

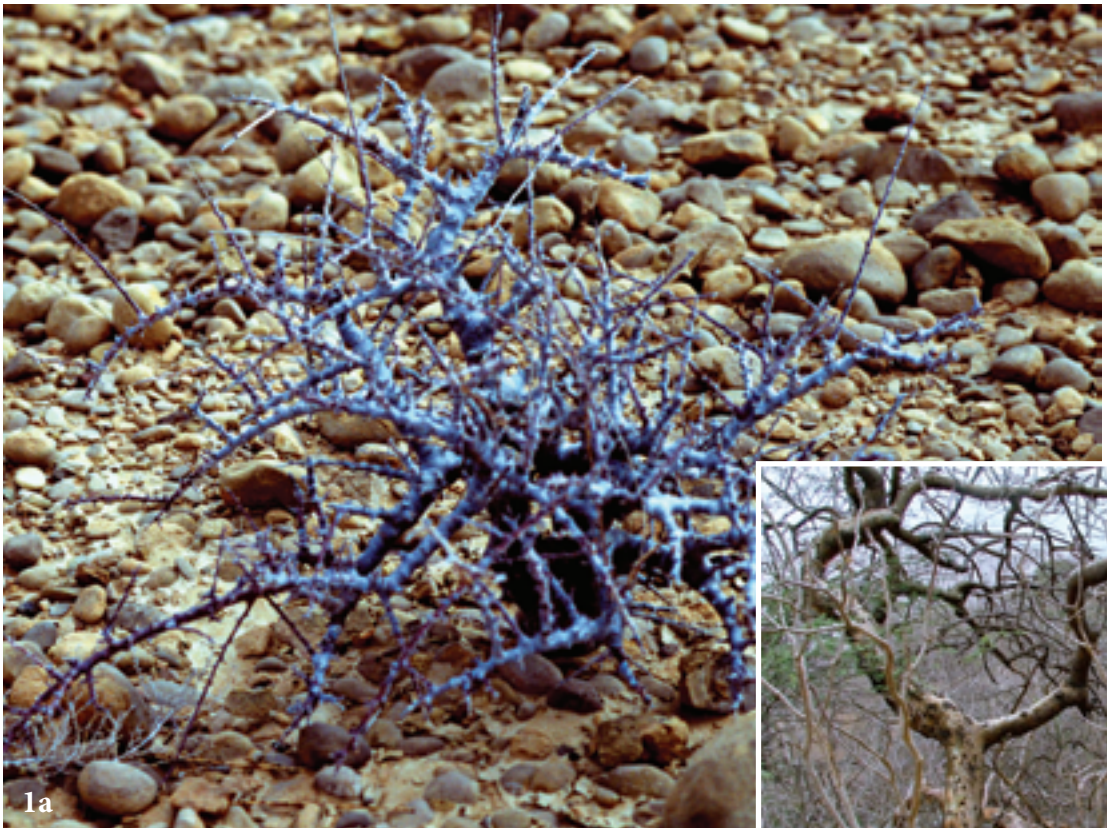
Commiphora gileadensis

History

For thousands of years, *Commiphora gileadensis* (L.) C.Chr. was one of the most significant plants of Arabia, and not only played an economic role in their society but was embedded within the local folklore of that region, making it as important as *Boswellia sacra*. Its gum resin, known as the Balm of Gilead, was actually more expensive than Frankincense, and the plant itself, in its entirety, was used for a variety

of health remedies: as an essential oil, and as an industrial dye throughout the peninsula. Consequently, these plants were protected within their natural habitat and cultivated in farms and private gardens. It was believed that the Queen of Sheba brought the plant to Palestine and shortly thereafter it was naturalized in the region.

C. gileadensis is considered to be the “weather predictor” of the desert and while this phenomenon is shared by most *Commiphora* it is more so with this species. *C. gileadensis* goes through a complete cycle of procreation within the short



1a & b Two extreme forms of *Commiphora gileadensis*: **a** growing in a harsh dry river bottom in Yemen, photographed by Bruno Mies, contrasting with. **b** A medium-sized tree in a rocky mountain woodland habitat, photographed by Boris Vrskovy.



2 a & b A small tree form of *Commiphora gileadensis* growing in a rock crevice in Oman; photograph by Boris Vrskovy. **b** Close up of exfoliating bark of tree depicted in figure 2a; photograph by Boris Vrskovy

monsoon period: it leafs out, flowers, gets pollinated, sets seeds and disburses those ripened seeds all within the few months of the monsoon season. As the monsoon rolls out, the trees lose their leaves, remaining leafless for most of the year until the next monsoon season. Occasionally when there is a rise of heat, humidity and low barometric pressure, the plants will leaf out off season but it is unknown if they produce flowers.

Biology

C. gileadensis is native to Eritrea, Ethiopia, Kenya, Sudan, Egypt, and Arabia. Its size varies depending on environment, ranging in form from a small shrub to a small tree of several meters tall (figures 1a, b). It covers a large territory of diverse environments encompassing harsh desert, woodlands, and rocky mountain terrain. It varies phenotypically from scaly, dark-grey branches to thick limbs with yellow exfoliating bark (figures 1a, 2a, b). The leaves are pinnate with 3-5 leaflets and are highly pubescent (figure 3). It is dioecious with male and female flowers on separate plants.

The male flowers are cream colored when they first open, but within 8-24 hours they turn red (figures 5a, b). The change of color attracts a variety of insects, ranging from bees attracted to the yellow/cream color, to ants attracted to the red. The pollen is ready for disbursement within a few hours after the flower opens. The female

flower, however, turns red within 4-8 hours and during this time it begins to deposit a sticky substance on the stigma. This ensures that the pollen carried by ants or other insects, will remain



3 A flowering branch showing a pair of male flowers and the pubescence of leaves and stem. The cream-colored flower is a newly opened and the red one is a day old, with pollen ready for release.



4 A cultivated specimen, in an 8" container, collected in Yemen by Gary James.

on the stigma. It appears that the female plant in its evolutionary process, has developed multiple methods, including catching any air-borne pollen, for a successful pollination.

The fruit is distinctive with white dividing lines giving the illusion of being a four-lobed fruit, however, like all *Commiphora*, it contains only a single seed (figure 6a, b). The fruit is edible and considered a delicacy in Arabia.

Culture

Perhaps the most difficult aspect of propagating *C. gileadensis* from seed is finding a male and female pair, and then growing them to flower at the same time. With patience and diligence, *Commiphora gileadensis* can be acclimated to an

artificial environment, thrive, and produce flowers. It is important that the cultivator respond to the plant's behavior and growth changes by adjusting the watering and feeding program. It is most active during the summer monsoon season, when heat and humidity are high and barometric pressures drop. During this period, the opportunity for new growth is excellent and consequently the plant will flower if it is in "condition". The term "condition" means a suitable environment with a combination of heat, humidity and nutrients that will bring the plant into a flowering state. During the resting period, water and feed very little, but do not let the soil dry out totally for too long. Increase water and feeding in late spring when the night temperatures reach above 23° C (75° F).

5 a & b A male flower, only a few hours old. **b** A red, one day old flower, with pollen ready for release.



5b



6a

6 a & b A pair of female flowers, pollinated less than 24 hours apart, showing the developmental changes which occur in a short time. The lower flower was pollinated first. **b** A 3 day old developing fruit.



6b

C. gileadensis is one of the few *Commiphora* that can not be forced to flower under stressful conditions. In contrast, when under stress the plant will shut down and lose all its leaves.

Do not try to use bottom heat with artificial light to activate the plant. Although it is possible, it requires a well conditioned plant to become active more than once a season.

Propagation

Once the plants have acclimated to the environment and are in condition, do not move them. Make sure that they are in the sunniest location with ample humidity and air movement. If you keep the same regimen (watering and feeding program) for both plants, the chances of them



If unsuccessful, the flower will fall off in three days.

The fruits will ripen within 2-3 weeks time and will naturally peel off exposing the stone. To ensure that the ripening process is complete, do not pull off the seeds by force but wait until they easily fall off with very little pressure.

The most successful time to sow the seeds in my area, the Sonoran Desert, is the early part of July, just before the monsoon season begins. Artificial heat and humidity during the wrong season will reduce the germination rate substantially. Seeds are viable for at least two years so there should not be any rush to sow them until the conditions are right. Use a well drained mixture but do not include organic material. A mixture of pumice and perlite, with a small amount of washed coarse sand, is ideal.

Seeds will germinate within 1-3 weeks and appear like most *Commiphora* with a swollen base firmly planted. Use liquid fertilizer with equal parts NPK during each watering. In the beginning use a very small amount of fertilizer then increase the amount proportion-

ally to the size of the seedlings. *C. gileadensis* as seedlings, or as fully grown plants, depend on taking in oxygen through the roots more so than most other species. The best way to get oxygen to the roots is through watering, so the soil mixture must be designed to dry out quickly enough so that the number of watering can be increased as much as possible.

This year I have germinated a dozen seeds while learning a great deal about how to increase the success rate for the next season. I hope to be able to offer first and second generation seedlings to the public in the not-too-distant future. A few generations in cultivation could bring about more forgiving plants that are more easily cultivated and that could be enjoyed by all. 🌵

ACKNOWLEDGMENTS

I thank Gary James for bringing two field collected plants back from his trip to Yemen, and Joe Stead, who was their curator for nearly a decade, for giving them to me. Without these additional plants, cultivating *Commiphora gileadensis* would have been difficult, to say the least.



7a

7b

7a & b After two weeks, a *Commiphora gileadensis* fruit is fully ripe, and ready to lose its covering by peeling off the seed. **b** A fresh seed, removed from the branch.

flowering at the same time are very high. Of the five plants in my collection, four will often flower just days apart. If a male plant blooms early, collect the flowers in a small petri dish by holding it under the flower and gently remove them. This operation requires patience and diligence, due to the fact that the ripe pollen can become airborne.

For pollination, use a number 2, or smaller, organic-haired brush and gently tap the tip, first on the stigma where the sticky substance is present, and then collect the pollen. This will allow ample pollen to stick to the brush, making the transfer easy and effective. Due to the size and delicate nature of the flowers, a steady hand is essential, so find a way to support your arm while working. To ensure a successful pollination, repeat the process several times within the blooming period (1-3 days). If the pollination was successful, results should become evident within 3-4 days, and the fruit should start rising out of the flower.