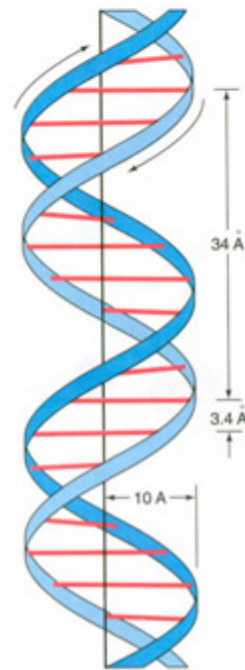
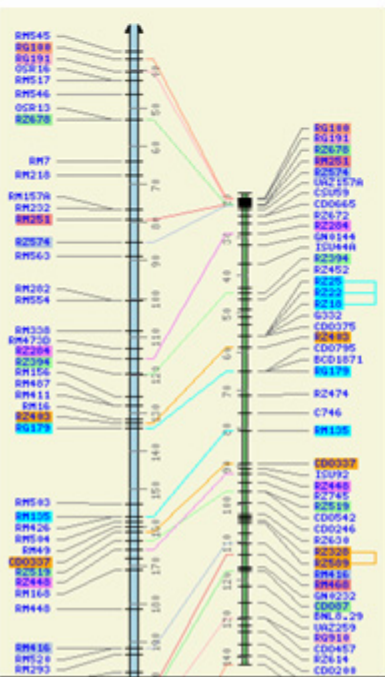


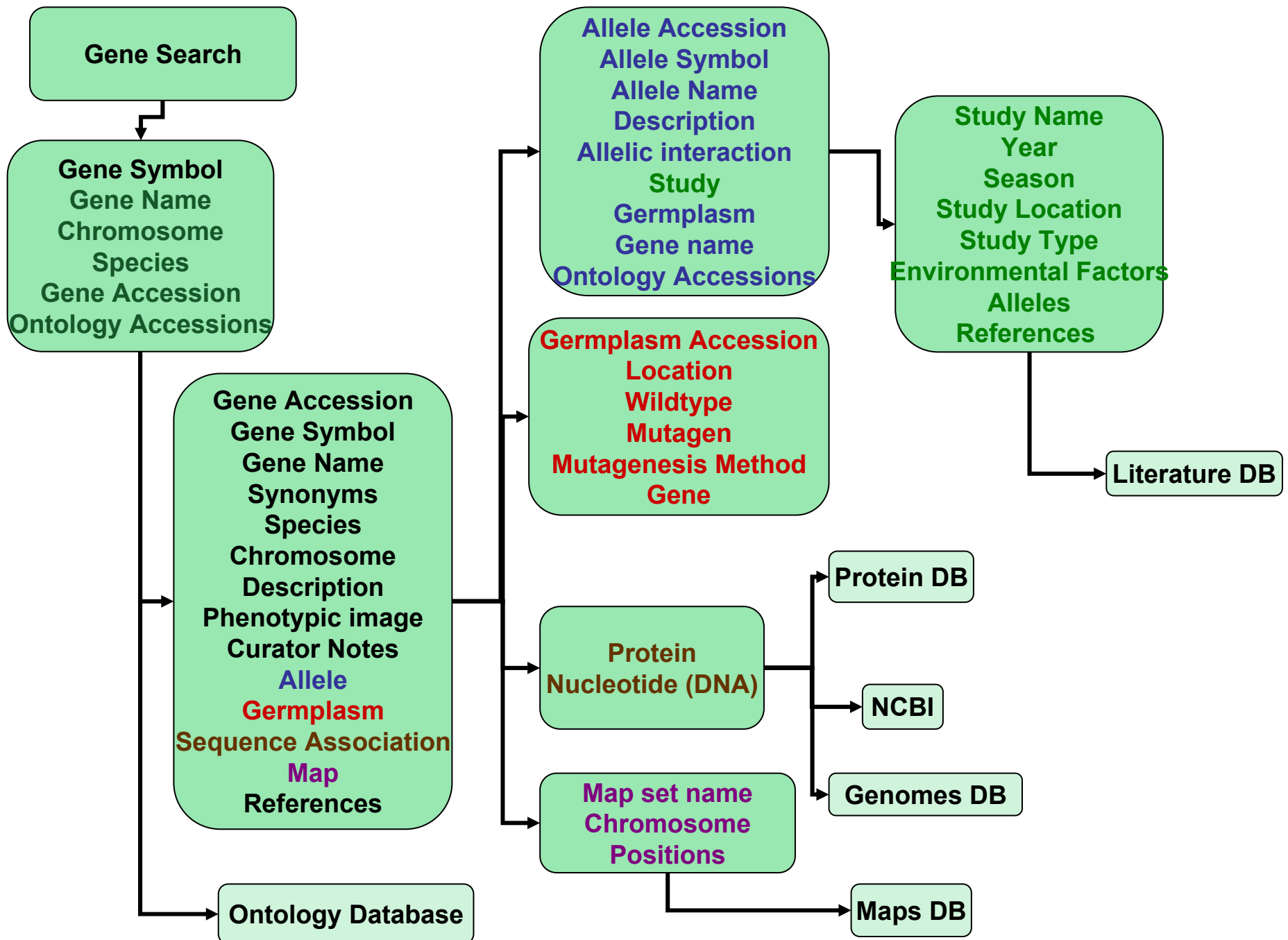


Welcome to the Gene and Allele Database Tutorial

This tutorial will describe how to navigate the section of Gramene that provides descriptions of alleles associated with morphological, developmental, and agronomically important phenotypes and variants of physiological characters, biochemical functions and isozymes.

Many genes in Gramene also have map positions and sequencing data.





Tutorial Help



The hand icon indicates a link that allows you to go to the same page in your web browser.



If you are viewing this tutorial with Adobe Acrobat Reader, click the "bookmarks" on the left hand side of the Reader for easier navigation.

Action Options are noted in this type of font.

Notes or comments use this style font.



Gramene Home Page

Quick Search

Find anything

Have Questions...?

- Gramene now has [tutorials](#) for every module.
- Ask questions through [Feedback](#) or [Email](#)

Gramene Tips:

Find proteins, maps, and QTL for your favorite species by using the [Taxonomy Ontology](#).

All Tips

Genomes-Ensembl
Maps-CMap
Markers
QTL
Genes
Proteins
Ontologies
Literature
Sequences-BLAST
All-GrameneMaps

Click here to open gene search

Quick Start

Accessed genomes for [Rice](#), [Maize](#) & [Arabidopsis](#); Look for [rice/maize synteny](#); Narrow your search for sequence alignment with [BLAST](#); search by [Gene Ontology](#).

or [ProSite](#) or Browse by Gene Ontology using [GO Slim](#).

[Barley](#), [Oats](#), [Sorghum](#), and other grasses, or use the [Taxonomy Ontology](#) types and species.

Identification Tool ([SSRIT](#)); or search by [marker type](#) or

TRAITS: Search the [Genes](#) or [QTL](#) database for important phenotype-related loci such as [Rice Genes](#), [Rice QTL](#), [Maize QTL](#). Don't forget to explore traits in [Ontologies](#).

LITERATURE: Search the literature for your friends and topics of interest.

SUBMISSION: Submit a [Rice Gene](#) or [Ontology Term](#) to Gramene.

Gramene is a curated, open-source, web-accessible data resource for comparative genome analysis in the grasses. Our goal is to facilitate the study of cross-species homology relationships using information derived from public projects involved in genomic and EST sequencing, protein structure and function analysis, genetic and physical mapping, interpretation of biochemical pathways, gene and QTL localization and descriptions of phenotypic characters and mutations.

Featured News

- Gramene Release 20 for March 2006. See the [release notes](#).
- [Gramene News Archive](#)
- PAG XIV [Gramene workshop materials](#) are available.
- [Rice News Worldwide](#) from IRRI

Visit with us at

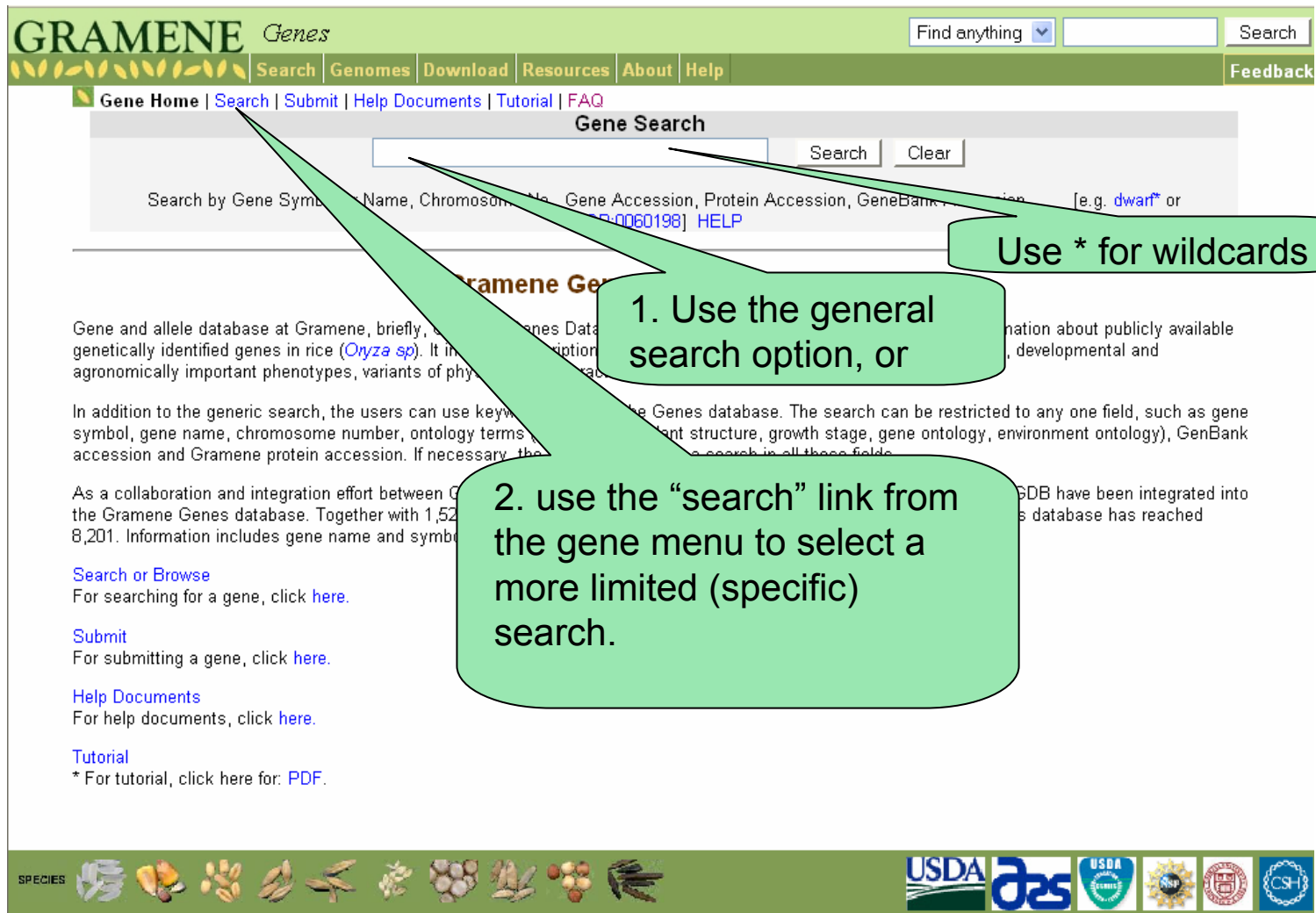
- [48th Maize Genetics Conference](#), March 9-12, 2006, Asilomar, Pacific Grove, CA

[Gramene Calendar](#)

SPECIES



Gene & Allele Database Home Page



GRAMENE Genes Find anything Search

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[Gene Home](#) | [Search](#) | [Submit](#) | [Help Documents](#) | [Tutorial](#) | [FAQ](#)

Gene Search

Search Clear

Search by Gene Symbol, Name, Chromosome, Map, Gene Accession, Protein Accession, GeneBank Accession, etc. [e.g. dwarf* or Oryza0060198] [HELP](#)

1. Use the general search option, or

2. use the "search" link from the gene menu to select a more limited (specific) search.

Use * for wildcards

Gramene Genes Database

Gene and allele database at Gramene, briefly, the Gramene Genes Database (GDB) is a comprehensive database of genetically identified genes in rice (*Oryza sp.*). It includes information about publicly available gene sequences, developmental and agronomically important phenotypes, variants of physical and molecular maps, etc.

In addition to the generic search, the users can use keywords to search the Genes database. The search can be restricted to any one field, such as gene symbol, gene name, chromosome number, ontology terms (e.g. plant structure, growth stage, gene ontology, environment ontology), GenBank accession and Gramene protein accession. If necessary, the search can be restricted to all these fields.

As a collaboration and integration effort between the Gramene Genes database and the Gramene Protein Database (GPD), the GDB have been integrated into the Gramene database. Together with 1,528,201. Information includes gene name and symbol, gene structure, gene ontology, etc.

[Search or Browse](#)
For searching for a gene, click [here](#).

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* For tutorial, click here for: [PDF](#).

SPECIES           

USDA  USDA    



Step one: Search Genes

3 methods

1. Search by **term**

GRAMENE Genes

Find anything Search

[Gene Home](#) | [Search](#) | [Submit](#) | [Help](#) | [Tutorial](#) | [FAQ](#) | [Feedback](#)

Gene Search

Search for *: Search in: Species:

Gene Symbol & Name All Species Search Clear

* eg, [d1](#), [dwarf-1](#), [GR:0060184](#), [flower*](#), [*tillering stage*](#) Or [view help](#)

OR

Browse by Ontology Database [Trait](#), [Plant Structure](#), [Growth Stage](#)

2. Click an **ontology** to retrieve a list of genes in that ontology.

OR

3. Browse for a gene via **Literature Database**

Go to the Literature Database in Gramene. Literature detail will display genes in the "Associated Data" field.



Step one: Search Genes

For Help, click
Help, Tutorial
or FAQ

GRAMENE Genes

Search Genomes Download

Gene Home | Search | Submit | Help | Tutorial | FAQ

Search for *: dwarf*

Search in: Gene Symbol & Name

Species: Rice

Search Clear

Browse by Ontology Database Trait

GR:00 Rice *tillering stage* Or view help

Maize All Species

Gene Symbol & Name
Gene Accession
Chromosome No.
TO/Trait
PO/Plant Structure
GO:Growth Stage
GO:Cellular Component
GO:Molecular Function
GO:Biological Process
GO:Environment
GeneBank Accession
Gramene Protein Accession
All Fields

Be aware of wildcards. In this example, searches for *dwarf, dwarf*, and *dwarf* will all give different results.

OR

1a/b. Enter a term and select what fields to search.
When you don't know the exact term, add the wildcard (*) to your search. For example, to browse genes by alphabetical order, enter the letter and wildcard (example "A*")

1c. Select species to search

1d. Click "Search" to view the gene detail page

Step Two: Results for Gene Search by Term / Key word



GRAMENE Genes Find anything Search

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Gene Search

Search for *: Search in: Species:

* eg, d1, dwarf-1, GR:0060184, flower*, *tillering stage* Or [view help](#)

There are 44 entries for "dwarf*", with 25 entries per page

Click to view next page of results as needed.

OR
[Structure](#), [Growth Stage](#)

Items 1 to 25 of 44. Page of 2 | [Next](#)

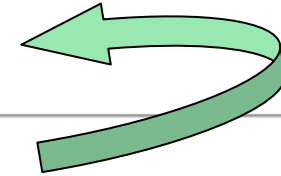
Gene Symbol	Gene Name	Synonyms	TO	PO	GRO	GO	EO	Chr. No.	Species	Accession
d1	dwarf-1	dwf1, daikoku dwarf, G-protein alpha subunit, GA1, GP-alpha-1, Guanine nucleotide-binding protein alpha-1 subunit, RGA1	leaf shape, seed shape, leaf lamina color, stem length, panicle length, leaf color, leaf length, internode length, leaf width, seed size, panicle type, plant height	stem, whole plant, leaf lamina, stem internode, inflorescence, leaf, seed	06-heading stage, 08-dough stage, 07-milk stage, 04-stem elongation stage, 02-seedling, 03-tillering stage, 05-booting stage, 09-mature grain stage	G-protein coupled receptor protein signaling pathway, defense response to pathogen, gibberellic acid mediated signaling, G-alpha-dependent development, GTP binding, heterotrimeric G-protein complex			Rice	GR:0060184
d10	dwarf-10	kikeibanshinriki or toyohikaribunwai tillering dwarf, d16, d15, dwf9	tiller number, internode length, stem thickness, stem length, panicle length	stem, stem internode, inflorescence, axillary shoot	04-stem elongation stage, 05-booting stage, 03-tillering stage, 01-germination	cell differentiation, unidimensional cell growth				
d11		hinkaneaikoku or nohrin 28, dwf10, d8	seed shape, internode length, stem length, panicle length	stem, stem internode, inflorescence, seed	04-stem elongation stage, 05-booting stage, 06-heading stage, 08-dough stage, 09-mature grain stage, 07-milk stage	development, unidimensional cell growth	4		Rice	GR:0060193
					04-stem elongation stage, 05-booting stage, 06-heading stage, 08-dough stage, 09-mature grain stage, 07-milk stage	response to temperature				

Click on linked column heading to order list by that column.

Click on a gene symbol to view the detail page for that particular gene.

Step three: Gene Detail Page

General Info



Summary for Gene: *d1* (GR:0060184)

[General Info.](#) | [Alleles and Genoplasm](#) | [Sequence Association](#) | [Map Position](#) | [Ortholog Association](#) | [References](#)

Select desired detailed info from menu and click.

General Information

Accession	GR:0060184
Gene Symbol	<i>d1</i>
Gene Name	<i>dwarf-1</i>
Gene Synonym(s)	dwf1, daikoku dwarf, G-protein alpha subunit, GA1, GP-alpha-1, Guanine nucleotide-binding protein alpha-1 subunit, RGA1
Species	Rice
Chromosome No.	5

Description

A typical small grain dwarf type with short and small, round floral glumes. Internodes

1.



1. Dwarf type of 'Shiokari' back

3.



3. Dwarf plant with small grains (dwarf plant)

Phenotypic Image

Gene name: Traditional gene names have been used. Some gene names have been modified according to the Gene Nomenclature System.

Gene symbol: Gene symbols have been assigned, according to the Gene Nomenclature System.

Gene synonym: List of names or symbols that have been used for a specific gene.

Description: Text defines the primary features used to detect the phenotype and other related information for a particular gene to distinguish it from the wild type.

Phenotypic image: (if available) Display image(s) and text explanation of phenotypes for a particular gene.

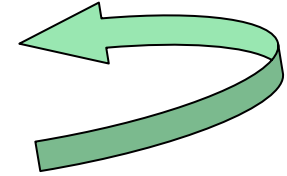
Click a thumbnail to enlarge image.

Curator

The gene is encoded by a single copy gene that the RGA1 gene is the immature embryo of rice blast. As a result, the type. H(2)O(2) produced by the expression of the constitutively active gene expression was induced by an avirulent race of rice blast and SE application on the leaf.

Step three: Gene Detail Page

Allele and Germplasm



[General Info.](#) | [Allele and Germplasm](#) | [Sequence Association](#) | [Map Position](#) | [Ontology Association](#) | [References](#)

Shows one or multiple allele names for a particular gene. Detailed information for the specific allele can be displayed when you click the allele name.

Allele	d1.wt1 , d1.1 , d1.2 , d1.3 , d1.4 , d1.5 , d1.6 , d1.7 , d1.8 , d1.9 , d1.10 , d1.11
Germplasm	A59 , C19 , Nipponbare , D25 , E017 , Akage-1 , CM392 , Kinmaze , A23 , Shiokari , Taichung65 , CM1361-1 , DK22 , DK1 , DKT-1 , DKT-2 , Daikoku , HO532 , FL2 , HO533 , HO537 , HO538 , HO541 , HO552 , CM382 , CM1792 , T6501 , Taichung 65-Daikoku dwarf

Shows one or multiple germplasm names for the particular gene. Click to view summary of the germplasm

Step three: Gene Detail Page



View of Allele Summary Page

Summary for Allele: *d1.wt1* (GR:0060184_1)

Accession	GR:0060184_1
Allele Symbol	<i>d1.wt1</i>
Allele Name	dwarf-1
Allele Description	Wild type.
Description of Allelic Interaction	Dominant.
Study	Nagao-1951a , Fujisawa-1999a
Germplasm	Nipponbare , Kinmaze , Shiokari , Taichung65
Gene	dwarf-1

Select for more detailed information on the referenced study(ies).

Select to return to gene detail page.

Ontology Association	
Trait	plant height(TO:0000207) , seed size(TO:0000391)
Plant Structure	seed(PO:0009010) , whole plant(PO:0000003)
Growth Stage	06-heading stage(GRO:0007044) , 09-mature grain stage(GRO:0007045)
Molecular Function	GTP binding(GO:0005525)

Allele designation: Different alleles of the same gene are distinguished by a decimal between the name of the gene and the number that follows, e.g., *gle1.1*. The synonyms for that allele are also listed following the allele designation.

Allele description: Provided if alleles give phenotypic differences.

Description of allelic interaction: Provided if the information about the interaction with other alleles or loci is available.

Step three: Gene Detail Page



View of Allele Study Page

Study: Nagao-1951a

Study Name	Nagao-1951a
Year	1951
Season	NA
Location	Hokkaido University, Japan
Study Type	Field Study
Environmental Factors	NA
Allele	Ap.1 (A-S, A.1, Sp.1), d1.wt1, dwf3.1 (d3.1), dwf4.1 (d4.1), dwf5.1 (d5.1), Pn.1, Pr.1, Rc.0 (Rc+), Rd.1, st2.1, cps.1, n1.2, clw.1, d2.wt1, dwf6.1

Select for detailed information on other genes in the study.

Reference

1. [Nagao-S.](#)
Genic analysis and linkage relationship of character
Advances in genetics.1951;4:181-212.

Provides a list of one or several studies or assays for that particular allele. Select to view literature entry for this publication.

Study name: Constructed of [author name] + [year of publication] + [a, b, c . . .] to differentiate among multiple studies for the same investigator and year.

Year: If the year of the study is. not available the year of the publication will be used.

Season: The seasons in which the study was done.

Location: If not available, first author or principal investigator's address will be used

Study type: Choices include field, greenhouse, growth chamber, and laboratory.

Environmental factors: Text description of environmental conditions for a particular study,

Step three: Gene Detail Page



View of Germplasm Summary Page

Summary for Germplasm: A59

Accession	A59
Location	Nagao's lab
Wild Type	A59
Mutagen	spontaneous
Mutagenesis Method	NA
Gene	dwarf-1

Select to return to gene detail page.

Accession: Germplasm accession or cultivar name associated with gene.

Location The laboratory where the related germplasm was used

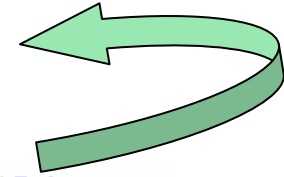
Wild Type: accession or cultivar name of the wild type used to generate the mutant line.

Mutagen: Mutagen used to generate the mutant allele.

Mutagenesis Method: Detailed mutagenesis method used to generate the mutant allele.

Step three: Gene Detail Page

Sequence Association



[General Info.](#) | [Allele and Germplasm](#) | [Sequence Association](#) | [Map Position](#) | [Ontology Association](#) | [References](#)

Click to view the nucleotide sequence link for each protein from the National Center for Biotechnology Information.

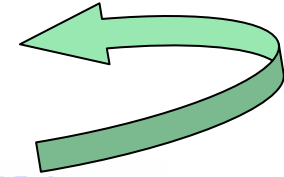
Select to view more information from Gramene's Protein database (See Protein tutorial).

Sequence Association	
Protein	Gramene Protein: P49083 , Q43604
Nucleotide (DNA)	GenBank Nucleotide: AB026176 , AB026177 , AB026178 , AB026179 , AB026180 , AB028602 , AB028603 , D38232
	Rice Ensembl Gene: LOC_Os05g26890

Select to view Tigr gene report in Genome browser (See Genomes tutorial).

Step three: Gene Detail Page

Map Position



[General Info.](#) | [Allele and Germplasm](#) | [Sequence Association](#) | [Map Position](#) | [Ontology Association](#) | [References](#)

Map Position				
#	Map Set Name	Linkage Group	Start Position	Stop Position
1	Hokkaido Morphological 2000	5	30.00 cM	30.00 cM
2	JRGP Nipponbare/Kasalath RFLP	5	58.40 cM	60.70 cM

Chromosome feature is located on.

Select to view the gene feature detail in Maps
(See Maps tutorial).

Step three: Gene Detail Page

Ontology Associations

[General Info.](#) | [Allele and Germplasm](#) | [Sequence Association](#) | [Map Position](#) | [Ontology Association](#) | [References](#)

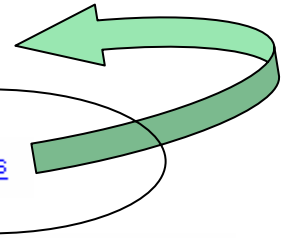
Ontology Association	
Trait	internode length (TO:0000145), leaf color (TO:0000326), leaf lamina color (TO:0000299), leaf length (TO:0000135), leaf shape (TO:0000492), leaf width (TO:0000370), panicle length (TO:0000040), panicle type (TO:0000089), plant height (TO:0000207), seed shape (TO:0000484), seed size (TO:0000391), stem length (TO:0000576)
Plant Structure	inflorescence (PO:0009049), leaf (PO:0009025), leaf lamina (PO:0020039), seed (PO:0009010), stem (PO:0009047), stem internode (PO:0020142), whole plant (PO:0000003)
Growth Stage	02-seedling (GRO:0007047), 03-tillering stage (GRO:0007049), 04-stem elongation stage (GRO:0007048), 05-booting stage (GRO:0007148), 06-heading stage (GRO:0007044), 07-milk stage (GRO:0007046), 08-dough stage (GRO:0007042), 09-mature grain stage (GRO:0007045)
Cellular Component	heterotrimeric G-protein complex (GO:0005834)
Molecular Function	GTP binding (GO:0005525)
Biological Process	G-protein coupled receptor protein signaling pathway (GO:0007189), defense response to pathogen (GO:0042829), development (GO:0007275), gibberellic acid mediated signaling pathway (GO:0042388)

Click links to go to the Ontology Database within Gramene. (See Ontology tutorial).

Step three: Gene Detail Page

References

[General Info.](#) | [Allele and Germplasm](#) | [Sequence Association](#) | [Map Position](#) | [Ontology Association](#) | [References](#)



Reference

DBxref

Oryzabase: 673

1. [Suharsono-U, Fujisawa-Y, Kawasaki-T, Iwasaki-Y, Satoh-H, Shimamoto-K.](#)
The heterotrimeric G protein alpha subunit acts upstream of the small GTPase Rac in disease resistance of rice.
Proceedings of the National Academy of Sciences of the United States of America. 1999;96:10284-10289.
2. [Ashikari-M, Wu-J, Yano-M, Sasaki-T, Yoshimura-A.](#)
Rice gibberellin-insensitive dwarf mutant gene Dwarf 1 encodes a gibberellin 2-beta-d-glucosyltransferase.
Proceedings of the National Academy of Sciences of the United States of America. 1999;96:10284-10289.
3. [Takamure-J, Hong-M-C, Kinoshita-T.](#)
Genetic interactions between major genes concerned with grain size in rice.
Breed Sci. 1996;46(Suppl. 1):78-.
4. [Takahashi-M.](#)
Linkage groups and gene schemes of some striking morphological characters in Japanese rice.
Symp Rice Genet Breed, Internatl Rice Res Inst (1963) Elsevier, Amsterdam. 1964;215-236.
5. [Kinoshita-T.](#)
Gene analysis of the rice map.
Biol. Mag. Tokyo. 1984;187-274.
6. [Ashikari-M.](#)
M...

Click to view Oryzabase's information on the selected gene.

Click to go to the reference in Gramene Literature database (See Literature tutorial).



How to Submit Newly Identified Genes

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Gene Search

Search Clear

Search by Gene Symbol or Name, Chromosome No., Gene Accession, Protein Accession, GeneBank Accession [e.g. *dwarf** or GR:0060198] [HELP](#)

Gramene Gene and Allele Database

Gene and allele database of genetically identified genes and agronomically important alleles.

In addition to the gene symbol, gene name, chromosome, accession and Gramene ID, the database also provides information on gene structure, gene expression, and gene function.

As a collaboration and the Gramene Genes database, the database contains 8,201. Information includes:

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A **web-based submission form** allows the user to submit newly identified genes that are accepted for publication or already available in scientific publications. Please try to submit online.

The user can also use this **PDF form** to print a hard copy, complete it and mail it to:

Gramene Curation Group

G15, Bradfield Hall

Plant Breeding, Cornell University

Ithaca, NY 14853, USA

Users are encouraged to send us your suggestions and comments by writing to us at gramene@gramene.org.

Please help us correct any errors or omissions that you observe. We are pleased to work with you to better serve the community.

SPECIES

Help Documents



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Release Notes:

Continually growing, Gramene release 2014.01 has a reorganized gene search interface over the last release. In addition to the generic search, the users can use keywords to search the Genes database. The search can be limited to one field, such as gene symbol, gene name, chromosome, gene family, gene structure, gene growth stage, gene ontology, environment ontology, Gene Ontology, or gene name. Users can also do a search in all these fields.

As a collaboration and integration effort between Gramene and MaizeGDB, the MaizeGDB has been integrated into the Gramene Genes database. As of release 2014.01, the total number of genes in the Genes database has reached 8,215.

Species	Genes	Note
Rice (Oryza)	1,539	Genes reported from 1994-2004.
Maize (Zea mays)	6,676	Genes imported from MaizeGDB.
Total	8,215	

[Top](#)

Description of Information in Gramene Genes Database:

1. For fully annotated genes, the database provides the following types of information to users:

◊ General information:

- ◆ **Gene name:** Traditional gene names have been used. Some gene names have been modified according to the Gene Nomenclature System.
- ◆ **Gene symbol:** Gene symbols have been assigned, according to the Gene Nomenclature System.
- ◆ **Gene synonym:** List of names or symbols that have been used for a specific gene.
- ◆ **Description:** Text defines the primary features used to detect the phenotype and other related information for a particular gene to distinguish it from the wild type.

Help documentation includes notes from the most recent database update, detailed notes about the information found in the database, and help on using the search tools.

Tutorials



Gramene Tutorials: [Navigation](#) | [Overview](#) | [Genomes](#) | [GrameneMart](#) | [BLAST](#) | [Maps](#) | [Markers](#) | [Proteins](#) | [Ontologies](#) | [Genes](#) | [QTL](#) | [Literature](#)

Click to select any Gramene tutorial.

Genes & Alleles Tutorial and Help Files

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Tutorial shows the features of a database. Tutorials come in several formats, including PowerPoint, PDF, and HTML. Some are also available in MS Word.

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FAQ's

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Gramene FAQ's may be browsed by category (based on datasets) or may be searched by keyword. (see search on bottom left of page)

2006-Feb-17 8:53am [cer17@cornell.edu](#)

[\[Insert Text Here\]](#)

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Subcategories:

[\[Icons\] Maps and CMap](#)

[\[Icons\] BLAST](#)

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[\[Icons\] Markers](#)

[\[Icons\] QTL](#)

[\[Icons\] Genes](#)

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Search FAQ

Answers in this category:

[\[Insert Text Here\]](#)

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[\[New Answer in "Gramene FAQ"\]](#)

2006-Feb-17 8:53am

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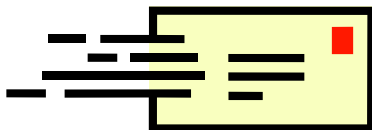
This is a [Faq-O-Matic](#) 2.721.

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Use the feedback button, located at the top of every page, to provide feedback or to ask questions about Gramene.

or



Email Gramene at gramene@gramene.org