



From left: Figure 1: Some of the diversity of monkeyflower (formerly *Mimulus*, now *Diplacus*, *Erythranthe*, and *Mimetanthe*) which can be found in close proximity at McLaughlin Reserve in Lake County, CA. Clockwise from top left: *D. douglasii*, *M. pilosus*, *D. bolanderi*, *E. guttatus*, *D. layneae*, *E. nudatus*. Figure 2: The diversity of leaves and flowers in the author's favorite genera: *Abronia* and *Tripterocalyx*. Top row (L-R): *Abronia nana* rosette, Nevada; *A. latifolia* foliage, California; *A. pogonantha* plant. Middle row (L-R): *A. bigelovii* rosette, New Mexico; *A. maritima* flowers, California; *A. alpina* flowers, California; Bottom row (L-R): *A. latifolia* flowers, California; *Tripterocalyx carneus* flowers, New Mexico; *T. micrantha* flowers, Wyoming.

Grow a Genus! *The excitement of looking at evolutionary radiations in your garden* by Eric LoPresti¹ Photos courtesy the author

Because they occur over long time and large spatial scales, the evolutionary processes that shaped the fantastic diversity of life on earth are often difficult to observe in action. Yet, a native plant gardener can observe and enjoy the diversity generated by this evolutionary process. Due to extreme rainfall, elevational, and climatic gradients, California has unique and hyper-diverse flora: the splashes of colored forb flowers you can see in early spring in many grasslands across California wonderfully demonstrate this phenomenon. Many of these interesting, beautiful, and easy-to-grow native genera are a fun and exciting gardening project to view these evolutionary radiations.

Both across and within habitats, evolutionary processes have shaped species in a single genus to be different in many traits, including floral morphology, flowering time, growth habit, and communities of associated animals. Coastal Northern California has places where three lupines (*Lupinus* spp.) grow in abundance: coastal bush lupine (*Lupinus arboreus*), a purple flowered shrub; silvery lupine (*L. chamissonis*), a hairy, yellow flowered shrub; and

the miniature, purple-flowered annual, sky lupine (*L. nanus*). Across California, dozens of other lupine species grow from low deserts to the high mountaintops. Lupines are not unique in their great morphological and species diversity. Pink, yellow, purple, orange, and red-flowered monkeyflowers (genera *Diplacus* and *Erythranthe*, formerly *Mimulus*) grow as shrubs, herbaceous perennials, and small annuals across the state, and even in a single watershed their diversity can be substantial (Figure 1). Grasslands are studded with *Clarkia* species with cupped, upright flowers, such as farewell-to-spring (*Clarkia amoena*), and open horizontal flowers with varying morphologies all the way to the finely dissected petals of the aptly named red ribbons (*Clarkia concinna*). Various sages (*Salvia* spp.) range from deserts to coasts and have amazing variation in plant morphology, flower color, and, quite strikingly, scent! The leaves, flowers, and habit of manzanitas (*Arctostaphylos* spp.) and California lilacs (*Ceanothus* spp.) differ greatly across each genus; each is a diverse genera of beautiful flowering perennials that may be prostrate groundcover or large shrubs.

Of course, most native plant nurseries do not carry every, or even many, species in a single genus. Many are rare, difficult to grow, or have never been propagated, and some genera may have multiple

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Grow a Genus! *continued*

species that are easier to find in cultivation, with sages and manzanitas being two of the better. Perhaps more rewarding, this spring and summer, go out and collect some seeds and experiment! Do this responsibly, minding local and state laws about collecting seeds and refer to the CNPS status of each species you plan to collect (<https://www.cnps.org/>). Small quantities of common species are easy and legal to collect on many public lands and roadsides. Marjorie Schmidt and Kartherine Greenberg's "Growing Native California Plants" (2012) is a useful reference for propagation. Many other gardening books, and, of course, communities of gardeners on the internet, can also be counted on for help. Once you have seedlings from collections or nurseries in your garden, this is where the fun starts!

Whether you envision this collection to be a window box with a few species of monkeyflowers, or an expansive backyard collection of sage shrubs, the reward will be similar. Continued observation, across the season, across the day, and in both your garden and while in nature can give you clues to the evolutionary processes which shape the diversity you have collected. For instance, pollination is an important ecological interaction that is fun to observe in your garden. Fairy fans (*Clarkia breweri*) attracts moths, flies, and bees, due to its highly scented light pink flowers, yet the closely related red ribbons (*C. concinna*) attracts only the flies and bees, as it lacks the strong scent necessary to attract moths (Miller et al. 2014). The small-flowered monkeyflower (*Erythranthe nasutus*) attracts few pollinators, instead self-pollinating, whereas the closely related

common yellow monkeyflower (*E. guttatus*) attracts bees to assist with pollination. Many of the differences in their ecology are due to this divergence in pollination style (Brandvain et al. 2014). In addition to pollination, herbivory (which plants get aphids or caterpillars?), habitat preference (which thrive in shade? which wilt in the sun?), morphology (do some grow upwards and others out? are some waxy and others sticky?), even smell (sweet or foul?), and seasonality (which flower first? which bloom until late fall?) are also fun and informative to note.

Take careful notes, build your collection, spend time with them, and you, too, might become a convert, or even a proselytizer of gardening with a single group of plants.



References cited

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