Chrysalidocarpus blackii (Arecaceae)

A New Species from Cultivation

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Ardent palm collector and grower Larry Black, a long-time International Palm Society and Palm Society of Southern California member, has assembled one of the finest, well grown collections of subtropical and tropical palms and companion plants in California. In 2022, on one of my many visits to his modest but unusually diverse garden in Fountain Valley in Orange County, about 50 km southeast of Los Angeles and seven km from the Pacific Ocean, Larry brought to my attention a clustered, moderate-sized *Chrysalidocarpus lanceolatus* (until recently *Dypsis lanceolata*) that he had obtained from a palm grower in Hawaii as *D. lanceolata* 'Compact Form' (now *C. lanceolatus* 'Compact Form'). He had two, mature specimens, both obtained from the same Hawaiian source and at the same time, planted together in a planter next to his back-yard swimming pool, each with similarities but also with some minor differences.

Larry suggested to me that these two plants differed from a plant in his front yard that he had also obtained from the same grower in Hawaii as *Dypsis lanceolata* (now *Chrysalidocarpus lanceolatus*). A close examination of this *C. lanceolatus* in the front yard showed some striking differences with the two in the back yard. I compared both the front- and back-yard plants with the literature (Dransfield Beentje 1995) and decided that the front-yard plant, although not a perfect match, was likely *C. lanceolatus* while the two back-yard plants were clearly more different.

As I investigated more, this situation became rather perplexing, especially in regard to the variability of characters, and several possibilities might be plausible explanations for this variability. First, *Chrysalidocarpus lanceolatus* and *C. lanceolatus* 'Compact Form' might simply be misidentified in cultivation, which can be a common occurrence. Second, *C. lanceolatus* has been sparsely collected and described in the literature (Dransfield and Beentje 1995); information about its inflorescence and especially pistillate flowers is scant or lacking. Perhaps more collections and a more expansive description could make sense of this perplexing variability. Third, the two back-yard plants of *C. lanceolatus* 'Compact Form' and the front-yard *C. lanceolatus* were seed-grown from cultivated mother plants, raising the perilous prospect of hybridization, especially within species-rich collections with numerous, closely related species.

1. Larry Black and his namesake palm, *Chrysalidocarpus blackii* (*Hodel 4017* [holotype] and *4019*).

2. *Chrysalidocarpus blackii* showing clustered habit. The two stems on the left are *Hodel 4019* while the others are *Hodel 4017*.

3. Stems of *Chrysalidocarpus blackii* are handsome, ringed, and green with a slight white waxy covering. Note the leaf bases on the stem on the right with their white waxy covering and reddish brown tomentum. *Hodel 4017*.

Indeed, I was initially comfortable with designating and naming the two plants of *Chrysalidocarpus lanceolatus* 'Compact Form' in Black's back yard as a hybrid. However, I constructed a detailed matrix where I compared characters of *C. lanceolatus* 'Compact Form', *C. lanceolatus,* and the related *C. cabadae* and *C. pembanus*, the latter three species as described in the literature (Dransfield and Beentje 1995); differences among the four taxa are at least as numerous and significant as the differences among *C. lanceolatus*, *C. cabadae*, and *C. pembanus* in the literature. Thus, I feel justified to name and describe Black's back-yard *C. lanceolatus* 'Compact Form' as a new species.

Here I take immense pleasure in naming this new species for Larry Black, who has long promoted and championed palms in California and supported the Palm Society of Southern California.

Chrysalidocarpus blackii Hodel **spec. nov. Figs. 1–31.** Type: USA. California. Orange County. Fountain Valley: garden of Larry Black, 22 August 2022, *D. R. Hodel 4017* with L. Black (holotype LASCA, isotype BH).

Dypsis lanceolata 'Compact Form' Hort.

Chrysalidocarpus blackii is similar to *C. cabadae*, *C. lanceolatus,* and *C. pembanus* but differs in the lack of ramenta (vs. ramenta present) on the pinnae midrib abaxially. From *C. cabadae* it also differs in the shorter leaf base (38 cm vs. 59–69 cm), fewer and wider middle pinnae (45–47 vs. 60 per side, 6.5–8 cm vs. 1.8–2.3 cm), and mostly glabrous or glabrescent peduncle (vs. with dense to sparse, minute, rusty scales). From *C. lanceolatus* it also differs in having a glabrous petiole and rachis (vs. tomentose and scaly, respectively), regularly arranged pinnae (vs. grouped pinnae), and glabrous main veins abaxially (vs. with minute, reddish scales). From *C. pembanus* it also differs in the shorter leaf base (38 cm vs. 60 cm), wider middle pinnae (6.5–8 cm vs. 3–3.9 cm), and pinnae with glabrous veins abaxially (vs. with shiny, brown scales).

Habit: clustered tree palm to 7 m tall (**Figs. 1–2**).

Trunks: 3–5, tightly arranged, erect to slightly leaning, 6–12 cm diam., ringed, internodes 6–12.7 cm, smooth, dark green, initially with light white-waxy covering (**Fig. 3**).

Leaves: 7–10, pinnate, ascending to spreading, distal portion curved slightly downward; **leaf base** 55 cm long, tubular and tightly clasping in proximal 30 cm and forming a prominent crownshaft, open opposite petiole in distal 20–25 cm, distal margins somewhat ragged and sometimes with an auricle or ligule 2 cm high (**Fig. 12**), densely covered with white wax especially distally and there with sparse to dense, reddish brown to gray tomentum that tends to weather away (**Figs. 4–5**); **petiole** 16.5–28 cm long , 3.5 cm wide, 2 cm thick, broadly channeled adaxially, lateral margins sharp, rounded abaxially and initially with a white–waxy bloom (**Fig. 6**); **rachis**

4. Leaf bases of *Chrysalidocarpus blackii* are tubular and densely and heavily covered with white wax and form a prominent crownshaft. *Hodel 4027*.

5. Leaf bases of *Chrysalidocarpus blackii* are white waxy and sparsely to densely covered with reddish brown to silvery gray tomentum, especially distally although the latter tends to weather away. *Hodel 4017*.

6. The petiole and rachis of *Chrysalidocarpus blackii* are typically covered with a white waxy bloom. *Hodel 4019*.

7. Larry Black holds a leaf blade of *Chrysalidocarpus blackii*. Note the broad, close-set, overlapping pinnae. *Hodel 4019*.

1.8–2 m long, 3.4 cm wide, 1.7 cm thick proximally, channeled like petiole, transitioning by mid-blade to D-shaped in transverse section and there 1.5 cm wide, 1.8 cm high including 3 × 3 mm square ridge adaxially, otherwise flat adaxially, rounded abaxially with a slight white waxy bloom, transitioning distally to knife-like ridge adaxially and rounded abaxially, tapering distally to 3 mm wide, 3 mm thick, D-shaped in transverse section but slightly angled adaxially, rounded abaxially; **pinnae** 45–47 per side, lower mid-blade to mid-blade largest, 38–49 × 5–8 cm, lanceolate, base contracted to 1.3 cm wide, a raised, elongate callous at point of attachment adaxially and abaxially, acuminate apically, opposite, regularly arranged, spaced 1.5–3 cm distant, margins of adjacent pinnae typically overlapping (**Figs. 7–8**), ascending off rachis to form narrow V-shaped blade of 45° proximally to 25° to 30° mid-blade and distally (**Fig. 9**), tips curling or drooping, glossy dark green adaxially, paler abaxially with abundant white wax to densely placed, minute, white, waxy scales (**Fig. 10**), sub-coriaceous, conspicuous and prominently raised midrib and marginal nerves along each margin adaxially and abaxially, 2 less prominent primary, 4–6 secondary, and numerous tertiary and lesser nerves adaxially, these yellow-green and not raised, all nerves fainter and only the midrib and 2 primary nerves raised abaxially, 2 most proximal pinnae 41.5 × 2 cm, linear-lanceolate, long-acuminate, other proximal pinnae 45 × 4 cm, lanceolate, long-

8. Pinnae of *Chrysalidocarpus blackii* are broad, close-set, and overlapping. Note the prominent midrib and marginal veins and curling tips. *Hodel 4019*.

9. Opposing pinnae on either side of the rachis of *Chrysalidocarpus blackii* ascend off rachis to form a narrow V-shaped blade of 45° proximally to 25° to 30° mid-blade and distally. *Hodel 4019*.

10. A close view of the abaxial pinnae surface of *Chrysalidocarpus blackii* shows the densely placed, minute, waxy scales as white dots. *Hodel 4019*.

11. Abaxial pinnae surface of *Chrysalidocarpus blackii* has a prominent midrib and marginal veins. *Hodel 4019*.

12. Inflorescences of *Chrysalidocarpus blackii* are interfoliar. Here they are emerging from behind leaf bases. Note the auricle at the top of the leaf base adjacent to the petiole. *Hodel 4019*.

13. Inflorescences of *Chrysalidocarpus blackii* are only partially exserted from behind the subtending leaf base. *Hodel 4019*.

14. Inflorescences of *Chrysalidocarpus blackii* are nearly one m long. Note the peduncular bract exserted well beyond the prophyll; it frequently breaks near its base and is thrust forward by the expanding panicle well beyond the prophyll. *Hodel 4017*.

15. The prophyll of *Chrysalidocarpus blackii* is nearly half the length of the inflorescence. *Hodel 4017*.

acuminate, ascending-spreading, sub-opposite to alternate, spaced 6.5 cm distant, most distal pinnae 17 × 2.2 cm, only slightly ascending off rachis, alternate, spaced 3.5 cm; newly opening leaf green to tinged with pinkish brown.

Inflorescences: 3–4, interfoliar, flowering and fruiting when only partially exserted from behind leaf base, prophyll, and peduncular bracts, nearly 1 m long, erect-spreading (**Figs. 12–14**); **peduncle** 38 cm long, 8.5 cm wide where clasping trunk, 6 cm wide and 2.5 cm thick at prophyll attachment 11 cm distal of trunk, tapering to 4.5 × 2.5 cm at apex (**Fig. 14**); **prophyll** 44 cm long, 6 cm wide along the proximal 17 cm where tightly clasping peduncle, in distal 27 cm split on one side but only partially on the other side, 7.5 cm wide, bifid, bicarinate, sturdy, woody, rigid (**Fig. 15**); **peduncular bract** attached 13 cm distal of prophyll attachment, 35.5 cm long (**Fig. 14**) but thrust off and carried distally by expanding panicle and rachillae leaving a truncate base 2 cm long (**Fig. 16**), slightly bicarinate, sturdy, woody, rigid, acute; **panicle** branched to 3 orders (**Fig. 17**), entire panicle greenish and mostly glabrous in flower and aging to brown tinged with pink in fruit, sometimes with sparsely scattered, tiny, silvery tan scales (**Figs. 18–19**); **rachis** 36 cm long, angled; 16 branches and 5 simple rachillae, bract to 5 mm high subtending branches and rachillae (**Fig. 20**), this bract mucronate and acuminate on a crescent-shaped base, most proximal branched largest and with most branches and rachillae, sub-peduncle 6.5 × 2 × 1 cm, sub-sub-peduncle 1.5 × 1 × 0.45 cm; **rachillae** to 20 cm long (**Fig. 17**), 5 mm diam. at base, 1.5 mm diam. at apex, spreading.

Flowers: in triads of a later-opening central pistillate flanked on either of two side by earlier-opening staminate on most of the rachilla but a few dyads of 2 staminate flowers distally, triads and dyads in a spiraling row, 2 mm distant within the row and in clefts 1 mm deep and 4 mm wide, proximal margin a lip-like, mucronate ridge 1 mm high (**Fig. 21**); staminate flowers each subtended by 0.5 mm high, whitish, broadly rounded bracteole, pistillate flowers subtended by 2, 0.75 mm high, greenish, broadly rounded, imbricate bracteoles with minutely ciliate margins; **staminate flowers** 5 × 12 mm (**Fig. 22**), white, faintly aromatic; calyx 2 × 3 mm, cupular, sepals 3, imbricate and/or connate in basal 1/2 to nearly to the apex, broadly ovate-rounded apically, light green with faint tinge of pink on apical margins; petals 3, 5 × 3 mm, ovate, spreading at anthesis, white, thick, rigid, faintly longitudinally nerved; stamens 6–7 mm high, exceeding petals, spreading, white; filaments 6–8 × 0.5 mm, white, connate basally; anthers 2 × 0.75 mm; pistillode 3–5 × 1.5 mm, columnar, pointed apically, white aging brownish; **pistillate flowers** 5 × 3–3.5 mm, ovoid (**Fig. 23**); calyx cupular, 2–2.5 × 3–3.5 mm, green, sepals cupular, imbricate in basal 1/2–3/4, broadly rounded and tinged pinkish brown apically; corolla 4.5 × 3–3.5 mm, petals broadly triangular, imbricate nearly to apex, light green, rounded-acute; pistil 5 × 2.5–3 mm, ovoid, white; style lacking; stigma lobes 3, exserted just above petals, sharply recurved, 0.75 mm long.

16. The base of the peduncular bract of *Chrysalidocarpus blackii* is severed, allowing the expanding panicle to carry the remaining, large distal part forward. *Hodel 4017*.

17. Panicles of *Chrysalidocarpus blackii* are branched to three orders. *Hodel 4017*.

18. Panicles of *Chrysalidocarpus blackii* are typically green in flower. Note the scattered, tiny, silvery tan scales that eventually weather away. *Hodel 4017*.

19. Although green in flower, panicles of *Chrysalidocarpus blackii* typically change to brown tinged with pink in fruit. *Hodel 4017*.

20. A small bract subtends panicle branches and rachillae on *Chrysalidocarpus blackii*. *Hodel 4017*.

21. Floral triads of *Chrysalidocarpus blackii* are in clefts with the proximal margin a lip-like ridge. *Hodel 4017*.

22. Staminate flowers of *Chrysalidocarpus blackii* are white and faintly aromatic. *Hodel 4017*.

23. Pistillate flowers of *Chrysalidocarpus blackii* have greenish sepals and petals and white, prominent, recurved stigma lobes. *Hodel 4017*.

Fruits: 15–20 × 8–11 mm, ellipsoid, tapering and rounded apically and basally, not yet soft ripe but near full size, pinkish red when soft-ripe (**Figs. 24–28**); **seed** 14–19 × 6–10 mm (**Figs. 25, 27**), endosperm homogeneous; fruiting perianth 5 × 5 mm, greenish, deeply lobed.

Distribution: Unfortunately, *Chrysalidocarpus blackii* is known only from cultivated plants and nothing is known about its natural range; however, the three species to which it appears most closely related are not found on Madagascar: *C. lanceolatus* is from the Comoro Islands; *C. pembanus* occurs on the African mainland in Pemba, Tanzania; and *C. cabadae*, like *C. blackii*, is known only from cultivated plants.

Ecology: Because its distribution is unknown, we can only surmise about its habitat from the two related species of known distribution, *C. lanceolatus* and *C. pembanus*. The former occurs in mid-elevation rain forest from 500 to 1,000 m elevation while the latter occurs below 50 m elevation in moist forest (Dransfield and Beentje 1995); thus, *C. blackii* is likely a palm of moist to wet forests.

Additional Specimen Examined: USA. California. Orange County. Fountain Valley: garden of Larry Black, 22 September 2022, *D. R. Hodel 4019* with L. Black (LASCA, BH).

Discussion: The description is from living material and based on the holotype (*Hodel 4017*) and its adjacent paratype (*Hodel 4019*). Black obtained both plants from the same grower in Hawaii at the same time and they originated from the same "mother" plant. Generally, *Chrysalidocarpus blackii* can be distinguished by its glabrous but waxy, broad, overlapping pinnae lacking ramenta and ascending off the rachis to form a narrowly V-shaped blade (**Figs. 8–9**).

Table 1 summarizes the critical character differences among *Chrysalidocarpus blackii* and its closest relatives, *C. lanceolatus*, *C. pembanus*, and *C. cabadae*. While one character, the lack of ramenta on the pinnae midrib and main veins abaxially, clearly sets it apart from all three related species, a varying combination of other characters also distinguishes it from its three relatives. Unfortunately, Table 1 is incomplete for several characters of *C. lanceolatus* and *C. pembanus*, which if known, might provide additional supporting evidence.

Chrysalidocarpus blackii would come out next to *C. cabadae* in Key 6 (inflorescence branched 2–4 orders, pinnae many and regularly arranged) in Dransfield and Beentje (1995), and the two can be distinguished by the different character states in the protologue and in Table 1.

Dransfield and Beentje (1995) provided interesting data on two of the three relatives of *Chrysalidocarpus blackii*. One is the angle formed by adjacent opposing pinnae on either side of the leaf blade, which is a measurement of how much they ascend off the rachis and affects the three-dimensional shape of the blade. In *C. pembanus* the angle is 90° while in *C. cabadae* it is 45°. In *C. blackii* it is even a sharper angle, from 45° proximally to 25° to 30° mid-blade and distally

Table 1. Some critical character differences among *Chrysalidocarpus blackii* and three related species.

Character	Chrysalidocarpus blackii[z]	Chrysalidocarpus lanceolatus[y]	Chrysalidocarpus pembanus[y]	Chrysalidocarpus cabadae[y]
Leaf base length (cm).	38	?	60	59–69
Petiole indumentum.	Glabrous with a glaucous bloom.	Reddish pubescent.	?	Glabrous.
Rachis indumentum.	Glabrous with a glaucous bloom.	Densely to sparsely scaly.	?	Glabrous.
Quantity of pinnae on each side of rachis.	45–47	?	40–50	55–60
Pinnae arrangement.	Regular.	Slightly irregular.	Regular.	Regular.
Width of middle pinnae (cm).	6.5–8	3.5–7	3–3.9	1.8–2.3
Pinnae tips.	Curling or drooping.	Straight?	Straight.	Straight.
Pinnae indumentum abaxially.	Dense, minute, white-waxy scales or thick white-waxy.	?	Dense, minute, white-waxy scales.	White-waxy.
Ramenta on pinnae midrib and main veins abaxially.	No.	Yes.	Yes.	Yes.
Main veins indumentum abaxially.	Glabrous.	Minute reddish scales.	Small, shiny brown scales.	Glabrous.
Peduncle indumentum.	Glabrous or sometimes initially with a few, tiny, silvery scales but glabrescent.	?	Densely reddish tomentose.	Dense to sparse, minute, rusty scales.

[z]From *Hodel 4017*, *4019*.

[y]From Dransfield and Beentje (1995).

24. Soft-ripe, mature fruits of *Chrysalidocarpus blackii* are pinkish red. *Hodel 4017*.

25. Soft-ripe, mature fruits of *Chrysalidocarpus blackii* are pinkish red and seeds have homogeneous endosperm. *Hodel 4017*.

26. Soft-ripe, mature fruits of *Chrysalidocarpus blackii* are pinkish red. *Hodel 4019*.

27. Soft-ripe, mature fruits of *Chrysalidocarpus blackii* are pinkish red and seeds have homogeneous endosperm. *Hodel 4019*.

28. The abundant, pinkish red, mature fruits of *Chrysalidocarpus blackii* make an attractive display. *Hodel 4019*.

(**Fig. 9**), making the blade profoundly V-shaped. Dransfield and Beentje (1995) do not provide this datum for *C. lanceolatus* but in an illustration of the leaf (p. 222), the angle appears to be well more than 90°, perhaps as much as 120°, which would make it the flattest leaf blade of the four taxa; however, this illustration might simply be a depiction of a pressed specimen where the leaves were artificially flattened during the pressing and drying process although similar illustrations of *C. pembanus* (p. 218) and *C. cabadae* (p. 220) clearly show the prominent angle formed by the adjacent, opposing pinnae along the rachis. The profoundly and narrowly V-shaped leaf blades of *Chrysalidocarpus blackii* and the pendulous pinnae tips give the blade a ruffled or nearly plumose appearance.

The pinnae tips, whether they are straight and rigid or curling and drooping might be another good character to distinguish *Chrysalidocarpus blackii* from its close relatives but this character state is not mentioned in Dransfield and Beentje (1995). But judging from the photographs of living plants of *C. pembanus* (p. 219) and *C. cabadae* (p. 221), the pinnae tips are straight and not curling or drooping. In the illustrations of *C. pembanus* (p. 218) and *C. cabadae* (p. 220), though, the pinnae tips look drooping but this condition might be the result of folding during the pressing and drying process to ensure they fit in their entirety on a standard herbarium sheet. In the illustration of *C. lanceolatus* (p. 222), the pinnae tips appear straight, but his condition could simply be another artifact of the pressing and drying process. Nonetheless, I am inclined to think that the curling or drooping pinnae tips of *C. blackii* might be an additional, good character to distinguish it from *C. cabadae*, *C. lanceolatus*, and *C. pembanus*.

Still another character that might be useful in distinguishing *Chrysalidocarpus blackii* from *C. cabadae*, *C. lanceolatus*, and *C. pembanus* is the spacing of the floral triads. In *C. blackii* the triads are two mm apart; in the other three species, Dransfield and Beentje (1995) described them simply as “distant.” Two mm apart seem rather close to me while distant seems rather farther apart, at least five or even 10 mm. It is unfortunate that the term “distant” in Dransfield and Beentje (1995) lacks a numerical measurement.

Inflorescences of *Chrysalidocarpus blackii*, including peduncle, rachis , and rachillae, typically exhibit an interesting color transition during maturation. They are green in flower but usually have changed to dark brown with a pinkish tinge when fruits mature to pinkish red (**Figs. 18–19**).

Another phenomenon is under what conditions leaves of *Chrysalidocarpus blackii* senesce, abscise, and fall away neatly and cleaning on their own (self-cleaning) or not. It appears that if a leaf is not currently subtending an inflorescence (for example in the winter), it will be self-cleaning. In contrast, if an inflorescence is present, the leaf remains securely attached and persists after senescing and turning brow.

29. New leaves of *Chrysalidocarpus blackii* emerge green and sometimes with a pinkish brown tinge. *Hodel 4019*.

New leaves of *Chrysalidocarpus blackii* emerge green or sometimes with a pinkish brown tinge (**Fig. 29**) and inflorescences seem not to be exserted completely in flower and fruit (**Fig. 13**), both characters noted by palm enthusiasts in PalmTalk, the International Palm Society's on-line forum for discussions about palms (*https://www.palmtalk.org/forum/forum/1-discussing-palm-trees-worldwide*).

I am unable completely to eliminate the possibility that *Chrysalidocarpus blackii* is a hybrid. Indeed, its cultivated origin where hybridization is not only a possibility but increasingly a likelihood, especially in species-rich collections with numerous, closely related species, and the variability in the two offspring under study here (*Hodel 4017* and *4019*), could bolster the case for hybridization.

If it is a hybrid, one of the parents is likely *Chrysalidocarpus lanceolatus* while I suspect the other parent might be *C. pembanus* or *C. cabadae*. With *C. lanceolatus* it shares broad pinnae while with *C. pembanus* it shares the abaxial pinnae surface densely covered with minute, waxy scale-like structures. This latter feature is clear and distinct on the paratype of *C. blackii* (*Hodel 4019*)

but less so on the adjacent-growing holotype (*Hodel 4017*), where the surface is covered with abundant wax and only a few waxy scale-like structures. With *C. cabadae* it shares the glabrous nature of its petiole, rachis, and pinnae although this latter species has many more and narrower pinnae. Only a molecular-based study could likely resolve whether *C. blackii* is a hybrid or not.

The possibility of inadvertent hybrids from cultivation casts a long, dark shadow over the notion the cultivated collections are a way to preserve species and their genetic resources. Actually, unless steps are taken to prevent hybridization, such as pollen exclusion, cultivated collections of species could likely lead to genetic contamination and the very demise of species that the collections are purported to preserve. That the cultivated "species" are actually genetically "true" to begin with and that some collectors intentionally make hybrids only contribute to this potential genetic erosion.

Cultivation

Despite its suspected tropical origin, *Chrysalidocarpus blackii* has performed adequately if not well at Larry Black's residence in Fountain Valley, California, which has a Mediterranean-type climate with long, warm, rainless summers and short, mild, sometimes moist winters, averaging about 300 mm of rain annually, although global warming has led to reduced rainfall, increased temperatures, and stubborn aridification. Larry's residence is on the boundary of Sunset Climate Zones 22 and 24 (Williamson 1988). Both zones are mild, with mostly high humidity and moderate temperatures, and rarely experience freezes. Typical summer daytime temperatures range from 24 to 28 C while nighttime temperatures range from 14 to 20 C. Typical winter daytime temperatures range from 15 to 21 C while nighttime temperatures range from 5 to 10 C. The lowest temperature recorded at Larry's house was -1.5 C in January 2007, which is a well known cold event among palm collectors and growers in California. The temperature rarely exceeds 37C and the highest recorded at Larry's house was 45 C during an early fall heat wave in 2017.

The soil is clay or clay loam with good water and nutrient holding capacity. Larry irrigates about once a week in the summer, applying sufficient water to moisten the upper 30 cm of root zone each time. Occasionally he applies a palm-special fertilizer with high amounts of nitrogen, potassium, and magnesium, all in time-release form, and with micronutrients.

Other than the infrequent cold weather, the most significant obstacles Larry faces in growing palms is the highly mineralized water, which contributes to leaf tip necrosis, and wind, which can shred leaf tips and exacerbate leaf tip damage.

Larry obtained the two plants of *Chrysalidocarpus blackii* (as *Dypsis lanceolata* 'Compact Form') about 2005 in 3.8 l containers from a grower in Hawaii. He planted them out adjacent to each

30. (left) and **31.** (right). *Chrysalidocarpus blackii*. *Hodel 4017* and *4019*. **30.** 2013. **31.** 2017, with James Tregear.

other in a planter next to his swimming pool in 2007, and they have grown well over the last 15 years, attaining about 3.5 m overall height and 1 m of trunk by 2013 (**Fig. 30**), 4.5 m overall height and 2 m of trunk by 2017(**Fig. 31**), and 8 m overall height and 5 m of trunk by 2022 (**Fig. 1**).

They attained maturity about five years ago and typically produce fruits abundantly. Seeds geminate readily (about 80% germination rate) if sowed in an aerated and porous but moist mix and maintained at 18 to 27 C.

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