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# Palmetto



Notes on *Harrisia fragrans* • Native Container Gardening • *Helenium amarum*

Notes on the Biology of the  
Fragrant Prickly Apple Cactus  
*Harrisia fragrans*

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**Above:** *Harrisia fragrans* flower, July 2011. The large, nocturnal flowers are approximately 4 to 4.5 inches across. *Photo by Jon Moore.*



**Fragrant prickly apple cactus (*Harrisia fragrans*, formerly known as *Cereus eriophorus* var. *fragrans*) is a native cactus found in scrub habitat, elevated sandy dunes, and on shell mounds along the east coast of Florida between New Smyrna Beach and Jensen Beach (USFWS 2010).**

It is largely limited to a very few protected sites and adjacent private properties, with the vast majority of individuals found in and around Savannas Preserve State Park (SPSP). At SPSP, the fragrant prickly apple cacti are growing on coarse white quartz sand with a surface layer of fine organic debris and/or leaf litter.

The fragrant prickly apple cactus was first discovered in a scrub hammock about 6 miles south of Fort Pierce by John Kunkel Small in 1917, while he was exploring scrub vegetation (Small 1918). The first specimen was probably collected within the boundaries of the present-day Savannas Preserve State Park. Small later reported specimens from Turtle Mound, about 9 miles south of New Smyrna Beach (Small 1925).

**Above left:** *Harrisia fragrans* growing in the Savannas Preserve State Park, 2009. **Below left:** The fragrant prickly apple cactus gets its name from the fruit, which is globose, about 2 to 3 inches across, and bright red or orange-red in color. *Photos by Jon Moore.*

# Notes on the Biology of the Fragrant Prickly Apple Cactus (*Harrisia fragrans*)

This cactus occurs singly or in small dispersed groups. The stems often form erect, reclining, or recumbent columns up to 15 feet long, however in open sunny spots this species will frequently grow as a shorter, highly branched form. The columns have 10-12 ribs with moderate to deep grooves between. Areolas have a cluster of 9-13 needle-like spines with one spine being particularly prominent and longer (young seedlings under 8 inches in height often lack a distinctively longer spine). New growth is characterized by very golden coloration to the spines at the distal tip of the column or branch. Shaded plants are bright green, while plants in the open sun for most of the day are yellowish green. Very sunburned plants take on a distinctly reddish tone.

Fragrant prickly apple cactus flowers start as small buds densely covered with fine white hairs. The red and brown buds grow to about 6 or 7 inches long prior to blooming and are sparsely covered with small tufts of white hairs just before blooming. The flowers are nocturnal, often opening after 10 P.M. and are about 4-4.5 inches across when fully opened. The corolla is white or faintly pinkish, possessing many white stamen filaments with yellow anthers. There are 9-12 stigmas on elongate styles. Flowering occurs April through October, and the flower smells like a blend of pine forest and freshly cut grass.

The specific pollinators are unknown, although at least two different beetle species have been found in the flowers shortly after opening, including a long-horn beetle (family Cerambycidae). It is likely that *Harrisia fragrans* is also pollinated by hawk moths, much like many other *Harrisia* species (Scogin 1985, Rojas-Sandoval & Melendez-Ackerman 2009).

The cactus gets its name from the fruit, which is globose, about 2-3 inches across, and bright red or orange-red in color. Inside the fruit is a translucent white pulp with an average of about 1,400 small black seeds (Rae 1995).

Propagating seedlings was not particularly difficult. Acid scarification of the seeds, as advocated by some authors (Dehgan & Perez 2005), was unnecessary. A small number of seeds scooped out with some surrounding pulp were placed directly onto a mixture of 70% white quartz sand and 30% unfertilized potting soil. Quartz sand from a scrub ridge was used to provide plants with mycorrhizae they might need for root growth.

Initially a watering regime that mimicked natural rain patterns was applied, however the seedlings were started during Florida's dry season, and several sprouts were lost to desiccation. Shifting the watering schedule to every 2-3

days, which mimics Southeastern Florida's wet season rain pattern, resulted in much greater success in both seedling sprouting and survival. The significant increase in sprouting after altering the watering schedule may indicate that the rainy season represents the initiation of recruitment in the wild. Seeds continued to sprout for up to 2 years after the start of the project, which may indicate some limited ability at seed banking.

Young seedlings usually grow in association with a nurse plant, which provides partial shade for some portion of the day. It is very likely that seeds are dropped next to nurse plants by birds that feed on the cacti fruit and then perch in the nurse plant. At Savannas Preserve State Park, the larger cacti (at least 1 foot tall) were most frequently found on the east, west, or north side of the nurse plant. Any seedlings that get started on the south side of a nurse plant are presumably eliminated by intense sunburn and desiccation. At SPSP, nurse plants were most commonly cabbage palms (*Sabal palmetto*), and less commonly various scrub oak species, including Chapman's oak (*Quercus chapmanii*), myrtle oak (*Q. myrtifolia*), or sand live oak (*Q. geminata*). Very infrequently, cacti were associated with wild muscadine grape vines (*Vitis rotundifolia*) or laurel greenbrier (*Smilax laurifolia*). Rae (1995) lists other nurse plants.

Besides desiccation, other sources of seedling damage and mortality include herbivory. In adult plants, small excavations by caterpillar grazing can be seen on the surface of the column and appear to do little harm, but in small seedlings these excavations can be devastating. Caterpillars responsible for killing seedlings include the larvae of Horace's Duskywing butterfly (*Erynnis horatius*), and other caterpillars from a small, unidentified moth were also observed. Younger seedlings are sometimes consumed by gopher tortoises, as evidenced by the results of a recent transplantation experiment at SPSP. Another form of damage was observed when a seedling planted near a dead scrub hickory was attacked by termites that excavated the entire interior of the column base.

Seedlings that attain a size greater than 6 inches tall are in some ways hardy plants. Young prickly apple cacti grow a circle of surface roots, a common feature for plants that gather rainwater in an arid environment with porous soil. They also grow deeper roots that sometimes produce a tap-root extending downward from the column. This combined root mass enables prickly apple cacti to survive damage to the column, and the column mass allows for survival from root damage. During the study, a few fragrant prickly apple cacti transplants were vandalized or accidentally damaged.



**Above:** The red and brown flower buds grow to about 6 or 7 inches long prior to blooming. The left bud has recently bloomed, and the right bud is ready to open in the coming evening. SPSP, 2009. *Photo by Jon Moore.*

Several were dug up and left on the surface where their roots dried out. When replanted, these plants started growing again in about a month. Another plant was accidentally cut in two at the base. Within a month, the root mass started a new column, and after 3 months the column was 2 inches tall. The damaged base of the column was cut, allowed to dry for a few days, planted into sand, and watered on the 2-3 day schedule. After 2 months, the column rooted from the lower areolas. The ability to root from the column was evident in the wild at SPSP, where several columns had fallen over and rooted in spots that gave rise to a series of new clones of the original plant.

Older fragrant prickly apple cacti are able to grow new columns fairly rapidly. One specimen at SPSP was photographed in 2009 with 4 recumbent columns, each about 4 feet long. Sixteen months later, the same plant had two additional upright columns, one 2 feet and the other 3 feet tall.

The Florida Native Plant Society has funded a project to transplant fragrant prickly apple cactus seedlings into several protected sites in the species former range. An

article featuring the transplanting project will be featured in an upcoming issue of *Palmetto*.

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