

The Cultivated Veitchias

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When I first visited Mr. and Mrs. A. C. Langlois at their home in Nassau, Bahama Islands, I was intrigued by the variety of palms grown at The Retreat and, at the same time, was dismayed by some of the problems they presented to the taxonomist. Among these problems, Mrs. Langlois mentioned that the handsome tree they grew as *Veitchia Joannis* was not the same as the trees grown under the same name in the Montgomery collection at Coconut Grove, Florida.

The year was 1951. Time did not permit me to study the Florida trees then but in succeeding years I made a special effort to obtain notes, photographs, and specimens so that comparisons could be made. In this I was much aided by Mr. B. E. Parham and later by his son, Mr. J. W. Parham, of the Department of Agriculture in Suva, Fiji, who procured splendid series of *Veitchia Joannis* in flower and fruit from its native country. Though a number of problems (such as the identity of the "Areca 208") remain, the problem of the veitchias has been resolved. The results appeared in technical form as a study of all 18 species of the genus in *Gentes Herbarum* 8:480-536, 1957. Five of the species are cultivated. Since it is with these five that members of the Palm Society will be most concerned, they are the principal subjects of this article.

Veitchias were unknown to botanical science until the year 1868 when Hermann Wendland described the genus *Veitchia* in Seeman's *Flora Vitiensis*. Wendland included three species from the Fiji Islands and one, *V. spiralis*, from the island of Aneityum in the New Hebrides. Of these, two (*V. spiralis* and *V. subglobosa*) remain incompletely known even today, one (*V. Storckii*) has been transferred to another genus as *Neoveitchia Storckii*, the fourth, *Veitchia*

Joannis, remains as the species typifying the genus.

Today we know ten species from the Fiji Islands (*V. filifera*, *V. Joannis*, *V. pedionoma*, *V. petiolata*, *V. Pickeringii*, *V. sessilifolia*, *V. simulans*, *V. Smithii*, *V. subglobosa*, *V. vitiensis*), three from the New Hebrides (*V. Macdanielsii*, *V. spiralis*, *V. Winin*), two from sources not surely known (*V. Hookeriana*, *V. Montgomeryana*), one from New Caledonia (*V. arecina*), and one from the Philippine Islands (*V. Merrillii*).

The last is far better known to most palm fanciers as *Adonidia Merrillii* or by one of several common names. By one of those unfortunate but none too rare instances in the palms, *Adonidia* had a separate history from 1919 (when the genus was founded by Beccari) until 1957. To explain why it now becomes a *Veitchia* will require several paragraphs of digression.

Despite the long record of *Veitchia Joannis* in cultivation—certainly since before 1883—the species lacked a complete formal description until 1957. The earliest description—that of Wendland—was based on fruits and seedlings but staminate or male flowers, so essential for an understanding of arecan palms, were not then known for the particular species. Wendland assumed, erroneously as we now know, that because the fruit was so similar to that of *Veitchia Storckii*, the staminate flowers were also similar. Later horticultural notices (in *The Gardeners' Chronicle*, series 2, 20: 205, 1883; *Revue Horticole* 55: 344, 1883; and several horticultural dictionaries and encyclopedias) illustrated young plants grown in Europe without follow-up notes on mature specimens.

Odoardo Beccari was the first to recognize that species of two distinct genera had been included in *Veitchia* by



Fig. 21. *Veitchia Merrillii* growing in the open at the Fairchild Tropical Garden, showing the distinctive crown, narrow internodes, and hanging reins. Photograph from Kodachrome by G. H. M. Lawrence. Reprinted from *Gentes Herbarum* 8: 502, fig. 144. 1957.

Wendland. With staminate flowers of *Veitchia Joannis* apparently at his disposal (there are some in his herbarium at Florence, Italy) and with specimens representing other related species from

New Caledonia and the New Hebrides, Beccari recognized that *Veitchia Storckii* differed from the three other veitchias. For it, he proposed the name *Neoveitchia* in a study published after his death

(*Webbia* 5: 76-79, 1921). In this article, three new species of *Veitchia* were added to the three remaining and staminate flowers were described for two. Since he was primarily concerned with palms of New Caledonia at the time, he did not add to our knowledge of *V. Joannis*. A study of arecan palms in manuscript remained unpublished until 1955 when Professor R. E. G. Pichi-Sermolli edited the generic descriptions in *Webbia* 11. There, for the first time, *Veitchia* was clearly defined in its emended sense.

Before the above generic study was published, I had concluded from a study of Fijian material, that *Veitchia* and a later genus *Vitiphoenix*, also from Fiji, were probably not distinct. To test my conclusions, I made a comparative study of related genera and was surprised and chagrined to find that *Adonidia*, which had always seemed so distinctive, appeared to differ from *Veitchia* (considering all the species) only in the ruminant endosperm of the seed.

Thus forewarned, I made careful comparisons of all parts of *Adonidia* with similar parts of species of *Veitchia* both from dried herbarium specimens and from living plants in Florida in a search for some other distinctive feature. Even the characteristic condensed trunk and crown of *Adonidia*, usual for open-grown trees, failed. The trunk and crown of trees grown in the shade of taller trees, as in some plots of the Fairchild Tropical Garden, elongates and sterile trees cannot then be distinguished readily from sterile trees of *Veitchia Montgomeryana*. Ripe fresh fruits are similar except for a slight difference in size; flowers and the essential character of the inflorescence are the same—all but the ruminant endosperm. This characteristic alone is not now considered sufficient to separate palm genera without supporting differences in flowers and other parts. Beccari, Burret, and Moore have all united species with ruminant and homogeneous endosperm in such natural genera as *Ptychosperma*, *Euterpe*, *Synechanthus*, *Reinhardtia*, and *Drymophloeus*. *Adonidia* was there-

fore joined to and submerged in *Veitchia* when the final study was published. The genus as I now interpret it is described in some detail below.

The species of *Veitchia* are moderate to tall, slender-trunked trees, often somewhat thickened at the base, solitary in habit, with 6-15 regularly pinnate leaves in a spreading or ascending crown above a conspicuous deep green crownshaft. The latter is often covered with pale woolly scales intermixed near the petiole with larger deep brown shining twisted scales. Deep green pinnae are very narrow where they unite with the rachis. Their greatest width is at the middle from which they again taper to an obliquely blunt or nearly pointed tip or, in the lowermost, to long slender hanging reins which often persist for a long time. As many as 5 inflorescences appear in succession below the crownshaft, each covered at first with two pale papery bracts (or spathes) one inside the other. These bracts soon fall, leaving the branched panicle free to expand into a mass of stiffish to slender and supple branches, the lower of which are once- to thrice-branched, the middle and upper progressively less branched to unbranched. Flowers are borne at nodes placed in a loose spiral or, toward the tip of the rachilla, almost opposite. The normal complement of flowers at each node is three—a central female which develops fully only after the two flanking male flowers have expanded and fallen. Toward the tip of the rachilla or, in some species, over half or more of the rachilla, the female flowers fail to develop so that only male flowers appear in pairs or singly at each node. The male flowers are larger than the female. They have 3 low imbricated sepals and 3 rather boat-shaped petals the sides of which do not overlap (valvate). Inside are numerous stamens (24-140) surrounding a central sterile pistillode which is attenuate from a bulbous base. Stamens are united in a fleshy mass at the very base but above have slender erect filaments and erect anthers cleft at the base and pointed or two-pronged at the tip. Female flowers have both sepals and petals imbricate in two whorls of three each within which lie 3-6 small tooth-shaped staminodes and the pistil with its unilocular ovary containing a single laterally attached ovule. Stigmas are 3, recurved and short. Fruit is orange-red or red at maturity seated in a pale yellow cupule of enlarged perianth parts. The outer surface is smooth covering a thin to moderately thick pulpy layer with imbedded flat fibers. The seed is enclosed in and attached along one side of a thin to thickish endocarp. Endosperm may be homogeneous or ruminant. The embryo is always borne at the base of the seed.

Although species of *Veitchia* can be distinguished with certainty only when

mature fruit is present, there are useful characteristics in the foliage that may be used to separate mature plants in sterile condition. Pinnae of *V. Merrillii*, *V. Montgomeryana*, and *V. Winin*, have numerous tiny pale-membranous brown-centered persistent scales along the fine nerves of the lower surface as opposed to *V. Joannis* and *V. sessilifolia* in which these are lacking or at least not persistent. These tiny scales, visible to the naked eye when foliage is dried but more readily seen through a magnifying glass or low-power hand lens, have proved to be the easiest way of distinguishing between specimens that had been confused under the name *V. Joannis*. It is important, however, that they not be confused with the larger red-brown twisted scales present near the base on the lower surface of the pinnae in all species.

All the cultivated veitchias have the leaves arranged in successive whorls of five so that the crown appears to have five radii when viewed from below. The appearance of the crown is often helpful. *Veitchia Merrillii* usually has 14-15 leaves in a crown so that the radii are three-tiered. The remaining species generally have 8-10 leaves in a crown in two tiers. *Veitchia Merrillii* (when open-grown) and *V. sessilifolia* have leaves that ascend then arch rather strongly so that the tip hangs down. The pinnae are directed upward from the rachis and are uniformly spaced in *V. Merrillii*. In *V. sessilifolia*, those of the tip are directed upward but those below tend to hang and the lowermost are widely separated and distinctly pendulous, often retaining the slender green lorae or reins for a long time.

Veitchia Joannis, *V. Montgomeryana*, and *V. Winin* have the fully developed leaves of the lower whorl more nearly horizontal. *V. Joannis* is distinct from the last two (which are difficult to separate from each other when sterile) in its much more pendulous pinnae, unfortunately not illustrated here, and in their greater number—70-80 on each side of

the rachis in well-grown mature trees versus 48-60 in the other two species. The number of pinnae, however, is not a safe characteristic since it varies according to the age and vigor of the individual tree.

Seedlings of all five species in comparable stages have not been available for comparison. It may be useful, however, to contrast those of *V. Joannis* and *V. Montgomeryana* since the latter has been distributed as *V. Joannis*:

Veitchia Joannis—apex of first leaves shallowly divided so the upper margins are less than twice as long as the midrib (rachis) and the broad apex is bluntly toothed; sheath greenish under a light coat of soft pale hairs intermixed with chaffy scales; the dark red-brown petiole densely chaffy with spreading scales; segments green throughout with no orange coloring on the upper side of the chaffy green rachis which is similar to the petiole in color and scales on the lower side.

Veitchia Montgomeryana—Apex of the first leaves deeply divided so that the upper margins of the segments are more than twice as long as the rachis and the narrowed apex is sharply toothed; sheath reddish with pale scales; petiole green or tinged with pink or orange and blotched with massed appressed gray scales which are seldom loose and chaffy; segments orange where attached to the orangish rachis which is blotched below; petioles of older leaves become nearly mahogany-colored but are still distinguishable by means of the blotches of gray scales; lower surface of the segments, at least of the fourth, fifth, and later leaves, densely and minutely pale scaly.

The aspects of foliage described above are not always constant even at maturity and are difficult to express in the form of a key. For the separation of flowering or fruiting plants, the following keys may be useful.

KEYS TO THE CULTIVATED SPECIES

Flowering material:

1. Female flowers borne nearly throughout the length of the rachillae, only the uppermost nodes with male flowers alone.
 2. Male flowers 13 mm. long with 130-140 stamens..... *V. Montgomeryana*.
 2. Male flowers 9-11 mm. long with 40-50 stamens.
 3. Inflorescence with persistent minute brown scales..... *V. sessilifolia*.
 3. Inflorescence lacking brown scales..... *V. Winin*.
1. Female flowers borne only in the lower half or less of each rachilla, the nodes above the middle bearing only paired or solitary male flowers.
 4. Male flowers 15-17 mm. long with normally 100-110 stamens; lower branches of the inflorescence once-branched..... *V. Joannis*.
 4. Male flowers 10-12 mm. long with 47-62 stamens; lower branches of the inflorescence twice-branched..... *V. Merrillii*

Fruiting material:

1. Seeds with ruminant endosperm..... *V. Merrillii*.
1. Seeds with homogeneous endosperm.
 2. Fruits large, 4-6 cm. long.
 3. Fruits borne only at the lowermost 2-3 (rarely to 6) nodes of the rachilla; seed markedly pointed..... *V. Joannis*.
 3. Fruits borne nearly the entire length of the rachilla; seed nearly rounded at the tip..... *V. Montgomeryana*.
 2. Fruits small, 1.4-2.2 cm. long.
 4. Inflorescence with persistent minute brown scales..... *V. sessilifolia*
 4. Inflorescence lacking brown scales..... *V. Winin*.

VEITCHIA JOANNIS

Veitchia Joannis was named for John Gould Veitch (1839-1870), grandson of James Veitch whom the generic name honors. We are told in *Flora Vitiensis* that Seeman introduced the species into the Botanic Garden at Sydney, Australia. John Veitch brought seeds to Europe but the seedlings do not appear to have persisted there. The first horticultural notices deal with seedlings later introduced into Belgium. Now the species is cultivated in the tropics of both hemispheres. Because *Veitchia Montgomeryana* has also been grown under the name *V. Joannis*, it is desirable to compare plants with descriptions for certain identification.

The species occurs wild on several islands of the Fiji group where it is known as *Niusawa*. The slightly as-

tringent fruits were eaten by children and the wood was used for spars in past times. Today the leaves are used for thatch and strips of the trunk for bows and arrows.

Trees of *Veitchia Joannis* are tall and slender. The brown, prominently ringed trunks reach a height of 32 m. in the wild state and a diameter of 28 cm. above the somewhat thickened base. A green crownshaft to 12 dm. long is covered, when young, with pale or rusty woolly scales. The 8-10 leaves ascend and arch when young but at maturity are nearly horizontal with 70-80 deep green pinnae regularly arranged along the rachis at intervals of 7-30 mm. and hanging gracefully at an angle of about 45 degrees. The petiole is short, only 10-23 cm. long, but the rachis may reach a length of 3.3 m. Pinnae are largest near the middle of the leaf where they may reach a length of 93 cm., a width of 8 cm. At the base, the pinnae are much narrowed. On the lower surface they bear minute deciduous scales, only the bases of which remain as tiny dots scarcely noticeable even when magnified. The large stiffish panicles, 50-60 cm. long and

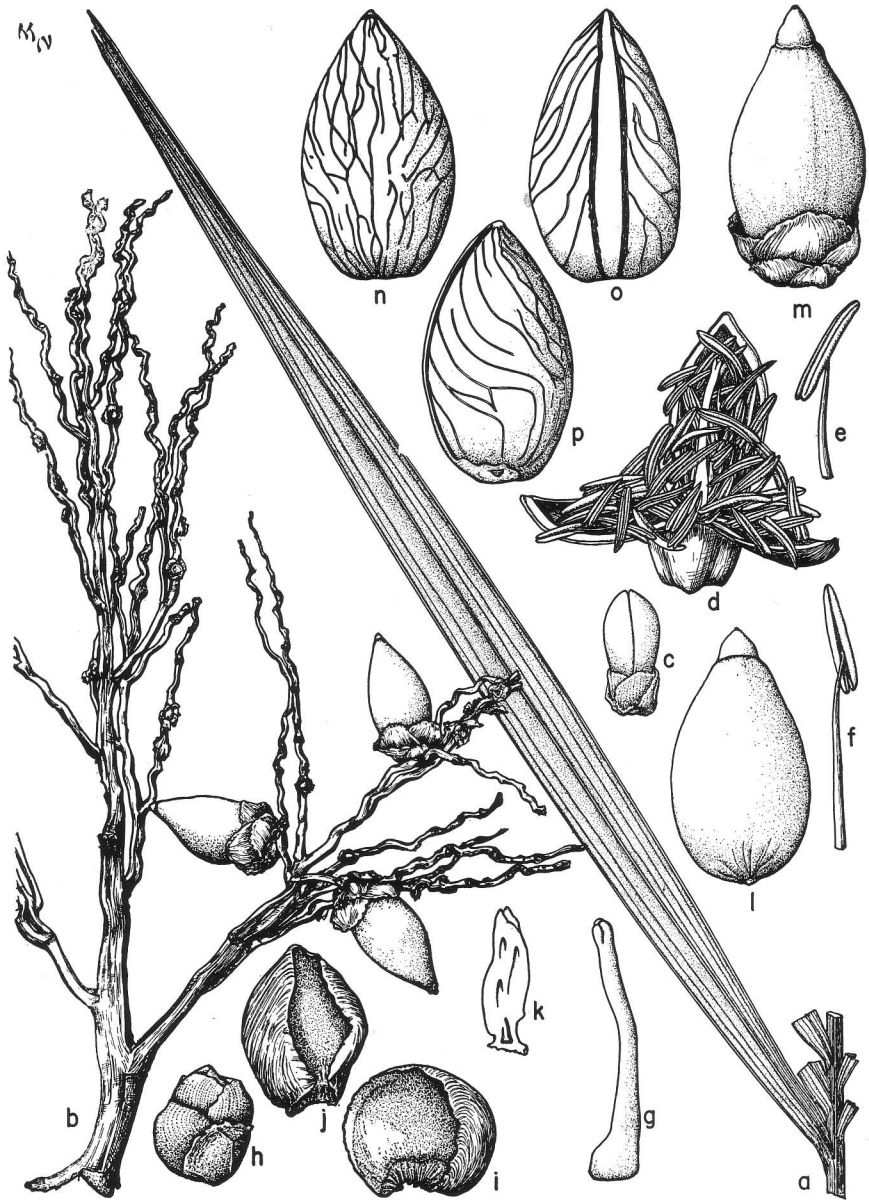


Fig. 22. *Veitchia Joannis* a, pinna $\times 1/5$; b, panicle lacking the base $\times 1/3$; c, male bud $\times 1$; d, male flower expanded $\times 2$; e, f, stamens $\times 3$; g, pistillode $\times 3$; h, female bud $\times 1$; i, j, sepal and petal of female flower $\times 2$; k, pistil in vertical section $\times 2$; l, m, fruit $\times 2/3$; n-p, seed in three views $\times 1$. Reprinted from *Gentes Herbarum* 8: 510, fig. 149, 1957.

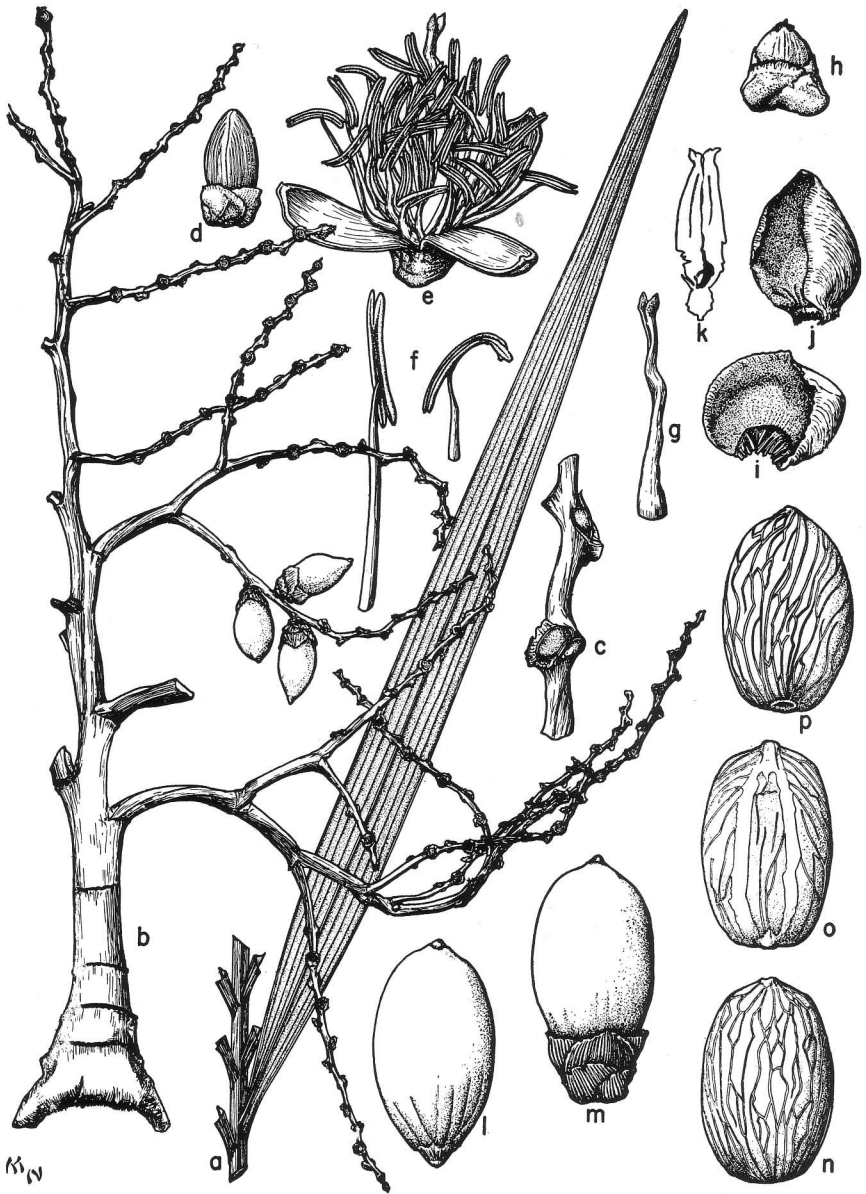


Fig. 23. *Veitchia Montgomeryana*. a, pinna $\times 1/5$; b, panicle with few fruits and many scars where fruits have fallen $\times 1/4$; c, portion of rachilla showing scars of central female and lateral male flowers $\times 1$; d, male bud $\times 1$; e, male flower expanded $\times 2$; f, stamens fresh and dried $\times 3$; g, pistillode $\times 2$; h, female flower $\times 1$; i, j, sepal and petal of female flower $\times 2$; k, pistil in vertical section $\times 2$; l, m, fruit $\times 2/3$; n-p seed in three views $\times 1$. Reprinted from *Gentes Herbarum* 8: 493, fig. 141. 1957.

about twice as broad, are covered with pale or rusty woolly scales which persist generally on protected angles. Lower branches of the panicle are again once-branched; upper branches are progressively less branched to forked or undivided. Ultimate rachillae are 10-20 cm. long, strongly flexuous, stiff and sharp-pointed (often tipped with a male flower) bearing female flowers only at the lower 2-3 (or rarely to 6) nodes, above having only paired or solitary male flowers. The latter are 15-17 mm. long with normally 100-110 stamens, though in abnormal flowers there may be as few as 83 with a number joined in a petal-like body. Anthers are pointed at the tip. The orange-red mature fruit is the largest in the genus. It measures 5-6 cm. in length, 2.2-3 cm. in diameter, and is capped with a prominent umbo about 4 mm. long. Seeds are pointed at the tip, to 3.6 cm. long, 2.1 cm. in diameter, with homogeneous endosperm.

VEITCHIA MERRILLII

The bonga de china palm, Manila palm, Merrill's palm or Christmas palm, as it is variously known, has become a popular horticultural subject in southern Florida and in the tropics elsewhere. In fact, it was first described from plants grown in Manila, though it was later found wild on the high limestone islands of the Calamianes-Palawan group in the Philippines.

David Fairchild has written a charming account of this palm in *Fairchild Tropical Garden Occasional Papers No. 1*, 1938, where he gave details of its introduction into Florida in 1913. The name used by Dr. Fairchild was the more familiar one—*Adonidia Merrillii*—which I must abandon with much regret. Despite its second change of name (for Beccari first described it as a species of the Australian genus *Normanbya*) the palm remains as attractive as ever and has amply borne out Dr. Fairchild's prediction that it would assume a prominent place in Florida dooryards.

In cultivation, *Veitchia Merrillii* is most frequently grown in the open. Under such conditions, the trunks are rather stocky, reaching a height of 5 m. with very narrow internodes and brown bark. Shade-grown trees are taller, more slender, with prominent internodes like those of other species described here. The crownshaft is 5-10 dm. long, green with a loose cover of deciduous pale scales.

A short petiole 10-15 cm. long continues into a rachis 1.75-2 m. long which ascends or spreads and arches at the tip. The leaves are 14-15 in usual crowns with 48-63 (rarely only 40) dull dark green pinnae to 75 cm. long, 5 cm. wide, borne at regular intervals of 2-4 cm. The lower surface of the pinnae has a cover of minute pale membranous scales persistent on the nerves. In the open, pinnae generally ascend from the rachis and curve over at the tip; in shade, they are more nearly horizontal. Inflorescences normally number 5 in a season. These are stiffish, 40-50 cm. long and broad, white cottony when young but soon devoid of hairs or scales except on the short peduncle. Lower branches are twice-branched, those of the middle once-branched, the upper unbranched. Female flowers are borne in the thicker lower half of rachillae 4.5-11 cm. long, the upper half being more slender and strongly flexuous with male flowers only. These are 10-12 mm. long with 47-62 stamens, the anthers either bifid or pointed at the tip. The handsome crimson fruits are 2.7-3.3 cm. long, 1.7-2 cm. in diameter, with a short cap at the tip. Seeds are somewhat pointed at the tip with a network of pale strands on the coat and ruminate endosperm.

VEITCHIA MONTGOMERYANA

Veitchia Montgomeryana is something of a mystery species. It has generally been confused with *V. Joannis* in cultivation and its native home is unknown. The first records that I have seen for this species are from cultivated trees in the botanical garden at Bogor (formerly Buitenzorg), Indonesia. The species takes its name from the late Colonel Robert H. Montgomery on whose estate in Coconut Grove, Florida, I was privileged to observe trees grown from seed obtained through the botanical garden in Singapore over twenty years ago.

Seedlings from the Florida trees have been distributed as *Veitchia Joannis*. They may be distinguished from that species as previously noted in comments on foliage preceding the keys. The species seems to thrive in southern Florida. On the Keys, it resists salt spray better than some other palms of its relationship. Old or poorly grown trees may have smaller inflorescences and fruit than is normal under optimum conditions.



Fig. 24. Native assistant holding a leaf of *Veitchia pedionoma* which is very similar to the general habit of *V. sessilifolia*. Photograph by A. C. Smith. Reprinted from *Gentes Herbarum* 8; 525, fig. 152. 1957.

Veitchia Montgomeryana becomes a tree 12 m. high or more, 20 cm. in diameter, with a trunk at first gray-scaly then brown. Bright green sheaths covered at first with pale scales intermixed with darker persistent scales compose the crownshaft which is 1-1.25 m. long. The leaves, usually 8-10 in a crown, have petioles about 25 cm. long tinged with orange above, gray below when young. The rachis,

which is 2.3-2.6 m. long in adult trees, has 50-60 dull dark green pinnae regularly arranged at intervals of 2-4.5 or, near the base, 7.5-10 cm. on each side. These are densely covered with minute pale scales along the nerves of the lower surface and are held nearly horizontal or only slightly pendulous. The longest pinnae are 80 cm. long, 5.5-7 cm. wide, narrowed to a slender oblique tip and slender

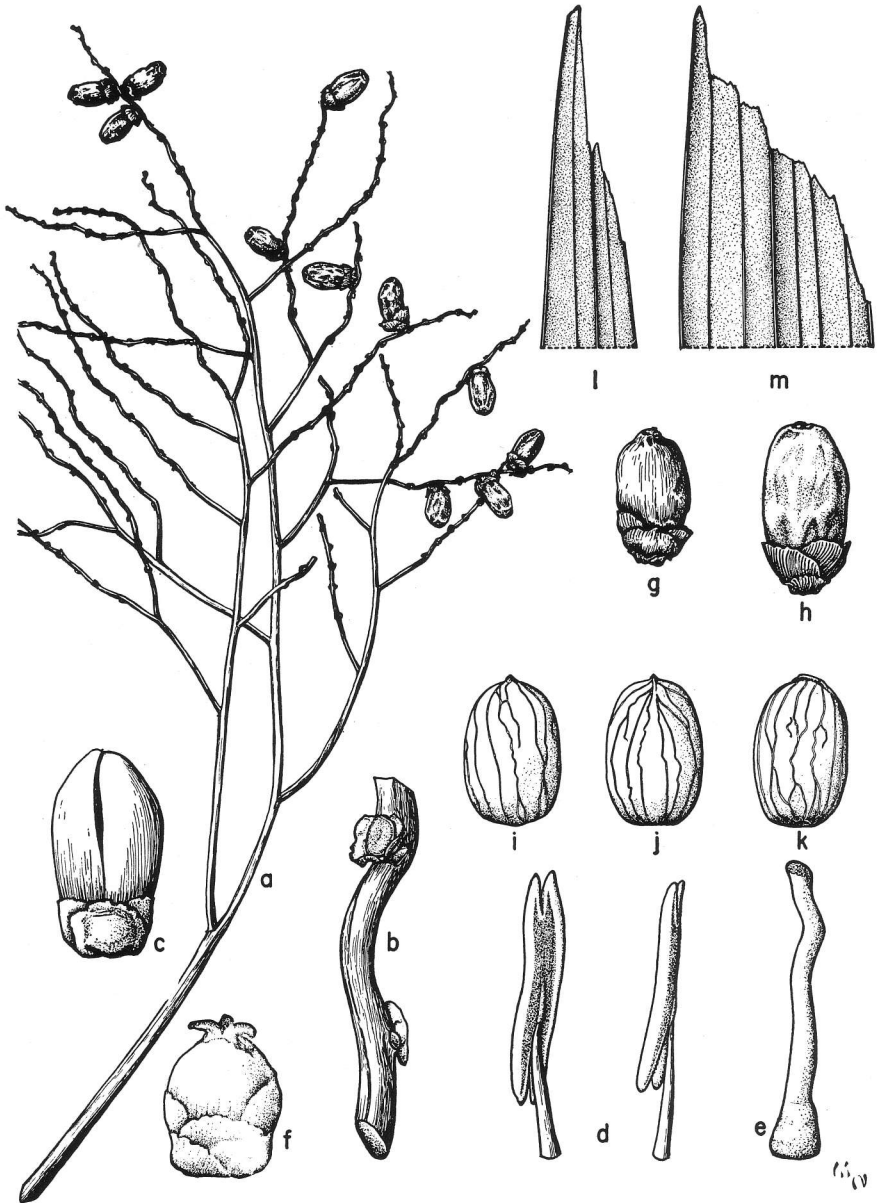


Fig. 25. *Veitchia sessilifolia*. a, portion of panicle in fruit $\times 1/3$; b, portion of rachilla showing scars of flowers and fruit $\times 3$; c, male flower $\times 3$; d, stamens $\times 6$; e, pistillode $\times 6$; f, female flower $\times 3$; g, h, fruits $\times 1$; i-k, seed in three views $\times 2$; l, m, tips of pinnae $\times 1$. Reprinted from *Gentes Herbarum* 8: 522, fig. 151. 1957.

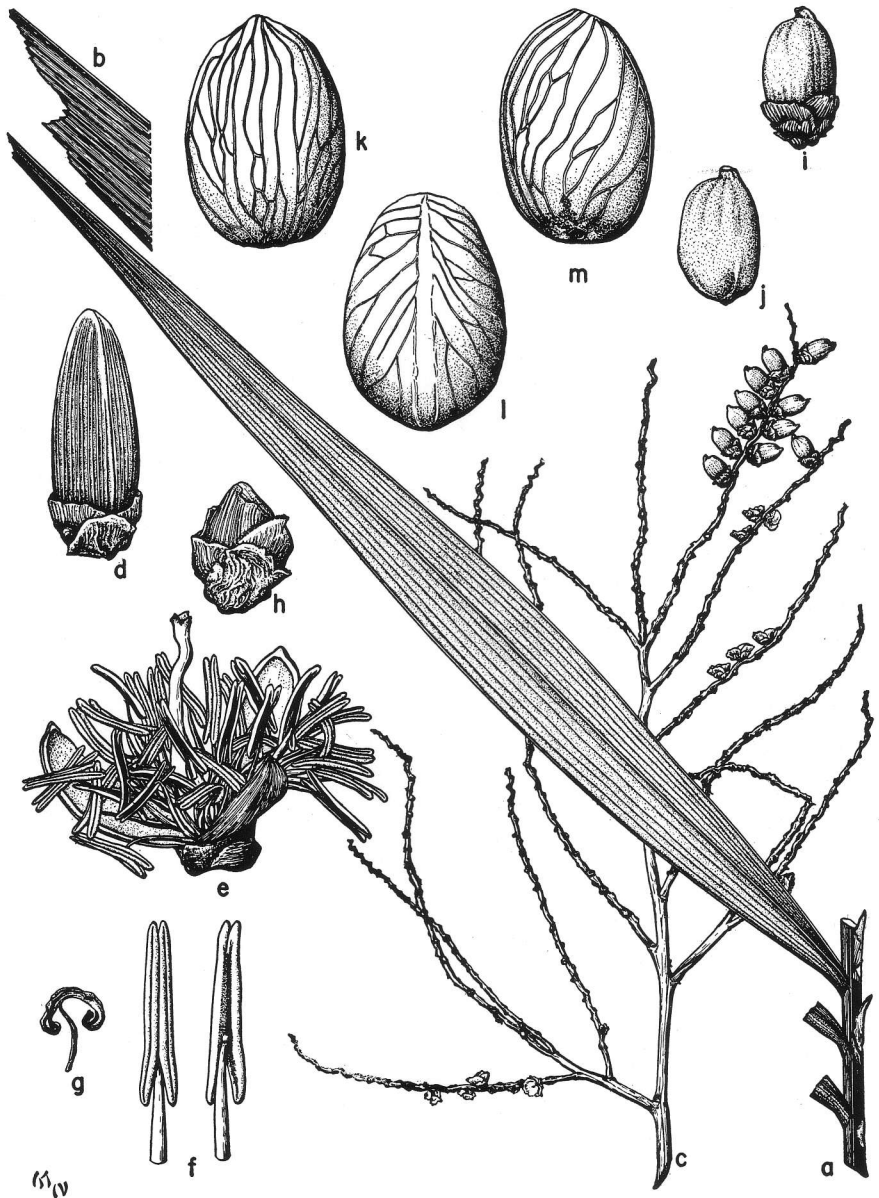


Fig. 26. *Veitchia Winin*. a, pinna $\times 1/5$; b, tip of pinna $\times 1$; c, branch of panicle $\times 1/3$; d, e, male flowers in bud and open $\times 3$; f, g, anthers fresh and dried $\times 5$; h, female bud $\times 3$; i, j, fruit $\times 1$; k-m, seed in three views $\times 3$. Reprinted from *Gentes Herbarum* 8: 500, fig. 143. 1957.



Fig. 27. *Veitchia Winin* (center) flowering at the Fairchild Tropical Garden. Photograph by Nixon Smiley. Reprinted from *Gentes Herbarum* 8: 480, fig. 139, 1957.

base. The inflorescence is broader than long, about 60 cm. long, 80 cm. wide, with the lower branches again once- or twice-branched, the remainder undivided. Female flowers appear at nodes nearly throughout the rather stiff smooth rachillae which are 13-25 cm. long. Male flowers about 13 mm. long have 130-140

stamens, the anthers bifid at the tip. The oblong-obovate red fruit is 3.9 to generally 4.5-4.6 cm. long, 2.4 cm. or rarely as little as 1.8 cm. in diameter, with a very short cap at the tip. Seeds 2.4-2.8 cm. long are rounded with a very short point at the tip. The endosperm is homogeneous.

VEITCHIA SESSILIFOLIA

I am familiar only with a single sterile tree of *Veitchia sessilifolia* (formerly *Vitiphoenix sessilifolia*) in the Montgomery collection. Another tree from the same lot of seed sent from the island of Vanua Levu, Fiji, by Dr. A. C. Smith has borne fruit at the Atkins Garden in Soledad, Cuba. The species, like some others related to it, is more compact and less graceful than others due to the stiffish leaves. The Fijians use the name *Niuniu* for these species. Because of its smaller habit, it may prove a good tree for small gardens when seeds or seedlings become available in the United States.

Veitchia sessilifolia is a relatively small species with trunks reported as 10 m. high, 11 cm. in diameter except where swollen at the base. The 6-7 leaves are more than 3 m. long, erect or ascending above a dark green white-woolly crownshaft 50 cm. long. They curve conspicuously at the tip. The petiole is often short, about 10 cm. long, but may be longer. Thick, somewhat leathery deep green pinnae are irregularly distributed along the rachis 46-47 on each side. Those near the base are separated at intervals of 10-23 cm. and they hang loosely for about a meter, trailing long slender reins or lorae at their tips. Pinnae near the middle of the leaf reach 82 cm. in length, 5.5 cm. in width. They are more closely placed and are directed forward and downward. Those at the tip are shorter, closely placed, and usually stand up from the rachis. Tips of the pinnae are often nearly acute on some trees, more strongly oblique on others. All of the pinnae lack scales other than the few large brown ones near the base on the lower surface. Very much branched inflorescences are covered with small persistent red-brown scales even in fruit. The lowest branches may be 1 m. long with 5-6 major branches, these again 2-3 times branched; upper branches are less branched to undivided. Rachillae 5-16 cm. long bear female flowers at most of the 5-17 nodes. Male flowers measure 9 mm. in length and have 40-48 stamens, the anthers of which are bifid at the tip. Red fruit 18-22 mm. long, 8-11 mm. in diameter, is rather blunt at the tip. The ovoid, very shortly pointed seeds 10 mm. long have homogeneous endosperm.

VEITCHIA WININ

When Professor L. H. MacDaniels, now retired from Cornell University, visited the New Hebrides Islands in 1949, he collected specimens and seeds of two undescribed species of *Veitchia*. One, *V. Macdanielsii*, does not appear to have survived in cultivation but the other, *V. Winin*, has borne fruit at the Fairchild Tropical Garden. The sterile trees much resemble those of *V. Montgomeryana* but the small fruits with their eccentric cap are quite distinct. Local inhabitants of Malekolo Island, where the species grows in forests at low elevations (10-50 meters), call it *Winin*, hence also its scientific epithet.

Trunks of *Veitchia Winin* are brown and somewhat thickened at the base but above are nearly uniform in diameter (to 17 cm. or more). Trees in the wild state attain a height of more than 20 m. The crownshaft, to 9.7 dm. long, and newest rings of the trunk are deep green with a dense coat of pale woolly scales interspersed with patches of dark red-brown conspicuously twisted scales at the tips of the sheaths composing the crownshaft. Each crown has 8-10 leaves which may be 3 m. long with a densely scaly petiole 2.3-2.8 dm. long. The pinnae, 46-48 on each side, are regularly arranged at intervals of 2.5 cm. or those near the base to 9 cm. apart. They are deep green above, clothed with tiny persistent pale membranous brown-centered scales on the nerves below as well as with larger brown scales. Central pinnae are largest, 65-75 cm. long, 7.5-11 cm. wide at the middle, tapered to a narrow base and an oblique tip 4.5 cm. wide. About 5 inflorescences are produced each season. These are glabrous except for the densely pale scaly peduncle. They measure to 8.5 dm. long and somewhat wider. Lower branches are again 2 to 3 times branched and the smooth ultimate rachillae are 8-20 cm. long with female flowers and fruits borne nearly to the tip. The male flowers are 10-11 mm. long with about 50 stamens, the anthers bifid at the tip. Mature fruits are small, red, and profuse, 14-19 mm. long, 9-10 mm. in diameter, and tipped with an eccentric cap. The small seeds are about 10 mm. long and rounded at the tip with homogeneous endosperm.