

## Rockin' with Cacti and Succulents

*is it a cactus and succulent garden?... Echinocereus reichenbachii*  
*...or a rock garden? Escobaria missouriensis / Pterocactus fischeri*

**hallmarks of traditional rock gardens:** rock alpine garden / *Gentiana acaulis*

- small plants with alpine origins
- primary objective – making a habitat hospitable to plants (rocks, raised beds, troughs)
- restricted to temperate climates
- color peaks in spring
- water features

**myth #1 – rock gardeners grow only small alpine plants:** cowboy's delight *Sphaeralcea coccinea* / *Maihuenia poeppigii* / *Hesperaloe parviflora*

- true alpine succulents on Mt Evans Scenic Byway CO: *Claytonia megarhiza* / *Rhodiola rhodantha* / *Rhodiola integrifolia* / *Sedum lanceolatum*
- rock garden favorites: *Sedum dasyphyllum*, *S. spathulifolium* 'Cape Blanco' / *S. hakonense* 'Chocolate Ball' / *S. obtusifolium* / *S. pachyclados* / *S. (hylotelephium) tatarowinii* 'Mongolian Stardust' / *S. hispanicum* 'Blue Carpet'
- *Sedum anacampseros* var. *majus* / *S. sediforme* / *S. Sunsparkler*® Cherry Tart *Sempervivum* 'Oddity' (*Thymus pannonicus*)
- the other hens and chicks: *Jovibarba heuffelii* / *J. hirta* / *Orostachys furusei* / *Rosularia serpentinica*
- Boulder CO: *Sempervivum* 'Pinecone' / *Sedum kamtschaticum*
- Denver CO: *Lapidaria margaratae* / *Ebracteola wilmaniae* / marsh orchid *Dactylorhiza* sp.
- South African Plaza at Denver Botanic Gardens (DBG): *Ruschia pulvinaris* / *Aloinopsis spathulata* (*Delosperma* Fire Spinner)
- South African succulents: *Aloinanthus* x 'Last Night' (*Aloinopsis* x *Nananthus*) / *Aloinopsis spathulata* / *A. rubriolineata* / *Bergeranthus jamesii* (*Dudleya cymosa*) / *Delosperma basuticum* 'White Nugget' / *Rabiea albipuncta* /
- Sunscapes, Pueblo CO: *Aloinanthus* x 'First Light' / *Aloinopsis* 'Orange Rush' / *Rabiea albipuncta*
- the truth is – collecting tendencies drive rock gardeners
- in Colorado, rock gardens have evolved into a mix of large and small plants from diverse origins: *Delosperma* 'Gold Nugget' / *Agave parryi* (pasqueflower seedheads *Pulsatilla vulgaris*)

**myth #2 – rock gardening is restricted to temperate climates:** rock gardening does have its origins in damp or wet climates where the biggest concern is too much precipitation

- water restrictions have fostered a revolution for rock gardeners in the West where winters are cold and summers are hot and dry: *Yucca harrimaniae* (*Cytisophyllum sessilifolium*, four-wing saltbush *Atriplex canescens*, Himalayan aster *Aster himalaicus*, *Alyssum sribryni*) / *Yucca pallida*
- cacti native to Colorado: *Echinocereus reichenbachii* 'Albispinus' / *E. x lloydii* / *E. x rotteri* / *Escobaria missouriensis* / *E. vivipara* var. *buoflama* / *Pediocactus simpsonii*
- Cold Hardy Cactus, Kelly Grummons, Lakewood CO: *Opuntia aurea* 'Coombe's Winter Glow' / *O. 'Dark Knight'* / *O. arenaria* reblooming in August / *O. phaeacantha* 'Paradox Form'
- cacti and succulents in unirrigated rock gardens: *Delosperma* 'Lavender Ice' (prairie phlox *Phlox andicola*) / *Sedum obtusifolium* / *Opuntia aurea* 'Chiffon Pink' (*Penstemon pseudospectabilis*)
- *Opuntia polyacantha* 'Nebraska Orange' / *O. imbricata* 'White Towers' / *O. humifusa*
- AlpenRidge, Littleton CO: *Opuntia fragilis* f. *desnuda* / *Orostachys furusei* / *O. spinosa* crested form

- Centennial CO
- rock/cacti gardens at Boyce Thompson Arboretum State Park, Superior AZ / Huntington Botanical Gardens Desert Garden, San Marino CA

**myth #3 – rock gardens always contain rocks:** *Yucca harrimaniae*, desert beardtongue *Penstemon pseudospectabilis*, sulphur-flower buckwheat *Eriogonum umbellatum* ‘Kannah Creek’

- cacti and succulents are frequently found in rocky environments: Hwy 34 Wheatland to Laramie WY / *Pediocactus simpsonii*
- growing in rocks: keeps roots cooler in summer and warmer in winter, keeps crowns dry, reduces competition: *Delosperma cooperi* ‘Mesa Verde’ / *D.* ‘White Nugget’ / *Orostachys furusei* / *Opuntia whipplei* ‘Snow Leopard’ (Tanager gazania *Gazania krebsiana*)
- the rock effect – increases winter hardiness: *Coryphantha sulcata* / *Echinocereus dasyacanthus* and hybrids / *Mammillaria melanacantha* / *Agave havardiana*
- rocks collect and concentrate run-off: in an arid climate a small amount of extra water can be the difference between life and death of a plant / *Lewisia rediviva* (Split Rock WY)

**myth #4 – raised beds are essential to rock gardens:** raised beds do increase the number of microclimates, improve drainage, increase air circulation (helps prevent rot) and accommodate more plants and stage for viewing: *Lewisia cotyledon*

- raised beds are essential to growing cacti in damp climates: *Pediocactus nigrispinus* (Ann Arbor MI) / *Agave ovatifolia* (Twello NL)
- Dryland Mesa – Denver Botanic Gardens: *Agave huachuensis* / *Coryphantha orcuttii* var. *koenigii* / *Opuntia echinocarpa*, *Calylophus lavandulifolia* / *O. aurea* ‘Coombe’s Winter Glow’
- going vertical (use engineered walls when the slope exceeds 30% or is over 3 ft.): *Delosperma nubigenum*

**myth #5 – all cacti and succulents want to bake** (intense solar radiation – UV light is 26% higher in Denver than at sea level): *Sempervivum arachnoideum* / *Sedum sieboldii* ‘Mediovariegatum’ / *Chiastophyllum oppositifolium*

- shade structure: *Echinocereus engelmannii* at Desert Botanic Garden, Phoenix AZ

**the rock gardener’s primary objective is making habitats to suit the needs of the plants:** *Raoulia australis* / sand bed

- small changes can have a huge impact on plant health (every nuance of exposure, every pocket of incongruous soil, every swale that holds a bit more moisture expands planting options): *Manfreda maculosa*
- macroclimates (4 sides by compass orientation) and microclimates (any areas that differ from prevailing conditions, i.e., wetter, drier, sunnier, shadier, less windy, soil type): within each macroclimate there are dozens of microclimates (Pawnee Buttes National Grasslands CO)
- horizontal rock gardens: *Jovibarba globilifera* / *Lewisia cotyledon*
- going below grade for extra protection from the elements: *Chamaebatiaria millefolium* (Craters of the Moon NP ID)
- insider tips: put “zone denial” selections next to a house wall (*Cylindropuntia kleiniae*) or cover temporarily during deep freezes
- Colorado Springs CO: mosaics of cacti and succulents
- free-standing walls and fences provide shade and windbreaks but can also impede air flow and frost drainage
- troughs – portable microclimates: *Echinocereus viridiflorus* / *Pediocactus knowltonii* / *P. winkleri* / *Lewisia* ‘Little Plum’

- expanding container options: *Cylindropuntia echinocarpa* 'Golden Lion' / *Orostachys chonetii*
- avante-garde containers

**myth #6 – color peaks in the spring:** DBG Rock Alpine Garden, *Escobaria vivipara*

- summer: Kendrick Lake Park, Lakewood CO - *Yucca pallida* / *Y. thompsoniana*
- autumn: DBG WaterSmart Border - *Sedum caudicicola* 'Lidakense' / *Opuntia phaeacantha* var. *major*, *Sedum* 'Purple Emperor'
- winter: *Agave chrysantha* / *Sedum spurium* 'Tricolor'
- evergreen succulents: *Delosperma* 'John Proffitt' / *D. nubigenum* / *Sedum spurium* / *Rabiea albipuncta* / *Stomatium beaufortense*

### **building a rock garden**

**choosing a site:** front yards / against a house wall / hillsides / odds and ends

- insider tip: don't site rock gardens containing cacti under messy trees or where you pile snow in winter

- Centennial CO: *Echinocereus coccineus* / *E. reichenbachii*

**soils (to amend or not?):** xeric plants evolved in native soils that are high in minerals and low in organic matter: *Yucca filimentosa* 'Bright Edge' (*Salvia officinalis* 'Icetrina') / *Coryphantha vivipara*

- amend selectively to create soil microclimates – patchy environments suit larger number of plants: for rock gardens, amend only lightly to aerate compacted soils and to increase the water-holding capacity (WHC) – 2% OM = 75% increase in WHC) – common denominator soil mix for rock garden plants: 1/3 existing soil, 1/3 sharp sand, 1/3 small rock

- amending soil: changing the soil to meet the plants' needs: *Yucca glauca*

- *Nolina texana* / *Agave parryi*, *Sedum* 'Angelina' / *Othonna capensis* / *Phemeranthus* (*Talinum calycinum*) / *Solidago* 'Wichita Mountains'

- display gardens at Timberline Gardens, Arvada CO:

- *Agave parryi* var. *neomexicana* / *Yucca pallida* / *Y. rupicola*
- growing opuntias in junk soil: *Opuntia aurea* 'Golden Carpet' / *O.* 'Mandarin Sunrise' / *O. niccolii*

- Chinle Cactus and Succulent Society display garden, Grand Junction CO: *Sedum sichotense*

**rock choices:** sandstone / lava

- choose only one type of rock if design unity is your goal

- rules are meant to be broken

- rock alternatives: hypertufa / concrete culverts / broken cement sidewalks / drain pipes (all Utrecht Botanic Gardens NL)

**rock arrangement:** nature's rock gardens: observe geology if convincingly naturalistic arrangement of rocks and plants is your objective

- naturalistic plantings in shale: creekbed / *Pediocactus simpsonii* / Front Range twinpod *Physaria bellii* / alpine bladderpod *P. reediana* in shale wall / succulents in stylized planting

- placing rocks: rock garden construction – Gardens at Spring Creek, Ft. Collins CO

- setting rocks: start at the base; large rocks first; follow strata; don't space evenly; slope into hill; bury 2/3's; shim as necessary

- crevice gardens: (vertical and horizontal): *Physaria bellii*, *Delosperma sphalmanthoides*, *Erigeron compositus* and *Veronica saturejoides*

- Raven Ranch, Franktown CO: garden of desert pavement

- *Talinum brevifolia* / *Yucca angustifolia* / *Agave toumeyana* var. *bella*, *A. nana* / *Grusonia clavata* / *Castilleja integra*

- Rock Alpine Garden at DBG: *Escobaria sneedii* var. *leei* / *Echinocereus viridiflorus* / *Talinum* 'Zoe'

- APEX Crevice Garden, Arvada CO: *Agave lechugilla* / *A. toumeyana* spp. *bella* / *Escobaria leei*

- urbanite crevice and rock gardens – Juniper Level Botanic Garden and Nursery, Raleigh NC: *Manfreda undulata* ‘Mint Chocolate Chip’ / x *Mangave* ‘Man of Steel’
- paths: access for maintenance & to view the garden
- stairs
- water features: desert seep / bubbling rock
- mulch:** reduces evaporation and erosion, keeps crowns dry, finished look: decomposed granite *Pediocactus simpsonii* / seashells *Opuntia humifusa* / marbles *Rosularia chrysantha*
- organic mulches – use for plants from meadows, tall grass prairie, forest edge, woodland habitats, irrigated gardens: yellow fairy wings *Epimedium versicolor* ‘Sulphureum’
- rock mulches – use for plants from dry, arid regions; shortgrass prairie; alpiners; xeric gardens: saltbush *Atriplex canescens*
- insider tip: collect mulch at the same time as collecting rocks
- dark colors collect heat: *Cleistocactus icosaginus* Lotusland, Montecito CA
- insider tip: use the same mulch in paths and beds

### **plant selection (where the fun begins)**

- gneiss crevice garden by Kenton Seth
- essential to match cultural conditions: sunlight, soil (fertility, drainage), water needs
- determining a plant’s needs is not always intuitive: *Lewisia cotyledon* subalpine / *L. nevadensis* moist mountain meadows / *L. tweedyi* north-facing cliffs / *L. pygmaea* moist alpine/ *L. rediviva* dry shrublands
- plant placement
- art in the rock garden: *Delosperma dyeri*
- *Agave parryi* spp. *neomexicana*
- *Pushing the Limits*, by Leo Chance. *CSSA Journal*, vol. 89, July-August 2017

**for more information about rock gardening, go to:** [www.rmncargs.org](http://www.rmncargs.org) and [www.rockstarplants.com](http://www.rockstarplants.com)

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