

## A new species of *Freycinetia* Gaudich (*Pandanaceae*) from West Kalimantan, Indonesia

Fitri Sri Rizki,<sup>1</sup> Tatik Chikmawati,<sup>1</sup> T. Rugayah<sup>2</sup>

<sup>1</sup>Department of Biology, Faculty of Mathematics and Natural Sciences, Bogor Agricultural University; <sup>2</sup>Herbarium Bogoriense, Botany Division, Research Center For Biology, Indonesian Institute of Sciences, Bogor, Indonesia

### Abstract

A new species *Freycinetia sessiliflora* Rizki & Rugayah is described and illustrated based on specimen character from Mount Nyiut-Sambas, West Kalimantan (Indonesia). The species is differed from others by having sessile pedicellus, concave cylindrical of inner bracts and bright red bracts.

### Introduction

*Freycinetia* Gaudich (*Pandanaceae*) is mostly distributed in the region of Malesia, particularly in Borneo, Celebes, Papua and Sumatra. The genus comprises approximately 200-300 species all over the world; about 150 species found in Indonesia.<sup>1</sup> *Freycinetia* was first described by the French botanist Gaudichaud in 1824. Along with *Pandanus*, *Sararanga*, *Martelidendron*, and *Benstoniana* were classified into *Pandanaceae* family.<sup>2,3</sup>

Bornean *Freycinetia* has seen thoroughly studied by Stone in 1970.<sup>4</sup> He described 24 species, and 11 species of them were reported as endemic to Borneo. Those species account mostly from N. Borneo (Sabah and Sarawak), only 13 species occur in Kalimantan. It is indicated that, Kalimantan is still under collected for *Pandanaceae*.

In 2006, several field studies have conducted in Kalimantan (Bukit-Baka-Bukit Raya National Park and Sebangau National Park). Three new species of *Freycinetia* have discovered by Keim (2009), namely *F. kartawinatae* Keim, *F. runcingensis* Keim, and *F. subracemosa* Keim in Kalimantan based on the recent collection and the herbarium specimens deposited in Herbarium Bogoriense.<sup>5,6</sup>

In 2013, there were conducted exploration of *Pandanaceae* in Mount Nyiut-Sambas, West Kalimantan. The Mt. Nyiut has wet tropical forest with moderate to steep topography and the highest area is 1701 m asl. From the exploration, 7 species *Freycinetia* were found, one of them is suspected as a new species namely *Freycinetia sessiliflora* Rizki & Rugayah. It has pectinate spinulose auricle similar to *F. rigidifolia* and *F. pectinata*, but it differs in its auricle apex, leaf and other generative characters. After comparing to the herbarium specimens deposited in Herbarium Bogoriense and a loan specimen from Rijksherbarium Leiden, we concluded this taxon as a new species.

### Results

#### *Freycinetia sessiliflora* Rizki & Rugayah Sp. nov.

*Freycinetia sessiliflora* similar to *F. rigidifolia* and *F. pectinata* in its pectinate spinulose auricle. But differ in its leaf size and floral characters. The leaf size 47-55 cm x 0.7-1.6 cm. Pedicellus sessile, inner bract concave cylindrical (Figures 1 and 2).

*Typus*: Indonesia, Borneo, West Kalimantan, Mt. Nyiut Sambas, 108°59' - 109°07'40" east longitude and 0°48'30" - 0°52'20" north latitude. 20 August 2013, Rizki 03 (Holo-BO!).

*Description*: Climber, climbing up to 10 meters, internodes 3.5-12 cm long, 0.5-1 cm in diameter. *Leaves* imbricate, linear-lanceolate, 47-55x0.7-1.6 cm, stiff, longitudinal veins visible on the adaxial and abaxial surfaces; apex acuminate, sometimes revolute when dry; margins and midrib on the abaxial surfaces armed

Correspondence: Tatik Chikmawati, Department of Biology, Faculty of Mathematics and Natural Sciences, Bogor Agricultural University, Raya Darmaga Kampus IPB Darmaga Bogor 16680, West Java, Indonesia.  
Tel.: +62.251.8622642.  
E-mail: tchikmawati@yahoo.com

Key words: *Freycinetia sessiliflora*; Mount Nyiut; sessile.

Acknowledgements: the authors would like to thank to the Bogor Agricultural University (IPB), thanks also to Herbarium Bogoriense and Rijksherbarium, Leiden for the opportunity using the specimens. Thank also to Dr. Ary P. Keim and Prof. Mien A. Rifai for their opinion in the scientific writing and comments to the manuscript.

Contributions: the authors contributed equally.

Conflict of interest: the authors declare no potential conflict of interest.

Funding: this study was supported by Directorate General of Higher Education (DIKTI), Kemendikbud RI, Government of Indonesia.

Received for publication: 5 November 2014.

Revision received: 18 November 2014.

Accepted for publication: 18 December 2014.

This work is licensed under a Creative Commons Attribution NonCommercial 3.0 License (CC BY-NC 3.0).

©Copyright F.S. Rizki et al., 2015  
Licensee PAGEPress srl, Italy  
International Journal of Plant Biology 2015; 6:5701  
doi:10.4081/pb.2015.5701

from the base to the apex; spine triangle 0.2x0.1 cm, gradually smaller and fewer to the apex, the smaller ones 0.1 mm. *Auricles* pectinate spinulose, lobed at the apex, 3.5-4x0.3-0.8 cm. *Staminate inflorescence* not known.

*Pistillate inflorescence* terminal, umbellate with 3 cephalia; peduncles cylindrical, glabrous, 5-6 cm long, 0.4 cm in diameter; bracts 9 (3x3), concave cylindrical spoon-like,

Table 1. Morphological differences between *Freycinetia sessiliflora*, *Freycinetia rigidifolia*, and *Freycinetia pectinata*.

Characters	<i>Freycinetia sessiliflora</i>	<i>Freycinetia rigidifolia</i>	<i>Freycinetia pectinata</i>
Size of leaf, cm	47-55 x 0.7-1.6	25-33 x 0.7-1.6	15-20 x 0.9
Auricles	Pectinate spinulose, apex lobed	Pectinate spinulose, apex rounded	Pectinate spinulose, apex rounded
Pedicellus	Sessile	1.5-3 x 0.3-0.4 cm	0.3-0.5 x 0.5-0.7 cm
Shape of bracts	Concave cylindrical	Oblong-cylindrical	Oblong-cylindrical
Number of bract	3-9	3-7	3-6
Number of cephalia per inflorescences	2-3	2-3	4-5
Number of stigma	2-4	2-3	4-6 (-12)

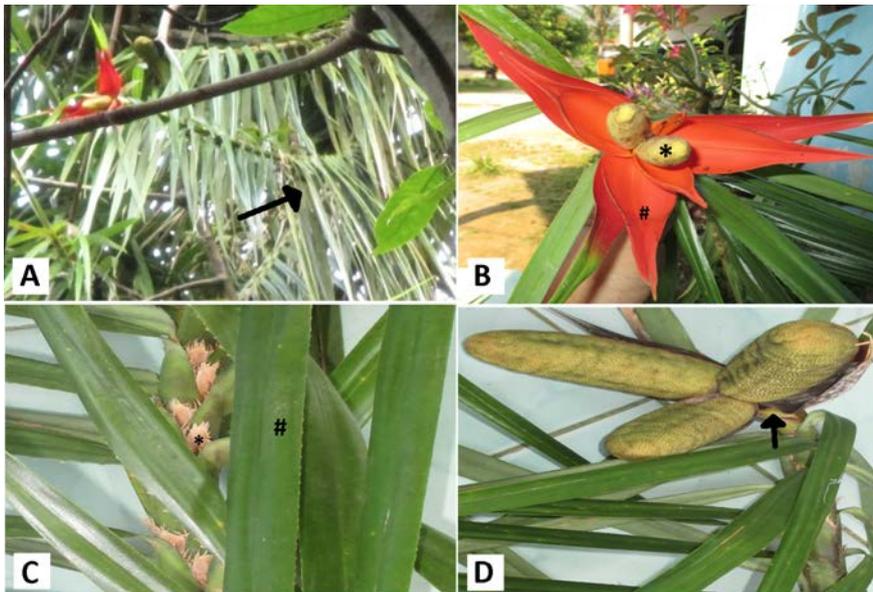


Figure 1. A) *Freycinetia sessiliflora* habit (see arrow); B) *F. sessiliflora* bractea and inflorescence: \*cephalia, #bract concave cylindrical; C) *F. sessiliflora* auricle pectinate spinulose, apex lobed: \*auricles pectinate spinulose, #leaves; *F. sessiliflora* cephalium and pedicellus sessile (arrow).

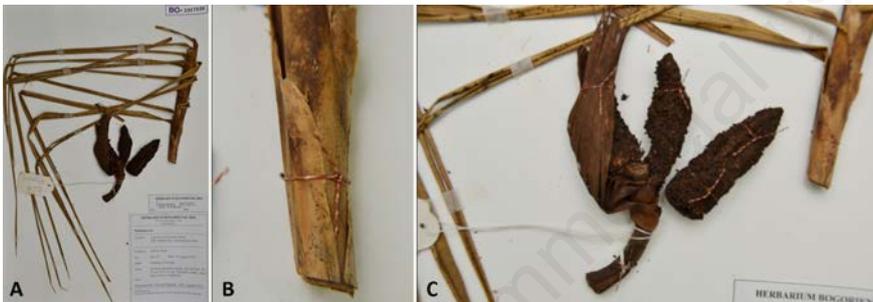


Figure 2. Holotype specimen of *Freycinetia sessiliflora* Rizki & Rugayah: A) *F. sessiliflora*; B) auricle of *F. sessiliflora*; C) inflorescence of *Freycinetia sessiliflora* Rizki & Rugayah.

outer 15-20×6-8 cm, inner 1.4-2×6-10 cm, red-orange, margins armed from the base to the apex. *Cephalia* 2-3, sessile, cylindrical, 6.5-8×2-2.5 cm long, berry pentagonal, 0.2-0.5 mm in diameter; stigma remains mostly 2-4, areola stigma with rings, seeds ellipsoid.

*Distribution*: West Kalimantan, Mount

Nyiut-Sambas.

*Etymology*: The epithet name is given for its obvious depressed pedicellus characteristic.

*Habitat*: *Freycinetia sessiliflora* located in lowland bush and secondary forest area from 90 to 750 m above sea level. Fruiting in August and February.

## Discussion

The naming of new species refers to the main character of this species i.e. sessile or sitting cephalium. This species closely related with *F. rigidifolia* and *F. pectinata* and included in section *Hemsleya* because it has a pectinate spinulose auricle. The differences of *Freycinetia sessiliflora* with *F. rigidifolia* and *F. pectinata* are the size of leaves, tip of auricle, shape of bractea, number of stigma and presence of pedicellus (Table 1).

## References

1. Stone BC. Malayan climbing pandans. The genus *Freycinetia* in Malaya. *Malayan Nat J* 1970;23:44-91.
2. Callmender MW, Chassot P, Kupfer P, Lowry P. Recognition of *Martellidendron*, a new genus of Pandanaceae, and its biogeographic implications. *Taxon* 2003;52:747-62.
3. Callmender MW, Lowry P, Forest F, et al. *Benstonea* Callm. & Buerki (Pandanaceae): characterization, circumscription, and distribution of a new genus of screw-pines, with a synopsis of accepted species. *Candollea* 2012;67:323-45.
4. Stone BC. Materials for a monograph of *Freycinetia* Gaud. (Pandanaceae) VI. Species of Borneo. *Gard Bull Sing* 1970;25:209-33.
5. Keim AP, Rugayah, Rustiami H. The Pandanaceae of the Bukit Baka Bukit Raya National Park and adjacent areas, West and Central Kalimantan, Indonesia, with notes on their nomenclature and the rediscovery of *Pandanus aristatus* and several new records. *Gard Bull Sing* 2006;63:31-62.
6. Keim AP. Three new species of *Freycinetia* (Pandanaceae) from Kalimantan, Indonesia. *Reinwardtia* 2009;13:15-20.