

GENOME SEQUENCING

Draft genome assemblies of 58 species of *Ribes* L. (Grossulariaceae, Saxifragales)

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Biodiversity Genomes

We present draft genome assemblies of 58 species of the genus *Ribes* L. (currants, gooseberries). These data highlight the considerable importance of herbaria for biodiversity research.

Introduction

Ribes L. (currants and gooseberries) are a diverse genus of around 150 species of temperate shrubs in the Grossulariaceae ([Figure 1](#)). The berries of many species—such as blackcurrant, redcurrant, and the European gooseberry—are edible and have horticultural and economic significance (Hummer and Dale 2010). However, the cultivation of *Ribes* is controlled, especially in the United States, because many species of *Ribes* are an alternative host for the devastating white pine blister rust (*Cronartium ribicola* J.C.Fischer; Geils et al. 2010). Despite its economic importance, very few genomic resources have been developed until recently, and the few resources available are focused on the cultivated taxa, while the wild relatives of these crops remain understudied. Ziegler et al. (2025) published a chromosome level assembly of blackcurrant (*Ribes nigrum*), Ruhsam et al. (2026) published a chromosome level assembly of European gooseberry (*Ribes uva-crispa*), and the Canadian BioGenome project recently produced an annotated genome of Red Flowering Currant (*Ribes sanguineum*). In this study, we contribute additional genomic resources by sequencing and assembling genomes for 58 species that span the diversity of the genus, including sampling across all recognized subgenera and most recognized sections.

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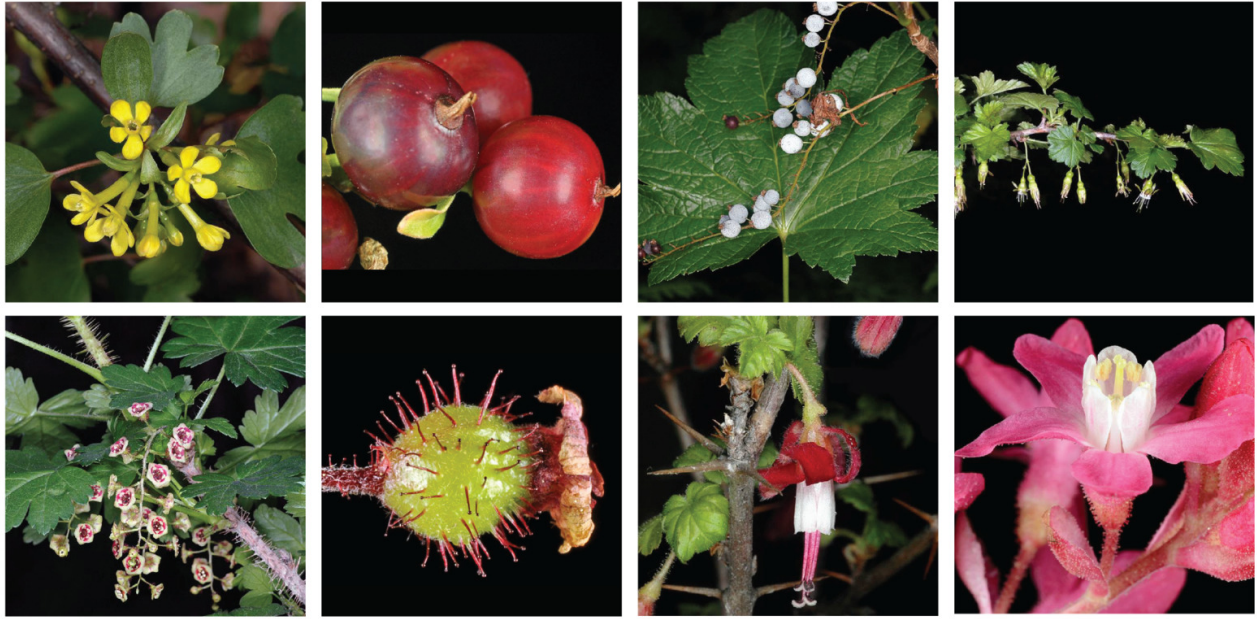


Figure 1. Morphological diversity of *Ribes*. Top (from left to right): *Ribes aureum* in flower, *R. aureum* in fruit, *R. bracteosum*, and *R. divaricatum*. Bottom (from left to right): *Ribes lacustre*, *R. laxiflorum*, *R. lobbii*, and *R. sanguineum*. Photo credit: Gerald D. Carr, reproduced with permission from the photographer.

Methods

Tissues were sampled from herbarium specimens of three institutions: the Missouri Botanical Garden (MO), the University of Washington Herbarium (WTU), and the Field Museum Herbarium (F). The sampling aimed to represent the geographic span, morphological distribution and previously recognized subgenera and sections. For each specimen, we collected one to three leaves depending on their size. DNA extraction was performed using a DNEasy genomic extraction kit (Qiagen, Redwood City, CA) using the standard process. Paired-end sequencing libraries were constructed using a TruSeq kit (Illumina, San Diego, CA) according to the manufacturer's instructions. The libraries were sequenced on an Illumina Hi-Seq platform in paired-end, 2 × 150bp format. The resulting fastq files were trimmed of adapter/primer sequences and low-quality regions with Trimmomatic v0.33 (Bolger et al. 2014). The trimmed sequence was assembled by SPAdes v3.15.4 (Bankevich et al. 2012) followed by a finishing step using Zanfona (Kieras et al. 2021).

Results and Data Availability

Taxa and data can be found in [Table 1](#). Genomes were successfully assembled despite various specimen ages (1979–2025) and methods of preservation (silica-dried tissue or herbarium-sampled material). The median age of the herbarium specimens sampled was 16 years old and the average age was 17 years old. Most specimens were not preserved using silica drying. Five samples did not pass quality checks for assembly and are not included here. These samples fell within the age and preservation method variation of the

successful taxa, and their failure appears to have been stochastic. Both the fact that the sequencing failure seemed to be random, and the fact that the sequencing quality of silica-dried material and herbarium sampled tissue are comparable, should be seen with optimism for future museomic (Davis and Knapp 2025) work on this group. This study is just one of many examples of the importance of biodiversity museums, not only as places to document past and current biodiversity, but as a pillar of modern biological research.

Table 1. Taxa sampled in this study and NCBI accession. Specimens marked with an asterisk correspond to silica dried samples obtained from the MO biobank or WTU tissue collection.

Taxon name	Specimen	Herbarium	Accession
<i>Ribes acerifolium</i>	Legler 13593	WTU	SRR40306625
<i>Ribes alpinum</i>	Phonological Observation Expedition #62	MO	SRR40306622
<i>Ribes andicola</i>	Ulloa 2436	MO	SRR40443053
<i>Ribes aureum</i>	Ricks 2022-22	WTU	SRR40443044
<i>Ribes binominatum</i>	Giblin 8270	WTU	SRR40306623
<i>Ribes brachybotrys</i>	Sylvester 930	MO	SRR40444174
<i>Ribes bracteosum</i>	Aguirre 2021-25	WTU	SRR40211970
<i>Ribes catamarcanum</i>	Sarrano 5049	MO	SRR40212465
<i>Ribes cereum</i> *	Moore 25-20	WTU	SRR40443055
<i>Ribes cucullatum</i>	Zuloaga 12644	MO	SRR40444172
<i>Ribes cuneifolium</i>	Wiegand 5167	MO	SRR40444181
<i>Ribes cynosbati</i>	Nee 64940	MO	SRR40211969
<i>Ribes divaricatum</i>	Giblin 8619	WTU	SRR40306624
<i>Ribes ecuadorensis</i>	Fernandez 1783	MO	SRR40444173
<i>Ribes elegans</i>	Valenzuela 11523	MO	SRR40212538
<i>Ribes erythrocarpum</i>	Zika 28856	WTU	SRR40443070
<i>Ribes franchetii</i>	Zhi-Duan 960790	MO	SRR40212537
<i>Ribes glaciale</i>	Zhi-Duan 960894	MO	SRR40444292
<i>Ribes hirtellum</i>	Smith 28538	MO	SRR40443069
<i>Ribes hirtum</i>	Ulloa 2447	MO	SRR40444182
<i>Ribes hudsonianum</i>	Shamseldin 2019-9	WTU	SRR40306950
<i>Ribes hudsonianum</i>	Legler 13751	WTU	SRR40443100
<i>Ribes incarnatum</i>	Fuentes 12643	MO	SRR40444313
<i>Ribes indecorum</i>	Lesica & Markert 1182	WTU	SRR40443081
<i>Ribes inerme</i> *	Wing 25-1	WTU	SRR40307126
<i>Ribes lacustre</i>	Olmstead 2023-30	WTU	SRR40307127
<i>Ribes latifolium</i>	Gage 5405	WTU	SRR40212444
<i>Ribes laxiflorum</i>	Giblin 6136	WTU	SRR40306621
<i>Ribes lehmannii</i>	Freire 11420	MO	SRR40212574
<i>Ribes leptanthum</i>	Holmgren 10887	WTU	SRR40212642
<i>Ribes leptostachyum</i>	Lewis 3790	MO	SRR40211966
<i>Ribes lobbii</i>	Jensen 107	WTU	SRR40307128
<i>Ribes macrobotrys</i>	Wiegand 5655	MO	SRR40211843
<i>Ribes magellanicum</i>	Bruhl 2257	MO	SRR40211845
<i>Ribes maximowiczii</i>	Boufford 37791	MO	SRR40212411
<i>Ribes missouriense</i> *	Davidse 43415	MO	SRR40307129
<i>Ribes montigenum</i>	Porcino 2018-6	WTU	SRR40443098
<i>Ribes montigenum</i>	Smith & Erwin 3588	WTU	SRR40307135
<i>Ribes nevadense</i>	Ertter & Strachan	WTU	SRR40307130

<i>Ribes nigrum</i>	Koroleva s.n.	MO	SRR41232382
<i>Ribes niveum</i>	Giblin 3475	WTU	SRR40307131
<i>Ribes oxyacanthoides</i>	Bockelman 14-032	WTU	SRR40307132
<i>Ribes pentlandii</i>	Beck 29276	MO	SRR40211852
<i>Ribes peruvianum</i>	Rodriguez 2367	MO	SRR40212664
<i>Ribes petraeum</i>	Thomas 27	MO	SRR40307133
<i>Ribes pinetorum</i> *	Schmidt 2733	MO	SRR40212796
<i>Ribes punctatum</i>	Stevens 34124	WTU	SRR40211895
<i>Ribes quercetorum</i>	Lesica & Markert 1165	WTU	SRR40212797
<i>Ribes roezlii</i>	Linder 21-36	WTU	SRR40443099
<i>Ribes rubrum</i>	Atha 6952	MO	SRR41232424
<i>Ribes sachalinense</i>	Legler 689	WTU	SRR40212527
<i>Ribes sanguineum</i>	Giblin 9039	WTU	SRR40643134
<i>Ribes spicatum</i>	Warsh 76	MO	SRR40443046
<i>Ribes uva-crispa</i> *	Merello 2986	MO	SRR40651391
<i>Ribes valdivianum</i>	Meza 1192	MO	SRR40211971
<i>Ribes viburnifolium</i> *	Tribble S.N.	WTU	SRR40307136
<i>Ribes viscosissimum</i> *	Wright 68	WTU	SRR40443834
<i>Ribes viscosum</i>	Smith 11927	MO	SRR40211846
<i>Ribes watsonianum</i>	Legler 13656	WTU	SRR40443833
<i>Ribes weberbaueri</i>	Vega Ocaña 13	MO	SRR40307835

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