

# GENOME DATABASE FOR ROSACEAE



Resources for Rosaceae Research Discovery and Crop Improvement

July 2024

Welcome to the July 2024 issue of the GDR newsletter. This newsletter is issued to inform users about new or updated data and tools in GDR and provide a summary from the quarterly Rosaceae Executive Committee (RosEXEC) meetings.

## Summary of RosEXEC meeting!

The summary of the third RosEXEC meeting of 2024 is available on page 3! Make sure to check it out to learn new things happening in Rosaceae Community!

## New tutorials available

Two short tutorials, "[how to use the ortholog/paralog search](#)" and "[How to download protein sequences](#)" were made available. See [the manual page](#) or our [YouTube channel](#) for more tutorials.

## GDR Outreach

- [BIMS workshop at NAPB 2024](#)
- [Presentations at Plant Biology 2024](#)

## New Genome Data/Functional Analysis

- New whole genome data are available for *Fragaria*, *Prunus* and *Malus* species!:
  - [Fragaria x ananassa Florida Brilliance](#)
  - [Fragaria x ananassa FL 16.33-8](#)
  - [Fragaria x ananassa FL 20.82-27](#)
  - [Cerasus speciosa IZO01](#)
  - [Prunus dulcis Texas Genome v3.0](#)
  - [Malus x domestica Golden Delicious GDT2T](#)
  - [Malus x domestica Golden Delicious FEM](#)

## Updated Features

- BIMS supports Field Book App sync function.
- Protein FASTA file download available from [sequence search](#).
- Link to the genome page from the GWAS page of MapViewer.

## New GWAS, QTL, map, marker, and TE data

New GWAS, QTL, map, marker, and Transposable elements data from nine publications added. View data in [QTL/GWAS Search](#), [Marker Search](#), [MapViewer](#), and [JBrowse](#).

- Cao et al. TGG. 2012; 8(5):975-990.
- Muñoz et al. Hortic. Res. 2023; 10(3):uhad006.
- Sargent et al. PloS one. 2019; 14(9):e0222829.
- Pott et al. Scientific reports. 2020; 10(1):20197.
- Sargent et al. TAG. 2012; 124(7):1229-40.
- Labadie et al. Front. Plant Sci. 2022; 13:869655.
- Rey-Serra P, et al. Plant science. 2021; 311:111010.
- Cockerton et al. BMC plant biology. 2020; 20(1):154.
- Yu et al. Hortic. Res. 2024; 11(6):uhae118

## Synteny to Arabidopsis Genome

Synteny data between Arabidopsis and Rosaceae genomes available in [Ortholog Search](#) and [Synteny Viewer](#)

## New JBrowse tracks for QTLs, GWAS, and markers

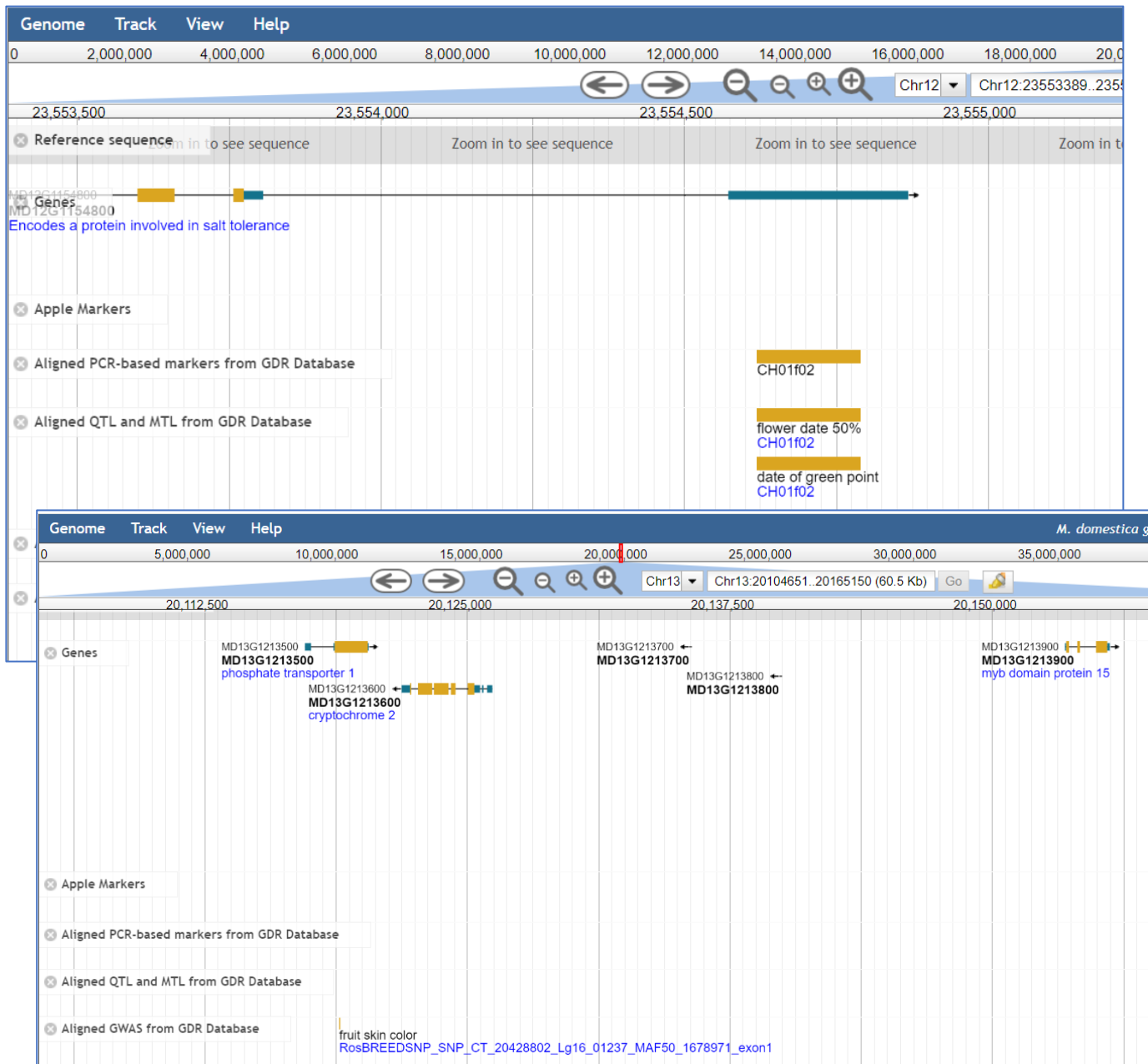
New [JBrowse](#) tracks below are available for the *Malus* and *Fragaria* genomes listed below. Find out more on the next page.

- *Malus x domestica* GDDH13 v1.1
- *Malus x domestica* 'Honeycrisp' Genome v1.1.a1
- *Malus x domestica* HFTH1 Whole Genome v1.0
- *Fragaria vesca* Genome v4.0
- *Fragaria x ananassa* Benihoppe Genome v1.0
- *Fragaria x ananassa* Camarosa Genome v1.0
- *Fragaria x ananassa* FL15.89-25 Genome v1.0
- *Fragaria x ananassa* Royal Royce Genome v1.0
- *Fragaria x ananassa* Yanli Genome v1.0

# Aligned markers and new JBrowse tracks

GDR is always looking for ways to take existing data and make it more useful for researchers. Using primer sequences from PCR-based markers (SSR, EST, etc.) in the database, and a short sequence BLAST analysis along with filtering, we have aligned the marker primers to some of the representative genomes of *Malus* and *Fragaria*. Alignment to more genomes will be done soon! The aligned positions are stored under the marker record. We have then mapped QTLs which are associated with aligned markers to genomes.

We have also added four new JBrowse tracks. One track is SNPs mapped to the genome. The second track is the aligned markers with PCR primers. And the last two tracks are aligned QTL either from provided genome positions or based on aligned markers associated with the QTL and GWAS with stored positions.



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Funded by: USDA SCRI, NIFA NRSP10, WSU  
and other U.S. Land Grant Universities

Hello! The third 2024 quarterly meeting of RosEXEC (Rosaceae Genomics Genetics and Breeding Executive Committee) took place virtually on Wednesday, July 10th. Here's what happened:

## GDR Support

Long-term financial sustainability for databases and database management is critical and has been a frequent topic of discussion at RosEXEC meetings. We are also taking concrete action on this issue. GDR director Dorrie Main is working in collaboration with the AgBioData Consortium to publish an opinion piece on the sustainability of databases. RosEXEC will be generating and signing a letter of support for long-term Federal funding of GDR and other databases and reaching out to commodity groups for additional letters of support. For short-medium term sustainability, we strongly encourage anyone reading this newsletter to include funding for GDR in your upcoming grant proposals.

## GDR Updates & Activities

The catalog of sequenced genomes continues to grow, with five more added in the 2<sup>nd</sup> quarter of 2024: 2 *Malus*, 2 *Prunus*, and 1 *Fragaria*. GDR has developed a standardized Crop Ontology for *Fragaria* and is currently working on *Rubus*. These ontology terms will be incorporated into BIMS (Breeders Information Management System). The GDR team has begun exploring AI technology, starting with OpenAI for assistance with answering general queries. The GDR team is also hard at work on a range of activities related to data submission. This includes curating the large amounts of data from publications, producing training videos, providing workshops, and developing standards for submission of newer data types. These activities are crucial to maintain compliance with U.S. government requirements that data generated from publicly funded projects be made available to the public in a timely manner.

## Challenge /Opportunity Statements for RGC Workshop Development

RosEXEC members will be developing 1-page statements regarding the specific challenges/opportunities in Rosaceae genomics. These statements are intended to be summaries of the current status of these important topics which can be used to develop effective workshops at the Rosaceae Genomics Conference being held next May (see Upcoming Events/Activities). Topics include:

- Data curation/database coordination and financial sustainability
- Genotyping platforms
- Pangenomics
- Phenomics
- Transcriptomics/data visualization

## Upcoming Events/Activities

The next RosEXEC meeting will be held in mid-October (exact date to be determined, but after the 10th). The American Society for Horticultural Science (ASHS) conference will be held in Honolulu, HI, 23-27 September. The Plant & Animal Genome Conference (PAG 32) will take place 10-15 January 2025. The next Rosaceae Genomics Conference (RGC12) will be held in Costa Brava, Spain 6-9 May 2025. RosEXEC is working to get financial support for travel to RGC for early-career scientists and those from economically disadvantaged locations, including non-R1 universities.

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