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The Genus Freycinetia (Pandanaceae) in New Caledonia (part 2)

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ABSTRACT

HUYNH, K.-L. (2004). The Genus Freycinetia (Pandanaceae) in New Caledonia (part 2). *Candollea* 59: 175-180. In English, French and English abstracts.

Three new species and a new subspecies of *Freycinetia* from New Caledonia are described (*F. delicata* Huynh, *F. involuta* Huynh, *F. subulata* Huynh, *F. hydra* subsp. *apodistigma* Huynh). New data on *F. coriacea* Warb. and *F. hydra* B. C. Stone subsp. *hydra* are also provided. Specific characters from both gross morphology and the anatomy of fruit, seed, and leaf auricles are used for the description.

RÉSUMÉ

HUYNH, K.-L. (2004). Le genre Freycinetia (Pandanaceae) en Nouvelle-Calédonie (2e partie). *Candollea* 59: 175-180. En anglais, résumés français et anglais.

Trois espèces nouvelles et une sous-espèce nouvelle de *Freycinetia* de la Nouvelle-Calédonie sont décrites (*F. delicata* Huynh, *F. involuta* Huynh, *F. subulata* Huynh, *F. hydra* subsp. *apodistigma* Huynh). Des données nouvelles chez *F. coriacea* Warb. et *F. hydra* B. C. Stone subsp. *hydra* sont aussi exposées. Des caractères spécifiques de la morphologie macroscopique et de l'anatomie du fruit, de la graine et des auricules de la feuille sont utilisés pour la description.

KEY-WORDS: PANDANACEAE – Freycinetia – New Caledonia – Taxonomy

Introduction

The present paper describes other unknown species of *Freycinetia* recently observed in New Caledonia. Specific characters from the anatomy of fruits, seeds, and leaf auricles (see HUYNH, 2000: 283-284; 2002: 513-514) are also used for description. They have proved useful in the taxonomy of this genus especially for distinguishing between closely related species (HUYNH, 2000, 2002).

Observations

1. ***Freycinetia delicata*** Huynh, **spec. nova** (sect. *Pleiostigma*) (Fig. 1)

Ramulus fructifer partim conservatus, reliquo axe 30 cm longo; internodiis 5-20 mm longis, 5 mm crassis, granularibus, teretibus. Folia infra infructescentiam 13-16 cm longa, (3-)4 cm lata in parte media 3-4 mm supra basim (auriculis non inclusis), lanceolata, 5 mm acuminata, dissita, in basi semiamplexicaulia; in sicco, membranacea, delicata, fragilia, cinerascentia in pagina

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adaxiali, brunneola in abaxiali, utrinque tessellata, non vel obscure striata, patentia sed generaliter secus venas longitudinales crispula; venis longitudinalibus utrinque pariter distinctis; venis transversalibus utrinque pariter visibilibus; marginibus armatis ex apice fere ad basim, denticulis tenuibus, usque ad 1/3 mm longis; costa media armata in 3/4 superis circiter; auriculis omnibus deciduis. Infructescentia terminalis, 3 spicis praedita, recurvata et axem ramuli applicata, pedunculo communi 1.3 cm longo; syncarpiis 3.2 cm longis, 8 mm latis, maturis (cum seminibus), cylindraceis, pedunculis 3 cm longis, 1.5-3 mm latis, 1.5 mm crassis, laevibus. Baccae 3 mm longae, sclerenchymate centrali in pileo praeditae sed fibris destitutae; stigmatibus 3-4, artis sed distinctis, omnibus annulo nitido fere completo cinctis. Semina 1.1 mm longa, 0.62 mm lata in medio, ± recta; strophiolo distincto, 0.15 mm lato; raphe distincta, 0.11 mm lata, cellulis raphidiphoris sparsis, cellulis crystalliferis absentibus.

Type: NEW CALEDONIA: Thy River Valley, ca. 12 air-km NE of Nouméa, forest, alt. ca. 400 m, 24.VI.1979, *McPherson 1699* (holo-: MO!) [vine around base of tree; mature fruit red].

Freycinetia delicata is named in reference to the delicate texture of its leaves. It is noteworthy by its greyish, tessellate, and crispulate leaves, and also by its recurved infructescence, applying the syncarps on the branchlet axis.

Freycinetia delicata appears closest to *F. coriacea* Warb., considering its leaves 13-16 cm long by 4 cm wide, its berries with 3-4 stigmas, its granular internodes, and its terminal and 3-syncarpic infructescence. This latter species differs from *F. delicata* by its syncarps which are at least 7 cm long when mature (thus at least twice as long), its syncarp peduncles which are 5 mm wide, in particular by its leaves which are coriaceous (see WARBURG, 1906: 17), untessellate, and brown or darkbrown, as observed below, in the specimens *McPherson 6028* and *6029* (MO!), which belong to *F. coriacea*.

2. ***Freycinetia hydra*** subsp. ***apodistigma*** Huynh, **subsp. nova** (sect. *Pleiostigma*)

A Freycinetia hydra subsp. hydra stigmatibus non stipitatis differt.

Type: NEW CALEDONIA: Col des Roussettes, I.1978, *Veillon 3441* (holo-: NOU!).

Paratype. – **NEW CALEDONIA:** Rivière Toma, alt. 500 m, 11.XI.1972, *Veillon 2791* (NOU!).

By having lateral inflorescences, berries with 6-10 stigmas, and leaves 40-50 cm long and 1.6-2.5 cm wide, the specimens *Veillon 3441* and *2791* appear very close to *F. hydra* B. C. Stone subsp. *hydra* as described by STONE (1979: 149). This close relationship is also shown by the anatomy of the berries of *Veillon 3441*, which have a central sclerenchyma and fusiform/elliptic fibre-bundles as do those of *F. hydra* subsp. *hydra* (see below). However, *Veillon 3441* (and *Veillon 2791*) have unstipitate stigmas, while *F. hydra* subsp. *hydra* have stipitate stigmas, each of these being supported by a style (STONE, 1979: Fig. 1B).

In the present study, *F. hydra* subsp. *apodistigma* is adopted. However, since its stigmas are morphologically different from those of *F. hydra* subsp. *hydra* as mentioned above, it should probably be considered a distinct species. In fact, by having stipitate stigmas, *F. hydra* subsp. *hydra* is unique in *Freycinetia*, for which reason STONE (1979) described sect. *Hydra* B. C. Stone to accommodate it.

3. ***Freycinetia involuta*** Huynh, **spec. nova** (sect. *Pleiostigma*) (Fig. 2)

Ramuli fertiles 6-7 cm longi, in apice infructescentiam ferentes, deorsum versus foliis praediti; internodiis 4-5 mm longis, 8 mm crassis, dense rugulosis, laevibus, teretibus. Folia infra infructescentiam 30-35 cm longa, 1 cm lata in parte media, e quarta supera ad apicem sensim attenuata, 2 cm caudata, ensiformia, e quarta infera ad prope basim sensim dilatata 2 cm lata (auriculis non inclusis), imbricata, in basi amplexicaulia; in sicco, subcoriacea, viridula interdum brunnea vel brunneola, omnibus valde involuta; venis longitudinalibus utrinque visibilibus sed plus in pagina abaxiali; venis transversalibus utrinque invisibilibus; marginibus armatis ex apice fere ad basim, denticulis minutis, ut maximum 2/3 mm longis; costa media armata ex apice fere ad basim;

auriculis omnibus conservatis, 3-3.5 cm longis, 4 mm latis, in apice adnatis, triangularibus, inermibus, membranaceis, atrobrunneis, non nitidis, (in microscopio) cellulis epidermicis omnibus non lignosis in una pagina sed omnibus lignosis in altera, mesophyllo multis longis separatis 1-3-stratis filis fibrarum cum fasciculis vasorum praedito, lamina non compressa. Infructescentia terminalis, 1 vel 2 spicis praedita; syncarpiis 4.5 cm longis, 2.3 cm latis, immaturis (sine seminibus), ellipticis, pedunculis 2.5 cm longis, 5 mm latis, 4.5 mm crassis, laevibus. Baccae 8 mm longae, 2 mm latae, rectangulares, sclerenchymate centrali conspicuo in pileo et numerosissimis fasciculis fibrarum fusiformibus/ellipticis praeditae; pileo 5 mm alto; stigmatibus 4-8(-10), areola stigmatica annulo distincto cincta.

Type: NEW CALEDONIA: Col des Roussettes, station Cagou, XI.1977, *Veillon 3336* (holo-: NOU!) [inflorescence on short lateral branchlets along stem].

The fact that the leaf auricles of *F. involuta* have an epidermis entirely lignified, at least at one side, as described above, suggests that they may probably not disintegrate into separate fibres.

Freycinetia involuta is most remarkable by its leaves. These are strongly involute, making the margins of the leaf blade closely meet with each other from the apex almost to the base over the adaxial face, while exhibiting the armed midnerve. Such leaves are rare in *Freycinetia*, and to date they do not seem to have been observed in any other species in New Caledonia. Furthermore, *F. involuta* is the only species in New Caledonia that has berries with up to 8(-10) stigmas but leaves of so reduced size, not exceeding 35 x 1 cm. It is also remarkable by having terminal inflorescences but very short fertile branchlets (6-7 cm).

Freycinetia involuta appears closest to *F. modica* Huynh, considering their leaf size, berry anatomy, and to some extent stigma numbers (4-8 stigmas for it; 4-5 for *F. modica*). This latter species differs from *F. involuta* by its syncarp peduncles which are 5 cm long (thus twice as long), its berries which have 4-5 stigmas, its leaf auricles which are 6 cm long (thus twice as long for the same leaf length), in particular its leaves which when dry are patent, never involute, and with margins unarmed in the middle part (see HUYNH, 2003: 298).

4. ***Freycinetia subulata*** Huynh, **spec. nova** (sect. *Pleiostigma*) (Fig. 3)

Internodia ramulorum 2.5 cm longa, 1.2 cm crassa, laevia, teretia. Folia 30-40 cm longa, 1.5-2.4 cm lata in parte media 1.5 cm in basi (auriculis non inclusis), ensiformia, subulata, abrupte attenuata in apice, 3-4 mm acuminata, dissita, in basi semiamplexicaulia; in sicco, coriacea, utrinque pariter atrobrunnea, dense striata in pagina adaxiali, patentia; venis longitudinalibus visibilibus in pagina abaxiali, invisibilibus vel obscuris in adaxiali; venis transversalibus invisibilibus in adaxiali, leviter visibilibus in abaxiali; costa media marginibusque armatis in brevi spatio in apice solum, denticulis punctiformibus; auriculis partim conservatis in aliquot foliis, 3.5-4.5 cm longis, 4 mm latis, membranaceis, cinerascentibus, in separatis fibris partim solutis, (in microscopio) cellulis epidermicis utrinque omnibus non lignosis, mesophyllo multis separatis longis 3-5-stratis filis fibrarum cum uno fasciculo vasorum praedito, lamina inter fila fibrarum leviter compressa. Ramulus fertilis brevis, 2 cm longus, in basi prophyllis et bracteis praeditus sed foliis destitutus, in apice infructescentiam ferens, lateralem igitur, 3 spicis praeditam; syncarpiis 4.5 cm longis, 1.3 cm latis, immaturis (sine seminibus), cylindraceis, pedunculis 2.5 cm longis, 3 mm latis, laevibus. Baccae 7 mm longae, 1.5 mm latae, sclerenchymate centrali conspicuo in pileo praeditae sed fibris destitutae; pileo 2 mm alto; stigmatibus (2-)3(-4), separatis, omnibus annulo nitido fere completo cinctis.

Type: NEW CALEDONIA: Hauteurs de Yaté, alt. 300 m, 8.II.1981, *MacKee 38714* (holo-: NOU!) [vine rather stout; fruits green, turning yellow].

Paratype. – **NEW CALEDONIA:** Negropo, Ouen ouai, gallery forest on schists, alt. 150 m, 28.VI.1972, *MacKee 25642* (NOU!).

The anatomy of the leaf auricles of *F. subulata* described above (epidermal cells all unlignified at both sides; mesophyll with long and separate fibre-strands) suggests that they disintegrate into separate fibres.

Freycinetia subulata appears closest to *F. panica* Huynh, considering their lateral inflorescence and leaf length. This latter species differs from *F. subulata* by its leaves which are membranaceous and narrower (30-35 x 1.2 cm), and in particular by its berries which have 4-6 stigmas and fusiform/elliptic fibre-bundles (see HUYNH, 2003: 298).

Considering its lateral inflorescence and leaves up to 40 x 2.4 cm, *F. subulata* may also be compared with *F. hydra*. This latter species differs from *F. subulata* by its leaves which are 50-65 x 2-3.2 cm, in particular by its berries which generally have 6-12 stigmas (see STONE, 1979: 149).

5. **Further notes on *Freycinetia coriacea* Warb. (sect. *Pleiostigma*)** (Fig. 4)

Material studied: NEW CALEDONIA: Mandjélia, above Pouébo, north end of Panié Massif, forested slopes, alt. ca. 740 m, 25.XI.1983, *McPherson 6028* and *6029* (MO!).

WARBURG (1906: 17) described *F. coriacea* as having the following characters. The leaves are coriaceous, lanceolate, 15-20 cm long, 3-5 cm wide; the margins are entire, or sparsely and minutely armed but densely and distinctly armed at the apex; the midnerve is obscurely armed at the apex; the longitudinal veins are prominent on the abaxial face. The infructescence is terminal, 3-syncarpic; the syncarps are 7 x 1.5 cm, with peduncles 4 cm long, 5 mm wide; the berries have (3-)4(-5) unconfluent stigmas.

The specimen *McPherson 6028* readily appears to belong to *F. coriacea* although its leaves are a little smaller (13-16 x 3-4.5 cm) and its syncarp peduncles a little shorter (3 cm) than described by WARBURG (1906: 17), these two differences appearing the most significant. The plant, which was a vine about 3 m high as field-noted, provides the following new data for this species. The branchlet internodes are 5-15 mm long, 5-10 mm thick, granular, terete. The infructescence is nodding ± perpendicularly to the branchlet axis, and the infructescence peduncle is about 1.3 cm long. The syncarp peduncles are smooth. The berries are 3 mm long and have a thick central sclerenchyma but no fibre-bundles. The stigmas are separate and have each an almost complete and shiny ring. The leaves are shortly acuminate, remote, and semiamplexicaul; in dry state, they are patent, with both faces brown or darkbrown and partly and slightly striate; the longitudinal veins are visible on both faces, but the transverse veins are invisible, consequently the leaves are untessellate; the auricles are all deciduous. In *McPherson 6029*, which also belongs to this species, the branchlet internodes are also granular, the infructescence is also nodding ± perpendicularly to the branchlet axis, and the leaves are also entirely untessellate, considering in particular these three significant features.

6. **Further notes on *Freycinetia hydra* B. C. Stone subsp. *hydra* (sect. *Pleiostigma*)**

Material studied: NEW CALEDONIA: Boulouparis, SE counterfort of Mt. Chassoua, gallery forest on graywackes, alt. ca. 250 m, 10.III.1994, *Veillon 7753* (NOU!).

Some anatomical features of the fruit of *F. hydra* subsp. *hydra* were not known. Therefore *Veillon 7753* is used to observe and describe them. This specimen readily appears to belong to *F. hydra* subsp. *hydra* given that its infructescence is lateral and 3-syncarpic, its stigma numbers are typical of this species as described by STONE (1979: 149), its leaves are 58 cm long by 2.5 cm wide, its syncarp peduncles are 2.2-2.5 cm long and smooth, and in particular its stigmas are clearly stipitate. The berries of *Veillon 7753* have numerous fusiform/elliptic fibre-bundles and a central sclerenchyma composed of both separate fibres and groups of fibres. The seeds have a distinct strophiole, and in the raphe only the small cells around the central vascular bundle are lignified.

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REFERENCES

HUYNH, K.-L. (2000). The genus Freycinetia (Pandanaceae) in New Guinea (part 3). *Candollea* 55: 283-306.

HUYNH, K.-L. (2002). The genus Freycinetia (Pandanaceae) in New Guinea (part 4). *Blumea* 47: 513-536.

HUYNH, K.-L. (2003). The genus Freycinetia (Pandanaceae) in New Caledonia (part 1). *Candollea* 58: 297-304.

STONE, B. C. (1979). A new species and new section of the genus Freycinetia (Pandanaceae) from New Caledonia. *Pacific Sci.* 33: 149-151.

WARBURG, O. (1906). Pandanaceae. *In:* SCHLECHTER, R., Beiträge zur Kenntnis der Flora von Neu-Kaledonien. *Bot. Jahrb. Syst.* 39: 17-19.

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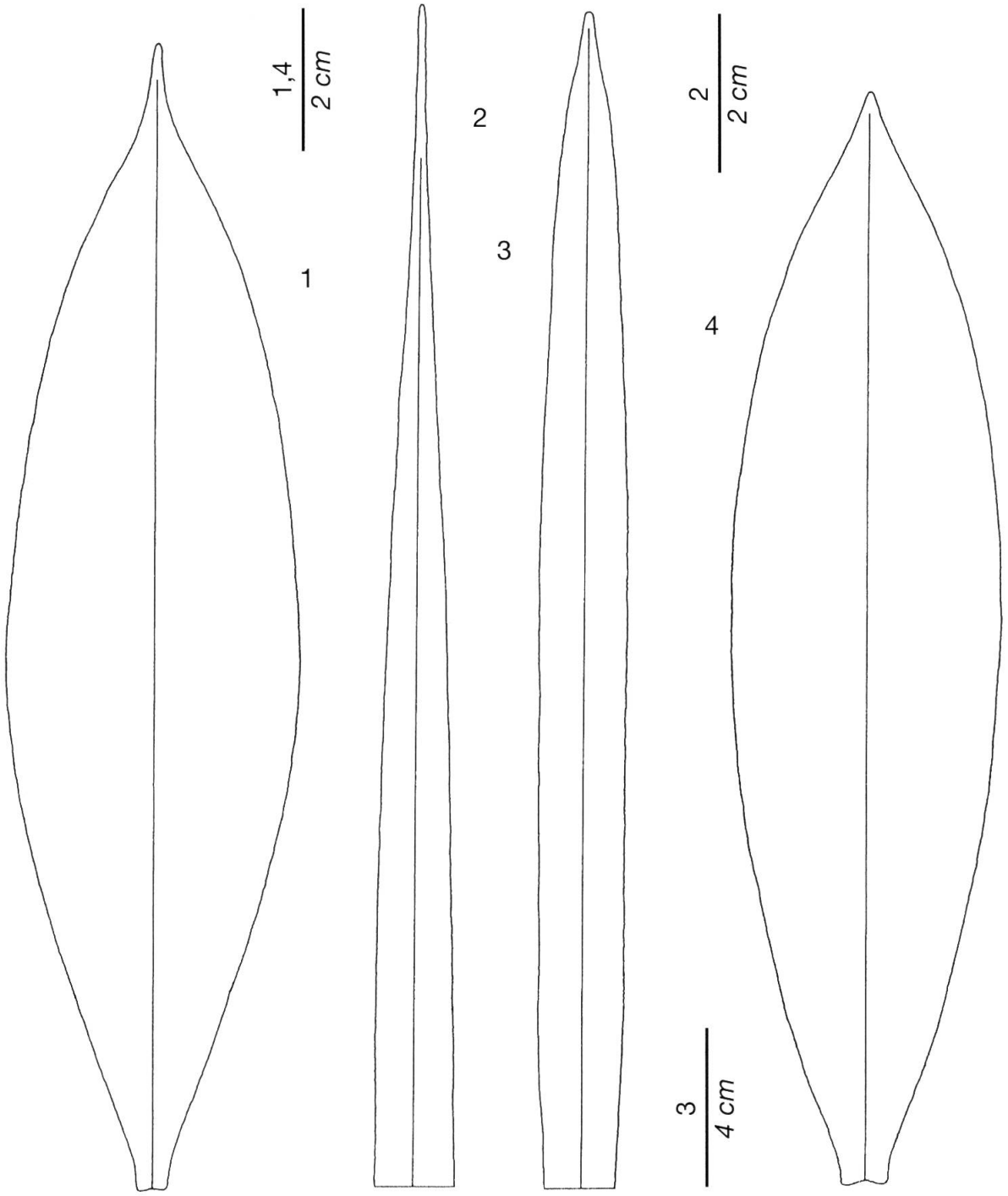

Fig. 1-4. – *Freycinetia delicata* Huynh [**1**: *McPherson 1699*, holotype], *F. involuta* Huynh [**2**: *Veillon 3336*, holotype], *F. subulata* Huynh [**3**: *MacKee 38714*, holotype], and *F. coriacea* Warb. [**4**: *McPherson 6028*].
1, 4: Leaves, flattened horizontally, viewed at the adaxial face (auricles not shown). **2, 3:** Upper part of leaves, flattened horizontally, viewed at the adaxial face.