

Rockin' with Cacti and Succulents

is it a cactus and succulent garden?... Jeff and Marie Thompson – Pueblo CO: *Echinocereus reichenbachii*

...or a rock garden? Mike Kintgen, Denver CO / *Escobaria missouriensis* / *Pterocactus fischeri*

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

- motivated by plant collecting
- 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

collecting tendencies drive rock gardeners:

- *Rabiea albipuncta* / *Sedum anacampseros* var. *majus* / *Sedum tatarowinii* 'Mongolian Stardust' / *Sempervivum* 'Oddity' (*Thymus pannonicus*)
- Panayoti Kelaidis, Denver CO: *Lapidaria margaratae* / *Ebracteola wilmaniae* / *Bergeranthus jamesii*, *Dudleya cymosa* / marsh orchid *Dactylorhiza* sp.
- South African Plaza – Denver Botanic Gardens: *Ruschia pulvinaris* / *Aloinopsis spathulata*
- Sunscapes, Bill Adams, Pueblo CO: *Aloinanthus* x 'First Light' / *Aloinopsis* 'Orange Rush' / *Rabiea albipuncta*
- 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'

myth #1 – rock gardeners grow only small, alpine plants: Dare Bohlander, Littleton CO: *Sphaeralcea coccinea* / *Maihuenia poeppigii* / *Hesperaloe parviflora*

- true alpine succulents on Mt Evans Scenic Byway CO: alpine spring beauty *Claytonia megarhiza* / queen's crown *Rhodiola rhodantha* / king's crown *Rhodiola integrifolia* / yellow stonecrop *Sedum lanceolatum*
- *Sedum dasyphyllum*, *S. spathulifolium* 'Capo Blanco' / *S. hakonense* 'Chocolate Ball' / *S. obtusifolium* / *S. pachyclados* / *S. tatarowinii* 'Mongolian Stardust' / *S. hispanicum* 'Blue Carpet'
- the other hens and chicks: *Jovibarba heuffelii* / *J. hirta* / *Orostachys furusei* / *Rosularia serpentinica*
- *Echinocereus reichenbachii* 'Albispinus' / *Escobaria missouriensis* / *Escobaria vivipara* var. *buoflora* / *Pediocactus simpsonii* / *Echinocereus* x *rotteri* / *Echinocereus* x *lloydii*
- South African succulents: *Aloinanthus* x 'Last Night' (*Aloinopsis* x *Nananthus*) / *Aloinopsis spathulata* / *Delosperma basuticum* 'White Nugget' / *Rabiea albipuncta* / *Bergeranthus jamesii* / *A. rubrolineata*
- 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*)

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

myth # 2 – rock gardens always contain rocks: *Yucca harrimaniae*, *Penstemon pseudo-*

spectabilis, *Eriogonum umbellatum* ‘Kannah Creek’

- cacti and succulents frequently occur in rocky environments: Hwy 34 Wheatland to Laramie WY / *Pediocactus simpsonii*
- *Delosperma cooperi* ‘Mesa Verde’ / *D.* ‘White Nugget’ / *Orostachys furusei* / *Opuntia whipplei* ‘Snow Leopard’ (Tanager gazania *Gazania krebsiana*)
- the rock effect, 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 # 3 – raised beds are essential to rock gardens: raised beds do increase the number of microclimates, improve drainage and increase air circulation (helps prevent rot), accommodate more plants and stage for viewing: *Lewisia cotyledon*

- 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* / *O. echinocarpa*, *Calylophus lavandulifolia* / *Opuntia aurea* ‘Coombe’s Winter Glow’
- going vertical with walls (use engineered walls when the slope exceeds 30% or is over 3 ft.): *Delosperma nubigenum*
- 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
- 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*

myth # 4 – all cacti and succulents want to bake (intense solar radiation – UV light is 12% higher in Denver than at sea level): *Sempervivum arachnoideum* / *Sedum sieboldii* ‘Mediovariegatum’ / *Chiastophyllum oppositifolium*

- horizontal rock gardens: *Jovibarba sobilifera* / *Lewisia cotyledon*
- going below grade for extra protection: *Chamaebatiaria millefolium* (Craters of the Moon ID)
- insider tip: put “zone denial” selections next to a house wall: *Cylindropuntia kleiniae*
- troughs – portable microclimates: *Echinocereus viridiflorus* / *Lewisia* ‘Little Plum’ / *Pediocactus knowltonii* / *P. winkleri*
- expanding container options: *Cylindropuntia echinocarpa* ‘Golden Lion’ / *Orostachys chanettii*
- wood containers

myth # 5 – 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

- rock gardens at Boyce Thompson Arboretum State Park, Superior AZ / Huntington Botanical Gardens Desert Garden, San Marino CA
- water restrictions have fostered a revolution for rock gardeners in the West: *Yucca harrimaniae* (*Cytisophyllum sessilifolium*, four-wing saltbush *Atriplex canescens*, Himalayan aster *Aster himalaicus*, *Alyssum sribryni*) / *Yucca pallida*
- desert tundra high steppe model (plants that are adapted to cold winters, hot summers, strong winds, high UV light, low precipitation, fire, grazing): tufted milkvetch *Astragalus spatulatus* / perky Sue *Tetraneuris acaulis*, sandwort *Arenaria hookeri* - Pawnee Buttes National Grasslands CO
- 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' / Eastern prickly pear *O. humifusa*
- Alpenridge, Sandy Snyder, Littleton CO: *Opuntia fragilis* f. *desnuda* / *Orostachys furusei* / *O. spinosa* crested form
- Dare Bohlander, Littleton CO
- Linda Boley, Boulder CO: *Sempervivum* 'Pinecone' / *Sedum kamtschaticum*
- Leo Chance, Colorado Springs CO: mosaic of cacti and succulents

myth #6 – color peaks in the spring: Denver Botanic Rock Alpine Garden

- summer: *Yucca pallida* / *Y. thompsoniana*
- autumn: *Sedum cauticola* 'Lidakense' / *Opuntia phaeacantha* var. *major*, *Sedum* 'Purple Emperor'
- winter: *Agave chrysantha* / *Sedum spurium* 'Tricolor'
- evergreen succulents: *Delosperma* 'John Proffitt' / *D. nubigenum* / *Sedum spurium* / *Stomatium beaufortense*

water features: small pond / bubbling rock

building rock gardens

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

- Elaine Menter, Centennial CO: *Echinocereus coccineus* / *E. reichenbachii*
- insider tip: don't site rock gardens under messy trees or where you pile snow in winter

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

- amended soil: changing the soil to meet the plants' needs (Kendrick Lake Garden, Lakewood CO): *Yucca glauca*
- 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
- *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 / pinal schist

- 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

rock arrangement

- placing rocks: rock garden construction – Gardens at Spring Creek, Ft. Collins CO
- nature's rock gardens: observe geology if convincingly naturalistic arrangement of rocks and plants is your objective
- *Pediocactus simpsonii* / Front range twinpod *Physaria bellii* / alpine bladderpod *P. reediana* in shale wall / succulents in stylized planting of shale

- 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 (red Cherokee sandstone at Gardens on Spring Creek, Fort Collins CO)
- crevice gardens: (vertical and horizontal): crevice garden class / *Physaria bellii*, *Delosperma sphalmanthoides*, *Erigeron compositus* and *Veronica saturejoides*
- Raven Ranch, Rebecca Day-Skowron: two different crevice garden schemes
 - *Talinum brevifolia* / *Yucca angustifolia* / *Agave toumeyana* v. *bella*, *A. nana* / *Grusonia clavata* / *Castilleja integra*
- Rock Alpine Garden – Denver Botanic Gardens: *Escobaria vivipara* / *E. sneedii* var. *leei* / *Talinum 'Zoe'* / *Echinocereus viridiflorus*
- APEX crevice garden, Arvada CO: *Agave lechugilla* / *A. toumeyana* spp. *bella* / *Escobaria leei*
- paths: access for maintenance & to view the garden
- stairs
- **mulch**: reduces evaporation and erosion, keeps crown dry, finished look: decomposed granite / stones / glass
- insider tip: collect mulch at the same time as collecting rocks
- 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* / *L. nevadensis* / *L. tweedii* / *L. pygmaea* Pike's Peak / *L. rediviva*
- plant placement
- art in the rock garden: *Agave parryi* spp. *neomexicana* / *Delosperma dyeri*

for more information about rock gardening, go to: www.rmcnargs.org and www.rockstarplants.com

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