









Table S1. List of the studied taxa and source of analyzed data. Names in parentheses in the third column indicate the specimen name as was originally published when it differs for the accepted name. Accession number indicates the record of the sequencing raw reads or the complete chloroplast genome sequence available at NCBI repository. Subgenus category is shown according to Hunt [12]. The last column shows representative images for the genera and subgenera level.

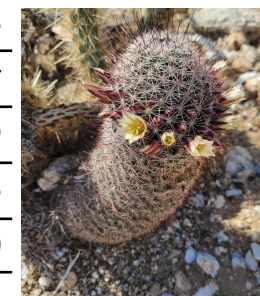
Genus	Subgenus	Specimen name	Taxonomic authority	Source	Accession number	Representative image
<i>Acharagma</i>		<i>A. roseanum</i> subsp. <i>galeanense</i> 35149	(Haugg) D.R.Hunt	Breslin et al., 2021	SRR12935149	 <p><i>A. roseanum</i>. By Ad Konings https://www.inaturalist.org/observations/46914915 (CC BY-NC 4.0)</p>
		<i>A. roseanum</i> subsp. <i>galeanense</i> 35162	(Haugg) D.R.Hunt	Breslin et al., 2021	SRR12935162	
<i>Ariocarpus</i>		<i>A. retusus</i>	Scheidw.	Breslin et al., 2021	SRR12935164	 <p><i>A. fissuratus</i> By Benjamin Schwartz https://www.inaturalist.org/observations/140050488 (CC BY-NC 4.0)</p>

<i>Blossfeldia</i>		<i>B. liliputana</i>	Werderm.	This study	SRR23441695	 <p><i>B. liliputana</i>. By Martin Lowry https://www.inaturalist.org/observations/38390881 CC BY-NC 4.0)</p>
<i>Coryphantha</i>	<i>Coryphantha</i>	<i>C. cornifera</i>	Lem.	Breslin et al., 2021	SRR12935099	 <p><i>C. sulcata</i>. By Ben Clement https://www.inaturalist.org/observations/81338667 (CC0 1.0)</p>
		<i>C. delaetiana</i>	A.Berger	This study	SRR23441683	
		<i>C. durangensis</i>	(Ruenge ex Schum.) Britton & Rose	Breslin et al., 2021	SRR12935157	
		<i>C. echinus</i>	(Engelm.) Orcutt	Breslin et al., 2021	SRR12935176	
		<i>C. elephantidens</i>	Lem.	Breslin et al., 2021	SRR12935165	
		<i>C. pallida</i>	Britton & Rose	Breslin et al., 2021	SRR12935156	
		<i>C. pallida</i> 20	Britton & Rose	This study	SRR23441652	
		<i>C. recurvata</i>	(Engelm.) Britton & Rose	Breslin et al., 2021	SRR12935166	
		<i>C. sulcata</i>	Britton & Rose	Breslin et al., 2021	SRR13416461	

<i>Neocoryphantha</i>	<i>C. clavata</i>	(Scheidw.) Backeb.	This study	SRR23441694	 <p><i>C. erecta</i>. By Ma. Eugenia Mendiola González https://www.inaturalist.org/observations/52319013 (CC BY-NC-SA 4.0)</p>
	<i>C. erecta</i>	(Lem. ex Pfeiff.) Lem.	Breslin et al., 2021	SRR12935151	
<i>Cumarinia</i>	<i>C. odorata</i>	(Boed.) Buxb.	Breslin et al., 2021	SRR12935150	 <p><i>C. odorata</i>. By Pedro Nájera Quezada https://www.inaturalist.org/observations/60033455 (CC BY-NC 4.0)</p>

<i>Escobaria</i>	<i>E. chihuahuensis</i>	Britton & Rose	Breslin et al., 2021	SRR12935122	 <p><i>E. tuberculosa</i>. By Patrick Alexander https://www.inaturalist.org/observations/33379348 (CC0 1.0)</p>
	<i>E. chlorantha</i> (<i>Coryphantha chlorantha</i>)	(Engelm.) Britton & Rose	Breslin et al., 2021	SRR12935127	
	<i>E. dasyacantha</i>	(Engelm.) Britton & Rose	This study	SRR23441672	
	<i>E. laredoi</i>	(Glass & R.A.Foster) N.P.Taylor	This study	SRR23441661	
	<i>E. robbinsorum</i> (<i>Coryphantha robbinsorum</i>)	(W.H.Earle) A.Zimm.	Breslin et al., 2021	SRR13416462	
	<i>E. tuberculosa</i>	(Engelm.) Britton & Rose,	Breslin et al., 2021	SRR12935113	
	<i>E. vivipara</i> (<i>Coryphantha vivipara</i>)	(Nutt.) Buxb.	Breslin et al., 2021	SRR13416463	
	<i>E. vivipara</i> subsp. <i>alversonii</i> (<i>Coryphantha alversonii</i>)	(J.M. Coult.) D.R. Hunt	Breslin et al., 2021	SRR12935160	
	<i>E. zilziana</i>	(Boed.) Backeb.	Breslin et al., 2021	SRR12935125	 <p><i>L. williamsii</i>. By Pedro Nájera Quezada https://www.inaturalist.org/observations/108476028 (CC BY-NC 4.0)</p>
<i>Lophophora</i>	<i>L. williamsii</i>	(Lem. ex Salm-Dyck) J.M. Coult.	Breslin et al., 2021	SRR12935152	

<i>Mammillaria</i>	<i>Chilita</i>	<i>M. albicans</i> 35103	(Britton & Rose) A. Berger	Breslin et al., 2021	SRR12935103
		<i>M. albicans</i> 35107	(Britton & Rose) A. Berger	Breslin et al., 2021	SRR12935107
		<i>M. armillata</i> 35089	K. Brandegee	Breslin et al., 2021	SRR12935089
		<i>M. armillata</i> 35095	K. Brandegee	Breslin et al., 2021	SRR12935095
		<i>M. armillata</i> 35120	K. Brandegee	Breslin et al., 2021	SRR12935120
		<i>M. armillata</i> 35144	K. Brandegee	Breslin et al., 2021	SRR12935144
		<i>M. blossfeldiana</i>	Boed.	Breslin et al., 2021	SRR12935112
		<i>M. boolii</i>	G.E. Linds.	Breslin et al., 2021	SRR12935148
		<i>M. capensis</i>	(H.E. Gates) Craig	Breslin et al., 2021	SRR12935169
		<i>M. cerralboa</i>	(Britton & Rose) Orcutt	Breslin et al., 2021	SRR12935094
		<i>M. dioica</i> 35119	K. Brandegee	Breslin et al., 2021	SRR12935119
		<i>M. dioica</i> 35131	K. Brandegee	Breslin et al., 2021	SRR12935131
		<i>M. dioica</i> 35170	K. Brandegee	Breslin et al., 2021	SRR12935170
		<i>M. dioica</i> subsp. <i>estebanensis</i> (<i>Mammillaria estebanensis</i>)	(G.E. Linds.) D.R. Hunt	Breslin et al., 2021	SRR12935168
		<i>M. goodridgii</i>	Scheer	Breslin et al., 2021	SRR12935115
		<i>M. goodridgii</i> var. <i>rectispina</i> 35106	Dawson	Breslin et al., 2021	SRR12935106
		<i>M. goodridgii</i> var. <i>rectispina</i> 35167	Dawson	Breslin et al., 2021	SRR12935167
		<i>M. grahamii</i>	Engelm.	Breslin et al., 2021	SRR12935133
		<i>M. grahamii</i> 20	Engelm.	This study	SRR23441685
		<i>M. grahamii</i> subsp. <i>sheldonii</i>	(Britton & Rose) D.R.Hunt	This study	SRR23441676





M. dioica. By Dan Horowitz

<https://www.inaturalist.org/observations/108563404>
(CC0 1.0)

	<i>M. grahamii</i> subsp. <i>sheldonii</i> 35158 (<i>Mammillaria sheldonii</i>)	(Britton & Rose) D.R.Hunt	Breslin et al., 2021	SRR12935158
	<i>M. grahamii</i> subsp. <i>sheldonii</i> 35161 (<i>Mammillaria sheldonii</i>)	(Britton & Rose) D.R.Hunt	Breslin et al., 2021	SRR12935161
	<i>M. hutchisoniana</i> 35118	(H.E. Gates) Boed.	Breslin et al., 2021	SRR12935118
	<i>M. hutchisoniana</i> 35173	(H.E. Gates) Boed.	Breslin et al., 2021	SRR12935173
	<i>M. hutchisoniana</i> subsp. <i>bullardiana</i> (<i>Mammillaria bullardiana</i>)	(H.E.Gates) Repp.	Breslin et al., 2021	SRR12935091
	<i>M. insularis</i>	H.E. Gates	Breslin et al., 2021	SRR12935175
	<i>M. mainiae</i>	K. Brandegees	Breslin et al., 2021	SRR12935121
	<i>M. mazatlanensis</i>	K. Schum.	This study	SRR23441677
	<i>M. phitauiiana</i> 35105	(E.M. Baxter) Werderm.	Breslin et al., 2021	SRR12935105
	<i>M. phitauiiana</i> 35111	(E.M. Baxter) Werderm.	Breslin et al., 2021	SRR12935111
	<i>M. schumannii</i>	Hildm.	Breslin et al., 2021	SRR12935090
	<i>M. slevinii</i>	(Britton & Rose) Boed.	Breslin et al., 2021	SRR12935110
	<i>M. thornberi</i> subsp. <i>yaquensis</i>	(R.T. Craig) D.R. Hunt	Breslin et al., 2021	SRR12935128
<i>Cochemiea</i>	<i>M. halei</i>	Brandegee	Breslin et al., 2021	SRR12935093
	<i>M. pondii</i> subsp. <i>maritima</i> (<i>Mammillaria maritima</i>)	(G.E.Linds.) D.R.Hunt	Breslin et al., 2021	SRR12935102
	<i>M. pondii</i> 20	Greene	This study	SRR23441667
	<i>M. pondii</i> 35087	Greene	Breslin et al., 2021	SRR12935087
	<i>M. pondii</i> 35172	Greene	Breslin et al., 2021	SRR12935172



M. halei. By [Ivan Phillipsen](#)
<https://www.inaturalist.org/observations/100000000>


	<i>M. pondii</i> subsp. <i>setispina</i> 35114	(J.M. Coult.) D.R. Hunt	Breslin et al., 2021	SRR12935114	ist.org/observations/38674775 (CC BY-NC 4.0)
	<i>M. poselgeri</i> 20	Hildm.	This study	SRR23441666	
	<i>M. poselgeri</i> 35117	Hildm.	Breslin et al., 2021	SRR12935117	
	<i>M. poselgeri</i> 35143	Hildm.	Breslin et al., 2021	SRR12935143	
	<i>M. poselgeri</i> 35145	Hildm.	Breslin et al., 2021	SRR12935145	
<i>Dolichothele</i>	<i>M. baumii</i>	Boed.	This study	SRR23441649	 <i>M. longimamma</i> . By Ma. Eugenia Mendiola González https://www.inaturalist.org/observations/47207187 (CC BY-SA 4.0)
	<i>M. longimamma</i>	DC.	This study	SRR23441680	
<i>Krainzia</i>	<i>M. albiflora</i>	Backeb.	Solórzano et al., 2019	MN517610.1	 <i>M. longiflora</i> . By Ulises Guzmán https://www.inaturalist.org/observations/
	<i>M. napina</i>	J.A. Purpus	This study	SRR23441674	
	<i>M. pectinifera</i>	F.A.C. Weber	Solórzano et al., 2019	MN519716.1	
	<i>M. solisioides</i>	Backeb.	Solórzano et al., 2019	MN518341.1	
	<i>M. theresae</i>	Cutak	This study	SRR23441660	



<i>Mammillaria</i>	<i>M. albicoma</i>	Boed.	This study	SRR23441651
	<i>M. bocasana</i>	Poselger	This study	SRR23441647
	<i>M. bocensis</i>	Craig	Breslin et al., 2021	SRR12935135
	<i>M. bombycina</i>	Quehl	This study	SRR23441693
	<i>M. bombycina</i> subsp. <i>perezdelarosae</i> (<i>Mammillaria perezdelarosae</i>)	(Bravo & Scheinvar) D.R.HUNT	Breslin et al., 2021	SRR12935132
	<i>M. brandegeei</i> 35092	(J.M. Coult.) K. Brandegee	Breslin et al., 2021	SRR12935092
	<i>M. brandegeei</i> 35098	(J.M. Coult.) K. Brandegee	Breslin et al., 2021	SRR12935098
	<i>M. crinita</i>	DC.	This study	SRR23441691
	<i>M. columbiana</i> subsp. <i>yucatanensis</i>	(Britton & Rose) D.R.Hunt	Breslin et al., 2021	SRR13416466
	<i>M. crucigera</i>	Mart.	Solórzano et al., 2019	MN517613.1
	<i>M. decipiens</i>	Scheidw.	This study	SRR23441690
	<i>M. discolor</i> subsp. <i>ochoteranae</i>	(Bravo) U. Guzmán	This study	SRR23441671
	<i>M. elongata</i>	DC.	This study	SRR23441688
	<i>M. evermanniana</i>	(Britton & Rose) Orcutt	Breslin et al., 2021	SRR12935108
	<i>M. heyderi</i> subsp. <i>gaumeri</i>	(Britton & Rose) D.R.Hunt	This study	SRR23441687
	<i>M. heyderi</i> 16460	Muehlenpf.	Breslin et al., 2021	SRR13416460
	<i>M. heyderi</i> subsp. <i>heyderi</i> 20	Muehlenpf.	This study	SRR23441684
	<i>M. huitzilopochtli</i>	D.R. Hunt	Breslin et al., 2021	SRR12935159
	<i>M. huitzilopochtli</i> 17	D.R. Hunt	Solórzano et al., 2019	MN517612.1





M. mammillaris “M. mammillaris” by Lourdes
https://commons.wikimedia.org/wiki/File:Mammillaria_mammillaris.jpg
(CC BY 2.0)



<i>M. huitzilopochtli</i> 20	D.R. Hunt	This study	SRR23441682
<i>M. johnstonii</i> 35129	(Britton & Rose) Orcutt	Breslin et al., 2021	SRR12935129
<i>M. johnstonii</i> 35130	(Britton & Rose) Orcutt	Breslin et al., 2021	SRR12935130
<i>M. lasiacantha</i>	Engelm.	This study	SRR23441681
<i>M. magnifica</i>	F.G. Buchenau	This study	SRR23441679
<i>M. magnimamma</i>	Haw.	This study	SRR23441678
<i>M. nana</i>	Backeb.	This study	SRR23441675
<i>M. nunezii</i>	(Britton & Rose) Orcutt	This study	SRR23441673
<i>M. peninsularis</i>	(Britton & Rose) Orcutt	Breslin et al., 2021	SRR12935101
<i>M. perbella</i>	Hildm. ex K. Schum.	This study	SRR23441670
<i>M. petrophila</i>	K. Brandegee	Breslin et al., 2021	SRR12935096
<i>M. petrophila</i> subsp. <i>arida</i>	(Rose ex Quehl) D.R.Hunt	Breslin et al., 2021	SRR12935142
<i>M. picta</i>	Meinsh.	This study	SRR23441669
<i>M. polyedra</i>	Mart.	This study	SRR23441668
<i>M. pottsii</i>	Scheer ex Salm-Dyck	Breslin et al., 2021	SRR12935141
<i>M. prolifera</i>	(Mill.) Haw.	Breslin et al., 2021	SRR13416465
<i>M. sartorii</i>	J.A.Purpus	This study	SRR23441665
<i>M. schiedeana</i>	Ehrenb. ex Schltdl	This study	SRR23441664
<i>M. scrippsiana</i>	(Britton & Rose) Orcutt	This study	SRR23441663
<i>M. sphacelata</i>	Mart.	Breslin et al., 2021	SRR12935136
<i>M. sphacelata</i> 20	Mart.	This study	SRR23441662

	<i>M. supertexta</i>	Mart. ex Pfeiff	Solórzano et al., 2019	MN508963.1	
	<i>M. tayloriorum</i>	Glass & R.A. Foster	Breslin et al., 2021	SRR12935097	
	<i>M. uncinata</i>	Zucc. ex Pfeiff.	This study	SRR23441653	
	<i>M. vetula</i> subsp. <i>gracilis</i>	(Pfeiff.) D.R.Hunt	This study	SRR23441686	
	<i>M. voburnensis</i> subsp. <i>eichlamii</i>	Quehl	This study	SRR23441689	
	<i>M. wiesingeri</i>	Boed.	This study	SRR23441659	
<i>Mammillopsis</i>	<i>M. senilis</i>	Lodd. ex Salm-Dyck	Breslin et al., 2021	SRR12935123	 <p><i>M. senilis</i>. By Selene Iazmin Delgado Corral https://www.inaturalist.org/observations/131919916 (CC BY-NC 4.0)</p>

<i>Oehmea</i>	<i>M. beneckeii</i>	Ehrenb.	This study	SRR23441648	 <p><i>M. beneckeii</i>. By Caja de Zicuirán https://www.inaturalist.org/observations/128801487 (CC BY-NC 4.0)</p>
<i>Phellosperma</i>	<i>M. barbata</i>	Engelm.	This study	SRR23441650	 <p><i>M. tetrancistra</i>. By Andy Kleinhesselink https://www.inaturalist.org/observations/5649546 (CC0 1.0)</p>
	<i>M. barbata</i> var. <i>viridiflora</i> (<i>Mammillaria viridiflora</i>)	Engelm.	Breslin et al., 2021	SRR12935155	
	<i>M. guelzowiana</i>	Werderm.	Breslin et al., 2021	SRR12935138	
	<i>M. tetrancistra</i> 35140	Engelm.	Breslin et al., 2021	SRR12935140	
	<i>M. wrightii</i>	Engelm.	Breslin et al., 2021	SRR12935147	
	<i>M. wrightii</i> subsp. <i>wilcoxii</i>	(Toumey ex K. Schum.) D.R. Hunt	Breslin et al., 2021	SRR12935134	
	<i>M. zephyranthoides</i>	Scheidw.	Solórzano et al., 2019	MN517611.1	

<i>Mammilloidia</i>	<i>M. candida</i>	(Scheidw.) Buxb.	This study	SRR23441692	 <p><i>M. candida</i>. By Alessandro Mosco https://www.inaturalist.org/observations/126613439 (CC BY-NC 4.0)</p>
<i>Neolloydia</i>	<i>N. conoidea</i>	(DC.) Britton & Rose	Breslin et al., 2021	SRR12935153	 <p><i>N. conoidea</i>. By CK Kelly https://www.inaturalist.org/observations/133038218 (CC BY 4.0)</p>
	<i>N. conoidea</i> 20	(DC.) Britton & Rose	This study	SRR23441658	
	<i>N. matehualensis</i>	Backeb.	This study	SRR23441657	

<i>Ortegocactus</i>	<i>O. macdougallii</i>	Alexander	Breslin et al., 2021	SRR12935137	
	<i>O. macdougallii</i> 20	Alexander	This study	SRR23441656	
					<p><i>O. macdougallii</i>. “Ortegocactus macdougalli” by Guillermo Huerta Ramos https://www.flickr.com/photos/xerofilo/353430608/in/photolist-Gy5QqO-UDjnVp-xeqBb-yik2b-Djo7Zq-wAUaio (CC BY-NC 2.0)</p>

<i>Pelecyphora</i>	<i>P. strobiliformis</i>	(Werderm.) Frič & Schelle ex Kreuz.	This study	SRR23441655	 <p><i>P. aselliformis</i>. By paola_pineda https://www.inaturalist.org/observations/121156391 (CC BY-NC 4.0)</p>
<i>Stenocactus</i>	<i>S. multicosatus</i> subsp. <i>zacatecasensis</i>	(Britton & Rose) U.Guzmán & Vázq.	This study	SRR23441654	 <p><i>S. multicosatus</i>. By Ad Konings https://www.inaturalist.org/photos/851505</p>

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Strombocactus

S. disciformis

(DC.) Britton & Rose

Breslin et al., 2021

SRR12935139



S. disciformis. By Jose
Antonio Aranda
Pineda

<https://www.inaturalist.org/observations/131295608>

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Turbinicarpus

T. alonsoi

Glass & S. Arias

Breslin et al., 2021

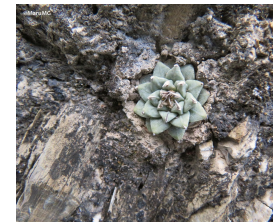
SRR12935124

T. viereckii

(Werderm.) V.John & Riha

Breslin et al., 2021

SRR12935163



T. alonsoi. By Ma.
Eugenia Mendiola
González

<https://www.inaturalist.org/observations/131295608>

[ist.org/observations/](https://www.ist.org/observations/140856491)

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