

# The Genus *Freycinetia* (Pandanaaceae) in New Guinea : part 6

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# The Genus *Freycinetia* (Pandanaceae) in New Guinea (part 6)

KIM-LANG HUYNH

## ABSTRACT

HUYNH, K.-L. (2002). The Genus *Freycinetia* (Pandanaceae) in New Guinea (part 6). *Candollea* 57: 55-65. In English, French and English abstracts.

Eleven new species of *Freycinetia* Gaudich. from New Guinea are described: *F. angakumiana* Huynh, *F. bassa* Huynh, *F. bosaviensis* Huynh, *F. hagenicola* Huynh, *F. kuborensis* Huynh, *F. kutubuana* Huynh, *F. neoforbesii* Huynh, *F. oblonga* Huynh, *F. pluvisilvatica* Huynh, *F. pseudoangustissima* Huynh, *F. viriosa* Huynh. Specific characters from both gross morphology and the anatomy of fruit, seed, and leaf auricles are used for description. The author gives the correct spelling of the epithet *lalokiensis* for the name *F. lolokiensis* Huynh following the misspelling of the name of the river Laloki, New Guinea.

## RÉSUMÉ

HUYNH, K.-L. (2002). Le genre *Freycinetia* (Pandanaceae) en Nouvelle Guinée (6<sup>e</sup> partie). *Candollea* 57: 55-65. En anglais, résumés français et anglais.

Onze nouvelles espèces du genre *Freycinetia* Gaudich. sont décrites de la Nouvelle Guinée: *F. angakumiana* Huynh, *F. bassa* Huynh, *F. bosaviensis* Huynh, *F. hagenicola* Huynh, *F. kuborensis* Huynh, *F. kutubuana* Huynh, *F. neoforbesii* Huynh, *F. oblonga* Huynh, *F. pluvisilvatica* Huynh, *F. pseudoangustissima* Huynh, *F. viriosa* Huynh. 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. L'auteur corrige l'épithète du nom *F. lolokiensis* Huynh en *F. lalokiensis*, suite à une erreur de transcription du nom de la rivière Laloki, Nouvelle Guinée.

**KEY-WORDS:** *PANDANACEAE* – *Freycinetia* – New Guinea – Taxonomy.

## Introduction

The present paper describes other unknown species of *Freycinetia* Gaudich. recently observed in New Guinea. Specific characters from the anatomy of fruit, seed, and leaf auricles (see HUYNH, 2000: 283-284) are also used for description. They have proved useful in the taxonomy of the genus especially for distinguishing between closely related species (HUYNH, 1997, 1999, 2000, 2001).

## Observations

### 1. *Freycinetia pseudoangustissima* Huynh, **spec. nova** (sect. *Oligostigma*) (Fig. 1)

*Ramulus fructifer* 10 cm longus in axe; internodiis 5 mm longis, 1.5-2 mm crassis, laevibus, teretibus. *Folia infra infructescentiam* 10-12 cm longa, (2.5-) 3 mm lata in parte media 2 mm in basi (auriculis non inclusis), anguste lanceolata sed plerumque leviter curvata, 5 mm acuminata, superne ± imbricata, inferne dissita, in basi semimplexicaulia; in sicco brunneola, submembranacea, leviter striata in pagina adaxiali, plerumque in 1-4 cm infra apicem secus costam

mediam per paginam adaxialem valde/arte plicata; venis longitudinalibus utrinque leviter visibilibus sed plus in pagina abaxiali; venis transversalibus utrinque invisibilibus; marginibus armatis in 5-10 mm infra apicem solum, denticulis minutissimis; costa media armata in dimidio supero, interdum in 2/3 superis, denticulis usque ad 1 mm longis; auriculis conservatis in aliquot foliis superis, 13 mm longis, 2.5 mm latis, triangularibus, in apice adnatis, tenuiter armatis in dimidio supero, membranaceis, albidis vel leviter brunneolis, utrinque subnitidis, laevibus, in microscopio, cellulis epidermicis omnibus non lignosis, mesophyllo multis separatis longis 1-2-stratis filis fibrarum cum uno fasciculo vasorum praedito, lamina inter fila fibrarum non compressa. Infructescentia terminalis, monosyncarpica; syncarpio 1.3 cm longo, 0.8 cm lato, immaturo, breviter cylindrico, pedunculo 10 mm longo, 1.5 mm lato, laevi. Baccae sclerenchymate-centrali in pileo praeditae sed fibris destitutae; stigmatibus generaliter 2, areola stigmatica annulo destituta.

**Typus:** Irian Jaya, Idenburg River, 4 km SW of Bernhard Camp, alt. 850 m, III.1939, Brass 13642 (Holo-: L !) [rainforest of the river flood plains; abundant].

It was field-noted that the plant was a climbing shrub with slender radiating branches, ascending to 6-7 m. It was also in the area of Bernhard Camp that *F. erythrospatha* Merr. & L. M. Perry and *F. pleurantha* Merr. & L. M. Perry were first found (MERRILL & PERRY, 1940).

The anatomy of the leaf auricles of *F. pseudoangustissima* described above (epidermal cells all unligified; mesophyll with several long separate fibre-strands) suggests that they probably disintegrated into separate fibres. *Freycinetia pseudoangustissima* is noteworthy in that in dry state, its leaves are generally closely applied by the midnerve at the adaxial face along 1-4 cm beneath the apex, simulating an abrupt cauda of 1-4 cm. *Freycinetia pseudoangustissima* appears very close to *F. angustissima* Ridl. (Papua New Guinea), in particular in habit. This latter species differs from *F. pseudoangustissima* especially by its syncarp which is globose with a scabrid peduncle; in particular, its leaf auricles are free at the apex by 1/3 (HUYNH, 1999: 180, Fig. 5), a rare feature. *Freycinetia angustissima*, which had been described briefly by RIDLEY (1886), was re-described in HUYNH (1999) using its type.

## 2. *Freycinetia angakumiana* Huynh, spec. nova (sect. *Oligostigma*) (Fig. 2)

Ramuli fructiferi 7-8 cm longi in axe; internodiis 5 mm longis, 2.5 mm crassis, laevibus, teretibus. Folia infra infructescentiam (20-) 25-31 cm longa, 3-4 mm lata in medio, 2.5 mm in basi (auriculis non inclusis), anguste linearia, 2-3 mm acuminata, imbricata, in basi amplexicaulia; in sicco brunneola/viridula, membranacea, flexibilia, leviter revoluta in marginibus, utrinque striata; venis longitudinalibus distinctis in pagina abaxiali, vix visibilibus in adaxiali; venis transversalibus utrinque invisibilibus; marginibus armatis supra basim et infra apicem solum, denticulis inferne usque ad 0.5 mm longis, superne minutis; costa media armata in dimidio supero circiter; auriculis conservatis in aliquot foliis superis, 2.5 cm longis, 3 mm latis, triangularibus, in apice adnatis, fere ad basim armatis, membranaceis, albidis, impellucidis, nitidis in pagina adaxiali, tenuiter striatis, leviter nervatis, in microscopio, cellulis epidermicis omnibus non lignosis, mesophyllo contiguus longis 1-2 (-3-) stratis filis fibrarum unicam taeniam formantibus cum 2 fasciculis vasorum praedito, lamina non compressa. Infructescentia terminalis, monosyncarpica; syncarpio 1.2 cm longo, 1.2 cm lato, immaturo, globoso/subgloboso, pedunculo 1.5 cm longo, 2.5 mm lato, scabrido. Baccae sclerenchymate-centrali in pileo et fasciculis fibrarum fusiformibus/ellipticis praeditae; stigmatibus (1-) 2 (-3), areola stigmatica annulo distincto et nitido cincta.

**Typus:** Papua New Guinea, Aseki-Menyamya Road, 5 km from Aseki, 7°20'S 146°10'E, alt. 1550 m, 7.I.1972, Streimann & Stevens LAE 53879 (Holo-: L !) [secondary forest].

It was field-noted that the leaves were midgreen and the inflorescences single. Aseki (locality) is at 7°21'S 146°12'E, Menyamya (locality) at 7°13'S 146°01'E. The collecting site was at

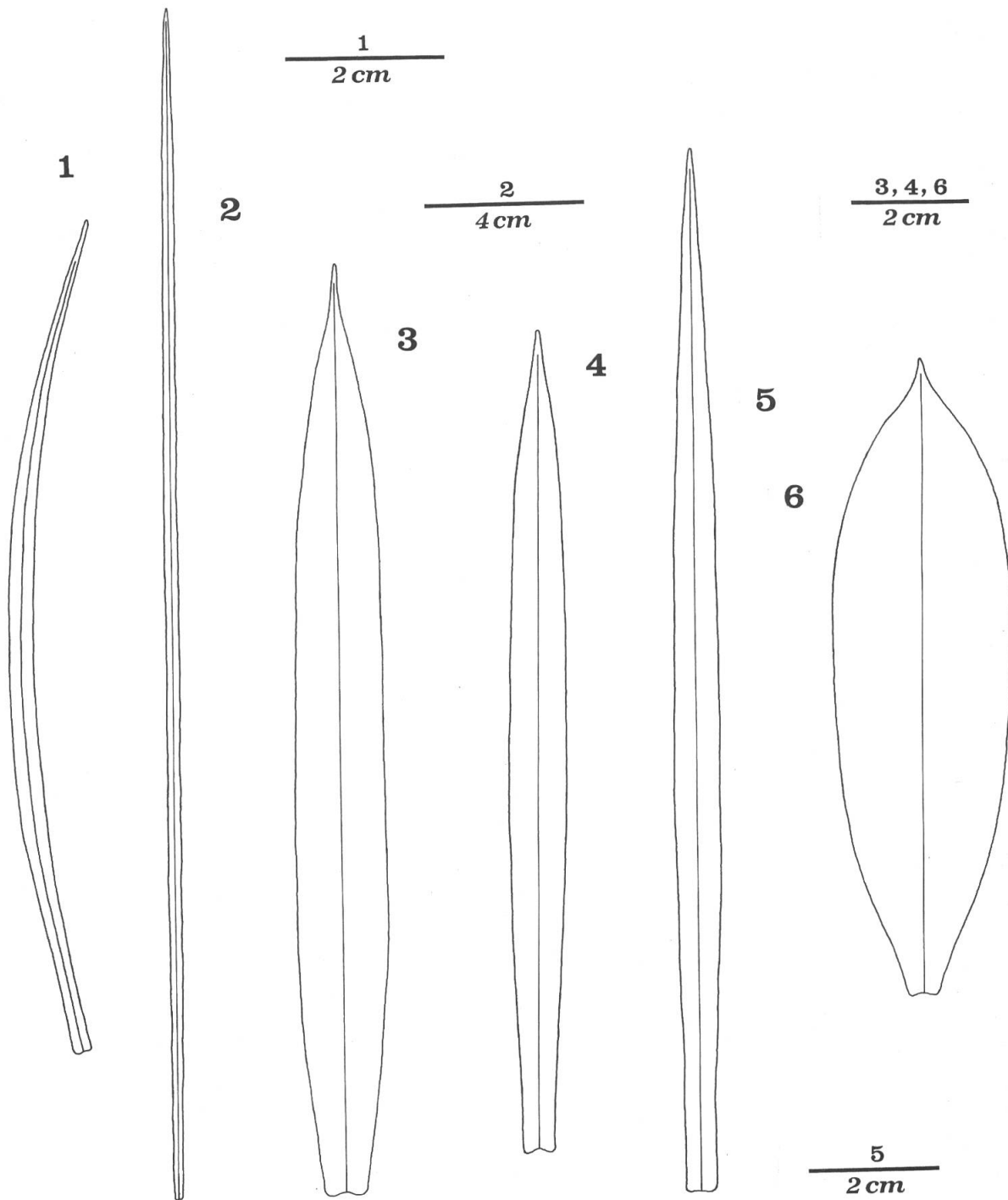


Fig. 1-6. – Leaves of *Freycinetia*, flattened horizontally, viewed by the adaxial face (auricles not shown): **1:** *F. pseudoangustissima* Huynh [Brass 13642]. **2:** *F. angakumiana* Huynh [Streimann & Stevens LAE 53879]. **3:** *F. kuborensis* Huynh [Vink 16580]. **4:** *F. hagenicola* Huynh [Womersley NGF 37494]. **5:** *F. kutubuana* Huynh [Jacobs 9163]. **6:** *F. pluvisilvatica* Huynh [Pullen 8232].

about 5 km west of the south-western borders of the Angakumia Ranges whose central position is at about 7°15'S 146°16'E.

The fact that the fibre strands in the leaf auricles of *F. angakumiana* form a single band across the auricle width, as described above, suggests that these probably did not disintegrate into separate fibres. *Freycinetia angakumiana* appears closest to *F. linearis* Merr. & L. M. Perry (Irian Jaya) which also belongs to sect. *Oligostigma*. This latter species differs from *F. angakumiana* especially by its infructescence which has 3-4 syncarps, its syncarps which are oblong (3 × 1 cm), and its leaves which are subcoriaceous, with margins unarmed or armed only in the apical part (MERRILL & PERRY, 1940: 164).

### 3. *Freycinetia kuborensis* Huynh, **spec. nova** (sect. *Oligostigma*) (Fig. 3)

*Ramulus fructifer partim conservatus, reliquo axe 32 cm longo; internodiis 2 cm longis, 5 mm crassis, laevibus, teretibus. Folia infra infructescentiam 15-17 cm longa, 1.5 cm lata in medio 8 mm in basi (auriculis non inclusis), oblongo-lanceolata, 3 mm acuminata, dissita, in basi semiamplexicaulia; in sicco brunnea/brunneola, subcoriacea, striata in pagina adaxiali, patentia; venis longitudinalibus utrinque invisibilibus vel obscuris; venis transversalibus utrinque invisibilibus; marginibus armatis in brevissimo spatio infra apicem solum, denticulis usque ad 0.5 mm longis; costa media armata in 1/4-1/3 supera, denticulis sparsis, longioribus quam marginalibus proximis; auriculis conservatis in aliquot foliis superis, 4 cm longis, 5 mm latis, triangularibus, in apice adnatis, membranaceis, ± atrobrunneis, non nitidis, dense fibrosis, in separatis fibris solutis, in microscopio, cellulis epidermicis omnibus non lignosis, mesophyllo multis longis multi-stratis separatis sed artis filis fibrarum cum 2 fasciculis vasorum praedito, lamina inter fila fibrarum leviter compressa. Infructescentia terminalis, 3-4 spicis praedita, pedunculo communi 3 cm longo; syncarpiis 1.1 cm longis, 0.7 cm latis, immaturis, elliptico-cylindricis, pedunculis 2 cm longis, 2.5 mm latis, scabridis. Baccae sclerenchymate-centrali fibrisque destitutae; stigmatibus 2 (-3), arte aggregatis igitur indistinctis, areola stigmatica annulo destituta.*

**Typus:** Papua New Guinea, Nona-Minj Divide, Kubor Range, Uinba, alt. 2000 m, VIII.1963, *Vink 16580* (Holo-: L !) [depleted primary forest].

Kubor Range extends from 6°00'S 144°24'E to 6°15'S 144°40'E.

Since the stigmas of *F. kuborensis* are indistinct, their numbers on berries were determined by observing the numbers of fertilization canals in the transverse sections of pilei, each fertilization canal corresponding to one stigma (see HUYNH, 2000: 284). The anatomy of the leaf auricles described above (epidermal cells all unligified; mesophyll with several long separate fibre-strands) accounts for their disintegration into separate fibres. Apparently *F. kuborensis* has no very closely related species among those which have been described.

### 4. *Freycinetia hagenicola* Huynh, **spec. nova** (sect. *Oligostigma*) (Fig. 4)

*Ramulus fructifer partim conservatus, reliquo axe 30 cm longo; internodiis 2 cm longis, 5 mm crassis, laevibus, teretibus. Folia infra infructescentiam (8-) 13-14 cm longa, 0.9-1 cm lata in medio 5 mm in basi (auriculis non inclusis), lanceolata, 3-4 mm acuminata, dissita, in basi semiamplexicaulia; in sicco brunnea, subcoriacea, perspicue striata in pagina adaxiali, tenuiter striata in abaxiali, patentia; venis longitudinalibus utrinque invisibilibus vel obscuris; venis transversalibus utrinque invisibilibus; marginibus armatis in brevissimo spatio infra apicem solum, denticulis usque ad 0.5 mm longis; costa media armata in 1/3 supera circiter, denticulis usque ad 1 mm longis; auriculis conservatis in aliquot foliis superis, 3 cm longis, 4 mm latis, triangularibus, in apice adnatis, membranaceis, brunneolis, non nitidis, dense fibrosis, in separatis fibris solutis, in microscopio, cellulis epidermicis omnibus non lignosis, mesophyllo multis artis longis crassis 8-9-stratis filis fibrarum cum minimum uno fasciculo vasorum praedito, lamina inter fila fibrarum leviter compressa. Infructescentia terminalis, 3 spicis praedita,*

*pedunculo communi 5 mm longo; syncarpiis 4 cm longis, 2.2 cm latis, maturis, cylindricis, pedunculis 15 mm longis, 2.5 mm latis, scabridis. Baccae sclerenchymate-centrali fibrisque destitutae; stigmatibus 2 (-3-4), indistinctis, areola stigmatica annulo destituta. Semina 1.8 mm longa, 0.4 mm lata in medio, plerumque recta; "strophiole" indistincto; raphe 0.1 mm lata, cellululis raphidiphoris praedita sed crystalliferis destituta.*

**Typus:** Papua New Guinea, Alipe Mendaka, north-east slopes of Mt. Giluwe, 4 miles from Tambul, 6°00'S 144°00'E, alt. 8000 ft, 11.IV.1969, *Womersley NGF 37494* (Holo-: L !; iso-: LAE !) [understorey of submontane forest].

It was field-noted that the plant was a sprawling liana, 4 ft high, with medium green leaves. Tambul (locality) is at 5°53'S 143°57'E. The specimen was collected in the area of Mt. Hagen, whose central position is at about 5°44'S 144°02'E.

Since the stigmas of *F. hagenicola* are indistinct, their numbers on berries were determined by observing the numbers of fertilization canals in the transverse sections of pilei (see HUYNH, 2000: 284). The anatomy of the leaf auricles described above (epidermal cells all unligified; mesophyll with several long separate fibre-strands) accounts for their disintegration into separate fibres.

*Freycinetia hagenicola* appears very close to *F. kuborensis* described above. It differs from this latter species especially by its leaves which do not exceed 1 cm in width, and its infructescence peduncle which is not longer than 0.5 cm. In *F. kuborensis*, the leaves are of ± the same length but one time and a half as wide (Fig. 3: compare with Fig. 4), and the infructescence peduncle is 3 cm long.

##### 5. *Freycinetia kutubuana* Huynh, **spec. nova** (sect. *Oligostigma*) (Fig. 5)

*Ramuli fructiferi 10-23 cm longi in axe; internodiis 12 mm longis, 2 mm crassis, laevibus, teretibus. Folia infra infructescentiam (13-) 18-20 (-22) cm longa, (4-) 6-7 mm lata in parte media 5 mm in basi (auriculis non inclusis), anguste sublanceolata, 3 mm acuminata, superne imbricata, inferne dissita, in basi semiamplexicaulia; in sicco viridula vel leviter brunneola, membranacea, flexibilia, utrinque striata, patentia; venis longitudinalibus distinctis in pagina abaxiali, minus in adaxiali; venis transversalibus utrinque invisibilibus; marginibus armatis in 5-15 mm infra apicem solum, raro cum 1-2 denticulis prope basim, denticulis usque ad 0.5 mm longis; costa media armata in dimidio supero, denticulis usque ad 1 mm longis; auriculis plerumque conservatis, 18 mm longis, 2.5 mm latis, in apice adnatis subtruncatisque, fere ad basim armatis, membranaceis, pallide brunneolis, subnitidis, dense tenuiter fibrosis, pagina abaxiali ab adaxiali fere omnino separata, in microscopio, cellululis epidermicis non lignosis in una pagina sed lignosis in altera, mesophyllo multis separatis longis filis fibrarum cum minimum uno fasciculo vasorum praedito, lamina inter fila fibrarum non compressa. Infructescentia terminalis, monosyncarpica; syncarpio 1.8 cm longo, 1.2 cm lato, immaturo, elliptico, pedunculo 15 mm longo, 1.3 mm lato, laevi. Baccae sclerenchymate-centrali in pileo praeditae sed fibris destitutae; stigmatibus generaliter 2, arte aggregatis igitur indistinctis vel vix visibilibus, areola stigmatica annulo destituta.*

**Typus:** Papua New Guinea, near Waro airstrip 20 km SSW of Kutubu, 6°31'S 143°10'E, alt. 500-600 m, 12.X.1973, *Jacobs 9163* (Holo-: L !; iso-: LAE !) [limestone country, primary forest 30-35 m high, on well-weathered soil].

Since the stigmas of *F. kutubuana* are indistinct or hardly visible, their numbers on berries were determined by observing the numbers of fertilization canals in the transverse sections of pilei (see HUYNH, 2000: 284). The fact that the leaf auricles have a lignified epidermis, as described above, suggests that they will probably not disintegrate into separate fibres.

*Freycinetia kutubuana* appears closest to *F. pauperata* Huynh (Papua New Guinea) which also belongs to sect. *Oligostigma*. This latter species differs from *F. kutubuana* especially by its stigmas which have a ring around the stigmatic areola, its leaves which are of the same length

but half as wide (17-22 × 0.3-0.4 cm), and its berries which have fusiform/elliptic fibre-bundles (HUYNH, 1999: 160-161).

**6. *Freycinetia pluvisilvatica* Huynh, spec. nova (sect. *Oligostigma*) (Fig. 6)**

*Ramulus fructifer partim conservatus, reliquo axe 30 cm longo; internodiis 1-1.5 cm longis, 5 mm crassis, laevibus, teretibus. Folia infra infructescentiam 11-12 cm longa, 2.5-3 cm lata in medio 6-8 mm in basi (auriculis non inclusis), lanceolata, 2 mm acuminata, dissita, in basi semiamplexicaulia; in sicco brunnea, subcoriacea/submembranacea, leviter tessellata in pagina abaxiali, utrinque striata, patentia, acumine secus costam mediam per paginam adaxialem interdum plicato; venis longitudinalibus visibilibus in pagina abaxiali, partim in adaxiali; venis transversalibus visibilibus in pagina abaxiali, invisibilibus in adaxiali; costa media marginibusque armatis in brevissimo spatio infra apicem solum, denticulis usque ad 0.5 mm longis; auriculis conservatis in aliquot foliis superis, 2 cm longis, 5 mm latis, membranaceis, brunneis, non nitidis, dense fibrosis, in separatis fibris solutis, in microscopio, cellulis epidermicis omnibus non lignosis, mesophyllo multis longis multi-stratis separatis sed artis filis fibrarum cum 2 fasciculis vasorum praedito, lamina inter fila fibrarum leviter compressa. Infructescentia terminalis, 3 spicis praedita, pedunculo communi 8 mm longo; syncarpiis 4 cm longis, 2.3 cm latis, maturis, cylindricis, pedunculis 1.5 cm longis, 2.5 mm latis, laevibus. Baccae 5 mm longae, sclerenchymate-centrali subdistincto in pileo praeditae sed fibris destitutae; stigmatibus 2-3, arte aggregatis igitur indistinctis, areola stigmatica annulo destituta. Semina 1.5 mm longa, 0.8 mm lata in medio, recta, interdum leviter curvata; "strophiole" distincto, ca. 1/6 latitudinis seminis lato; raphe ca. 1/2 latitudinis seminis lata, cellulis raphidiphoris praedita sed crystalliferis destituta.*

**Typus:** Papua New Guinea, Mori River, Yanu Road, ca. 15 km NE of Cape Rodney, 10°04'S 148°32'E, alt. ca. 30 m, 8.IX.1969, Pullen 8232 (Holo-: L !) [rainforest on gently undulating terrain].

Since the stigmas of *F. pluvisilvatica* are indistinct, their numbers on berries were determined by observing the numbers of fertilization canals in the transverse sections of pilei (see HUYNH, 2000: 284). The anatomy of the leaf auricles described above (epidermal cells all unligified; mesophyll with several long separate fibre-strands) accounts for their disintegration into separate fibres.

It is not easy to determine whether *F. pluvisilvatica* belongs to sect. *Oligostigma* or *Pleio stigma*. Its berries have two or three stigmas but it is not possible to establish which type is predominant. On the whole, they give the impression that most of them have two stigmas, therefore the species is placed in sect. *Oligostigma*. *Freycinetia pluvisilvatica* appears closest to *F. glomerosa* Huynh (Papua New Guinea). This latter species differs from *F. pluvisilvatica* especially by its syncarps which are globose, its berries which generally have one stigma, its seeds where the "strophiole" is thicker than the raphe, and its leaves which are chartaceous (HUYNH, 1999: 165). *Freycinetia pluvisilvatica* is noteworthy by its raphe which is up to about half the width of the seed.

**7. *Freycinetia bassa* Huynh, spec. nova (sect. *Pleio stigma*) (Fig. 7)**

*Ramulus fructifer partim conservatus, reliquo axe 21 cm longo; internodiis 1.5 cm longis, 5.5 mm crassis, laevibus, teretibus. Folia infra infructescentiam 12-13 cm longa, 1.7-2 (-2.1) cm lata in medio 4-5 mm in basi (auriculis non inclusis), lanceolata, 2 mm acuminata, dissita, in basi semiamplexicaulia; in sicco brunneola, submembranacea, utrinque striata, patentia; venis longitudinalibus perspicuis in pagina abaxiali, invisibilibus vel obscuris in adaxiali; venis transversalibus invisibilibus in pagina adaxiali, interdum visibilibus supra basim in abaxiali; costa media marginibusque armatis in brevissimo spatio infra apicem solum, denticulis usque ad 0.5 mm longis; auriculis conservatis in aliquot foliis, 3 cm longis, 4 mm latis, membranaceis, brunneis, non nitidis, dense fibrosis, in separatis fibris solutis, in microscopio, cellulis epidermi-*

*cis omnibus non lignosis, mesophyllo multis longis multi-stratis separatis sed plerumque artis filis fibrarum cum 2 fasciculis vasorum praedito, lamina inter fila fibrarum leviter compressa. Infructescentia terminalis, 4 spicis praedita, pedunculo communi 1 cm longo; syncarpiis 6 cm longis, 2.5 cm latis, maturis, cylindricis, pedunculis 2 cm longis, 3 mm latis, laevibus. Baccae 8 mm longae, sclerenchymate-centrali fibrisque destitutae; stigmatibus 2-3 (-5), areola stigmatica annulo angusto sed distincto nitido cincta. Semina 1.3 mm longa, 0.75 mm lata in medio, ± recta; “strophiole” distincto, 0.10 mm lato; endospermio 0.33 mm lato; raphe 0.32 mm lata, cellulis raphidiphoris praedita sed crystalliferis destituta.*

**Typus:** Papua New Guinea, Cape Rodney, 10°07'S 148°18'E, alt. 200 ft, 21.VI.1968, *Henty NGF 38568* (Holo-: L !) [forest on hilly country, grey-brown heavy soil].

It was field-noted that the fruit was red. The collecting site was very near the sea shore, as seen on map.

*Freycinetia bassa* is named in reference to its habitat at low altitude. The anatomy of the leaf auricles described above (epidermal cells all unlignified; mesophyll with several long separate fibre-strands) accounts for their disintegration into separate fibres.

It is not easy to determine whether *F. bassa* belongs to sect. *Oligostigma* or *Pleio stigma*. Berries with two stigmas are the most frequent, but three stigmas are also frequent, while berries with four or five stigmas are also observed, therefore the species is placed in sect. *Pleio stigma*. Apparently *F. bassa* has no very closely related species among those which have been described. It shows some resemblance with *F. setosa* Huynh and *F. glaucifolia* Huynh (Papua New Guinea). These two species differ from *F. bassa* especially by their syncarp peduncles which are scabrid, and their berries which have a central sclerenchyma (HUYNH, 1999: 171-172).

## 8. *Freycinetia bosaviensis* Huynh, **spec. nova** (sect. *Pleio stigma*) (Fig. 8)

*Ramulus fructifer partim conservatus, reliquo axe 27 cm longo; internodiis 1 cm longis, 6 mm crassis, laevibus, trigonis. Folia infra infructescentiam 19-21 cm longa, 2.5-2.7 cm lata in medio 1 cm in basi (auriculis non inclusis), lanceolata, 4-5 mm acuminata, dissita, in basi semiamplexicaulia; in sicco brunneola, subcoriacea, striata in pagina adaxiali, patentia; venis longitudinalibus invisibilibus in pagina adaxiali, invisibilibus vel obscuris in abaxiali; venis transversalibus utrinque invisibilibus; marginibus armatis in brevissimo spatio infra apicem solum, denticulis minutissimis; costa media armata in 1/4-1/3 supera, denticulis minutissimis, inferne sparsis; auriculis conservatis in aliquot foliis superis, 5-6 cm longis, 5 mm latis, triangularibus, in apice adnatis, membranaceis, brunneis, nervatis, utrinque non nitidis et dense fibrosis, in microscopio, cellulis epidermicis omnibus non lignosis, cellulis hypodermicis non lignosis in una pagina sed lignosis in uno strato in altera, mesophyllo longis separatis filis fibrarum cum fasciculis vasorum praedito, lamina non compressa. Infructescentia terminalis, 4 spicis praedita, pedunculo communi 7 mm longo; syncarpiis 3 cm longis, 1.5 cm latis, immaturis, subcylindricis, pedunculis 2.2 cm longis, 3.5 mm latis, laevibus. Baccae sclerenchymate-centrali in pileo praeditae sed fibris destitutae; stigmatibus (2-) 4-5 (-6), plerumque indistinctis, areola stigmatica annulo destituta.*

**Typus:** Papua New Guinea, Mount Bosavi, northern side, NW of mission station, ca. 6°26'S 142°50'E, alt. 600-700 m, 8.X.1973, *Jacobs 9087B* (Holo-: LAE !) [primary forest, locally disturbed, old well-drained volcanic soil].

The central position of Mount Bosavi is at about 6°36'S 142°50'E. The “mission station” is the Ludesa mission. It was field-noted that two specimens were collected both from plants whose fruits turned orange when ripe: *Jacobs 9087A* (not seen), from a shady place, leaves dark green; *Jacobs 9087B*, from an open place, leaves light green.

Since the stigmas of *F. bosaviensis* are generally indistinct, their numbers on berries were determined by observing the numbers of fertilization canals in the transverse sections of pilei (see HUYNH, 2000: 284). The fact that the leaf auricles have a lignified hypodermis, as described



above, suggests that they probably did not disintegrate into separate fibres. *Freycinetia bosaviensis* appears very close to *F. glaucifolia* (Papua New Guinea). This latter species differs from *F. bosaviensis* especially by its syncarp peduncles which are scabrid, its stigmas which have a ring around the stigmatic areola, and its leaf margins which are armed along the apex and in the lower half (HUYNH, 1999: 172).

**9. *Freycinetia neoforbesii* Huynh, spec. nova (sect. *Pleiostigma*) (Fig. 9)**

*Ramulus fructifer 6 cm longus in axe, cum foliis 7-13 cm longis 3-5 mm latis in dimidio supero, abrupte multo latoribus in infero 13 cm longis 1.3 cm latis. Internodia in ramulis fructiferis 3-4 mm longa, 2.5 mm crassa, non vel vix granulata; infra, in ramis, 5-10 mm longa, 4.5-5 mm crassa, dense perspicue granulata, trigona. Folia lanceolata, dissita, in basi semiamplexicaulia; in ramis 12-14 cm longa, 1.2-1.4 cm lata in medio 6 mm in basi (auriculis non inclusis), 3-4 mm acuminata; in sicco peratrobrunnea, nigricantes, subcoriacea/submembranacea, striata in pagina adaxiali, patentia; venis longitudinalibus perspicuis in pagina abaxiali, visibi-*

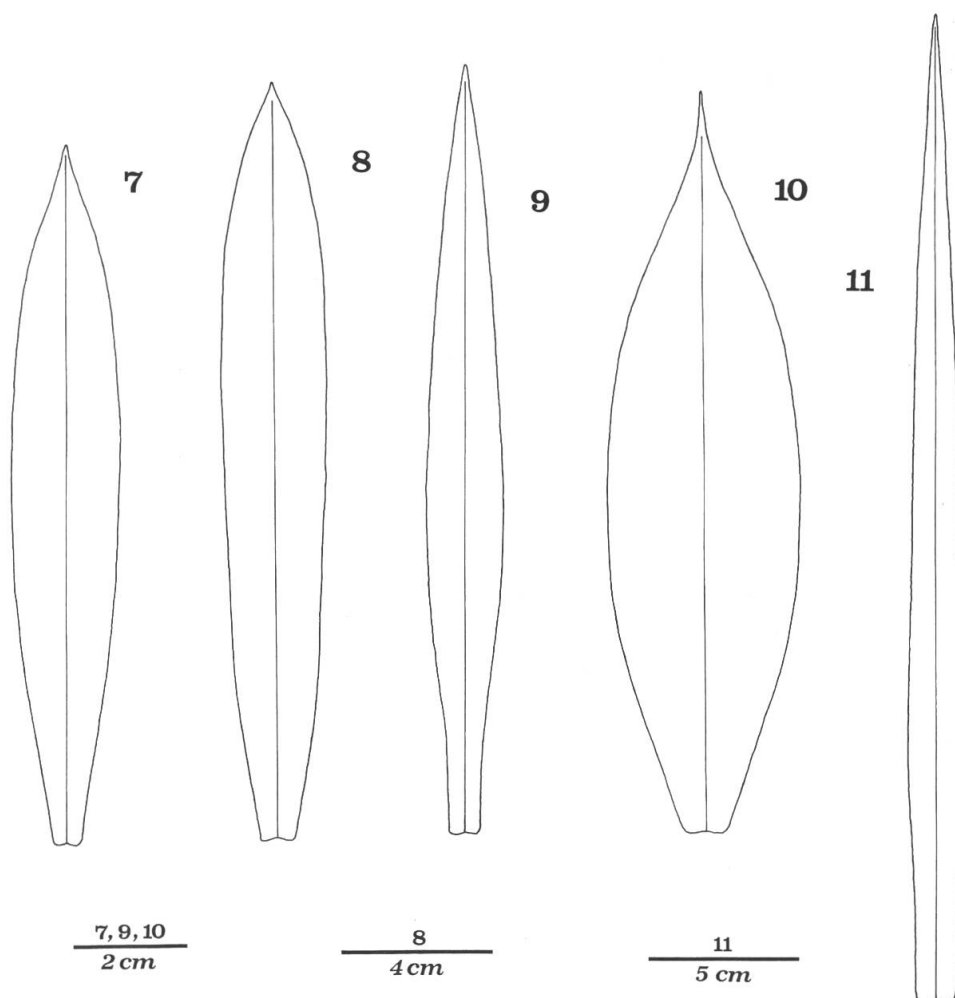


Fig. 7-11. – Leaves of *Freycinetia*, flattened horizontally, viewed by the adaxial face (auricles not shown): **7:** *F. bassa* Huynh [*Henty NGF 38568*]. **8:** *F. bosaviensis* Huynh [*Jacobs 9087B*]. **9:** *F. neoforbesii* Huynh [*Streimann NGF 45155*]. **10:** *F. oblonga* Huynh [*Streimann LAE 51997*]. **11:** *F. viriosa* Huynh [*Jacobs s.n.*].

libus in adaxiali; venis transversalibus partim visibilibus in pagina abaxiali, invisibilibus in adaxiali; marginibus armatis in brevi spatio infra apicem et supra basim solum, denticulis usque ad 1/3 mm longis; costa media armata in 1/4-1/3 supera circiter; in spatio longiore quam marginibus; auriculis partim conservatis in aliquot foliis superis, 1.5-1.8 cm longis, 4 mm latis, ut videtur adnatis in apice et armatis fere ad basim, membranaceis, brunneolis, laevibus, nitidis, impellucidis, in microscopio, cellulis epidermicis non lignosis in una pagina sed plerumque lignosis in altera, mesophyllo 2 fasciculis vasorum praedito sed filis fibrarum destituto, lamina non compressa. Infructescentia terminalis, 2 spicis praedita, pedunculo communi 5 mm longo; syncarpiis 1 cm longis, 1 cm latis, immaturis, globosis, pedunculis 1 cm longis, 2 mm latis, laevibus. Baccae sclerenchymate-centrali in pileo praeditae sed fibris destitutae; stigmatibus 3 (-4), areola stigmatica annulo angusto sed distincto nitido cincta.

**Typus:** Papua New Guinea, Buso, 7°25'S 147°10'E, alt. sea level, 17.VIII.1970, *Streimann NGF 45155* (Holo-: L !) [beach forest].

It was field-noted that the plant was a climber on *Pentaphalangium* and had dull green leaves.

The fact that the leaf auricles of *F. neoforbesii* do not have separate fibre strands in the mesophyll, as described above, suggests that they probably did not disintegrate into separate shreds.

*Freycinetia neoforbesii* appears closest to *F. forbesii* Ridl. (Papua New Guinea), considering their granular stem, their leaves of  $\pm$  the same size, and in particular their fertile branchlets which have two sorts of leaves (HUYNH, 2000: Fig. 23), the lower leaves differing abruptly in shape and size from the upper leaves, which is a feature observed in these two species only. *Freycinetia forbesii* (see HUYNH, 2000: 294) differs from *F. neoforbesii* by the following characters. (1) Its leaves in dry state are rather chartaceous, in any case less rigid. (2) The margins of its leaves are armed in the apical part only, and the auricles are 1.1 cm long. (3) Its infructescence comprises four syncarps, and these are elliptic pyramidal, in no case globose. (4) Its berries generally have two stigmas, for which reason it belongs to sect. *Oligostigma*; in addition, they do not have a central sclerenchyma. (5) The internodes on its fertile branchlets are up to 20 mm long, and they are densely granular; in *F. neoforbesii*, these internodes do not exceed 4 mm, and they are not or only slightly granular. (6) The leaves along its fertile branchlets show an abrupt transition in both width and length, the upper leaves being 4.5-8  $\times$  0.4 cm, the lower 15-16  $\times$  1.5-1.8 cm; in *F. neoforbesii*, the transition is abrupt for the width but progressive for the length, the upper leaves being 7-13  $\times$  0.3-0.5 cm, the lower 13  $\times$  1.3 cm. (7) Finally, its leaves which were collected on 27 January 1886 are dark greenish, and it appears impossible that they will turn very dark brown like those of *F. neoforbesii*. Furthermore, *F. forbesii* has a montane area (RIDLEY, 1886) while *F. neoforbesii* is a lowland species: this difference in habitat also, may suggest that the latter species is different from the former.

#### 10. *Freycinetia oblonga* Huynh, *spec. nova* (sect. *Pleiostigma*) (Fig. 10)

*Ramulus fructifer partim conservatus, reliquo axe 17 cm longo; internodiis 2 cm longis, 5 mm crassis, laevibus,  $\pm$  teretibus. Folia infra infructescentiam (10-) 12-13 cm longa, (2.5-) 3.5 cm lata in medio 7-8 mm in basi (auriculis non inclusis), lanceolata, 5-7 mm acuminata, perspicue dissita, in basi semiamplexicaulia; in sicco viridula, membranacea, perspicue tessellata in pagina abaxiali, partim sed striata in adaxiali, patentia; venis longitudinalibus perspicuis in pagina abaxiali, visibilibus in adaxiali; venis transversalibus distinctis in pagina abaxiali, partim visibilibus in adaxiali; marginibus armatis in brevissimo spatio infra apicem solum, denticulis usque ad 1/4 mm longis; costa media inermi vel armata in brevissimo spatio infra apicem; auriculis partim conservatis in aliquot foliis superis, 2.5 cm longis, brunneis, non nitidis, dense fibrosis, in separatis fibris solutis, in microscopio, cellulis epidermicis omnibus non lignosis, mesophyllo longis 2-4-stratis separatis filis fibrarum cum minimum uno fasciculo vasorum praedito. Infructescentia terminalis, 3 spicis praedita, pedunculo communi 1 cm longo; syncar-*

*piis 6 cm longis, 1.6 cm latis, submaturis, oblongo-cylindricis, pedunculis 1.5 cm longis, 3 mm latis, laevibus. Baccae sclerenchymate-centrali fibrisque destitutae; stigmatibus (3-) 5-6, areola stigmatica annulo destituta. Semina submatura; "strophiole" indistincto; raphe cellulis raphidiphoris praedita sed crystalliferis destituta.*

**Typus:** Papua New Guinea, Aseki-Koki Road, 7°20'S 146°10'E, alt. 1200 m, 9.I.1972, Streimann LAE 51997 (Holo-: L !) [disturbed poor forest].

It was field-noted that the fruit was red and the leaves were dull dark green above, green below. Aseki (locality) is at 7°21'S 146°12'E. The collecting site is near the Angakumia Ranges (central position at about 7°15'S 146°16'E) and west of the Ekuti Dividing Range (central position at about 7°23'S 146°28'E).

*Freycinetia oblonga* is named in reference to its syncarps. The anatomy of the leaf auricles described above (epidermal cells all unligified; mesophyll with several long separate fibre-strands) accounts for their disintegration into separate fibres. Apparently *F. oblonga* has no very closely related species among those which have been described.

#### 11. *Freycinetia viriosa* Huynh, spec. nova (sect. *Pleiostigma*) (Fig. 11)

*Ramulus fructifer 26 cm longus in axe; internodiis 2.5 cm longis, 1 cm crassis, laevibus, teretibus. Folia infra infructescentiam 25-30 (-33) cm longa, 1.3-1.5 (-2) cm lata in parte infera 1-1.2 cm in basi (auriculis non inclusis), ensiformia, acuta et 2-3 mm acuminata, imbricata, in basi amplexicaulia; in sicco brunnea, coriacea, perspicue carinata infra apicem, utrinque non striata, patentia; venis longitudinalibus leviter visibilibus in pagina abaxiali, invisibilibus in adaxiali; venis transversalibus utrinque invisibilibus; marginibus armatis in brevi spatio infra apicem solum, interdum supra basim etiam, denticulis usque ad 1 mm longis; costa media armata in dimidio supero circiter, inferne sparsim; auriculis plerumque partim conservatis, 5-6 cm longis, 8-10 mm latis, in apice adnatis subrotundatis, armatis minimum in parte supera, subcoriaceis, brunneis/brunneolis, non nitidis, fibrosis, in separatis fibris solutis, in microscopio, cellulis epidermicis omnibus non lignosis, mesophyllo multis separatis longis filis fibrarum cum aliquot fasciculis vasorum praedito, lamina inter fila fibrarum leviter compressa. Infructescentia terminalis, 3 spicis praedita, pedunculo communi 1.5 cm longo; syncarpiis 5 cm longis, 2.5 cm latis, maturis, ± cylindricis, pedunculis 2-2.5 cm longis, 4 mm latis, laevibus. Baccae 5 mm longae, sclerenchymate-centrali in pileo praeditae sed fibris destitutae; stigmatibus (2-) 4-5 (-7-10), areola stigmatica annulo perspicuo nitido cincta; pileo 2 mm longo, late pyramidali. Semina 1.2 mm longa, 0.5 mm lata in medio, recta sed plano-convexa; "strophiole" distincto, 0.10 mm lato; endospermio 0.30 mm lato; raphe distincta, 0.10 mm lata, cellulis raphidiphoris praedita sed crystalliferis destituta.*

**Typus:** Papua New Guinea, south-east of Lae on the coast, opposite Lasanga Island, Baden Bay, 7°25'S 147°10'E, alt. sea level, 17.XI.1973, Jacobs s.n. (Holo-: L !) [primary forest depleted, with secondary growth].

This is the only specimen of *Freycinetia* collected by Jacobs on 17 November 1973. Although it has no collector number, the date may help to recognize it.

*Freycinetia viriosa* is named in reference to the impression of force given by its leaves, in particular by its prophylls. The anatomy of the leaf auricles described above (epidermal cells all unligified; mesophyll with several long separate fibre-strands) accounts for their disintegration into separate fibres. Apparently *F. viriosa* has no very closely related species among those which have been described.

**12. Freycinetia lalokiensis** (*lolokiensis*, sphalm.) Huynh in Bot. Jahrb. Syst. 121: 158. 1999 (sect. *Oligostigma*)

Laloki river, the type locality, was misspelled as \*Loloki" in HUYNH (1999: 158). It passes by Sogeri, which is at 9°25'30"S 147°25'40"E.

**New material:** Papua New Guinea, ca. 4-5 miles west of Sogeri, Rouna Falls, Laloki river, alt. 1300 ft, 7.IX.1962, *Schodde 2943* (L !); Papua New Guinea, above Boridi village, 9°05'S 147°38'E, alt. 1280 m, 28.IX.1973, *Foreman & Vinas LAE 60085* (L !).

Four infructescences are observed in *Schodde 2943*, two in *LAE 60085*. All six infructescences are terminal and have two syncarps: this corroborates the fact that the infructescence of this species has two syncarps as described (HUYNH, 1999: 159). In *Freycinetia*, the infructescences generally have one or three syncarps.

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