

A New Species of *Calamus* (Palmae) from Taiwan

Andrew Henderson⁽¹⁾

(Manuscript received 20 April, 2005; accepted 27 May, 2005)

ABSTRACT: *Calamus beccarii* is described from Taiwan. It is compared with the two other species of *Calamus* from Taiwan, *C. formosanus* and *C. siphonospathus*, and distinguished from them by its presence of a flagellum and absence of a cirrus.

KEY WORDS: *Calamus beccarii*, new species, Taiwan.

In the first edition of the Flora of Taiwan, Li (1978) recognized one species of *Calamus*, *C. formosanus* Becc., and one of *Daemonorops*, *D. margaritae* (Hance) Becc. Chang (1988), in a revision of *Calamus* in Taiwan, recognized three species – *C. formosanus*; *C. siphonospathus* Mart., a Philippine species newly collected from Lanyu Island of the southern coast of Taiwan; and a new species, *C. orientalis* in which he included specimens formerly determined as *Daemonorops margaritae*. In the second edition of the *Flora of Taiwan*, Liao (2000) also recognized *C. formosanus* and *C. siphonospathus*, but included a third, previously overlooked species, *C. quinquesetinerivius* Burret, in which he placed *C. orientalis* as a synonym.

In preparation for a *Field Guide to the Palms of Southern Asia*, I have examined specimens from Taiwan from A, K, and NY, including type specimens, and I conclude that three species of *Calamus* are present, one of them undescribed. I believe this has been overlooked because of a lack of study of type specimens, and confusion of the two climbing organs found in *Calamus* – flagella and cirri. The flagellum is a long, whip-like structure borne on the leaf sheath, and is a sterile inflorescence. The cirrus is an extension of the leaf rachis, without leaflets. Both flagella and cirri have stout, grapnel-like spines.

I provide synonymy and brief descriptions of *C. formosanus* and *C. siphonospathus*, and a complete description of the new species. The three species may be distinguished as follows.

Key to the species of *Calamus* in Taiwan

- 1. Flagella present; cirri absent *Calamus beccarii*
- 1. Flagella absent; cirri present.
 - 2. Stems solitary; pinnae linear, closely spaced; inflorescence bracts swollen *C. siphonospathus*
 - 2. Stems clustered; pinnae broadly lanceolate, distantly spaced; inflorescence bracts tightly sheathing
..... *C. formosanus*

Calamus beccarii Henderson, sp. nov.

Fig. 1

Type: Taiwan. Pingtung: Bankinsing, no date, A. Henry 521a (holotype: NY; isotype: K).

Ab omnibus speciebus generis Formosae flagello praesenti et cirrho absentia differt.

Stems clustered, to 50 m long and 4 cm diameter (with leaf sheaths). Leaf sheaths brown, covered with black, needle-like, horizontally spreading spines to 2.5 cm long, these arranged

1. Institute of Systematic Botany, New York Botanical Garden, Bronx, NY 10458, USA. Tel: 1-718-8178973; Fax: 1-718-2201029; Email: ahenderson@nybg.org

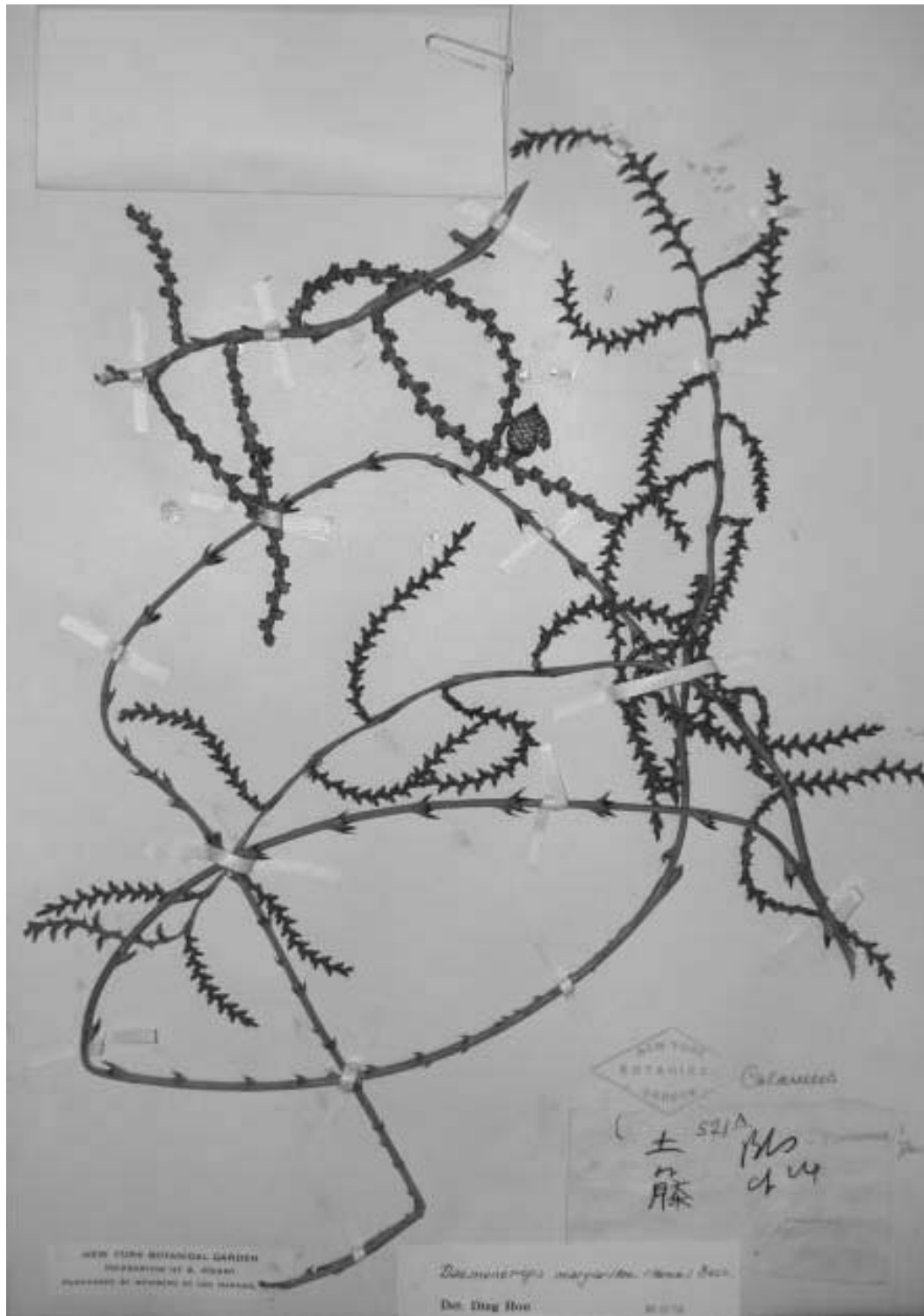


Fig. 1. Holotype of *Calamus beccarii*.

in short rows, interspersed with shorter spines to 0.5 cm long; knees obscure; ocreas present, densely spiny; flagella present, to 2.5 m long, with groups of grapnel-like spines abaxially; petioles to 22 cm long, sparsely covered with stout, yellowish spines to 1 cm long; rachis to 0.8

m long, abaxially with solitary, recurved, grapnel-like spines; pinnae 30-62 per side of rachis, linear, closely spaced to 2 cm apart, to 40 cm long and 1.5 cm wide, with minute spines on the veins abaxially and adaxially; cirri absent. Inflorescences to 3 m long; staminate inflorescences branched to two orders, flagellate, the bracts closely sheathing the main axis and with curved spines abaxially; rachillae 5-9 cm long, inserted above the mouth of the sheathing bract; rachillae bracts distichously arranged; floral bracteole cupular, tomentose along the margins; staminate flowers to 4.5 mm long, to 38 per rachilla, arranged alternately and distichously along the rachillae; calyx 4 mm long, tubular except for the 3-lobed apex; corolla 4 mm long, with 3 valvate petals free to the base; stamens 6; anthers dorsifixed; pistillode 1 mm long, 3-lobed; pistillate inflorescences branched to two orders; rachillae 4-10 cm long; rachillae bracts distichously arranged; distal floral bracteole with a small lateral depression bearing sterile staminate flower; pistillate flowers to 22 per rachilla, borne alternately and distichously along the rachillae; sepals to 4 mm long, connate basally, lobed above; petals to 3 mm long, free; fruits globose-ellipsoid, to 2 cm long including a short beak, to 1.2 cm diameter; scales fringed, yellowish-brown; endosperm homogeneous.

Distribution and habitat: Taiwan, in Kaohsiung and Pingtung counties, in lowland rainforest at low elevations.

Common name: *Tu-teng*.

Discussion: By its climbing habit, flagellum, tubular inflorescence bracts, sessile rachillae, and homogeneous endosperm this species appears to belong in Beccari's (1908) Group V. This large group of species is widespread throughout the Asian tropics. *Calamus beccarii* appears most similar morphologically to two Group V species from China (*C. rhabdocladus* Burret and *C. walkeri* Hance). *Calamus beccarii* differs from these in its needle-like spines (versus flattened spines) and its larger fruits (to 2 cm versus 1.4 cm long).

Additional specimens examined: Taiwan. Kaohsiung: Shenping, 12 Dec 1987, *Chang 1897b* (K). Pingtung: Chunjih Hsiang, Chachayalaishan Protection Area, 29th Compartment, 1 Mar 1992, *Liao 209* (A); "Formosa", no date, *Henry 521* (NY); Bankinsing, no date, *Henry 521b* (K).

Calamus siphonopathus Martius, Hist. nat. palm. 3: 342. 1840. Type. Philippines. Luzon: Manila, no date, *G. Perrottet s. n.* (holotype: G, n.v.).

Stems solitary, to 30 m long and 5 cm diameter (with leaf sheaths); leaf sheaths yellowish-brown, sparsely covered with needle-like, yellowish spines to 1 cm long; knee obscure; ocreas present, membranous; flagella absent; petioles to 20 cm long; pinnae to 50 per side of rachis, linear, regularly arranged, closely spaced to 2 cm apart; cirri present, to 1 m long. Inflorescence bracts open and swollen near the apex; fruits ellipsoid, to 0.6 cm long and 0.4 cm diameter, yellowish-brown.

Distribution and habitat: Taiwan, known only from Lanyu Island (Botel Tobago); scrub forest at low elevations.

Common name: *Lanyu sheng-teng*.

Additional specimens examined: Taiwan. Botel Tobago, 30 May 1976, *Chang 8608* (K); same locality, 13 Sep 1987, *Chang 1828-9* (K).

Discussion: This species is known only from the Philippines, and just reaches Taiwan on Lanyu Island. It is very variable morphologically, and six varieties are recognized (Lapis, 1987). The Taiwan plants were placed, without discussion, in var. *sublevis* Becc. by Chang (1988).

Calamus formosanus Becc., Rec. Bot. Surv. India 2: 211. 1902. Type. Taiwan. Kelung, 1864, *R. Oldham 629* (holotype: K).

Calamus quinquesetinervius Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15: 810. 1943. Type. Taiwan.
 Karenko: near Nanwo, 24 Nov 1918, *E. Wilson 11112* (holotype: B, destroyed; isotypes: A, K).
Calamus orientalis C. E. Chang, Quarterly Journal of Chinese Forestry 21: 108. 1988. Type. Taiwan.
 Nantou: Lienhuachi, *C. E. Chang 18496* (holotype: PPI n.v.; holotype image: NY).

Stems clustered, to 20 m long and 5 cm diameter (with leaf sheaths); leaf sheaths yellowish-brown, densely covered with flattened, yellowish, upward-pointing spines to 2 cm long; knees prominent, swollen, spiny; ocreas short or absent; flagella absent; petioles short or absent; pinnae 18-19 per side of rachis, broadly lanceolate, irregularly arranged (regularly arranged on young plants), distantly spaced 5-8 cm apart; cirri present. Inflorescence bracts tightly sheathing; fruits pedicellate, ellipsoid, to 2 cm long and 1 cm diameter, yellowish-brown.

Distribution and habitat: Taiwan, widely distributed in lowland to montane rainforest, to 1000 m elevation.

Common name: *Huang-teng*.

Additional specimens examined: Taiwan. Ilan: Fu Shan, Fu Shan branch office of Taiwan Forestry Research Institute, 26-27 Sep 1989, *Boufford et al. 25112* (A, K, NY). Nantou: Sun Moon Lake, 20 Nov 1987, *Chang 18552-3* (K); Round Lake, Candidius, 1918, *Wilson 10004* (A). Pingtung: Bankinsing mountains, no date, *Henry 522* (A, NY); South Cape, no date, *Henry 587* (K); same locality, no date, *Henry 687* (A); same locality, no date, *Henry 1354* (K); Mutanshe, 2 Apr 1926, *Saito 7901* (A). Taipei: Tamsui, no date, *Morse s. n.* (K). Unknown county: Dainamon, NE coast, no date, *Price 1127* (K).

Discussion: The type of *C. formosanus*, and the illustration and description of Beccari (1908, 1913), show a palm with irregularly arranged, distantly spaced, broadly lanceolate pinnae, and the rachis ending in a cirrus. This is identical with the isotype of *Calamus quinquesetinervius* and an image of the type and illustration of *C. orientalis*. *Calamus formosanus* was placed by Beccari (1908) in Group XV, and appears to be a member of the *C. palustris* group of species.

ACKNOWLEDGEMENTS

I thank Dr. Sheng-Zehn Yang, curator of PPI, for providing an image of the type of *Calamus orientalis*; the curators of A, K, and NY for making specimens available for study; Ya-Yi Huang for help with translation; and Dr. Lucia Kawasaki for the latin diagnosis.

LITERATURE CITED

- Beccari, O. 1908. Asiatic Palms – Lepidocaryeae. The species of *Calamus*. Ann. Roy. Bot. Gard. (Calcutta) **11**: 1-518.
- Beccari, O. 1913. Asiatic Palms – Lepidocaryeae. The species of *Calamus*. Supplement to Part 1. Ann. Roy. Bot. Gard. (Calcutta) **11** (Appendix): 1-142.
- Chang, C.-E. 1988. The genus *Calamus* L. in Taiwan. Quarterly Journal of Chinese Forestry **21**: 108-112.
- Lapis, A. 1987. An account of taxa related to *Calamus siphonospathus* complex. Sylvatrop The Philippine Forest Research Journal **12**: 62-85.
- Li, H.-L. 1978. Palmae. In: Huang, T.-C. *et al.* (eds.). Flora of Taiwan, 1st ed. **5**: 784-794. Editorial Committee, Department of Botany, National Taiwan University, Taipei, Taiwan.
- Liao, J.-C. 2000. Palmae. In: Huang, T.-C. *et al.* (eds.). Flora of Taiwan, 2nd ed. **5**: 655-662.

Editorial Committee, Department of Botany, National Taiwan University, Taipei, Taiwan.

臺灣新種省藤屬植物—土藤 (棕櫚科)

Andrew Henderson⁽¹⁾

(收稿日期：2005 年 4 月 20 日；接受日期：2005 年 5 月 27 日)

摘 要

本文予臺灣新種植物土藤命名；且本種具有纖鞭，不具卷鬚，可與臺灣產另兩種省藤屬植物(蘭嶼省藤與黃藤)區別。

關鍵詞：土藤、新種、臺灣。

1. Institute of Systematic Botany, New York Botanical Garden, Bronx, NY 10458, USA. Tel: 1-718-8178973; Fax: 1-718-2201029; Email: ahenderson@nybg.org