

## Chuniophoenix in Cultivation

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Among the genera of Asiatic Coryphoideae, *Chuniophoenix* is certainly one of the most enigmatic. These attractive palms are still uncommon in nurseries and on seed lists, but our experience at Fairchild Tropical Garden (FTG) suggests that they deserve to be more widely grown.

There are only two species in the genus. *Chuniophoenix hainanensis* Burret (Figs. 1,2) was the first species to be described. Burret (1937) named the genus after Professor W. Y. Chun, then-director of the Botanical Institute, College of Agriculture, Sun Yatsen University (now Zhongshan University), Guangzhou, China. The species epithet refers to the palm's island home, Hainan.

Three years later, Burret (1940) described a second species, *Chuniophoenix nana* Burret (see Back Cover), from Vietnam in the vicinity of Hanoi. The specific epithet means "dwarf," and describes the habit of this palm. A third species, *C. humilis* C. Z. Tang and T. L. Wu, was described in 1977 from Hainan (Tang and Wu 1977), but this name is a taxonomic synonym of *C. nana*. Plants cultivated under the name *C. humilis* should be called *C. nana*.

Both species have been growing in FTG since 1985. As they are mature and fruiting, we have the opportunity to compare the two species with each other, as well as with other coryphoid palms. FTG has one mature plant of *C. hainanensis* and several mature plants of *C. nana*.

Although molecular evidence (Uhl et al. 1995) and technical details (Uhl and Dransfield 1987) point to *Kerriodoxa* as the closest relative to *Chuniophoenix*, the two genera are dissimilar in a number of obvious ways and would never be confused. Unlike *Kerriodoxa*, both species of *Chuniophoenix* are caespitose (suckering) palms. The leaves of *Chuniophoenix* lack hastulae, whereas those of *Kerriodoxa* have hastulae. The leaves of *Chuniophoenix* also lack the white scales on their undersides that are so character-

istic of *Kerriodoxa*. It is the inflorescence of *Chuniophoenix* that immediately distinguishes it from *Kerriodoxa* and all other genera of the Coryphoideae. The peduncular bracts are green (becoming brown with age), tubular and tightly clasping around the jointed rachillae. Even the bracteoles that subtend each flower or flower cluster are tubular and clasping. Burret (1937) and Uhl and Dransfield (1987) noted the resemblance of the *Chuniophoenix* inflorescence to those of certain Calamoideae.

The two species of *Chuniophoenix* are readily distinguished from each other, even in the vegetative condition. The obvious difference is size: *C. nana* has stems <2 cm in diameter and leaf blades <40 cm in diameter, but *C. hainanensis* has stems ca. 15 cm in diameter and leaf blades ca. 120 cm in diameter. The habit of *C. nana* is reminiscent of species of *Rhapis*, with tight clusters of stems each <1.5 m tall. FTG's *C. hainanensis*, flowering for the first time at eleven years old, has stems <0.5 m tall; their ultimate height is unknown but probably not >3–4 m.

The petioles of both species are unarmed, deeply channelled on the upper side, and rounded below. In *C. hainanensis* they are vested with a powdery white indumentum on the abaxial surface and are 80–90 cm long. The petioles of *C. nana* are glabrous and 28–39 cm long. In *C. nana*, the leaf sheath is tubular and unsplit. The leaf sheaths of FTG's specimen of *C. hainanensis* are also unsplit, although those of much older specimens in the South China Botanical Garden, Guangzhou (Fig. 2), are split as in *Thrinax* (J. Dransfield, personal communication).

Both species possess costapalmate leaves. The costa extends briefly into the blade, but the leaf is noteworthy in lacking a hastula. The segment apices are acute, not bifid as in many other genera. The lamina color of both species is blue-green, but not glaucous, on both surfaces. The leaves of *C. hainanensis* typically have 40–43 segments per leaf, and those segments are 59–64



1. *Chuniophoenix hainanensis* growing in full sun at Fairchild Tropical Garden. 2. *Chuniophoenix hainanensis* at South China Botanical Garden bearing numerous inflorescences. Note split leaf base in the center of the photograph (photo courtesy of J. Dransfield).

cm long and 4.0–4.5 cm wide. The leaves of *C. nana* have only 21–23 segments, and they are grouped in six or seven clusters of three and five segments each. The individual segments are 26–35 cm long and ca. 1 cm wide.

The inflorescences of both species are borne among the leaves, one per node. That of *C. hainanensis* is longer, to ca. 100 cm, and branched to two orders; whereas the inflorescence of *C. nana* is ca. 40 cm long and only once branched. In *C. nana*, the flowers are borne singly (rarely paired) along the rachillae, but in *C. hainanensis* flowers are borne in small clusters along the rachillae. Both species blossom in winter and early spring (November–April) in Miami.

The flowers of these palms are similar in size

and shape, but dissimilar in fragrance and color (and perhaps in pollinators). The flowers are ca. 9.5 mm across, with a loose, membranous, cupulate calyx, and three strongly reflexed petals. There are six stamens, the inner whorl of which is strongly fused to the upper surfaces of the petals for about half the length of the filaments. A single cylindrical gynoecium is found in the center of the flower. The flower of *C. nana* is white with yellow anthers and is sweetly scented. That of *C. hainanensis* is burgundy red with yellow anthers and a greenish-yellow gynoecium, and it has a sour, slightly unpleasant aroma.

Uhl and Dransfield (1987) reported that some plants are polygamodioecious (bearing both bisexual and unisexual flowers). All of FTG's plants are hermaphroditic. The flower clusters in

*C. hainanensis* often appear to be composed of functionally carpellate and functionally staminate flowers, because the older, pollinated flower in the cluster often has a swollen ovary and empty anther sacs, while the younger flower still has an unfertilized ovary and anthers bursting with pollen.

Fruits ripen ca. 10–11 mo after flowering. Both species produce soft, juicy to mealy fruits, which are bright orange-red when ripe. The surface of the fruit is smooth but becomes finely verrucose (warty) when dry. The stigmatic scar is minute and apical. Most fruits have only one seed with a lateral hilum, but exceptional fruits of *C. nana* have been found with two seeds. Fruits of *C. hainanensis* are obovoid to pyriform, 21.1–26.2 mm long and 18.1–22.9 mm in diameter. Fruits of *C. nana* are globose to oblate-spheroidal, 12.2–16.1 mm long and 12.0–17.7 mm in diameter.

Both species have seeds that are oblate-spheroidal, but in *C. nana* the seeds are also slightly flattened on the hilum side. Seeds are 10.0–13.3 mm long and 11.5–15.1 mm in diameter in *C. hainanensis* and 7.4–10.9 mm long and 8.7–12.1 mm in diameter in *C. nana*. The endosperm is ruminant in *C. hainanensis* but homogeneous in *C. nana*. Germination in these species is remote tubular. The eophyll in both species is strap-shaped and plicate, with an acute apex.

*Chuniophoenix* was reported to have a remarkably low chromosome number,  $n = 5$  (Hsu and Huang, cited in Uhl and Dransfield 1987). This count, however, is likely in error, as Röser and colleagues (1997) reported that in *C. nana*  $2n = 36$  (and by inference,  $n = 18$ ), which is the usual number found in the Coryphoideae (Röser 1993).

Both species seem well-adapted to Miami's climate, and both are reported to be hardy as far north as Orlando, Florida (Bobick, in Tollefson 1997). *Chuniophoenix hainanensis* is forgiving of Miami's strong sun and highly alkaline soils; it is undamaged by brief exposure to temperatures as low as  $-3^{\circ}\text{C}$  ( $26^{\circ}\text{F}$ ) (Noblick, *in press*). *Chuniophoenix nana* requires some shade and is more prone to micronutritional deficiencies in our limestone soils. The latter species makes an elegant houseplant, although it still appreciates applications of micronutrients. At FTG, both species appear to be relatively free of serious

pests, but Southeastern Lubber Grasshoppers [*Romalea microptera* (Beauvois)] sometimes feed on the leaves of *C. nana* and can cause considerable damage if left unchecked. They can be controlled by hand-picking and administering the *coup de grâce* under foot.

*Chuniophoenix* is a genus of unusual fan-palms with tremendous horticultural potential. These attractive palms add another choice to the landscaper's palette, and they should grow as well for others as they do at FTG.

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