

# The Genus *Coccothrinax* in Cultivation

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1. A portion of the extensive collection of *Coccothrinax* at Fairchild Tropical Botanic Garden.



For many years, only a handful of *Coccothrinax* species have ever been cultivated outside of the Caribbean basin. In the last five years, over two dozen additional species have become available to collectors. Although little is known about the needs of these species in cultivation, some of these palms are very beautiful and deserve wider use.

Palms of the genus *Coccothrinax* are species from coastal scrub and open forest from the Caribbean islands and bordering lands (Uhl & Dransfield 1987). While most forest species are found in the mid-canopy, a few are emergent palms. All are solitary, with the exception of *C. pseudorigida* and *C. fagildei*, which cluster.

Currently, there are 50 accepted species in the genus. Considerable taxonomic confusion exists because many pockets of endemism occur in eastern Cuba, perhaps due to the rich assemblages of soil types and microclimates,

and most species seem to possess limited distribution ranges, making finding the palms, much less collecting ripe seeds, difficult.

When Henderson, Galeano and Bernal published the *Field Guide to the Palms of the Americas* in 1995, they reduced the number of species to 14 and indicated that the genus was in dire need of revision. However, Moya and Leiva's checklist (2000) enumerated 38 species for Cuba alone. When the second largest center of distribution, Hispaniola, is considered, the number of accepted species

2. *Coccothrinax crinita*, a species known for its long fibers covering the trunk.



may be even greater. It is easy to see that this genus does indeed need a great deal of work to sort out the species. Complicating matters further is the fact that anecdotal evidence strongly suggests that a significant amount of hybridization has occurred among the species cultivated in South Florida, a situation making taxonomic work based upon these individuals challenging, to say the least. A complete taxonomic review of *Coccothrinax* would clarify the taxonomy of existing species and would be particularly welcome in the light of the current collecting activity in Cuba and the Dominican Republic that may very well result in the discovery of new species.

This article focuses on the cultivation of some of the attractive, but little known, taxa that have recently come into South Florida. Because of the confusion regarding names, the taxonomy of the genus cannot be ignored completely. This paper thus relies more closely on the work of Cuban botanists most familiar with the species in the wild than on other published accounts.

For many years, only a handful of *Coccothrinax* species have ever been cultivated. In this paper, we define "cultivation" to mean species found in the landscape trade or in private collections (botanic gardens and individual collectors).



3. *Coccothrinax miraguama* is appreciated for its attractive, persistent leaf base fibers.



4. The trunk of *Coccothrinax spissa* is swollen.

Interestingly, a few species are widely grown, while the many more species are practically unknown outside their countries of origin. Some of these species deserve wider use because of their beauty.

Presently, only about eight taxa are known to be grown for the commercial landscape market; a handful are being tried in the Canary Islands, but another 30 have gradually begun to be grown in South Florida. Proximity to wild seed sources, however irregular and limited in quantity, and similar climate and soil type, make South Florida well suited for cultivating and studying the genus. Their slow growth rate makes them challenging

candidates for long term study, and for the same reason, few of the newly available species are likely to be embraced by the landscape trade. Several species that have moderately fast growth rates hold some promise. Warm and dry regions of Australia and Hawaii could also be well suited for growing this genus, but low soil pH in both locations limits *Coccothrinax* cultivation. Few species grow well in either location. Likewise, southern California does not seem to be a good habitat for most species because of its long and cool winters.

For many years, *Coccothrinax argentata*, *C. barbadensis*, *C. crinita* (Fig. 2), *C. miraguama* (Fig. 3) and *C. spissa* (Fig. 3) were the only



5. A suspected hybrid between *Coccothrinax* and *Zombia*.

species widely found in cultivation, although a handful of names (*C. argentea*, *C. martii*, *C. alta*) were indiscriminately applied to plants available at local palm sales. Occasionally plants identified as *C. boschiana*, *C. clarensis*, *C. cupularis*, *C. gracilis*, *C. fragrans*, *C. inaguensis*, *C. jamaicensis*, *C. readii* and *C. yuruguana* have been sold at Fairchild Tropical Botanic Garden or South Florida Palm Society sales. However, very few other species have appeared in cultivation until the past three years when collectors from around the Caribbean basin began palm prospecting in Cuba and the Dominican Republic. As a result, seeds and seedlings of numerous taxa have begun to

appear at local palm sales and offered on the Internet by commercial seed and plant vendors. However, because the taxonomy is in disarray and there are no mature specimens of these new “immigrants” in South Florida, it is important to acknowledge that identification of these newly offered species is tentative at best. In a few cases, quantities of “fresh seeds” have been offered from locations where the palms simply do not exist and/or many months after the plants finished their annual fruiting.

Collections of seeds from palms in the type localities and extensive photo collections have

Table 1. Species of *Coccothrinax* in cultivation.

<i>Coccothrinax</i> species	Native to	Characteristics
<i>argentata</i>	Pine rocklands of South Florida including Florida Keys; coastal hammocks of southern Florida Keys; Bahamas; Yucatan.	Lax leaves dark green above and silver below; high drought and salt tolerance; slow growing.
<i>barbadensis</i>	Coastal scrub from Lesser Antilles south to Trinidad and Margarita Island, Venezuela.	Large green leaves, may be slightly silver below; fastest growing of genus (seed to 6 m [20 ft.] in ten years).
<i>borhidiana</i>	Scrub forest on karst near coast, Matanzas, Cuba.	Exceptionally stiff leaves with short petioles; leaves retained for years – superficially resembling a miniature <i>Copernicia macroglossa</i> ; erect inflorescences; South Florida specimens are finally producing large purple fruit after about 18 years of cultivation from seed; salt and drought tolerant.
<i>crinita</i>	Low serpentine hill soils in central and western Cuba; critically endangered.	Large green leaves; long arching inflorescences above the crown with large burgundy fruit; persistent leaf sheaths form thick layer of fibers on trunk; critically endangered in the wild (<100 plants in habitat) but arguably the most easily recognized and widely grown species of the genus in the world; easy to grow in alkaline soils despite being native to serpentine habitat; requires more water than others in genus.
<i>miraguama</i>	Pine forests and sandy scrub in western Cuba.	Probably several different subspecies; all share rigid green pinwheel leaves and coarse fibers; trunks favorable as hosts for small epiphytic orchids and bromeliads.
<i>proctori</i>	Cayman Islands.	Fast growing, salt tolerant, tall palm with close affinities to <i>C. argentata</i> and perhaps <i>C. barbadensis</i> .
<i>scoparia</i>	Widespread in pine forests in the Dominican Republic (and Haiti?)	Similar to <i>C. miraguama</i> with stiff, deeply divided leaves and wide, coarse leaf sheath fibers; trunk more slender.
<i>spissa</i>	Scrublands and open pasture in southern Dominican Republic and Haiti.	Stoutest trunk in genus (up to 70 cm [27.5 in.] in diameter in cultivated specimens); usually swollen midstem.



6. Community pot of seedlings of *Coccothrinax argentata* making vigorous growth.

been made to help identify the plants using the older *Coccothrinax* literature. Buyers should realize that all identifications should be considered tentative until more extensive field work is done and the genus is formally revised. In the meantime, growers should keep accurate records of seed sources and their own cultivation experiences to contribute to a growing body of information on this genus of attractive palms.

In the last few years, small quantities of seeds and nursery-grown seedlings labeled as *C. alexandri*, *C. argentea*, *C. camagueyana*, *C. fragrans*, *C. ekmanii*, *C. garciana*, *C. gundlachii*, *C. hiorami*, *C. macroglossa*, *C. moaensis*, *C. montana*, *C. munizii*, *C. borhidana*, *C. nipensis*, *C. pauciramosa*, *C. pseudorigida*, *C. salvatoris* and *C. saxicola*, have become available to growers. Because these species are “new to the trade” little is known about their cultural

requirements. This paper, therefore, presents what is known at this time and identifies what may be some horticulturally valuable species worthy of greater use in the subtropical and tropical landscapes.

#### Species in Cultivation

Because Florida is close to the center of distribution of the genus and has the wet/dry season and alkaline soil preferred by most members of the genus, more *Coccothrinax* (ca. 40 taxa) are cultivated here than anywhere else. The majority of species are recent arrivals, and few fruiting specimens exist. Anecdotal evidence suggests that what have been recognized as *Coccothrinax* species (particularly those in the *C. argentata* – *C. readii* – *C. inaguensis* – *C. litoralis* and *C. barbadensis* – *C. alta* – *C. readii* – *C. proctorii* – *C. jamaicensis* groups outside of Cuba) can form fertile hybrids. This evidence suggests that each

group may be one species that displays a wide range of characteristics across its range rather than a guild of multiple species. Additionally, an intergeneric and sterile *Coccothrinax* × *Zombia* hybrid has flourished at Fairchild Tropical Botanic Garden in Miami for decades (Fig 5). Obviously the application of DNA analysis to all *Coccothrinax* could help clarify the picture.

Table 1 presents the species that have been grown for the longest time in South Florida, as well as in Hawaii, Australia, the Canary Islands and elsewhere. Palms known as *C. alta* and *C. argentea* are also in cultivation, but all the mature plants the authors have seen have horticultural origins and resemble either *C. argentata* or *C. barbadensis*, or share a mixture

of characteristics that make identification challenging.

### Cultivating *Coccothrinax*

*Coccothrinax* are best grown from freshly collected ripe seeds. After removing the pulp, soak the seeds 1–3 days and discard any “floaters.” Dried seeds may be soaked for over a week to rehydrate them. Sow the seeds shallowly in a 10–15 cm deep community pot of well drained medium kept in a warm, sunny space. Fresh seeds germinate best, but seeds can take up to a year to germinate. Be patient and do not throw the seeds out until they rot. If the soil mix breaks down, remove the ungerminated seeds, replace the mix and resow.



7. The root mass of *Coccothrinax hiorami* is large and benefits from a large, roomy pot.

8. *Coccothrinax boschiana* is slow-growing but attractive, even as a young plant.



Community pots may be divided when seedlings are at the two-leaf stage. Seedlings should be placed in pots deep enough to accommodate the long roots (Fig. 6) *Coccothrinax* germinates remotely, so be sure to plant the seedling so the roots are below the soil and the bud of the seedling is above ground. Once again, a well-drained medium is best and may be amended with crushed limestone rock or dolomite for drainage and to maintain an alkaline root zone.

*Coccothrinax* benefits from over-potting – that is, planting in larger pots than most palms, because of their proportionately greater root mass (Fig. 7). Growth rates can be increased by moving seedlings and juvenile plants into pots one size greater than the usual sequence. Keep potted *Coccothrinax* off the ground on benches to ensure good air circulation around the plants. Most species (except *C. crinita*, *C. montana* and *C. yunquensis*) will tolerate full sun even as seedlings. Growers in subtropical



9. *Coccothrinax borhidiana* is a handsome palm for gardens.

regions will also need to provide cold protection for these small potted palms, especially from dry winds and cold rain that encourage fatal fungal infections. Regular applications of a balanced time release palm fertilizer and micronutrient sprays will also promote growth and strengthen plants against conditions of low humidity and cool winter temperature. Patience is also a requirement for growing palms in this genus as most are slow-growing, particularly for the first 3–5 years.

Because most species are found in sunny, seasonally dry climates and in well drained alkaline soils, similar landscape conditions will promote the best growth when the palms are ready to be planted. Dig a large hole to accommodate future root growth and then water and mulch the newly planted palms to mimic their habitat. Planting at the beginning of the rainy season will help young plants get established. Keep mulch away from the trunk to avoid fungal infection and fertilize lightly



10. *Coccothrinax camagueyana* has silvery leaves with bluish cast.

for the first six months with a palm fertilizer with N-P-K ratio of 2-1-3 and micronutrients. Liquid fertilizers may be used for plants in the ground or in pots but are unlikely to have much effect on slow-growing palms such as these.

Many of the very attractive Cuban species are found in serpentine soils rich in nickel and/or other heavy metals such as iron, chromium, cobalt and manganese. These soils also feature high magnesium/calcium ratios with

correspondingly low levels of calcium, potassium and phosphorus. In fact, calcium levels in serpentine soils are virtually zero. Serpentine soils can be either acidic or alkaline with older serpentine areas tending to be more acidic and newer ones slightly more alkaline. For the serpentine species (*C. sp. "azul"*, *C. camagueyana*, *C. clarensis*, *C. garciana*, *C. moaensis*, *C. pseudorigida* and *C. yuruguana*) long-term container culture may be the only viable option unless local soils are serpentine

as well. Alternatively, using an iron and magnesium amendment once a month seems beneficial.

### Species worthy of wider cultivation

The following species are worthy of wider cultivation because of the characteristics listed and their prospective adaptability to subtropical or tropical conditions on well drained alkaline soils.

*C. alexandri* – 13–20 m, robust, Cuban, coastal palm with large crown of stiff leaves with silver undersides.

*C. boschiana* (Fig. 8) – slender, Dominican Republic, coastal species with leaves golden green above and silver below; heavy, coarse fiber; slow-growing.

*C. brevicrinis* – Cuban palm with short trunk, short, coarse fibers and dense crown intermediate in “hairiness” between *C. borhidiana* (Fig. 9) and *C. crinita* (Fig. 2); from a different part of Cuba with different soil (*C. crinita* comes from serpentine area, *C. brevicrinis* from alkaline calcareous soils).

*C. camagueyana* (Fig. 10) – drought tolerant, serpentine species good for pot culture, moderate growth rate, stiff leaves with silver-

blue cast on upper surface; similar to plants known as *C. “azul”* (Fig. 11).

*C. fragrans* – Dominican Republic and Cuban species with stout trunk; close affinity to *C. spissa*.

*C. garciana* – serpentine species from Cuba with spiny red leaf fibers to 2 cm wide, rigid round leaves on short petioles; exceptionally slow growth rate and soil requirements may limit this to long-term pot culture.

*C. gundlachii* – robust, Cuban species with large, stiff leaves, erect inflorescence and heavy, coarse fiber.

*C. littoralis* – coastal Cuban species found in sandy, wet, littoral scrub; high salt tolerance and moderate growth rate.

*C. macroglossa* (Fig. 12) – robust, Cuban palm with large black fruit, stiff leaves that are silver underneath, coarse fibers.

*C. montana* – an understory palm from the moist mountains of the central Dominican Republic; dark green leaves deeply divided; fast-growing; white fruit.

11. The species known to growers as *Coccothrinax “azul”* is one of the bluest species.





12. *Coccothrinax macroglossa* has stiff leaves that are silvery underneath.

*C. munizii* (Fig. 13) – a thin-stemmed, Cuban species with small, wedge-shaped leaves; tiny fruit; a good planting companion with cactus.

*C. pauciramosa* – medium-sized, coastal, Cuban species with erect inflorescence and heavy, coarse fiber; easy to cultivate.

*C. salvatoris* – Cuban brackish forest species with a compact crown, wide leaf segments, heavy fiber and starburst-like leaves.

#### Many questions remain

A handful of other species (*C. clarensis*, *C. cupularis* (Fig. 14), *C. ekmanii*, *C. guantanamoensis*, *C. hiorami*, *C. inaguensis*, *C. jamaicensis*, *C. pseudorigida*, *C. readii*, *C. saxicola*, *C. yunquensis*, and *C. yuraguana*) are so poorly represented in cultivation that identification of some of the plants may be questionable, particularly if the plants were grown from seeds collected in botanic gardens. Furthermore, the following taxa remain poorly known altogether or unknown in cultivation outside their country of origin (Cuba, unless

otherwise noted): *C. acunana*, *C. baracoensis*, *C. bermudezii*, *C. concolor* (Haiti, extinct?), *C. elegans*, *C. fagildei* (clustering with up to 100 heads!), *C. leonis*, *C. microphylla*, *C. moaensis*, *C. muricata*, *C. nipensis*, *C. orientalis*, *C. pumila*, *C. rigida*, *C. savannarum*, *C. trinitensis*, and *C. victorini*) that their horticultural potential cannot be evaluated at this time.

#### A further comment

As we worked on this article, we realized that cultivating *Coccothrinax* serves as a metaphor of life itself and offers many meaningful lessons – patience is an important virtue, actions often take a long time to bear fruit and no matter how much we would like to see things happen, Nature moves according to its own timetable. *Coccothrinax* seedlings need the right nutrients, just the right amount of water and sunlight and a healthy environment. They can tolerate a fair amount of pests, including overprotective “parents.” Whenever our conversation turns to which species just produced its first divided leaf after years of growth, we are reminded of these lessons.



13. *Coccothrinax munizii* is a slender palm with stiff leaves from the driest part of southeastern Cuba.

### Summary

As more species of *Coccothrinax* are cultivated, we hope that commercial growers and collectors will share their experiences in palm forums and in the literature so that these attractive palms will find greater use in landscapes. We hope to see more *in situ* and *ex situ* conservation efforts, particularly for the Cuban species with limited distributions, in order to buffer the effects of human activity, particularly coastal tourism, in Cuba and the Dominican Republic. Additionally, consistent practice of sustainable collection techniques and appropriate horticultural methods can also ensure the survival of *Coccothrinax* in the wild and in cultivation. These practices include

collecting a few seeds from many individuals rather than all the seeds of a few specimens, harvesting only ripe seeds and processing them promptly, matching the cultural conditions to the plant's own habitat as closely as possible, as well as carefully monitoring these palms from sowing to planting in the landscape. It is particularly important to obtain as much knowledge as possible of the ecology of these palms in the wild, as this information will help us determine each species' suitability for cultivation and techniques of conservation.

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14. *Coccothrinax cupularis* is still uncommon outside botanical gardens. This specimen grows at Fairchild Tropical Botanic Garden, Miami, Florida.

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