

GEPHE SUMMARY

| | Gephebase Gene | GephelD |
|---|----------------|--------------|
| TFL1/GmTFL1 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^TFL1/GmTFL1^#gephebase-summary-title) | GP00001122 | Main curator |
| Entry Status | Martin | |
| Published | | |

PHENOTYPIC CHANGE

| | Trait Category | |
|---|-----------------------------|---|
| Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title) | Trait | |
| Growth determination habit (https://www.gephebase.org/search-criteria?/and+Trait=^Growth+determination+habit^#gephebase-summary-title) | Trait State in Taxon A | |
| Glycine max; Glycine soja | Trait State in Taxon B | |
| Glycine max (determinate growth habit) | Ancestral State | |
| Data not curated | Taxonomic Status | |
| Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Domesticated^#gephebase-summary-title) | | |
| Taxon A | | Taxon B |
| | Latin Name | Latin Name |
| Glycine max (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Glycine+max^#gephebase-summary-title) | | Glycine max (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Glycine+max^#gephebase-summary-title) |
| | Common Name | Common Name |
| soybean | | soybean |
| | Synonyms | Synonyms |
| soybean; soybeans; Glycine max (L.) Merr.; Glycine max; cv. Wye | | soybean; soybeans; Glycine max (L.) Merr.; Glycine max; cv. Wye |
| | Rank | Rank |
| species | | species |
| | Lineage | Lineage |
| cellular organisms; Eukaryota; Viriplantae; Streptophytina; Embryophytina; Tracheophytina; Euphylophyta; Spermatophytina; Magnoliophytina; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Fabales; Fabaceae; Papilionoideae; 50 kb inversion clade; NPAAA clade; indigoferoid/millettoid clade; Phaseoleae; Glycine; Soja | | cellular organisms; Eukaryota; Viriplantae; Streptophytina; Embryophytina; Tracheophytina; Euphylophyta; Spermatophytina; Magnoliophytina; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Fabales; Fabaceae; Papilionoideae; 50 kb inversion clade; NPAAA clade; indigoferoid/millettoid clade; Phaseoleae; Glycine; Soja |
| | Parent | Parent |
| Soja () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1462606) | | Soja () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1462606) |
| 3847 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3847) | | NCBI Taxonomy ID 3847 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3847) |
| No | is Taxon A an Infraspecies? | is Taxon B an Infraspecies? |

GENOTYPIC CHANGE

| | Generic Gene Name | UniProtKB Arabidopsis thaliana |
|---|-------------------------|--|
| TFL1 | | P93003 (http://www.uniprot.org/uniprot/P93003) |
| | Synonyms | GenebankID or UniProtKB |
| MED24.6; TERMINAL FLOWER 1; TFL-1; At5g03840; F8F6_50 | | ABS57463 (https://www.ncbi.nlm.nih.gov/nucleotide/ABS57463) |
| | String | |
| 3702.AT5G03840.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT5G03840.1) | | |
| | Sequence Similarities | |
| Belongs to the phosphatidylethanolamine-binding protein family. | | |
| | GO - Molecular Function | |
| GO:0003712 : transcription coregulator activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003712) | | GO - Biological Process |
| GO:0030154 : cell differentiation (https://www.ebi.ac.uk/QuickGO/term/GO:0030154) | | |
| GO:0009908 : flower development (https://www.ebi.ac.uk/QuickGO/term/GO:0009908) | | |
| GO:0009910 : negative regulation of flower development | | |

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009910>)
 GO:0009744 : response to sucrose (<https://www.ebi.ac.uk/QuickGO/term/GO:0009744>)
 GO:0090344 : negative regulation of cell aging
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0090344>)
 GO:0006623 : protein targeting to vacuole
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0006623>)

GO - Cellular Component

GO:0005886 : plasma membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0005886>)
 GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)
 GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)
 GO:0031982 : vesicle (<https://www.ebi.ac.uk/QuickGO/term/GO:0031982>)
 GO:0005773 : vacuole (<https://www.ebi.ac.uk/QuickGO/term/GO:0005773>)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

P113L

Experimental Evidence

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

| | Taxon A | Taxon B | Position |
|------------|---------|---------|----------|
| Codon | - | - | - |
| Amino-acid | - | - | - |

Main Reference

Artificial selection for determinate growth habit in soybean. (2010) (<https://pubmed.ncbi.nlm.nih.gov/20421496>)

Authors

Tian Z; Wang X; Lee R; Li Y; Specht JE; Nelson RL; McClean PE; Qiu L; Ma J

Abstract

Determinacy is an agronomically important trait associated with the domestication in soybean (*Glycine max*). Most soybean cultivars are classifiable into indeterminate and determinate growth habit, whereas *Glycine soja*, the wild progenitor of soybean, is indeterminate. Indeterminate (*Dt1/Dt1*) and determinate (*dt1/dt1*) genotypes, when mated, produce progeny that segregate in a monogenic pattern. Here, we show evidence that *Dt1* is a homolog (designated as *GmTFL1*) of *Arabidopsis* terminal flower 1 (*TFL1*), a regulatory gene encoding a signaling protein of shoot meristems. The transition from indeterminate to determinate phenotypes in soybean is associated with independent human selections of four distinct single-nucleotide substitutions in the *GmTFL1* gene, each of which led to a single amino acid change. Genetic diversity of a minicore collection of Chinese soybean landraces assessed by simple sequence repeat (SSR) markers and allelic variation at the *GmTFL1* locus suggest that human selection for determinacy took place at early stages of landrace radiation. The *GmTFL1* allele introduced into a determinate-type (*tfl1/tfl1*) *Arabidopsis* mutants fully restored the wild-type (*TFL1/TFL1*) phenotype, but the *GmTFL1* allele in *tfl1/tfl1* mutants did not result in apparent phenotypic change. These observations indicate that *GmTFL1* complements the functions of *TFL1* in *Arabidopsis*. However, the *GmTFL1* homeolog, despite its more recent divergence from *GmTFL1* than from *Arabidopsis TFL1*, appears to be sub- or neo-functionalized, as revealed by the differential expression of the two genes at multiple plant developmental stages and by allelic analysis at both loci.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

3 ([#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^TFL1/GmTFL1^/and+Taxon ID=^3847^/or+Gene Gephebase=^TFL1/GmTFL1^/and+Taxon ID=^3847))

EXTERNAL LINKS

COMMENTS

