

# Two New Species of *Basselinia* and a New Variety of *Chambeyronia divaricata* (Arecaceae) from New Caledonia

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A few years ago, the keen eye of co-author Gilles Pierson, ardent admirer, grower, and promoter of the rich, diverse, and unusual flora of New Caledonia, and especially its palms, brought to the attention of co-author Donald Hodel two cultivated, moderate to large, solitary, red-fruited *Basselinia* that he was unable to assign to a known species. Endemic to New Caledonia, the 13 known species of *Basselinia* all have black fruits except the more recently named *B. moorei*, which has red fruits, and perhaps *B. favieri*, which is also reported to have red fruits but we feel this assertion is likely in error and will discuss it later in this article. The paucity of known red-fruited *Basselinia* species and the fact that the two unidentified taxa were fortuitously cultivated on the historic Lavoix estate on Mt. Koghi just outside of Nouméa, made for ready comparison and determination of their status, and a day of relatively easy collecting, precluding the necessity of making a long, arduous trip to Mt. Panié in the northern part of the Island where both authors had seen them growing. Also, Pierson brought to Hodel's attention a variety of *Chambeyronia divaricata* with a "watermelon" crownshaft composed of light green leaf bases with yellowish vertical streaks, in the same manner as the more famous *C. macrocarpa* var. *flavopicta*. Here we formally name and describe the two new *Basselinia* species and the new variety of *C. divaricata* and provide information about their history and discovery, distribution and ecology, and conservation status. Descriptions of all three, new taxa are based on fresh, living material.

## **Basselinia**

Until recently, *Basselinia* included 13 species of small to large, solitary or clustered, pinnate-leaves palms endemic to New Caledonia (Dransfield et al. 2008, Hodel and Pintaud 1998, Moore and Uhl 1984, Pintaud and Baker 2008, Pintaud and Stauffer 2011). They occur in all rain forest habitats on the Island from near sea level to the top of Mt. Panié, the highest peak at 1,618 m elevation.



1. *Basselinia pendulina* is a solitary, moderate, pinnate-leaved palm having a prominent grayish white crownshaft with a slight purplish tinge. Note the pendulous inflorescences. *Hodel 4028*, holotype.



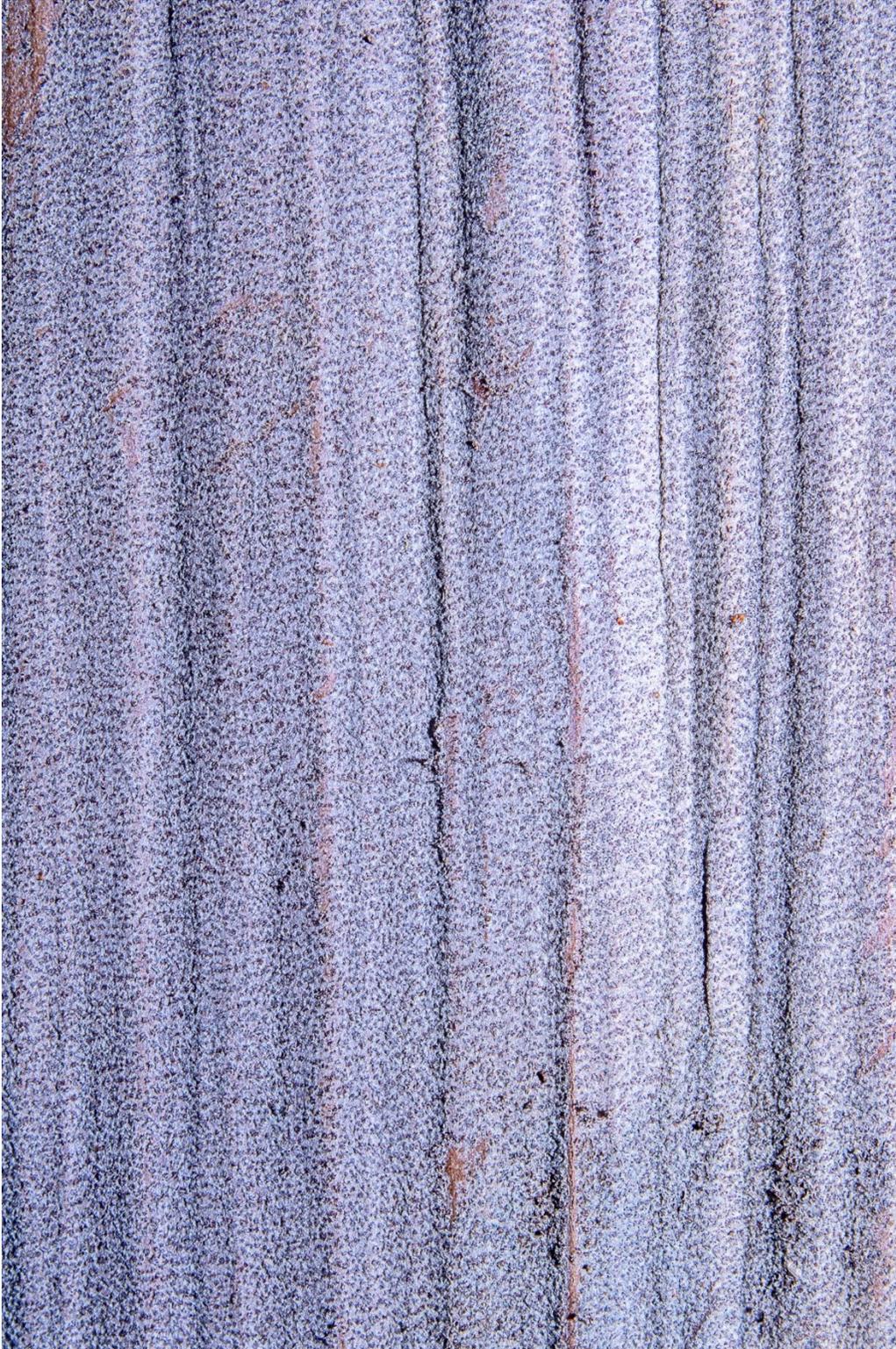
2. The trunk of *Basselinia pendulina* is prominently ringed with slightly indented leaf scars. *Hodel 4028*, holotype.



**3.** *Basselinia pendulina* has a prominent, swollen, grayish white crownshaft with a purplish tinge. Note the pendulous inflorescences.



4. Leaf bases of *Basselinia pendulina* are typically densely covered abaxially with grayish white tomentum and have a purplish tinge. *Hodel 4028*, holotype.



5. Leaf bases of *Basselinia pendulina* are typically densely covered with grayish white tomentum with a purplish tinge. *Hodel 4028*, holotype.



6. The adaxial surface of leaf bases of *Basselinia pendulina* are coppery red. Hodel 4028, holotype.



7. Leaf bases of *Basselinia pendulina* have wing-like extensions continuing on to either side of the petiole.



8. *Basselinia pendulina* has the pinna abaxial midrib and proximal primary nerve from the base to mid-pinna with scattered to occasionally contiguous, tan ramenta. *Hodel 4028*, holotype.



9. Inflorescences of *Basselinia pendulina* are infrafoliar and strikingly pendulous.



**10.** The strikingly pendulous inflorescences of *Basselinia pendulina* are branched to three orders and have narrow branch and rachilla attachment angles, making for parallel rachillae.

*Basselinia* is the largest genus in subtribe Basseliniinae, which includes six genera in the southwestern Pacific: *Lepidorrhachis* on Lord Howe Island; *Physokentia* in the Bismarck Archipelago and Fiji; *Cyphosperma* in Fiji; and *Basselinia*, *Burretiokentia*, *Cyphophoenix*, and *Cyphosperma* in New Caledonia (Pintaud and Baker 2008, Pintaud and Stauffer 2011). The nearly always incompletely sheathing prophyll and often heavily ornamented endocarp help to distinguish Basseliniinae from other genera in Areceae. The generic alignment within Basseliniinae is still in flux, though, and some former genera now included in synonymy might be resurrected (W. J. Baker pers. comm.).

Dransfield et al. (2008) distinguished *Basselinia* from the other five genera in Basseliniinae by its fruits typically with lateral stigmatic remains and the smooth or pitted but not sculptured endocarp. Pintaud and Stauffer (2011) noted that *Basselinia* differed from the other five genera in its smaller fruits with the stigmatic remains at a 90° angle from a line joining the center of the fruit and the position of the embryo; the other five genera typically have larger fruits with the stigmatic remains at a 120° to 180° angle from a line joining the center of the fruit and the position of the embryo.

Moore and Uhl (1984) divided *Basselinia* into two sections: *Basselinia*, with five, mostly small, clustering species and *Taloua*, until recently with seven, moderate to large, solitary species (*B. glabrata* was unplaced) (Pintaud and Stauffer (2011)). *Taloua* appears to be the least specialized section of *Basselinia* and within it an informal grouping of three, large-flowered species (staminate flowers more than 3 mm in length), *B. moorei*, *B. sordida*, and *B. velutina*, retain the most primitive characteristics in habit, inflorescence, and floral structure (Pintaud and Stauffer 2011).

The two new *Basselinia* species presented here are in the large-flowered group of section *Taloua*, increasing the quantity of species in this informal grouping to five, in section *Taloua* to 10, and in the genus to 15. Both have red mature fruits and both are restricted to Mt. Panié, further solidifying this mountain's reputation as the most palm-rich site in New Caledonia and as a biodiversity and conservation hotspot (Pintaud et al. 2001).

***Basselinia pendulina* Hodel & G. Pierson sp. nov. Figs. 1–21, 46.** Type: CULTIVATED. New Caledonia. Province Sud. Dumbéa: Mt. Koghi, “mountain” house of the late Lucien Lavoix, ca. 350 m below or before house along road, -22.191932, 166.519729, 26 February 2024, D. R. HODEL 4028, with G. Pierson and Ayu Warlina (holotype NOU093338, NOU093339, NOU093340, NOU093341, NOU093342, NOU093343, NOU093344, NOU093345, NOU093346, NOU093354).

This new species differs from all other *Basselinia* in its combination of mature red fruits and prominently pendulous inflorescences.



11. The peduncle of *Basselinia pendulina* is downward curved, Hodel 4028, holotype.

**Habit:** Moderate, solitary, forest palm to 12 m tall (**Fig. 1**).

**Trunk:** 14 cm DSH, prominently ringed with leaf scars, these 1–2 cm wide, slightly indented; internodes 3–4 cm, (**Fig. 2**), tan, orange-tan where freshly exposed.

**Leaves:** 12–15, regularly pinnate, ascending to spreading, slightly recurved distally (**Fig. 1**); base 75 cm long, tubular and forming a prominent, often swollen crownshaft 28–30 cm wide (80 cm wide when cut and splayed open and flattened) (**Fig. 3**), although splitting opposite petiole with pressure exerted by enclosed and swelling inflorescences, abaxially densely covered with grayish white tomentum (**Figs. 4–5**), with a purplish tinge or cast, adaxially glabrous and coppery red (**Fig. 6**), distally with wing-like extensions continuing on to either side of petiole (**Fig. 7**); petiole to 25 cm long, at base 7 cm wide, 4 cm thick, at apex 5.5 cm wide, 3 cm thick, wing-like extensions from leaf base for nearly its entire length, abaxially rounded, adaxially slightly and broadly channeled with sharp lateral margins, green but abaxially partially covered with grayish tomentum, tinged with pink when freshly cut; rachis 2.4 m long, 4 × 3 mm at apex, tinged with pink when freshly cut, abaxially rounded, adaxially flat proximally and then becoming costate with a 2-sided ridge, this quickly becoming knife-like, same tomentum as petiole, tinged with pink when freshly cut;



**12.** With *Basselinia pendulina*, the peduncular bract (left) has more grayish indument than and is enveloped within the prophyll (right), which is mostly glabrescent and falls away rather quickly. *Hodel 4028*, holotype.



**13.** The peduncular bract of *Basselinia pendulina* is densely to moderately covered with grayish tomentum abaxially. *Hodel 4028*, holotype.



**14.** *Basselinia pendulina* often has a second, much reduced peduncular bract. *Hodel 4028*, holotype.



**15.** Branches and rachillae have been reduced to show the inflorescence rachis of *Basselinia pendulina*. Note the relatively narrow branch and rachilla attachment angles. *Hodel 4028*, holotype.



**16.** Rachillae of *Basselinia pendulina* are densely covered with a short, thick, gray, hairy indument. *Hodel 4028*, holotype.



17. Staminate flowers of *Basselinia pendulina* are pinkish and unusually large for the genus. *Bruy 2607*. © 2024 by G. Pierson.

blade to 1.6 m wide; pinnae ca. 47 per each side of the rachis, regularly arranged, straight, forward pointing, ascending off rachis in same plane on each side of rachis, most proximal to 38 × 1 cm, contacted to 5 mm wide at base, spaced 8 mm apart, lower mid-blade largest, these to 101 × 4.5 cm, sub-opposite, contracted to 1.5 cm wide at base, spaced 3.5–4.5 cm apart, most distal to 33 × 1.2 cm, contracted at base to 1 cm wide, spaced 5 cm apart, all pinnae thin-leathery, rigid, plastic-like, acuminate to long-acuminate, bright green, adaxially midrib and 3–4 primary nerves on either side prominent, lesser nerves numerous, abaxially all nerves raised, abaxially scattered to occasionally contiguous, tan ramenta 2–2.5 × 0.75–1 mm from base to ca. mid-pinna on midrib and most proximal primary nerve (**Fig. 8**).

**Inflorescences:** 3, infrafoliar, pendulous, to 100 × 60 cm (**Figs. 9–10**), branched to 3 orders; base clasping trunk ca. 12 cm wide; peduncle 10 cm long, 7 cm wide and 3.5 cm thick at base, 5.5 cm wide and 2.5 cm thick at apex, downward-curved (**Fig. 11**), densely covered with short, thick, tan to grayish, hairy indument, tinged with pink when freshly cut; prophyll attached 2 cm distal of base, completely encircling peduncle, to 65 cm long, ca. 7 cm wide (14 cm when cut and splayed open and flattened), beaked at apex, thick-papery, reddish coppery with some whitish tomentum becoming mostly glabrous (**Fig. 12**); peduncular bract attached 3–3.5 cm above base, to 75 cm long, 10 cm wide (20 cm when cut and splayed open and flattened) (**Fig. 12**), beaked at apex, thin leathery, abaxially densely to moderately covered with grayish tomentum (**Fig. 13**), adaxially glabrous and tan; 2<sup>nd</sup> peduncular bract 33 cm long, 6 cm wide (**Fig. 14**); 1 rudimentary peduncular bract typically present, this to 5 × 1.5 cm, narrowly triangular; rachis to 30 cm long, pendulous, with same indument as peduncle, branch and rachilla attachment angles narrow (**Fig. 15**); 8 main branches, 2 with 1–2 sub-branches with 9–12 rachillae and 7 simple rachillae, 6 with 2–4 rachillae each, and 9 simple rachillae present, bracts subtending branches 1 cm high, triangular, green, 1<sup>st</sup> and 2<sup>nd</sup> order branches and rachillae attachment angles narrow so rachillae hanging parallel to each other (**Fig. 10**); rachillae to 60 cm long, 1 cm diam. at base, 3 mm dim. at apex, pendulous, densely covered with short, thick, gray, hairy indument (**Fig. 16**).

**Flowers:** In triads composed of a later-opening pistillate flower flanked on each of 2 sides with earlier-opening staminate flowers spirally arranged in proximal 3/4, spaced 2–4 mm distant, paired or solitary staminate flowers only distally, triads and paired and solitary staminate flowers in clefts nearly as wide as rachillae, 4–9 mm wide, 3–6 mm long, and 1.5–4 mm deep, proximal lip of cleft 1 mm high; bracteoles not seen.

Staminate flowers 6 mm long in bud just prior to anthesis, petals brownish; at anthesis 8–10 × 9–12 mm (including immersed base in cleft) (**Fig. 17**); calyx 3.5–4 × 4–5 mm, sepals 3, broadly rounded, imbricate nearly to apex, dark brown, with some indument as rachilla; petals 6, 5–6 × 3.5–4.5 mm, broadly ovate, brownish, erect to spreading, valvate, slightly incurved, acute, faintly longitudinally striated; stamens and pistillode on 1.5 mm high platform-like base; stamens 6, 7–



18. Mature, ripe fruits of *Basselinia pendulina* are red. Hodel 4028, holotype.



19. Mature, ripe fruits of *Basselinia pendulina* are red. Note the pendulous and parallel rachillae. *Hodel 4028*, holotype.



20. Mature, ripe fruits of *Basselinia pendulina* are red. Hodel 4028, holotype.



21. Mature, ripe fruits of *Basselinia pendulina* are red. Note the basal embryo and stigmatic remains just proximal of middle. Hodel 4028, holotype.

7.5 mm high, greatly exceeding petals, erect, filaments 6–6.5 mm long, 0.75 mm wide near apex and there articulated, expanding to 1.25 mm wide at base and there connate, connate base and proximal half of filament pinkish lavender, fading to white distally (**Fig. 17**); anthers 1–1.5 mm long, oval-oblong, dorsifixed near middle; pistillode 2.5–3 × 2.5–3 mm, pyramidal, non-truncated, dark pink, apex smooth and rounded to somewhat differentiated (**Fig. 17**).

Pistillate flowers not seen.

**Fruits:** 10 × 9 mm, globose, red (**Figs. 18–21**); stigmatic remains 1/3 up from the base (**Fig. 21**); seed 5 × 5 mm; endosperm homogenous; embryo basal (**Fig. 21**); fruiting perianth 4 mm high, brown; staminodes 3, 1–1.5 mm long, long-triangular, brown.

**Etymology:** The specific epithet is from the Latin *pendulinus* meaning hanging down, and refers to the strikingly pendulous inflorescences that hang down against the trunk.

**Distribution and Ecology:** This new species is restricted to mixed, wet forest on soils derived from schistose rocks on the east slope of Mt. Panié from 200–500 m elevation.

**Conservation Status:** Although a formal assessment of the conservation status of *Basselinia pendulina* has not been done, the species occurs in a protected site with limited access in a rather vast expanse of mostly undisturbed, wet forest on Mt. Panié. Thus, a formal assessment might consider it vulnerable (VU) or, as Pintaud et al. (1999) did for companion species *Basselinia favieri* and *Chambeyronia piersoniorum*, consider it lower risk, conservation dependent (LRcd).

**Additional Specimens Examined:** NEW CALEDONIA. Province Nord. Hienghène: Mt. Panié, trail from Tiaot to summit, 500 m elevation, 21 June 1971, *Moore et al. 9964* (NOU, P); elevation unknown, 18 September 1966, *Schmid 1610* (NOU). CULTIVATED. New Caledonia. Province Sud. Dumbéa: Mt. Koghi, “mountain” house of the late Lucien Lavoix, -22.191932, 166.519729, 4 April 2023, *D. Bruy 2607 bis* (collected by G. Pierson) (NOU).

***Basselinia pseudovelutina* Hodel & G. Pierson sp. nov. Figs. 22–45.** Type: CULTIVATED. New Caledonia. Province Sud. Dumbéa: Mt. Koghi, “mountain” house of the late Lucien Lavoix, ca. 700 m below or before house along road, -22.194615, 166.519982, 26 February 2024, *D. R. HODEL 4027*, with G. Pierson, T. Pierson, and Ayu Warlina (holotype NOU093327, NOU093328, NOU093329, NOU093330, NOU093331, NOU093332, NOU093333, NOU093334, NOU093335, NOU093336, NOU093337, NOU093353).



**22.** *Basselinia pseudovelutina* is a solitary, moderate, pinnate-leaved palm with a prominent, grayish white crownshaft. Note the ascending-drooping inflorescences. *Hodel 4027*, holotype.



**23.** *Basselinia pseudovelutina* is a solitary, moderate, pinnate-leaved palm with a prominent grayish white crownshaft and ascending-drooping inflorescences.



**24.** The trunk of *Basselinia pseudovelutina* is prominently ringed with slightly indented leaf scars. *Hodel 4027*, holotype.



**25.** Leaves of *Basselinia pseudovelutina* are regularly pinnate, ascending to spreading, and slightly recurved distally. *Hodel 4027*, holotype.

This new species differs from all other *Basselinia* in its combination of mature red fruits and nearly contiguous ramenta on the midrib and primary nerves of the abaxial pinna surfaces, which extend from the base nearly to the apex of each pinna.

**Habit:** Moderate, solitary, forest palm to 12 m tall (**Figs. 22–23**).

**Trunk:** 13 cm DSH, prominently ringed with leaf scars, these 1–1.75 cm wide, slightly indented; internodes 2.5–4 cm, tan (**Fig. 24**).

**Leaves:** 11–14, regularly pinnate, ascending to spreading, slightly recurved distally (**Figs. 22–23, 25**); base 75–100 cm long, tubular and forming a prominent, often swollen crownshaft 25 cm wide (66 cm wide when cut and splayed open and flattened) (**Fig. 26**) although splitting opposite petiole with pressure exerted by enclosed and swelling inflorescences, abaxially densely covered with grayish white tomentum (**Fig. 27**), adaxially glabrous and coppery red (**Fig. 28**), distally with wing-like extensions continuing on to each side of petiole (**Fig. 29**); petiole to 25 cm long, 6–7 cm wide, 3.5–5 cm thick, with wing-like extensions from base for 17–23 cm, abaxially rounded, adaxially slightly and broadly channeled with sharp lateral margins, green but abaxially partially



26. The grayish white leaf bases of *Basselinia pseudovelutina* form a prominent crownshaft. Note the ascending inflorescence peduncle and rachis and the ascending to drooping rachillae.



**27.** Leaf bases of *Basselinia pseudovelutina* are densely covered abaxially with grayish white tomentum. *Hodel 4027*, holotype.



**28.** Leaf bases of *Basselinia pseudovelutina* are coppery red adaxially. Hodel 4027, holotype.



**29.** Leaf bases of *Basselinia pseudovelutina* have wing-like extensions continuing on to either side of the petiole. *Hodel 4027*, holotype.



**30.** Freshly cut petioles and rachises of *Basselinia pseudovelutina* have a pinkish tinge. *Hodel 4027*, holotype.



**31.** Freshly cut petioles of *Basselinia pseudovelutina* have a pinkish tinge. *Hodel 4027*, holotype.



**32.** *Basselinia pseudovelutina* has the pinna abaxial midrib and proximal primary with nearly contiguous, brown ramenta nearly to the pinna apex. *Hodel 4027*, holotype.



**33.** Inflorescences of *Basselinia pseudovelutina* have ascending to drooping, infrafoliar inflorescences.



**34.** Inflorescences of *Basselinia pseudovelutina* have ascending peduncles and rachises and ascending to drooping rachillae.



**35.** The short, stout peduncle of *Basselinia pseudovelutina* is densely covered with short, thick, tan, hairy indument. *Hodel 4027*, holotype.



**36.** The abaxial surface of the prophyll of *Basselinia pseudovelutina* becomes mostly glabrous and coppery red. *Hodel 4027*, holotype.



**37.** The adaxial surface of the prophyll of *Basselinia pseudovelutina* is glabrous and coppery red. *Hodel 4027*, holotype.



**38.** The peduncular bract of *Basselinia pseudovelutina* is densely covered with pinkish tan tomentum. *Hodel 4027*, holotype.



**39.** The peduncular bract of *Basselinia pseudovelutina* is densely covered with pinkish tan tomentum. *Hodel 4027*, holotype.



**40.** Branches and rachillae have been reduced to show the inflorescence rachis of *Basselinia pseudovelutina*. Note the relatively wide branch and rachilla attachment angles. *Hodel 4027*, holotype.

covered with grayish brown tomentum, tinged with pink when freshly cut (**Figs. 30–31**); rachis 2.4 m long, 4 × 3 mm at apex, abaxially rounded, adaxially flat proximally and then becoming costate with a 2-sided ridge, this quickly becoming knife-like, same tomentum as petiole, tinged with pink when freshly cut; blade to 1.7 m wide; pinnae ca. 37 per each side of the rachis, regularly arranged, forward pointing, ascending off rachis in same plane on each side of rachis, most proximal to 32 × 0.7 cm, spaced 1 cm apart, lower mid-blade to mid-blade largest, these to 135 × 6.2 cm, sub-opposite, contracted to 3 cm wide at base, spaced 6 cm apart, most distal to 39 × 3 cm, spaced 2.5 cm apart, all pinnae thin-leathery, rigid, plastic-like, acuminate to long-acuminate, bright green, adaxially midrib and 2 primary nerves on either side prominent and raised, lesser nerves numerous, abaxially nerves prominent, abaxially mostly contiguous, brown ramenta 4–8 × 1.5–2 mm extending from base nearly to apex of midrib and 2 primary nerves on either side of midrib (**Fig. 32**), abaxially minutely brown-spotted between main veins especially proximally.

**Inflorescences:** 2–4, infrafoliar, ascending to drooping, to 75 × 60 cm (**Figs. 33–34**), branched to 2 orders; base clasping trunk ca. 12 cm wide; peduncle 5 cm long, 7 cm wide, 3 cm thick, ascending, densely covered with short, thick, tan, hairy indument (**Fig. 35**), tinged with pink when freshly cut; in bud enclosing prophyll and peduncular bract 60–70 × 15–17 cm; prophyll attached 2 cm distal of base, completely encircling peduncle, to 60 cm long, ca. 10 cm wide (22 cm when cut and splayed open and flattened), beaked at apex, thick-papery, reddish coppery with some whitish tomentum becoming mostly glabrous (**Figs. 36–37**); peduncular bract attached 3.5 cm above base, 60–70 cm long, 15 cm wide (31 cm when cut and splayed open and flattened), beaked at apex, thin leathery, densely covered with pinkish tan tomentum (**Figs. 38–39**); 1–3 rudimentary peduncular bracts typically present, these to 2 × 6 cm, very broadly triangular, coppery brown; rachis to 12 cm long, ascending, same indument as peduncle (**Fig. 40**); 4 main branches with 2–5 rachillae each and 7 simple rachillae present, subpeduncles to 3 cm long, 5 cm wide, 1.5 cm thick, bracts subtending branches 1 cm high, triangular, green, branch and rachillae attachment angles relatively wide; rachillae to 52 cm long, 1 cm diam. at base, 5 mm diam. at apex, ascending-spreading to drooping, same indument as peduncle.

**Flowers:** In triads composed of a later-opening pistillate flower flanked on each of 2 sides with earlier-opening staminate flowers, spirally arranged in proximal 3/4, spaced 2–5 mm distant, paired or solitary staminate flowers only distally, triads and paired and solitary staminate flowers in clefts 3.5–7 mm wide and 1.5–2 mm deep, proximal lip of cleft 0.75 mm high; bracteoles not seen.



**41.** Staminate flowers of *Basselinia pseudovelutina* are among the largest in the genus. Note the rachilla with dense, tan, hairy indument. *Hodel 4027*, holotype.



**42.** Staminate flowers of *Basselinia pseudovelutina* have pinkish purple filaments and a dark pink pistillode. *Hodel 4027*, holotype.



43. Mature, ripe fruits of *Basselinia pseudovelutina* are red. © 2024 by G. Pierson



**44.** These fruits of *Basselinia pseudovelutina* are full size and mature but not yet red and ripe. *Hodel 4027*, holotype.



**45.** Fully developed but not yet red, ripe fruits of *Basselinia pendulina* are green. Note the seeds with a basal embryo and the stigmatic remains just proximal of the middle. *Hodel 4027*, holotype.

Staminate flowers 7–8 mm long in bud just prior to anthesis, petals whitish; at anthesis 8–9 × 9–10 mm (including base immersed in cleft), fragrant (**Figs. 41–42**); calyx 3–3.5 × 4 mm, cupular, brown, sepals 3, broadly rounded, imbricate nearly to apex, keeled abaxially, with a little indument as rachilla; petals 6, 6 × 3.5–4 mm, broadly ovate, erect to spreading, valvate, acute, thick, fleshy, finely longitudinally striated, cream-white; stamens and pistillode on 1.5 mm high platform-like base; stamens 6, 7–7.5 mm high, exceeding petals, erect to spreading; filaments 6.5–7 mm long, 0.75 mm wide near apex and there articulated, expanding to 1.5 mm wide at base and there connate, light pinkish purple (**Fig. 42**); anthers 1.5–1.75 × 0.75–1 mm, oblong, bilobed, dorsifixed between base and middle; pistillode 2–2.5 × 2–2.5 mm, conic-pyramidal, non-truncated, dark pink, slightly fluted, apex differentiated, rounded (**Fig. 42**).

Pistillate flowers not seen.

**Fruits:** 10 × 6.5 mm, rounded-ellipsoid, red (**Figs. 43–45**); stigmatic remains 1/3 distal from the base (**Fig. 45**); seed 5 × 4 mm; endosperm homogenous; embryo basal (**Fig. 45**); fruiting perianth 4 mm high, brown; staminodes 1–2, 1.25 mm long, triangular.

**Etymology:** The specific epithet is from the Greek *pseudo*, meaning false or resembling but not equaling, and *velutina*, in reference to *Basselinia velutina*, and alludes to the similarity of this new species to and how it was confused with *B. velutina*.

**Distribution and Ecology:** This new species is restricted to mixed, wet forests on soils derived from schistose rocks on the east slope of Mt. Panié from 300–800 m elevation.

**Conservation Status:** Although a formal assessment of the conservation status of *Basselinia pseudovelutina* has not been done, the species occurs in a protected site with limited access in a rather vast expanse of mostly undisturbed, wet forest on Mt. Panié. Thus, a formal assessment might consider it vulnerable (VU) or, as Pintaud et al. (1999) did for companion species *Basselinia favieri* and *Chambeyronia piersoniorum*, consider it lower risk, conservation dependent (LRcd).

### Discussion of the Two, New *Basselinia* Species

When naming *Basselinia moorei*, Pintaud and Stauffer (2011) noted that it had escaped recognition primarily because it had been long assumed to be higher-elevation populations of *B. velutina*. The situation is the same for *B. pseudovelutina*, which is similar to *B. velutina* but is distinguished when fertile by its red rather than black fruits and the leathery rather than woody peduncular bract, the shorter rachillae (52 vs. 66 cm), the articulated rather than non-articulated filaments, and the non-truncate rather than truncate pistillode much shorter than the stamens.

The situation for *Basselinia pendulina* is somewhat similar, but how it was confused with *B. velutina* is more difficult to comprehend because it is immediately and easily distinguished when



**46.** *Basselinia pendulina* on the east slope of Mt. Panié at about 450 m elevation in 1996 was mistaken for *B. velutina*. Note the grayish white crownshaft with purplish tinge, pendulous inflorescences, and orange-brown, newly exposed trunk. Scanned from a transparency.

fertile by its prominently pendulous inflorescences having narrow branch and rachillae attachment angles making for a narrow panicle with the rachillae parallel to each other and red fruits. Indeed, the inflorescence is perhaps the most distinctive in section *Taloua* or perhaps even of all of *Basselinia*. Everything about it is pendulous, from the downward-curved peduncle to the pendulous rachis and rachillae. The entire inflorescence is pendulous and typically eventually hangs flat or nearly so against the trunk. Co-authors Hodel and the late Jean-Cristophe Pintaud, when discussing the preparation of their account of the New Caledonia palms (Hodel and Pintaud 1998), were uneasy about assigning this taxon to *B. velutina*, which they eventually did, basing their decision on others' determinations. They even illustrated and erroneously captioned as *B. velutina* on Mt. Panié (Hodel and Pintaud 1998, p. 59, Plate 22 C) (**Fig. 46**) a specimen that would eventually become *B. pendulina*.

Having mature red fruits of *Basselinia pendulina*, *B. pseudovelutina*, and *B. moorei* at hand would have greatly facilitated distinguishing these taxa from *B. velutina*, but, unfortunately, mature fruits of New Caledonia palms are often scarce.

Because three species have now been named from Mt. Panié that were once considered *Basselinia velutina*, we suspect that *B. velutina* does not occur on Mt. Panié, or if it does, it is extremely rare. What was once considered *B. velutina* from low to middle elevations on the famous mountain is mostly *B. pendulina*, that from middle elevations is *B. pseudovelutina*, and that from high elevations is *B. moorei*.

Indeed, Moore and Uhl (1984) noted that *Basselinia velutina* has a disjunct distribution with a southern population around Plateau de Dogny and Katrikoin, which is where the type originated, and a northern population on Mt. Panié. They noted that differences existed between the southern and northern populations but felt these were insignificant.

Furthermore, Moore and Uhl (1984) reported that *Basselinia favieri*, which also occurs on Mt. Panié and with *B. pendulina* and *B. pseudovelutina*, also has red fruits. However, we have always seen *B. favieri*, which has a distinctive, divaricately branched, unusually large and expansive inflorescence, with black fruits and, because of the scarcity of mature fruits, suspect that its fruit color has been confused with one or both of the new red-fruited species named and described here.

Comparisons of characters between *Basselinia pseudovelutina* and *B. pendulina*, and among all five large-flowered species of *Basselinia*, section *Taloua*, are listed in **Table 1**. Both new species have among the largest staminate flowers in the large-flowered group; in both they are at least as long or longer in bud just prior to anthesis than the other three species in the group. At anthesis they are the largest in *Basselinia*.

**Table 1. Comparison of large-flowered species of *Basselinia*, section *Taloua*. Adapted from Pintaud and Stauffer (2011).**

Character	<i>B. moorei</i>	<i>B. sordida</i>	<i>B. velutina</i>	<i>B. pendulina</i>	<i>B. pseudo-velutina</i>
<b>Pinna color</b>	Light green	Dark green	Light green	Dark green	Dark green
<b>Ramenta distribution</b>	Scattered proximal 1/3	Abundant proximal 4/5	Abundant base to apex	Scattered proximal 1/3	Abundant base to apex
<b>Peduncular bract</b>	?	Thin-papery	Thick-woody	Thin-leathery	Thin-leathery
<b>Rachillae length (cm)</b>	36	45	66	60	52
<b>Rachillae indument</b>	Thin, gray	Thick white	Thin gray	Thick gray	Thick tan
<b>Staminate flower length (mm)*</b>	5.0–6.0	3.2–4.0	5.0	6.0	7.0–8.0
<b>Filament</b>	Articulated	Articulated	Non-articulated	Articulated	Articulated
<b>Pistillode</b>	Non-truncated	Truncated	Truncated	Non-truncated	Non-truncated
<b>Fruit color</b>	Red	Black	Black	Red	Red
<b>Fruit shape</b>	Globose	Subglobose	Ellipsoid	Globose	Globose-ellipsoid
<b>Stigmatic remains</b>	Middle	Distal of middle	Proximal of middle	Proximal of middle	Proximal of middle

\*In bud just prior to anthesis.

Here we provide a revised key to the species of *Basselinia* section *Taloua* (adapted from Moore and Uhl 1984):

Pinnae 25 or more on each side of rachis; inflorescences with whitish, grayish, tan, or golden brown hairs.

Mature, ripe fruits red.

Inflorescences strikingly pendulous . . . . . *B. pendulina*

Inflorescences ascending to spreading with rachillae spreading or spreading-drooping.

Pinnae 37 on each side of rachis; rachillae to 52 cm long . . . . . *B. pseudovelutina*

Rachillae 31 or fewer on each side of rachis; rachillae to 36 cm long . . . . . *B. moorei*

Mature ripe fruits black.

Rachillae velutinous with hairs not obscuring bracteoles subtending floral triads.

Pinnae 39–43 on each side of rachis; inflorescence axes with pale brown or grayish hairs; sepals of staminate flowers dark brown, darker than petals, with white hairs to middle dorsally; fruits with stigmatic remains near or proximal of middle . *B. velutina*

Pinnae 30–34 on each side of rachis; inflorescence axes with white hairs becoming dirty white to gray with age; sepals of staminate flowers brown, not darker than petals, mostly glabrous; fruits with stigmatic remains distal of middle . . . . . *B. sordida*

Rachillae densely tomentose with hairs obscuring bracteoles subtending floral triads.

Floral triads well separated along rachillae; sepals of staminate flowers not obscured by hairs . . . . . *B. tomentosa*

Floral triads contiguous along rachillae; sepals of staminate flowers obscured by hairs . . . . . *B. favieri*

Pinnae 21 or fewer on each side of rachis.; inflorescences with red-brown to dark brown hairs or brown scales.

Rachillae pendulous, green, mostly glabrous . . . . . *B. humboldtiana*

Rachillae stiff, spreading, covered with red-brown to dark brown hairs.

Leaf base olive-green with minute brown-black scales abaxially; rachilla hairs not obscuring bracteoles subtending floral triads . . . . . *B. iterata*

Leaf base red-purple to dark green with red-brown hairs abaxially; rachillae hairs obscuring bracteoles subtending floral triads . . . . . *B. porphyrea*

That Nouméa businessperson Lucien Lavoix would have cultivated *Basselinia pendulina* and *B. pseudovelutina* at his estate on Mt. Koghi is unsurprising. He was perhaps the best know collector and champion of New Caledonia palms of his era in the middle 20<sup>th</sup> century. He frequently accompanied and/or was well connected with well known personages who were studying New Caledonia’s palms at the time, including botanists and plantspeople M. Schmid, J.-M. Veillon, H. S. MacKee, T. Jaffré, and Luc Chavalier in New Caledonia, D. Barry of Los Angeles, California, and especially H. E. Moore, Jr. of Cornell University in New York, enabling him to amass a fine and extensive collection of the Island’s palms at his mountain-side retreat. On his collecting forays



**47.** *Chambeyronia divaricata* var. *flavolineata* is a small, solitary, few-leaved, understory palm. *Hodel 4029*, holotype.

around the Island, he probably returned with seeds but more likely seedlings because mature fruits of the Island's palms are so often scarce. He made several trips to the legendary Mt. Panié, even discovering the famous, elusive, and rare “*palmier á gros fruits*,” *Lavoxia macrocarpa* (now *Clinosperma macrocarpa*), a “holy grail” among palm fanciers, which Moore named in his honor. Indeed, speculation is rife that Lavoix would have likely planted his namesake palm on his mountain estate, prompting many to search for it but without success. Unfortunately, records of his plantings do not exist.

### **Chambeyronia divaricata**

Formerly known as *Actinokentia divaricata*, *Chambeyronia* was recently revised, resulting in the inclusion of *Actinokentia* and *Kentiopsis*, which made the new combination *C. divaricata* (Hodel et al. 2021). Co-author Pierson recently discovered a variety of *A. divaricata* that differs from the original species in its lime-green leaf bases densely mark with vertical, cream-yellow streaks, creating a mottled or “watermelon” crownshaft as in *C. macrocarpa* var. *flavopicta* (Hodel and Pintaud 2021). However, in this new variety, the mottling does not extend on to the stem and prophyll as in *C. macrocarpa* var. *flavopicta*.

#### **Chambeyronia divaricata** var. **flavolineata** Hodel & G. Pierson var. nov. Figs. 47–

**58.** Type: New Caledonia. Province Nord. Koua Valley: ca. 3 km west-southwest of the mouth of the Koua River, south side of Koua River at base of west-facing slope, 35 m elev., -21.341318, 165.754963, 27 February 2024, D. R. HODEL 4029, with G. Pierson and Ayu Warlina (holotype NOU093347, NOU093348, NOU093349, NOU093350, NOU093351, NOU093352).

This new variety differs from *Chambeyronia divaricata* var. *divaricata* in its lime-green leaf bases with cream-yellow, vertical, irregular, streaks giving a mottled appearance to the crownshaft.

**Habit:** Small, slender, solitary understory palm to 5 m tall (Figs. 47–48).

**Stem:** 3.5–4 cm DSH, ringed with leaf scars, these 1.5 cm wide, whitish; internodes 4.5–5 cm, lime-green with white tomentum aging brown and vertically fissured; conspicuous roots at base (Fig. 49).

**Leaves:** 5, regularly pinnate, spreading (Figs. 47–48), new leaf emerging reddish brown (Fig. 50); base ca. 47 cm long, tubular and forming a prominent, often swollen crownshaft, abaxially lime-green with cream-yellow, vertical, irregular streaks giving a mottled appearance to the crownshaft (Fig. 51); petiole ca. 67 cm long, at base 4.7 cm wide, 2 cm thick, at apex 2 × 2 cm, abaxially rounded, adaxially channeled in proximal 25 cm becoming flat distally, smooth, reddish purple to reddish brown; rachis 1.25 m long, 1.75 mm diam. at apex, abaxially rounded, adaxially



**48.** *Chambeyronia divaricata* var. *flavolineata* is a small, solitary, few-leaved, understory palm.



**49.** *Chambeyronia divaricata* var. *flavolineata* typically has a conspicuous cone of roots supporting the stem at the base. *Hodel 4029*, holotype.

with an angled costa; pinnae 24 per each side of the rachis, regularly arranged, straight, very slightly forward pointing, most proximal to 42 × 3.8 cm, lower mid-blade largest, these to 64 × 5.5 cm, most distal to 9 × 1.5 cm, all pinnae thin-leathery, acuminate, bright green, adaxially midrib prominent, raised, lesser nerves numerous, abaxially all nerves raised, midrib prominent, yellowish, marginal nerves prominent, yellowish, lesser nerves conspicuous, abaxially scattered to contiguous, grayish brown ramenta 4.5 × 0.75–1 mm in proximal 30 cm (**Fig. 52**).

**Inflorescences:** 2, infrafoliar, spreading, to ca. 38 × 46 cm (**Fig. 53**), branched to 3 orders (**Fig. 54**); base clasping stem ca. 4.5 cm wide; peduncle 6.5 cm long, 8 mm thick; prophyll attached 1 cm distal of base, not seen; peduncular bract attached 2.2 cm distal of base, not seen; rachis to 20 cm long; 4 main branches, 3 simple branches, and 6 simple rachillae present; rachillae to 21 cm long, 2–2.5 mm diam. stiffish, spreading, curling, and intertwined (**Fig. 55**), green in flower, moderately covered with small, brown scales.

**Flowers:** In triads composed of a later-opening pistillate flower flanked on each of 2 sides with earlier-opening staminate flowers spirally arranged in proximal 2/3, spaced 3–5 mm distant,



50. The new leaf of *Chambeyronia divaricata* var. *flavolineata* typically emerges red.



**51.** Leaf bases of *Chambeyronia divaricata* var. *flavolineata* are lime-green with cream-yellow, vertical, irregular streaks giving a mottled appearance to the crownshaft. *Hodel 4029*, holotype.



52. *Chambeyronia divaricata* var. *flavolineata* has scattered to contiguous, grayish brown ramenta in the proximal 30 cm of the abaxially midrib. *Hodel 4029*, holotype.



**53.** *Chambeyronia divaricata* var. *flavolineata* has infrafoliar, spreading inflorescences and infructescences. *Hodel 4029*, holotype.



54. Inflorescences of *Chambeyronia divaricata* var. *flavolineata* are branched to three orders. *Hodel 4029*, holotype.



55. Rachillae of *Chambeyronia divaricata* var. *flavolineata* are stiffish, spreading, curling, and intertwined. *Hodel 4029*, holotype.

paired or solitary staminate flowers only distally, triads and paired and solitary staminate flowers in clefts 2 mm wide and 1 mm deep, proximal lip of cleft 0.5–0.75 mm high.

Staminate flowers at anthesis 3.5 × 4 mm (including immersed base in cleft) (**Fig. 56**); calyx 1.5 × 1.5 mm, cupular, brown, sepals 3, broadly rounded, imbricate nearly to apex; petals 6, 2.75 × 1.54 mm, ovate, erect to spreading, valvate, pinkish cream-colored, acute; stamens numerous, 3 mm high, slightly exceeding petals, erect, filaments 2–2.5 mm long, 0.25 mm wide; anthers 1 mm long, long-ovate, scarcely bilobed, dorsifixed near base and there wider; pistillode not seen.

Pistillate flowers not seen.

**Fruits:** 3 × 1.5 cm, red, stigmatic remains apical (**Figs. 57–58**); seed 2 × 1.25 cm, embryo basal (**Fig. 58**).

**Etymology:** The varietal epithet is from the Latin *flavo*, meaning yellow, and *linea*, meaning line or streak, and alludes to the vertical, cream-yellow streaking on the leaf bases.

**Distribution and Ecology:** This new variety occurs in moist, mixed forests at low elevations (35 m), growing with an occasional *Basselinia pancheri* in the shade of *Chambeyronia houailouensis* and *C. oliviformis* and broad-leaves tree species on gently sloping land at the base of hillsides along the Koua River in Houailou commune, a few km from the east coast. It extends westward in a narrow band in suitable habitat to Le Cap in Poya near the west coast, where we have seen it at 800 m elevation at Nodela with *Burretiokentia dumasii* and *Clinosperma bracteale*.

**Conservation Status:** Although a formal assessment of the conservation status of *Chambeyronia divaricata* var. *flavolineata* has not been done, the type locality is a large forest remnant in proximity to human habitation and agriculture, especially cattle, the latter of which have unrestricted access to the site and can trample and/or eat fallen fruits and seedlings. Thus, we feel that this variety is probably vulnerable at this site; however, the range of this variety is more expansive, and we know next to nothing of its status in other locations although the forest is mostly fragmented across its range. Pintaud et al. (1999) considered *C. oliviformis*, a species with a similar range as *C. divaricata* var. *flavolineata*, as endangered (EN), and perhaps this category would be more appropriate although this new variety occurs in greater quantities than *C. oliviformis*. We suggest fencing of the forest remnant at the type locality to exclude cattle, horses, pigs, and other potentially harmful animals. Doing so would also offer protection to perhaps the largest population of *Chambeyronia houailouensis* and significant quantities of *C. oliviformis*.



56. Staminate flowers of *Chambeyronia divaricata* var. *flavolineata* have numerous, white stamens. *Hodel 4029*, holotype.



57. These fruits of *Chambeyronia divaricata* var. *flavolineata* are nearly full sized but have not yet attained their mature bright red color. *Hodel 4029*, holotype.



**58.** Ripe mature fruits of *Chambeyronia divaricata* var. *flavolineata* are bright red with apical stigmatic remains and seeds with a basal embryo. *Hodel 4029*, holotype.

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