



Welcome to the 4th issue of the CottonGen newsletter in 2022. This newsletter is issued to inform users about **new or updated data and tools in CottonGen**. In addition to new and updated data, each issue will provide more information on data or tools on **the featured tools/data** section.

New Genome Data/Functional Analysis

Data from 3 whole genome assemblies:

<u>G. hirsutum (AD1) 'ZZM2' genome CAAS_v1 (2022, ncbi)</u> <u>G. stocksii (E1) genome_ZSTU v1</u>. (<u>Yu et al.,2021</u>) <u>G. bickii (G1) genome JZU_v1. (in press)</u>

CottonGen Functional Analysis (InterProScan and KEGG, Protein Homologies, Cottongen Marker and RefTran Alignments, etc.) **added to** the **genome:**

G. anomalum (B1) genome JAAS_v1.2_a1.1 (Xu 2022)

- **Other New Data**
- RBTN data from 2021 trials, which includes 4,676 phenotype data of 17 fiber quality or yield traits from of 12 difference locations (<u>RBTN</u> <u>2021</u>).
- Fiber quality, yield, and morphological traits QTLs, phenotypes and genetic map data (*Gowda*, 2022)
- Publications of GRIN new cultivar and germplasm registrations
- Standardize names of Linkage Groups and Chromosomes to enhance data queries

Below is an example of how those standardized Linkage Group Names assist users to find all markers associated with 'Seed cotton yield' and their genetic location on a specific linkage group on all AD maps.

In the interface of <u>MageSearch Marker</u>, fill in information of the specific chromosome and select the field you want to see or download

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seed number per boll 🗸	Probes						
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Ortholog/Paralog Search

This search is a tool to retrieve orthologs/paralogs that are detected using MCScanX (Wang et al. 2012) and its default settings. Sequences in ortholog/paralog columns between different assemblies/annotations of the same species represents potentially the same genes. **To start**, go to <u>Orthologs/paralogs in MegaSearch</u>, then choose data fields to view and download.

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534,813 Ortholog/Paralog	Note: actual rows in downloaded file depend on the selected fields.						
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Click the 'View' button from 'Downloadable Fields', the search results will display at below.

#	Genome1	Chromosome1	Ortholog1	Genome2	Chromosome2	Ortholog2	Associated Gene
1	Gossypium raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000005- RA	Gossypium anomalum (B1) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0002	Goano05G0002
2	Gossypium raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000006- RA	Gossypium anomalum (B1) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0003	Goano05G0003
3	Gossypium raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000009- RA	Gossyplum anomalum (B1) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0004	Goano05G0004
4	Gossypium raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000010- RA	Gossyplum anomalum (B1) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0005	Goano05G0005
5	Gossypium raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000011- RA	Gossyplum anomalum (B1) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0006	Goano05G0006
6	Gossyplum raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000013- RA	Gossypium anomalum (B1) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0007	Goano05G0007
7	Gossypium raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000014- RA	Gossyplum anomalum (B1) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0008	Goano05G0008
8	Gossyplum raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000015- RA	Gossyplum anomalum (B1) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0009	Goano05G0009
9	Gossypium raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000016- RA	Gossypium anomalum (B1) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0010	Goano05G0010
10	Gossypium raimondii (D5) 'D5-4' genome NSE v1	D5_05	D5.v1.pred_00000018- RA	Gossypium anomalum (B1) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0011	Goano05G0011

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You can visit gene pages to see orthologs/paralogs and syntenic blocks in all other genomes by clicking name from the result list (exp, the first one), you will see the gene page at below and see syntenic block by clicking on a block name.

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OBC DISC3020 Disk t perd_0000519.RA, 680_DISC3049 del_DUSC00111 Disk t perd_0000017.44A 0 GED_DISC3070 Disk t perd_0000519.RA, 680_DISC3049 Disk t perd_0000519.RA, 680_DISC3056 GB_DISC3070 NA NA GED_DISC3070 Disk t perd_0000519.RA, 680_DISC3056 Disk t perd_0000519.RA, 680_DISC3056 GB_DISC3056 NA NA GED_DISC3056 Disk t perd_0000519.RA, 680_DISC3056 Disk t perd_0000519.RA, 680_DISC3056 GB_DISC3056 Disk t perd_0000519.RA, 080_DISC3056 OB st perd_00000518.RA, 080_DISC3056 OB st perd_0000518.RA, 080_	GB_D05G3495	D6 D5 D5	v1.pred_00003534-RA v1.pred_00003548-RA v1.pred_00003574-RA	-		
DSt Tpred 2000314 - RA DSt tpred 2000311 - RA DSt tpred 200031 - RA DSt tpred 20031 - RA <td>GB_D05G3428 GB_D05G3376</td> <td>D6</td> <td>v1.pred_00003619-RA v1.pred_00003648-RA</td> <td>-</td> <td></td> <td></td>	GB_D05G3428 GB_D05G3376	D6	v1.pred_00003619-RA v1.pred_00003648-RA	-		
GB_005G362 D5/11 prod_000038274A D5/01 prod_00000713 D5/11 prod_0000013-00 0 GB_005G349 D5/11 prod_00000124A GB_005G3014 D5/11 prod_0000019-RA 0	GB_D05G3296	05	v1.pred_00003741-RA v1.pred_00003781-RA	-		
05_000001124 PA	GB_D05G3626 GB_D05G3649	mi	kado.D5.v1_5G10106.1			
		D5	v1.pred_00004124-RA	GB_0000014	D3.V1.pred_0000019-RA	0
61122148 52453098 GB_DUGGDUTS US VT.pred_DUDUD20-KA 0						

You can also use this tool to generate a list of matching genes (and true paralogs) between two genome assemblies of the same species by clicking on the 'CSV' (comma-separated values) or 'TSV' (tab-separated values) buttons.

A	B	C	D	E	F	G	н
Genome	1	Chromosome1	Ortholog1	Genome2	Chromosome2	Ortholog2	Associated Gene
1 Gossypiu	im raimondii (05) '05-4' genome NSF_v1	05_05	D5.v1.pred_00000005-RA	Gossypium anomalum (81) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0002	Goano05G0002
2 Gossyph	im raimondii (D5) 'D5-4' genome NSF_v1	05_05	D5.v1.pred_0000006-RA	Gossypium anomalum (81) genome JAA5_v1.2_a1.1	Chr05	evm.model.Goano05/G0003	Goano05G0003
3 Gossyph	im raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000009-RA	Gossypium anomalum (B1) genome JAA5_v1.2_a1.1	Chr05	evm.model.Goanc05G0004	Goano05G0004
4 Gossypic	im raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000010-RA	Gossypium anomalum (B1) genome JAA5_v1.2_a1.1	Chr05	evm.model.Goanc05G0005	Goano0560005
5 Gossypiu	im raimondii (D5) 'D5-4' genome NSF v1	D5_05	D5.v1.pred_00000011-RA	Gossypium anomalum (B1) genome JAAS v1.2 a1.1	Chr05	evm.model.Goanc05G0006	Goano05G0006
6 Gossypic	im raimondii (D5) 'D5-4' genome NSF_v1	05_05	D5.v1.pred_00000013-RA	Gossypium anomalum (B1) genome JAA5_v1.2_a1.1	Chr05	evm.model.Goanc05G0007	Goano05G0007
7 Gossypic	m raimondii (D5) 'D5-4' genome NSF_v1	05_05	D5.v1.pred_00000014-RA	Gossypium anomalum (B1) genome JAA5_v1.2_a1.1	Chr05	evm.model.Goanc05G0008	Goano0560008
8 Gossypis	im raimondii (05) '05-4' genome NSF_v1	05_05	D5.v1.pred_00000015-RA	Gossypium anomalum (B1) genome JAAS_v1.2_a1.1	Chr05	evm.model.Goano05G0009	Goano05G0009
9 Gossypis	m raimondii (D5) 'D5-4' genome NSF_v1	05_05	05.v1.pred_00000016-RA	Gossypium anomalum (B1) genome JAAS v1.2 a1.1	Chr05	evm.model.Goano05G0010	Goano05G0010
10 Gossypiu	im raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000018-RA	Gossypium anomalum (81) genome JAA5_v1.2_a1.1	Chr05	evm.model.Goanc05G0011	Goano0560011
11 Gossypis	im raimondii (D5) '05-4' genome NSF v1	D5 05	D5.v1.pred 00000019-RA	Gossypium anomalum (B1) genome JAA5 v1.2 a1.1	Chr05	evm.model.Goanc05G0012	Goano0560012
12 Gossyph	im raimondii (D5) 'D5-4' genome NSF_v1	D5_05	D5.v1.pred_00000020-RA	Gossypium anomalum (81) genome JAA5 v1.2 a1.1	Chr05	evm.model.Goano05G0013	Goano05G0013
13 Gossyph	im raimondii (D5) 'D5-4' genome NSF v1	D5 05	D5.v1.pred 00000021-RA	Gossypium anomalum (B1) genome JAAS v1.2 a1.1	Chr05	evm.model.Goanc05G0014	Goano0560014
14 Gossepie	m raimondii (D5) 'D5-4' genome NSF v1	D5 05	D5.v1.pred 00000023-RA	Gossypium anomalum (B1) genome JAAS v1.2 a1.1	Chr05	evm.model.Goano05G0015	Goano05G0015

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