Neognathae; Galloanserae; Galliformes; Phasianidae; Phasianinae; Gallus	Lineage
Gallus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9030)	Parent	Gallus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9030)	Parent
9031 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9031)	NCBI Taxonomy ID	9031 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9031)	NCBI Taxonomy ID
No	is Taxon A an Infrappecies?	Yes	is Taxon B an Infrappecies?
			Taxon B Description
		Gallus gallus; White Leghorn	

GENOTYPIC CHANGE

HAO1	Generic Gene Name	E1BRR7 (http://www.uniprot.org/uniprot/E1BRR7)	UniProtKB Gallus gallus
-	Synonyms	AADN03003298 (https://www.ncbi.nlm.nih.gov/nucore/AADN03003298)	GenebankID or UniProtKB
9031.ENS GALP00000014358 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=9031.ENS GALP00000014358)	String		
	Sequence Similarities		
Belongs to the FMN-dependent alpha-hydroxy acid dehydrogenase family.			
	GO - Molecular Function		
GO:0005102 : signaling receptor binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005102)			
GO:0010181 : FMN binding (https://www.ebi.ac.uk/QuickGO/term/GO:0010181)			
GO:0008891 : glycolate oxidase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0008891)			
	GO - Biological Process		
GO:0001561 : fatty acid alpha-oxidation (https://www.ebi.ac.uk/QuickGO/term/GO:0001561)			
GO:0046296 : glycolate catabolic process (https://www.ebi.ac.uk/QuickGO/term/GO:0046296)			
	GO - Cellular Component		
GO:0005777 : peroxisome (https://www.ebi.ac.uk/QuickGO/term/GO:0005777)			
Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Unknown^#gephebase-summary-title)			Presumptive Null
Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Cis-regulatory^#gephebase-summary-title)			Molecular Type
Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=^Unknown^#gephebase-summary-title)			Aberration Type
unknown; but intergenic QTL peak with decomposed effects on expression of BMP2 and HAO1			Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Linkage Mapping^#gephebase-summary-title)			Experimental Evidence
A sexual ornament in chickens is affected by pleiotropic alleles at HAO1 and BMP2, selected during domestication. (2012) (https://pubmed.ncbi.nlm.nih.gov/22956912)			Main Reference
Johnsson M; Gustafson I; Rubin CJ; Sahlqvist AS; Jonsson KB; Kerje S; Ekwall O; K��mpe O; Andersson L; Jensen P; Wright D			Authors
Domestication is one of the strongest forms of short-term, directional selection. Although selection is typically only exerted on one or a few target traits, domestication can lead to numerous changes in many seemingly unrelated phenotypes. It is unknown whether such correlated responses are due to pleiotropy or linkage between separate genetic architectures. Using three separate intercrosses between wild and domestic chickens, a locus affecting comb mass (a sexual ornament in the chicken) and several fitness traits (primarily medullary bone allocation and fecundity) was identified. This locus contains two tightly-linked genes, BMP2 and HAO1, which together produce the range of pleiotropic effects seen. This study demonstrates the importance of pleiotropy (or extremely close linkage) in domestication. The nature of this pleiotropy also provides insights into how this sexual ornament could be maintained in wild populations.			Abstract
The role of pleiotropy and linkage in genes affecting a sexual ornament and bone allocation in the chicken. (2014) (https://pubmed.ncbi.nlm.nih.gov/24655072)			Additional References

RELATED GEPHE

2 (BMP2, MNR2) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^9031^/and+Trait=Fertility/or+Taxon ID=^9031^/and+Trait=Bird head morphology/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

@Pleiotropy @SexualTrait

