

Calamus vitiensis (ARECACEAE), A NEW RECORD OF RATTAN IN SUMBAWA ISLAND, INDONESIA

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ABSTRACT

Calamus vitiensis, previously known to occur only in Papua New Guinea, Australia (Queensland), the Solomon Islands, Vanuatu, and Fiji is now also found in the mountainous area of Batudulang, West Sumbawa, Lesser Sunda Islands, Indonesia. This paper presents a complete report of the description, notes, and illustrations of the species.

Keywords: *Calamus*, Lesser Sunda Islands, new record, Sumbawa

INTRODUCTION

Calamus, which comprises about 400 species, is one of the largest genera in the family Arecaceae. The genus is all native to and distributed from tropical Africa, tropical and subtropical Asia, to South West Pacific (Vorontsova *et al.* 2016). Rattans, including *Calamus*, occurs in the Malesiana region, particularly in the Malay Peninsula, Sabah, Sarawak, Brunei (Dransfield 1979; 1984; 1992; 1997; Dransfield & Patel 2005), and the Philippines (Baja-Lapis 2010). The genus was totally revised by Beccari (1908; 1911). In 2015, during an expedition launched by Herbarium Bogoriense in a mountainous area in west Sumbawa Island, Batudulang village, Batulanteh district, a species of *Calamus* was collected. This expedition was in conjunction with the flora of Lesser Sunda Islands project. However, the description of this species of *Calamus* does not match any of those *Calamus* species in the Lesser Sunda Islands, but matches very well with the description of *C. vitiensis* Warb. ex Becc. Several records show that *C. vitiensis* is only known to occur in Papua New Guinea, Australia (Queensland), the Solomon Islands, Vanuatu, and Fiji (Govaerts & Dransfield 2005; Dowe 2010; Baker *et al.* 2003). Based on morphometric

techniques, Baker *et al.* (2003) recognized four species of *Calamus aruensis* complex in New Guinea and the Pacific Islands (the Solomon Islands, Vanuatu, and Fiji), including *C. vitiensis*. These four species, *Calamus aruensis*, *C. vitiensis*, *C. dasyacanthus* and *C. pacypus*, are endemic to New Guinea and can be easily recognized by sheath spines and cirrus characters.

MATERIALS AND METHODS

The morphology of *C. vitiensis* was described based on the herbarium specimens deposited in Leiden Herbarium (L), Kew Herbarium (K), Firenze Herbarium (FI) and Herbarium Bogoriense (BO). Detailed morphological measurements were made using a ruler and a long arm microscope. DNA extraction amplification and sequencing of two barcoding regions, namely *rbcL* and *matK* were carried out using published primers under standard conditions (Kress & Erickson 2007). This paper also uses Baker *et al.* (2003) as the main reference material.

RESULTS AND DISCUSSION

Taxonomic Description

Calamus vitiensis Warb. ex Becc. Ann. Roy. Bot. Gard. (Calcutta) 11:350 (1908). Type: Small

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Island of Taviuni of the Fiji group, October 1881, 1,200 m asl, Weber 111 (holotype B destroyed; isotype FI!). — *Calamus stipitatus* Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15: 814 (1943). Type: Solomon Islands, Island of San Cristobal, Kirakira, August 23, 1932, L. J. Brass 2719 (holotype B, destroyed; isotypes BM, BO!, BRI). — *Calamus vanuatuensis* Dowse, Principes 37: 206 (1993). Type: Vanuatu. Erromango, Nouankao R., Chew Wee-Lek RSNH 118 (holotype PVNH; isotype KI!).

Slender solitary rattan climbing to 15 m. Stem with sheaths 20 mm in diam., without sheaths 7 mm in diam.; internodes 12.5 cm. Leaf cirrate, to ca. 2 m long including cirrus and petiole very short; sheath dark green, spines absent to numerous, yellow-green to brown, triangular, spine bases sometimes slightly swollen adaxially, spines usually rather uniform size, solitary or occasionally also with very few partial whorls of up to 6, spine impressions on sheath sometimes conspicuous, sheath mouth unarmed; knee present conspicuously; ocrea present; flagellum absent; petiole very short to 20 mm, rounded abaxially, unarmed or with few to many short triangular spines; rachis 1.2–2 m; leaflets 10–22 each side of rachis, arranged regularly or in widely spaced pairs, broadly lanceolate, longest leaflets 18–43 × 3.5–7 cm, apical leaflets 7–23.5 × 0.9–1.5 cm, basal leaflets small, leaflet surfaces unarmed or with very few bristles 0.8–2.2 mm on adaxial surface of major veins, leaflet margins unarmed or with very few bristles 0.2–5 mm, most numerous near apex, transverse veinlets inconspicuous; cirrus 0.6–2 m, cirrus spines arranged regularly. Staminate inflorescence unseen. Pistillate inflorescence, up to ca. 2 m long including 26 cm peduncle, branched to 2 orders; prophyll 14–31 × 1–1.2 cm, strictly tubular, with 2 keels, prophyll mouth entire, with acute, triangular limb to one side, sometimes subtending primary branch, indumentum as on sheath, unarmed or lightly armed with short spines; peduncular bracts absent or rarely 1, rachis bracts and peduncular bract (if present) 5.7–25 × 0.3–1.5 cm, similar to prophyll, unarmed to lightly armed as prophyll; primary branches 6–12, to 28 cm long, 8–28 cm apart, straight to recurving, with up to 40 rachillae, bracts on primary branch funnel-shaped; rachillae 0.9–9.5 × 0.1–0.2 cm, sublinear

to arcuate; rachilla bracts 1–2 × 1.5–2 mm, distichous to subdistichous, often rather widely spaced; flower clusters sometimes distinctly stalked, stalk 0.8–1.5 mm long. Fruit globose, still very young.

Distribution

Calamus vitiensis Warb. is distributed across Papua New Guinea, Australia (Queensland), the Solomon Islands, Vanuatu, Fiji, and now also in West Sumbawa (Indonesia).

Habitat and Ecology

Calamus vitiensis is a common species in the primary and secondary forest, between 60–750 m asl (Dransfield *et al.* 2008). In this study, the species was found in the mountainous area of Sumbawa Island at around 600 m asl.

Vernacular Names

Fiji: Ngganuya (Taveuni). Papua New Guinea: Wusiu (Manus). Solomon Islands: Kalitao, Kalitau (Kwaraae). Vanuatu: Gawolo (Vanua Lava). Sumbawa: Owe (Samawa).

Uses

Calamus vitiensis Warb. is used generally for cordage, for tying houses, for making swings for children, and the sap from the cut stem is used for curing eye ailments.

Notes

This is the first occurrence of *Calamus vitiensis* in Sumbawa, Lesser Sunda Islands. Its voucher information and GenBank accession numbers are presented in Table 1. Since there is no other accession of *C. vitiensis*, its DNA sequences are the first record for the GenBank.

Specimens Examined

Fiji, Taveuni, slopes of Mt. Manuka, east of Wairiki, August 03, 1953, AC Smith 8132, sterile (L). Jayapura, July 1956, Sijde BW 4003 (L). Manokwari Regency: Arfak Plains, Settlement Unit Seven, April 1994, Moge 6246 (BO!, K, L!, MAN, NY). Merauke Regency: Kwell, Sept. 2000, Maturbongs *et al.* 653 (BO, K!, MAN). Mimika Regency: Mile 39 on road from Timika to Tembagapura, March 1998, Heatubun *et al.*

260 (AAU, BH, BO!, K, L!, MAN). Nabire Regency: Samabusa, Feb. 2001, Maturbongs *et al.* 676 (BO!, K, MAN). Sorong Regency: Sorong, Klasaman, km 14, Sept. 1995, Maturbongs 278 (K, MAN); Raja Ampat Islands, Batanta Island, Waylebed, July 1996, Maturbongs 307 (K, MAN); Raja Ampat Islands, N Misool Island, 10 km SW of Limalas, Jan. 2002, Maturbongs *et al.* 695 (AAU, BO!, K, LAE, MAN); Raja Ampat Islands, Waigeo

Island, Waifoi, June 1997, Maturbongs 510 (K, MAN); Raja Ampat Islands, Salawati Island, Wayom, July 1996, Maturbongs 303 (K, MAN); Yapen Waropen Regency: Yapen Island, trans-Yapen highway, Oct. 1998, Maturbongs & Sagisolo 616 (BO!, K, L, MAN, N). Sumbawa, western part of Batudulang village, Batulanteh district, May 16, 2016, LD Sulistyaningsih 295, fertile (BO!) (Fig. 1 & 2).

Table 1 Voucher information and GenBank accession numbers for *Calamus vitiensis*

Species	Gene region	GenBank accession number	Voucher (Herbarium location)
<i>Calamus vitiensis</i>	rbcL	MG886842	LDS295(BO)
	MatK	MG886843	LDS295(BO)



A



B

Figure 1 A. Habit; B. Leaf sheath armature



A



B

Figure 2 A. Infructescences; B. Close up of infructescences

CONCLUSION

The existence of *Calamus vitiensis* from the mountainous area of Batudulang, West Sumbawa of Lesser Sunda Islands is confirmed and accepted as a new record. Since there is no other accession number of *C. vitiensis*, its record of DNA sequences is also the first for the GenBank,

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