

Supplementary Table S1. *Gordonia* cluster DR bacteriophages included in the comparative analyses. For detailed information on each bacteriophage, please visit the Howard Hughes Medical Institute (HHMI) – Science Education Alliance (SEA) Phage Hunters Advancing Genomics and Evolutionary Science (PHAGES) website at <http://phagesdb.org>.

Phage Name	Isolation host	Length (bp)	GC-content	# ORFs	# tRNAs	Accession #	Reference
AnarQue	<i>G. rubripertincta</i> NRRL B-16540	61,822	68.8	86	0	OK216879	Curran <i>et al.</i> 2022
AnClar	<i>G. terrae</i> 3612	61,856	69.8	81	1	MN908693	unpublished
BiggityBass	<i>G. terrae</i> CAG3	63,202	69.4	83	0	ON260813	Versoza, Howell <i>et al.</i>
CloverMinnie	<i>G. terrae</i> 3612	61,098	68.7	84	0	MN234196	unpublished
Ligma	<i>G. terrae</i> NRRL B-16283	61,714	70.2	87	0	OM105886	unpublished
Mariokart	<i>G. terrae</i> NRRL B-16283	60,762	70.5	83	0	MT657335.1	unpublished
NHagos	<i>G. rubripertincta</i> NRRL B-16540	59,580	68.2	82	0	MN369758.1	Harrington <i>et al.</i> 2020
Sour	<i>G. terrae</i> NRRL B-16283	61,670	68.0	79	1	NC_042132.1	unpublished
Yago84	<i>G. terrae</i> 3612	61,890	70.0	83	0	MK801725.1	Pope <i>et al.</i> 2020

Supplementary Table S2. Bacteriophages included as outgroups in the comparative analyses. Abt2graduatex2 contains a *hicA*-like toxin (pham 34446) whereas Fizzles and Suffolk contain a RuvC-like resolvase (pham 34304). For detailed information on each bacteriophage, please visit the Howard Hughes Medical Institute (HHMI) – Science Education Alliance (SEA) Phage Hunters Advancing Genomics and Evolutionary Science (PHAGES) website at <http://phagesdb.org>.

Phage Name	Isolation host	Length (bp)	GC-content	# ORFs	# tRNAs	Accession #	Reference
Abt2graduatex2	<i>S. griseus</i> ATCC 10137	57,385	69.2	71	0	MF975638.1	Erill & Caruso 2018
Fizzles	<i>M. foliorum</i> NRRL B-24224	62,078	68.2	104	0	MW924638.1	unpublished
Suffolk	<i>M. smegmatis</i> mc ² 155	68,262	66.6	97	0	KF713485.1	Pope <i>et al.</i> 2015

Supplementary Table S3. Host bacteria included in the comparative analyses.

Host	# Genes	Length (kb)	GC-content	Accession #	Reference
<i>E. coli</i>	4,091	4,509	50.6	CP028765	Kang <i>et al.</i> 2021
<i>G. hydrophobica</i>	3,962	4,579	67.5	JAFBGB010000001	unpublished
<i>G. malaque</i>	4,349	4,714	66.2	FNRZ010000008	unpublished
<i>G. rubripertincta</i>	4,740	5,104	67.5	CP059694	Han <i>et al.</i> 2020
<i>G. terrae</i>	4,979	5,709	67.8	CP029604	unpublished
<i>N. asteroides</i>	6,341	6,987	71.8	CP089214	Sichtig <i>et al.</i> 2019
<i>N. brasiliensis</i>	7,949	8,936	68.2	CP022088	Sichtig <i>et al.</i> 2019
<i>N. nova</i>	7,450	8,349	67.8	CP006850	Luo <i>et al.</i> 2014
<i>N. otitidiscaviarum</i>	6,735	7,688	69.1	CP041695	unpublished
<i>R. erythropolis</i>	6,025	6,509	62.5	CP032403	unpublished
<i>R. globerulus</i>	6,013	6,740	61.7	CP079698	Lozano-Andrade <i>et al.</i> 2021

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