Recently the Slosson endowment has helped to fund exciting new displays at UCLA and UC Berkeley and new flower breeding at UC Irvine.

Accounts of the new sign systems at the UC Riverside and UC Santa Cruz gardens offer inside views of a key area of garden management.

A new database at the UC Davis gardens will expedite research and assist visitors seeking details on specific plants.

UCLA Displays Shrubs from Mediterranean-type Climates

Arthur C. Gibson and David Verity

Chaparral is a dense, evergreen, fire-adapted shrubland of western North America, particularly common in the coastal ranges of Alta and northern Baja California and in more inland localities in the foothills of the Sierra Nevada and along the Mogollon Rim of Arizona. Especially in densely populated coastal California, people are ever aware of the inherent danger of living adjacent to or even within this type of flammable vegetation. In many areas fire departments enforce strict brush clearance laws to create buffer zones between homes and the chaparral shrubs. However, even clearances exceeding 50 meters are sometimes not wide enough to spare structures from wind-driven flames and showers of burning embers.

Slopes having chaparral vegetation receive low annual precipitation, typically 350-700 millimeters per year with over two thirds occurring during the mild winter months, whereas summers are dry and hot. When undisturbed, a dense and almost impenetrable shrub cover forms, growing to about two meters in height. The vegetation is green during the early spring just following the rainy season, but it soon dries and old leaves turn brown. As stands grow tall, the shrubs accumulate many dead branches, adding fuelwood for potential fires. At any age in the growth of a stand fire may sweep across the slopes and canyons, removing the standing biomass, but native species of shrubs are adapted either to resprout from their root crowns or recover from seed to reestablish the shrub cover within five years.

From Chile comes *Fabiana imbricata* (Solanaceae), a densely branched shrub with small ericoid leaves and a lavish display of tubular white flowers.

Very similar types of fire-adapted shrublands are characteristic in other warm and temperate regions where Mediterranean-type climate prevails: around the Mediterranean Sea, in the Cape Region of South Africa, in coastal Chile, and in coastal southern and southwestern Australia. There are various names for these semiarid plant communities, such as chaparral, matorral, macchia, maquis, fynbos and kwongan, but, nonetheless, they

Visitors to the Mediterranean Section are greeted with a sign describing the typical climate and the nature of the shrubs found in chaparral-like vegetation.

strongly resemble each other in vegetative structure. Many of the dominant species have fairly thick, tough, evergreen leaves termed "sclerophylls." In each of the isolated regions around the world, however, the sclerophyllous shrub species are different and even may belong to totally different plant families. Because plants from unrelated families, in adapting to the same survival strategies, have evolved to look very much alike, these sclerophylls are appreciable examples of convergent evolution, and growing these species in a small garden gives the observer an opportunity to analyze those similarities.

In the Mildred E. Mathias Botanical Garden at UCLA a section has been dedicated to educating students and visitors about the types of shrubs that inhabit the fire-prone landscape of this Mediterranean-type climate. The display, initiated in 1987 and sponsored by Slosson funds, provides comparisons with shrub plants from other regions of the world. The hillside where the Mediterranean-climate plants now reside was formerly an uninspired planting of conifers. After the trees were cut and stumps removed, extensive work was done to regrade the hill, build a soil and gravel path for visitors and carts, and provide an overbuild drainage system especially to handle runoff from heavy winter rains.

Broad-leaved sclerophylls that can grow to be tall specimens are planted along the back of the garden, eventually to form a living fence for the display. Included in the border are some common shrubs of California chaparral, such as scrub oak (*Quercus dumosa*, Fagaceae), mountain mahogany (*Cercocarpus betuloides*, Rosaceae), holly-leaved cherry (*Prunus ilicifolia*, Rosaceae), and toyon (*Heteromeles arbutifolia*, Rosaceae). In the UCLA display visitors can view these next to their sclerophyllous counterparts from Europe, such as holly-leaved myrtle

Among the attractive bloomers is this hemispherical shrub of *Pimelia ferruginea* (Thylmelaeaceae) from southwestern Australia, which in summer produces a rich bouquet of rose-pink flowers.

***Eremophila maculata* (Myoporaceae), an endemic of Australia, has attractive spotted petals in its red and salmon flowers.**

(*Myrtus communis*, Myrtaceae), buckthorn (*Rhamnus alaternus*, Rhamnaceae), *Phillyrea angustifolia* (Oleaceae) from Portugal, and a shrubby form of *Arbutus unedo* (Ericaceae) called 'Elfen King'. They can also compare Chilean species, such as *Kageneckia oblonga* (Rosaceae), *Luma apiculata* (Myrtaceae), and *Ugli molinae* (Myrtaceae).

In front of the border is a set of low shrubs that appear to tolerate the fairly heavy soils of the botanical garden. An uncommon plant with handsome, broad leaves is *Coriaria myrtifolia* (Coriariaceae) from the Mediterranean. Very different in appearance are the needlelike leaves of chamise, represented here by the short-leaved dwarf form, *Adenostoma fasciculatum* var. *obtusifolium* (Rosaceae), which is found from San Diego County southward.

In order to guarantee sufficient drainage for many of the Australian and South African sclerophylls, an area of approximately 75 square meters was excavated to a depth of 0.6 meters and refilled with decomposed granite. The interface layer was mixed with local soil before the refilling was completed, so to allow water to pass through properly. A thin layer of fine-leaved mulch was then spread over the surface. In this soil many of the most unusual species have been planted. Among those that have survived two years are needle-leaved (ericoid) species of heath (*Erica*, Ericaceae) from South Africa and *Pimelia ferruginea* (Thymelaeaceae), a small hemispherical Australian shrub that becomes hidden by rose-pink flowers. Proteads (Proteaceae), including species of *Grevillea*, *Isopogon*, *Banksia*, *Leucospermum*, and *Melaleuca*, have done well. The display includes intriguing small shrubs of the genera *Pickeringia* (Fabaceae), *Guichenotia* (Sterculiaceae), *Calocephalus* (Asteraceae), *Correa* (Rutaceae), *Templetonia* (Fabaceae), *Eremophila* (Myoporaceae) and *Cneorum* (Cneoraceae). Planted on the front of the display adjacent to the path are three prostrate species, *Kennedia carinata* (Fabaceae), *Grevillea infundibularis* (Proteaceae), and *Kunzea pomifera* (Myrtaceae).

One of the most vigorous growers has been *Fabiana imbricata* (Solanaceae) from Chile, which has dense branches with ericoid leaves and produces masses of tubular white flowers — like short candles — along the shoots. This shrub grew rapidly to two meters tall in the well-drained soil.

Although most species in the collection are evergreen and sclerophyllous, a significant number of common plants are semi-deciduous or even completely deciduous

Numerous species of mints (Lamiaceae) are found in European and California plant communities. In the foreground is the yellow-flowered *Phlomis fruticosa*, and behind is *Salvia* x "Allen Chickering," which has lavender flowers.

An aromatic shrub from the Mediterranean is this mint *Teucrium majoricum* (Lamiaceae), here showing its lavender flowers.

A commonly cultivated Mediterranean shrub is *Myrtus communis* (Myrtaceae), which produces masses of white flowers in early summer.

during the dry season. A small collection of these is planted on the street side of the garden. Examples include species of the mint family (Lamiaceae), including New World species of sage (*Salvia*) and others from Europe (*Lavendula* and *Phlomis*). Highly successful has been a prostrate selection of *Salvia munzii*. Like the mints, European species of *Cistus* (Cistaceae) and some meter-tall specimens of *Medicago arborea* (Fabaceae) with interesting trifoliate leaves are drought dormant and semi-deciduous. Among the drought deciduous species are California currants and gooseberries (*Ribes*, Saxifragaceae) and *Fuchsia lycoides* (Onagraceae) from Chile. Growing side by side are specimens of the only chaparral species native to both the Old and New Worlds, *Styrax officinalis* from Southern California and from Europe. A thick layer of pine needle mulch was applied to protect the soil, particularly when plants are dormant.

Plants were well-watered during establishment but are being weaned to a water regime closely matching native conditions. Eventually some type of pruning may be needed to avoid crowding. More than a dozen species have been lost in the heavy soils, and we are still experimenting to find those that tolerate our local conditions.

A bench alcove was installed at the high point, where a sign describes the collection. Here tour guides can pause in front of a low hedgerow of *Eriogonum fasciculatum* (Polygonaceae) to orient visitors. More and more classes and school groups are exploring this garden and using it as an educational experience.

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