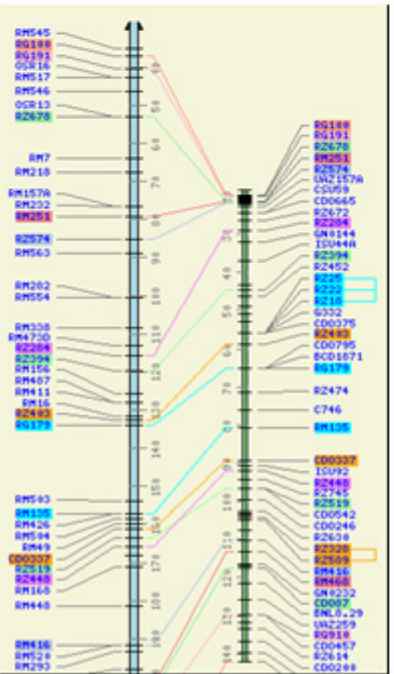
A Comparative Mapping Resource

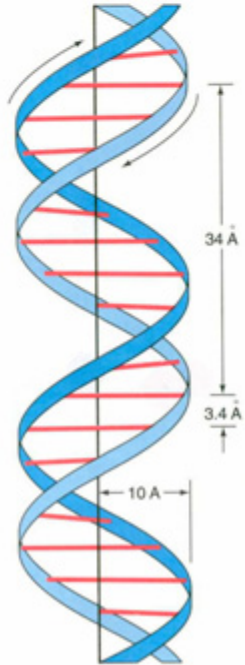
GRAMENE

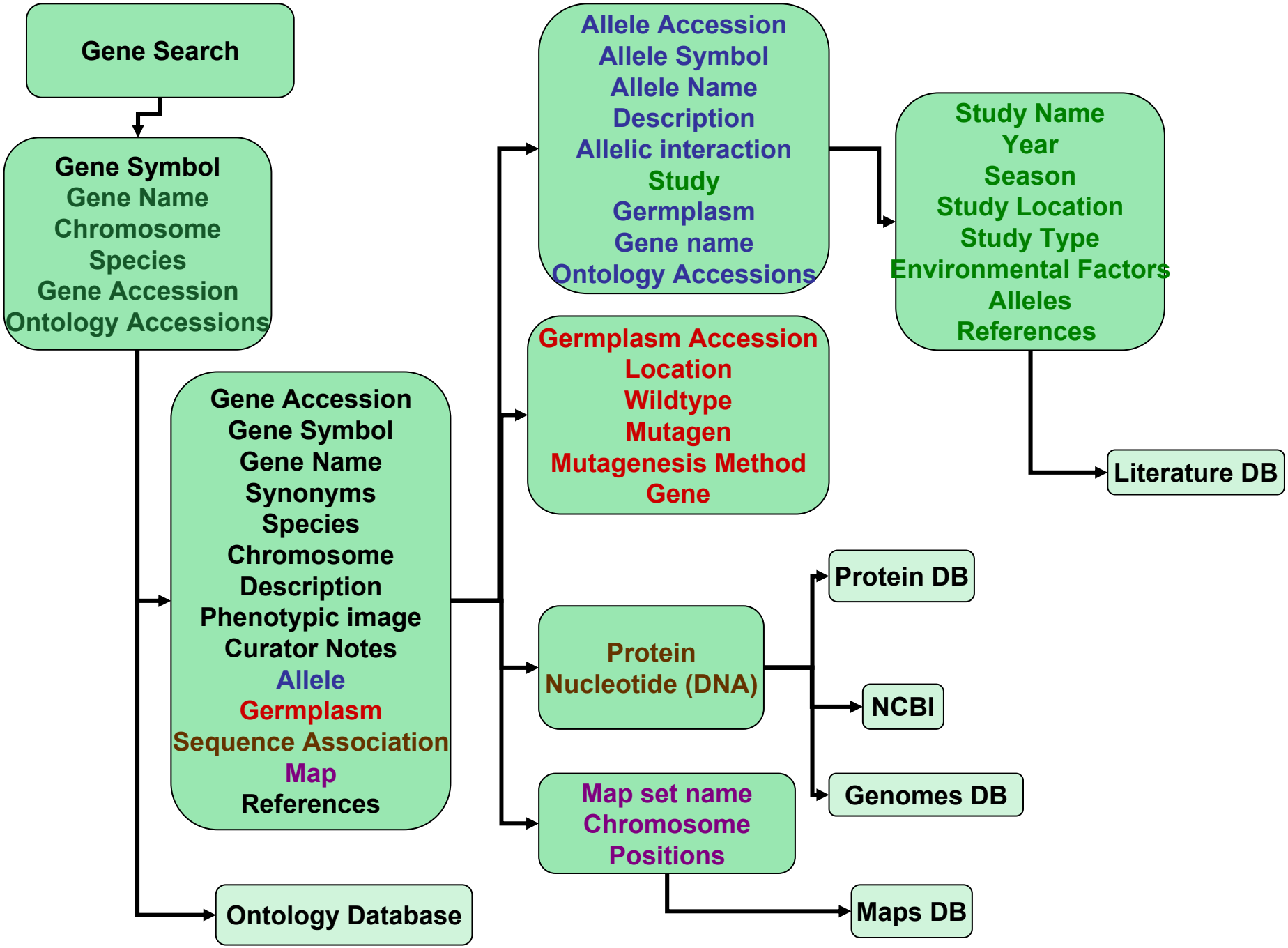
# Welcome to the Gene and Allele Database Tutorial

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.






Gene Search
Gene Symbol
Gene Name
Chromosome
Species
Gene Accession
Ontology Accessions
Gene Accession
Gene Symbol
Gene Name
Synonyms
Species
Chromosome
Description
Phenotypic image
Curator Notes
Allele
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Map
References
Ontology Database
Allele Accession
Allele Symbol
Allele Name
Description
Allelic interaction
Study
Germplasm
Gene name
Ontology Accessions
Study Name
Year
Season
Study Location
Study Type
Environmental Factors
Alleles
References
Literature DB
Germplasm Accession
Location
Wildtype
Mutagen
Mutagenesis Method
Gene
Protein
Nucleotide (DNA)
Protein DB
NCBI
Genomes DB
Map set name
Chromosome
Positions
Maps DB

# 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

GRAMENE *A Resource for Comparative Grass Genomics* *v20 (March 2006)*

Search | Genomes | Download | Resources | About | Help | Feedback

- Genomes-Ensembl
- Maps-CMap
- Markers
- QTL
- Genes
- Proteins
- Ontologies
- Literature
- Sequences-BLA
- All-GrameneMa

Click here to open gene search

## Quick Search

Find anything

Search

## 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**

## Quick Start

nced genomes for Rice, Maize & Arabidopsis; Look for rice/maize synteny; Narrow your search for sequence alignment with BLAST; search by Gene Ontology.

m or ProSite or Browse by Gene Ontology using GO Slim.

Barley, Oats, Sorghum, and other grasses, or use the types and species.

ntification Tool (SSRIT); or search by marker type or

**TRAITS**: Search the Genes or QTL database for important phenotype-releated 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

Last modified: Thu Mar 2 08:09:09 2006

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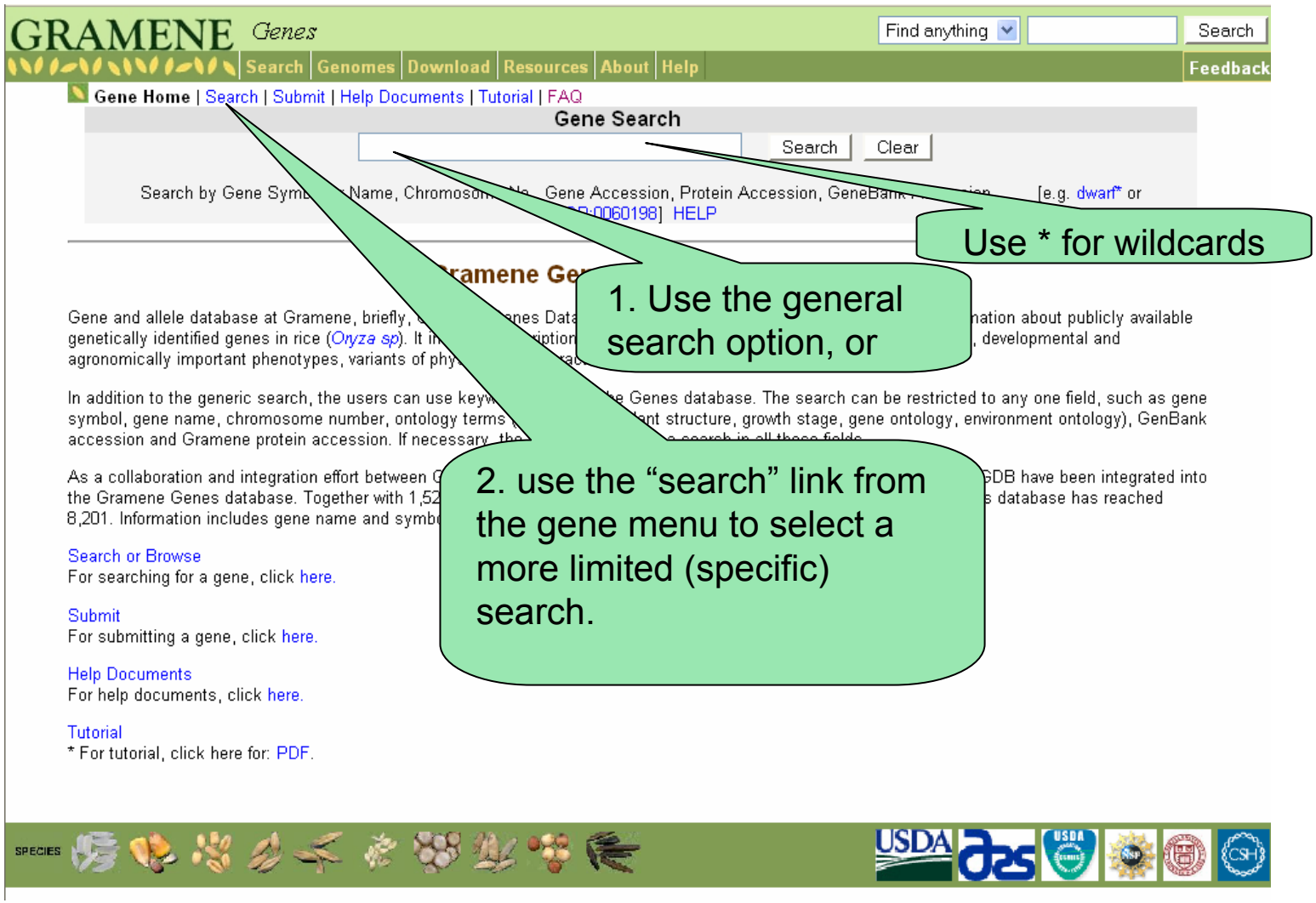
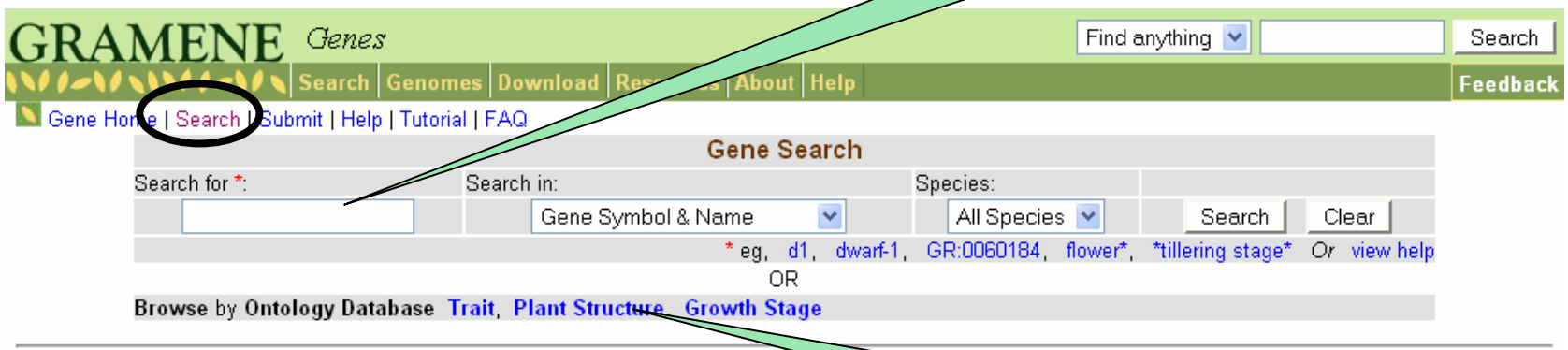
# Gene & Allele Database Home Page



# Step one: Search Genes

*3 methods*

**1.** Search by **term**




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

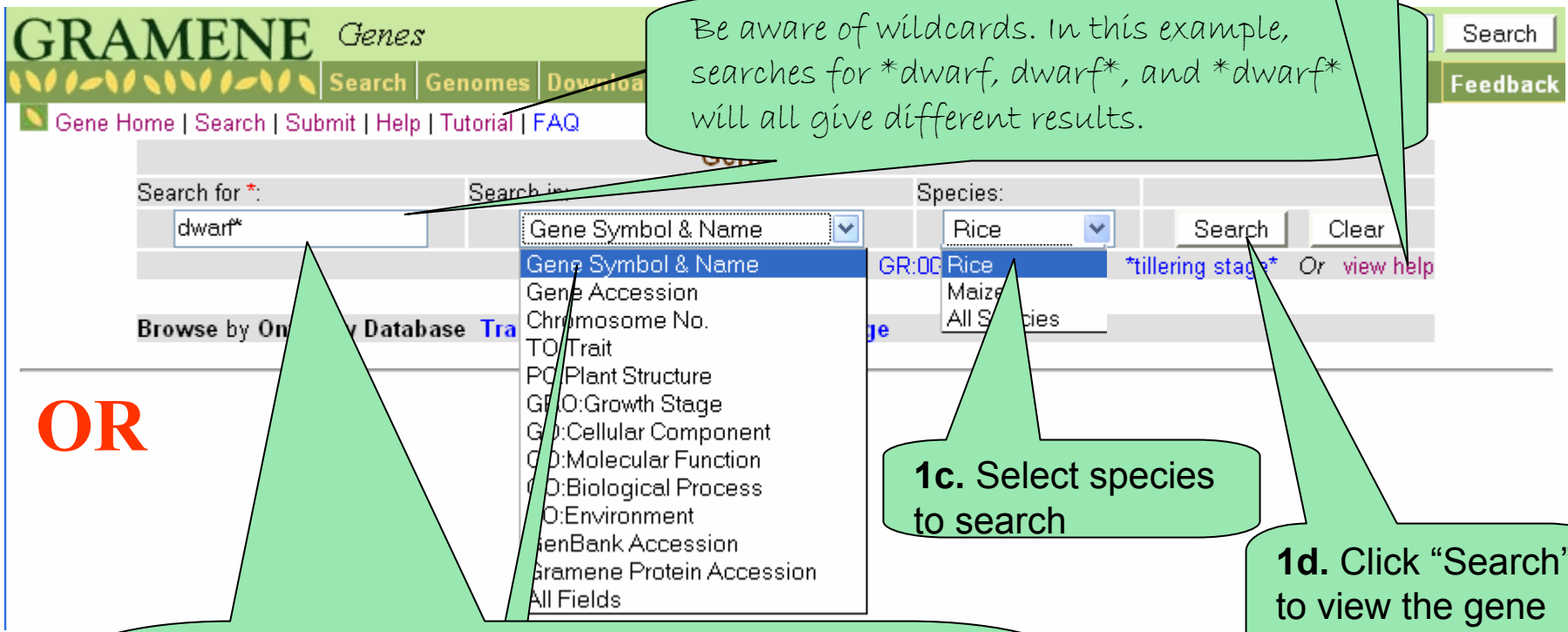
**OR**

**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

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




**1c.** Select species to search

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

**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*")

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

GRAMENE Genes

Find anything | Search

Search | Genomes | Download | Resources | About | Help | Feedback

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

## Gene Search

Search for *: dwarf*

Search in: Gene Symbol & Name

Species: Rice

Search | Clear

* eg, d1, dwarf-1, GR:0060184, flower*, *tillering stage* Or view help

OR

Structure, Growth Stage

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

Items 1 to 25 of 44. Page 1 of 2 | Next

Click to view next page of results as needed.

| 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 bindi heterotrimeric G-protein complex | | | ce | 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 grow | | | | |
| d11 | | inkaneaikoku 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 | 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. | Allele and Germplasm | Sequence Association | Map Position | Ontology Association | References

Select desired detailed info from menu and click.

| General Information | |
|---|---|
| Accession | GR:0060184 |
| Gene Symbol | *d1* |
| Gene Name | *dwarf-1* |
| 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 a and small, round floral glumes. Internodes |
| Phenotypic Image | 1. 1. Dwarf type 'Shiokari' back<br>3. 3. Dwarf plant small grains (d |
| Curator | The coded by a single copy g that the RGA1 p he immature em ce of rice blast. A type. H(2)O(2) produ ed ession of the constitutively a defense signaling and resistance to rice blast. The gene expression was induced by an avirulent race of rice blast and SE application on the leaf. |

Click a thumbnail to enlarge image.

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

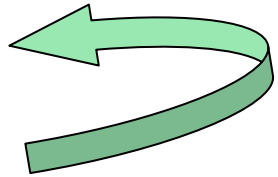
**Gene symbol**: Gene symbols have been assigned, according to the Gene Nomenclature System.

**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.

# 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, JD-1, DKT-1, DKT-2, Daikoku, HO532, FL2, HO533, HO537, HO538, HO541, HO552, CM382, CM1792, T65dr (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** | *d1.wt1* |
| **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*, *nl1.2*, *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.

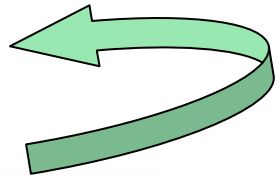
Select to view more information from Gramene's Protein database (See Protein tutorial).

| Sequence Association | |
|---|---|
| **Protein** | Gramene Protein: P49083, Q43604 |
| **Nucleotide (DNA)** | GenBank Nucleotide: AB026176, AB026177, AB026178, AB026179, AB026180, AB028602, AB028603, D38232<br>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*

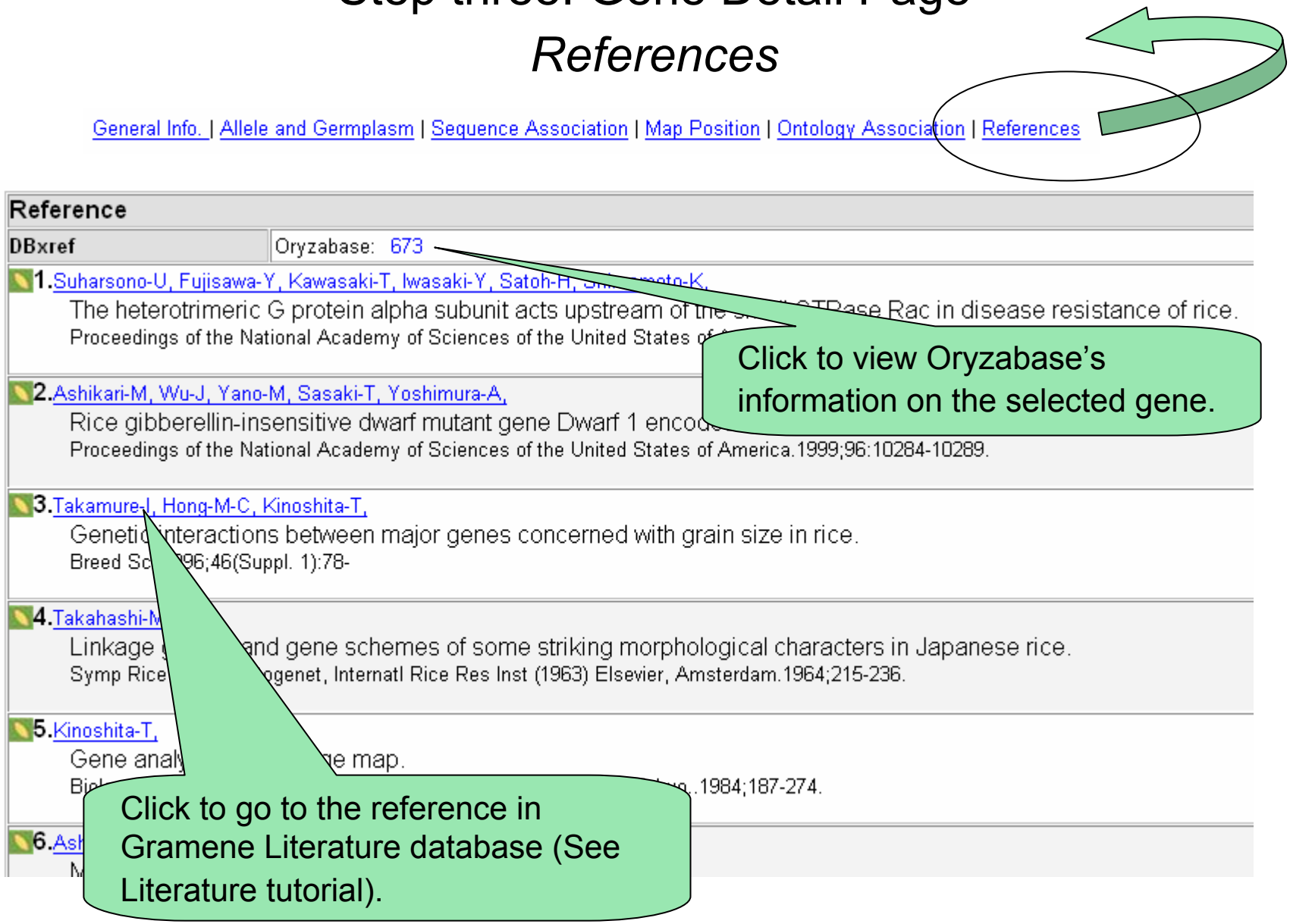
General Info. | Allele and Germplasm | Sequence Association | Map Position | Ontology Association | References

| 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:0007[illegible]), defense response to pathogen (GO:0042829), development (GO:0007275), gibberellic acid mediated signaling [illegible]a-dependent (GO:0042388) |

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

# Step three: Gene Detail Page

## *References*



# How to Submit Newly Identified Genes

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 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 databa
genetically identified g
agronomically importa

In addition to the gene
symbol, gene name, c
accession and Grame

As a collaboration and
the Gramene Genes d
8,201. Information incl

Search or Browse
For searching for a ge

Submit
For submitting a gene,

Help Documents
For help documents, c

Tutorial
* For tutorial, click her

SPECIES

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

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.

# Help Documents

GRAMENE *Genes*

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Release Notes | Information Help | Search Help | Submit Help

Release Notes:

Continually growing, Gramene release 20 p[illegible] reorganized gene search interface over the last release. In addition to the generic search, the users can use keyw[illegible]rch the Genes d[illegible] one field, such as gene symbol, gene name, chromo[illegible] growth stage, gene ontology, environment ontology), Gene[illegible] users also can do a search in all these fields.

As a collaboration and integration effort between Gramene and Maize[illegible] MaizeGDB have been integrated into the Gramene Genes database. [illegible] genes, the total number of genes in the Genes database has reache[illegible]

| 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*

Find anything | Search

Search | Genomes | Download | Resources | About | Help | Feedback

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

**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

**Tutorials**: Select your preferred format:

- PowerPoint (for non-IE)
- Adobe PDF
- Webpage (for IE, Safari, Konqueror)
- MS Word

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

Help Files

FAQ

Release Notes

SPECIES

# FAQ's

Submit a question to Gramene

GRAMENE *Cache*

Find anything | Search

Search | Genomes | Download | Resources | About | Help | Feedback

**Gramene FAQ**

[Category Title and Options] [Edit Category Permissions]

[Duplicate Category as Answer]

[New Answer in "Gramene FAQ"] [New Subcategory of "Gramene FAQ"]

[Insert Text Here] [Insert Uploaded Text Here]

[Edit This Text]
[Duplicate This Text]
[Remove This Text]
[Upload New Bag Here]

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] [Insert Uploaded Text Here]

[Edit This Text]

Subcategories:
- Maps and CMap
- BLAST
- Proteins
- Ontologies
- Genomes
- Markers
- QTL
- Genes
- Literature
- Data Curation
- Gramene Program
- Diversity
- GrameneMart
- Pathways

Select a module to view it's FAQs

[Duplicate This Text]

[Upload New Bag Here]

Answers in this category.

[Insert Text Here] [Insert Uploaded Text Here]

[New Answer in "Gramene FAQ"]
*2006-Feb-17 8:53am*

Search FAQ

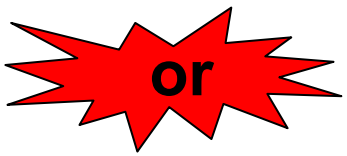
This document is: http://dev.gramene.org/cgi-bin/fom?file=1

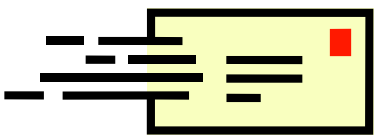
[Search] [Appearance] [Show This *Entire* Category] [Show This Category As Text] [Show This *Entire* Category As Text] [Hide Expert Edit Commands]

This is a Faq-O-Matic 2.721.

# Contact Gramene

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





Email Gramene at gramene@gramene.org