

## GEPHE SUMMARY

<p>FAD2B (<a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=FAD2B#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=FAD2B#gephebase-summary-title</a>)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00002074</p> <p>Courtier</p>	<p>GepheID</p> <p>Main curator</p>
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## PHENOTYPIC CHANGE

<p>Physiology (<a href="https://www.gephebase.org/search-criteria?/and+Trait+Category=Physiology#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait+Category=Physiology#gephebase-summary-title</a>)</p> <p>Oil composition (oleate levels) (<a href="https://www.gephebase.org/search-criteria?/and+Trait=Oil+composition+oleate+levels#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=Oil+composition+oleate+levels#gephebase-summary-title</a>)</p> <p>Arachis hypogaea (Peanut) normal oleate level</p> <p>Arachis hypogaea (Peanut) high oleate level</p> <p>Taxon A</p> <p>Domesticated (<a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=Domesticated#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=Domesticated#gephebase-summary-title</a>)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>	<p>Taxon A</p> <p>Arachis hypogaea (<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Arachis+hypogaea#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Arachis+hypogaea#gephebase-summary-title</a>)</p> <p>peanut</p> <p>peanut; goober; ground-nut; Arachis hypogaea L.; Arachis hypogaea</p> <p>species</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Fabales; Fabaceae; Papilionoideae; 50 kb inversion clade; dalbergioids sensu lato; Dalbergieae; Pterocarpus clade; Arachis</p> <p>Arachis () - (Rank: genus) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3817">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3817</a>)</p> <p>3818 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3818">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3818</a>)</p> <p>is Taxon A an Intraspecies?</p> <p>No</p>	<p>Latin Name</p> <p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon B an Intraspecies?</p> <p>Taxon B Description</p>	<p>Taxon B</p> <p>Arachis hypogaea (<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Arachis+hypogaea#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Arachis+hypogaea#gephebase-summary-title</a>)</p> <p>peanut</p> <p>peanut; goober; ground-nut; Arachis hypogaea L.; Arachis hypogaea</p> <p>species</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Fabales; Fabaceae; Papilionoideae; 50 kb inversion clade; dalbergioids sensu lato; Dalbergieae; Pterocarpus clade; Arachis</p> <p>Arachis () - (Rank: genus) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3817">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3817</a>)</p> <p>3818 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3818">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3818</a>)</p> <p>is Taxon B an Intraspecies?</p> <p>Yes</p> <p>chemically induced mutant M2-225</p>	<p>Latin Name</p> <p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon B an Intraspecies?</p> <p>Taxon B Description</p>
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## GENOTYPIC CHANGE

<p>FAD2B</p> <p>FAD; FAD2</p> <p>-</p> <p>-</p> <p>GO:0050184 : phosphatidylcholine desaturase activity (<a href="https://www.ebi.ac.uk/QuickGO/term/GO:0050184">https://www.ebi.ac.uk/QuickGO/term/GO:0050184</a>)</p> <p>GO:0006629 : lipid metabolic process (<a href="https://www.ebi.ac.uk/QuickGO/term/GO:0006629">https://www.ebi.ac.uk/QuickGO/term/GO:0006629</a>)</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p> <p>GO - Biological Process</p> <p>GO - Cellular Component</p>	<p>UniProtKB Arachis hypogaea</p> <p>Q9LKK6 (<a href="http://www.uniprot.org/uniprot/Q9LKK6">http://www.uniprot.org/uniprot/Q9LKK6</a>)</p> <p>0</p>	<p>GenebankID or UniProtKB</p>
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GO:0016021 : integral component of membrane  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)

Presumptive Null

Yes ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Yes^#gephebase-summary-title](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](https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Coding^#gephebase-summary-title))

Aberration Type

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

Insertion Size

100-999 bp

Molecular Details of the Mutation

insertion of 205-bp miniature inverted-repeat transposable element (MITE) called ahMITE1 at position 997 of the coding region; which causes a frameshift

Experimental Evidence

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

Main Reference

High-oleate peanut mutants result from a MITE insertion into the FAD2 gene. (2004) (<https://pubmed.ncbi.nlm.nih.gov/14968307>)

Authors

Patel M; Jung S; Moore K; Powell G; Ainsworth C; Abbott A

Abstract

A high-oleate trait in the cultivated peanut (*Arachis hypogaea* L.) was reported to rely on the allelic composition of the two homeologous, microsomal oleoyl-PC desaturase genes (ahFAD2A or ahFAD2B). The enzyme activity of either ahFAD2A or ahFAD2B is sufficient for a normal oleate phenotype, and a significant reduction in the levels of ahFAD2B and a mutation in ahFAD2A were reported to be responsible for the high-oleate phenotype in one chemically induced mutant (M2-225) and one derived from a naturally occurring (8-2122) mutant. Here, we report an insertion of the same miniature inverted-repeat transposable element (MITE) in the ahFAD2B gene in another chemically induced mutant (Mycogen-Flavo) and the previously characterized M2-225 mutant. In both cases, this MITE insertion in ahFAD2B causes a frameshift, resulting in a putatively truncated protein sequence in both mutants. The insertion of this MITE in ahFAD2B, in addition to the point mutation in ahFAD2A, appears to be the cause of the high-oleate phenotype in Mycogen-Flavo and M2-225 mutants. Utilizing sequences of the MITE, we developed a DNA marker strategy to differentiate the two insertion-containing mutants from the normal oleate peanut variety (AT-108) and the naturally occurring, high-oleate mutant 8-2122. Reverse transcript-PCR/differential digestion results reveal the expression of both ahFAD2A and ahFAD2B genes in Mycogen-Flavo mutant. This result is in contrast to the observation that ahFAD2B transcripts are greatly reduced in the M2-225 mutant having the MITE insertion further 3' in ahFAD2B gene.

Additional References

## RELATED GEPHE

Related Genes

1 (FAD2A) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=~3818^/and+Trait=Oil composition/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=~3818^/and+Trait=Oil+composition/and+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

1 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~FAD2B^/and+Taxon ID=~3818^/or+Gene Gephebase=~FAD2B^/and+Taxon ID=~3818^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=~FAD2B^/and+Taxon+ID=~3818^/or+Gene+Gephebase=~FAD2B^/and+Taxon+ID=~3818^#gephebase-summary-title))

## EXTERNAL LINKS

## COMMENTS

@TE - The null mutation in FAD2A is also necessary for the high oleate level phenotype.