Sego Lily
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Silene petersonii

In the Company of Moonworts: The Flora of Heliotrope Mountain

by Braydon Lake

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by Braydon Lake. Photos by Braydon Lake.

Heliotrope Mountain rises above 11,000 feet near the southern edge of Utah's Wasatch Plateau, a quiet highpoint sculpted from fractured limestone and alpine colluvium. Its upper slopes are underlain by the Flagstaff Formation—carbonate-rich sedimentary layers deposited in ancient Eocene lake beds, now uplifted and slowly weathering under alpine conditions. Over time, frost action, gravity, and snowpack have carved the mountain's surface into loose scree fields, shallow slope breaks, and subtle gullies. These features, though unnoticed from a distance, structure everything about where and how plants grow here.

Moisture collects unevenly across the landscape, especially in shallow depressions known as nivation hollows—formed where snow lingers longest and gradual melt erodes the soil. These hollows offer brief pockets of stability in an otherwise harsh environment, holding finer sediments and staying cooler and wetter into summer. The surrounding ridgelines and talus fields, by contrast, support plants that thrive in exposure, clinging to cracks and mineral soil. I climbed the mountain in mid-July, drawn by the unique plants that call these wind-scoured mountains home.

I began my exploration on its northern edge, where the bright white limestone scree slopes supported a vibrant community of calcareous-loving plants. I was first introduced to *Packera cana* (woolly groundsel) and its neighbor, the more localized *Packera musiniensis* (Musinea groundsel), both rooted firmly in the loose rocky substrate, their rhizomatous roots helping anchor them in the shifting limestone scree. *Silene petersonii* (Peterson's catchfly) stood like bright pink soldiers.

Climbing higher, the flora shifted. *Potentilla ovina* var. *ovina* (sheep cinquefoil) grew out of boulders beneath limestone hoodoos. Further up in the loose scree, I passed patches of *Askellia pygmaea* (dwarf alpine hawksbeard) and *Sabulina nuttallii* (Nuttall's sandwort), their tiny forms scattered across the talus like threads of alpine embroidery. *Noccaea fendleri* subsp. *glauca* (Fendler's

Nivation hollows.

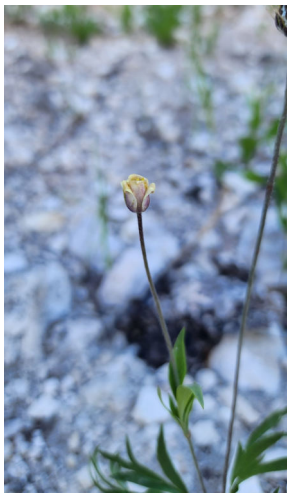
Packera cana.

Packera musiniensis.

Potentilla ovina var. *ovina.*

Askellia pygmaea.

Sabulina nuttallii var. *nuttallii*.



From left: *Noccaea fendleri* subsp. *glauca*, *Penstemon whippleanus*, *Anemone multifida* var. *stylosa*, *Castilleja applegatei* subsp. *viscida*, and *Castilleja rhexiifolia.*

Astragalus kentrophyta var. *tegetarius.*

Epilobium clavatum and *Silene petersonii.*

pennycress) was in seed, with dark purple foliage and seed pods. Even *Astragalus kentrophyta* var. *tegetarius* (mat milkvetch) made an appearance—its dense, sprawling mats forming a spiny cushion.

The bases of the scree slopes were painted with deeper hues—*Penstemon whippleanus* (dusky beardtongue) joined by fiery *Castilleja applegatei* subsp. *viscida* (sticky Applegate's paintbrush) and the rosy *Castilleja rhexiifolia* (Rhexia-leaf paintbrush). The dark-foliaged *Anemone multifida* var. *stylosa* (Pacific anemone) and the deeply hued *Epilobium clavatum* (talus willowherb) followed me along the roadside back to my car.

I transitioned to the western side of the mountain to begin my true ascent toward the summit, climbing the rough, shifting scree until I reached the first upper ridgeline. The scree was loose and steep—a challenge, but the plant life made every step worthwhile. There, hundreds of *Townsendia montana* (mountain Townsend daisy) had already gone to seed, their dandelion-like heads catching the wind and drifting across the talus. *Cerastium beeringianum* (Bering chickweed) seed heads nestled between the stones, and *Aquilegia scopulorum* subsp. *scopulorum* (Utah columbine) bloomed in full, floating on wiry stems in the broad daylight.

Townsendia montana.

Cerastium beeringianum.

Aquilegia scopulorum subsp. *scopulorum.*

Aquilegia scopulorum subsp. *scopulorum.*

Botrychium neolunaria.
First occurrence.

Botrychium neolunaria.
Second occurrence.

Krummholz Engelmann spruces.

Calcareous meadow.

As I crouched down to photograph a columbine, I caught sight of something small and unexpected—*Botrychium neolunaria* (American moonwort). Just a couple of individuals, delicate and beady, peeking out from the chunky soil beneath. It felt like stumbling onto a secret—the very plant that had brought me to Heliotrope, appearing just when I wasn't looking for it. Still, I hoped to find the larger population rumored to grow closer to the summit. I documented them and carried on toward the timberline.

Beyond the krummholz *Picea engelmannii* (Engelmann spruce) at the edge of the plateau, the forest gave way to a broad subalpine meadow, rich with botanical diversity. The soil remained calcareous, and *Potentilla ovina* var. *decurrens* (Uinta cinquefoil) mounded between scattered *Cymopterus lemmonii* (false alpine spring parsley), *Anticlea elegans* (mountain death camas), and *Physaria hemiphysaria* subsp. *hemiphysaria* (Skyline bladderpod). Short alpine grasses stitched the space together, creating a deep purple/green carpet contrasting the white talus.

The meadow slowly shifted to taller grasses and open grassland, where *Ribes montigenum* (mountain gooseberry) dotted in patches and *Geum triflorum* subsp. *ciliatum* (old man's whiskers) grew in swaths, creating openings in the taller grass. As I crossed the meadow, I approached the final plateau—a great white cap of limestone.

From about 10,800 feet in elevation and above, the vegetation grew sparse and more specialized. The calcareous summit hosted only the toughest species: *Eriogonum brevicaule* var. *caelitum* (Wasatch Plateau wild buckwheat), *Erigeron untermanii* (Indian Canyon

Potentilla ovina var. *decurrens* (Uinta cinquefoil).

Potentilla ovina var. *decurrens* (Uinta cinquefoil).

Townsendia montana.

Cymopterus lemmonii.

Polemonium viscosum, *Ivesia gordonii*, *Castilleja rhexiifolia* and *Anticlea elegans* var. *elegans*, and *Epilobium clavatum.*

fleabane), and *Polemonium viscosum* (Sky Pilot) clung to cracks and shallow soil.

Approaching the summit, massive limestone boulders marked the high ridgeline. Suddenly, the air filled with movement—tortoiseshells and checkerspot butterflies, hundreds of them, chasing one another in the strong winds. *Eriogonum brevicaule* var. *caelitum* and *Ivesia gordonii* (Gordon's mousetail) bloomed en masse in golden cushions. Even *Draba oligosperma* was here, its long seed stalks jutting from the boulder crevices.

Physaria hemiphysaria subsp. *hemiphysaria*.

Grassy meadow.

Eriogonum brevicaule var. *caelitum*.

Eriogonum brevicaule var. *caelitum*.

Draba oligosperma.

Erigeron untermanii (Indian Canyon fleabane).

Geum triflorum subsp. *ciliatum* (old man's whiskers), *Sabulina nuttallii* subsp. *nuttallii* (Nuttall's sandwort), *Poa glauca* subsp. *rupicola* (timberline bluegrass), and two photos of *Botrychium neolunaria.*

Botrychium neolunaria.

Senecio amplectens var. *holmii* (Holm's ragwort).

Senecio amplectens var. *holmii* (Holm's ragwort).

Erigeron compositus.

Ranunculus adoneus subsp. *adoneus* (alpine buttercup).

Ranunculus adoneus subsp. *adoneus* (alpine buttercup).

Castilleja applegatei viscida and *Monardella odoratissima.*

At the highest alpine flat, the summit sits at 11,131 feet above sea level. Here, where the air is thin and the soils fine and fragile, I found the flora entering late season. Most were already in fruit—*Astragalus montii* (Monti's milkvetch), *Sabulina rubella* (beautiful sandwort), and *Sabulina macrantha* (house stitchwort) had finished flowering, their seed structures delicate and spare against the wind. *Gentianella tortuosa* (Cathedral Bluffs gentian) bloomed in light lavender hues, and clusters of *Sabulina nuttallii* subsp. *nuttallii* (Nuttall's sandwort) clung to every bit of available space. I noted several alpine grasses—one of which is *Poa glauca* subsp. *rupicola* (timberline bluegrass), the other, which I assume to be *Elymus scribneri* Scribner's wheatgrass).

On my return, I finally reached the larger population of *Botrychium neolunaria* (American moonwort). Dozens of plants dotted the slope, most no taller than 3 cm—fragile, translucent green, and easily mistaken for something far more ordinary. But to find them is to come face to face with a lineage that predates not only flowers, but dinosaurs.

Moonworts belong to one of the oldest vascular plant families still alive today—Ophioglossaceae—a group of ferns that has persisted for over 300 million years. These plants produce just one frond per season, divided into a

Senecio crassulus.

Phlox pulvinata.

Ericameria discoidea.

sterile leaf-like segment (trophophore) used for photosynthesis, and a fertile frond (sporophore) with tiny bead-like sporangia, each containing exactly 64 spores. *Botrychium neolunaria*, in particular, was long lumped in with *B. lunaria*, its more robust European cousin, until careful morphological and molecular work found that North American populations represented distinct species. *B. neolunaria* tends to be smaller, more delicate, and better adapted to high-elevation or subalpine habitats where snow lingers and the growing season is short.

Even more remarkable is its life history: much of this plant's existence happens underground. It relies on mycorrhizal fungi for nutrient exchange and may go years without producing an above-ground frond. Whether it appears at all depends on a perfect combination of timing, soil temperature, and moisture. Seeing this little plant, knowing how long it waited to emerge, and where it thrives brings that much more awe. To see even one is special. To find dozens was remarkable. It felt like the kind of moment you'd climb a mountain for. I stayed with this population for a moment, taking photographs, and before too long it was time for me to head back. Not wanting to leave, I convinced myself to make the hike back.

The trek back brought even more surprises: *Senecio amplectens* var. *holmii* (Holm's ragwort), *S. crassulus* (thick-leaved ragwort), and *Erigeron compositus* (cutleaf fleabane) made tall, showy appearances. *Phlox pulvinata* (cushion phlox) appeared in scattered cushions. Down near the edge of one snowbank that had only recently melted back, the slope was littered with hundreds of golden *Ranunculus adoneus* subsp. *adoneus* (alpine buttercup), as if the snow had transformed directly into flowers.

As I returned to the meadow, *Eriogonum brevicaule* var. *caelitum* and *Ericameria discoidea* waved me goodbye. Making my way through Engelmann spruces, I reached my final stretch…

Rather than return down the same scree, I descended a still steep, but less treacherous and much gentler route farther west, greeted at the bottom by a glorious display of *Castilleja applegatei* var. *viscida* and *Monardella odoratissima* subsp. *glauca* (pale coyote mint). The day had offered more than I could have expected—a cascade of habitats, each one distinct, stitched together by stone, wind, and short summer days. Heliotrope Mountain, for all its elevation and effort, had unfolded its secrets generously.

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Your membership is vital to the Utah Native Plant Society. It is important that your information is correct and up to date for notifications and the delivery of The Sego Lily newsletter.

Any questions about your membership, Contact Tony Stireman, *tstireman@gmail.com*.

It is always time to consider the next issue of the Utah Native Plant Society *Sego Lily* which relies almost entirely upon articles from the society's membership. Please submit articles of your native plant stories and photos from hikes and field trips, conservation activities… whatever might be informative and interesting to fellow members.

The *Sego Lily* editors can use most any text format for articles (**PDFs can be troublesome**). Photos are always best submitted in original resolution and as individual files **separate** from text. You can indicate desired positioning within a document. We are looking forward to hearing from you. For submissions and/or questions: newsletter@unps.org or cathy.king@gmail.com

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